

# GENE FAMA'S IMPACT

## A QUANTITATIVE ANALYSIS

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Gene Fama has been the most prominent empiricist in finance for 50 years. He is the founder of empirical research in modern finance. For somebody who believes in numbers as he does, it is fitting to evaluate his impact using quantitative measures. We do so in this paper. As we collected data, we learned more about how exceptional Gene's impact is.

A scholar impacts the world because his research increases our knowledge. The most straightforward measure of how research increases our knowledge is a count of how often it is cited. We focus on a broad measure of citations, namely citations from Google Scholar, as our main measure. Per Google Scholar, Gene has more than 140,000 citations. To put this number in perspective, we compare Gene's citations to those of the Fellows of the American Finance Association. The median number of Google Scholar citations for the Fellows of the American Finance Association is 32,902. Only four Fellows have more than 100,000 citations.

We then explore in more detail which papers are most highly cited. Gene has three papers that have both more than 2,000 citations in the Social Sciences Citation Index and more than 11,000 Google citations. Strikingly, only one of these papers is an empirical paper. It is the paper with Ken French titled "Common Risk Factors in the Returns on Stocks and Bonds," published by the *Journal of Financial Economics*. The other two papers are "Efficient Capital Markets: A Review of Theory and Empirical Work" and the paper with Michael Jensen titled "Separation of Ownership and Control."

Our examination of Gene's citations shows how broad his range of interest was through his career. Of his top three papers, two are in asset pricing and one is in corporate finance.

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“Efficient Capital Markets” is, in many ways, Gene’s most influential paper. The citations do not show it partly because the contribution of the paper is to define the concept of efficient capital markets in a way that has lasted for more than 40 years. When authors talk about efficient capital markets, they refer to Gene’s definition, but they rarely cite him. This is the ultimate mark of a paper’s influence—its contribution becomes so embedded in a field’s way of thinking and communicating that there is no need to cite the original paper when referring to its key concept.

Gene’s influence has spread through students. Gene has advised a large number of Ph.D. students. We attempted to create a complete list of students advised either as chair or as a member of the student’s committee and found 102 students. These students have gone on to conduct their own influential research. A simple way to see the success of Gene as an adviser is that 11 of his students have more than 10,000 Google citations. Six of his former students have been president of the American Finance Association and one received the Nobel Memorial Prize in Economic Sciences.

We conclude the paper with an attempt to explain why Gene has been so successful and for so long. Gene’s professional life spans four complete decades. In each one of these decades, he published at least 15 papers. For the last complete decade, he was in his 60s. The decade in which he produced papers with the highest average number of citations is the 1990s, when he was in his 50s. His three most cited works are each published in a different decade. This lifecycle pattern of production is unusual among Nobel Prize winners. We speculate that it is the product of a person with a fierce intellect who loves what he is doing and has an unparalleled work ethic.

#### SECTION 1. GENE FAMA’S IMPACT ON FINANCE.

A scholar can impact the world at large as well as his academic discipline. There are no easy quantitative measures of this impact. But we know Gene’s impact is enormous. “Efficient markets” is a household name throughout the world. The efficient markets view inspired countless laws, regulations, accounting practices, and policies, many of which you will read about in subsequent essays in this volume. It affects how investors make their investment decisions and evaluate their performance. It also has been (mistakenly, in our view, but a measure of influence nonetheless) blamed for a financial crisis.

The limitations of citation counts are well-known, but despite these limitations, citation counts provide the most straightforward and objective assessment of a scholar’s impact. There are two distinct approaches to counting

citations. The most traditional approach is to use the Social Sciences Citation Index (SSCI). The other approach is to use Google Scholar. Searching within Google Scholar is made easier with a program called “Publish or Perish” (Harzing 2007). Results with Google Scholar can be sensitive to how the search is conducted. To minimize the risk of errors, we conducted the search multiple times. Two research assistants conducted the search separately for each name. We then worked to reconcile their results when they were materially different. The number of citations in Google Scholar to SSCI is roughly 5 to 1.

With Google Scholar, Gene has 140,562 citations. Using SSCI instead, Gene has 30,154 citations. To put the number of citations in perspective, we collect the citations of all the Fellows of the American Finance Association (AFA). The list of the Fellows includes all past presidents of the AFA who were alive in 2000 when the Fellows list was created, as well as elected Fellows. Each year at least one Fellow has been elected. Gene is the first elected Fellow of the AFA. All winners of the Nobel Memorial Prize in Economics with work in finance who were alive in 2000 are Fellows. This list does not provide a perfect comparison group, as some highly cited financial economists are not Fellows. For instance, Tim Bollerslev is not a Fellow, but he would be among the top ten most highly cited Fellows as his citation count is 63,678. Table 1 shows the Google citations for all Fellows with more than 20,000 Google citations.

Thirteen fellows have less than 20,000 Google citations. Figure 1 plots the distribution of the number of citations for AFA Fellows.

Table 1 and Figure 1 show clearly how large Gene’s impact is compared to the typical Fellow. The mean Google citations for all 47 AFA Fellows (excluding Gene) is 39,790. The distribution is skewed as the median is 32,902. Gene’s cites are more than three times the mean and more than four times the median. The standard deviation of the number of Google citations for AFA Fellows is 32,240. Consequently, Gene’s number of Google citations is more than three standard deviations above the mean. The top five AFA Fellows in Google citations are, in order: Andrei Shleifer, Gene Fama, Michael Jensen, Kenneth Arrow, and Robert Engle. Not surprisingly, three of the five have received the Nobel Memorial Prize in Economics.

With the introduction of the World Wide Web, the number of downloads has become a new measure of interest in a scholar’s work. The Social Science Research Network (SSRN) publishes download statistics on the top authors. Gene’s papers have been downloaded an astounding 386,573 times on SSRN. Gene has been involved with the SSRN since its inception. He is Chair of the Board of Trustees of SSRN.

TABLE 1. Google Scholar citations to Fellows of the American Finance Association Showing all Fellows with 20,000 or more citations. There are 47 Fellows as of 2014.

	<i>Total Citations</i>		<i>Total Citations</i>
1 Andrei Shleifer	168,336	19 Myron S. Scholes*	38,455
2 Eugene F. Fama*	140,562	20 Jeremy Stein	37,932
3 Michael C. Jensen	123,957	21 Sheridan Titman	37,389
4 Kenneth Arrow*	112,621	22 Sanford J. Grossman	35,902
5 Robert F. Engle*	84,429	23 Harry Markowitz*	33,261
6 Robert E. Lucas, Jr.*	69,926	24 William F. Sharpe*	33,012
7 Richard Thaler	68,839	25 Richard Roll	32,792
8 Paul Samuelson*	68,410	26 Darrell Duffie	30,917
9 Kenneth R. French	64,030	27 Douglas W. Diamond	27,553
10 Robert C. Merton*	59,972	28 Franklin Allen	26,670
11 John Y. Campbell	55,381	29 Lars Peter Hansen*	26,082
12 Stephen A. Ross	54,710	30 John C. Cox	25,311
13 Stewart C. Myers	48,867	31 Eduardo S. Schwartz	24,759
14 Franco Modigliani*	46,571	32 Burton G. Malkiel	24,550
15 Raghuram Rajan	45,559	33 Michael J. Brennan	21,219
16 René Stulz	45,397	34 John H. Cochrane	20,451
17 Robert Shiller*	43,261		
18 Bengt Holmström	41,357		

\* Winners of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel.

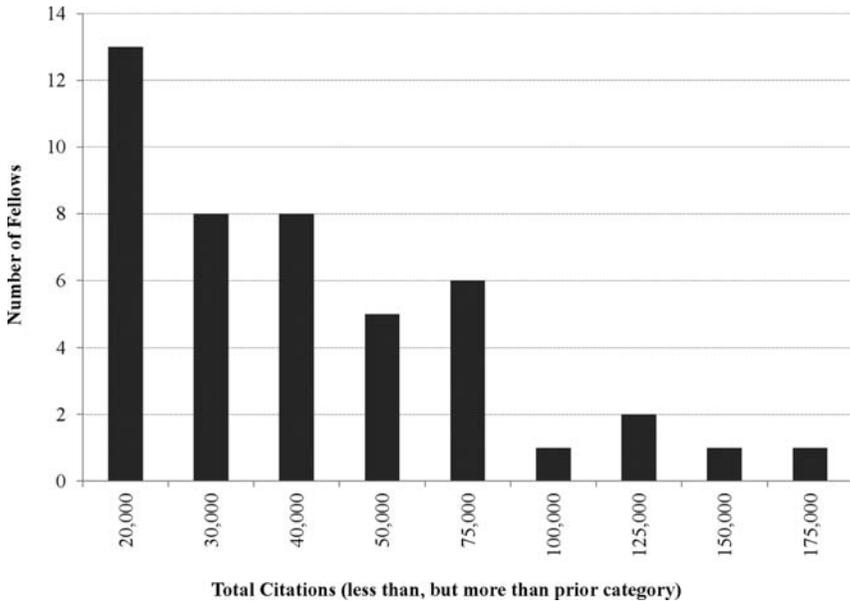


Figure 1. Distribution of citations to AFA Fellows

## SECTION 2. WHERE DOES THE IMPACT COME FROM?

We now turn to a more detailed examination of the citation impact of Gene's work. Google Scholar reports citations to 107 papers and 2 books. In Table 2, we separate the papers into six groups: asset pricing, efficient markets, corporate control, banking, dividend policy and capital structure, and interest rates, exchange rates, and futures prices. (Though dividing papers across these groups is straightforward in most cases, some of our decisions are admittedly subjective.)

Gene's impact is strongest in the first three groups. In each of these groups, Gene has at least two papers with more than 1,000 cites in SSCI and at least one paper with 10,000 Google sites. The other three groups have distinctly less impact—by Gene's standards, but not by the standards of almost all members of the finance profession—as no paper has more than 500 SSCI citations or more than 2,000 Google citations.

Figure 2 shows the distribution of the number of papers across areas. The asset pricing group has the most papers—a total of 37. The interest rate and foreign exchange area—a close cousin of asset pricing—is the second most active group. The corporate control and banking groups are the least active.

Yet Figure 3 shows that the corporate control group has the most citations per paper. This success is due to two enormously successful papers. The first one, with Michael Jensen, is "Separation of Ownership and Control." The second one is by Gene alone, "Agency Problems and the Theory of the Firm." The first paper has 2,321 SSCI citations and the second has 1,743.

The efficient markets group is the second most successful group in terms of average citations per paper. This group includes "Efficient Capital Markets," which has 2,432 SSCI and 11,658 Google Scholar citations. Gene's dissertation, "The Behavior of Stock-Market Prices," is the second most cited article in that group with 1,373 SSCI citations and 6,598 Google Scholar citations. Finally, the asset pricing group is the third most successful group in citations per paper. That group includes three papers that have more than 1,000 SSCI citations. These three papers include two papers with Ken French published in the 1990s, "Common Risk Factors in the Returns on Stocks and Bonds" and "The Cross-Section of Expected Stock Returns." The third paper is the one with Jim MacBeth from the 1970s titled "Risk, Return, and Equilibrium: Empirical Tests."

Gene has both empirical papers and theoretical papers. His first theoretical paper was published in 1965, which is the first year that he appeared in scholarly journals. Some of the theory papers have a mathematical model. Others

TABLE 2. Google Scholar and Social Sciences Citation Index citations to papers and books by Eugene Fama

Asset Pricing	Google Scholar	SSCI	Authors	Title	Year	Publication
1	11,697	2,430	EF Fama, KR French	Common risk factors in the returns on stocks and bonds	1993	<i>Journal of Financial Economics</i>
2	10,515	1,801	EF Fama, KR French	The cross-section of expected stock returns	1992	<i>Journal of Finance</i>
3	7,584	1,620	EF Fama, JD MacBeth	Risk, return, and equilibrium: Empirical tests	1973	<i>Journal of Political Economy</i>
4	3,287	727	EF Fama, KR French	Industry costs of equity	1997	<i>Journal of Financial Economics</i>
5	2,571	627	EF Fama, KR French	Business conditions and expected returns on stocks and bonds	1989	<i>Journal of Financial Economics</i>
6	2,498	587	EF Fama, KR French	Permanent and temporary components of stock prices	1988	<i>Journal of Political Economy</i>
7	2,448	446	EF Fama, KR French	Size and book-to-market factors in earnings and returns	1995	<i>Journal of Finance</i>
8	2,375	553	EF Fama, KR French	Dividend yields and expected stock returns	1988	<i>Journal of Financial Economics</i>
9	1,940	435	EF Fama	Stock returns, real activity, inflation, and money	1981	<i>American Economic Review</i>
10	1,894	509	EF Fama, GW Schwert	Asset returns and inflation	1977	<i>Journal of Financial Economics</i>
11	1,558	252	EF Fama, KR French	Value versus growth: The international evidence	1998	<i>Journal of Finance</i>
12	1,064	215	EF Fama	Stock returns, expected returns, and real activity	1990	<i>Journal of Finance</i>
13	984	178	EF Fama, KR French	The equity premium	2002	<i>Journal of Finance</i>
14	784	152	JL Davis, EF Fama, KR French	Characteristics, covariances, and average returns: 1929 to 1997	2000	<i>Journal of Finance</i>
15	750	94	EF Fama, KR French	The capital asset pricing model: Theory and evidence	2004	<i>Journal of Economic Perspectives</i>
16	549	176	EF Fama	Multi-period consumption-investment decisions	1968	<i>American Economic Review</i>
17	512	66	EF Fama	Components of investment performance	1972	<i>Journal of Finance</i>
18	424	35	EF Fama, KR French	The CAPM is wanted, dead or alive	1996	<i>Journal of Finance</i>
19	404	129	EF Fama	Risk, return and equilibrium: Some clarifying comments	1968	<i>Journal of Finance</i>
20	389	133	EF Fama	Portfolio analysis in a stable Paretian market	1965	<i>Management Science</i>
21	321	49	EF Fama, KR French	The value premium and the CAPM	2006	<i>Journal of Finance</i>
22	267	44	EF Fama, KR French	Luck versus skill in the cross-section of mutual fund returns	2010	<i>Journal of Finance</i>
23	239	45	EF Fama	Multifactor portfolio efficiency and multifactor asset pricing	1996	<i>Journal of Financial and Quantitative Analysis</i>
24	210	56	EF Fama	Risk, return, and equilibrium	1971	<i>Journal of Political Economy</i>
25	189	49	EF Fama, GW Schwert	Human capital and capital market equilibrium	1977	<i>Journal of Financial Economics</i>
26	146	35	EF Fama, KR French	Disagreement, tastes, and asset prices	2007	<i>Journal of Financial Economics</i>

(Continued)

TABLE 2. (Continued)

	Google Scholar	SSCI	Authors	Title	Year	Publication
27	109	45	EF Fama, JD MacBeth	Tests of the multiperiod two-parameter model	1974	<i>Journal of Financial Economics</i>
28	90	6	EF Fama, KR French	Size, value, and momentum in international stock returns	2012	<i>Journal of Financial Economics</i>
29	71	14	EF Fama	A note on the market model and the two-parameter model	1973	<i>Journal of Finance</i>
30	56	9	DG Booth, EF Fama	Diversification returns and asset contributions	1992	<i>Financial Analysts Journal</i>
31	53	10	EF Fama, KR French, DG Booth, R Sinquefeld	Differences in the risks and returns of NYSE and NASD stocks	1993	<i>Financial Analysts Journal</i>
32	51	11	EF Fama	Determining the number of priced state variables in the ICAPM	1998	<i>Journal of Financial and Quantitative Analysis</i>
33	49	14	EF Fama, KR French	Average returns, B/M, and share issues	2008	<i>Journal of Finance</i>
34	39	13	EF Fama, JD MacBeth	Long-term growth in a short-term market	1974	<i>Journal of Finance</i>
35	32		EF Fama, KR French	The economic fundamentals of size and book-to-market equity	1992	Unpublished working paper, University of Chicago
36	31		EF Fama, KR French	The CAPM: Theory and evidence	2003	Center for Research in Security Prices (CRSP)
37	26	11	EF Fama	Ordinal and measurable utility	1972	<i>Studies in the Theory of Capital Markets</i>
	56,206	11,576	Subtotal			
<i>Efficient Markets</i>						
1	11,658	2,432	EF Fama	Efficient capital markets: A review of theory and empirical work	1970	<i>Journal of Finance</i>
2	6,598	1,373	EF Fama	The behavior of stock-market prices	1965	<i>Journal of Business</i>
3	4,251	794	EF Fama, KR French	Multifactor explanations of asset pricing anomalies	1996	<i>Journal of Finance</i>
4	4,206	834	EF Fama	Efficient capital markets: II	1991	<i>Journal of Finance</i>
5	3,563	627	EF Fama	Market efficiency, long-term returns, and behavioral finance	1998	<i>Journal of Financial Economics</i>
6	3,265	815	EF Fama, L Fisher, M Jensen, R Roll	The adjustment of stock prices to new information	1969	<i>International Economic Review</i>
7	741	100	EF Fama	Random walks in stock market prices	1965	<i>Financial Analysts Journal</i>

8	732	174	EF Fama, ME Blume	Filter rules and stock-market trading	1966	<i>Journal of Business</i>	
9	669	150	EF Fama	Mandelbrot and the stable Paretian hypothesis	1963	<i>Journal of Business</i>	
10	495	89	EF Fama, KR French	Dissecting anomalies	2008	<i>Journal of Finance</i>	
11	468	142	EF Fama, R Roll	Parameter estimates for symmetric stable distributions	1971	<i>Journal of the American Statistical Association</i>	
12	438	159	EF Fama, R Roll	Some properties of symmetric stable distributions	1968	<i>Journal of the American Statistical Association</i>	
13	166	46	EF Fama, AB Laffer	Information and capital markets	1971	<i>Journal of Business</i>	
14	110	14	EF Fama	Efficient capital markets: Reply	1976	<i>Journal of Finance</i>	
15	62	45	EF Fama	Tomorrow on the New York Stock Exchange	1965	<i>Journal of Business</i>	
16	58	10	EF Fama, KR French	The anatomy of value and growth stock returns	2007	<i>Financial Analysts Journal</i>	
17	57	23	EF Fama	Perfect competition and optimal production decisions under uncertainty	1972	<i>Bell Journal of Economics and Management Science</i>	
18	45	45	EF Fama	Perspectives on October 1987, or, What did we learn from the crash?	1988		
19	45	44	EF Fama, KR French	Luck versus skill in the cross section of mutual fund alpha estimates	2009	<i>Journal of Finance</i>	
	37,627	7,871	Subtotal				
<i>Corporate Control</i>							
1	11,421	2,321	EF Fama, MC Jensen	Separation of ownership and control	1983	<i>Journal of Law and Economics</i>	
2	8,716	1,743	EF Fama	Agency problems and the theory of the firm	1980	<i>Journal of Political Economy</i>	
3	3,520	712	EF Fama, MC Jensen	Agency problems and residual claims	1983	<i>Journal of Law and Economics</i>	
4	506	98	EF Fama, MC Jensen	Organizational forms and investment decisions	1985	<i>Journal of Financial Economics</i>	
5	152	12	EF Fama	Contract costs and financing decisions	1990	<i>Journal of Business</i>	
6	91	26	EF Fama	Time, salary, and incentive payoffs in labor contracts	1991	<i>Journal of Labor Economics</i>	
7	88	30	EF Fama, AB Laffer	The number of firms and competition	1972	<i>American Economic Review</i>	
	24,494	4,942	Subtotal				

(Continued)

TABLE 2. (Continued)

	Google Scholar	SSCI	Authors	Title	Year	Publication
<i>Banking</i>						
1	1,813	378	EF Fama	What's different about banks?	1985	<i>Journal of Monetary Economics</i>
2	889	192	EF Fama	Banking in the theory of finance	1980	<i>Journal of Monetary Economics</i>
	2,702	570	Subtotal			
<i>Dividend Policy and Capital Structure</i>						
1	1,730	279	EF Fama, KR French	Testing trade-off and pecking order predictions about dividends and debt	2002	<i>Review of Financial Studies</i>
2	1,704	295	EF Fama, KR French	Disappearing dividends: Changing firm characteristics or lower propensity to pay?	2001	<i>Journal of Financial Economics</i>
3	744	169	EF Fama, H Babiak	Dividend policy: An empirical analysis	1968	<i>Journal of the American Statistical Association</i>
4	551	87	EF Fama, KR French	Taxes, financing decisions, and firm value	1998	<i>Journal of Finance</i>
5	540	119	EF Fama, KR French	Forecasting profitability and earnings	2000	<i>Journal of Business</i>
6	501	87	EF Fama, KR French	Financing decisions: who issues stock?	2005	<i>Journal of Financial Economics</i>
7	391	82	EF Fama, KR French	New lists: Fundamentals and survival rates	2004	<i>Journal of Financial Economics</i>
8	352	84	EF Fama	Risk-adjusted discount rates and capital budgeting under uncertainty	1977	<i>Journal of Financial Economics</i>
9	307	63	EF Fama	The effects of a firm's investment and financing decisions on the welfare of its security holders	1978	<i>American Economic Review</i>
10	250	47	EF Fama, KR French	Profitability, investment and average returns	2006	<i>Journal of Financial Economics</i>
11	206	38	EF Fama	The empirical relationships between the dividend and investment decisions of firms	1974	<i>American Economic Review</i>
12	193	21	EF Fama, KR French	The corporate cost of capital and the return on corporate investment	1999	<i>Journal of Finance</i>
13	138	59	GD Eppen, EF Fama	Cash balance and simple dynamic portfolio problems with proportional costs	1969	<i>International Economic Review</i>
14	110	22	EF Fama	Discounting under uncertainty	1996	<i>Journal of Business</i>

15	73	30	GD Eppen, EF Fama	Solutions for cash-balance and simple dynamic-portfolio problems	1968	<i>Journal of Business</i>
16	63	26	GD Eppen, EF Fama	Three asset cash balance and dynamic portfolio problems	1971	<i>Management Science</i>
17	25		EF Fama, KR French	Dividends, debt, investment, and earnings	1997	
	7,878	1,508	Subtotal			
			<i>Interest Rates, Exchange Rates, and Futures Prices</i>			
1	1,458	385	EF Fama	Forward and spot exchange rates	1984	<i>Journal of Monetary Economics</i>
2	1,074	411	EF Fama	Short-term interest rates as predictors of inflation	1975	<i>American Economic Review</i>
3	1,033	252	EF Fama, RR Bliss	The information in long-maturity forward rates	1987	<i>American Economic Review</i>
4	669	208	EF Fama	The information in the term structure	1984	<i>Journal of Financial Economics</i>
5	626	203	EF Fama, KR French	Commodity futures prices: Some evidence on forecast power, premiums, and the theory of storage	1987	<i>Journal of Business</i>
6	483	147	EF Fama, MR Gibbons	Inflation, real returns and capital investment	1982	<i>Journal of Monetary Economics</i>
7	417	97	EF Fama	Term-structure forecasts of interest rates, inflation and real returns	1990	<i>Journal of Monetary Economics</i>
8	315	105	EF Fama, MR Gibbons	A comparison of inflation forecasts	1984	<i>Journal of Monetary Economics</i>
9	281	77	EF Fama, KR French	Business cycles and the behavior of metals prices	1988	<i>Journal of Finance</i>
10	221	93	EF Fama	Inflation uncertainty and expected returns on Treasury bills	1976	<i>Journal of Political Economy</i>
11	221	82	EF Fama	Forward rates as predictors of future spot rates	1976	<i>Journal of Financial Economics</i>
12	211	75	EF Fama, A Farber	Money, bonds, and foreign exchange	1979	<i>American Economic Review</i>
13	202	76	EF Fama	Term premiums in bond returns	1984	<i>Journal of Financial Economics</i>
14	159	39	EF Fama	Term premiums and default premiums in money markets	1986	<i>Journal of Financial Economics</i>
15	132	44	EF Fama	Financial intermediation and price level control	1983	<i>Journal of Monetary Economics</i>
16	122	42	EF Fama	Interest rates and inflation: The message in the entrails	1977	<i>American Economic Review</i>
17	119	35	EF Fama	Inflation, output, and money	1982	<i>Journal of Business</i>
18	60	22	EF Fama, GW Schwert	Inflation, interest, and relative prices	1979	<i>Journal of Business</i>
19	57	12	EF Fama	The behavior of interest rates	2006	<i>Review of Financial Studies</i>
20	47		EF Fama	A pricing model for the municipal bond market	1977	Manuscript, University of Chicago

(Continued)

TABLE 2. (Continued)

	Google Scholar	SSCI	Authors	Title	Year	Publication
21	38	11	EF Fama	Transitory variation in investment and output	1992	<i>Journal of Monetary Economics</i>
22	3		EF Fama	Annual inflation and money growth	1979	
23	2		EF Fama	Money and inflation	1979	
24	2		EF Fama	A price model for the municipal bond market	1977	Unpublished manuscript, University of Chicago
25	1		EF Fama	Short-term inflation and money growth	1979	
	7,953	2,416	Subtotal			
<i>Books</i>						
1	2,237	772	EF Fama	Foundations of finance: Portfolio decisions and securities prices	1976	
2	1,465	499	EF Fama, MH Miller	The theory of finance	1972	
	3,702	1,271	Subtotal			

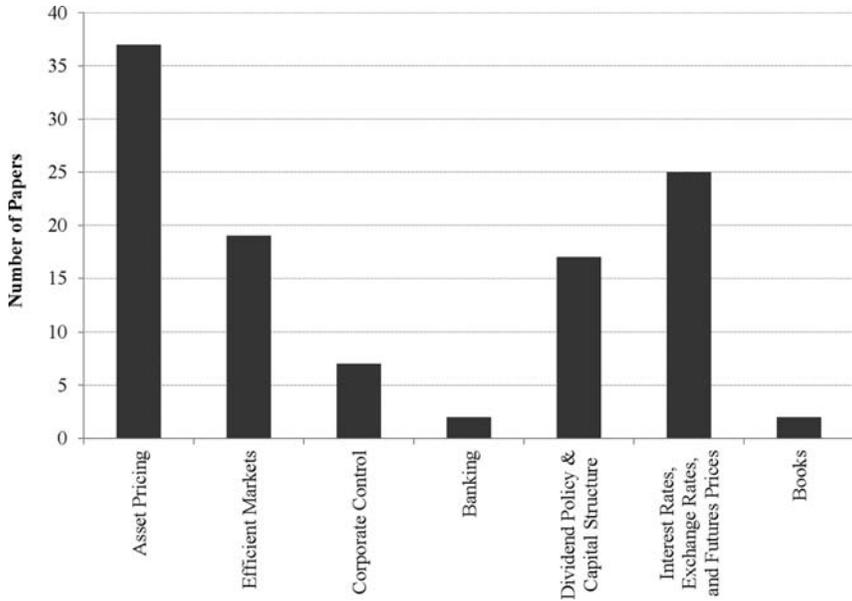


Figure 2. Distribution of Fama papers across research areas

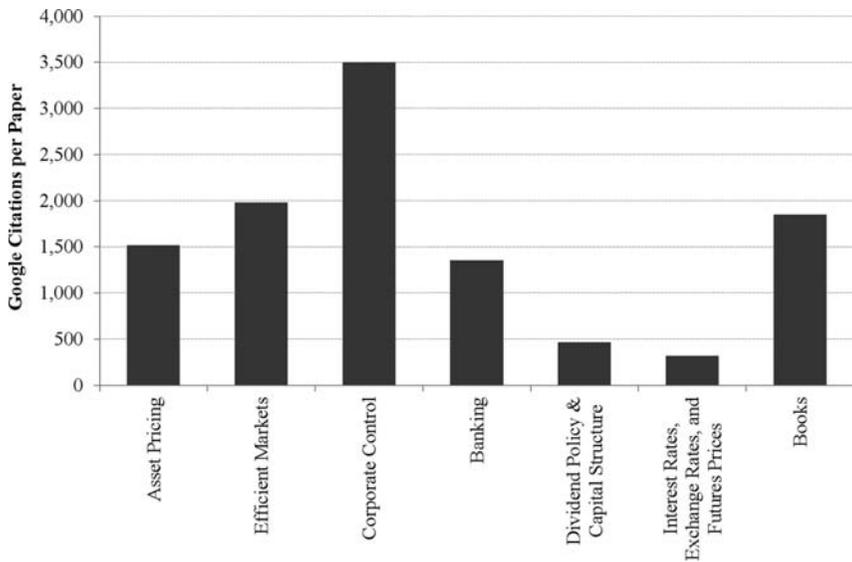


Figure 3. Average citations to Fama papers across research areas

are more conceptual. Two of the three most impactful papers are theoretical conceptual papers: “Efficient Capital Markets” and “Separation of Ownership and Control.”

Gene has theoretical papers in each of the groups we identify. However, the impact of these papers differs according to the group. The top five papers in the corporate control group are all theoretical papers. They have a total of 24,315 Google citations. Fifteen out of 44 AFA Fellows have fewer Google citations for their whole career output. Both of Gene’s banking papers are theoretical. In the efficient markets group, three of the top five papers are conceptual theoretical papers, with a total of 19,427 Google citations. In the asset pricing and interest rates and exchange rates group, no theoretical paper is among the top 10 papers. In the dividend policy and capital structure group, two theoretical papers are among the top 10 cited papers. However, neither paper has a large number of citations by Gene’s standards. Specifically, “Risk-Adjusted Discount Rates and Capital Budgeting under Uncertainty” has 352 Google citations while “The Effects of a Firm’s Investment and Financing Decisions on the Welfare of Its Security Holders” has 307 Google citations.

We collect data on where Gene published his papers. Figure 4 shows that he published 23 papers in the *Journal of Finance*, followed closely by the *Journal of Financial Economics* with 20 papers.

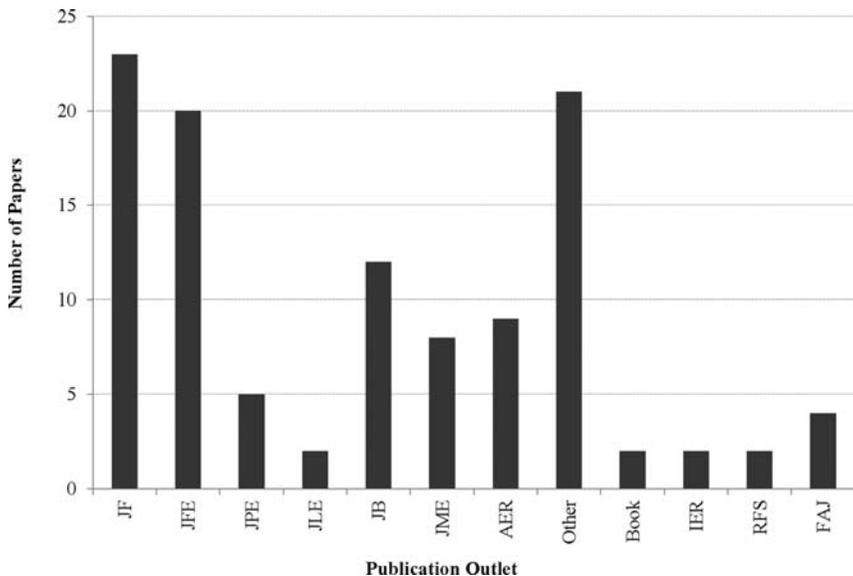


Figure 4. Distribution of Fama papers across journals

GENE FAMA'S IMPACT

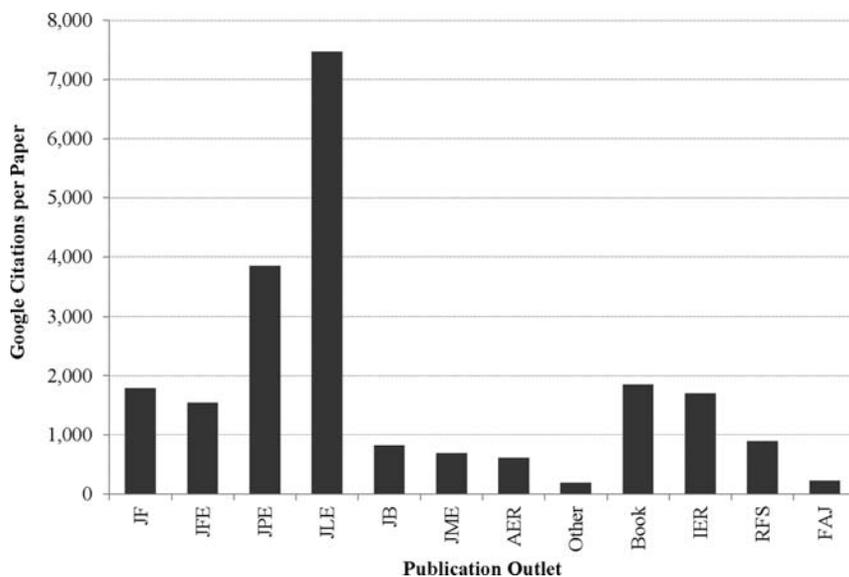


Figure 5. Average citations per Fama paper across journals

In contrast, he published only two papers in the *Review of Financial Studies*. He also published in the main economics journals with nine papers in the *American Economic Review* and five in the *Journal of Political Economy*. Figure 5 shows the average number of citations per paper across the journals in which Gene published.

His highest average number of citations per paper is in the *Journal of Law and Economics*. Only three of Gene’s papers are published in that journal and they are all coauthored with Michael Jensen. These papers have a total of 23,657 citations.

Finally, it is amazing to see that Gene’s work spans parts of six decades. Figure 6 shows the number of papers he published in each decade from the 1960s through the current decade.

Since the first and last decades only include about five years when Gene was publishing, it is not surprising that the number of papers is smaller, but the sustained quantity of output reflected in this graph is truly unique in our experience.

Figure 7 shows the average citations per paper across decades. The 1980s and 1990s, which include much of the Fama-French asset pricing research and the Fama-Jensen corporate control work, have the highest average levels of

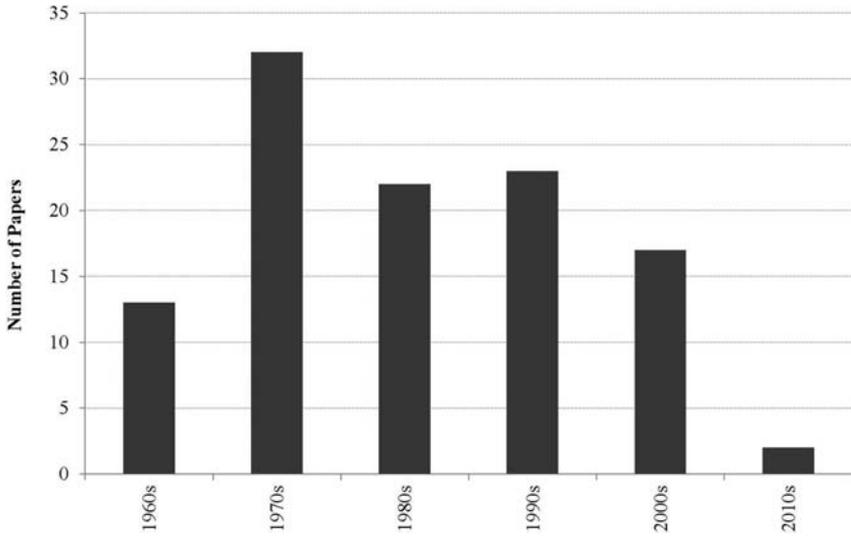


Figure 6. Distribution of Fama papers across decades

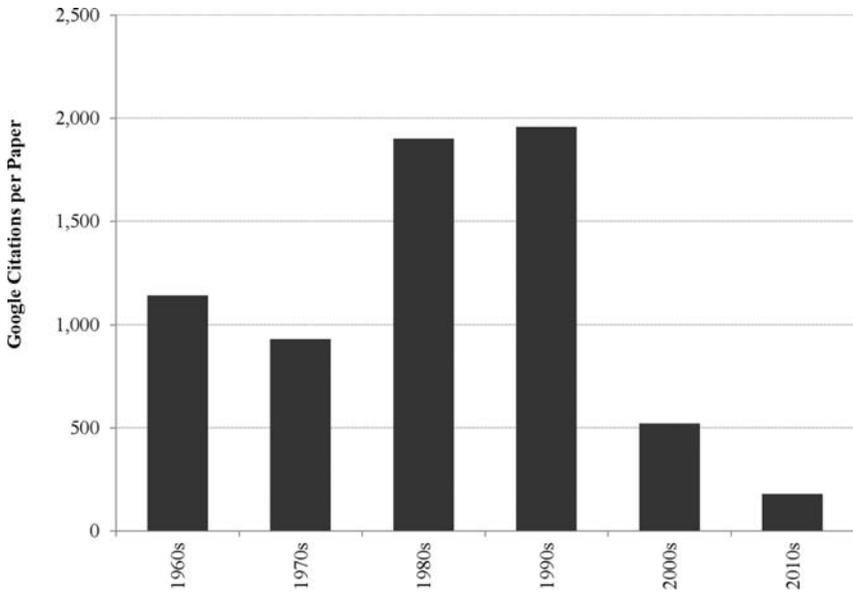


Figure 7. Average citations per Fama paper across decades

citations per paper. Nevertheless, papers from all of these decades have extremely high levels of average citations.

### SECTION 3. GENE'S IMPACT THROUGH HIS STUDENTS.

Scholars have an impact on the field through the students they train who go on to themselves have an impact on the field. In that dimension, Gene's achievement is impressive, perhaps uniquely so. He advised 102 Ph.D. students either as chair or as a member of the committee. Collectively, these students have 585,645 Google citations. Of these 102 students, he was the chair for 48 students. These students have 438,353 Google citations. The average number of citations per Ph.D. student whose dissertation committee was chaired by Gene is 9,132.

Among the students for whom Gene was the adviser, Michael Jensen has the largest number of Google citations with 123,957. Without him, the average number of citations per Ph.D. student advised by Gene drops to 6,689. The students with more than 20,000 Google citations include Campbell Harvey, Richard Roll, Myron Scholes, and one of the authors of this article, G. William Schwert. The list includes two former editors of the *Journal of Finance*, the founding editor and the current editor of the *Journal of Financial Economics*, editors of the *Journal of Accounting and Economics* and the *Journal of Accounting Research*, and five former presidents of the American Finance Association.<sup>1</sup>

In keeping with the relevance of Gene's work for the world of investments, it is not surprising that several of his former students are investment managers. Clifford Asness and John Liew cofounded AQR Capital Management in 1998. As of March 2016, AQR has over \$142 billion in assets under management. Dimensional Fund Advisors (DFA), which was started in 1981 by two of Gene's students, David Booth and Rex Sinquefeld, has designed its menu of products and services around the Fama-French asset pricing research. As of March 2016, DFA had over \$388 billion assets under management. Gene has been an active part of DFA's success as a director and consultant. The success of DFA has been very beneficial for the University of Chicago, as reflected in the naming of the Booth School of Business in 2008. Many of Gene's other PhD students now work at the top echelons of the investment world.

1. We include Campbell Harvey in the list of AFA presidents as he will hold the title in two years

SECTION 4. SOME COMMENTS ON GENE'S UNIQUENESS.

The numbers do not tell the whole story of Gene's remarkable impact on finance and economics.

In addition to Gene's impact through his own work and through his students, for over 50 years Gene has had a significant influence on his professional colleagues. This influence is most obvious through his interactions with the faculty at the University of Chicago. Scholars also benefit from comments from Gene on their papers even when they are not at the university. Both of us were visitors at Chicago and we know countless other visitors whose approach to finance was influenced by Gene and whose work, like ours, has benefitted and still benefits from interacting with him. His uniquely economical e-mails commenting on papers are always valuable. Many colleagues have benefited from his one-word, red-ink, hand-written comments on a paper draft.

One of Gene's biggest contributions has been his presence in the finance seminar at the University of Chicago. The ultimate test for a paper by an empiricist has long been whether Gene would find it credible and interesting. In that seminar, Gene has always had the ability to keep people honest with their work and with what the data were saying. There is always a possibility that Gene could ask for the code, as he is known to have done. As a result, he made the work presented at the seminar better, whether it was presented by faculty members or by individuals coming from the outside.

Gene has never hesitated to say what he thinks about papers he reads or papers that he listens to. As we know from experience, the fact that a paper is a lead article in a leading journal does not prevent Gene from concluding that the empirical results of the paper are not credible. To Gene, science can only progress with absolute honesty.

As journal editors, both of us have interacted with Gene as an author and as a referee for more than 35 years. He has been a role model. When one of us (René Stulz) created the "Tips for Authors" list on the *Journal of Finance* website (which migrated to the *Journal of Financial Economics* website when René finished his terms as *JF* editor), many of the examples of how authors should write papers and react to referees' reports are based directly on Gene's behavior.

We have both been privileged to observe Gene as a referee of others' papers. Gene is the longest continuously active editor at the *JFE*, having been a coeditor when it was first published in 1974. Many people who achieve much more modest success in our profession often find it too taxing to continue to serve

as a referee or editor, reading, thinking about, and offering constructive criticism to authors who are hoping to get their papers published in an academic journal. Gene, in contrast, has always found time to contribute his time and thoughts to his professional colleagues, usually without any direct recognition for his efforts since referee reports are anonymous to the author. As shown in Figure 8, since 1994 Gene averages more than four referee reports per year for the *JFE*, which is higher than the average workload for the rest of the editorial board.

Figure 9 shows that his average turnaround time is a little more than 10 days, compared to about 32 days for the rest of the editorial board and over 40 days for ad hoc referees. His behavior as a referee for the *Journal of Finance* from 1988 to 2000 (Rene Stulz's tenure as editor) was similar.

It is rare for a scholar to maintain such an intense involvement with research at the forefront of the field for 50 years as Gene has done. Empirical research on the lifecycle of the impact of Nobel prizewinners in economics shows that authors of theoretical/conceptual contributions peak early in life (see Weinberg and Galenson 2005). More empirically oriented researchers appear to make their contributions later in life. Gene made highly impactful contributions in his 20s, but the Nobel Prize committee cites work from his 50s as well. He published seven asset pricing papers with more than 1,000 Google

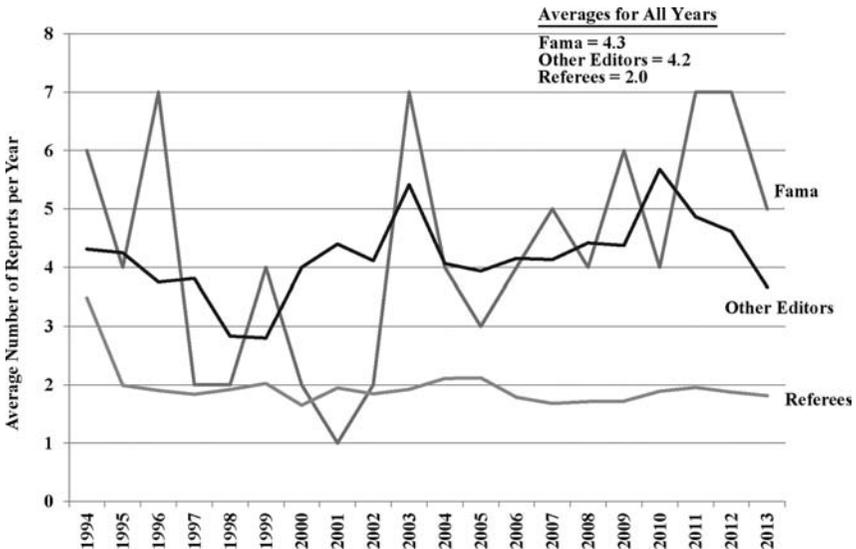


Figure 8. Average number of JFE referee reports, 1994–2013

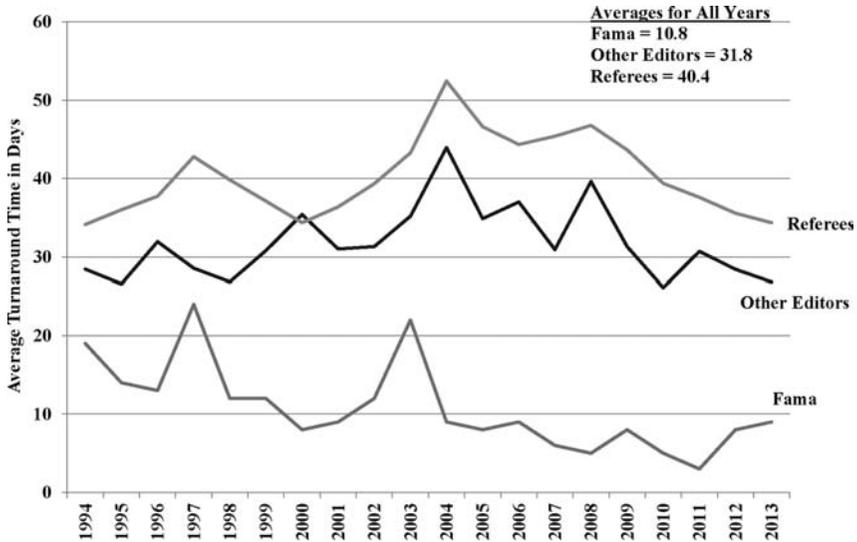


Figure 9. Average turnaround time for JFE referee reports, 1994–2013

citations in his 50s. In his 60s, he had two corporate finance papers with more than 1,000 cites. His three most highly cited papers were published in 1970, 1983, and 1993.

What is it that makes these papers special? None of the papers is a technical tour de force. None uses the most advanced econometric or theoretical techniques. Instead, each one of these papers opens up a new way for financial economists to think about their field. The 1970 paper does so by making sense of what market efficiency means and why it has to be taken seriously. The 1983 paper sets up a framework to understand corporate governance. The 1993 paper proposes an empirical asset pricing model that has been the benchmark model for finance research ever since. Though often using apparently simple econometric techniques, however, Gene is immensely influential as an empirical methodologist. Fama-MacBeth regressions, portfolio sorts, event studies, and assessing luck versus skill are just some of Gene's defining empirical methods that lasted decades.

Why have these papers been so successful? Why has Gene been so successful? Gene always works on his papers relentlessly. He has always understood that it is not enough to have insights or results. They have to be communicated so that they will impact the profession. Gene keeps rewriting his drafts. He has strong opinions on how papers should be written. As editors, both of us have

imposed some of these opinions on countless authors. Gene also works intelligently and efficiently. Gene's discipline is unparalleled. He avoids distractions that make most of us less productive, but doing so allows him to be in his office with a regularity that would be close to impossible to replicate for most of his colleagues in finance. This discipline has not stood in the way of him being a kind and considerate person. One of us, René Stulz, remembers that one of the first phone calls he received after back surgery was from Gene. It is often said that for a paper to be highly cited, it is important to travel far and wide to present the paper and to work hard at selling it through personal interactions. This view may be correct, but if it is, Gene is a huge exception. Finally, and most importantly, Gene has always loved and respected research—and data. When the facts change, so does Gene's mind.

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