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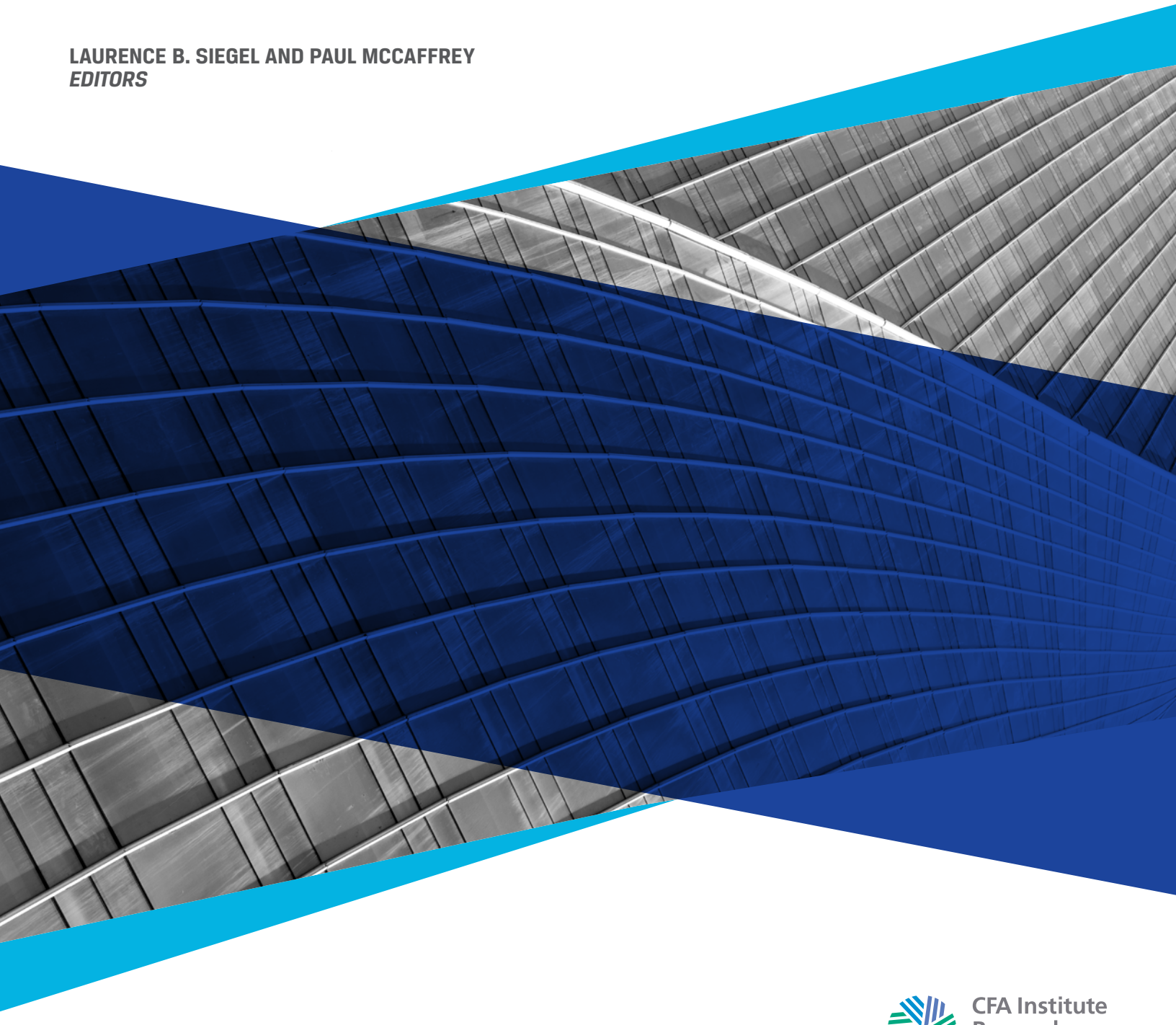
REVISITING THE EQUITY RISK PREMIUM

LAURENCE B. SIEGEL AND PAUL MCCAFFREY
EDITORS



CFA Institute Research Foundation

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CFA Institute
Research
Foundation

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PRESENTATION BY RAJNISH MEHRA: REFLECTIONS ON THE EQUITY PREMIUM

Rajnish Mehra: I'm going to discuss something totally orthogonal to what has been previously presented here today. But it is relevant, especially to what Elroy Dimson said about American exceptionalism.

Is the Equity Premium a Risk Premium?

Empirically, we observe several factor premia—for example, the Fama–French three-factor model identifies three: the equity premium, the size premium, and the value premium. I want to address the question: Are these factor premia a premium for *risk*? If they are, we can ask a second question—*how much* of the factor premium is a risk premium? For example, Ed Prescott and I documented that only about 1 percentage point of the equity premium is a premium for bearing systematic risk—hence, the "Equity Premium Puzzle."[40]

Let me just share some thoughts on this, and then we can discuss it.

Textbook finance characterizes the equity, size, and value premia as risk premia. I will argue that, while the equity premium is at least partially a risk premium, size and value are not. My argument is based on the premise that a genuine risk premium is *invariant* to whether or not I know that the premium exists.

The Size Premium

The size premium was documented by Rolf Banz and Marc Reinganum at about the same time as we wrote our equity premium puzzle paper.[41] In the fall of 1979, Myron Scholes had invited me to visit the Center for Research in Security Prices (CRSP), and Ed Prescott was visiting the Economics Department at the University of Chicago. We worked in Fischer Black's old office on the top floor of the business school, now known as Booth. Many of you may remember the suite of offices on that floor, including Jim Lorie, Jon Ingersoll, Eugene Fama, and Myron Scholes.

Let's look at **Exhibit 44**.

You can see the dramatic size premium in the exhibit; I haven't put up the *t*-statistics or any other details, but the key finding in Rolf Banz's 1980 work was that the size premium was a huge 8.3% per year (of small- over large-cap stocks).[42] You'd do anything for that!

Exhibit 44. The Size Premium before and after It Was Documented in 1980

Annual Mean Value Weighted Returns (%)			
Period	**Small Firms**	**Large Firms**	**Size Premium**
1927–1979	18.81	10.51	8.30
1927–2020	16.64	11.79	4.85
1980–1989	15.01	17.79	−2.78
1990–1999	15.96	19.31	−3.35
2000–2009	10.29	1.25	9.04
2010–2019	13.35	14.36	−1.01
1980–2020	13.84	13.43	0.40

Note: "Value-weighted" means capitalization-weighted. Returns are arithmetic means.

[40]See Mehra and Prescott (1985).

[41]See Banz (1981); Reinganum (1981).

[42]See Banz (1981). Banz's definition of small cap was small indeed—the bottom quintile, by count, of New York Stock Exchange stocks sorted by capitalization each year. Later research revealed a smaller size premium (over the same historical period) for stocks that were in the intermediate quintiles.

But you couldn't do anything about it. Buying small-cap stocks was not, up until 1980, an actionable decision rule. Once you got to know about it in 1980, it became actionable. After that, the premium just isn't there, and the premium for the entire 1927–2020 sample (including the period where it was so large) is statistically indistinguishable from zero. That fact leads me to conclude that the small-cap premium is not a risk premium. It was a premium. But once it was in everyone's information set and became tradeable, it disappeared. The risk is still there, but the premium is not.

Exhibit 45 is the illustration that you would normally see in books documenting the differential returns of small and large stocks. (The use of an arithmetic rather than logarithmic scale exaggerates the difference, which is what many of these book authors want to do.)

But I think **Exhibit 46** is what you really want to show. This starts in 1980, and there is no big difference between the returns of large versus small stocks.

Something similar happened with the value premium (see **Exhibit 47**). For the sake of this analysis, I'm assuming that the value premium was discovered in 1990. Just looking at the realized returns, it is apparent that the value premium "disappeared" once it became a part of our information set. Changes in expected stock returns are hard to measure, however, and we need another decade of data to make a definitive statement about the value premium.

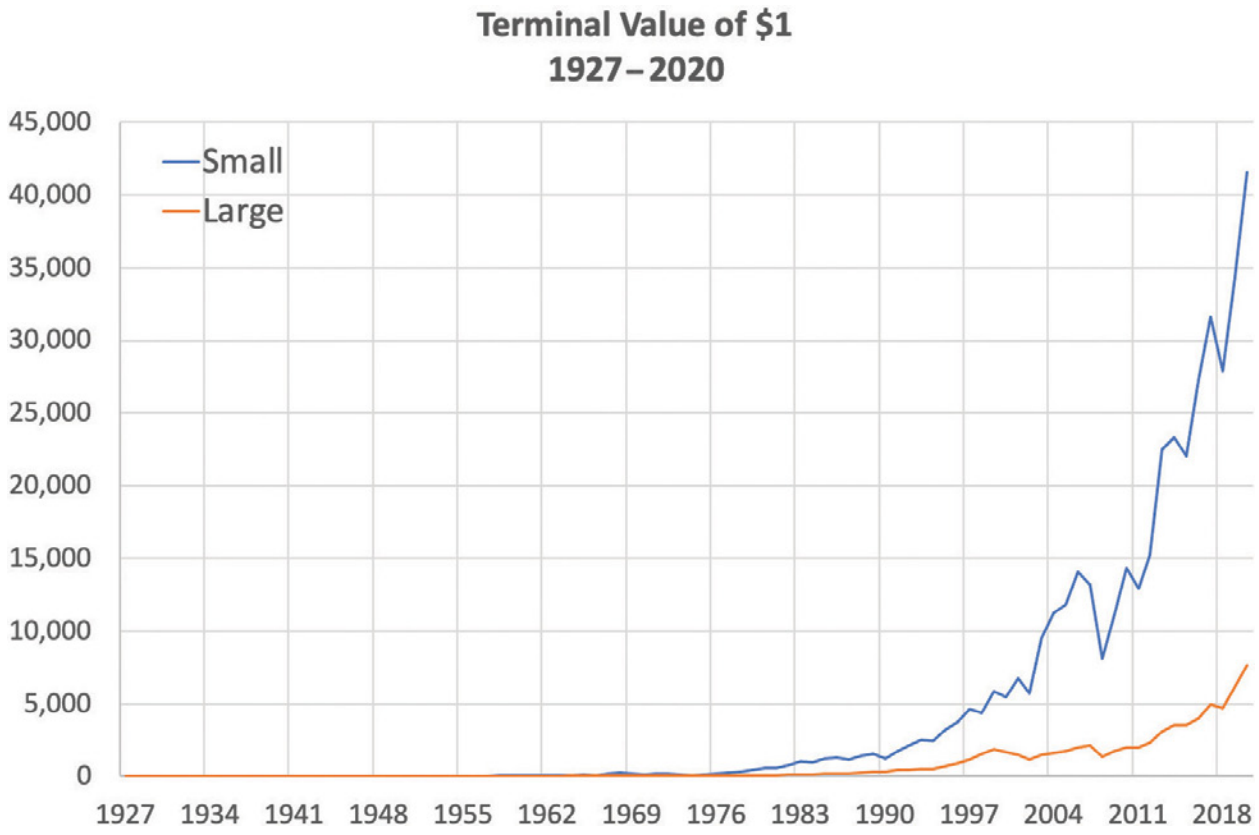
Persistence of the Equity Premium

On the other hand, if you look at the equity premium as shown in **Exhibit 48**, it's as stable as it ever was. Knowledge about the existence of the premium did not eliminate it. The persistence of the equity premium is considerably different than what you see with the value or the size premium. This is consistent with it being a risk premium.

Mean Reversion in Equity Returns

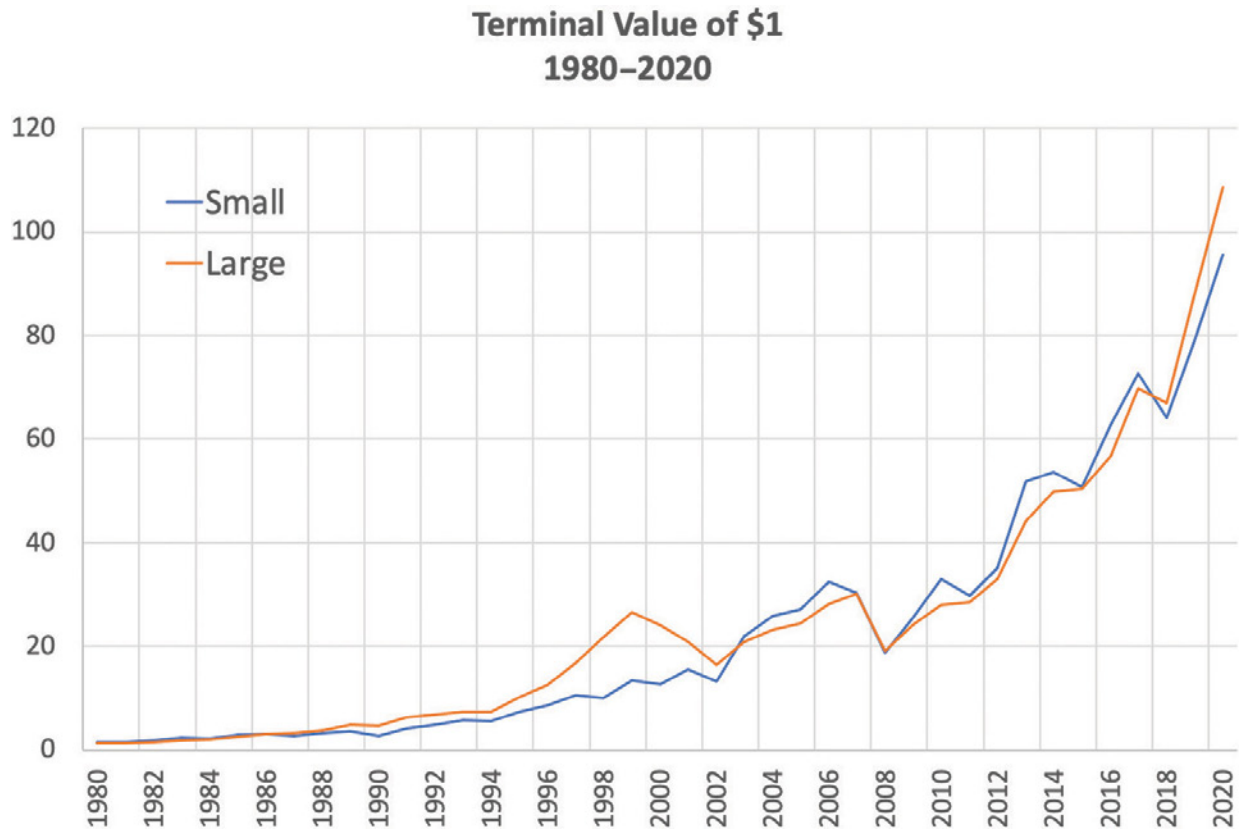
The other point I want to talk about is whether the equity premium is mean-reverting and perhaps predictable. The profession's view on this topic has shifted over time. The prevailing paradigm in the 1960s and 1970s (the halcyon days of the

Exhibit 45. Cumulative Total Returns on Small- and Large-Cap Stocks, 1927–2020



Source: Based on data from Kenneth French's website (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/).

Exhibit 46. Cumulative Total Returns on Small- and Large-Cap Stocks, 1980–2020



Source: Based on data from Kenneth French's website (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/).

Exhibit 47. The Value Premium before and after It Was Documented in 1990

Annual Mean Value Weighted Returns (%)			
Time Period	**Growth Firms**	**Value Firms**	**Value Premium**
1927–1989	11.27	17.59	6.32
1927–2020	11.88	15.86	3.98
1990–1999	20.34	17.57	–2.77
2000–2009	1.01	8.26	7.25
2010–2019	15.67	12.65	–3.04
1990–2020	13.13	12.34	–1.78

efficient market hypothesis!) is best characterized by a quote from Fama: "This paper has presented strong and voluminous evidence in favor of the random walk hypothesis."[43]

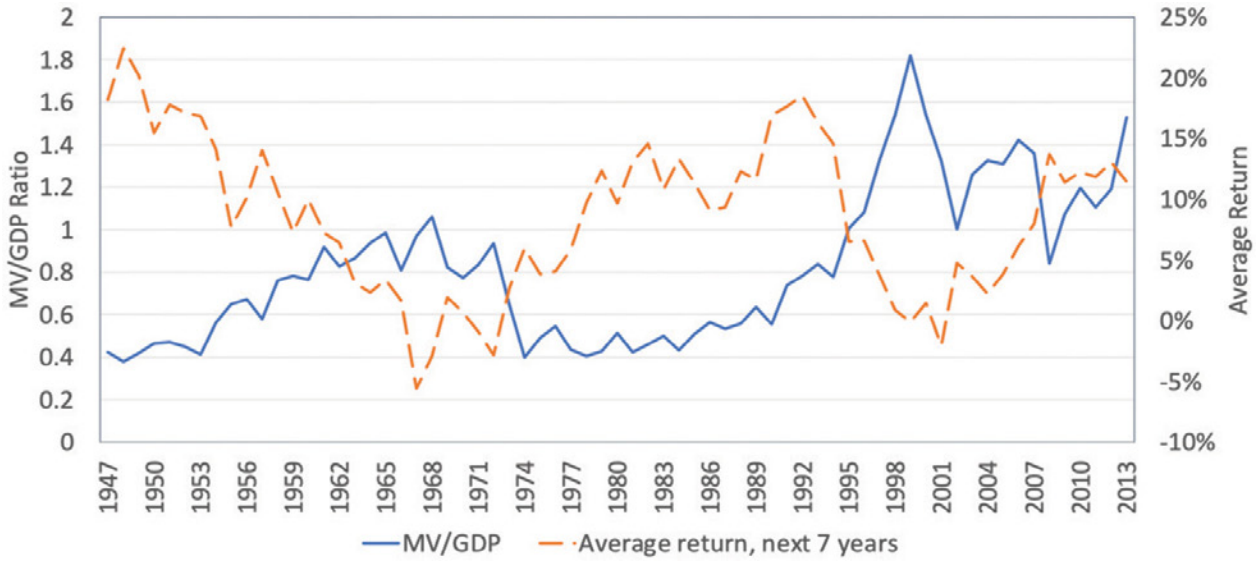
In the 1990s, there was a paradigm shift in whether stock returns are predictable or not. In their 1988 paper, Fama and French took a very different position: "There is much evidence

[43]See Fama (1965).

Exhibit 48. The Equity Premium before and after 1979

Time Period	% Real Return on Market Index Mean	% Real Return on Riskless Security Mean	% Real Premium Mean
1889–2020	8.2	1.3	6.9
1889–1978	6.98	0.8	6.18
1980–2020	9.6	1.5	8.1

Exhibit 49. Market Value to GDP Ratio and Subsequent Average Seven-Year Equity Return, 1947–2020



Note: Data are for the United States.

that stock returns are predictable"[44]—in other words, they are *not* a random walk. And then, in John Cochrane's presidential address to the American Finance Association, he said, "All price-dividend ratio volatility corresponds to variation in expected returns. None corresponds to variation in expected dividend growth, and none to 'rational bubbles.'"[45]

The implicit underlying belief is that the predicting variables (dividend-price ratios, earnings-price ratios) follow a stationary process that reverts to some unspecified normal value.

Campbell and Shiller succinctly summarize this view:

> It seems reasonable to believe that prices are not likely ever to drift too far from their normal relationships to indicators of fundamental value, ... Thus ... when stock prices are very high relative to these indicators ... [they] will ... fall in the future to bring the ratios back to more normal historical levels.[46]

Let me show you some empirical evidence regarding equity return predictability. **Exhibit 49** shows the ratio of US equity market capitalization to GDP along with subsequent seven-year returns.

This relationship held up well until the Global Financial Crisis. Looking at market value to GDP, it was a stationary series up to 2007. After that, however, it has no longer

[44]See Fama and French (1988).

[45]See Cochrane (2011).

[46]See Campbell and Shiller (1998, p. 11).

been so, as shown by applying the standard test for non-stationarity. A lot of our economic intuition was based on this earlier relationship. I entirely agree with the earlier presenters that this is not a market timing strategy, but it does give you an idea of what the average equity return is going to be.

In 2007, there was a structural shift in the economy. Real interest rates become negative; currently the entire term structure of real interest rates up to 30 years is negative, implying a negative marginal product of capital. Any assessment of the equity premium after 2007 must take into account these negative real interest rates.

One plausible explanation is that the equity premium went up after the Global Financial Crisis. If you take the historical (1929–2020) relationship between the market value/GDP ratio and subsequent equity return and extrapolate from it as shown in **Exhibit 50**, then the expected compound annual return on equities over the next five years is –5%. I wouldn't have too much faith in that forecast, however, because of the structural change.

To sum up my views on the mean reversion story, I think that it was valid until about 2007, but something changed in the economy around that time and we're out of that paradigm.

Discussion of Rajnish Mehra's Presentation

Jeremy Siegel: The ratio of equity market capitalization to GDP is often called the Warren Buffett indicator. It's his favorite indicator. I have often criticized it. Until the last 20 years or so, about 7% of the profits of the S&P 500 were from foreign sales. Now 40% to 45% of profits are from foreign sales. So, to compare US market cap to just US GDP is not an apples-to-apples comparison.

Rajnish Mehra: I'm looking only at domestic operations here. I'm not looking at foreign equity.

Jeremy Siegel: I'm not talking about foreign companies. I'm talking about profits of US firms and the market capitalization of US firms. Isn't that what you've used in Exhibit 49?

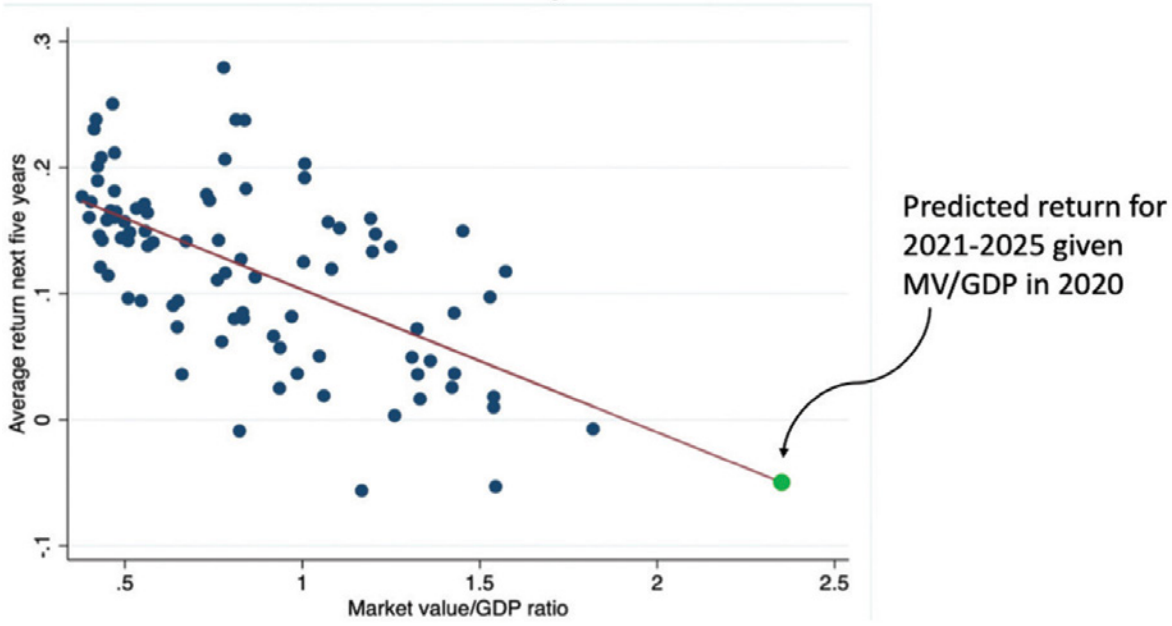
Rajnish Mehra: I have used domestic corporations, yes.

Jeremy Siegel: Yes, domestically housed corporations, but they're getting their profits from abroad, when they didn't before.

Laurence Siegel: Rajnish, when you use the term "domestic operations" it suggests that you've broken out the foreign

Exhibit 50. Market Value/GDP Ratio and Subsequent (Next Five Years) Average Equity Return, 1929–2020

$$R_{t\to t+5}^{e,avg} = \alpha + \beta\left(\frac{MV_t}{GDP_t}\right) + \varepsilon_t$$



operations of US-based companies. I don't think you've done that, have you?

Rajnish Mehra: No, I have not. What I'm saying is that the market capitalization of listed domestic corporations is not the full market value of all businesses in the United States.

Laurence Siegel: I am aware of that argument and agree with it—that the market cap of a stock market index misses a lot of privately held companies, sole proprietorships, and so forth. I think Jeremy is saying something different, which is that the S&P itself, holding that constant, has become more of a global index over time as its constituent companies became multinationals.

Rob Arnott: Rajnish, in looking at the past returns and past linkages with the linkage breaking down since 2007, I think it is strictly a function of what Cliff was alluding to earlier, which is revaluation. The valuation ratio has soared. A revaluation alpha should never be part of our forward-looking expected risk premium.

Rajnish Mehra: I think that's the most likely scenario. That the risk premium has gone up is consistent with the fact that real expected returns have become smaller and maybe gone negative.

But there are other stories that are floating around. There is an excellent paper by Farhi and Gourio called "Accounting for Macro-Finance Trends: Market Power, Intangibles, and Risk Premia."[47] They present evidence on the trends affecting some key macroeconomic and finance variables, focusing on six groups of indicators. I think the most plausible scenario is an increase in the risk premium, but one has to solve this puzzle jointly with other observations. You can't just pick one part of it—you must address the fact that the risk-free rate has declined so much and yet the return on equity has not declined. Why is that so? These are hard issues, and we don't have enough data after 2009 to resolve them.

[47]See Farhi and Gourio (2018).

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