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# Journal of APPLIED CORPORATE FINANCE

## In This Issue: Capital Structure and Payout Policy



Columbia Business School

# A Look Back at Modern Finance: Accomplishments and Limitations

A Conversation between Eugene F. Fama, the Robert R. McCormick Distinguished Service Professor of Finance at the University of Chicago and 2013 Nobel Laureate in Economic Sciences, and Joel M. Stern, Chairman and CEO of Stern Value Management. *Chicago, June 23, 2016.*

*It is easy after meeting Eugene Fama to see how financial markets, with their seemingly chaotic movements, would have met their match in this disciplined and accomplished academic and would have in turn revealed to him their own fundamental discipline. But it is also easy to see how this man, who is as gracious and patient as he is intelligent, would concede to the markets their vagaries—and readily admit that there is a lot we still don't know, even after a half-century of study. His discussion with Joel Stern, the well-known EVA practitioner, provides a substantive review of academic research in finance.* —Janice Willett, Guest Editor

## The M&M Theorems and Corporate Capital Structure

**Joel Stern:** You've obviously had a remarkable career, culminating in a Nobel Prize, and you are considered a giant in the field of finance. I'm sure there were people along the way who influenced your research. Merton Miller would certainly be one, but who else stands out as having had a significant effect on your professional development?

**Eugene Fama:** Harry Roberts was very instrumental in developing my attitude toward empirical work. He always believed that we use models only as a way of organizing our thinking—that we shouldn't take the model itself seriously. Our ultimate goal is to learn what we can from the data.

**Stern:** He was one of your thesis advisors, right? And your entire thesis was eventually published in the *Journal of Business* as "The Behavior of Stock Prices," which was one of the longest papers ever published anywhere. In that paper, you demonstrated that the past behavior of stock prices cannot be used to predict their future behavior. That was a radical idea back then.

**Fama:** At the time, I was a student looking for a thesis. Computers had just come around, and a lot of statisticians and economists were looking at speculative pricing series. Benoit Mandelbrot visited Chicago quite frequently, and he was researching "fat-tailed" or Pareto distributions; that is, distributions in which the outcomes are much more variable than those in a classic bell-shaped, or "normal," distribution. Mandelbrot was a pure mathematician working at IBM then, and his idea was that most distributions are fat-tailed—such as rainfall and how often flooding occurs relative to how often you would expect flooding in a normal distribution. Two-thirds of my thesis was basically about the distribution of stock returns.

**Stern:** We'll get back to asset pricing in a bit, but let's talk a little about Merton Miller and corporate finance. In Miller's paper, "Debt and Taxes," he concludes that debt is not cheaper than equity. This was another radical idea because corporate CFOs routinely argued that the "right" kind of financing could create value.

**Fama:** There's a later paper that he wrote with Myron Scholes, "Dividends and Taxes," in which they laid out the conditions under which capital structure doesn't matter. The basic argument was that capital structure doesn't matter when debt is priced as if the implicit tax rate is the same as the corporate tax rate. In other words, there's a premium built into interest rates that effectively compensates investors for the higher

taxes they have to pay, which eliminates the favorability of debt financing. But we've never really documented whether or not that's true.

**Stern:** What about the proposition that dividends gained must be equal to capital gains lost?

**Fama:** Of course. That's M&M.

**Stern:** I raise the question in part because I'm scheduled next month to debate someone who claims that dividends are what the investor cares about—that dividends are the driving force behind corporate valuations.

**Fama:** Well, that might be true in the narrow sense that the stock price is just the present value of the payouts. Eventually, of course, there has to be some sort of cash payout, otherwise you've bought the Brooklyn Bridge.

That said, *changes* in dividend policy can also communicate information about the value of the company. But since dividends are typically announced at the same time as earnings, it's hard to disentangle those effects. There's no doubt that management has information that the market doesn't, and because companies are so reluctant to cut their dividends, a dividend increase is genuine news about the firm's prospects. That's the dividend signaling hypothesis from the old days—although you don't hear about it much anymore.

**Stern:** Often a company will report that earnings are up by, say, 30%, and simultaneously increase dividends by, say, 12%, and the idea is that the board is communicating that the "normalized" or recurring increase in earnings is 12%.

**Fama:** That's the Lintner model—dividends are smoothed to pick up the permanent increase in earnings. It's interesting, though, that it doesn't work in Europe. They don't smooth dividends the way we do here.

**Stern:** Another signaling device is stock splits. What about Copeland's paper, "The Evidence Against Stock Splits"? He made the point that stock splits reduce liquidity—in other words, the volume of shares traded does not keep pace with the split.

**Fama:** But that's not true anymore, is it? My experience with money managers is that they don't think in terms of buying numbers of shares; they decide the dollar value that they want to invest.

**Stern:** Copeland also makes the point that transaction costs go up after a stock split.

**Fama:** But these days, with prices quoted in decimals, there are no trading costs, so that hardly matters.

**Stern:** What about the idea that the stock price should be in a desirable trading range?

**Fama:** What that meant in the old days was the range that maximized commissions per dollar. It was well documented that brokers were advising companies to price their shares in the sweet spot of the commission schedule.

**Stern:** So what is the motivation for a stock split? Is it a way of signaling to the market that the shares are undervalued?

**Fama:** I don't think that was borne out in our study of stock splits. Again, the problem is that companies often increase the dividend at the same time as the split, so if there's a price bounce, it's hard to know if it's the dividend or the split. Stock buybacks are another signaling device. Of course, there's perfect substitutability between dividends and buybacks. It all goes back to the tax rate that is implied by the pricing of dividends. For M&M to work, dividends have to be priced as if they are tax-free. Miller mentions that in his "Debt and Taxes" paper. And the shareholder can always create dividends by selling shares.

**Stern:** It's interesting that you mention buybacks. General Electric recently bought back 20% of their outstanding shares with funds they received from liquidating GE Capital. Though I doubt that this was the GE management team's rationale for buybacks, many people believe that their stock price will go up just because the EPS is going to be higher.

**Fama:** Well, the EPS *will* be higher because there are fewer shares. Suppose I took my business and sold half of it and returned the proceeds to the shareholders. Nothing happens to EPS. If GE is saying that its EPS is going up, what they're really saying is that GE Capital was generating lower rates of return—and lower EPS—than the rest of the company.

**Stern:** It might very well have been—though on a risk-adjusted basis, that is not clear.

**Fama:** You're right. It was a profitable business until Dodd-Frank came along.

## Tax Policy

**Stern:** If you were able to write tax policy, what would you do?

**Fama:** All economists agree that a consumption tax is the most efficient way of raising revenue. The problem is that all governments that institute a consumption tax also keep the income tax. If there were a constitutional amendment

that made it illegal to have both, I'd sign on for a consumption tax in an instant. But to propose a new consumption tax because it's "more efficient" is clearly just a way of raising taxes. All taxes distort incentives; for long-term growth purposes, though, a consumption tax is less problematic. I know very intelligent non-economists who talk about low corporate tax rates with no understanding of how often a corporate dollar is taxed all along the line. And then there's the nonsense of having deductible interest and nondeductible dividends—I think we're the only country in the world that does that.

If you have to have an income tax, I would have a graduated income tax, but those paying the higher rates would have a say in how the money is spent. Everyone would pay a flat tax that the government gets to use, and those paying above the flat tax would get to decide whether it goes to charities or to the government—and if the latter, where in the government it would go.

**Stern:** How do you know that the wealthy person would spend the money the way the poorer person who needs the money would?

**Fama:** How do I know the *government* will do that?

**Stern:** That's the reason Milton Friedman used to say that a smaller government is the best government. The mistake we made was building large buildings in Washington.

## Behavioral Finance

**Stern:** Let's change course a bit and talk about behavioral finance, which is often held up as a challenge or counterpoint to the efficient markets hypothesis. I was asked once to debate Richard Thaler on behavioral finance. I wasn't very familiar with it at the time, but when I heard what he was saying, I was just as puzzled as the audience. Where's the theory that underlies it?

**Fama:** That's the point—there *is* none! We just did a conversation that was published by *Chicago Booth Review*[1] in which I claim that I'm really the most important person in behavioral finance. I make that claim because most of behavioral finance is just a criticism of the theory of efficient markets, which I played a role in developing. Without efficient markets, the behavioral finance people have nothing to talk about.

**Stern:** But people take this very seriously, and not only at the premier graduate business schools. There's even talk of Thaler winning a Nobel Prize.

**Fama:** Well, Thaler is different in the sense that his research is motivated by the psychology that he takes to be the underpinnings of what he's doing. Most of behavioral finance is just dredging for anomalies; you go through the CRSP Compustat tapes and find what you can, but it has nothing to do with any concepts from psychology. It's not motivated by anything other than what they dub "irrational."

But "irrational" has to have some foundation. I wrote a review paper on behavioral finance 20 years ago in the *Journal of Financial Economics* in which I said that the behavioralists need to come up with a theory that we can test so that we can see what's there.

**Stern:** How would you summarize Thaler's contribution to financial economics?

**Fama:** He really moved cognitive psychology into finance in a couple of papers that he wrote with Werner DeBondt. They were very influential in getting people to think about these concepts. But it still hasn't evolved into a full-fledged scientific theory because there's no story of asset prices that we can test.

**Stern:** And yet there are newly minted PhD students from outstanding schools who are pursuing this as if there were a worthwhile outcome.

**Fama:** Well, there are two levels. If you look at people's individual behavior, there are well-documented traits from cognitive psychology that show up everywhere, and the behavioral economists have a lot to say at that level. But *the leap to the effect on market prices* is something that I have yet to see documented empirically. You can't do it with claims and anecdotes.

**Stern:** The behavioralists are fond of talking about market bubbles as evidence against market efficiency. Some years ago, there was a 65th birthday celebration for you at which people presented papers in your honor. One of the presenters pointed out that markets weren't irrational—despite the 2000 collapse—because there is *always* the probability that a collapse can take place, even if markets know what they're doing.

**Fama:** Yes, that was the Internet period. In hindsight, people called it a bubble. But it was clear that the Internet would be a huge thing for business—which it ultimately has been, of course. But there weren't many abnormal profit opportunities back then because it was a very competitive environment. At the time, it would have taken one and one-half Microsofts

1. Available at http://review.chicagobooth.edu/economics/2016/video/are-markets-efficient.

to justify all the dot-com valuations, so there had to be one and one-half Microsofts in the Internet somewhere. They just didn't turn up until later in the form of Google and Facebook.

**Stern:** There was an issue of the *Journal of Business* devoted to anomalies—things like the year-end effect, the January effect, and the small-firm effect—in which it appeared that simple trading rules could generate abnormal returns. But within a short time, those anomalies had mostly been explained away by excellent academic research. I think the same will happen with the behavioral economists' anecdotes.

**Fama:** The turn-of-the-year effect ended up being irrelevant because it had to do with the way prices were quoted. It's a small-stock phenomenon; but if you look at mutual funds that hold small stocks, there is no turn-of-the-year effect. It was only in the quoted prices of the individual stocks.
I always say that market efficiency is a "model"—that is, it's an approximation of economic reality. But for my purposes, it's an approximation that works. The market is not completely efficient, of course. For example, it's well documented that insiders have information that the market doesn't.

## Asset Pricing and the Cost of Capital

**Stern:** So let's turn in earnest to asset pricing, which has been your principal focus over the last several decades. What does asset pricing mean, and how is it applied within the corporation—that is, who should care about it? And should it be taught in MBA programs as opposed to just in PhD programs?

**Fama:** Asset pricing is central to almost everything. The appropriate concept of risk in markets, and how risk is priced, and the relation between risk and expected return—that's what asset pricing is all about. Who generates the risk? Well, it's businesses of all sizes.

**Stern:** Are there tools in asset pricing that allow us to estimate the cost of capital for the firm?

**Fama:** Let me answer that question a step at a time. We started in the 1960s with the capital asset pricing model—the so-called beta model—which was used for a long time for estimating the cost of capital. Then empirical work came along that suggested the CAPM didn't work very well, so a consumption-based asset-pricing model emerged, but that didn't work either. Then in 1993, Ken French and I came out with the three-factor model, which has held sway for over 20 years. The three factors were the market, which is always a factor, plus a value-growth factor and a small-stock factor. Our model did much better than the CAPM, although now people have uncovered things that can't be explained by our model either. But that's the way models go.

The three-factor model was what I call an *empirical* asset-pricing model, because it was motivated by things people found in the data. We developed a risk story around those findings, and we formed factors that looked like risk factors in that they had not only high returns but also a lot of volatility. One of the factors was the difference between the returns on value stocks and growth stocks. Initially the behavioral people said that it was just an arbitrage opportunity, because if you go long one and short the other, you get a zero-variance portfolio. But what you actually get is a high variance, which means that it looks like a risk factor.

The difficulty with multifactor asset-pricing models—which you can put under the banner of Bob Merton's intertemporal capital asset-pricing models, with multiple sources of risk that have different prices per unit of variance—is that we haven't really identified what is causing different sources of variance to have different prices per unit. And that takes me back to your original question about what this all means for corporate finance. This is why my faculty fired me from teaching corporate finance, because my view is that what we teach our students has very flimsy theoretical underpinnings.

Take DCF analysis, for example, which comes out of the perfect certainty world of Irving Fisher. My first objection is that we don't live in a perfect certainty world. But let's push past that problem. We then have the problem of estimation. So let's suppose the sky opens and a voice tells us that CAPM is the right model, and all we have to do is to estimate beta. The problem here is that, for individual stocks, the estimate of beta is garbage. Even for an industry, there's no hope of estimating beta because it's too dynamic through time. Ken French and I wrote a paper that showed you're no better off using two years of data than ten years of data because there's so much movement.

But now let's suppose that the sky opens again and the correct beta comes down. Now, all you have to do is to estimate the market premium. But all we can really say is that it's a number somewhere between 2% and 10%, and we have very little basis for settling on a particular estimate. And yet the number you choose will have a dramatic effect on your results.

**Stern:** What about the paper by Bob Merton in which he used an expectations model to estimate the market premium?

**Fama:** But Bob's conclusion was that it's estimated with a ton of uncertainty, which is the fundamental problem. Ultimately, in a DCF calculation, you've got cash flows in the numerator, which are random variables, and you've got another random variable in the denominator. At this point, a statistician's hair is standing on end because you've got a ratio of two random variables. In the end, we have no evidence that the whole process is any better than a rule of thumb.

## The Future of Business Education

**Stern:** It's good that we are near the top of the market in MBA pricing because when people read this interview, they might decide that a bachelor's degree is more than sufficient. What rules of thumb are you thinking of?

**Fama:** Well, in the old days, people used the payback method—or the internal rate of return. We simply don't know which approach yields better numbers.

**Stern:** Nonetheless, in your opinion, your work in asset pricing is not only logically part of an MBA program, but the very best MBA programs should focus a lot of attention on it.

**Fama:** That's certainly true of the students who are concentrating in finance.

**Stern:** If you were designing the optimal MBA program, does Chicago come closest to it? Or perhaps MIT?

**Fama:** They both do. Still, whenever we do a curriculum review, I always argue for eliminating course requirements and giving the students more choice. Back in the day, MBA students were newly minted undergrads. Today they're adults, with experience and well-defined goals. Maintaining course requirements has the effect of creating demand for certain areas, so you have to have faculty in that area, and the faculty have an incentive to have more faculty in that area. That said, I think Chicago has about as much choice as anyone; about half the courses are required and half are electives. A lot of students do double majors.

**Stern:** What courses would you require in an MBA program?

**Fama:** Well, it's hard for me to imagine that someone doesn't need accounting. Everyone should be literate in accounting; it's the language of business. We are surprisingly lax about finance at Chicago; if someone has an undergrad business degree and they're not going to major in finance in the MBA program, we don't require finance. We do require statistics, which I think they should know because statistics is in everything now, and we also require behavioral science, which is taught by psychologists, although I'm not convinced we couldn't live without it. So we talk about the basic disciplines—accounting, economics, behavioral science, statistics—and then you can add other areas.

**Stern:** When I first came here as a student and I was in Merton Miller's finance class, I asked if there were going to be case studies at Chicago. His response was that studying cases takes time away from studying the underlying theory—that there was no reason to settle for someone's interpretation when you could settle for the facts.

**Fama:** Well, that's always been a reasonable point of view. But early on, when I taught corporate finance, I used cases, although not standard Harvard cases... What did Mert talk about for ten weeks?

**Stern:** He talked about the papers that they had published—the 1958, 1961, and 1963 papers. On the first day of class, he put two columns on the board, one labeled "M&M" and the other labeled "T." "T" represented "them"—that is, everyone else, and what they said about corporate finance.

**Fama:** I'm not sure I could spend ten weeks talking about those papers. Of course, we've had a lot of work on corporate finance in the interim, so there's a lot more to cover. But the question remains, have we really learned anything?

**Stern:** A few years ago, I was teaching executive MBA students here at Chicago and you were the luncheon guest speaker. You remarked that you were no longer allowed to teach corporate finance because you don't believe there's any value created on the right-hand side of the balance sheet.

**Fama:** That's not exactly what I said. But as we've discussed, I *am* skeptical about what MBA students are taught in terms of the cost of capital. There's a lot of uncertainty in estimating that number. Even with the "correct" asset-pricing model in terms of risk and return, the ability to estimate the parameters of that model is very limited, and the whole process ends up not having much value.

## Incentive Compensation

**Stern:** Let's move on to a topic near and dear to my heart: incentive compensation. Suppose you were asked to design an incentive program that would maximize the value of the organization. We might not be able to estimate the cost of capital—the required rate of return—but we do have a shot at calculating the actual rate of return over a particular time period. I once posed this question to Merton Miller and he suggested stock options—although stock options really only work at the top levels of management. What would you propose that would work for the troops as well?

**Fama:** Joel, you have far more experience designing incentive plans than I have. To be perfectly frank, I have kind of a cynical view that the people at the top decide what they want to do, and then the people down below come up with the numbers to justify it.

**Stern:** You could teach a new class—the *conspiracy* theory of finance! Actually, Raghuram Rajan, Henri Servaes, and Luigi Zingales suggested a kind of reverse agency problem in which the behavior of upper management is influenced by middle managers who aspire to senior roles and therefore

exert pressure on the current senior managers not to engage in self-dealing or other value-destroying behavior. By the same token, senior managers monitor themselves because they don't want to risk losing the high-quality people coming up in the organization who are creating tremendous value.

**Fama:** That's an interesting idea. Of course, incentive schemes in general are about bringing owners and managers closer together. Lots of economics is about incentives. Better incentive schemes are essential to almost everything—planning, investment, valuation, execution—and my guess is that what works is different for each company depending on the top management and the nature of the business.

**Stern:** The paper that really influenced me in this area was Mike Jensen's piece, "Eclipse of the Public Corporation," in which he suggested that publicly traded corporations are going to disappear into KKR-type organizations to resolve the agency problem.

**Fama:** A return to Berle and Means. That was in the 1980s, the period of management buyouts.

**Stern:** Exactly. The threat of unfriendly takeovers had been interrupted by the Delaware courts, so that the market for corporate control was not functioning the way it should. But the insight I had was that we could accomplish the same thing—that is, bring ownership and management closer together—through incentive contracts that gave the employees a percentage of the improvement in performance that is attributable to management, and that would pay out over time based on the sustainability of results in order to prevent short-termism. One of your early students, Marshall Blume, wrote a paper that suggested that 50% of a company's performance is due to general economic conditions, another 25% is due to industry conditions, and the remaining 25% is the discretionary performance of management. Clearly, any incentive scheme has to filter out economic and industry conditions.

**Fama:** That's pretty standard now, isn't it? Abbie Smith wrote a paper showing that industry-adjusted payouts were widespread. Companies are already making the adjustment for industry conditions. But the bottom line is that better incentive schemes are essential—certainly, that's what we learn from economics.

## The Role of the CFO

**Stern:** Let's explore another important aspect of corporate finance. How do you view the role of the treasurer or CFO?

**Fama:** In my view, the CFO should come up with reporting methods that will give management better information for decision-making. That's what distinguishes the chief financial officer from the chief accountant. He or she should be thinking more creatively about improving the decision-making process. In the old days, at least, the treasurer was the capital budgeting person. A lot of the work in asset pricing can be brought to bear on capital budgeting—but again, theoretical finance does not offer a menu that will work in every situation. Measuring performance on a risk-adjusted basis is no small feat, but that's what I think CFOs and corporate treasurers should at least consider trying to do with their different operating businesses.

**Stern:** Your point earlier was that the models being used for assessments of risk in order to calculate a required rate of return are not reliable. So for purposes of making an executive decision, they might not be helpful, right?

**Fama:** Still, decisions have to be made. You certainly need good projections from the accounting side.

## Finance Today

**Stern:** Fischer Black said a number of years ago that everything interesting in finance had already been done, and that's why he went to Goldman Sachs.

**Fama:** And yet we still have no real resolution on the key questions of debt and taxes, or dividends and taxes. The M&M papers laid out the circumstances under which the right-hand side of the balance sheet can make a difference. But we have trouble testing whether debt is priced with the grossed-up tax effect built into it, which would give debt an advantage. You can't just compare municipals and corporates because municipals are priced on an arbitrage basis relative to corporates. It could be that the tax bracket built into corporates is zero, but municipals are priced down relative to that because they are tax-advantaged. So we still don't know the answers to questions raised by those two papers back in the 1970s and 1980s.

And Fischer himself kept pursuing finance research even after he went to Goldman. Fischer had an unusual mind—he was someone who could make you think differently about what you were doing. Unlike Merton Miller, who was uncanny and had brilliant ideas and was always right, Fischer had brilliant ideas, but he was right about 5% of the time. And yet that 5% was really important—one example was his contribution to options pricing. People extend the frontiers of finance in different ways. My son-in-law, John Cochrane, thinks differently than the rest of the world about everything. People like that can make you see your own research in a different way. Fischer was like that, as were Merton Miller, Harry Roberts, Steve Ross, Richard Roll, Mike Jensen, and Bob Merton, to name a few.

By contrast, Ken French and I think very much alike. We're very productive together, but we're not going to change

each other. If you put us together, you get a bigger total, but not something entirely different.

**Stern:** What's being done now in finance that interests you?

**Fama:** Let me answer that question indirectly. If you go back to the early 1960s when all of this started, there were no good journals in finance. The *Journal of Business* was as good as anything out there. The *Journal of Finance* was awful. But there was an explosion of research in the 1960s and 1970s, with a couple of schools involved in most of it, and Michael Jensen and I started the *Journal of Financial Economics*—well, Mike really did all the work—which raised the level of what was accepted as academic research. And then René Stulz took over the *Journal of Finance* and turned that around, and now there are at least three very good journals—the third being *The Review of Financial Studies,* which is a very successful journal. Certainly anything in those journals is interesting.

**Stern:** At your 65th birthday party, one of the speakers talked about the discipline of your daily routine—you get up at 5 a.m., work out for an hour…

**Fama:** Yes, the mornings are my time. I always say that I do my own work in the morning, and I do other people's work in the afternoon—administrative work, editorial work... I've always done it that way, so after 50+ years, people know not to bother me in the morning, but in the afternoons, I'm wide open.

**Stern:** You're spending more time in California these days. Do you spend any time at UCLA?

**Fama:** Not really. When I used to go to UCLA from where I live, it would take me 20 minutes to get there, but now it could be two hours, and it's basically hopeless before 9 a.m. and after 3 p.m. Los Angeles has become what I call a land of 1,000 islands—you live on an island and you don't leave that island or you may never get back.

**Stern:** Still playing tennis?

**Fama:** Not really—it got to the point that people I wouldn't even have played with in my younger days were beating me. I play golf and swim now.

**Stern:** Well, thank you so much for your time today. It's truly been an honor.

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