Dimensional

PERSPECTIVES

# Celebrating Groundbreaking Research with Giants of Finance: Fama and French

Savina Rizova, PhD
Global Head of Research

**Jun 21, 2023**

## KEY TAKEAWAYS

- This year marks the anniversaries of research that laid the foundation for a new way to invest.
- Merton's Intertemporal Capital Asset Pricing Model (ICAPM) (1973), the Fama/French three-factor model (1993), and Novy-Marx's profitability research (2013) underpin Dimensional strategies.
- In the second of three conversations, we hear from Eugene Fama and Kenneth R. French about their three-factor model, now ubiquitous in financial theory and practice.

In 1993, two academics out of the University of Chicago, future Nobel laureate Eugene Fama and his longtime collaborator Kenneth R. French, published "Common Risk Factors in the Returns on Stocks and Bonds." The paper proposed a three-factor model for stocks that included, in addition to the market factor, a size factor and a value factor. The three-factor model appeared to explain differences in average stock returns and enabled investors to attribute over- and underperformance to factor exposure. This provided the industry with a way to transform the concept of multifactor asset pricing into practical investment solutions.

The year 2023 marks the anniversaries of that and two other breakthroughs in financial science that underpinned a new way of investing—factor investing—which combined the low cost, transparency, and diversification of index investing with a systematic pursuit of higher expected returns:

- Fifty years since the publication of Robert C. Merton's Intertemporal Capital Asset Pricing Model (ICAPM), which provided the theoretical framework for multifactor

*Please see the end of this document for important disclosures.*

investing.

- Thirty years since the development of the three-factor model of Fama and French, which paved the way for the implementation of multifactor systematic investing.
- Ten years since the publication of the profitability research of Robert Novy-Marx, which added the profitability premium to the ranks of size and value as an important long-term driver of expected stock returns.

In honor of these 50-, 30-, and 10-year anniversaries, I had the great fortune to interview the pioneers themselves on their findings. In this series of three articles, I asked Bob, Ken, Gene, and Robert about the impact and continuing relevance of their groundbreaking work. Here, in part two, Professors Gene Fama and Ken French talk with me about their three-factor model, which has become ubiquitous in financial theory and practice.

## 30 YEARS OF THE THREE-FACTOR MODEL

The significance of the three-factor model cannot be overstated. It is on almost all finance and economics syllabuses, and every credible asset manager in the world has a view on how its strategy fits within the framework of the three (now five) factors. There were, of course, value investors and people with an affinity for smaller companies before 1993. But the Fama/French model provided a framework for why certain stocks and fund managers tended to outperform others. And at a time when most investors faced the binary choice between stock picking and index tracking, the research implied a third option that systematically targets premiums.

Question

: Why has the three-factor model you developed become so popular both in academia and the industry?

Answer

: When we developed the three-factor model, it was the best model available for estimating expected stock returns, and it organized expected returns in an intuitive way. Small and value stocks tend to have higher expected returns than big and growth stocks. We know the model is not literally true, but it has held up well relative to competitors.

Q

: This year marks the 50th anniversary of the publication of Professor Merton's Intertemporal Capital Asset Pricing Model (ICAPM), which provided a theoretical framework for multifactor investing. Can we link the three-factor model to the ICAPM?

A

: When we developed the three-factor model, we were thinking within the framework of the ICAPM: Differences in expected return are linked to risk. Over the last 30 years, we and other researchers have not found a smoking gun that links specific differences in expected return to specific ICAPM risks. Both of us think multifactor risk in the sense of Merton's (1973) ICAPM is important.

**Q:** What led you to expand the three-factor model to a five-factor model in 2015?

A

: For many years, we have interpreted the ratio of book equity and market equity as a catchall for differences in expected returns (Ball, 1978). If book equity is a good proxy for expected cash flows to shareholders, high book value relative to market value implies a high long-run discount rate, or equivalently, a high long-run expected stock return. But book is a noisy measure of expected cash flows.

Valuation theory says expected stock returns are related to three variables—B/M [book to market], expected profitability, and expected investment. Controlling for B/M and expected profitability, higher expected investment implies lower expected cash flows to investors and lower expected returns. Controlling for B/M and expected investment, higher expected profitability implies higher expected cash flows to investors and higher expected returns. Controlling for expected profitability and expected investment, we are back to our simple prediction that a high B/M predicts a high long-run expected return.

We confirm these predictions in FF (2006), but the relations are weaker than we expected. The research challenge is to improve the proxies for expected profitability and expected investment. Novy-Marx (2013) identifies a proxy for expected profitability that is strongly related to average return. Aharoni, Grundy, and Zeng (2013) identify a weaker but still reliable relation between investment and average return. In the spirit of HML [high minus low] in our three-factor model, we use their measures to construct the profitability and investment factors in the five-factor model (FF, 2015). Adding these improves the three-factor model. Five-factor models for the United States and regions outside the US explain important patterns in average returns that three-factor models cannot (FF, 2016 and 2017).

Q

: Where do you see financial science and investing evolving?

A

: The excitement of research is not knowing the answer to this question. We will continue along the trail, wherever it may lead.

## MORE FROM THIS SERIES

CELEBRATING GROUNDBREAKING RESEARCH WITH GIANTS OF FINANCE: ROBERT C. MERTON

CELEBRATING GROUNDBREAKING RESEARCH WITH GIANTS OF FINANCE: ROBERT NOVY-MARX

Savina Rizova is an employee of Dimensional Investment LLC, a subsidiary of Dimensional Fund Advisors LP.

Eugene Fama and Ken French are members of the Board of Directors of the general partner of, and provide consulting services to, Dimensional Fund Advisors LP. Robert Merton provides consulting services to Dimensional Fund Advisors LP. Robert Novy-Marx provides consulting services to Dimensional Fund Advisors LP.

---

The information in this material is intended for the recipient's background information and use only. It is provided in good faith and without any warranty or representation as to accuracy or completeness. Information and opinions presented in this material have been obtained or derived from sources believed by Dimensional to be reliable, and Dimensional has reasonable grounds to believe that all factual information herein is true as at the date of this material. It does not constitute investment advice, a recommendation, or an offer of any services or products for sale and is not intended to provide a sufficient basis on which to make an investment decision. Before acting on any information in this document, you should consider whether it is appropriate for your particular circumstances and, if appropriate, seek professional advice. It is the responsibility of any persons wishing to make a purchase to inform themselves of and observe all applicable laws and regulations. Unauthorized reproduction or transmission of this material is strictly prohibited. Dimensional accepts no responsibility for loss arising from the use of the information contained herein.

This material is not directed at any person in any jurisdiction where the availability of this material is prohibited or would subject Dimensional or its products or services to any registration, licensing, or other such legal requirements within the jurisdiction.

"Dimensional" refers to the Dimensional separate but affiliated entities generally, rather than to one particular entity. These entities are Dimensional Fund Advisors LP, Dimensional Fund Advisors Ltd., Dimensional Ireland Limited, DFA Australia Limited, Dimensional Fund Advisors Canada ULC, Dimensional Fund Advisors Pte. Ltd., Dimensional Japan Ltd. and Dimensional Hong Kong Limited. Dimensional Hong Kong Limited is licensed by the Securities and Futures Commission to conduct Type 1 (dealing in securities) regulated activities only and does not provide asset management services.

**RISKS**
**Investments involve risks. The investment return and principal value of an investment may fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original value. Past performance is not a guarantee of future results. There is no guarantee strategies will be successful.**

**Diversification neither assures a profit nor guarantees against loss in a declining market.**

UNITED STATES

Dimensional Fund Advisors LP is an investment advisor registered with the Securities and Exchange Commission.

Investment products: • Not FDIC Insured • Not Bank Guaranteed • May Lose Value
Dimensional Fund Advisors does not have any bank affiliates.

CANADA

These materials have been prepared by Dimensional Fund Advisors Canada ULC. The other Dimensional entities referenced herein are not registered resident investment fund managers or portfolio managers in Canada.

This material is not intended for Quebec residents.

Commissions, trailing commissions, management fees, and expenses all may be associated with mutual fund investments. Please read the prospectus before investing. Unless otherwise noted, any indicated total rates of return reflect the historical annual compounded total returns, including changes in share or unit value and reinvestment of all dividends or other distributions, and do not take into account sales, redemption, distribution, or optional charges or income taxes payable by any security holder that would have reduced returns. Mutual funds are not guaranteed, their values change frequently, and past performance may not be repeated.

AUSTRALIA

This material is issued by DFA Australia Limited (AFS License No. 238093, ABN 46 065 937 671). This material is provided for information only. No account has been taken of the objectives, financial situation or needs of any particular person. Accordingly, to the extent this material constitutes general financial product advice, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to the investor's objectives, financial situation and needs. Investors should also consider the Product Disclosure Statement (PDS) and the target market determination (TMD) that has been made for each financial product either issued or distributed by DFA Australia Limited prior to acquiring or continuing to hold any investment. Go to dimensional.com/funds to access a copy of the PDS or the relevant TMD. Any opinions expressed in this material reflect our judgement at the date of publication and are subject to change.

NEW ZEALAND

This material is issued by DFA Australia Limited (incorporated in Australia, AFS License No. 238093, ABN 46 065 937 671). This material is provided for information only. This material does not give any recommendation or opinion to acquire any financial product or any financial advice product, and is not financial advice to you or any other person. No account has been taken of the objectives, financial situation or needs of any particular person. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to the investor's objectives, financial situation and needs. Investors should also consider the Product Disclosure Statement (PDS) and for the Dimensional Wholesale Trusts the target market determination (TMD) that has been made for each financial product or financial advice product either issued or distributed by DFA Australia Limited prior to acquiring or continuing to hold any investment. Go to dimensional.com/funds to access a copy of the PDS or the relevant TMD. Any opinions expressed in this material reflect our judgement at the date of publication and are subject to change.

WHERE ISSUED BY DIMENSIONAL IRELAND LIMITED

Issued by Dimensional Ireland Limited (Dimensional Ireland), with registered office 3 Dublin Landings, North Wall Quay, Dublin 1, Ireland. Dimensional Ireland is regulated by the Central Bank of Ireland (Registration No. C185067).

WHERE ISSUED BY DIMENSIONAL FUND ADVISORS LTD.

Issued by Dimensional Fund Advisors Ltd. (Dimensional UK), 20 Triton Street, Regent's Place, London, NW1 3BF. Dimensional UK is authorised and regulated by the Financial Conduct Authority (FCA) - Firm Reference No. 150100.

Dimensional UK and Dimensional Ireland do not give financial advice. You are responsible for deciding whether an investment is suitable for your personal circumstances, and we recommend that a financial adviser helps you with that decision.

Dimensional UK and Dimensional Ireland issue information and materials in English and may also issue information and materials in certain other languages. The recipient's continued acceptance of information and materials from Dimensional UK and Dimensional Ireland will constitute the recipient's consent to be provided with such information and materials, where relevant, in more than one language.

NOTICE TO INVESTORS IN SWITZERLAND: This is advertising material.

JAPAN

For Institutional Investors and Registered Financial Instruments Intermediary Service Providers.
This material is deemed to be issued by Dimensional Japan Ltd., which is regulated by the Financial Services Agency of Japan and is registered as a Financial Instruments Firm conducting Investment Management Business and Investment Advisory and Agency Business.

Dimensional Japan Ltd.
Director of Kanto Local Finance Bureau (FIBO) No. 2683
Membership: Japan Investment Advisers Association

SINGAPORE

This material is deemed to be issued by Dimensional Fund Advisors Pte. Ltd., which is regulated by the Monetary Authority of Singapore and holds a capital markets services license for fund management.

This advertisement has not been reviewed by the Monetary Authority of Singapore and should not be shown to prospective retail investors.
FOR PROFESSIONAL INVESTORS IN HONG KONG

This material is deemed to be issued by Dimensional Hong Kong Limited (CE No. BJE760) ("Dimensional Hong Kong"), which is licensed by the Securities and Futures Commission to conduct Type 1 (dealing in securities) regulated activities only and does not provide asset management services.

This material should only be provided to "professional investors" (as defined in the Securities and Futures Ordinance [Chapter 571 of the Laws of Hong Kong] and its subsidiary legislation) and is not for use with the public. This material is not intended to constitute and does not constitute marketing of the services of Dimensional Hong Kong or its affiliates to the public of Hong Kong. When provided to prospective investors, this material forms part of, and must be provided together with, applicable fund offering materials. This material must not be provided to prospective investors on a standalone basis. Before acting on any information in this material, you should consider whether it is suitable for your particular circumstances and, if appropriate, seek professional advice.

Neither Dimensional Hong Kong nor its affiliates shall be responsible or held responsible for any content prepared by financial advisors. Financial advisors in Hong Kong shall not actively market the services of Dimensional Hong Kong or its affiliates to the Hong Kong public.