Market Risk Premium for any market is not salubrious for peace or mind.
https://comcom.govt.nz/__data/assets/pdf_file/0029/282674/5B20225D-NZCC-12-Cost-of-capital-determination-EDBs-and-WIAL-3-May-2022.pdf.
https://indialogue.io/clients/reports/public/5d9da61986db2894649a7ef2/5d9da63386db2894649a7ef5

The CAPM is wrongly derived from very beginning (basically, CAPM is the first order condition for optimal portfolio decision (which must have a unique solution of mean-variance efficient portfolio) with its unique solution of market portfolio. CAPM is, of course, a tautology even the market portfolio is mean-variance efficient, not an asset pricing no matter market portfolio is mean-variance efficient or no. In sum, CAPM is theoretical useless.

En Uruguay la práctica más aceptada es descontar flujos convertidos a USD dada la debilidad de la moneda local y dolarizacion de la economía.

Your research over the years has been enlightening. It would be interesting to see the "meta" research on your data, that is, an analysis of the cross-section / time series to determine if there is any information embedded in the disperse responses that you receive, e.g. for forecasting or determining whether the consensus is correct over time.

I am guessing you already know my answers:
1. I do not use CAPM, the build-up-method or similar strategies to figure out required rates of return, and I pay no attention to the so-called "Market Risk Premium". Instead I rely mostly on the Pepperdine Cost of Capital Survey in my work.
2. I acknowledge current and changing U.S. Treasury bond rates because it's probably true they have some effect on investors' Required Rates of Return. But I don't use any specific number at any given time so I don't have an answer to your second question either.

We use a WACC of 8.0% for our pan-European industrial coverage, including UK, CH. We are not explicitly modeling Rf, beta or premium.

I just wanted to thank you for your annual surveys. I work in the intersection between academic theory and economic policy, and your annual surveys provide me with an excellent tool for explaining the market environment for debt-financed government spending. I am especially pleased with the opportunity that your survey provides, to point to the risk-free rates in relation to where par yields are on treasury debt, trends in inflation-adjusted securities and government bond rating.

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Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024

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ABSTRACT

This paper contains the statistics of a survey about the Risk-Free Rate (**R_F**) and the Market Risk Premium (**MRP**) used in 2024 for **96 countries**. We got answers for 104 countries, but we only report the results for 96 countries with more than 6 answers.

The paper also contains the links to previous years surveys, from 2008 to 2023.

JEL Classification: G12, G31, M21

Keywords: equity premium; required equity premium; expected equity premium; risk-free rate

March 11, 2024

xPpLmnlsj

1. Market Risk Premium (MRP), Risk Free Rate (RF) and Km [RF + MRP] used in 2024 in 96 countries

We sent a short email (see exhibit 1) in February, 2024 to more than 14,000 email addresses of finance and economics professors, analysts and managers of companies obtained from previous correspondence, papers and webs of companies and universities. We asked about the Risk-Free Rate (**RF**) and the Market Risk Premium (**MRP**) **used *"to calculate the required return to equity in different countries"***.

By March 9, 2024, we had received 1,634 emails. 134 persons answered that they do not use MRP (see table 1), most of them use Km (required return to equity) but do not use MRP nor RF. The remaining emails had specific Risk-Free Rates and MRPs used in 2024 for one or more countries.[1] We would like to sincerely thank everyone who took the time to answer us.

Table 1. MRP and RF used in 2022: 1,624 emails

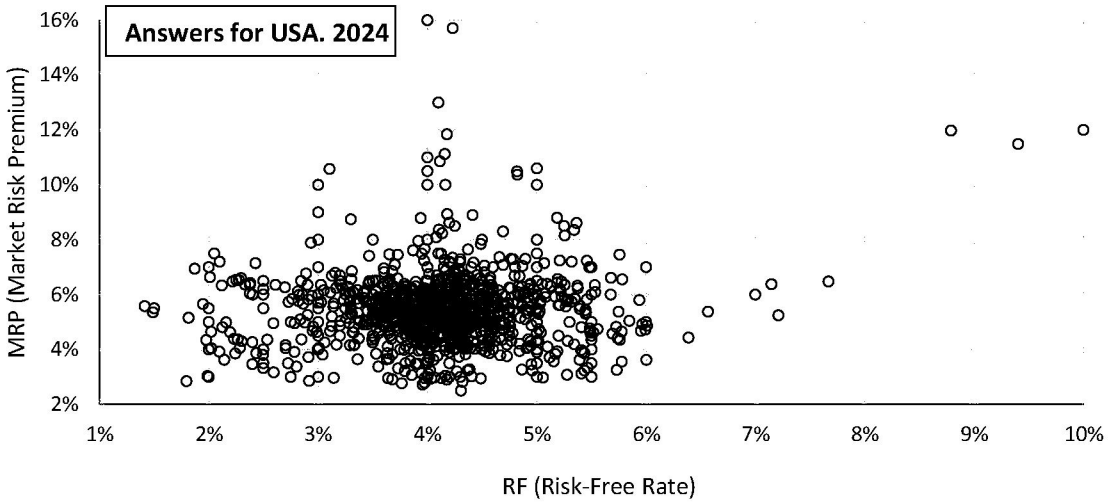
	Total
Answers reported (MRP figures)	**4,064**
Answers for countries with less than 6 answera	**22**
Outliers	**42**
"I can't provide you those figures: now are confidential"	**61**
Only MRP or RF (not both)	**34**
"We do not use MRP"	**134**

Table 2 contains the statistics of the **MRP** used in 2024 **for 96 countries**. We got answers for 102 countries, but we only report the results for 96 countries with more than 6 answers.

Table 3 contains the statistics of the Risk-Free Rate (**RF**) used in 2024 in the 96 countries[2] and **Table 4** contains the average of **Km** (required return to equity: Km = Risk-Free Rate + MRP).

Figure 1 is a graphic representation of the answers (Km and RF) we got for USA.

Figure 1. Answers for USA. RF and Km (RF + MRP) used in 2024



[1] We considered 54 of them as outliers because they provided a very small MRP (below 2%)

[2] Fernandez, P. (2020), "'Normalized' Risk-Free Rate: Fiction or Science Fiction?" Available at: https://ssrn.com/abstract=3708863

Table 2. Market Risk Premium (MRP) used for 96 countries in 2024

MRP	Number of Answers	Average	Median	MAX	min
USA	1287	5,5%	5,5%	16,0%	3,0%
Spain 2024	413	6,4%	6,0%	15,0%	3,0%
AbuDhabi	6	6,0%	6,3%	6,5%	5,1%
Andorra	6	8,2%	8,7%	8,9%	7,0%
Argentina	13	21,3%	21,1%	26,7%	13,0%
Australia	34	5,5%	5,4%	10,0%	2,0%
Austria	56	5,9%	5,9%	10,2%	3,0%
Bangladesh	6	11,6%	11,6%	12,9%	10,6%
Barbados	6	16,3%	17,1%	18,2%	13,4%
Belgium	68	5,7%	5,5%	8,0%	3,0%
Bolivia	8	15,1%	14,8%	17,9%	13,0%
Bosnia	21	7,9%	6,0%	16,6%	3,0%
Brazil	56	7,6%	8,3%	11,1%	3,5%
Bulgaria	11	6,8%	7,3%	8,3%	3,0%
Canada	60	5,2%	5,5%	7,5%	0,5%
Chile	21	6,3%	6,3%	7,4%	5,2%
China	36	6,6%	6,0%	13,0%	2,0%
Colombia	19	7,4%	7,4%	9,2%	4,6%
Costa Rica	10	12,2%	12,9%	14,7%	8,8%
Croatia	22	6,2%	6,0%	9,0%	3,0%
Cyprus	7	7,8%	7,4%	9,0%	7,0%
Czech Republic	27	5,6%	5,6%	8,0%	0,3%
Denmark	34	5,8%	5,5%	12,0%	3,0%
Dominican Rep.	9	11,1%	11,5%	13,0%	9,4%
Ecuador	17	15,8%	18,7%	23,2%	4,5%
Egypt	11	16,8%	15,6%	20,0%	14,4%
Estonia	17	6,3%	6,7%	6,9%	5,3%
Ethiopia	7	19,5%	20,5%	20,7%	16,9%
Finland	32	5,7%	5,5%	8,0%	3,0%
France	92	5,6%	5,6%	8,0%	3,0%
Georgia	8	10,0%	10,5%	10,7%	8,6%
Germany	273	5,6%	5,6%	8,5%	2,0%
Ghana	7	22,7%	23,8%	25,7%	18,3%
Greece	41	6,7%	6,0%	12,2%	3,0%
Hong Kong	23	7,3%	6,6%	13,0%	5,2%
Hungary	24	6,3%	6,0%	9,0%	3,0%
Iceland	6	6,6%	6,9%	7,1%	5,5%
India	31	8,4%	8,0%	16,0%	4,0%
Indonesia	9	8,2%	8,3%	9,1%	7,0%
Ireland	38	5,5%	5,7%	7,2%	3,0%
Israel	23	6,0%	5,9%	7,1%	5,0%
Italy	86	6,2%	6,0%	12,0%	3,0%
Jamaica	6	13,2%	13,8%	14,9%	10,6%
Japan	39	5,5%	6,0%	7,5%	3,0%
Kazakhstan	6	7,8%	7,9%	8,9%	6,0%
Kenya	9	14,9%	15,0%	16,2%	13,4%
Korea, (South)	22	5,8%	5,8%	6,5%	5,1%
Kuwait	12	6,3%	6,7%	6,9%	5,3%
Latvia	13	7,0%	7,3%	7,7%	6,0%
Lithuania	28	6,5%	6,7%	7,1%	5,5%
Luxembourg	39	5,5%	5,5%	8,0%	3,0%
Malaysia	8	7,2%	7,4%	8,0%	6,0%
Malta	7	6,2%	5,8%	7,5%	5,5%
Mauritius	8	8,7%	9,1%	9,4%	7,4%

Mexico	47	7,3%	7,4%	13,0%	4,6%
Mongolia	10	16,4%	16,4%	21,0%	13,4%
Montenegro	6	11,4%	12,0%	13,7%	7,3%
Morocco	17	9,1%	9,5%	9,9%	7,8%
Mozambique	13	18,6%	19,1%	20,7%	15,0%
Netherlands	61	5,4%	5,4%	8,0%	3,0%
New Zealand	12	6,0%	5,9%	7,5%	4,4%
Nigeria	11	15,2%	15,6%	17,9%	12,0%
Norway	30	5,4%	5,3%	8,0%	3,0%
Pakistan	11	16,3%	18,9%	22,1%	6,0%
Panama	10	8,9%	8,5%	13,0%	7,0%
Peru	21	8,8%	7,5%	16,4%	5,7%
Phillipines	13	7,4%	7,2%	8,8%	6,0%
Poland	33	5,8%	5,8%	8,0%	3,0%
Portugal	46	6,0%	6,0%	8,2%	2,7%
Qatar	9	6,7%	6,3%	12,0%	4,6%
Romania	32	7,4%	7,4%	9,7%	5,5%
Nrth Macedonia	6	10,7%	10,6%	12,2%	9,4%
Russia	19	10,5%	10,5%	18,9%	4,7%
Saudi Arabia	22	6,8%	6,1%	14,0%	4,6%
Serbia	18	6,9%	6,0%	11,1%	3,0%
Singapore	21	5,1%	5,1%	5,7%	4,4%
Slovakia	21	5,6%	5,8%	8,0%	0,5%
Slovenia	18	5,9%	6,0%	8,0%	3,0%
South Africa	33	8,3%	8,6%	16,0%	5,0%
Sri Lanka	7	23,5%	23,8%	25,7%	21,0%
Sweden	55	5,4%	5,4%	8,0%	3,0%
Switzerland	61	5,3%	5,3%	8,0%	3,0%
Taiwan	28	6,0%	6,0%	8,0%	3,0%
Tanzania	7	13,9%	14,6%	14,9%	12,0%
Thailand	13	7,7%	8,0%	8,7%	6,6%
Trinidad and Tobago	7	10,0%	10,5%	10,7%	8,6%
Tunisia	8	21,7%	22,5%	25,3%	16,9%
Turkey	13	16,5%	17,2%	20,0%	12,0%
Uganda	6	13,9%	14,6%	14,9%	12,0%
Ukraine	10	22,6%	22,4%	25,5%	21,0%
United Arab Emirates (UAE)	13	6,2%	5,7%	12,0%	3,5%
United Kingdom	82	5,7%	5,6%	8,0%	4,0%
Uruguay	9	9,0%	8,5%	13,0%	7,0%
Venezuela	9	26,8%	29,0%	32,3%	13,0%
Vietnam	10	9,7%	10,4%	10,8%	8,0%
Zambia	8	22,7%	23,8%	25,7%	18,3%

Table 3. Risk Free Rate (R_F) used for 96 countries in 2024

R_F	Number of Answers	**Average**	Median	MAX	min
USA	1287	4,1%	4,0%	10,0%	1,5%
Spain 2024	413	3,5%	3,5%	5,1%	2,0%
AbuDhabi	6	2,9%	2,8%	3,5%	2,7%
Andorra	6	3,3%	3,2%	4,0%	2,9%
Argentina	13	17,4%	15,8%	40,0%	9,5%
Australia	34	4,2%	4,2%	5,0%	2,5%
Austria	56	3,0%	3,0%	4,5%	2,0%
Bangladesh	6	9,2%	8,9%	14,1%	5,5%
Barbados	6	4,9%	4,7%	5,8%	4,6%
Belgium	68	3,1%	3,0%	4,5%	2,0%

Bolivia	8	6,8%	6,8%	8,1%	5,7%
Bosnia	21	3,8%	3,1%	8,1%	2,0%
Brazil	56	9,8%	10,0%	13,5%	4,5%
Bulgaria	11	4,1%	4,1%	6,3%	2,6%
Canada	60	3,5%	3,5%	5,0%	1,7%
Chile	21	6,0%	5,4%	13,0%	4,5%
China	36	3,0%	2,5%	5,1%	2,0%
Colombia	19	9,8%	9,6%	13,0%	5,4%
Costa Rica	10	4,7%	5,0%	5,8%	3,5%
Croatia	22	3,1%	3,1%	4,5%	2,0%
Cyprus	7	3,6%	3,4%	4,1%	3,2%
Czech Republic	27	3,4%	3,4%	5,0%	2,0%
Denmark	34	2,9%	2,9%	4,5%	2,0%
Dominican Rep.	9	7,9%	7,8%	9,2%	7,4%
Ecuador	17	13,9%	14,1%	17,3%	9,0%
Egypt	11	18,7%	18,1%	27,0%	14,8%
Estonia	17	2,3%	2,2%	3,5%	1,5%
Ethiopia	7	12,0%	11,7%	13,8%	11,4%
Finland	32	3,0%	3,0%	4,5%	1,8%
France	92	3,0%	3,0%	4,5%	1,0%
Georgia	8	4,9%	4,7%	5,8%	4,7%
Germany	273	2,7%	2,5%	7,5%	1,0%
Ghana	7	18,6%	18,0%	21,9%	17,4%
Greece	41	3,3%	3,3%	4,7%	2,0%
Hong Kong	23	3,9%	3,8%	4,3%	3,6%
Hungary	24	4,3%	3,4%	8,9%	2,0%
Iceland	6	6,4%	6,2%	7,4%	6,1%
India	31	7,2%	7,1%	10,0%	6,0%
Indonesia	9	6,9%	6,9%	7,7%	6,4%
Ireland	38	2,9%	3,0%	3,5%	2,2%
Israel	23	4,4%	4,1%	5,6%	3,9%
Italy	86	3,4%	3,5%	4,5%	2,0%
Jamaica	6	4,8%	4,6%	5,8%	4,5%
Japan	39	1,1%	0,8%	4,0%	0,5%
Kazakhstan	6	5,7%	5,8%	7,0%	4,8%
Kenya	9	16,1%	15,4%	20,1%	14,1%
Korea, (South)	22	3,5%	3,5%	4,0%	2,9%
Kuwait	12	2,0%	2,0%	2,3%	1,9%
Latvia	13	2,3%	2,9%	3,5%	0,9%
Lithuania	28	3,1%	3,6%	4,3%	1,5%
Luxembourg	39	3,1%	3,0%	4,5%	2,0%
Malaysia	8	4,0%	4,1%	4,5%	3,7%
Malta	7	3,7%	3,5%	4,2%	3,3%
Mauritius	8	4,6%	4,4%	5,6%	4,1%
Mexico	47	9,2%	9,2%	12,0%	5,4%
Mongolia	10	10,4%	9,8%	12,0%	9,5%
Montenegro	6	6,6%	7,1%	8,1%	2,5%
Morocco	17	3,7%	3,7%	4,5%	3,3%
Mozambique	13	7,3%	7,3%	9,2%	5,0%
Netherlands	61	2,9%	3,0%	4,5%	2,0%
New Zealand	12	4,9%	4,8%	5,7%	4,7%
Nigeria	11	13,9%	14,8%	18,0%	5,0%
Norway	30	3,3%	3,3%	4,5%	1,5%
Pakistan	11	15,7%	15,7%	17,2%	14,2%
Panama	10	6,6%	6,9%	7,0%	5,7%
Peru	21	6,2%	6,4%	7,7%	4,0%
Phillipines	13	6,0%	6,0%	7,3%	5,0%
Poland	33	4,3%	4,5%	6,8%	2,0%

Portugal	46	3,1%	3,0%	5,8%	2,0%
Qatar	9	4,7%	4,8%	6,0%	2,9%
Romania	32	6,4%	6,6%	7,8%	3,0%
Nrth Macedonia	6	6,4%	6,2%	7,5%	5,9%
Russia	19	11,1%	11,5%	15,0%	4,9%
Saudi Arabia	22	5,4%	5,1%	8,0%	4,3%
Serbia	18	4,2%	3,5%	8,0%	2,0%
Singapore	21	3,2%	3,0%	4,0%	2,6%
Slovakia	21	3,1%	3,1%	4,5%	2,0%
Slovenia	18	3,1%	3,0%	4,5%	2,0%
South Africa	33	10,3%	10,1%	12,0%	9,0%
Sri Lanka	7	12,6%	13,0%	15,4%	9,3%
Sweden	55	2,9%	2,9%	4,5%	1,9%
Switzerland	61	2,2%	2,1%	4,5%	0,7%
Taiwan	28	1,4%	1,2%	2,2%	0,8%
Tanzania	7	9,3%	8,8%	11,5%	8,1%
Thailand	13	2,7%	2,6%	3,0%	2,4%
Trinidad and Tobago	7	4,9%	4,7%	5,8%	4,7%
Tunisia	8	7,9%	7,6%	9,2%	7,6%
Turkey	13	18,6%	15,2%	30,0%	10,0%
Uganda	6	13,6%	13,0%	17,7%	11,3%
Ukraine	10	13,1%	11,7%	20,6%	7,7%
United Arab Emirates (UAE)	13	4,5%	4,2%	6,7%	3,0%
United Kingdom	82	4,0%	4,0%	6,0%	2,0%
Uruguay	9	7,1%	8,0%	10,4%	2,0%
Venezuela	9	24,1%	24,7%	29,9%	20,2%
Vietnam	10	3,1%	3,0%	4,5%	2,2%
Zambia	8	26,6%	26,8%	29,0%	23,9%

Table 4. Km [Required return to equity (market): R_F + MRP)] used for 96 countries in 2024

Km = R_F + MRP	Number of Answers	**Average**	Median	MAX	min
USA	1287	9,6%	9,5%	22,0%	5,0%
Spain 2024	413	9,8%	9,7%	20,0%	6,0%
AbuDhabi	6	8,9%	9,1%	9,3%	8,3%
Andorra	6	11,5%	11,8%	11,8%	10,9%
Argentina	13	38,7%	38,2%	63,0%	30,0%
Australia	34	9,6%	9,3%	15,0%	5,0%
Austria	56	8,9%	8,5%	13,2%	6,1%
Bangladesh	6	20,8%	20,6%	24,7%	17,1%
Barbados	6	21,2%	21,8%	22,8%	19,1%
Belgium	68	8,8%	8,5%	10,5%	6,1%
Bolivia	8	21,9%	21,6%	24,6%	20,1%
Bosnia	21	11,7%	8,8%	22,9%	6,1%
Brazil	56	17,3%	16,5%	23,2%	12,3%
Bulgaria	11	10,9%	11,5%	13,9%	6,1%
Canada	60	8,4%	8,7%	11,0%	2,5%
Chile	21	12,4%	11,9%	19,0%	10,9%
China	36	9,6%	9,8%	17,0%	4,5%
Colombia	19	17,2%	17,6%	21,8%	11,9%
Costa Rica	10	16,9%	17,6%	18,4%	13,8%
Croatia	22	9,3%	8,9%	13,0%	6,1%
Cyprus	7	11,4%	10,9%	13,1%	10,7%
Czech Republic	27	8,9%	9,0%	11,2%	3,7%
Denmark	34	8,7%	8,5%	16,0%	6,1%
Dominican Rep.	9	19,1%	19,0%	21,0%	17,9%
Ecuador	17	29,7%	34,4%	37,2%	15,0%

Egypt	11	35,4%	35,0%	47,0%	29,3%
Estonia	17	8,6%	8,5%	9,3%	8,4%
Ethiopia	7	31,5%	32,0%	32,2%	29,8%
Finland	32	8,6%	8,5%	10,5%	6,1%
France	92	8,6%	8,5%	12,0%	5,0%
Georgia	8	14,9%	15,2%	15,4%	14,0%
Germany	273	8,3%	8,4%	16,0%	4,5%
Ghana	7	41,3%	41,5%	43,7%	38,2%
Greece	41	10,0%	9,5%	16,6%	6,1%
Hong Kong	23	11,2%	10,2%	16,8%	9,3%
Hungary	24	10,6%	9,3%	17,9%	6,1%
Iceland	6	13,0%	13,1%	13,4%	12,3%
India	31	15,7%	15,4%	26,0%	11,5%
Indonesia	9	15,1%	14,9%	16,1%	14,1%
Ireland	38	8,4%	8,4%	10,4%	6,1%
Israel	23	10,4%	10,4%	11,8%	9,0%
Italy	86	9,7%	9,5%	16,5%	6,0%
Jamaica	6	18,0%	18,4%	19,4%	16,2%
Japan	39	6,6%	6,9%	9,3%	4,5%
Kazakhstan	6	13,5%	13,1%	14,7%	12,4%
Kenya	9	31,0%	30,6%	33,5%	28,7%
Korea, (South)	22	9,3%	9,4%	9,9%	8,8%
Kuwait	12	8,4%	8,6%	8,8%	7,6%
Latvia	13	9,3%	9,4%	10,2%	8,6%
Lithuania	28	9,6%	9,8%	10,3%	8,6%
Luxembourg	39	8,6%	8,5%	10,5%	6,1%
Malaysia	8	11,2%	11,3%	12,1%	10,2%
Malta	7	10,0%	9,6%	11,7%	9,4%
Mauritius	8	13,3%	13,4%	13,6%	12,7%
Mexico	47	16,5%	17,0%	24,3%	11,2%
Mongolia	10	26,8%	25,9%	33,0%	24,1%
Montenegro	6	18,0%	19,1%	21,7%	9,8%
Morocco	17	12,9%	13,2%	13,2%	12,1%
Mozambique	13	25,9%	26,9%	28,0%	20,0%
Netherlands	61	8,3%	8,3%	10,5%	6,1%
New Zealand	12	10,9%	10,7%	12,4%	9,5%
Nigeria	11	29,1%	31,2%	32,7%	17,0%
Norway	30	8,7%	8,8%	10,5%	6,1%
Pakistan	11	32,0%	34,6%	36,3%	21,5%
Panama	10	15,4%	14,8%	20,0%	13,4%
Peru	21	14,9%	14,3%	22,6%	11,0%
Phillipines	13	13,4%	13,8%	15,1%	11,5%
Poland	33	10,1%	10,5%	13,8%	6,1%
Portugal	46	9,1%	9,0%	11,6%	5,8%
Qatar	9	11,4%	10,4%	18,0%	9,6%
Romania	32	13,8%	14,4%	17,5%	8,5%
Nrth Macedonia	6	17,0%	17,2%	18,4%	15,5%
Russia	19	21,6%	19,6%	29,4%	16,1%
Saudi Arabia	22	12,3%	11,2%	22,0%	9,1%
Serbia	18	11,1%	9,3%	19,1%	6,1%
Singapore	21	8,3%	8,2%	9,0%	7,7%
Slovakia	21	8,8%	8,8%	11,1%	3,4%
Slovenia	18	9,0%	8,9%	11,8%	6,1%
South Africa	33	18,6%	18,1%	25,0%	15,5%
Sri Lanka	7	36,1%	36,0%	38,2%	34,8%
Sweden	55	8,3%	8,1%	10,5%	6,1%
Switzerland	61	7,5%	7,6%	10,5%	5,0%
Taiwan	28	7,3%	7,5%	10,2%	4,5%

Tanzania	7	23,2%	23,0%	24,0%	22,6%
Thailand	13	10,4%	10,4%	11,3%	9,5%
Trinidad and Tobago	7	14,9%	15,2%	15,4%	14,0%
Tunisia	8	29,7%	30,1%	33,0%	25,8%
Turkey	13	35,1%	34,5%	42,5%	28,0%
Uganda	6	27,5%	27,1%	29,7%	26,1%
Ukraine	10	35,7%	34,1%	43,3%	30,3%
United Arab Emirates (UAE)	13	10,7%	10,0%	18,0%	6,5%
United Kingdom	82	9,7%	9,8%	12,5%	6,0%
Uruguay	9	16,0%	17,0%	21,0%	11,6%
Venezuela	9	50,9%	54,1%	57,0%	34,0%
Vietnam	10	12,8%	12,5%	15,2%	11,0%
Zambia	8	49,3%	49,4%	53,2%	44,4%

2. Changes from 2015 to 2018, 2019, 2020, 2021, 2022 and 2023

Tables 5 and 6 compare the results of the 2023 survey with the results of the surveys published in 2015, 2018, 2019, 2020, 2021 and 2022.

Table 5. Km [Required return to equity (market): RF + MRP)]
Averages of the surveys of 2023, 2022, 2021, 2020, 2019, 2018 and 2015

	average Km (RF + MRP)						
	2023	**2022**	**2021**	**2020**	**2019**	**2018**	**2015**
USA	9,5	8,3	7,3	7,5	8,3	8,2	7,9
Spain	10,1	8,8	7,4	7,6	8,1	8,8	8,1
Argentina	57,7	58,3	41,6	29,6	25,0	23,2	35,5
Australia	10,0	9,7	9,0	10,3	9,3	9,7	9,1
Austria	9,5	7,6	6,5	7,1	7,4	8,2	8,5
Belgium	10,2	7,2	6,5	7,1	7,4	7,8	6,8
Brazil	21,5	20,1	14,2	12,7	15,4	15,7	16,5
Canada	9,5	8,5	7,5	7,5	8,3	8,7	8,2
Chile	11,8	13,1	10,2	10,2	10,5	10,2	10,4
China	12,8	12,6	9,0	9,8	11,5	10,1	12,6
Colombia	20,6	16,5	13,8	14,5	13,9	15,4	12,1
Czech Rep.	10,9	10,1	7,8	8,2	8,7	8,5	7,4
Denmark	9,0	7,2	6,5	7,0	7,2	7,6	6,8
Finland	9,4	7,0	6,5	7,5	7,3	7,6	6,9
France	9,0	7,6	6,6	7,0	7,2	7,5	7,1
Germany	8,2	6,9	6,4	6,6	6,8	6,7	6,6
Greece	15,0	8,2	7,8	19,1	19,7	20,6	29,3
Hungary	16,7	11,6	10,4	10,5	11,9	11,5	9,4
India	15,5	12,5	12,9	11,8	14,8	14,7	15,8
Indonesia	14,9	13,2	12,9	13,9	16,2	15,6	16,4
Ireland	9,6	7,3	6,6	7,9	7,4	8,1	6,8
Israel	10,8	8,7	6,8	7,8	8,4	7,7	6,1
Italy	11,1	7,7	7,0	7,5	7,9	8,4	6,9
Japan	7,1	6,4	5,7	7,1	7,2	6,0	6,5
Korea (South)	9,3	9,7	8,3	8,1	9,1	8,8	8,5
Mexico	16,0	14,8	12,2	13,7	15,4	15,3	12,3
Netherlands	8,7	7,5	6,7	7,5	7,3	7,5	7,7
New Zealand	10,9	9,5	8,0	8,6	8,9	8,9	9,5
Norway	9,2	7,5	7,2	7,0	7,4	8,1	6,9
Peru	14,9	13,3	11,1	10,7	13,1	12,6	11,2
Poland	13,4	9,7	8,2	9,0	9,7	9,4	7,9
Portugal	11,6	7,8	8,2	8,7	10,1	10,4	7,3

Russia	27,6	20,0	13,8	13,7	16,8	16,5	17,1
South Africa	18,1	16,4	15,1	14,6	16,4	14,5	15,9
Sweden	7,5	7,4	8,4	7,1	7,4	8,9	6,5
Switzerland	7,4	7,2	5,3	7,0	7,3	8,0	6,5
Thailand	11,1	10,1	9,5	10,2	11,3	12,4	16,0
Turkey	32,7	33,6	27,2	21,2	20,8	18,0	17,1
UK	9,8	8,5	6,9	6,9	8,3	7,5	7,3
Uruguay	17,7	12,7	11,3	15,2	12,8	13,6	10,7
Venezuela	64,3	58,8	60,2	34,5	36,3	28,6	23,1

Table 6. Market Risk Premium (MRP) and Risk Free Rate (RF) (%)
Averages of the surveys of 2023, 2022, 2021, 2020, 2019, 2018 and 2015

	Av. 2023		Av. 2022		Av. 2021		Av. 2020		Av. 2019		Av. 2018		Av. 2015	
	RF	MRP	RF	MRP	RF	MRP	RF	MRP	RF	MRP	RF	MRP	RF	MRP
USA	3,8	5,7	2,7	5,6	1,8	5,5	1,9	5,6	2,7	5,6	2,8	5,4	2,4	5,5
Spain	3,5	6,6	2,1	6,7	1,0	6,4	1,3	6,3	1,7	6,4	2,1	6,7	2,2	5,9
Argentina	29,6	28,1	28,4	29,9	24,2	17,4	12,3	17,3	10,1	14,9	9,3	13,9	12,6	22,9
Australia	3,8	6,2	3,4	6,3	2,6	6,4	2,4	7,9	2,8	6,5	3,1	6,6	3,1	6,0
Austria	2,7	6,8	1,8	5,8	0,6	5,9	0,9	6,2	1,3	6,1	2,0	6,2	2,8	5,7
Belgium	3,8	6,4	1,4	5,8	0,6	5,9	0,9	6,2	1,2	6,2	1,6	6,2	1,3	5,5
Brazil	12,2	9,3	10,3	9,8	6,5	7,7	4,8	7,9	7,2	8,2	7,3	8,4	9,0	7,5
Canada	3,5	6,0	2,8	5,7	1,9	5,6	1,8	5,7	2,5	5,8	2,9	5,8	2,3	5,9
Chile	4,9	6,9	5,7	7,4	3,9	6,3	3,6	6,6	4,2	6,3	4,1	6,1	3,9	6,5
China	4,2	8,6	3,9	8,7	2,8	6,2	3,1	6,7	4,0	7,5	3,8	6,3	4,5	8,1
Colombia	11,6	9,0	9,8	6,7	6,9	6,9	6,3	8,2	6,2	7,7	6,7	8,7	3,8	8,3
Czech Rep.	4,3	6,6	4,1	6,0	2,0	5,8	1,8	6,4	2,4	6,3	2,6	5,9	1,8	5,6
Denmark	2,9	6,2	1,4	5,8	0,7	5,8	0,9	6,1	1,2	6,0	1,6	6,0	1,3	5,5
Finland	3,2	6,2	1,4	5,6	0,6	5,9	1,0	6,5	1,1	6,2	1,7	5,9	1,2	5,7
France	3,0	6,0	1,3	6,3	0,8	5,8	0,8	6,2	1,2	6,0	1,6	5,9	1,5	5,6
Germany	2,5	5,7	1,2	5,7	0,6	5,8	0,8	5,8	1,1	5,7	1,4	5,3	1,3	5,3
Greece	4,1	10,9	1,6	6,6	0,9	6,9	6,4	12,7	4,3	15,4	4,8	15,8	15,0	14,3
Hungary	8,3	8,4	4,9	6,7	3,3	7,1	3,1	7,4	4,0	7,9	3,6	7,9	0,6	8,8
India	7,1	8,5	5,6	6,9	5,6	7,3	4,8	7,0	6,5	8,3	6,8	7,9	7,4	8,4
Indonesia	6,9	8,0	5,5	7,7	5,9	7,0	6,3	7,6	7,2	9,0	6,8	8,8	7,5	8,9
Ireland	2,9	6,7	1,5	5,8	0,7	5,9	1,3	6,6	1,4	6,0	1,6	6,5	1,3	5,5
Israel	3,9	6,9	2,7	6,0	1,1	5,7	1,5	6,3	2,0	6,4	1,9	5,8	0,9	5,2
Italy	4,0	7,1	1,7	6,0	1,0	6,0	1,3	6,2	1,6	6,3	2,3	6,1	1,5	5,4
Japan	1,1	6,1	0,5	5,9	0,5	5,2	0,9	6,2	1,1	6,1	0,3	5,7	0,7	5,8
Korea (South)	2,9	6,4	3,7	6,0	2,4	5,9	2,0	6,1	2,5	6,6	2,4	6,4	2,3	6,2
Mexico	8,3	7,7	7,4	7,4	5,8	6,4	5,4	8,3	7,1	8,3	6,8	8,5	4,3	8,0
Netherlands	3,0	5,6	1,3	6,2	0,9	5,8	1,6	5,9	1,3	6,0	1,7	5,8	1,8	5,9
New Zealand	4,7	6,3	3,8	5,7	2,0	6,0	2,4	6,2	3,0	5,9	3,1	5,8	2,9	6,6
Norway	3,4	5,8	1,7	5,8	1,8	5,4	1,2	5,8	1,4	6,0	2,4	5,7	1,4	5,5
Peru	6,5	8,4	6,4	6,9	4,3	6,8	3,7	7,0	5,6	7,5	5,3	7,3	4,0	7,2
Poland	6,1	7,2	4,0	5,7	2,7	5,5	2,4	6,6	3,1	6,6	3,4	6,0	2,7	5,2
Portugal	3,4	8,2	1,6	6,2	1,4	6,8	1,6	7,1	2,6	7,5	3,2	7,2	1,6	5,7
Russia	9,4	18,2	5,8	14,2	5,7	8,1	5,9	7,8	8,3	8,5	7,8	8,7	7,4	9,7
South Africa	9,4	8,7	9,1	7,3	8,1	7,0	6,7	7,9	8,0	8,4	7,6	6,9	8,2	7,7
Sweden	1,9	5,7	1,4	6,0	0,9	7,5	1,0	6,1	1,3	6,1	1,8	7,1	1,1	5,4
Switzerland	1,7	5,6	1,4	5,8	0,1	5,2	0,9	6,1	1,1	6,2	1,1	6,9	1,1	5,4
Thailand	3,0	8,1	3,1	7,0	2,2	7,3	4,5	5,7	3,1	8,2	3,5	8,9	8,7	7,3
Turkey	14,4	18,3	22,6	11,0	17,7	9,5	10,9	10,3	11,2	9,6	10,3	7,7	7,8	9,3
UK	3,9	6,0	2,4	6,1	1,3	5,6	1,1	5,8	2,1	6,2	2,0	5,5	2,1	5,2
Uruguay	8,3	9,3	5,4	7,3	4,2	7,1	6,1	9,1	4,4	8,4	5,3	8,3	3,6	7,1
Venezuela	34,8	29,5	32,7	26,1	40,4	19,8	11,4	23,1	12,6	23,7	11,7	16,9	3,5	19,6

3. Previous surveys

2008	http://ssrn.com/abstract=1344209
2010	http://ssrn.com/abstract=1606563; http://ssrn.com/abstract=1609563
2011	http://ssrn.com/abstract=1822182; http://ssrn.com/abstract=1805852

2012	http://ssrn.com/abstract=2084213
2013	http://ssrn.com/abstract=914160
2014	http://ssrn.com/abstract=1609563
2015	https://ssrn.com/abstract=2598104
2016	https://ssrn.com/abstract=2776636
2017	https://ssrn.com/abstract=2954142
2018	https://ssrn.com/abstract=3155709
2019	https://ssrn.com/abstract=3358901
2020	https://ssrn.com/abstract=3560869
2021	https://ssrn.com/abstract=3861152
2022	https://ssrn.com/abstract=3803990
2023	https://ssrn.com/abstract=4407839

Welch (2000) performed two surveys with finance professors in 1997 and 1998, asking them what they thought the Expected MRP would be over the next 30 years. He obtained 226 replies, ranging from 1% to 15%, with an average arithmetic EEP of 7% above T-Bonds.[3] Welch (2001) presented the results of a survey of 510 finance and economics professors performed in August 2001 and the consensus for the 30-year arithmetic EEP was 5.5%, much lower than just 3 years earlier. In an update published in 2008 Welch reports that the MRP "used in class" in December 2007 by about 400 finance professors was on average 5.89%, and 90% of the professors used equity premiums between 4% and 8.5%.

Johnson et al (2007) report the results of a survey of 116 finance professors in North America done in March 2007: 90% of the professors believed the Expected MRP during the next 30 years to range from 3% to 7%.

Graham and Harvey (2007) indicate that U.S. CFOs reduced their average EEP from 4.65% in September 2000 to 2.93% by September 2006 (st. dev. of the 465 responses = 2.47%). In the 2008 survey, they report an average EEP of 3.80%, ranging from 3.1% to 11.5% at the tenth percentile at each end of the spectrum. They show that average EEP changes through time. Goldman Sachs (O'Neill, Wilson and Masih 2002) conducted a survey of its global clients in July 2002 and the average long-run EEP was 3.9%, with most responses between 3.5% and 4.5%.

Ilmanen (2003) argues that surveys tend to be optimistic: *"survey-based expected returns may tell us more about hoped-for returns than about required returns".* Damodaran (2008) points out that *"the risk premiums in academic surveys indicate how far removed most academics are from the real world of valuation and corporate finance and how much of their own thinking is framed by the historical risk premiums... The risk premiums that are presented in classroom settings are not only much higher than the risk premiums in practice but also contradict other academic research".*

Table 4 of Fernandez et al (2011a) shows the evolution of the Market Risk Premium used for the USA in 2011, 2010, 2009 and 2008 according to previous surveys (Fernandez et al, 2009, 2010a and 2010b).

The magazine *Pensions and Investments* (12/1/1998) carried out a survey among professionals working for institutional investors: the average EEP was 3%. Shiller[4] publishes and updates an index of investor sentiment since the crash of 1987. While neither survey provides a direct measure of the equity risk premium, they yield a broad measure of where investors or professors expect stock prices to go in the near future. The 2004 survey of the Securities Industry Association (SIA) found that the median EEP of 1500 U.S. investors was about 8.3%. Merrill Lynch surveys more than 300 institutional investors globally in July 2008: the average EEP was 3.5%.

A main difference of this survey with previous ones is that this survey asks about the **Required** MRP, while most surveys are interested in the **Expected** MRP.

[3] At that time, the most recent Ibbotson Associates Yearbook reported an arithmetic HEP versus T-bills of 8.9% (1926–1997).

[4] See http://icf.som.yale.edu/Confidence.Index

4. Expected and Required Equity Premium: different concepts

Fernandez and F. Acín (2015) claim and show that Expected Return and Required Return are two very different concepts. Fernandez (2007, 2009b) claims that the term "equity premium" is used to designate four different concepts:

1. **Historical** equity premium (HEP): historical differential return of the stock market over treasuries.
2. **Expected** equity premium (EEP): expected differential return of the stock market over treasuries.
3. **Required** equity premium (REP): incremental return of a diversified portfolio (the market) over the risk-free rate required by an investor. It is used for calculating the required return to equity.
4. **Implied** equity premium (IEP): the required equity premium that arises from assuming that the market price is correct.

The four concepts (HEP, REP, EEP and IEP) designate different realities. The **HEP** is easy to calculate and is equal for all investors, provided they use the same time frame, the same market index, the same risk-free instrument and the same average (arithmetic or geometric). But the **EEP,** the **REP** and the **IEP** may be different for different investors and are not observable.

The **HEP** is the historical average differential return of the market portfolio over the risk-free debt. The most widely cited sources are Ibbotson Associates and Dimson *et al.* (2007).

Numerous papers and books assert or imply that there is a "market" EEP. However, it is obvious that investors and professors do not share "homogeneous expectations" and have different assessments of the **EEP**. As Brealey et al. (2005, page 154) affirm, *"Do not trust anyone who claims to know what returns investors expect".*

The **REP** is the answer to the following question: What incremental return do I require for investing in a diversified portfolio of shares over the risk-free rate? It is a crucial parameter because the REP is the key to determining the company's required return to equity and the WACC. Different companies may use, and in fact do use, different **REPs**.

The **IEP** is the implicit REP used in the valuation of a stock (or market index) that matches the current market price. The most widely used model to calculate the IEP is the dividend discount model: the current price per share (P_0) is the present value of expected dividends discounted at the required rate of return (Ke). If d_1 is the dividend per share expected to be received in year 1, and g the expected long term growth rate in dividends per share,

$$P_0 = d_1 / (Ke - g), \text{ which implies: } IEP = d_1/P_0 + g - R_F \quad (1)$$

The estimates of the IEP depend on the particular assumption made for the expected growth (g). Even if market prices are correct for all investors, there is not an IEP common for all investors: there are many pairs (IEP, g) that accomplish equation (1). Even if equation (1) holds for every investor, there are many *required* returns (as many as expected growths, g) in the market. Many papers in the financial literature report different estimates of the IEP with great dispersion, as for example, Claus and Thomas (2001, IEP = 3%), Harris and Marston (2001, IEP = 7.14%) and Ritter and Warr (2002, IEP = 12% in 1980 and -2% in 1999). There is no a common **IEP** for all investors.

For a particular investor, the **EEP** is not necessary equal to the REP (unless he considers that the market price is equal to the value of the shares). Obviously, an investor will hold a diversified portfolio of shares if his EEP is higher (or equal) than his REP and will not hold it otherwise.

We can find out the REP and the EEP of an investor by asking him, although for many investors the REP is not an explicit parameter but, rather, it is implicit in the price they are prepared to pay for the shares. However, it is not possible to determine the REP for the market as a whole, because it does not exist: even if we knew the REPs of all the investors in the market, it would be meaningless to talk of a REP for the market as a whole. There is a distribution of REPs and we can only say that some percentage of investors have REPs contained in a range. The average of that distribution cannot be interpreted as the REP of the market nor as the REP of a representative investor.

Much confusion arises from not distinguishing among the four concepts that the phrase *equity premium* designates: Historical equity premium, Expected equity premium, Required equity premium and Implied equity premium. 129 of the books reviewed by Fernandez (2009b) identify

Expected and Required equity premium and 82 books identify Expected and Historical equity premium.

Finance textbooks should clarify the MRP by incorporating distinguishing definitions of the four different concepts and conveying a clearer message about their sensible magnitudes.

5. Conclusion

Most previous surveys have been interested in the Expected MRP, but this survey asks about the Required MRP.

This paper contains the statistics of a survey about the Risk-Free Rate (**RF**) and the Market Risk Premium (**MRP**) used in 2024 for **96 countries**. We got answers for 104 countries, but we only report the results for countries with more than 6 answers.

This survey links with the *Equity Premium Puzzle*: Fernandez et al (2009), argue that the equity premium puzzle may be explained by the fact that many market participants (equity investors, investment banks, analysts, companies…) do not use standard theory (such as a standard representative consumer asset pricing model…) for determining their Required Equity Premium, but rather, they use historical data and advice from textbooks and finance professors. Many investors still use historical data and textbook prescriptions to estimate the required and the expected equity premium.

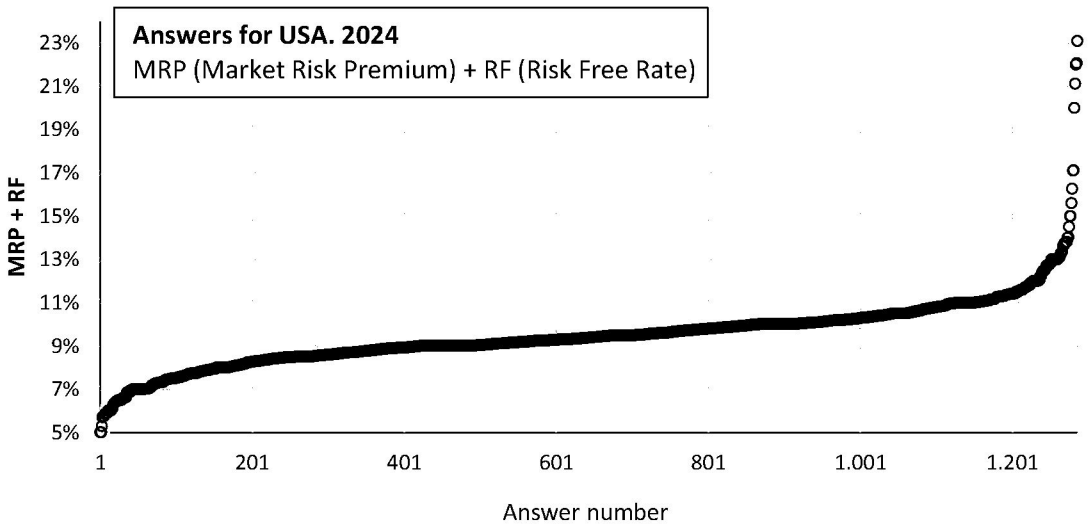


EXHIBIT 1. Mail sent in February 2024

Survey Market Risk Premium and Risk-Free Rate 2024

We are doing a **survey** about the **Market Risk Premium** (MRP or Equity Premium) and **Risk-Free Rate** that companies, analysts, regulators and professors use to calculate the **required return on equity** in different countries.

I would be grateful if you would kindly answer the following 2 questions. No companies, individuals or universities will be identified, and only aggregate data will be made public. I will send you the results in a month.

Best regards and thanks,

Pablo Fernandez. Professor of Finance. IESE Business School. Spain.

2 questions:

1. The Market Risk Premium that I am using in 2024
for USA is: _____%
for_____ is: _____ %
for_____ is: _____ %

2. The Risk-Free rate that I am using in 2024
for USA is: _____ %
for _____ is: _____ %
for _____ is: _____ %

EXHIBIT 2. Some comments and webs recommended by respondents.

Equity premium: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html
http://www.market-risk-premia.com/market-risk-premia.html
http://www.marktrisikoprämie.de/marktrisikopraemien.html

US risk free rate: http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2015

risk free rate: http://www.basiszinskurve.de/basiszinssatz-gemaess-idw.html
http://www.econ.yale.edu/~shiller/
http://www.cfosurvey.org/pastresults.htm
http://alephblog.com/

I'm not much use for you because I don't add a market risk premium to a risk free rate to get a basic equity rate of return. Many years ago, I took your lessons to heart and stopped using any sort of build-up method, principally because it is backwards looking. Instead, I rely on the Pepperdine survey, along with my understanding of how investors think and my best judgement of the risks of a particular asset. I have not found any better way to do this.

Islamic Development Bank works under development mandate and therefore does not follow market based premium on pricing, and uses its internal costs as benchmark. In short, all of our member countries are given financing at the same pricing.

Our commercial bank can invest overnight funds in our excess balance account with the U.S. Federal Reserve Bank at 2.5%. Our overall cost of funds is 0.2%, yielding a spread of 2.3%. Our leverage ratio (equity/assets) is 9.63%. Hence, our pre-tax risk-free rate is 23.88% of equity. Our target is to earn a net interest margin (interest income less interest expense as a percentage of earning assets) of 4.00%, which yields a targeted asset yield of 4.2%, or 43.61% of equity.

Market risk premium = actual equity return - risk free rate

I want to explain the unusually high risk premium I am using in the US market (7%). In my opinion, the way that costs whether they be raw materials, labor, interest etc. process through the economy differently than a simple "add on" cost. I believe that as any cost increase requires a greater capital base to hold inventory or to produce goods and services, that the pass through is not just the actual cost but the cost plus an increment for a return on the greater capital base. Accordingly, the "cost" of money with interest rates so low is more likely than not to be higher in the future. Labor also with unemployment so low is more likely than not to be higher in the future. Therefore although I do not see traditional commodity inflation and labor costs have been unusually stable for this unemployment level, I believe the probability is higher of an increase than a decrease. Thus I have a higher than would be expected market risk premium to address the direction I think the pressures will move on the discount rate. Conversely, If wrong on the upward pressures on capital

returns; it would likely be due to slowing global growth and/or trade disruption of longer duration. In that event I again want a higher discount rate to reflect that greater risk potential. Interesting times we live in.

I do not use a MRP or a RF rate for three reasons:
1) I am retired.
2) I do not accept their validity.
3) The "new normal" makes no economic or financial sense.

I am an academic in a public university – I don't know of any University discount rate.

"The subject who is truly loyal to the Chief Magistrate will neither advise nor submit to arbitrary measures." Junius

Prima de riesgo que utilizo en España: diferencia de rentabilidad que ofrece el bono español respecto al alemán. Tipos de interés sin riesgo: los extraídos día a día del boletín de deuda pública española en operaciones de compra-venta al contado.

I don't value companies on this basis. I prefer to use price to earnings ratio.

In the Netherlands there is a discussion with the fiscal authorities. A lot of valuation experts use the MRP from your Survey. The Fiscal authorities accept that but want consequently also the use of the Rf from your survey. There is a lot of discussion when we use a normalized adjusted Rf.

Por tipo de interés sin riesgo se entiende en el corto plazo, pe 3 meses, al tipo de interés interbancario al plazo correspondiente para el área de referencia. En caso del euro, sería el EURIBOR y en caso de EEUU el Libor USD. Hablando de riesgo soberano USA y Alemania son considerados Benchmarks, por lo que su prima de riesgo es 0 y por tanto se les considera que son libres de riesgo. (Excepto entre ellos cuando se habla de riesgo entre EUR y USD) Por ello, cuando hablamos de prima de riesgo de un país, pe. España, hablamos del diferencial de tipos que hay el bono español con el de Alemania, tomando el mismo plazo. Normalmente se utiliza el plazo estándar del 10 años.

Sigo las recomendaciones de Credit Swiss Global Investment Return Yearbook, en este caso, 2018, con un 3,5% de PRM. No me gustan las recomendaciones de Damodaran, cuando incluye un riesgo país a España mayor que el de, creo, Perú o Ecuador, El tipo de interés sin riesgo que utilizo es, para España, el de el bono alemán a 10 años, según leo es de 0,17%, aunque Credit Swiss, creo recordar utiliza otro....el de EEUU es de 2,73%.

The risk free rate is determined on the historical present value-equivalent base interest rates on the basis of a series of payments increasing with the selected growth rate over a period of 1,000 years. For the calculations, the spot rate from year 30 to year 1,000 is updated constantly based upon the valuation date.

Germany

Risk free rate	0.9%	20 y Bund	Investing.com/rates-bonds/germany-20-year-bond-yield (1-1-2018)
Adjustment	1.8%	Credit Suisse	Credit Suisse Global Investment Source book and Yield book 2016 – Range of estimated long term real rate government bonds 1900-2015 - globally diversified
Risk free rate Adjusted	**2.7%**		

I don't use the market risk premium. I use a hurdle rate of return and won't invest in investments that don't achieve that hurdle. I aspire to a 25% rate of return on my investments but will generally settle for 15%.

I use the relevant rate from each country/currency "risk-free" yield curve to discount the respective expected future cash flow: V0 = CF1/(1 + Rf1 + risk prem)^1 + CF2/(1 + Rf2 + risk prem)^2 + ... + CFt/(1 + Rft + risk prem)^t

The Rf that I am using in 2019 for USA is: 10 year historical average, US Treasuries 20-year notes.

I use the US Equity premium of Damodaran to avoid explanations or justifications to clients.

We only use ROS (Return on Sales).

Rf: 3%, of which 2% is a premium for the risk of manipulation of the interest rate market operated by the ECB with the Quantitative Easing.

Al tener limitación nacional al hacer inversiones, debemos emplear un tipo de interés sin riesgo alto. Al operar en mercados muy consolidados, con pocos operadores y con fuertes barreras de entrada, la prima de riesgo de mercado es muy alta.

En anteriores encuestas intenté ofreceros un tipo orientativo pero estos últimos años, después de la "experimentación" de tipos, de diferentes QE con tipos negativos… sólo tengo una certeza, que ya hemos comentado en muchas ocasiones: es muy difícil, o de dudosa utilidad, establecer un tipo de interés sin riesgo. Porque ¿Es normal que la Deuda Griega pague menos que la Deuda de USA? ¿Emisiones de Deuda del gobierno argentino a periodos larguísimos? ¿Deuda alemana o suiza en tipos negativos?…
Respecto a establecer una tasa que sirva como referencia, mantendría dos premisas: 1) El horizonte de inversión (una Tasa de referencia con el mismo plazo); 2) La seguridad en las estimaciones de los flujos de caja futuros del proyecto o inversión: en caso de menor confianza o duda en las estimaciones, mayor tasa de Descuento
Como norma, siempre tenemos en cuenta que la Renta variable ha sido en periodos muy largos el activo más rentable y, por tanto, a muy largo plazo es el Activo de "Menor riesgo"

Fascinating results. It is always interesting how investors and fund managers interpret the risk free rate of countries who have a negative prevailing long-term bond rate.

I am sure you that you are analysing the data and asking more questions that data can answer. It´s time to improve theory! I hope you will advance on it.

In my DCF valuation I use a global perspective of the marginal investor hence a global MRP.

I match rf with currency/inflation of cash flows being discounted and do not rely too much on current interest rates due to imperfections in the market. The MRP is made consistent with the level of interest rate I use in my model (E(Rm)-Rf) end end up with 6%

For equities we use a 10% as a cost of opportunity independently of the level of interest.

Rf: average last 5-year 10 year Treasury

I would like to help you with these two questions, but the problem is that in no any literature sources or analytical reports I met the calculation of Market Risk Premium and Risk Free rate for Uzbekistan.

The risk free rate that I use depends upon the timing of the future cash flows. I refer to the interest rate swap market and the US treasury market for starters. These days, one has to bear in mind currency volatility as that has a bigger effect on PV than market cost-of-capital.

We use the same Market Risk Premium for any country: 5,75% (source: Damodaran). Only Rf changes.

I am happy that you are asking the second question, because it accounts for what I consider to be a historical anomaly in the reply to the first question. I've concluded that the ERP was recently 3-4 percent. But I think US monetary policy (the various "QE" programs) have in the past couple of years distorted the traditional relationship between expected total market returns and the risk free rate. QE has been driving the US Treasury rate down, while the expected total market return has held steady, leading to a larger than usual market risk premium. This higher market risk premium is not a sign of higher market equity risk, but of the perverse impact of aggressive monetary policy.

For the US in 2015: MRP: 14% (as US equities are even more highly priced than last year).

Interest rates are artificially well below historic levels. Thus, bonds and equities values are artificially inflated.

I do not use "canned" rates applicable for a whole year. The rates I use are time-specific and case-specific, depending on conditions prevailing as of the valuation date.

I must confess I am still surprised with the rates suggested that are at the upper bound of respondent answers.

One hint: It might make sense to ask more precisely about the premium before/after personal income tax. For Germany the premium would differ and I am not sure how people would interpret the question.

The Risk-Free Rate we use is based on rates published by the Federal Reserve. We use the 20 year rate, currently 2.73%. The Equity Risk Premium we use is based on Duff & Phelps Annual Valuation Handbook.

For foreign countries, I generally look at it in dollar terms and assume that purchasing power parity held; hence, I'd use US rates. If I had to do it in a foreign currency, I would use the local 10-year treasury for the risk-free rate. I would use the US equity risk premium, adjust for inflation to real terms, and then adjust for foreign inflation to put it in local nominal terms.

USA. MRP 6.4% - essentially bloomberg/ibbotson number. RF 10 year U.S. treasury yield.

Exijo un mínimo de un 15% de retorno neto de impuestos a cualquier acción, independientemente de su nacionalidad.

No existe un activo libre de riesgo en absoluto. Y menos en estos distorsionados entornos debido a la intervención de los bancos centrales. En mi modesta opinión, creo que nunca sido tan riesgosa la renta fija como lo es ahora.

No creo especialmente en el modelo de CAPM y prefiero usar una cifra basada en el sentido común.

Market Risk Premium for any market is not salubrious for peace or mind.
https://comcom.govt.nz/__data/assets/pdf_file/0029/282674/5B20225D-NZCC-12-Cost-of-capital-determination-EDBs-and-WIAL-3-May-2022.pdf.
https://indialogue.io/clients/reports/public/5d9da61986db2894649a7ef2/5d9da63386db2894649a7ef5

The CAPM is wrongly derived from very beginning (basically, CAPM is the first order condition for optimal portfolio decision (which must have a unique solution of mean-variance efficient portfolio) with its unique solution of market portfolio. CAPM is, of course, a tautology even the market portfolio is mean-variance efficient, not an asset pricing no matter market portfolio is mean-variance efficient or no. In sum, CAPM is theoretical useless.

En Uruguay la práctica más aceptada es descontar flujos convertidos a USD dada la debilidad de la moneda local y dolarizacion de la economía.

Your research over the years has been enlightening. It would be interesting to see the "meta" research on your data, that is, an analysis of the cross-section / time series to determine if there is any information embedded in the disperse responses that you receive, e.g. for forecasting or determining whether the consensus is correct over time.

I am guessing you already know my answers:
1. I do not use CAPM, the build-up-method or similar strategies to figure out required rates of return, and I pay no attention to the so-called "Market Risk Premium". Instead I rely mostly on the Pepperdine Cost of Capital Survey in my work.
2. I acknowledge current and changing U.S. Treasury bond rates because it's probably true they have some effect on investors' Required Rates of Return. But I don't use any specific number at any given time so I don't have an answer to your second question either.

We use a WACC of 8.0% for our pan-European industrial coverage, including UK, CH. We are not explicitly modeling Rf, beta or premium.

I just wanted to thank you for your annual surveys. I work in the intersection between academic theory and economic policy, and your annual surveys provide me with an excellent tool for explaining the market environment for debt-financed government spending. I am especially pleased with the opportunity that your survey provides, to point to the risk-free rates in relation to where par yields are on treasury debt, trends in inflation-adjusted securities and government bond rating.

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Research

FIDELITY INSTITUTIONAL INSIGHTS

Capital Market Assumptions: A Comprehensive Global Approach for the Next 20 Years

We believe that asset returns over the next 20 years will be lower than their long-term averages, with stocks outperforming bonds and emerging markets generating the highest returns

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KEY TAKEAWAYS

- Our long-term capital market assumption for U.S. equities is below long-term average returns due to lower growth potential and higher starting valuations.
- Emerging-markets stocks represent the most attractive area for public market return expectations due to favorable growth prospects and better starting valuations.
- Fixed income return expectations are higher compared with 2021 due to higher starting bond yields.
- Higher-than-expected inflation likely would hurt most equity and fixed income returns, with long-duration nominal fixed income facing the most risk from higher inflation.
- One scenario that could boost equity returns is continued central bank induced financial repression, which could keep real rates low and support higher valuations relative to historical averages.

Fidelity INVESTMENTS

Expectations based on our 2022 capital market assumptions[1]

Exhibit 1: EM equities have the highest real return potential over the long term.

Fidelity Secular CMA Return and Volatility Estimates

ASSET CLASS	REAL RETURNS	VOLATILITY
Emerging Market Equities	5.1%	23%
Global Equities ex-USA (MSCI ACWI ex-U.S.)	3.7%	18%
U.S. High Yield	3.3%	11%
Developed Market (ex-U.S.) Equities	3.3%	19%
U.S. Equities	3.0%	17%
Commodities (BCOM)	2.1%	21%
Developed non-U.S. Bonds USD Hedged	2.0%	5%
IG Bonds (Bloomberg Barclays U.S. Aggregate)	1.9%	7%
Municipal Bonds	1.4%	7%
Developed non-U.S. Sovereign Debt USD Hedged	1.4%	5%
U.S. 10yr Treasury Bond	1.3%	9%
U.S. TIPS	1.0%	8%
U.S. 30 Year Treasury Bond	0.6%	11%
U.S. Cash	-0.2%	3%

Our CMAs are forward-looking estimates but are not presented as investment recommendations or guarantees of actual future performance.

Volatility: standard deviation of returns. See appendix for index details. Real returns are geometric annualized average return expectations over 20 years, adjusted for inflation. Source: Fidelity Investments (AART), as of 4/30/22.

U.S. Equities

- For U.S. stocks, we expect a 3% annualized real return through 2042, less than half the 6.6% average since 2001 and the 7.1% advance since 1926. Our 20-year real return estimate declined from 3.1% in 2021. Risk-adjusted return estimates remain lower than their historical norms.
- Valuations for U.S. stocks remain elevated compared with the rest of the world. We believe they will converge closer to those of other developed markets over time.
- Compared with 2021 we see reduced earnings potential for U.S. stocks as higher rates increase corporate interest expenses. Offsetting this negative, we note that the decline for the U.S. stock market in the early half of 2022 resulted in more-attractive starting valuations.

U.S. Bonds

- We expect bond markets to produce a real return of 1.9% annualized over the next 20 years, vs. 2.1% a year historically (since 1926). This estimate rose from 1.5% in 2021, largely influenced by higher yields that increased the attractiveness of new bond investments.
- One meaningful risk is that higher-than-expected inflation over the next two decades could reduce the returns of long-duration nominal fixed-income assets, such as 30-year Treasury bonds.
- Partly reflecting increased interest rate and inflation risks, we expect bonds to produce a lower Sharpe ratio relative to the past two decades.

Emerging Markets

- Emerging equities represent the most promising area in the public markets, due to our expectations for higher real GDP growth and low starting valuations.
- We anticipate a 5.1% real return for emerging markets in the next 20 years, compared with a 6.1% real return over the past two decades.

Developed Markets (ex-U.S.)

- We expect most non-U.S developed countries, including Australia, Canada, the UK, France, Germany, and Japan, to lag the real GDP growth of the U.S. through 2042, mainly due to birth rates and other demographic trends. This is expected to keep earnings growth subdued relative to the U.S. and emerging markets.
- Return estimates for developed-equity markets outside the U.S. are 3.3% in real terms over the next 20 years, topping U.S. stocks. We expect a diminished return for developed non-U.S. markets versus the long-term historical average, and slightly higher volatility compared with the U.S., based on a higher concentration of more-cyclical sectors.

U.S. Bonds vs. U.S. Stocks

We expect the lower return environment will result in less attractive risk-adjusted returns for global equities compared with the historical average, with Sharpe ratios remaining relatively even across core stock and bond categories (Exhibit 2).

Our forecasts place the 1.1% expected gap between the real returns of U.S. equities and U.S. investment-grade bonds over the next 20 years in the 7th percentile relative to history, which is significantly lower than the previous two decades (Exhibit 3).

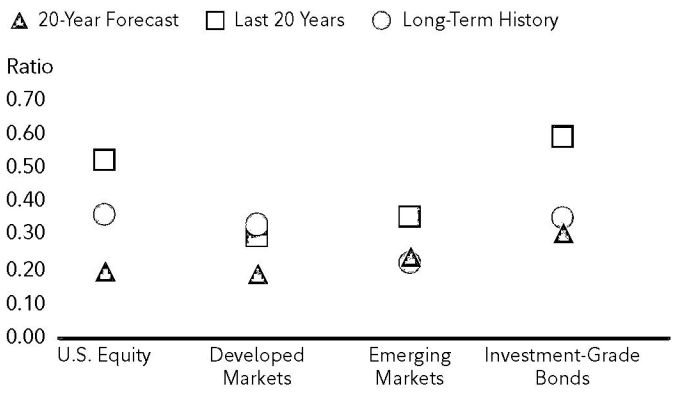
A higher rate of inflation could increase this performance gap going forward and coincide with higher correlations between stocks and bonds.

EXHIBIT 2: Risk-adjusted return estimates for equities are now lower than their historical levels.

Historical and Forecasted Geometric Average Returns

REAL ANNUALIZED RETURNS	20-YEAR FORECAST	LAST 20 YEARS	LONG-TERM HISTORY
U.S. Equity	3.0%	6.6%	7.1%
Developed Markets (ex-U.S.)	3.3%	3.8%	5.3%
Emerging Markets	5.1%	6.1%	4.5%
Investment-Grade Bonds	1.9%	1.3%	2.1%
Cash/Short-Term Debt	-0.2%	-1.2%	0.4%

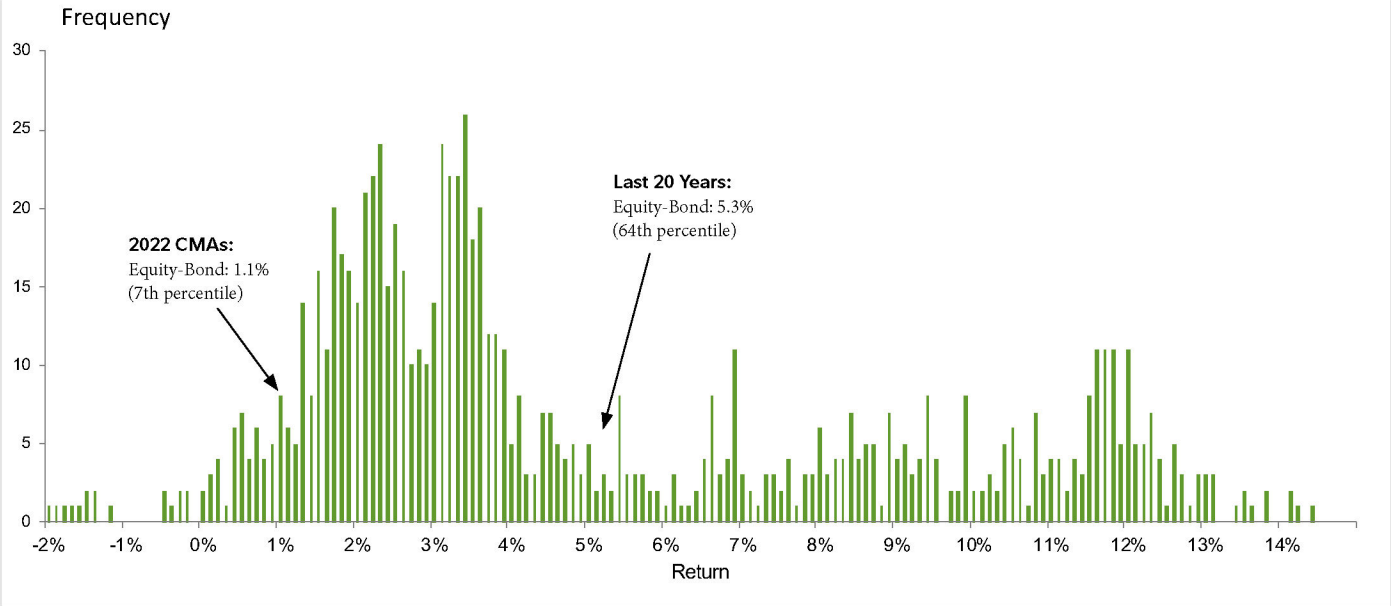
Historical and Forecasted Sharpe Ratios



Real annualized returns calculated as geometric average returns. Long-term history: since 1926. Sharpe ratio compares portfolio returns above the risk-free rate relative to overall portfolio volatility, with a higher Sharpe ratio implying better risk-adjusted returns. Past performance is no guarantee of future results. You cannot invest directly in an index. Asset-class total returns are represented by indexes from the following sources: Fidelity Investments, Morningstar, MSCI, Bloomberg Finance L.P. Source: Fidelity Investments proprietary analysis of historical asset class returns, as of 4/30/22.

EXHIBIT 3: Over the next 20 years, we expect U.S. equities to outperform bonds by a smaller margin than they did during the past 20 years.

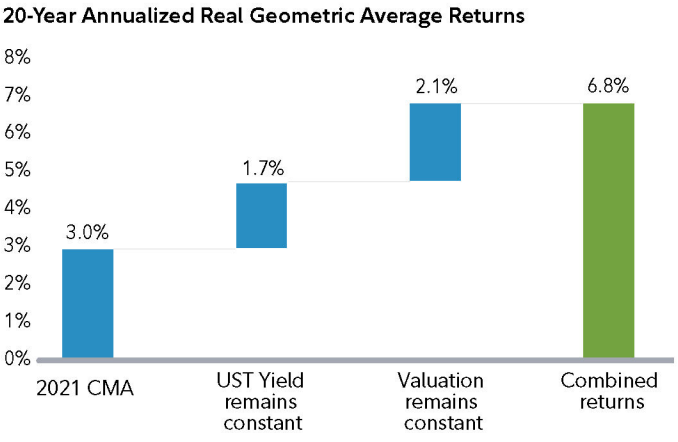
U.S. Equity Excess Returns over Investment-Grade Bonds (1926–2022)



Past performance is no guarantee of future results. U.S. Equities—Dow Jones U.S. Total Stock Market Index; Investment-Grade Bonds—Bloomberg U.S. Aggregate Bond Index. Source: Fidelity Investments (AART), as of 4/30/22.

EXHIBIT 4: Varied yield and valuation scenarios could result in different realized U.S. equity returns.

U.S. Equity CMA Yield and Valuation Scenarios



Source: Fidelity Investments, as of 4/30/22.

Scenario analysis: Other factors could lead to higher or lower returns

Our CMAs are 20-year estimates. We acknowledge a range of outcomes can influence returns, volatility levels, and asset correlations. In the next few exhibits, we illustrate how realized returns can differ from our forecasts and explore some of the key factors driving the differences. These scenarios include shifts in growth and inflation regimes, and financial repression from central banks.

Exhibit 4 illustrates how varied yield and valuation scenarios could lead to higher U.S. equity returns over the next several decades. For example, if interest rates (U.S. Treasury yields) remain at roughly 2022 levels over the next 20 years, U.S. equities would gain an additional 1.7% per year, as a lower interest expense would boost earnings.

If valuations do not revert lower, as they do in our estimates, equity returns would be 2.1% higher on an annual basis.

While these factors are correlated and may not result in a real U.S. equity return of 6.8%, this example is meant to emphasize how different macro scenarios could lead to varied outcomes.

The Impact of Inflation on Returns and Correlations

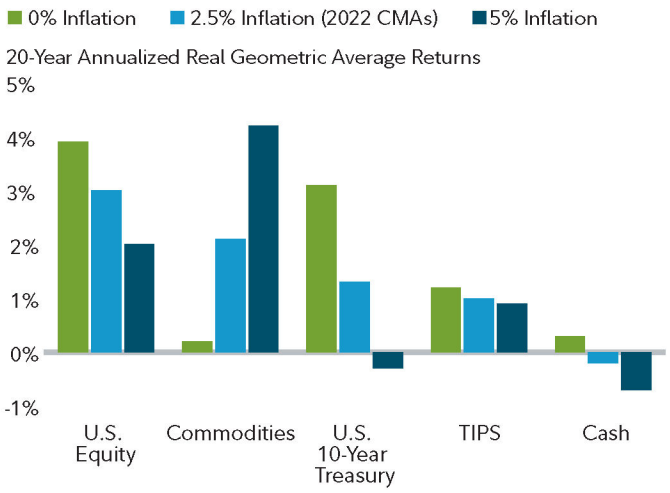
Inflation is a prime example of how varying yield and valuation trajectories can impact our CMAs (Exhibit 5). Higher inflation tends to weigh on the real returns of both stocks and bonds—especially bonds.

- Within fixed income categories, higher inflation often corresponds with more inflation uncertainty, which tends to increase nominal bond yields and bring down real returns.
- On the equity side, the upward pressure that inflation puts on interest rates can drag on returns by bringing down valuations, increasing interest expense, and reducing the incentive to use leverage. All three factors can hamper profit margins and earnings potential.
- Higher inflation often benefits commodities, largely due to higher real returns.

Inflation also impacts the correlation between different asset classes. For example, when inflation is elevated, stocks and bonds tend to have positive correlations, and commodities often have lower correlations to equities. For these reasons, owning inflation hedges as part of a strategic asset allocation, such as TIPS, commodities, and real assets, can be beneficial. Our base case scenario is for inflation to remain around 2.5%, which we expect would keep the stock/bond correlation negative. However, if we experience higher inflation over the next two decades, stock/bond correlations would likely turn positive, rising most significantly for longer-duration bonds (Exhibit 6).

EXHIBIT 5: High inflation is a drag on real returns, especially for nominal fixed income.

Asset Class CMA Inflation Scenarios



Source: Fidelity Investments as of 4/30/2022.

EXHIBIT 6: Higher inflation may increase stock/bond correlations.

	LOW INFLATION REGIME	HIGH INFLATION REGIME	CHANGE
Investment Grade-Bonds	20%	32%	↑
30-Year Treasuries	8%	22%	↑
10-Year Treasuries	1%	17%	↑
TIPS	-6%	-6%	—
Commodities	5%	-5%	↓

U.S. Equities—MSCI USA Index; Investment-Grade Bonds—Bloomberg U.S. Aggregate Bond Index; TIPS—Bloomberg U.S. Treasury Inflation Protected Notes; Bloomberg Commodity Index. Source: Fidelity Investments (AART), as of 4/30/22.

No matter the asset class, this study showed that higher inflation tends to be associated with a greater uncertainty of capital market outcomes. This underscores the potential benefit of inflation hedges, such as TIPS and commodities, as part of a multi-asset portfolio.

Financial repression: A wild card

Financial repression refers to monetary and regulatory actions that artificially suppress real (inflation-adjusted) interest rates. These policy moves help fulfill government objectives, although they can hurt savers.

- **Equities:** By suppressing real yields, financial repression tends to boost equity performance, primarily by boosting equity valuations and suppressing interest expense.
- **Fixed Income:** The impact of financial repression on fixed income is contingent on the inflation regime. If inflation is high, we would expect nominal yields to rise, impairing bond performance.

Our analysis suggests that financial repression tends to increase the relative performance of stocks versus bonds, whether policy actions result in a high-or low-inflation regime. Also, if inflation were to surprise to the upside, we would expect stocks to outperform bonds by a wider margin (Exhibit 7).

Since the range of potential outcomes is more uncertain during financial repression, strategic asset allocation decisions are essential to help mitigate unforeseen outcomes. This includes maintaining long-term exposure to real assets and non-U.S. equities to provide diversification.

Details of our CMA Framework and Philosophy

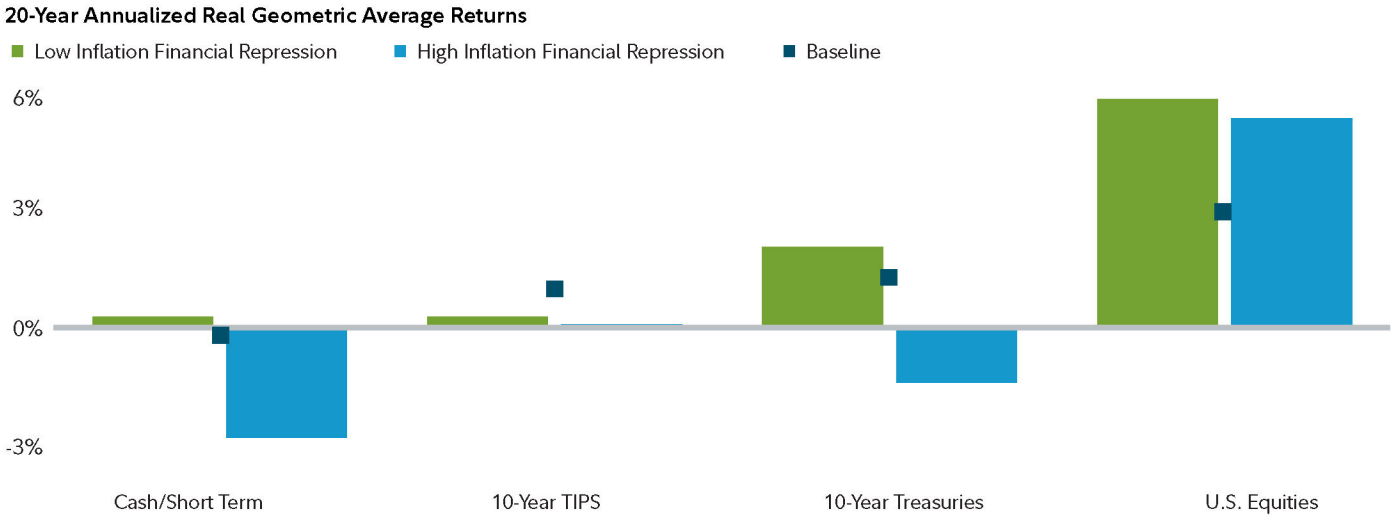
The following section provides greater detail regarding our methodology for estimating asset-class returns, volatility, and correlations.

Our Beliefs

Long-term capital market assumptions (CMAs) can serve as valuable inputs for investment decisions. These assumptions can help financial advisors position their clients to reach their long-term goals; assist

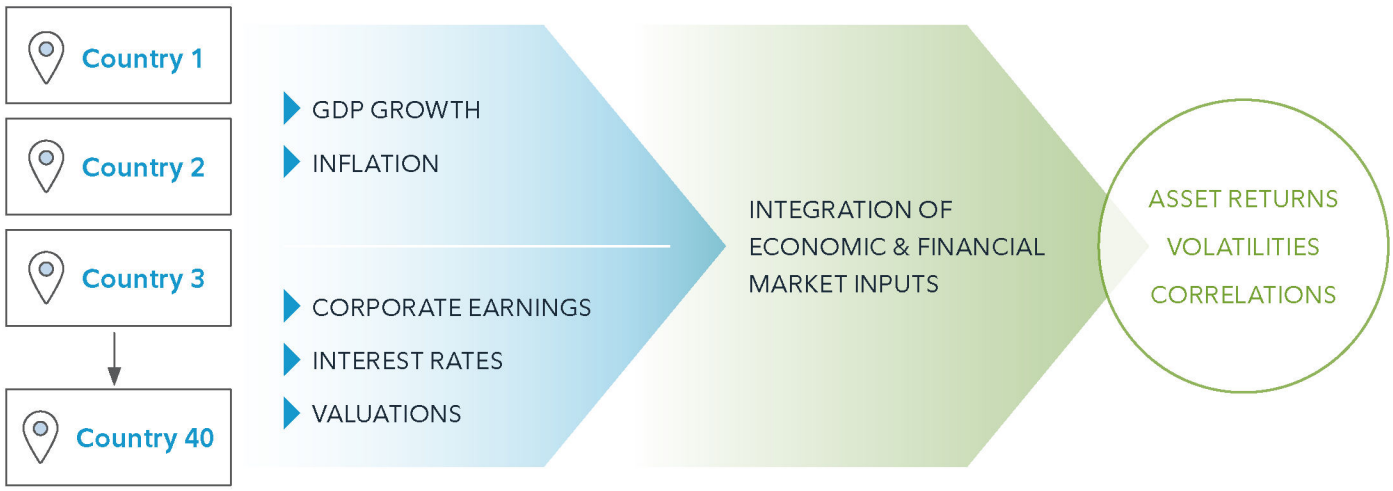
EXHIBIT 7: Financial repression tends to increase the expected performance gap between stocks and bonds, with higher inflation lowering asset-return estimates.

Asset Class CMA Financial Repression Scenarios



Source: Fidelity Investments as of 4/30/22.

EXHIBIT 8: Our CMA process is global, forward-looking, and dynamic.



For illustrative purposes only. Source: Fidelity Investments (AART).

institutional money managers in making strategic asset allocation decisions; and aid pension fund managers in creating assumptions on equity returns and interest rates to aid pension managers in supporting their decisions for managing defined benefit plans.

Our CMA framework focuses on the specifics of how economic and financial market inputs influence asset returns over long periods of time (Exhibit 8). While other approaches assume the connection between GDP growth and asset returns is either perfect or nonexistent, our framework is built on the following beliefs:

- There is a principal relationship between economic trends and asset-class performance.
- By deriving country-specific assumptions, we generate estimates that are global and adaptive across diverse economies and asset categories.

What makes our capital market assumptions different

We focus on a 20-year horizon to build our secular (long-term) CMAs to align with investment planning and portfolio construction considerations.

While secular CMAs are intended primarily for strategic allocation decisions, we develop other types of forecasts for shorter-horizon decisions. As an example, our business cycle research focuses on economic trends, which form a basis for return and volatility patterns over shorter time horizons to add value through active asset allocation. (See our "Quarterly Market Update" and "Business Cycle Update" series for more details.)

We develop 20-year forecasts because asset returns often deviate significantly from long-term historical averages, providing opportunity for forward-looking estimates to add to an investment process. Since 1926, 20-year real (inflation-adjusted) equity market returns have averaged 7%, but have ranged from 0% to 14% due to differences in the economic growth and inflation landscape, valuations, and the interest rate environment.

We believe our CMA research process provides a better sense of whether the next 20 years will be on the high or low end of historical outcomes. We therefore incorporate the core themes of global GDP growth with a deep consideration of the current capital market composition.

A Global Perspective

Lastly, by adapting to today's global environment, in which developing countries account for a growing share of the world economy and the investment universe, our approach avoids the limitations of backward-looking data that can be dominated by the history of the U.S. and other developed markets.

Our multidimensional, scalable approach—based on fundamentals such as growth, earnings, and valuation—can be applied to diverse economies to provide the building blocks for CMAs at the country, sector, and sub-asset-class level. The 20-year time horizon is flexible enough to capture shifts in the economic and market landscape, but stable enough to serve as assumptions for long-term investment strategies.

By focusing on the specifics of how GDP growth and assets returns are related—and how they differ— our approach avoids the overly simplistic assumptions of some CMA frameworks.

Our Forward-Looking Approach

A dynamic blending of market composition, profit margins, interest rates, debt levels, inflation, and our first-in-class GDP growth forecasts can produce a thoughtful forward-looking view that limits the dependence on historical averages. The basis for our asset return and volatility assumptions is our 20-year forecast of gross domestic product (GDP) growth for the 40 largest countries in the MSCI All Country World Index, described in the Fidelity article, "Secular Outlook for Global Growth: the Next 20 Years." Our forecasts are based on a panel approach that synthesizes trends across multiple countries. We believe this approach makes our forecasts more robust than those derived from individual country data.

Return assumptions: A blend of economic and financial measures

We believe the current environment of low yields and the shift to lower-trend GDP growth will result in lower fixed income returns relative to history. Our secular rate outlook is based on the strong relationship between GDP and bond yields, since faster-growing economies are supported by more productive investment that justifies higher borrowing costs. Empirically, there have been deviations from this relationship during financial booms and subsequent busts, but over longer time horizons, higher rates of nominal GDP growth have generally coincided with higher interest rates.

Fixed income

We base our fixed income return expectations on the assumption that sovereign—or government—bond yields will gravitate toward the rate of nominal economic growth in the long term. Specifically, we assume that the yield on 10-year U.S. Treasury bonds will converge nonlinearly to our nominal GDP forecast of 4.2% annually over a 20-year time horizon (Exhibit 9).

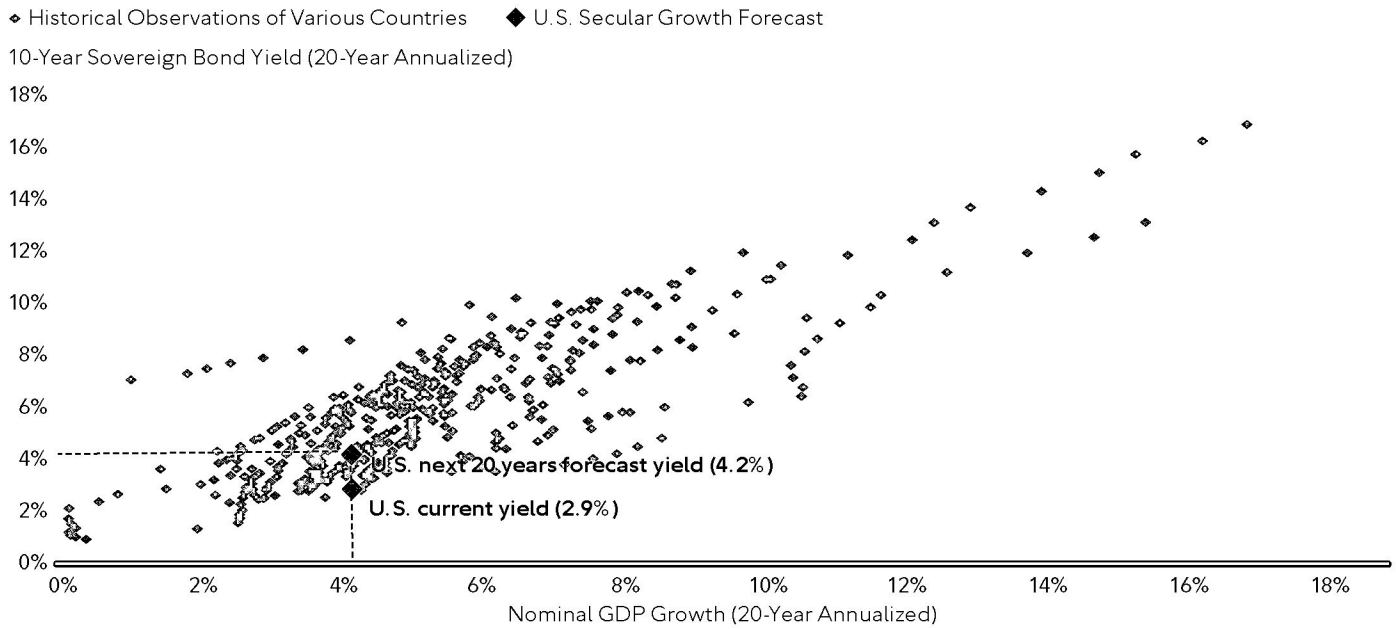
Government bonds: We believe falling bond prices will be a drag on future returns as yields rise over time, with longer-duration bonds expected to produce the lowest returns.[2] As yields rise, positive returns from higher coupon income—in addition to roll-down returns achieved as bonds mature along a positively sloped yield curve—could help offset the price depreciation, resulting in our estimate of 1.3% annualized real return for a constant maturity 10-year Treasury note and 0.6% for a constant maturity 30-year Treasury bond.[3]

Investment-grade bonds: The returns to credit-sensitive bonds are a function of both the "risk-free" rate calculated for government bonds and the additional return potentially generated by the credit spread, which compensates investors for the uncertainty and default risk of corporate bonds.[4] We also adjust returns to match the duration of the investment-grade bond universe, which is around 6.5 years.[5] Using these assumptions, we arrived at our estimate of a 1.9% return for the Bloomberg Aggregate Bond Index over the next 20 years.[6] (Exhibit 1).

Cash/Short-term debt: Given our estimated government bond yields, we then calculate term premia to forecast potential returns of short-maturity government securities.[7] We form a forward-looking view of the yield curve by linking our term premia expectations to country-specific histories and the

EXHIBIT 9: Government bond yields and GDP growth have been highly correlated over the long term.

Nominal GDP Growth vs. Sovereign Bond Yields, 1985–2022



GDP: Gross Domestic Product. Source: Official country estimates, Haver Analytics, Bloomberg Finance L.P., Fidelity Investments (AART), as of 4/30/22.

uncertainty about future growth and inflation, as reflected in the dispersion of forecasts among market observers. Due to the very short duration of cash, price depreciation from rising yields will be minimal, while the convergence to higher yields over time can increase coupon returns. However, current negative real yields are a considerable drag on cash, resulting in a real return estimate of -0.2%, which would fail to outpace inflation over the next 20 years.

Equities

Corporate earnings growth is the bedrock of our forward equity view. We model future earnings growth by linking GDP growth and financial market inputs and then incorporate a forward-looking valuation estimate that is not based on historical averages.

Earnings: We base our earnings expectations on GDP growth prospects adjusted for the industry mix of the equity market, to reflect the productivity rates specific to the universe of publicly traded companies, rather than the productivity rate of the overall economy.

For example, the equity market-capitalization weight of the highly productive U.S. technology sector significantly exceeds its weight in GDP, which implies that the productivity of the equity market exceeds overall economic productivity.[8] Also, interest rates and leverage are a significant driver of earnings growth. For example, higher leverage increases the return on equity while lower interest rates reduce interest costs, providing a boost to earnings expectations over the 20-year horizon. Rising longer-term market yields from mid-2020 through mid-2022 have reduced our market assumptions for equities.

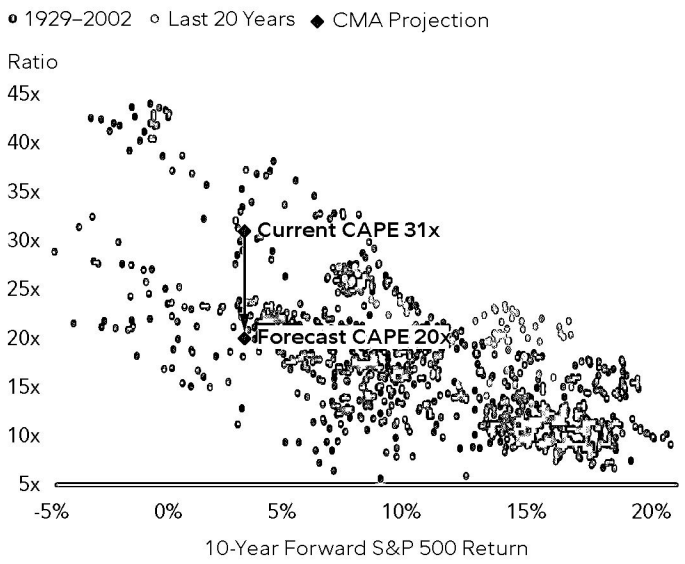
Valuations: We develop estimates based on the key drivers of a country's cyclically adjusted price-to-earnings (CAPE) multiple, such as market composition, growth, and inflation, rather than assuming that valuations will revert to historical averages. For instance, higher inflation rates tend to increase uncertainty and risk premia, resulting in lower valuations. Also, a larger weight of high-valuation industries such as technology boosts valuations. For the U.S., we expect the CAPE to average 20x

over the next 20 years, which is above its long-term average of 17x earnings. In the aggregate, our worldwide valuation estimates for the next 20 years are higher than historical averages, reflecting the increased importance of high-productivity industries and continued credibility of global central banks in containing inflationary pressures.

Whether a country's equity market return will be boosted or hindered by repricing back to this long-term trend also depends on starting valuations.[9] The CAPE for the U.S. stock market was 31x earnings, well above our long-term expectations as of April 30, 2022 (Exhibit 10). Outside the U.S., equity valuations were lower, but still expensive relative to our expectations.

EXHIBIT 10: We expect U.S. equity valuations to converge lower over the next 20 years.

Shiller CAPE vs. Forward U.S. Equity Returns



Past performance is no guarantee of future results. It is not possible to invest directly in an index. All indexes are unmanaged. See Appendix for important index information. Price-to-earnings (P/E) ratio (or multiple): stock price divided by earnings per share, which indicates how much investors are paying for a company's earnings power. Cyclically adjusted earnings are 10-year averages adjusted for inflation. Source: FactSet, Haver Analytics, Fidelity Investments (AART), as of 4/30/22.

Equity return expectations: Overall, we expect domestic and non-U.S. equities to have lower returns over the next 20 years as a result of slower global growth and elevated valuations. There are, however, some key differences across different segments of the market. We expect U.S. equities to trail the returns of both developed-markets equities outside the U.S. and emerging market equities (Exhibit 1).

Volatility and correlations

We built a forward-looking process for forecasting volatilities and correlations using a regime-based simulation engine.[10] We use historical data to simulate return paths starting from a secular and cyclical state most closely resembling the current environment. As of April 2022, our starting secular state is low growth and a mix of high and low inflation, and our starting cyclical state is a mix of mid- and late cycle. We take a core set of asset classes with relatively reliable historical data beginning in the 1950s and identify these core assets as factors. For non-core asset classes, we can estimate factor exposures and calculate a covariance matrix using 20-year simulations of the secular state, starting from today's starting conditions and using a transition matrix to account for the potential transitions to a different growth or inflation regime.

In contrast, most attempts at portfolio optimization are conducted using asset correlations that are calculated from past historical returns, for which there is limited history for newer asset classes such as emerging-market equities and global sovereign debt.

We believe there are shortcomings to this approach, as asset correlations can change over time. During the past 60 years, the 20-year correlation between U.S. equities and investment-grade bonds ranged from -0.1 to 0.4. At a given point in time, whether inflation or growth is the more dominant factor will influence correlations. When inflation is low and stable, growth has a greater impact on correlations. Because stock performance is positively tied to changes in growth expectations, while bond returns are inversely related, investment-grade bond returns tend to have a low or

even negative correlation with equity returns in a low-inflation environment. By contrast, when inflation is higher and more volatile—as it was in the 1970s—the correlation between stocks and bonds increased.

Relative return conclusions

Following are some of our key findings when comparing our return, volatility, and correlation estimates:

- We expect stocks and bonds to have lower real returns relative to the last 20 years and vs. their long-term histories.
- We anticipate risk-adjusted returns for U.S. and developed-market equity categories to be lower than long-term historical levels.
- We expect bonds to have a much lower Sharpe ratio relative to the past two decades.
- Although higher inflation expectations increase stock/bond correlations, we expect bonds to remain a good diversifier against equity returns.
- Under the different scenarios we ran to explore the impact inflation, financial repression, and other factors on our CMAs, we continue to expect stocks to outperform bonds.

As with any financial planning or portfolio construction process, comparing relative returns across asset categories is essential. Although we expect asset returns will be lower than they have been historically, our base case is for equities to outperform bonds over the next 20 years.

Appendix

Asset classes shown in Exhibit 1 are represented by the following indexes: Emerging-Market Stocks—MSCI Emerging Markets Index; Global Equities ex. U.S.—MSCI All Country World Index (ACWI) ex USA Index; Developed Market ex. U.S. Equities—MSCI World ex USA Index; U.S. Equities—Dow Jones U.S. Total Stock Market Index; U.S. High-Yield Bonds—ICE Bank of America (BofA) U.S. High Yield Index; Investment-Grade Bonds—Bloomberg U.S. Aggregate Bond Index; Developed Market Non-U.S. Bonds USD Hedged—Bloomberg Global Aggregate ex USD Total Return Index Value Hedged USD; Municipal Bonds—Bloomberg Municipal Bond Index; U.S. TIPS—Bloomberg U.S. Treasury Inflation Protected Notes; Developed Market Non-U.S. Sovereign Debt USD Hedged—Bloomberg Global Treasury DM ex US 30% EUR 10% Country Cap Total Return Index Hedged USD; U.S. Cash/Short-Term—Bloomberg 1-3 Month US Treasury Bill Index.

Index Definitions

Bloomberg Global Aggregate ex USD Total Return Index Value Hedged USD measures the performance of global investment-grade debt from 24 local currency markets. It is a multi-currency index that includes fixed-rate treasury, government-related, corporate, and securitized bonds from developed- and emerging-market issuers while excluding U.S.-denominated debt.

Bloomberg Global Treasury DM ex US 30% EUR 10% Country Cap Total Return Index Hedged USD measures the total return of fixed-rate, local currency government debt of investment-grade developed-market countries (excluding the United States), hedged to USD. The index maintains 30% exposure to eurozone countries and includes a 10% country cap.

Bloomberg Commodity Index measures the performance of the commodities market. It is calculated on an excess return basis and reflects commodity futures price movements.

Bloomberg 1-3 Month US Treasury Bill Index is designed to measure the performance of public obligations of the U.S. Treasury that have a remaining maturity of greater than or equal to 1 month and less than 3 months.

Bloomberg Municipal Bond Index is a market value-weighted index of investment-grade municipal bonds with maturities of one year or more.

Bloomberg U.S. Aggregate Bond Index is an unmanaged, market value-weighted performance benchmark for investment-grade fixed-rate debt issues, including government, corporate, asset-backed, and mortgage-backed securities with maturities of at least one year.

Bloomberg U.S. Treasury Inflation Protected Notes Index is a market value-weighted index that measures the performance of inflation-protected securities issued by the U.S. Treasury.

Consumer Price Index (CPI) is an inflationary indicator that measures the change in the cost of a fixed basket of products and services, including housing, electricity, food, and transportation.

Dow Jones U.S. Total Stock Market Index℠ is a full market capitalization-weighted index of all equity securities of U.S.-headquartered companies with readily available price data.

ICE BofA U.S. High Yield Index is a market capitalization-weighted index of U.S. dollar-denominated, below-investment-grade corporate debt publicly issued in the U.S. market.

MSCI ACWI (All Country World Index) ex USA Index is a market capitalization-weighted index designed to measure investable equity market performance for global investors of large and mid cap stocks in developed and emerging markets, excluding the United States.

MSCI Emerging Markets (EM) Index is a market capitalization-weighted index designed to measure the investable equity market performance for global investors in emerging markets.

MSCI® Europe, Australasia, Far East Index (EAFE) is an unmanaged, market capitalization-weighted index designed to represent the performance of developed stock markets outside the U.S. and Canada.

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Endnotes

[1] Past performance is not a guarantee of future results. All historical performance data quoted is as of 4/30/22, unless otherwise noted.

[2] Duration estimates a bond's change in price given a change in interest rates, assuming a parallel shift in the yield curve (neither steepening nor flattening).

[3] The roll-down return is the gain (loss) caused by a falling (rising) yield when a bond approaches its maturity date. Therefore, as bonds approach their maturity date, they should roll down the positively sloped yield curve to a lower yield, creating a gain.

[4] Treasury securities are considered "risk free" because they are backed by the full faith and credit of the U.S. government.

[5] As of Apr. 30, 2022.

[6] The composition of the combined investment-grade bond portfolio has a similar weighting of government and corporate bonds as the Bloomberg U.S. Aggregate Bond Index. Investment-grade bonds are bonds rated BBB-/ Baa3/ BBB- or higher by Standard & Poor's/Moody's/Fitch.

[7] The term premium is the excess yield that investors require to commit to holding a long-term bond instead of a series of shorter-term bonds.

[8] Source: Bureau of Economic Analysis, Haver Analytics, Fidelity Investments (AART) as of Apr. 30, 2022.

[9] We define current valuations as today's cyclically adjusted P/E ratio, or the Shiller CAPE, which is the ratio of today's stock market index price divided by the average of the last 10 years of operating earnings per share.

[10] Correlation measures interdependencies between two random variables, with coefficients indicating perfect negative correlation at –1, absence of correlation at 0, and perfect positive correlation at +1.

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Fidelity Thought Leadership Vice President Christie Myers provided editorial direction for this article.

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Stock markets are volatile and can fluctuate significantly in response to company, industry, political, regulatory, market, or economic developments. Foreign markets can be more volatile than U.S. markets due to increased risks of adverse issuer, political, market, or economic developments, all of which are magnified in emerging markets. These risks are particularly significant for investments that focus on a single country or region.

Although bonds generally present less short-term risk and volatility than stocks, bonds do contain interest rate risk (as interest rates rise, bond prices usually fall, and vice versa) and the risk of default, or the risk that an issuer will be unable to make income or principal payments.

Additionally, bonds and short-term investments entail greater inflation risk—or the risk that the return of an investment will not keep up with increases in the prices of goods and services—than stocks. Increases in real interest rates can cause the price of inflation-protected debt securities to decrease.

Investing involves risk, including risk of loss.

Past performance and dividend rates are historical and do not guarantee future results.

Diversification and asset allocation do not ensure a profit or guarantee against loss.

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Industry Update — July 15, 2022

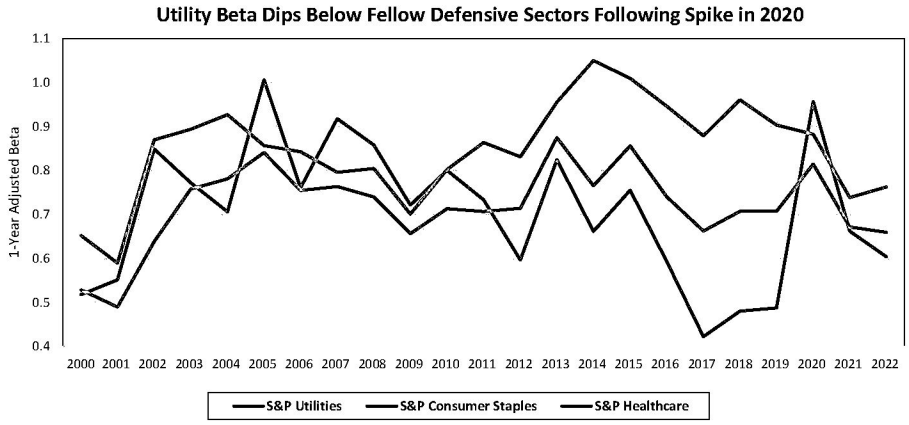
Utilities

Figure of the Week: Utility 1-Year Beta Continues Downward Trajectory

Our Call

Figure of the Week

Click image to enlarge in HTML view.



Note: 2022 beta based on trailing twelve months through 6/30/22
Source: Factset and Wells Fargo Securities, LLC

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Analyst Long-term Growth Forecasts, Accounting Fundamentals and Stock Returns

Working Paper Draft Date: 4/4/2016

Abstract:

We decompose consensus analyst long-term growth forecasts into a hard growth component that captures accounting information (asset and sales growth, profitability and equity dilution) and an orthogonal soft growth component. The soft component does not forecast future returns, and the hard component does forecast future returns, but in a perverse way. Specifically, stocks with accounting information indicating favorable long-term growth forecasts tend to realize negative future excess returns. This and other evidence we present is consistent with biased long-term growth forecasts generating stock mispricing.

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I. Introduction

The Gordon growth model expresses a stock's price as a function of its current dividends, a discount rate, and long-term growth expectations. Of the three relevant components of price, determining long-term growth expectations requires the most judgement and is the most likely to be subject to systematic mistakes. This paper analyzes potential errors in long-term growth expectations by examining the long-term consensus (mean) forecasts of earnings reported by sell-side analysts.[2] Consistent with earlier work, we find evidence of systematic errors in the forecasts, as well as evidence that these errors are reflected in stock prices in ways that are consistent with various return anomalies discussed in the academic finance literature.

To better understand the biases in long-term growth forecasts we decompose the forecasts into what we call a hard component, which can be explained by accounting and choice variables, and a soft component, which is the residual. Elements of the hard component include accounting ratios that capture profitability and changes in sales, as well as choices that influence asset growth and equity dilution. As we show, both components of long-term growth are related to current stock prices, suggesting that either the forecasts or the rationale used by the forecasters influence stock prices.[3] However, our evidence indicates that the forecasts of sell-side analysts are systematically biased, and that these biases may have influenced stock prices in ways that make their returns predictable.

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[2]Analysts periodically provide forecasts of the current, one- and two-year forward EPS and a longer-term growth rate (LTG) that reflects expected annual percentage changes in EPS after the two-year EPS forecast. The exact forecast period for LTG is subjective and can vary by analyst. Da and Warachka (2011) explain that LTG reflects an analyst's perception of EPS growth over the three-year period starting two years from now.

[3]There is a large literature that links analyst long-term growth forecasts to stock prices. Easton, Taylor, Shroff and Sougiannis (2001), Bradshaw (2004), Claus and Thomas (2001), Gebhardt, Lee and Swaminathan (1998) and Nekrasov and Ogneva (2011) use analyst long-term growth as an input for a residual income valuation model to estimate the cost of capital. Bandyopadhyay, Brown and Richardson (1995) examine 128 Canadian firms and find that 60% of the variation in analyst stock price recommendations can be explained by long-term earnings growth forecasts.

The observed biases are linked to the hard component of the growth forecasts. In particular, the forecasts suggest that analysts believe profits are mean reverting, but profitability actually tends to be fairly persistent. The forecasts also indicate that analysts believe that high past sales growth is a good predictor of future earnings growth. However, we find that high sales growth is actually weakly negatively associated with future earnings growth. Endogenous firm decisions, such as the rate of asset growth, and the use of external financing, are associated with higher growth forecasts, but the relationship between these choices and actual earnings growth is actually negative. The soft component of the growth forecasts does in fact correctly predict actual growth, although in some tests the relationship is relatively weak.

The above evidence is consistent with the idea that the logic of mapping hard information to expected future growth rates may be leading investors astray. If this is the case, investors may be able to profit with trading strategies that buy stocks when the hard component of growth is unfavorable and sell when the hard component is favorable. Our evidence, which is consistent with other papers in the investment anomalies literature, indicates that this is indeed the case.

Our paper is not the first to describe biases in analyst long-term growth forecasts and relate these biases to abnormal stock returns.[4] Previous research by Dechow and Sloan (1997), Chan, Karceski and Lakonishok (2003), La Porta (1996) and Sloan and Skinner (2002) find evidence that overly optimistic equity analyst forecasts contribute to the value premium and that growth stocks underperform when high expectations are not met. Copeland, Dolgoff, and Moel (2004) show that innovations in analyst long-term growth estimates are positively correlated with contemporaneous stock returns. A more recent paper by Da and Warachka (2011) conjectures that short-term earnings forecasts are much more accurate than the long-term forecasts and shows that a strategy that exploits differences between these forecasts generates excess returns.

We contribute to this literature in a number of ways. In particular, we are the first to consider how the various types of hard information, such as endogenous choices like asset growth and equity issues may influence long-term growth forecasts. Second, we are the first to seriously consider the challenges associated with estimating realized long-term earnings growth in a sample with considerable survivorship bias – close to 1/3 of our sample has missing realized five-year earnings growth as reported by I/B/E/S. Some of the missing firms were acquired and some went bankrupt, so our sample of survivors is clearly biased. As we will describe in detail later, to address this problem, we use the market-adjusted returns measured until the firm is no longer in the database to create a proxy for EPS growth rate.

Our paper is also related to the literature that examines the relation between information disclosed in firms' financial statements and future stock returns. For example, Novy-Marx (2013) finds that highly profitable firms outperform low profit firms. Lakonishok, Shleifer and Vishny (1994) report a negative relation between sales growth and future returns. There is also a larger literature that explores whether various measures of asset growth and equity dilution explain stock returns.[5] This literature suggests two potential explanations for why analysts provide favorable long-term growth forecasts for firms growing assets and raising external equity. The first explanation, discussed in Daniel and Titman (2006), is that executives tend to raise capital when soft information about growth prospects is most favorable. If analysts tend to overreact to this soft information, then we will see a relation between favorable analyst forecasts, increases in external financing, and negative future returns. A second, somewhat more cynical explanation is that analysts issue optimistic growth forecasts for firms that are likely to be raising capital externally. The idea here is that analysts that make optimistic

[5]Pontiff and Woodgate (2008), Daniel and Titman (2006) and Bradshaw, Richardson and Sloan (2006) find that firms that repurchase shares outperform those that issue additional shares. Cooper, Gulen and Schill (2008) and Titman and Wei (2004) find evidence that asset and capital investment growth, respectively, are negatively related to future returns.

long-term growth forecast make it easier for their investment bankers to generate underwriting business.[6]

One can potentially distinguish between these explanations by examining our evidence on data both before and after the enactment of the global research analyst settlement in September 2002 (See Kadan, Madureira and Wang (2009), Clarke, Kohrana, Patel and Rau (2011) and Loh and Stulz (2011) for more information on the global research analyst settlement), which curtailed the ability of investment bankers to influence sell-side recommendations. Consistent with the idea that the settlement changed analyst behavior, we find that the relation between hard information and future returns are weaker in the post-settlement period. This evidence, however, should be interpreted with caution given the short post-global settlement sample period and confounding events such as the inclusion of certain accounting ratios in quantitative investment models (McLean and Pontiff (2014) and Chordia, Subrahmanyam and Tong (2014)) and the effect of regulation-FD (Agrawal, Chadha and Chen (2006) and Mohanram and Sunder (2006)).

The rest of this paper is organized as follows. The first section describes the data used in our analysis and the characteristics of high and low forecasted growth firms. The second section presents the decomposition of analyst long-term growth forecasts and examines the persistence of long-term growth forecasts and different accounting and valuation ratios. The third section presents the main analysis, exploring how various measures of expected growth are related to valuation ratios and realized earnings growth. The fourth section analyzes how different components of long-term growth forecasts predict future stock returns. The fifth section discusses pre- and post-Global Settlement evidence and evaluates various explanations for our results. The final section concludes.

II. Data

[6]For a discussion of this more cynical view see Cragg and Malkiel (2009), Dechow, Hutton and Sloan (2000), Lin and McNichols (1998), Teoh and Wong (2002).

Our main variable of interest, consensus analyst long-term growth (LTG), is taken from I/B/E/S and reflects the mean analyst estimate of annualized earnings growth.[7] There are a few challenges associated with using this measure as an estimate of projected growth. First, each individual analyst long-term growth estimate is updated periodically at the discretion of the analyst, which creates the possibility of stale data. However, as we show, consensus analyst growth forecasts are very persistent through time, suggesting that the individual analyst forecasts change very slowly. Second, analysts do not always produce a long-term growth estimate to go alongside their shorter-term forecasts.

The starting sample for this study includes all NYSE, AMEX and NASDAQ stocks listed on both the Center for Research in Security Prices (CRSP) return files and the Compustat annual industrial files from 1982 through 2014. Information on stock returns, market capitalizations and prices are from the CRSP database. Balance and income sheet information, shares outstanding and GICS industry codes are from the COMPUSTAT database. Analyst long-term consensus growth forecasts (LTG), current stock prices, next year's consensus EPS and actual five-year annual EPS growth rates are from Institutional Brokers Estimate System (I/B/E/S) Summary file. I/B/E/S compiles these forecasts on the third Thursday of every month.

We exclude stocks that have negative or missing book equity, missing industry codes, LTG estimates, or missing accounting data required to construct the different variables used in this study. Two of our measures require non-zero information on sales and assets in year *t-2*, which mitigates backfilling biases. While we include financial stocks, excluding those securities has very little impact on the results reported in the paper. Our final sample has an average of 2,213 firms in each year.

[7]Our empirical results are economically similar using the median consensus forecast instead of the mean.

Following Fama and French (1992), we form all of our variables at the end of June in year *t*, using fiscal year *t-1* accounting information and analyst estimates from June of year *t*. For valuation ratios such as Price/Book, we use market equity from December of year *t-1*. For EPS valuation ratios based on analyst estimates and measures of company size, we use market equity from June of year *t* to measure the information in the numerator and the denominator at the same point in time. Stock returns are adjusted for stock delisting to avoid survivorship bias, following Shumway (1997). Portfolios used in various asset pricing tests are formed once a year on the last day in June, allowing for a minimum of a six-month lag between the end of the financial reporting period and portfolio formation.

Variable definitions are as follows. Realized EPS growth (REAL EPS) is from I/B/E/S and reflects the annualized growth rate in EPS over the past five years. Equity dilution (EQDIL) is measured as the percentage growth in split-adjusted shares outstanding. Sales growth (△SALES) is constructed as the year-over-year percentage growth in revenues divided by split-adjusted shares outstanding. Asset growth (△ASSETS) is equal to the year-over-year percentage growth in assets divided by split-adjusted shares outstanding. Profitability (ROA) is defined as operating income before depreciation scaled by assets. SIZE is the logarithm of company market capitalization measured at the end of June.[8] P/B is the logarithm of the market equity to book equity. P/E_{t+1} is the logarithm of the forward price to earnings calculated as the analyst consensus EPS for the next year divided by the price per share. Change in analyst long-term earnings forecasts (△LTG) is the year-over-year change in analyst consensus long-term earnings forecasts. Each year, variables are cross-sectionally winsorized to reduce the effect of outliers by setting values greater than the 99th percentile and less than the 1st percentile to the 99th and 1st

[8]To calculate book equity, we use the following logic which is largely consistent with the tiered definitions used by Fama and French (1992). Book equity is equal to shareholders' equity plus deferred taxes less preferred stock. If shareholders' equity is missing, we substitute common equity. If common equity and shareholders' equity are both missing, the difference between assets and liabilities less minority interest is selected. Deferred taxes are deferred taxes and/or investment tax credit. Preferred stock is redemption value if available; otherwise, carry value of preferred stock is used. We set to zero the following balance sheet items, if missing: preferred stock, minority interest, and deferred taxes.

percentile breakpoint values, respectively. All variables are updated annually at the end of June of each year. Our variable definitions are largely consistent with previous studies.

[Insert Figure 1 Here]

Figure 1 reports the average and median annual consensus analyst long-term growth forecast (LTG) from 1982 to 2014 and five-year realized EPS annualized growth rate from 1982 to 2009. The mean estimated growth rate over this period is remarkably stable, increasing from 15.4% in 1982 to 19.7% in 2001 and then decreasing to 14.0% in 2014. The actual five-year growth rate (1982 reflects the five-year growth rate between years 1982 and 1987) fluctuates from slightly higher than 0% to 17.8%. The median cross-sectional forecast and realized earnings growth rates show a similar pattern. Realized growth tends to be high following recessions (1991, 2003, and 2008) and much lower in periods that include recessions in the five-year window.

At the end of June of each year *t* stocks are allocated into quintiles based on LTG. Table 1 reports formation period (using accounting information from year *t-1*) value-weighted summary statistics for various accounting ratios, price-ratio variables and market capitalizations for each of the five quintile portfolios. The first quintile portfolio contains the firms with the lowest expected growth; the fifth quintile portfolio contains the firms with the highest expected growth. Over our sample period, analysts expect the lowest growth firms to average 7% annualized growth in earnings per share, while the top group has average projected EPS growth rates that are four times as large. The distribution of LTG is right-skewed: the middle group (3rd quintile) has close to a 14% lower growth rate than the highest growth group, but only a 7% higher growth rate than the lowest growth group.

[Insert Table 1 Here]

Although the following comparison is plagued with clear survival bias, it is useful to compare the long-term growth forecasts with realized EPS growth. Realized EPS growth does line up with projected growth – increasing monotonically from a low of 3.0% for the quintile portfolio with the lowest LTG to a high of 13.6% for the highest LTG. The average forecast error, defined as the difference between the forecast and the actual growth, also increases monotonically moving from left to right, rising from 3.9% for the lowest LTG growth to 14.4% for the highest LTG group. Even the lowest expected growth firms based on LTG miss their long-term earnings projections, although the misses are relatively small. In contrast, the highest expected growth firms have average realized growth that is more than 50% less than their ex-ante forecast.

The second section of Table 1 Panel B shows that many of the accounting variables used in our study have a meaningful relation with long-term growth forecasts. High expected growth firms tend to have greater equity dilution (EQDIL) and higher past sales (ΔSALES) and asset growth (ΔASSETS). We also observe the same asymmetry associated with expected growth rates – the highest growth group has equity dilution ratios, sales and asset growth rates that are twice as large as the 4th quintile, while the difference between the 3rd and 4th quintile is not as large. Our last non-price variable, profitability (ROA), does not appear to be related to consensus long-term analyst growth.

The third section of Table 1 Panel B examines how price-related variables are related to growth expectations. The results show that low growth rate firms are not the largest firms in our sample, with a time-series average of yearly cross-sectional mean capitalization (SIZE) of 30.9 BN, but are larger than the highest growth rate firms, which have capitalizations of 19.8 BN. High growth firms also tend to have much higher valuation ratios (P/B, P/E_{t+1}) – the highest growth group has a market capitalization that is on average 39x next-period expected earnings, while the lowest growth group has a market capitalization that is only 14x next-period expected earnings. This is consistent with the idea that greater growth opportunities are reflected in higher valuation ratios.

III. Decomposing Growth Expectations

Table 2 presents regressions that document the relation between the hard information variables and long-term growth forecasts. The first four rows of Table 2 display univariate panel regressions of LTG on different firm characteristics using annual data from 1982 to 2014. Errors are clustered by firm and year. Long-term growth is measured as of June of year *t*, while the independent variables use accounting information from fiscal year *t-1*. Similar to Table 1, equity dilution (EQDIL), sales growth (ΔSALES) and asset growth (ΔASSETS) are all positively related to LTG. The fourth variable, profitability (ROA), is negatively related to long-term growth, but is not reliably different from zero (T-stat=1.65). Past sales growth has the highest explanatory power, explaining 10% of the variation in long-term growth.

[Insert Table 2 Here]

Rows 5 through 8 report our estimates of multivariate cross-sectional regressions of LTG on the four non-price accounting variables. The regressions are run both with and without fixed effects that capture variation in long-term growth forecasts by industry and year. In most regressions, the coefficients of both the accounting variables and the industry and firm fixed effects are statistically significant, indicating that we can explain analyst long-term growth forecasts with hard information.

The positive coefficients on sales growth indicate an expectation that the past sales growth will persist into the future, which should in turn lead to future EPS growth. Higher asset growth, or growth of certain quantities on the balance sheet, such as property, plant and equipment, can indicate the firm is making presumably positive NPV investments that will generate future earnings. Equity issuances can also indicate the presence of growth opportunities due to a need for additional capital, while share repurchases may indicate the lack of growth opportunities. The negative coefficient on

profitability signifies expected mean reversion, as those low profit firms are expected to have the highest growth in EPS when compared to high profit firms.

The panel regressions reported in Table 2 implicitly assumes that the multivariate relation between the hard information variables and analyst long-term consensus growth forecasts are constant over time. Figure 2 displays the time-series Fama-MacBeth coefficients of contemporaneous accounting variables from a regression explaining analyst long-term growth forecasts. As the figure shows, most relationships are stable over time and all of the equity dilution, sales and asset growth coefficients are positive. The profitability coefficient varies the most, reaching a minimum in the late 90s, during which many technology firms had poor profits but high future expected growth. There does not appear to be a large difference in the coefficient estimate before and after the global settlement (August 2002).

[Insert Figure 2 Here]

In the tests that follow, we decompose analyst long-term growth forecasts into two parts. The first component, which we call *Hard Growth*, is the fitted values from the regression reported in the last row of Table 2 and reported in Equation 1.

$$\text{Hard Growth} = 0.04 + 0.08\ \text{EQDIL} + 0.05\ \Delta\text{SALES} + 0.04\ \Delta\text{ASSETS} - 0.12\ \text{ROA} \qquad (1)$$

The second component, denoted *Soft Growth*, is the difference between LTG and Hard Growth. Soft Growth reflects analyst private views or information content in LTG that is unexplained by observable accounting variables.

For our measure of Hard Growth, we use the coefficients of the independent variables from the equation reported above, but we do not include the coefficients on industry or time dummies to avoid any forward-looking bias. This assumption is not

material – when we use only same period information to form hard and soft growth measures, the results presented in later sections are not materially different.

To better understand how growth expectations are incorporated into market prices, Table 3 estimates the relation between the components of long-term growth and two valuation ratios. Panel A reports results for log price-to-book (P/B) and Panel B reports results for log of forward earnings-to-price (P/E_{t+1}). The first four rows of each panel examine the relation between the valuation ratios and the four accounting ratios. For the P/B ratio, each of the four accounting variables is significantly positively related, with R^2 ranging from 0.11 to 0.29. Given P/B ratio reflects the market's expectations of growth opportunities: the coefficients on the positive indicators of growth (EQDIL, ΔASSETS, ΔSALES) have the correct sign, while the coefficient on the negative indicator of growth, ROA, has the incorrect sign, although it has the lowest t-statistics of the four variables. For the P/E_{t+1} ratio displayed in Panel B, the three variables that indicate growth all have the predicted positive sign, although sales growth is not statistically significant. ROA has a negative sign and is statistically significant after controlling for industry variation.

[Insert Table 3 here]

The last four rows of each panel in Table 3 use Hard Growth (the fitted values from the last regression reported in Table 2) and Soft Growth (the difference between LTG and Hard Growth or the residual of the same regression) as independent variables. For both valuation ratios, we find that Soft Growth has a positive and highly significant relation with value. Hard Growth is also positive and significant in most regressions, but the relationships are not as strong. Indeed, all of the regressions are consistent with both the hard and soft information in the analyst forecasts being incorporated into market prices.

IV. Do Growth Estimates Predict Future Earnings Growth?

We next examine whether the soft and hard components of forecasted earnings growth actually predict realized earnings growth (REAL EPS). I/B/E/S and Dechow and Sloan (1997) estimate realized earnings growth over the past five years using an AR(1) regression of log (EPS) using six annual observations between years *t* and *t+5*, where year *t* is the reference year that LTG is measured. Hence, one can estimate the extent to which long term growth forecasts and the various components of expect growth predict actual growth.

Unfortunately, sample selection bias creates a major problem for this analysis. Estimating realized earnings growth requires future realizations of non-negative EPS values, and a number of firms in the sample experience negative earnings and a number of other firms drop out of our sample. Specifically, in our sample from 1982 to 2009, we have five-year earnings growth rates for only two-thirds of the original sample (41,957 out of 63,842 firm-years). For those stocks with five-year earnings growth data (REAL EPS), 97.4% have a full 60 months of stock returns, and the average compound return is 14.4% per year for this sample. In comparison, only 22.5% of stocks with missing REAL EPS data have 60 months of stock returns – those firms with 60 months of data, but missing REAL EPS data, have stock returns that averaged only 5.37% per year.

Clearly, the firms with missing data performed worse than those that stayed in our data base. However, firms leave the sample for a variety of reasons, such as mergers, as well as bankruptcy and negative future earnings. Hence, in addition to losing firms that do very poorly, we lose some because the firms did very well – as a result, the bias should affect both low and high expected growth firms. Indeed, we find that 42% of the high expected growth firms (top quintile based on LTG each year) and 27% of low expected growth firms (lowest quintile) have missing five-year earnings growth information.

Heckman's (1979) two-stage selection model provides a potential solution for this sample selection problem. However, this approach requires an instrument that is

correlated with whether or not REAL EPS is missing but which is uncorrelated with actual EPS growth. Unfortunately, we have not been able to come up with a good instrument. What we do instead is come up with proxies for the missing data. Specifically, we calculate the five-year market-adjusted return $R_{i,MAR(t,t+5)}$ as the difference between the compound annual five-year stock return $R_{i(t,t+5)}$ measured from July of year t to June of year $t+5$ less the compound annual market return $R_{Mkt(t,t+5)}$ measured over the same period.[9]

$$R_{i,MAR(t,t+5)} = R_{i(t,t+5)} - R_{Mkt(t,t+5)} \quad [2]$$

Figure 3 reports value-weighted, market-adjusted returns $R_{MAR(t,t+5)}$ for decile portfolios formed by ranking stocks on I/B/E/S five-year realized EPS growth rate (REAL EPS). We include all stocks that have non-missing EPS data. Moving from left-to-right, the average five-year market-adjusted return rises from -19.0% to 8.6%. The monotonic relation between the EPS growth and stock returns is consistent with Ball and Brown (1968), Ball, Kothari and Watts (1993), Daniel and Titman (2006) and suggests that return information is a good proxy for EPS growth.

[Insert Figure 3 Here]

The approach we take fills in missing earnings data, which reflect close to 1/3 of our sample, with estimates based on observed stock returns. Specifically, our matching process involves calculating the percentile rank of $R_{MAR(t,t+5)}$ for a given year using all firms (including those with missing REAL EPS), defined as the percent of firms with a lower $R_{MAR(t,t+5)}$, and takes values between 0 and 100. We then do the same exercise calculating the percentile rank of REAL EPS using the sample of non-missing firms from Figure 3.

[9] When a firm has less than 60 months of data, we use the available return data to estimate compound annual market-adjusted returns.

For each missing REAL EPS observation, we then assign the average five-year EPS growth rate estimated in the same year for the REAL EPS percentile rank that corresponds to the same percentile rank of $R_{MAR(t,t+5)}$. Our procedure matches a distressed firm with poor stock returns and missing EPS growth rate, potentially due to negative earnings or a bankruptcy a low EPS growth rate. Similarly, the procedure matches a firm that has high stock returns and a missing five-year EPS growth rate, possibly due to a corporate action such as a merger, with a high EPS growth rate.

Figure 4 displays a histogram of $R_{MAR(t,t+5)}$ for those firms with missing REAL EPS data. This figure provides a sense of the distribution of market-adjusted stock returns for the sample with missing data and whether firms are matched to low or high realized EPS growth rates. The matched firms often have very low or very high market-adjusted returns – 22% of the missing sample in which $R_{MAR(t,t+5)}$ was in the bottom decile of future average returns, while 19% were in the top decile. In contrast, only 11% of the missing sample had future five-year returns that were either in the fifth or sixth deciles.

We examine why firms have missing REAL EPS. For those firms in the highest decile of market-adjusted returns, 93% were delisted because of a merger or acquisition. Among those in the lowest decile of market-adjusted returns, almost all of those firms were either delisted over the next five years because of bankruptcy or had negative earnings over the five-year period.

[Insert Figure 4 Here]

Table 4 reports results for a panel regression of 5-year realized EPS growth (REAL EPS) on our measures of hard and soft information. When REAL EPS is missing, we assign a future EPS growth rate as described above. Errors are clustered by industry and firm, which help to correct for the overlapping nature of estimating realized EPS growth over five years. The first two rows display results without inclusion of LTG; the third and fourth rows include LTG. In our fourth specification reported on the fourth row, we find

equity dilution (T-stat=7.41), sales growth (T-stat=2.67) and asset growth (T-stat=2.16) are all significantly negatively related to actual growth, despite being positively related to forecasted growth. Profitability is also reliably positively related to actual growth (T-stat=5.02), even though profitability loads negatively on forecasted growth. We also find a negative relation between LN (P/B) ratio (T-stat=3.11) and realized growth, suggesting that growth stocks have lower earnings growth when compared to value stocks. After including industry and year dummies, the coefficient on analyst long-term growth (T-stat=1.00) is no longer significant, indicating that analyst long-term estimates are relatively poor predictors of actual earnings growth after controlling for hard information, and industry and year fixed effects.

[Insert Table 4 Here]

The last two rows of Table 4 report regression results of hard and soft growth on realized five-year earnings growth. In our first specification in row 5, we find a negative and significant relation between hard growth (T-stat=4.39), and realized earnings growth. We also find a significant positive relation between soft growth (T-stat=2.58) and realized earnings growth. After including industry and year dummies reported in the last row of Table 4, the coefficient on soft growth declines from 0.11 to 0.02 and is no longer significantly different from zero (T-stat=0.63). A straightforward extension of our analysis (which, for the sake of brevity, we do not report) is that hard accounting information also explains analyst forecast errors; i.e. the difference between the realized 5-year earnings growth and the analyst long-term consensus growth forecast.

To understand the importance of these results, recall that Table 2 shows that sales and asset growth and equity dilution variables are positively related to analyst long-term growth expectations, while profitability is negatively related. Table 4 illustrates the opposite: profitability is positively related to actual earnings growth, but sales and asset growth and equity dilution is negatively related. These results are consistent with a bias

in how analysts and markets perceive hard information when making earnings growth forecasts and setting prices.

Analysts, and by extension financial markets, may make mistakes due to the way they interpret the persistence of certain accounting variables. Increasing sales and high profitability is generally associated with greater earnings growth. Similarly, endogenous variables such as asset growth and equity dilution may indicate future investment or the presence of growth opportunities. In Figure 3, we report Spearman rank correlations for each variable and their future values to examine the persistence of different variables that are related to growth expectations. The x-axis reflects the number of years between the current and future variable values. Correlations for each measure decline as more time elapses.

[Insert Figure 3 Here]

Our results suggest that analysts make mistakes when interpreting the persistence of accounting information while setting growth expectations. The "level" variables based on ratios of balance sheet information or market prices (ROA, P/B, P/E_{t+1}) tend to have high persistence, initially ranging from 0.70 to 0.84 for a one-year lag (t+1) and falling to 0.43 to 0.62 for a five-year lag (t+5). Value companies tend to stay value companies, and profitable firms tend to stay profitable. In contrast, the "change" variables, or those variables based on differences in balance sheet quantities (EQDIL, ΔASSETS, ΔSALES), exhibit far less persistence: one-year lag correlations are between 0.41 to 0.27 and decline to 0.20 to 0.11 for a five-year lag. Analyst long-term growth (LTG) is also very persistent, with serial correlations that decline from 0.84 (one-year) to 0.61 (five-year).

The correlations reported in Table 2 and Equation 1 show how analysts expect certain accounting quantities will affect future earnings growth. For example, profitability has a negative loading on LTG, indicating that analysts believe that low profit firms today will have higher earnings growth and hence high future profits. In reality, profitability is

fairly persistent and low profit firms do not have higher earnings growth when compared to high profit firms. Sales growth also has a positive correlation with analyst long-term earnings growth forecasts indicating that analysts expect sales growth will persist in the future, even though it is actually not very persistent and a negative (weak) indicator of actual earnings growth. Similarly, endogenous variables such as asset growth and equity dilution which should reflect growth opportunities load positively on LTG. However, these indicators of growth are also not very persistent and are actually negatively related to actual earnings growth.

As we show, there is a tendency for these mistakes to at least partially correct over the following year. Table 5 reports regressions of year-over-year changes in analyst consensus long-term growth (LTG) on accounting and manager choice variables. The first four rows show that change variables (equity dilution, asset and sales growth) are associated with strong negative revisions in LTG. The coefficient on the fourth variable, ROA, does not predict innovations in LTG. Our composite variable, Hard Growth, also predicts when LTG forecasts will be revised downwards.

[Insert Table 5 Here]

If LTG forecasts do in fact reflect market beliefs, and if their revisions can be predicted with the Hard Growth component, then one might conjecture that the Hard Growth component also predicts returns. As we show in the next section, this is indeed the case.

V. Do Errors in Growth Forecasts Lead to Return Predictability?

Our final analysis, reported in Table 6, examines how the different components of long-term growth forecasts explain differences in average stock returns. Panel A of the Table reports average value-weighted returns for portfolios formed on LTG, Hard Growth and Soft Growth for those firms with available LTG and accounting data. Consistent with

Jung, Shane and Yang (2012), we find that analysts' consensus long-term growth expectations are unrelated to future stock returns. Our measure of Hard Growth, however, is strongly negatively related to average returns. Average returns for value-weighted portfolios formed on Hard Growth reported in the 2nd row of Table 6 Panel A decline from 1.19 for decile 1 (lowest growth) to 1.04 for decile 9. The last decile, which includes the firms with the highest Hard Growth indicators (low profitability, high external financing, high asset and sales growth), has monthly returns that are 55 basis points lower than the previous decile; the difference between the top and bottom decile is -0.60% per month (T-stat=2.66). In contrast, the last row of Table 6 Panel A shows that Soft Growth, which reflects analysts' views that is unrelated to accounting information, is unrelated to stock returns.

[Insert Table 6 Here]

Panels B and C of the table report these same portfolio returns for smaller firms and for a larger sample that also includes firms that do not have LTG data. Panel B, which reports returns on the smallest half of the firms (based on market capitalization), shows stronger results – the average return of the top decile is 0.86% less per month (T-stat=3.88) when compared to the average return of the bottom decile. Panel C examines a larger data on firms with data available to measure Hard Growth, but including firms that may not have LTG forecasts. Not requiring LTG estimates doubles the sample size to an average of 4,045 firms per month. As we show, with this larger sample that more closely reflects the samples used in earlier studies of these return anomalies, we find a very strong relation between our estimate of hard growth and stock returns – the average return of a portfolio that is long the highest decile of hard growth firms and short the lowest decile of hard growth firms is -0.79% (T-stat = 3.38).

[Insert Table 7 Here]

Table 7 reports results from Fama-MacBeth regressions of monthly returns on our hard and soft growth measures, with controls for firm size and book-to-market. There is evidence of a weak size (insignificant in all regressions) and stronger value effect (significant in every regression except one) in our sample. In the first regression on the left of the table, LTG is not related to average returns. The second regression includes variables that capture accounting information and manager decisions. We find a significant and positive relation between equity dilution (T-stat=5.25) and asset growth (T-stat=4.39) and average returns. The coefficient of sales growth (T-stat=1.86) is positive and the coefficient of profitability (T-stat=1.66) is negative, the significance of each is marginal. Including LTG in the third regression causes the significance of all the variables to increase – with sales growth (T-stat=2.12) and profitability (T-stat=2.16) now significantly different from zero at the 5% level. The t-statistics and coefficients on the hard information variables reported in the 4th regression are even stronger after including fixed effects that capture differences in industry returns each month.

The final two regressions examine how hard and soft growth relate to average returns. The results largely mirror those reported in Table 6, with LTG and soft growth not related to average returns while hard growth is strongly negatively related to average returns. The Fama-MacBeth approach equal-weights stock returns in each cross-section, compared to the value-weighted portfolio returns reported in the previous table. Our results suggest that hard growth generates a larger difference in returns among smaller stocks when compared to larger stocks, which is consistent with the results presented in Table 6 Panels B and C.

VI. The Effect of the Global Analyst Research Settlement on Long-term Growth Forecasts

The results presented in the previous sections suggest the market misinterprets hard information that signals high growth leading to underperformance, particularly for firms with the most extreme growth forecasts. One possibility explored in Dechow, Hutton

and Sloan (2000) is that analysts hype those firms to gain more investment banking business and make it easier for firms to issue equity or debt. An alternative explanation is that managers tend to invest when intangible information is positive and that investors tend to over-react to intangible information (Daniel and Titman (2006)). Manager choice variables such as equity dilution and asset growth signal favorable or unfavorable intangible information, which leads to return predictability.

Rule NASD 2711 and NYSE 472, better known as the Global Analyst Research Settlement, were regulations to reduce the ability of investment banks to influence analysts' stock recommendations. The ruling required the analysts to provide disclosure of any conflict they (or their firm) may have with the recommended stock. We follow Kadan, Madureira and Wang (2009), Clarke, Khorana, Patel and Rau (2011) and Loh and Stulz (2011) by assigning the period starting with September 2002 as the post-global settlement. Analyzing our tests pre- and post-global settlement allows us to better understand how analysts change how (i) analysts form their forecasts, (ii) forecasts are incorporated into market prices, (iii) actual earnings growth is related to hard and soft information, and (iv) whether hard and soft information still has the ability to predict future stock returns.

Our decomposition is important, as we are able to explain how analysts, markets and actual earnings growth differentially react to information on long-term growth forecasts. The competing explanations provided by Dechow, Hutton and Sloan (2000) and Daniel and Titman (2006) are more relevant for managerial decisions related to capital issuance and retirements, or the level of capital expenditures and are less relevant for firm characteristics that are largely out of the control of the manager, such as sales growth or profitability.

Returning to Figure 2, we do not find meaningful differences in the way analysts form their long-term growth expectations: changes in sales and asset growth and equity

dilution is positively related to LTG, while ROA is negatively related to LTG. Our results suggest that Global Settlement did not change how analysts process hard information.

[Insert Table 8 Here]

Table 8 replicates the main analyses in our paper for the pre-Global Settlement period from July 1982 to August 2002 and the post-Global Settlement period from September 2002 to December 2014. In our analysis presented in Table 8, we do not include ΔSALES and ROA as independent variables and instead focus on the manager choice variables that related to the competing explanations for our results: EQDIL and ΔASSETS. Table 8 Panel A reports our split-sample results for the panel regressions from Tables 3 and 4. In the early period, we find a very strong correlation between asset growth and the natural log of the price-to-book ratio (T-stat=12.79), consistent with Fama and French (2015), who find a high correlation between HML (low price-to-book less high price-to-book factor) and CMA (low asset growth less high asset growth), and a weaker but still statistically positive relation between log price-to-book and equity dilution (T-stat=2.75). In the later period, we find the coefficient on equity dilution becomes negative (T-stat=6.54), and there is still a positive relation with asset growth (T-stat=7.67). The weaker results in the post-global settlement period for manager choice variables help explain why Hard Growth (T-stat=0.49) is insignificantly positively related to price-to-book ratio.

For the natural log of forward earnings-to-price ratios reported in rows 5 through 8 of Table 8 Panel A, we find a positive correlation between both manager choice variables and price-to-book ratio in the pre-GS period, but the asset growth's coefficient sign flips in the post-GS period. Despite the negative relation between △ASSETS and LN (P/B), the coefficient on Hard Growth (T-stat=2.21) in the later period is still significantly different from zero.

The next four rows display regression results for the pre- and post-GS periods for regressions predicting five-year realized earnings growth. Before global settlement, price-to-book ratio is significantly negative related to actual EPS growth (T-stat=2.66, 3.70), while after global settlement price-to-book is unrelated to actual EPS growth (T-stat=0.64, 0.70). The coefficient on asset growth is significantly negative in the early period (T-stat=2.14), but becomes insignificant in the later period (T-stat=0.50). Equity dilution is a little stronger in the later period, when compared to the earlier period. We find a slightly higher Hard Growth coefficient estimate in the post-global settlement period (0.64) when compared to the pre-global settlement period (0.70).

The last four rows reports split-sample regression results predicting year-over-year changes in LTG. In both sub-periods, we find that equity dilution and asset growth predict negative innovations in LTG, but the coefficient on equity dilution in the post-GS period while significantly different from zero is roughly half of what it was in the pre-GS period. We also find that hard growth is associated with negative future changes in LTG in both sub-periods.

Table 8 Panels B and C report pre- and post-GS period average returns for value-weighted portfolios formed on various growth measures. The return earned by going long firms in the highest decile of equity dilution and going short the lowest decile of equity dilution declines from -0.90% (T-stat=4.47) in the earlier period to -0.43% (T-stat=1.81) in the later period. The long/short return for asset growth is negative and marginally significant in the early period (-0.53), but is positively and insignificant in the later period (0.24%). These results help explain why the difference between the highest decile portfolio and lowest decile portfolio of Hard Growth in the early period is -0.74% (T-stat=2.25) in the early period, but shrinks to -0.36% (T-stat=1.49) in the later period.

As we show, soft growth which reflects analysts' private views are positively related to valuations (P/B, P/E_{t+1}), is (weakly) positively related to actual growth, and does not explain stock returns. Our findings suggest that this component of analyst long-term

growth is accurately incorporated into market prices, and that when those growth expectations are met there is no material return predictability. There is also very little change in how soft growth is related to valuations and actual earnings growth pre- and post-global settlement.

In contrast, analysts in the post-global settlement period still assign higher growth expectations to firms with low profitability, high past sales and asset growth and high external financing *despite the regulation's potential influence* on the bias of these estimates. Firms with these characteristics also experience negative revisions in long-term growth forecasts in the post-GS period. Our evidence suggests regulation did not materially change how analysts interpret hard information when making long-term growth forecasts – thus, either the analysts are still trying to gain investment banking business by issuing overly optimistic growth forecasts, or are making genuine mistakes when setting long-term earnings growth expectations. However, it is hard to draw conclusions due to the small sample size of the post-GS period.

Our findings suggest the market, however, isn't fooled by this analyst behavior after August 2002 and potentially learned from the mistakes made when setting prices during the dot-com period between 1998 and 2002 as the relation between hard growth and the log of the price-to-book ratio is weaker. Hard information is a negative predictor of realized earnings growth in both sample periods. In the post-GS period, we find weaker evidence that hard information predicts future returns, which suggests our results are driven by former hypothesis related to analysts hyping stock prices to win investment banking business. However, there is an alternative explanation related to certain market participants exploiting profitability, asset growth or external financing factors to correct and profit from investor mistakes related to mispricing associated with long-term growth forecasts. Of course, we cannot rule out that the weaker results in the latter period are a result of a small sample size instead of a shift in investor behavior or other informed traders exploiting this mispricing.

VII. Conclusion

There is now substantial evidence linking various income statement and balance sheet items to future excess stock returns. While it is possible that these excess returns are associated with systematic sources of risk that investors wish to avoid, the magnitudes of the observed abnormal returns and the Sharpe ratios that can be obtained by exploiting the strategies are simply too large to be consistent with equilibrium risk premia. In other words, during our sample period, the evidence suggests that the consensus views of investors were incorrect along some meaningful dimensions.

To explore this hypothesis, we use the consensus analyst long-term earnings growth forecast as a proxy for growth expectations and examine how these expectations are influenced by various accounting variables. Our focus is on two variables that are under the direct control of a firm's management – the extent to which the firm issued or repurchased its shares and the extent to which it grew is assets and two variables that management can only indirectly control – the sales growth and profitability of the firm. As we show, these variables explain the consensus long-term growth forecasts of analysts, and as such, they also influence stock prices. However, the sign of the correlation between these variables and realized earnings growth is inconsistent with the correlation between these variables and both analyst long-term earnings growth forecasts and firm valuations. Thus, high market prices reflect faulty growth expectations and sorting stocks on these accounting variables produces meaningful differences in average returns.

It would be nice to have better intuition about why the analysts and investors made these mistakes. One possibility, explored in a number of papers, is that analysts bias their earnings forecasts to cater to firms that are likely to need future investment banking services. Another possibility is that market prices influence management choices. If the market and the analyst community view the firm favorably, the firm is more likely to raise capital, grow its assets, and may feel less compelled to increase sales and

profitability. In other words, the favorable view of the market may in some cases sow its own seeds of destruction. Finally, it's possible that the analysts simply made mistakes in our sample period.

While we have made a preliminary exploration of these issues by looking at how long-term earnings growth forecasts have changed over time, our results are not conclusive. Hopefully, future research can help better understand the cause of these earnings forecast errors.

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Figure 1. Average Consensus Analyst Long-term Growth Estimates and Realized 5-year EPS Growth Rate from 1982 to 2014. The figure plots cross-sectional mean and median estimates for LTG and REAL EPS by year. LTG is the mean estimate of all analysts' expectations of the future EPS annual growth rate measured in the 3rd week of June of year *t*. REAL EPS is the five-year average annualized realized EPS growth rate between year *t* and year *t+5*.

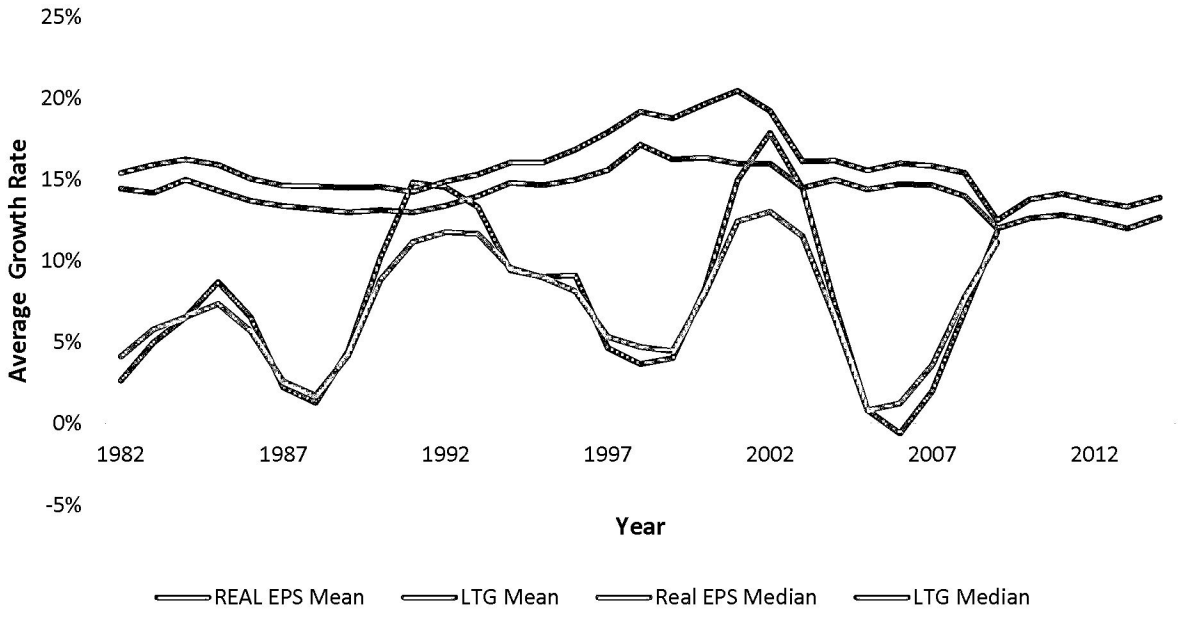


Table 1. Sample Summary Statistics from 1982 to 2014. This table presents summary statistics for firms that meet the restrictions described in the data section. The first panel describes the distribution of analyst long-term growth forecasts, LTG. At the end of June of each year *t*, stocks are ranked on LTG and then allocated to five groups, each with an equal number of stocks. The second panel reports value-weighted averages for LTG, 5-year realized earnings growth, accounting ratios, valuation ratios and market capitalization for each quintile portfolio using information available at the portfolio formation date. Variable definitions are as follows. LTG measures the mean estimate of all analysts' expectations of the future EPS annual growth rate measured in the 3rd week of June of year *t*. REAL EPS is the five-year average annualized future EPS growth rate between year *t* and year *t+5*. EqDil (equity dilution) is the percentage change in split-adjusted shares outstanding from year *t-2* to year *t-1*. ΔSales (sales growth) is the percentage change in revenues per split-adjusted share from year *t-2* to year *t-1*. ΔAssets (asset growth) is the percentage change in assets per split-adjusted share from *t-2* to *t-1*. ROA (profitability) is operating income in year *t-1* divided by assets for year *t-1*. SIZE x 10^9 is market capitalization (in millions) as of June of year *t*. P/B (price/book ratio) is market capitalization as of December of year t-1, divided by book equity in year *t-1*. P/E_{t+1} (price/forward earnings ratio) is price per share divided by fiscal year 1 analyst consensus earnings per share measured in the 3rd week of June of year *t*. The sample has an average of 2,213 firms per year.

Panel A. Average Analyst Long-Term Growth Statistics

p1	Median	Mean	p99	σ
0.010	0.142	0.158	0.484	0.084

Panel B. Average Firm Characteristics by Analyst Long-Term Growth Quintile

	1	2	3	4	5
Growth Variables					
LTG	0.070	0.111	0.141	0.181	0.280
REAL EPS	0.030	0.057	0.070	0.087	0.136
Non-Price Variables					
EQDIL	0.024	0.018	0.015	0.037	0.076
ΔSALES	0.048	0.070	0.098	0.155	0.311
ΔASSETS	0.059	0.091	0.122	0.181	0.335
ROA	0.140	0.145	0.170	0.188	0.171
Price Variables					
SIZE x 10^9	30.91	32.93	26.55	23.34	19.80
P/B	1.98	3.18	3.70	4.80	6.54
P/E_{t+1}	14.31	16.15	19.04	23.60	39.00

Table 2. Panel Regression Explaining Long-Term Growth from 1982 - 2014. This table reports results from panel regressions of analyst long-term growth (LTG) on past accounting growth measures. LTG is the mean estimate of all analysts' expectations of the EPS annual growth rate between year *t+2* to year *t+5* measured in the 3rd week of June of year *t*. EQDIL (equity dilution) is the percentage change in split-adjusted shares outstanding from fiscal year-end in *t-2* to *t-1*. ΔSALES (sales growth) is the percentage change in revenues per split-adjusted share from *t-2* to *t-1*. ΔASSETS (asset growth) is the percentage change in assets per split-adjusted share from year *t-2* to year *t-1*. ROA (profitability) is operating income in year *t-1* divided by assets in year *t-1*. N is the average number of stocks each year. Certain regressions use industry (Based on GICs 10 sector definitions) and year fixed effects. T-statistics are reported in parentheses based on robust standard errors that are clustered by firm and industry. The number of firm-year observations is 74,130.

	Intercept	EQDIL	ΔSALES	ΔASSETS	ROA	R^2	Industry Fixed Effect?	Year Fixed Effect?
Coefficient	0.16	0.12				0.04	No	No
t-stat	(11.75)	(4.02)						
Coefficient	0.15		0.08			0.10	No	No
t-stat	(11.35)		(13.56)					
Coefficient	0.15			0.08		0.07	No	No
t-stat	(10.62)			(12.68)				
Coefficient	0.17				-0.11	0.02	No	No
t-stat	(8.23)				(1.65)			
Coefficient	0.15	0.10	0.06	0.05	-0.11	0.17	No	No
t-stat	(8.23)	(9.36)	(13.99)	(8.12)	(1.87)			
Coefficient	0.07	0.09	0.05	0.04	-0.12	0.34	Yes	No
t-stat	(20.92)	(7.50)	(10.46)	(13.40)	(4.54)			
Coefficient	0.14	0.09	0.06	0.05	-0.10	0.20	No	Yes
t-stat	(10.77)	(11.18)	(15.13)	(7.68)	(1.85)			
Coefficient	0.04	0.08	0.05	0.04	-0.12	0.37	Yes	Yes
t-stat	(7.56)	(8.43)	(10.52)	(14.23)	(4.64)			

Figure 2. Coefficient Estimates from Annual Regressions Explaining Long-Term Growth from 1982 - 2014. This figure plots the time-series of coefficients from a Fama-Macbeth regression of analyst long-term growth on equity dilution, sales growth, asset growth, profitability variables and industry dummies. LTG measures the mean estimate of all analysts' expectations of the EPS annual growth rate between year *t+2* to year *t+5* measured in the 3rd week of June of year *t*. EQDIL (equity dilution) is the percentage change in split-adjusted shares outstanding from fiscal year-end in *t-2* to *t-1*. ΔSales (sales growth) is the percentage change in revenues per split-adjusted share from *t-2* to *t-1*. ΔAssets (asset growth) is the percentage change in assets per split-adjusted share from *t-2* to *t-1*. ROA (profitability) is operating income in *t-1* divided by assets in *t-1*.

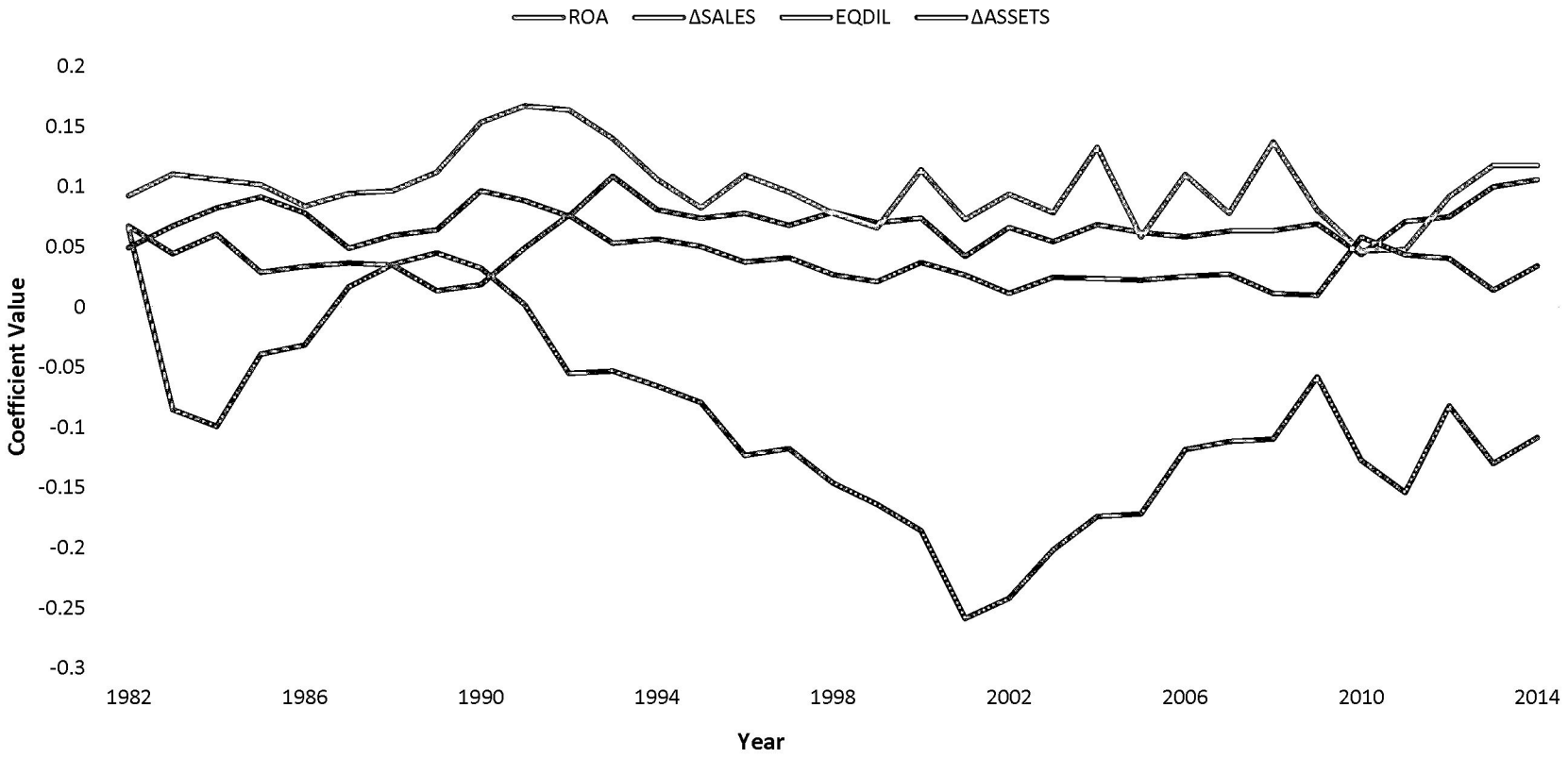


Table 3. Panel Regression Explaining Price-to-Book and Price-to-Forward Earnings Valuation Ratios from 1982 to 2014. The dependent variable for the regression is either the natural log of P/B ratio (Panel A) or the natural log of the P/E_{t+1} ratio (Panel B). P/B (price/book ratio) is market capitalization as of December of year t-1, divided by book equity in year *t-1*. P/E_{t+1} (price/forward earnings ratio) is price per share divided by fiscal year 1 analyst consensus earnings per share measured in the 3rd week of June of year *t*. EqDil (equity dilution) is the percentage change in split-adjusted shares outstanding from fiscal year-end in *t-2* to *t-1*. ΔSales (sales growth) is the percentage change in revenues per split-adjusted share from *t-2* to *t-1*. ΔAssets (asset growth) is the percentage change in assets per split-adjusted share from *t-2* to *t-1*. ROA (profitability) is operating income in *t-1* divided by assets for *t-1*, Hard Growth is the fitted value from the last regression listed in Table 2 and Soft Growth is equal to LTG minus Hard Growth. The independent variables are constructed using financial statement data from the fiscal period ending in year t-1. N is the average of firms each year. For brevity, the intercept is not reported. Robust standard errors are clustered by firm and industry.

Panel A. P/B

	EQDIL	ΔSALES	ΔASSETS	ROA	Hard Growth	Soft Growth	R^2	Industry Fixed Effect?	Year Fixed Effect?	N
Coefficient	0.38	0.40	0.26	1.60			0.11	No	No	2,213
t-stat	(5.98)	(6.18)	(7.16)	(2.59)						
Coefficient	0.33	0.40	0.26	1.81			0.20	No	Yes	2,213
t-stat	(4.43)	(6.53)	(7.46)	(3.02)						
Coefficient	0.33	0.31	0.22	1.71			0.21	Yes	No	2,213
t-stat	(5.06)	(7.75)	(9.95)	(2.82)						
Coefficient	0.28	0.31	0.22	1.85			0.29	Yes	Yes	2,213
t-stat	(3.84)	(7.92)	(9.38)	(3.11)						
Coefficient					2.02	3.74	0.16	No	No	2,213
t-stat					(3.14)	(11.74)				
Coefficient					1.38	3.01	0.27	Yes	Yes	2,213
t-stat					(2.89)	(11.73)				

Panel B. P/E_{t+1}

	EQDIL	ΔSALES	ΔASSETS	ROA	Hard Growth	Soft Growth	R^2	Industry Fixed Effect?	Year Fixed Effect?	N
Coefficient	0.21	0.06	0.14	-0.62			0.02	No	No	2,022
t-stat	(5.34)	(0.90)	(3.16)	(0.86)						
Coefficient	0.21	0.06	0.14	-0.43			0.13	No	Yes	2,022
t-stat	(4.94)	(0.84)	(3.87)	(0.61)						
Coefficient	0.14	0.01	0.09	-1.25			0.14	Yes	No	2,022
t-stat	(3.39)	(0.16)	(2.71)	(3.69)						
Coefficient	0.14	0.01	0.10	-1.10			0.23	Yes	Yes	2,022
t-stat	(3.05)	(0.12)	(3.41)	(3.53)						
Coefficient					2.20	2.80	0.14	No	No	2,022
t-stat					(3.44)	(7.85)				
Coefficient					2.10	2.32	0.28	Yes	Yes	2,022
t-stat					(4.24)	(8.39)				

Figure 3. Value-weighted Average Market-Adjusted Return for Portfolios Formed on Realized EPS Growth Rate from 1982 to 2009. At the end of June of year *t*, stocks are allocated to ten portfolios according to realized EPS growth rate (REAL EPS). The figure reports the average value-weighted (using market capitalization as of the end of June in year *t*), market-adjusted five-year return measured over the 60 months starting in July of year *t*. There is an average of 1,498 firms per year with non-missing five-year EPS growth rates.

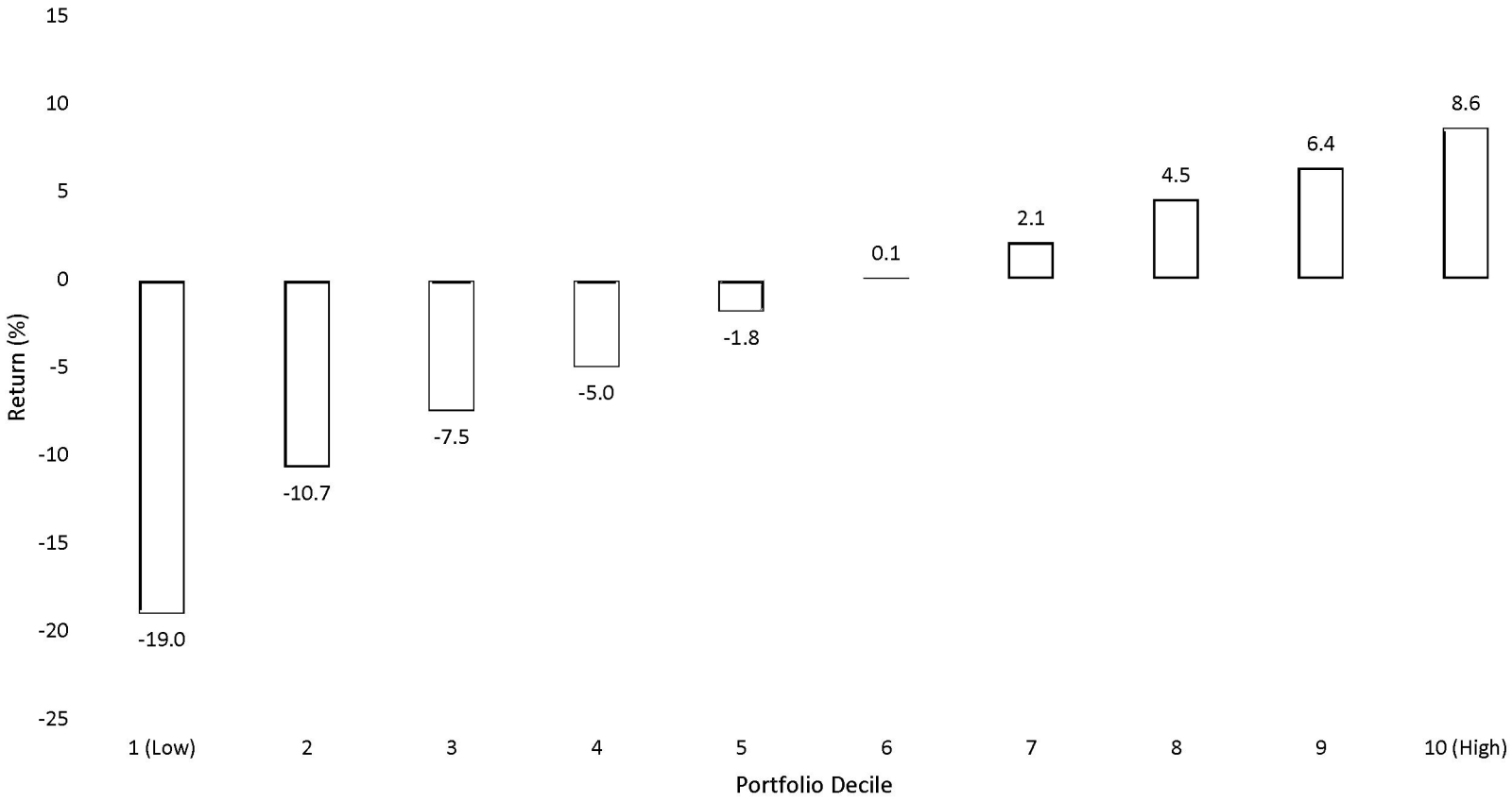


Figure 4. Histogram of Five-year Market-adjusted Returns with Missing EPS Five-year Growth Rates from 1982 to 2009. This figure reports the percentage of firm-years with missing realized earnings (REAL EPS) information, by market-adjusted return decile. There are 21,885 firm-years with future stock returns that have missing five-year EPS growth rates that were assigned EPS growth rates using our matching technique.

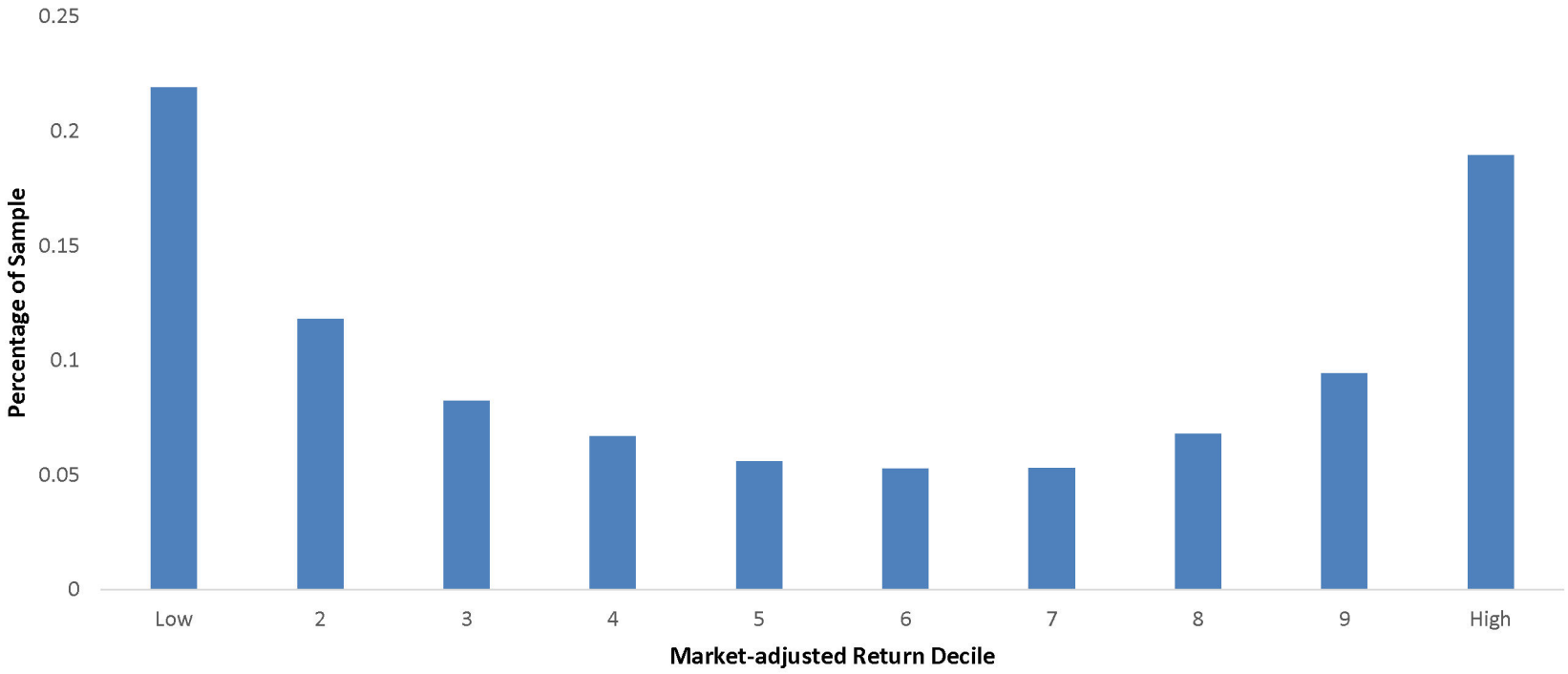


Table 4. Panel Regression Explaining Realized Earnings Growth from 1982 to 2014. The dependent variable for the regression is realized earnings growth (REAL EPS), which is the five-year annualized EPS growth rate. EQDIL is equity dilution measured as the percentage change in adjusted shares outstanding over the previous year. ΔSALES is the percentage change in split-adjusted revenues over the previous year. ΔASSETS is the percentage change in split-adjusted assets over the previous year. ROA is profitability, measured as operating income before depreciation divided by assets. LTG is measured as of the 3rd week in June of year t, while the independent variables are constructed using financial statement data from the fiscal period ending in year t-1. T-statistics, reported in parentheses, are based on robust standard errors that are clustered by firm and industry. For brevity, the intercept is not reported.

	LTG	EQDIL	ΔSALES	ΔASSETS	ROA	Hard Growth	Soft Growth	LN(P/B)	R^2	Ind & Year Fixed Effect?	N
Coefficient		-0.09	-0.02	-0.03	0.05			0.00	<.01	No	2,280
t-stat		(6.33)	(1.67)	(2.44)	(1.83)			(0.79)			
Coefficient		-0.10	-0.02	-0.03	0.12			-0.01	0.05	Yes	2,280
t-stat		(7.37)	(2.19)	(2.12)	(5.13)			(2.79)			
Coefficient	0.11	-0.10	-0.02	-0.03	0.07			-0.01	0.02	No	2,280
t-stat	(2.60)	(6.78)	(2.61)	(2.62)	(3.21)			(1.91)			
Coefficient	0.03	-0.10	-0.02	-0.03	0.13			-0.02	0.05	Yes	2,280
t-stat	(0.99)	(7.40)	(2.66)	(2.12)	(5.06)			(3.11)			
Coefficient						-0.52	0.11	-0.01	<.01	No	2,280
t-stat						(4.39)	(2.58)	(1.84)			
Coefficient						-0.61	0.02	-0.01	0.05	Yes	2,280
t-stat						(6.09)	(0.63)	(2.24)			

Figure 5. Persistence of Variables that Explain Growth from 1982 to 2009. This figure plots the average time-series Spearman correlation for different variables and their 1-, 2-, 3-, 4- and 5-year lag values using annual data. LTG measures the mean estimate of all analysts' expectations of the EPS annual growth rate between year *t+2* to year *t+5* measured in the 3rd week of June of year *t*. EQDIL (equity dilution) is the percentage change in split-adjusted shares outstanding from fiscal year-end in *t-2* to *t-1*. ΔSALES (sales growth) is the percentage change in revenues per split-adjusted share from *t-2* to *t-1*. ΔASSETS (asset growth) is the percentage change in assets per split-adjusted share from *t-2* to *t-1*. ROA (profitability) is operating income in *t-1* divided by assets for *t-1*. B/M (book/market ratio) is book equity in year *t-1* divided by market equity in December of *t-1*. P/B is market capitalization in December *t-1* divided by book equity in year *t-1*. P/E_{t+1} is the price per share in June *t*, divided by analyst EPS estimate for the next year *t+1*.

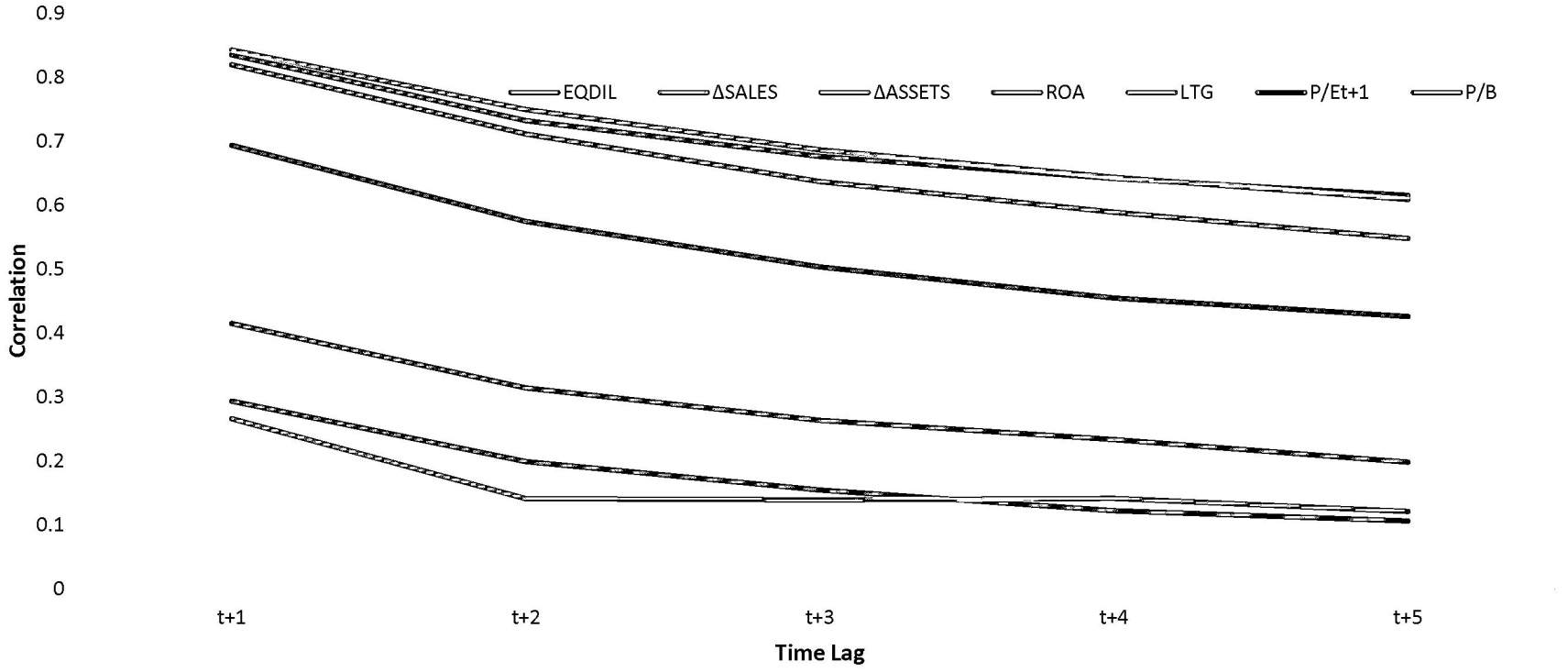


Table 5. Panel Regression Explaining Changes in Long-term Growth Estimates from 1982 to 2013. The dependent variable for the regression is the year-over-year change in analyst long-term growth forecasts ($LTG_{t+1} - LTG_t$) measured in the 3rd week of June of year *t*. EqDil (equity dilution) is the percentage change in split-adjusted shares outstanding from fiscal year-end in *t-2* to *t-1*. ΔSales (sales growth) is the percentage change in revenues per split-adjusted share from *t-2* to *t-1*. ΔAssets (asset growth) is the percentage change in assets per split-adjusted share from *t-2* to *t-1*. ROA (profitability) is operating income in *t-1* divided by assets for *t-1*, Hard Growth is the fitted value from the last regression listed in Table 2. The independent variables are constructed using financial statement data from the fiscal period ending in year t-1. N is the average of firms each year. For brevity, the intercept is not reported. Robust standard errors are clustered by firm and industry.

	EQDIL	ΔSALES	ΔASSETS	ROA	Hard Growth	R^2	Industry Fixed Effect?	Year Fixed Effect?	N
Coefficient	-0.02	-0.02	-0.01	0.00		0.03	No	No	1,929
t-stat	(7.81)	(5.91)	(8.21)	(0.31)					
Coefficient	-0.02	-0.02	-0.01	0.00		0.05	No	Yes	1,929
t-stat	(8.44)	(6.13)	(7.85)	(0.11)					
Coefficient	-0.02	-0.02	-0.01	0.00		0.03	Yes	No	1,929
t-stat	(7.62)	(5.74)	(7.82)	(0.41)					
Coefficient	-0.02	-0.02	-0.01	0.00		0.05	Yes	Yes	1,929
t-stat	(8.31)	(5.91)	(7.32)	(0.25)					
Coefficient					-0.24	0.02	No	No	1,929
t-stat					(5.40)				
Coefficient					-0.23	0.05	Yes	Yes	1,929
t-stat					(6.30)				

Table 6. Value-weighted Monthly Returns for Portfolios Formed on Long Term Growth Measures from July 1982 to December 2014. At the end of June of year *t*, stocks are allocated to ten portfolios based on the decile breakpoints for LTG (analyst long-term growth estimate), Hard Growth (fitted values from the last regression in Table 2) and Soft Growth (LTG minus Explained Growth). Panel A presents results for the original sample of firms with non-missing LTG. Panel B presents results for the bottom half of firms in the original sample based on market capitalization at the end of June of each year. Panel C reports results for all firms listed in CRSP/Compustat (including those with missing LTG data) that have valid data to construct EQDIL, ΔSALES, ΔASSETS, ROA and positive book equity. T-statistics are reported in parentheses to the right of each estimate. Monthly returns are reported in percentages.

Panel A. Original Sample

	1	2	3	4	5	6	7	8	9	10	10-1	*t-stat*	n
LTG	1.14%	1.10%	1.15%	1.12%	1.03%	1.08%	1.13%	1.25%	0.89%	1.15%	0.01%	(0.02)	2,153
Hard Growth	1.19%	1.18%	1.07%	1.22%	1.08%	1.23%	0.95%	1.05%	1.04%	0.59%	-0.60%	(2.66)	2,153
Soft Growth	0.98%	1.06%	1.15%	1.06%	1.22%	0.96%	1.06%	1.21%	1.02%	1.31%	0.33%	(0.96)	2,153

Panel B. Small Firms Only

	1	2	3	4	5	6	7	8	9	10	10-1	*t-stat*	n
LTG	1.24%	1.29%	1.23%	1.30%	1.29%	1.39%	1.28%	1.10%	1.17%	1.06%	-0.18%	(0.54)	1,077
Hard Growth	1.41%	1.44%	1.49%	1.27%	1.28%	1.37%	1.13%	1.36%	1.12%	0.55%	-0.86%	(3.88)	1,077
Soft Growth	1.18%	1.18%	1.14%	1.24%	1.25%	1.28%	1.32%	1.32%	1.23%	1.22%	0.05%	(0.15)	1,077

Panel C. All Firms (Includes Missing LTG Data Firms)

	1	2	3	4	5	6	7	8	9	10	10-1	*t-stat*	n
Hard Growth	1.16%	1.18%	1.11%	1.12%	1.11%	1.20%	1.02%	0.99%	0.98%	0.37%	-0.79%	(3.38)	4,045

Table 7. Fama-MacBeth Regressions of Monthly Returns on Growth, Size and Book/Market Measures from July 1982 to December 2014. This table reports the results of a set of Fama-MacBeth regressions of monthly returns on lagged growth measures, equity dilution, sales and asset growth, profitability, size and the book-to-market ratio. N is the average number of firms in the sample each year. LTG is the mean estimate of all analysts' expectations of the EPS annual growth rate between year *t+2* to year *t+5* measured in the 3rd week of June of year *t*. EQDIL (equity dilution) is the percentage change in split-adjusted shares outstanding from fiscal year-end in *t-2* to *t-1*. ΔSALES (sales growth) is the percentage change in revenues per split-adjusted share from *t-2* to *t-1*. ΔASSETS (asset growth) is the percentage change in assets per split-adjusted share from year *t-2* to year *t-1*. ROA (profitability) is operating income in year *t-1* divided by assets in year *t-1*. LN (Size) is the natural log of the market capitalization. LN (P/B) is the natural log of the price-to-book ratio. Hard Growth is the fitted value from the last regression listed in Table 2 and Soft Growth is equal to LTG minus Hard Growth. N is the average number of stocks each year. Certain regressions use industry dummies (based on GIC's 10 sector definitions). T-statistics are reported in parentheses to the right of each estimate and are based on Newey West corrected standard errors with a lag of 12 months. Monthly returns are reported in percentages.

	1		2		3		4		5		6	
Intercept	0.016	(2.18)	0.019	(2.52)	0.015	(2.16)	0.013	(2.33)	0.019	(2.72)	0.017	(3.19)
LTG	0.002	(0.17)			0.012	(1.25)	0.007	(1.11)				
EQDIL			-0.014	(5.25)	-0.015	(5.58)	-0.013	(5.62)				
ΔSALES			-0.002	(1.86)	-0.003	(2.12)	-0.003	(3.13)				
ΔASSETS			-0.005	(4.39)	-0.005	(4.51)	-0.005	(4.55)				
ROA			0.009	(1.66)	0.010	(2.18)	0.015	(2.96)				
Hard Growth									-0.072	(4.65)	-0.079	(5.54)
Soft Growth									0.012	(1.20)	0.007	(0.97)
Ln(SIZE)	0.000	(0.43)	0.000	(0.95)	0.000	(0.59)	0.000	(0.43)	0.000	(0.60)	0.000	(0.49)
Ln(P/B)	-0.001	(1.98)	-0.001	(1.01)	-0.002	(2.39)	-0.001	(1.98)	-0.002	(2.26)	-0.002	(2.81)
Ind Fixed Effect?	No		No		No		Yes		No		Yes	
R^2	0.03		0.03		0.04		0.08		0.03		0.08	
N	2,154		2,154		2,154		2,154		2,154		2,154	

Table 8. Pre- and Post-Global Settlement (August 2002) Split-Sample Regressions and Value-weighted Portfolio Returns from July 1982 to December 2014. This table replicates key results in earlier tables for different sample periods. Pre-GS refers to the period from July 1982 to August 2002, and post-GS refers to the period from September 2002 to December 2014. Panel A displays panel regression results similar to Tables 3 and 4; Panels B and C display average value-weighted returns for portfolios formed on various growth forecasts similar to analysis presented in Table 5. LTG is the mean estimate of all analysts' expectations of the EPS annual growth rate between year *t+2* to year *t+5* measured in the 3rd week of June of year *t*. EQDIL (equity dilution) is the percentage change in split-adjusted shares outstanding from fiscal year-end in *t-2* to *t-1*. ΔASSETS (asset growth) is the percentage change in assets per split-adjusted share from year *t-2* to year *t-1*. LN (Size) is the natural log of the market capitalization. LN (P/B) is the natural log of the price-to-book ratio. Hard Growth is the fitted value from the last regression listed in Table 2 and Soft Growth is equal to LTG minus Hard Growth. N is the average number of stocks each year. The regressions in Panel A include year and industry fixed effects (based on GIC's 10 sector definitions). T-statistics reported are double-clustered by firm and industry. Monthly returns shown in Panels B and C are reported in percentages.

Panel A. Panel Regression Split-Sample Results

	Dependent Variable	EQDIL	ΔASSETS	Hard Growth	Soft Growth	LN (P/B)	R^2	Time Period	N	Table Reference
Coefficient	LN (P/B)	0.09	0.42				0.23	Pre-GS	2,250	3A
t-stat		(2.75)	(12.79)							
Coefficient	LN (P/B)	-0.37	0.62				0.20	Post-GS	2,140	3A
t-stat		(6.54)	(7.67)							
Coefficient	LN (P/B)			1.60	3.38		0.30	Pre-GS	2,250	3A
t-stat				(5.04)	(12.08)					
Coefficient	LN (P/B)			0.66	2.27		0.21	Post-GS	2,140	3A
t-stat				(0.49)	(8.18)					
Coefficient	LN (P/E_{t+1})	0.19	0.12				0.24	Pre-GS	2,078	3B
t-stat		(3.06)	(2.94)							
Coefficient	LN (P/E_{t+1})	0.36	-0.13				0.11	Post-GS	1,923	3B
t-stat		(3.85)	(2.57)							
Coefficient	LN (P/E_{t+1})			2.09	2.37		0.32	Pre-GS	2,078	3B
t-stat				(4.66)	(12.28)					
Coefficient	LN (P/E_{t+1})			2.36	3.18		0.18	Post-GS	1,923	3B
t-stat				(2.21)	(4.85)					
Coefficient	REALEPS	-0.10	-0.03			-0.01	0.05	Pre-GS	2,255	4

t-stat		(6.39)	(2.14)			(2.66)				
Coefficient	REALEPS	-0.13	-0.01			0.01	0.08	Post-GS	2,357	4
t-stat		(5.18)	(0.50)			(0.64)				
Coefficient	REALEPS			-0.57	0.04	-0.02	0.05	Pre-GS	2,255	4
t-stat				(4.77)	(0.90)	(3.70)				
Coefficient	REALEPS			-0.75	0.04	0.01	0.08	Post-GS	2,357	4
t-stat				(4.40)	(0.62)	(0.70)				
Coefficient	ΔLTG	-0.02	-0.02				0.04	Pre-GS	1,962	5
t-stat		(7.59)	(11.16)							
Coefficient	ΔLTG	-0.01	-0.02				0.03	Post-GS	1,842	5
t-stat		(3.54)	(11.54)							
Coefficient	ΔLTG			-0.24			0.05	Pre-GS	1,962	5
t-stat				(6.03)						
Coefficient	ΔLTG			-0.20			0.03	Post-GS	1,842	5
t-stat				(6.29)						

Panel B. Table 6 Pre-GS (July 1982 - August 2002)

	1	2	3	4	5	6	7	8	9	10	10-1	*t-stat*	N
LTG	1.30%	1.25%	1.37%	1.30%	1.23%	1.19%	1.35%	1.20%	0.84%	1.15%	-0.15%	(0.28)	2,173
Hard Growth	1.37%	1.31%	1.21%	1.37%	1.17%	1.46%	1.09%	1.22%	1.06%	0.63%	-0.74%	(2.25)	2,173
Soft Growth	1.15%	1.24%	1.36%	1.23%	1.37%	1.12%	1.12%	1.14%	1.11%	1.37%	0.23%	(0.48)	2,173
EQDIL	1.65%	1.40%	1.31%	1.21%	1.24%	1.43%	1.33%	1.05%	0.81%	0.75%	-0.90%	(4.47)	2,173
ΔASSETS	1.33%	1.21%	1.10%	1.48%	1.23%	1.22%	1.44%	1.29%	1.08%	0.81%	-0.53%	(1.78)	2,173

Panel C. Table 6 Post-GS (September 2002 – December 2014)

	1	2	3	4	5	6	7	8	9	10	10-1	*t-stat*	N
LTG	0.88%	0.85%	0.78%	0.83%	0.72%	0.91%	0.78%	1.35%	0.98%	1.15%	0.27%	(0.70)	2,122
Hard Growth	0.89%	0.98%	0.85%	0.98%	0.95%	0.87%	0.72%	0.76%	0.99%	0.53%	-0.36%	(1.49)	2,122
Soft Growth	0.72%	0.72%	0.80%	0.73%	0.92%	0.79%	1.02%	1.19%	0.98%	1.20%	0.48%	(1.20)	2,122
EQDIL	0.94%	0.68%	0.86%	0.92%	0.85%	1.10%	1.17%	0.80%	0.95%	0.51%	-0.43%	(1.81)	2,122
ΔASSETS	1.13%	1.26%	1.36%	1.26%	1.40%	1.07%	1.09%	1.22%	1.05%	1.38%	0.24%	(0.48)	2,122

FRANKLIN TEMPLETON | Institute

December 2022

Franklin Templeton Investment Solutions

2023 Capital Market Expectations

Brighter times ahead

Contents

About capital market expectations

Every year we review the data that drive capital markets—current valuation measures, historical risk premia, economic growth and inflation prospects—to provide the foundation for our forecasts. We update the models that we use and review their continued appropriateness. Crucially, our models are based on first-principle economic relationships and reflect seasoned practitioner judgment.

We continue to include as part of every capital market forecast a measure of the expected volatility of that asset class, informed by long-term observed standard deviation of returns. Given that changes to global central banks' quantitative easing policies may have repressed both equity and bond market volatility over past years, but increased turbulence more recently, our approach to modeling volatility reduces recency bias and is particularly appropriate at a time when leading central banks are shifting to normalize policy.

Our capital market expectations (CMEs) are designed to provide annualized return expectations over a longer-term horizon, typically viewed as 10 years. Specifically, we calculate geometric mean return expectations over a 10-year period, which both fully captures the average length of a US business cycle and aligns with the strategic planning horizon of many institutional investors.[1]

Our modeling approach is based on a blend of objective inputs, quantitative analysis and fundamental research, consistent with the skill set of our Franklin Templeton Investment Solutions (FTIS) business. Underpinning these inputs are assumptions on the sustained growth rates that developed and emerging economies can expect to achieve and the level of price inflation they will likely experience. This approach is forward looking, rather than being based on historical average returns. This is especially important in an evolving macroeconomic environment.

1. Since 1945, the National Bureau of Economic Research has defined 12 US business cycles, with an average duration of 75 months.

Summary

We believe riskier assets, such as global stocks and corporate bonds, have greater performance potential than global government bonds, despite slightly slower global growth and a marginal increase to global inflation expectations.

- We believe that maintaining a diversified portfolio of risk premia, in addition to the traditional benefits of a balanced portfolio between stocks and bonds, is the most likely path toward stable potential returns.
- Equity returns will likely be driven by earnings growth and yield, supported by some valuation uplift but offset by margin normalization that is likely to occur over our 10-year horizon.
- With global interest rates starting from relatively elevated levels and expected to rise a little further before normalizing, overall return expectations from all fixed income assets have become more attractive than has been the case in recent years, and notably higher than we anticipated in our 2022 CME forecasts.
- The risk premium contained within corporate bond yields appears to be more than adequate compensation for the likely level of default risk across the business cycle.
- Over the 10-year horizon used for our CMEs, we see relatively healthy alternative risk premia and a constructive environment for asset returns.

Our capital market expectations

Our 2023 CMEs are that the prospective returns of global equities and corporate bonds will be more attractive than the anticipated returns of global government debt.

Our geometric mean return expectation over a 10-year period for global equities is higher than last year and broadly in line with the historical annualized return. Overall, we expect global equities to return 8.3% annualized over the 10-year period, with developed markets returning 8.2%.[2]

By comparison, we expect global developed government bonds to return 4.3% in US-dollar terms.[3]

10-Year Annualized Capital Market Expectations (USD) Return Expectations

Equity Expectations

As of September 30, 2022

Asset Class Name	Expected Return (Geometric)	Expected Risk (Std. Dev)	Sharpe Ratio	Past 20-Yr Annualized Return
GLOBAL EQUITY	**8.3%**	**16.3%**	**0.31**	**8.5%**
Developed-Market Equity	**8.2%**	**16.3%**	**0.30**	**8.6%**
US	7.9%	16.0%	0.29	9.9%
Canada	8.4%	19.4%	0.26	9.3%
EAFE	8.9%	16.5%	0.34	6.3%
EMU	8.9%	20.6%	0.27	6.4%
UK	8.4%	17.1%	0.30	5.1%
Japan	9.8%	16.0%	0.41	4.5%
Pacific Ex-Japan	8.7%	19.4%	0.28	9.0%
Australia	8.4%	21.7%	0.24	9.5%
Emerging Market Equity	**9.3%**	**19.8%**	**0.31**	**9.0%**
China	9.8%	23.5%	0.28	10.0%
Specialty Equity				
Global Listed Infrastructure*	7.2%	16.2%	0.24	8.2%
US Listed Infrastructure	6.1%	13.0%	0.22	7.6%
Global REITS	8.0%	19.2%	0.25	6.4%
US REITS	8.0%	21.2%	0.23	7.7%

*Denotes where shorter average is used (20-yr unavailable), periods range from 92 to 237 months.
Source: Franklin Templeton Investment Solutions.

Fixed Income Expectations

As of September 30, 2022

Asset Class Name	Expected Return (Geometric)	Expected Risk (Std. Dev)	Sharpe Ratio	Past 20-Yr Annualized Return
GLOBAL GOVERNMENTS				
Global Governments	**4.3%**	**6.6%**	**0.16**	**2.4%**
US Goverment	3.9%	4.6%	0.14	2.6%
Canadian Goverment*	4.0%	8.6%	0.09	4.0%
Euro Government	4.9%	10.0%	0.16	2.9%
UK Government	5.8%	10.8%	0.24	1.3%
Japanese Government	4.2%	9.3%	0.11	0.4%
Australian Government*	4.9%	10.6%	0.16	–0.3%
China Government*	3.6%	4.5%	0.08	4.8%
Inflation Linked				
Global Inflation Linked	4.5%	8.4%	0.14	3.5%
GLOBAL CREDIT				
Global Investment Grade Credit	**5.9%**	**7.1%**	**0.37**	**3.5%**
US Investment Grade	5.6%	6.4%	0.37	4.1%
EU Investment Grade	6.1%	10.5%	0.28	2.9%
UK Investment Grade	8.0%	12.7%	0.38	1.9%
Global High Yield	**6.9%**	**9.8%**	**0.37**	**7.2%**
US High Yield	6.6%	9.1%	0.37	7.4%
Euro High Yield	7.9%	14.9%	0.31	7.5%
UK High Yield	9.3%	14.6%	0.42	10.0%
US High Yield Loans	6.2%	8.8%	0.34	4.6%
US Securitized				
US MBS	4.5%	3.5%	0.34	2.8%
Municipal Bonds				
US Munis	4.5%	4.6%	0.24	3.4%
Emerging Markets Goverments				
Emerging Market Debt-Corp (Hard)*	5.9%	9.8%	0.27	4.5%
Emerging Market Debt-Gov (Hard)*	6.4%	9.4%	0.33	5.8%
Emerging Market Debt-Gov (Local Fx)*	5.4%	11.6%	0.19	4.4%

Source: Franklin Templeton Investment Solutions.

2. There is no assurance any forecast, projection or estimate will be realized.
3. Ibid.

Other Expectations
As of September 30, 2022

Asset Class Name	Expected Return (Geometric)	Expected Risk (Std. Dev)	Sharpe Ratio	Past 20-Yr Annualized Return
ALTERNATIVES				
US Private Credit	7.7%	14.0%	0.32	8.7%
US Private Real Estate	5.2%	13.5%	0.14	8.5%
US Private Equity	9.3%	22.3%	0.27	11.6%
Commodities	5.3%	16.2%	0.12	1.5%
Global Hedge Funds	5.9%	6.6%	0.36	5.7%
FX vs. USD				
AUD	0.9%	11.7%	—	0.8%
CAD	0.8%	8.5%	—	0.7%
CNY	0.7%	3.9%	—	0.8%
EUR	1.6%	8.6%	—	0.0%
GBP	1.5%	8.6%	—	–1.7%
JPY	3.3%	8.4%	—	–0.9%

Asset Class Name	Expected Return (Geometric)
CASH TREASURY RATES (3-MONTH)	
US Cash	**3.3%**
AUD Cash	3.3%
CAD Cash	2.6%
CNY Cash	2.8%
EUR Cash	1.5%
GBP Cash	2.5%
JPY Cash	0.4%

Source: Franklin Templeton Investment Solutions.

Themes driving long-term global growth

In creating these CMEs, we incorporate the FTIS team's views on longer-term investment themes that impact the global economy. We debate these themes at our Annual Investment Symposium, in collaboration with senior leaders from across Franklin Templeton's wide range of specialist investment managers.

At our fourth annual Investment Symposium in October 2022, we discussed a range of secular themes that ultimately feed into two foundational components of our CMEs—growth and inflation—while incorporating a parallel theme of "future threats to human existence," which combines geopolitical with sustainability issues. We explore our views on these trends below, how they impact our gross domestic product (GDP) and consumer price inflation outlooks, and consequently our CMEs. For a more detailed review of the symposium discussions, please see our *Investment Symposium* paper.

1. Growth

We believe the next decade will look different than the one before, as technology and policy will prove disruptive and bailouts, if they occur, may be of more limited scope. In this age of disruption, will productivity rise or fall? As countries prioritize food and energy security in the next decade, changes will need to occur, and compromises will be made. Is this enough to ensure sufficient economic growth, or will structural headwinds, like aging demographics and global indebtedness, reassert themselves?

The last three years have been a period of enormous disruption. The practical interruption of supply chains because of COVID-19 and the war in Ukraine has had implications for prices of goods and driven the mass migration of people. Additionally, the process of globalization has been interrupted in reaction to geopolitical stress and the desire to ensure

security of supply. There are many other changes on the horizon, including the balance between energy security and progress toward a renewable energy transition. These types of changes seem to suggest that the resilience of global growth going forward may be challenged or, at least, desynchronized by region.

On the flip side, there are ongoing examples of technology firms moving production to other areas around the globe. Zeroing in on technological disruption, are we coming to an age of digital transformation? During the COVID pandemic, companies embraced technology to engage customers and become more efficient. In the years to come, artificial intelligence and machine learning could create new worker capacity and change the way work gets done. Ultimately, technological advancement in other areas such as quantum computing and cloud computing could drive productivity, boost growth and eventually be deflationary. **The positive impact of technology likely offsets the fracturing of global supply chains due to geopolitical stress, but the balance point may continue to shift over time.**

A long-term approach to estimating growth is to measure the number of hours worked in an economy and how productive each hour worked is. Demographics drive the number of hours worked for most economies, and the trend for most of the world's major economies is clear: populations are getting older. The dependency ratio has already doubled in Japan and is heading that way in the eurozone (see Exhibit 2). Immigration policy is unlikely to be sufficient to solve this, as nationalism has increased across most regions, limiting the prospect of immigration. **Our view is that demographics will likely be a small headwind to growth over the next decade.**

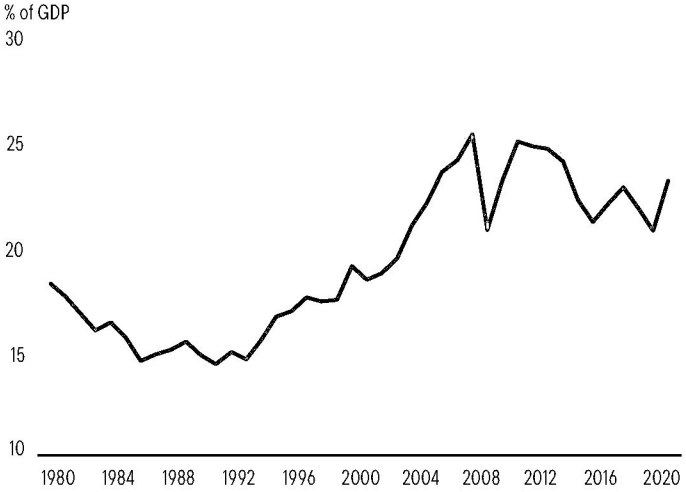
Productivity is the other driver of growth and the key to offsetting the weaker demographic outlook. Recent history is not especially encouraging. The business cycle that followed the global financial crisis was marred by weak productivity growth across OECD economies. Looking ahead, our forecast for productivity growth falls in the region of 1.5%, **as we expect productivity growth rates to rise to their long-run average, which is higher than the level seen in the most recent cycle but falls short of what many would hope for.**

Capital investment is a major driver of productivity, and fiscal stimulus is a pillar for sustained above-trend growth. The fiscal stimulus response to the COVID-19 pandemic was staggering, reaching approximately 15% of global GDP in 2020. **We expect fiscal spending, particularly in areas such as green infrastructure, to provide tailwinds for years to come.**

Globalization May Evolve, But We Do Not Expect a Major Retrenchment

Exhibit 1: Global Goods Export

1980–2021

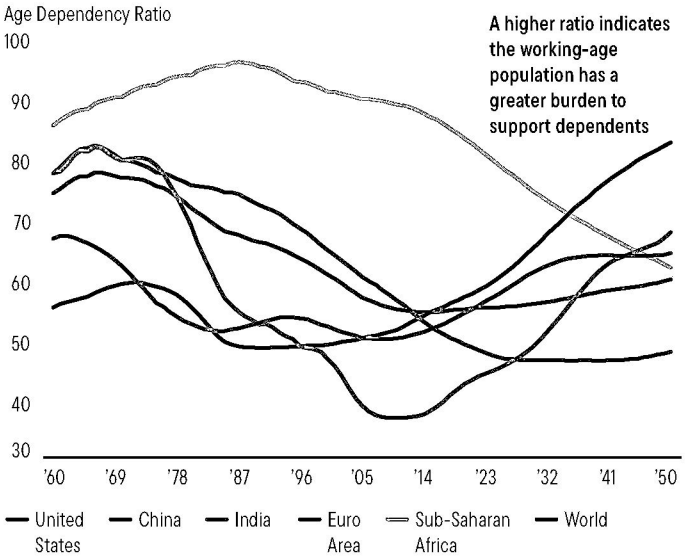


Sources: WTO, IMF, Macrobond. There is no assurance that any estimate, forecast or projection will be realized. Important data provider notices and terms available at www.franklintempletondatasources.com.

The Ratio of Working-age Population (as a % of the Total Population) Will Shrink Over the Coming Decades

Exhibit 2: World Bank—Age Dependency Ratio Projections

January 1960–January 2050E



Sources: World Bank, Macrobond. There is no assurance that any estimate, forecast or projection will be realized. Important data provider notices and terms available at www.franklintempletondatasources.com.

Both the United States and the eurozone, among others, have fiscal agendas that are geared toward decarbonization. In the shorter term, the war in Ukraine may complicate this transition, but it has provided another vivid example of the need for capital investment. The shift in Europe's oil and gas imports from Russia to other sources has highlighted the region's inadequate energy infrastructure. A multi-year investment cycle is required to build this infrastructure.

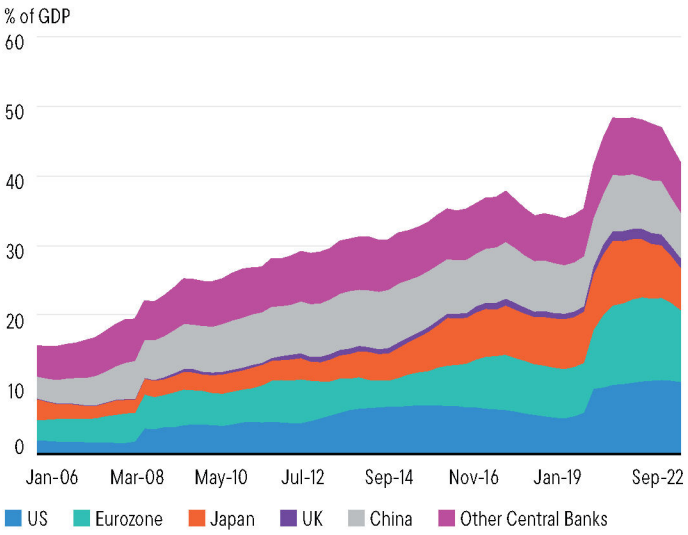
The war could also accelerate the development and adoption of renewable energy sources. One encouraging point on this front is the passage of the Inflation Reduction Act (IRA) in the United States, which provides material subsidies for green energy investments, including hydrogen production and geological storage. The country could also transition from being an importer of solar modules and wind turbines to an exporter of them, given the incentives and tax credits.

The flip side of proactive fiscal policy is that we are already in a world awash with debt. This is a recurring argument that we discussed in previous symposiums and has only deteriorated in the past 12 months. High debt levels can negatively impact growth while also muting the world's response to the next crisis. For instance, many emerging market countries have seen their credit ratings downgraded, which will make it harder to borrow in the next crisis. Debt levels are also leading to increased uncertainty about whether governments will be able to effectively react when the next calamity hits. The rise of political polarization within countries or regions may also place another hurdle in the path of fiscal support. The extent to which global central banks are willing to halt the early stages of quantitative tightening (i.e., the normalization of their balance sheets) (see Exhibit 3) and again act as a shock- absorber for debt markets remains to be seen. For now, **as monetary policy normalizes and balance sheets contract, debt levels and changes in who holds large chunks of them will be a modest drag on activity levels.**

Central Banks are Beginning to Reduce Their Balance Sheets

Exhibit 3: Central Bank Assets

As of September 30, 2022



Sources: Reserve Bank of Australia, BCB Community Bank, Statistics Canada, People's Bank of China, Central Bank of Denmark, European Central Bank, Central Bank of Ireland, Reserve Bank of India, Bank of Japan, Bank Negara Indonesia. Important data provider notices and terms available at www.franklintempletondatasources.com.

Taking all of this into account, **we expect slightly slower global growth in the decade ahead. We see GDP expanding at a 2.8% annual rate**, with developed markets growing slightly more slowly, over the 10-year horizon used in our CMEs. (See Exhibit 5, on the next page, for a chart of growth expectations across key regions and countries).

2. Inflation

The era of the Great Inflation (1965–1982) was followed by the Great Moderation (mid-1980s to 2007). Since then, we've had the global financial crisis, the COVID pandemic and now near-synchronized rate hikes on the part of global central banks to battle inflation. The big question on everyone's mind is what are inflation expectations going forward? Can we return to the era of sustained economic growth and low inflation around 2%?

Perhaps the most pressing theme currently impacting consumers, businesses and markets is inflation. It has grown to dominate the discussion in our investment symposium in recent years and did so again this year. Inflation has a direct impact on consumer behavior, and expectations for future price rises are a big driver of central bank actions. We believe global inflation is close to its cyclical peak and will moderate from current levels, but how it will evolve remains uncertain. The key observation about central bank policy objectives is that their resolve to keep inflation expectations anchored appears to have been stiffened by the period of uncomfortably high inflation during the last two years. Previous discussions about targeting average levels of inflation, or incorporating medium-term forecasts into the process, have been downplayed. These factors have not gone away, but they have been overtaken by a singular focus on fighting inflation (often described as US Federal Reserve Chair Jerome Powell channeling one of his predecessors, Paul Volker). This has been accompanied by a willingness to accept the collateral damage caused by higher-than-anticipated interest rates, in the form of slower growth and potentially higher unemployment, in the years ahead. This clarification of objectives has gone some way to moderating market-observed levels of inflation expectations. **We believe medium-term inflation expectations remain well anchored and broadly compatible with central banks' established definitions of price stability.**

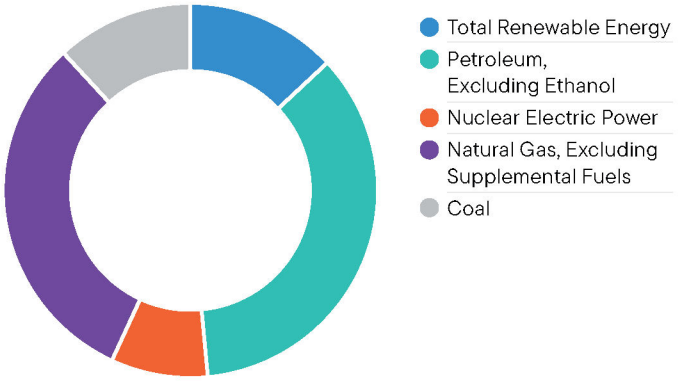
While we do not doubt central banks' desire to see inflation return to more normal levels in a timely manner, we view some of the elements of current inflation as somewhat sticky. Notably, wage inflation will remain elevated until labor markets return to a degree of balance. This probably feeds into slightly elevated levels of services inflation, even over the medium term. Similarly, the investment needed to complete a full transition to clean energy may boost demand for certain commodities, such as copper, as well as squeezing out other private sector investment that may have boosted productivity and held back inflation. The investment need to facilitate a green transition should not be underestimated, given the scale of non-renewable energy sources that are still being used in 2022 (see Exhibit 4), and the imperative to speed up their elimination. **Sticky components are likely to be responsible for inflation over-shooting target levels in the medium term.**

As we have discussed in previous years' CME publications, secular deflationary forces which dominated the last four decades are still in place. Even if the geopolitical environment argues for some roll-back of globalization, it has not gone away completely. Globalization remains an effective force for profitability that companies will not easily abandon. Technological innovation, as we discussed under the growth heading, is driving prices down around the world. Today's growth in debt, and the management of accumulated central bank balance sheets (as we showed in Exhibit 3), will limit future demand. **Disinflationary forces have changed, and their role may be diminished today, but they remain powerful factors keeping a lid on inflationary pressures.**

Green Energy is a Major Initiative for Most Developed Markets Over the Long-term

Exhibit 4: Energy Consumption by Source

As of July 31, 2022



Source: Macrobond. Important data provider notices and terms available at www.franklintempletondatasources.com.

Those who believe inflation may be more persistent argue that demographic trends could prove to be an inflationary force. Additionally, current supply-side constraints and structural changes (some due to COVID-19, others due to the changed perspective on security of supply due to the war in Ukraine) could result in more persistent inflation and continued elevated levels of volatility in this measure. These fears point to higher inflation expectations potentially creating a wage-price spiral, with workers demanding higher wages and companies passing those costs on to consumers.

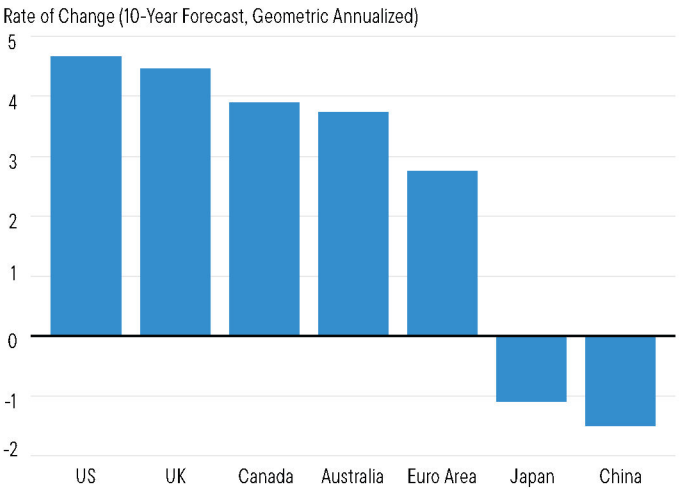
Monetary policy is the key governor of the relationship between growth and inflation, and with current core inflation remaining well above central bank targets (see Exhibit 5), this will keep policy tight in the near term. **While we see good reason for slightly higher levels of inflation, it seems unlikely that inflation will run far above central bank targets on a sustained basis**. The powerful tool of interest-rate hikes will be used as needed, with the potential consequence of increased growth volatility.

As we look ahead, we anticipate some longer-lasting impact on trend levels of inflation. These effects are likely to be stronger in economies such as the United States. However, with a notably elevated starting point, compared with the last two decades, inflation across the key developed and emerging economies is expected to moderate again in the medium term. Over the 10-year horizon used in our CMEs, **we expect global inflation to average 3.0%, a touch higher from last year's assumption** (see Exhibit 6 on the next page).

High Core Inflation is Affecting Central Bank Policy

Exhibit 5: Core Inflation Minus Central Bank Target

As of September 30, 2022

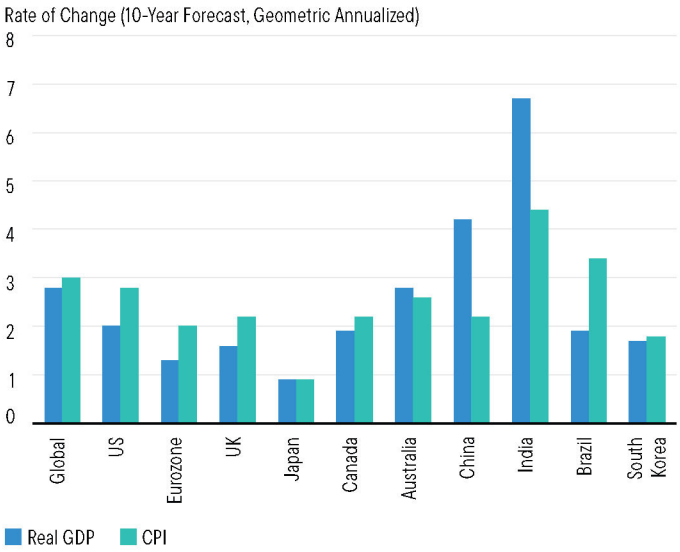


Source: FTIS, Macrobond. Important data provider notices and terms available at www.franklintempletondatasources.com.

Stable Growth Projections While Inflation Forecasts Tick Slightly Higher

Exhibit 6: Growth and Inflation Forecasts

As of September 30, 2022



Source: Macrobond. There is no assurance that any estimate, forecast or projection will be realized. Important data provider notices and terms available at www.franklintempletondatasources.com.

Conclusion

We tackle numerous questions around the longer-term asset implications regarding growth and inflation. Our macroeconomic outlook is only modestly different than that of last year, with global growth slightly lower and a marginal increase in global inflation expectations. As usual, there is some variation across regions, as shown in Exhibit 6 on the next page.

These longer-term expectations are point forecasts that attempt to capture a broader range of different outcomes. We can encapsulate them in the four-quadrant matrix (see Exhibit 7) as been reduced over the past year—we do not place a higher level of confidence in any one particular outcome. At the same time, **we retain a preference toward inflation ultimately being driven by the level of demand, rather than supply constraints, leading us to favor outcomes on the minor diagonal (bottom left to top right).**

Global Growth and Inflation Scenarios

Exhibit 7: Describing Each Scenario

Goldilocks
High Growth / Low Inflation

- 4th industrial revolution increases productivity as businesses embrace digitization
- Globalization reorients, although largely remains intact, driven by businesses continual search to maintain profitability
- Central banks effectively anchor inflation expectations near target levels

Reflation
High Growth / High Inflation

- Fiscal policy remains proactive and sizeble, aimed at key populist issues like inequality
- Green energy transition creates durable investment impulse
- Globalization evolves, rather than retracts, as businesses' continue their pursuit of profitability

Stagnation
Low Growth / Low Inflation

- Global indebtedness weighs on growth, and increased debt service ratios limit demand
- Monetary and fiscal policy become overly reactive, marred by large balance sheets and increasing polarization between political parties
- Aging demographics and income inequality increase savings relative to investment

Stagflation
Low Growth / High Inflation

- Geopolitical uncertainty rises, leading to a reduction in globalization and increased business uncertainty
- Transition to green energy is volatile and mismanaged, leading to higher commodity prices
- Aging demographics limits supply-side production, proving to be inflationary

Sources: Franklin Templeton Investment Solutions.

Asset class return considerations

Fixed income—government bonds

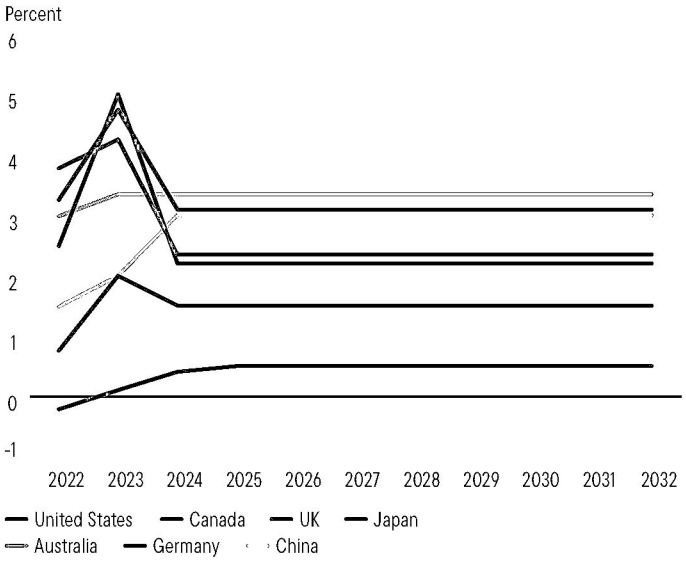
We view the prospective return from low-risk assets as being driven primarily by the starting level of government bond yields, which are themselves driven by anticipated policy rates. The starting yield can explain a large portion of the expected return forecast because any initial movement higher (lower) in bond price is offset by an ensuing lower (higher) yield in the following years of our time period. This yield base provides the first building block of portfolio return potential. On top of this we layer additional elements for asset class risk premia (which we discuss in the next section) and risk premia for illiquidity or complexity. Having seen policy rates rise quite sharply over the past year, the base levels for all our asset forecasts have increased. The total prospective returns from broadly diversified multi-asset portfolios have increased substantially due to this higher base yield, in our opinion.

This combination of slower growth and only slightly elevated inflation will likely drive many central banks to quickly reach a terminal policy rate that is somewhat restrictive, before normalizing official interest rates in the early part of our 10-year forecast horizon (see Exhibit 8). However, a strong desire to support a full economic recovery, through the provision of plentiful liquidity, will persist for a longer time in certain large economies, notably Japan, where inflation has consistently undershot central bank targets. These conflicting forces have pushed government bond yields up sharply from the exceptionally low levels reached in 2020. Real short-term interest rates started from deeply negative levels in most markets, and although they have increased recently, in a longer-term comparison they remain depressed. We anticipate a further increase in real rates to mainly occur through inflation dropping back toward central banks' targets in the coming years.

Policy Rate Expectations

Exhibit 8: Regional Short Rate Forecasts

As of September 30, 2022



Sources: Bloomberg, FTIS Forecasts. There is no assurance that any estimate, forecast or projection will be realized. Important data provider notices and terms available at www.franklintempletondatasources.com.

With global interest rates starting from relatively elevated levels, and expected to rise further before normalizing, overall return expectations from all fixed income assets have become more attractive than has been the case in recent years, in our analysis, and notably higher than we anticipated in our prior forecasts.

The term premium is a measure of the extra yield that owners of bonds demand, in excess of the anticipated average level of short-term interest rates for the life of the bond, to compensate for making a longer-term investment. This premium reflects supply and demand factors, including central banks' quantitative tightening policies, which recently replaced quantitative easing in some markets. This has seen the term premium oscillate over the past year, giving an ambiguous signal. Although it remains well above its pandemic lows, further increases over the next few years may occur as we expect an eventual normalization in monetary policy, relative to the restrictive levels being reached in many developed markets at this time.

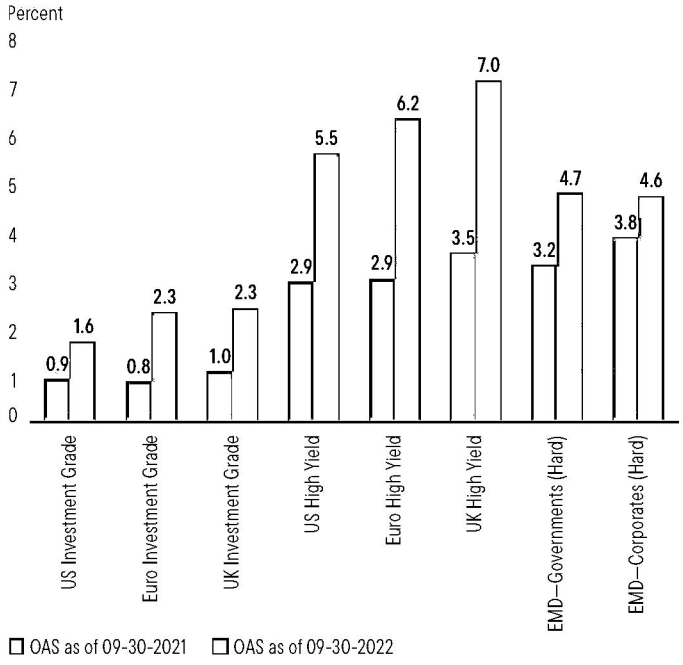
However, demographics and the investment behavior of an aging population continue to weigh on the term premium, as does the re-regulation of financial institutions, which has boosted demand for assets perceived as safe (Basel II). This may result in bond yields remaining lower than our historical experience, through this and the next cycle.

Within the fixed income asset class, the additional yield or spread that developed market corporate bonds provide has generally risen as fears of recession have mounted.

Credit Spreads Offer Adequate Compensation for Default Risk

Exhibit 9: Current Option Adjusted Spread (OAS)

As of September 30, 2022



Sources: Bloomberg. There is no assurance that any estimate, forecast or projection will be realized. Important data provider notices and terms available at www.franklintempletondatasources.com.

A desire to enhance portfolio return potential had seen many investors add to holdings of higher yielding securities, prior to the current rate hiking cycle, boosting demand for riskier fixed income assets. It appears the correlated rise in government bond yields and credit spreads that occurred during 2022 has re-based this "reach for yield" motivation. As a result, the current yield offered by corporate credit, especially lower-rated issues, is high by historical comparisons (see Exhibit 9). And compared with lower-risk government bonds, whose yield we have noted has risen to more appealing levels, the additional spread appears more normal. **Given our outlook for growth, the risk premium contained within corporate bond yields seems to be more than adequate compensation for the likely level of default risk over a full business cycle. The projected Sharpe Ratio is among the more attractive asset classes that we forecast, when we consider the balance of prospective return potential in relation to anticipated levels of volatility.**

Equity

Equity markets have corrected sharply during the past year, following a period of appreciation from pandemic-induced lows in 2020. They joined the correlated move seen in government bond yields and credit spreads, to create a "sell everything" environment. This was driven by the aggressive policy tightening cycle adopted by many developed market central banks in response to multi-decade high levels of inflation. Developed market valuations, based on price-to-earnings (P/E) ratios, have dropped below their historical averages. They are, similarly, less expensive than they were last year when judged on a price-to-book basis. This remains the case even when we smooth out the effect of recent volatility in earnings, such as by using longer-term, cyclically adjusted metrics. Using CAPE (cyclically adjusted P/E) ratios, stocks appear fairly valued, in general. However, they are outright cheap in Japan and China, for example, and these markets may be supported by the valuation factor in the longer term. As a result, **we believe global equities can trade at slightly higher multiples than today, as some normalization is likely to occur over our 10-year horizon**.

This valuation tailwind might be slightly offset by prospective earnings growth that is undermined by an ongoing cyclical slowdown in the early part of our forecast horizon. In addition, corporate margins have expanded since the economic low point in 2020 and remain at elevated levels. We do not believe that margins will remain at such levels throughout our forecast horizon. As a result, a decline in margins may act as a headwind to earnings per share (EPS) growth and overall equity return.

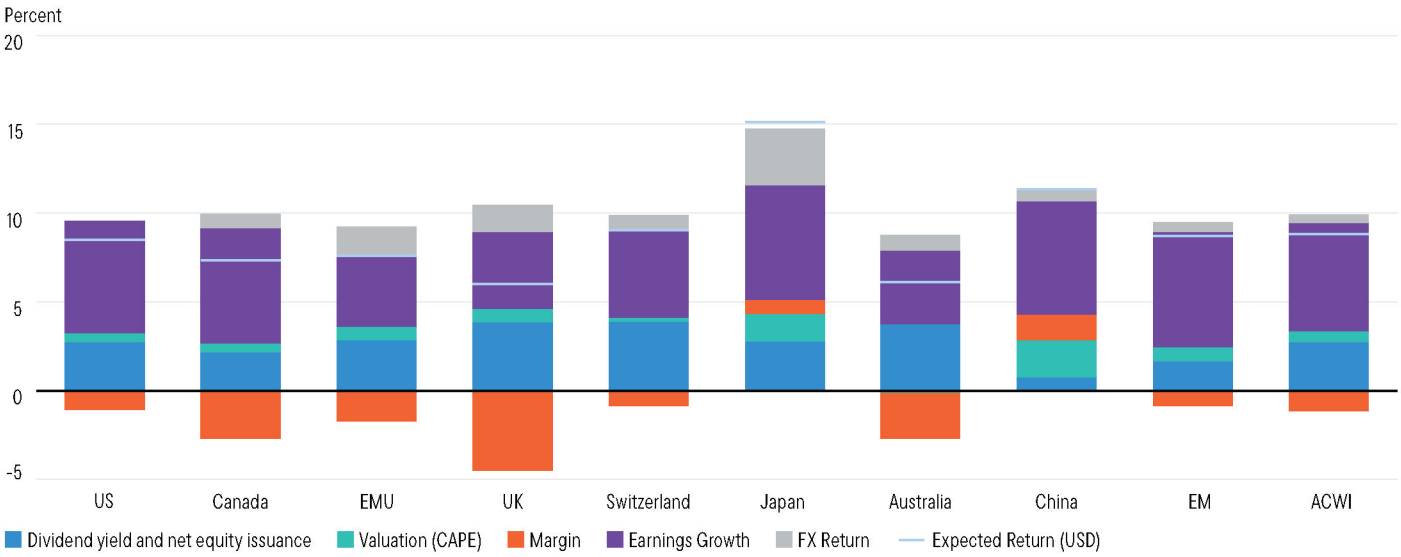
We break down the return potential of various stock markets into their key drivers of return: EPS growth, carving out margin adjustments; dividend yield and net share issuance; valuation normalization (CAPE); and anticipated foreign exchange movements. This is shown graphically (see Exhibit 10 on the next page). This highlights that over ten years, the key driver of returns is the level and growth of earnings and total shareholder yield. **Changes in valuation metrics are no longer a headwind to equity return potential even as margins act to offset this in our expected returns across most regions**.

When we analyze equities relative to lower-risk assets, we believe global stocks have greater risk-adjusted return potential than global bonds in an environment of continued global expansion, thereby earning their equity risk premium. When calculated using several approaches, we arrive at an **equity risk premium for global stocks in the region of 4% over government bonds**.

Valuations Are No Longer a Headwind to Equity Returns, Although We Still Expect Margins to Normalize

Exhibit 10: Building Blocks Model: Equity Return Decomposition

As of September 30, 2022



Sources: FTIS, Bloomberg, Macrobond. Important data provider notices and terms available at www.franklintempletondatasources.com.

Alternatives: private assets

Private assets may be a beneficial addition to multi-asset portfolios from several perspectives: they can offer a higher return potential, may include an illiquidity premium and provide access to a broad array of heterogenous investments. We focus on the three primary private asset classes in the US market: US private real estate, US private credit and US private equity. Private asset expected returns and risk expectations are reflective of broad-based, core, institutional allocations to these asset classes. For instance, our US private real estate expectations are based on the typical exposure profile of an institutional core real estate fund in The National Council of Real Estate Investment Fiduciaries (NCREIF) Open-End Diversified Core Equity (ODCE) Index. Importantly, our estimates include assumptions for leverage and typical fund fees.

We generally estimate private asset return expectations by using both bottom-up and top-down modeling approaches. Bottom-up models use a build-up approach to estimating market implied discount rates based on prevailing fundamental data and forward-looking assumptions. Top-down models identify public asset proxies with common economic risks and growth sensitivities, with necessary adjustments to account for the idiosyncrasies that these private assets may have over their respective proxies, including the impact of their cost of financing.

Our private asset expected returns reflect the impact of asset pricing trends in public markets, most notably a higher risk-free rate environment, as noted above. For example, our US private real estate expected return faces a headwind due to relatively low starting appraisal-based capitalization rates. Unlike its public market counterparts, private real estate has yet to re-price to reflect an environment with negative leverage (financing rates exceeding cap rates) and low transaction activity. We capture this dynamic by assuming an expansion in terminal cap rates. The drag from multiple expansion is largely offset by our expectation for robust cash flow growth due to a favorable supply/demand environment in core real estate sectors such as industrial spaces and single/multi-family homes.

In contrast, our assumptions for private credit and private equity show a meaningful return premium over public markets. We capture several fundamental advantages to direct lending strategies based on attractive yield spreads and modest expected credit losses. And private equity continues to offer returns at least proportional to its higher risk profile relative to public equities. We caution that increasing competition and “dry powder” in the form of an overhang of uninvested capital can be expected to compress the future illiquidity premia in private markets relative to historical norms.

Importantly, our private asset expected returns capture broad-based exposures and are heavily dependent on our assumptions for strategy mix, valuations, leverage, cost of leverage, fees, etc. Investors should consider the exposure profile of their target managers and acknowledge any differences relative to our assumptions. Manager selection is critically important in the private asset space as investors cannot simply "buy the index" to capture unconditional beta returns. In selecting and deciding the size of potential allocations to underlying private asset managers, investors should further assess the potential for managers to add value (alpha) in addition to assessing whether managers can adequately capture the returns we expect at the asset class level.

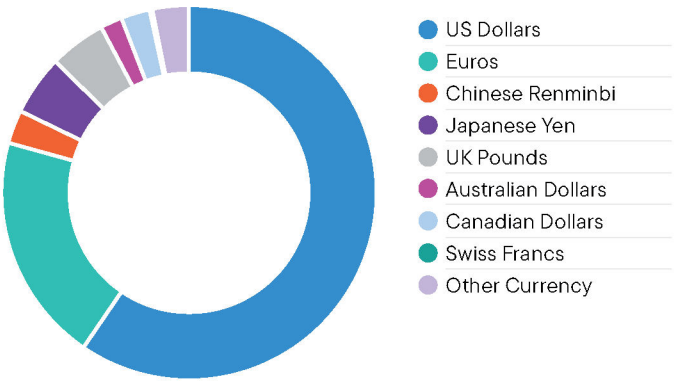
Foreign exchange effects

At the end of a period of unusually easy fiscal policy and with monetary policy tightening well underway, the US dollar's preeminent position remains intact, but its current relative overvaluation has become more extreme in the past year. We believe the US dollar is likely to weaken over our 10-year horizon. We use purchasing power parity (PPP) approaches for developed market currencies, which support this correction of the US dollar's overvaluation, enhancing the return potential for assets denominated in other currencies. **We continue to view the US dollar as the world's reserve currency and see low probability of that changing over even a 10-year horizon. Given its preeminent position in the holdings of other central banks (see Exhibit 11), the US dollar is likely to continue to trade with an appropriate valuation premium embedded within it.** However, the status of the euro and the Chinese renminbi may be somewhat enhanced over such a long view.

US Dollar Remains the Preeminent Reserve Currency

Exhibit 11: Reserve Currency

As of June 30, 2022



Sources: IMF, Macrobond. Important data provider notices and terms available at www.franklintempletondatasources.com.

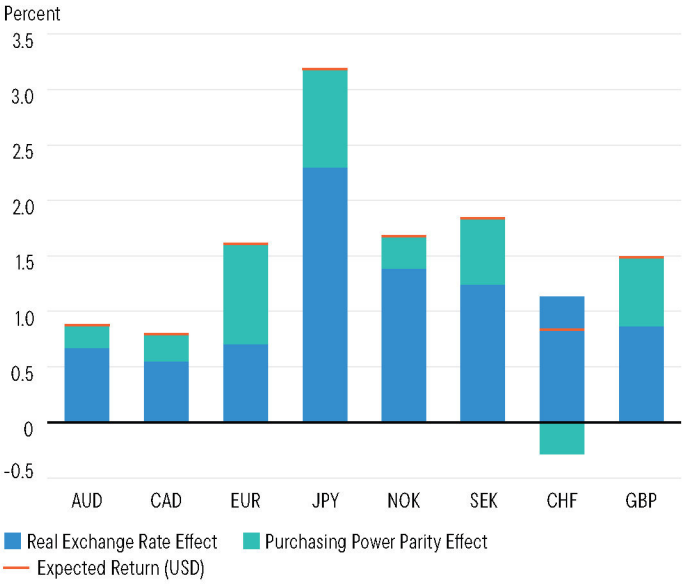
We also consider our relative inflation forecasts. Higher inflation can erode the purchasing power of a currency. Our view of marginally higher inflation in the United States generally acts as a headwind for US-dollar returns (see Exhibit 12). **The combination of high valuations and higher expected inflation results in our expectation that most developed market currencies will appreciate against the US dollar over the next decade.**

For emerging market currencies, we favor a real effective exchange rate (REER) approach. REER compares a nation's currency value against an index of the currencies of its major trading partners, adjusted for inflation. The superior growth prospects of emerging market economies have led to more return potential in emerging market currencies, but this is matched by higher expected volatility. In general, **emerging market countries that have suffered the worst economic recoveries, usually with accompanying currency weakness, now have the brightest prospects.**

US Dollar is Expected to Depreciate vs. All Major Currencies

Exhibit 12: Developed Market FX Decomposition

As of September 30, 2022



Sources: Bloomberg, Macrobond. There is no assurance that any estimate, forecast or projection will be realized. Important data provider notices and terms available at www.franklintempletondatasources.com.

Multi-asset perspective

The expected return for multi-asset portfolios is appreciably higher than last year's projections. Government bond yields have risen and now provide a notably higher return, albeit still the lowest of the mix. Riskier assets are generally forecasted to produce similarly higher returns. Valuations for both equities and corporate credit have corrected and will act as a tailwind to longer-term return potential. Private assets' prospects are mixed but generally offer healthy prospective return premiums. Overall, risk premiums are slightly above average, with our projected equity risk premium estimated to be 4% above global government bonds. Similarly, excess returns in credit are now slightly above long-term averages, with some variation among the sectors.

Government bonds may appear more appealing from a return perspective, but this comes at the price of an additional risk: persistent inflation. Stock/bond correlations have been modestly negative for the last 20 years, led by lower-risk government bonds and risky equities. However, in the past year during the "sell everything" market that we described above, short-term correlations have risen sharply, and performance has been negative for both equities and government bonds (see Exhibit 13).

The primary underlying reason has been high inflation, which has dominated growth fluctuations in dictating the performance of both asset classes and thus the related correlations. We still expect growth to be the key macro driver over the next decade, but we are giving greater probability to slightly higher inflation and greater levels of volatility in this measure. This has led many commentators to argue that the role lower-risk government bonds can play in a balanced portfolio could be reduced, which lowers their attractiveness in a multi-asset portfolio. While our forecasts for correlations

Traditional Assets: No Place to Hide During Stagflation

Exhibit 13: US Equities vs. Treasuries, Annual Returns Since 1948

Data as of November 3, 2022

Sources: Standard and Poor's 500, U.S. Department of Treasury, Macrobond. Indexes are unmanaged and one cannot directly invest in them. They do not include fees, expenses or sales charges. **Past performance is not an indicator or a guarantee of future results.** Important data provider notices and terms available at www.franklintempletondatasources.com.

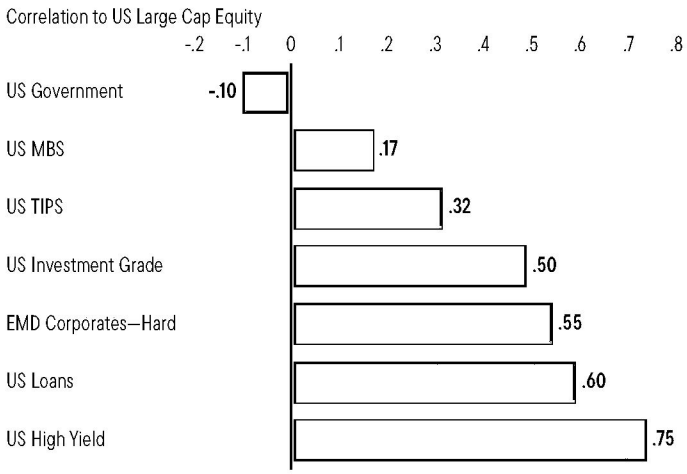
have evolved over the past year, we still believe that government bonds offer attractive diversification benefits. Combined with yields returning to some of the most attractive levels seen over the last 30 years, these assets remain important in multi-asset portfolios (see Exhibit 14).

More broadly, **we believe that maintaining a diversified portfolio of risk premia in addition to the traditional benefits of a balanced portfolio between stocks and bonds is the most likely path toward stable potential returns**. We also believe active management of this asset mix can enhance potential return and manage the level of total portfolio risk that is taken.

Higher Spread Fixed Income has Greater Correlation with Equities

Exhibit 14: Fixed Income Asset Class Correlations to US Equities (Unhedged USD)

As of September 30, 2022



Source: FTIS, Bloomberg. Important data provider notices and terms available at www.franklintempletondatasources.com.

Appendix

Historical Correlation

Long-term correlations between major asset classes, estimated using 20-year historical data. Expected correlations help quantify the relationships among asset classes. Expected correlation is as important as expected return and risk estimates when constructing portfolios.

	Asset Classes																					
Asset Classes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	20	21
1 **Global Equities**	1.0																					
2 **Developed Market Equity**	1.0	1.0																				
3 US Large Cap Equity	1.0	1.0	1.0																			
4 Canada Equity	0.9	0.9	0.8	1.0																		
5 EAFE Equity	1.0	1.0	0.9	0.9	1.0																	
6 EMU Equity	0.9	0.9	0.9	0.8	1.0	1.0																
7 UK Equity	0.9	0.9	0.8	0.9	0.9	0.9	1.0															
8 Japan Equities	0.8	0.8	0.7	0.6	0.8	0.7	0.7	1.0														
9 Pacific ex Japan Equity	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.7	1.0													
10 Australia Equities	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.7	1.0	1.0												
11 **Emerging Market Equity**	0.9	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.9	0.8	1.0											
12 China Equities	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.7	0.6	0.8	1.0										
13 Global Listed Infrastructure	0.9	0.9	0.8	0.8	0.9	0.8	0.9	0.7	0.9	0.9	0.8	0.5	1.0									
14 US Infrastructure	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.4	0.5	0.6	0.4	0.1	0.8	1.0								
15 Global REITs	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.6	0.8	0.8	0.6	0.4	0.8	0.7	1.0							
16 US REITs	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.7	0.7	0.6	0.3	0.7	0.7	1.0	1.0						
17 Global Treasury	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.4	0.3	0.4	0.3	1.0					
18 US Government Bond	−0.1	−0.1	−0.1	−0.2	−0.2	−0.2	−0.2	−0.1	−0.2	−0.1	−0.2	−0.1	−0.1	0.0	0.0	0.1	0.7	1.0				
19 Canada Government Bond	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.5	0.7	0.6	0.7	0.5	0.7	0.5	0.6	0.5	0.6	0.3	1.0			
20 Euro Government Bond	0.5	0.5	0.4	0.4	0.5	0.6	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.3	0.4	0.4	0.9	0.4	0.7	1.0		
21 UK Government Bond	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.5	0.4	0.7	0.5	0.6	0.7	1.0	
22 Japan Government Bond	0.0	0.0	0.0	0.0	0.0	0.0	−0.1	0.0	0.0	0.0	0.0	−0.1	0.1	0.1	0.1	0.1	0.8	0.6	0.3	0.5	0.4	1.0
23 Australia Government Bond	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.8	0.7	0.7	0.5	0.7	0.5	0.7	0.6	0.7	0.2	0.9	0.7	0.6	0.5
24 China Government Bond	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.4	0.2	0.3	0.4	0.4	0.3
25 Global Inflation Linked Bonds	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.3	0.6	0.4	0.6	0.5	0.8	0.5	0.7	0.8	0.8	0.5
26 **Global Investment Grade Bond**	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.4	0.7	0.5	0.7	0.6	0.8	0.5	0.8	0.8	0.7	0.5
27 US Investment Grade	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.3	0.6	0.5	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.4
28 Euro Investment Grade	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.5	0.7	0.6	0.6	0.5	0.7	0.4	0.6	0.5	0.8	0.3	0.7	0.9	0.7	0.4
29 UK Investment Grade	0.7	0.7	0.6	0.6	0.7	0.6	0.7	0.5	0.6	0.6	0.6	0.4	0.7	0.5	0.6	0.5	0.6	0.2	0.7	0.7	0.9	0.3
30 **Global High Yield**	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.8	0.8	0.8	0.5	0.8	0.6	0.8	0.7	0.4	0.0	0.7	0.5	0.5	0.1
31 US High Yield	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.6	0.7	0.7	0.7	0.4	0.8	0.6	0.8	0.7	0.3	0.0	0.6	0.4	0.4	0.1
32 Euro High Yield	0.8	0.8	0.7	0.7	0.8	0.8	0.8	0.6	0.8	0.8	0.8	0.5	0.8	0.5	0.7	0.6	0.6	0.0	0.7	0.8	0.5	0.2
33 UK High Yield	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.5	0.7	0.7	0.7	0.5	0.7	0.4	0.6	0.5	0.4	−0.1	0.6	0.5	0.6	0.1
34 US High Yield Loans	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.3	0.7	0.5	0.6	0.6	0.0	−0.3	0.4	0.2	0.2	−0.1
35 **US MBS**	0.2	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.7	0.8	0.5	0.5	0.6	0.6
36 Munis	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.3	0.3	0.4	0.3	0.6	0.6	0.4	0.4	0.5	0.4
37 EMD—Corporates (Hard)	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.5	0.6	0.5	0.6	0.5	0.4	0.2	0.6	0.5	0.4	0.1
38 EMD—Governments (Hard)	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.5	0.7	0.7	0.7	0.4	0.7	0.6	0.7	0.6	0.6	0.3	0.7	0.6	0.5	0.3
39 EMD—Governments (Local)	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.8	0.5	0.7	0.5	0.6	0.5	0.6	0.1	0.7	0.7	0.5	0.3
40 US Private Credit	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.3	0.6	0.4	0.5	0.5	0.0	−0.3	0.3	0.2	0.2	−0.1
41 US Private Real Estate	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.6	0.6	0.5	0.3	0.6	0.6	0.8	0.9	0.3	0.0	0.5	0.3	0.4	0.1
42 US Private Equity	0.8	0.8	0.9	0.7	0.8	0.7	0.7	0.6	0.7	0.7	0.6	0.4	0.7	0.5	0.7	0.6	0.2	−0.1	0.5	0.4	0.4	0.0
43 **Commodities**	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.4	0.6	0.6	0.6	0.5	0.5	0.3	0.4	0.4	0.2	−0.2	0.5	0.4	0.2	0.0
44 Global Hedge Funds	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.6	0.8	0.8	0.7	0.5	0.8	0.5	0.7	0.6	0.1	−0.4	0.5	0.3	0.3	−0.1

Correlations continued

Asset Classes	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
23 Australia Government Bond	1.0																					
24 China Government Bond	0.4	1.0																				
25 Global Inflation Linked Bonds	0.7	0.7	1.0																			
26 Global Investment Grade Bond	**0.8**	**0.3**	**0.7**	**1.0**																		
27 US Investment Grade	0.6	0.2	0.8	0.7	1.0																	
28 Euro Investment Grade	0.8	0.3	0.8	0.9	0.7	1.0																
29 UK Investment Grade	0.7	0.4	0.8	0.8	0.7	0.7	1.0															
30 Global High Yield	**0.7**	**0.2**	**0.7**	**0.8**	**0.7**	**0.7**	**0.7**	**1.0**														
31 US High Yield	0.7	0.1	0.6	0.7	0.7	0.6	0.7	0.7	1.0													
32 Euro High Yield	0.7	0.2	0.7	0.8	0.6	0.9	0.8	0.9	0.7	1.0												
33 UK High Yield	0.6	0.2	0.6	0.7	0.5	0.7	0.8	0.8	0.7	0.7	1.0											
34 US High Yield Loans	0.4	0.0	0.4	0.5	0.5	0.4	0.5	0.8	0.8	0.7	0.7	1.0										
35 US MBS	**0.5**	**0.3**	**0.6**	**0.6**	**0.6**	**0.4**	**0.4**	**0.2**	**0.2**	**0.2**	**0.1**	**0.7**	**1.0**									
36 Munis	0.4	0.2	0.6	0.6	0.7	0.4	0.4	0.5	0.5	0.4	0.3	0.3	0.7	1.0								
37 EMD—Corporates (Hard)	0.7	0.1	0.6	0.7	0.7	0.6	0.6	0.8	0.8	0.7	0.6	0.6	0.3	0.7	1.0							
38 EMD—Governments (Hard)	0.7	0.2	0.7	0.8	0.8	0.7	0.7	0.8	0.8	0.7	0.6	0.6	0.5	0.6	0.7	1.0						
39 EMD—Governments (Local)	0.8	0.3	0.6	0.7	0.6	0.8	0.6	0.7	0.7	0.8	0.6	0.5	0.3	0.4	0.7	0.7	1.0					
40 US Private Credit	0.3	0.0	0.3	0.4	0.4	0.3	0.5	0.7	0.7	0.6	0.6	0.9	0.0	0.3	0.6	0.5	0.7	1.0				
41 US Private Real Estate	0.5	0.2	0.5	0.5	0.5	0.4	0.5	0.6	0.6	0.5	0.4	0.5	0.2	0.3	0.5	0.5	0.5	0.4	1.0			
42 US Private Equity	0.6	0.2	0.4	0.5	0.4	0.5	0.5	0.7	0.7	0.6	0.5	0.5	0.2	0.2	0.5	0.5	0.5	0.5	0.6	1.0		
43 Commodities	**0.5**	**0.1**	**0.4**	**0.4**	**0.3**	**0.5**	**0.4**	**0.6**	**0.5**	**0.6**	**0.5**	**0.5**	**–0.2**	**0.1**	**0.5**	**0.4**	**0.5**	**0.4**	**0.3**	**0.7**	**1.0**	
44 Global Hedge Funds	0.5	0.1	0.5	0.7	0.6	0.6	0.7	0.8	0.8	0.7	0.7	0.8	–0.2	0.3	0.7	0.6	0.6	0.7	0.5	0.7	0.7	1.0