The top 400 asset managers

Asset managers in our listing are ranked by global assets under management and by the country of the main headquarters and/or main European domicile. Assets managed by these groups total €56.3trn.

	Company	Country	Total 2016 31/12/15 (€m)	Total 2015 31/12/14 (€m)
1	BlackRock	US/UK	4,398,439	3,844,383
2	Vanguard Asset Management	US/UK	3,091,979	2,577,380
3	State Street Global Advisors	US/UK	2,066,479	2,023,149
4	Fidelity Investments	US	1,830,330	1,595,380
5	BNY Mellon Investment Management	US/UK	1,492,895	1,407,163
6	J.P. Morgan Asset Management	US/UK	1,361,178	1,266,805
7	PIMCO	US/Germany	1,321,158	1,162,583
8	Capital Group	US	1,272,080	1,167,231
9	Prudential Financial	US	1,089,737	968,628
10	Legal & General Investment Mngt.†	UK	1,012,389	893,900
11	Goldman Sachs Asset Management Int.	US/UK	996,651	846,182
12	Amundi	France	985,028	865,985
13	Wellington Management	US	853,274	755,108
14	Northern Trust Asset Management	US/UK	805,763	771,951
15	Natixis Global Asset Management	France/US	801,128	735,530
16	TIAA Global Asset Management	US	786,479	703,529
17	Deutsche Asset Management	Germany	777,091	721,747
18	Invesco	US/UK	714,070	654,645
19	Franklin Templeton Investments	US/UK	703,220	727,394
20	T. Rowe Price	UK	702,479	617,163
21	AXA Investment Managers	France	669,436	623,008
22	Legg Mason	US	618,397	586,004
23	Sumitomo Mitsui Trust Bank	Japan	614,762	512,279
24	UBS Asset Management	Switzerland/UK	597,234	552,089
25	Affiliated Managers Group	US	578,310	512,635
26	Mitsubishi UFJ Trust and Banking Corp.	Japan	551,179 (1)	-
27	Insight Investment*	UK	550,044	464,976
28	BNP Paribas Investment Partners	France	530,187	513,986
29	New York Life Investments	US	469,930	434,797
30	Allianz Global Investors	Germany	441,860	412,484
31	Columbia Threadneedle Investments	US/UK	434,918	417,841
32	AllianceBernstein (AB)	US/UK	430,305	391,742
33	Schroder Investment Management	UK	425,401	386,597
34	APG	Netherlands	406,413	399,000
35	Generali Investments Europe	Italy	395,872	372,289
36	Aberdeen Asset Management	UK	394,213	416,602
37	Aviva Investors	UK	393,352	304,910
38	HSBC Global Asset Management	UK	390,423	375,060
39	MFS Investment Management	US/UK	380,179	355,859
40	Morgan Stanley Investment Mngt.	US/UK	374,180	333,151
41	Dimensional Fund Advisors	US/UK	357,434	314,562
42	Principal Global Investors	US/UK	349,821	275,359
43	Aegon Asset Management	Netherlands	345,422	300,915
44	Standard Life Investments	UK	343,555	343,042
45	M&G Investments	UK	335,824 (1)	330,188
46	Federated Investors	US/Germany	332,546	298,391
47	Mellon Capital*	US	323,860	315,529
48	Wells Capital Management	US	321,485	289,891
49	Natixis Asset Management*	France	320,600	304,900
50	Macquarie Asset Management	Australia	314,856	306,040
51	Nomura Asset Management	Japan/UK	309,326	256,415
52	Credit Suisse	Switzerland	297,192	322,968
53	Eaton Vance Management (Int.)	US/UK	283,393	244,639
54	Manulife Asset Management	Canada	277,352	228,652
55	Robeco Group	Netherlands	268,062	245,996
56	Eurizon Capital	Italy	267,057	227,640
57	Union Investment	Germany	260,802	232,100
58	RBC Global Asset Management	Canada	257,297	258,024
59	MEAG	Germany	254,813	247,079
60	Fidelity International*	US/UK	251,386	224,401
61	SEI	US/UK	239,800	208,000
62	Dodge & Cox	US	238,761	222,779
63	Pioneer Investments	Italy	223,614	201,030
64	Neuberger Berman	US/UK	221,263	206,637
65	DekaBank	Germany	217,555	202,238
66	BNY Mellon Cash Inv. Strategies*	US	205,990	197,718
67	Babson Capital Management	US	205,068	175,900
68	BMO Global Asset Management	Canada	204,388	214,200
69	Loomis Sayles & Company*	US	204,200	185,800
70	Voya Investment Management	US	191,901	-
71	Nordea Asset Management	Denmark	188,978	173,873
72	NN Investment Partners	Netherlands	186,874	186,454
73	SEB	Sweden	185,365	172,887
74	Guggenheim Partners Investment Mngt.	US	181,892	161,116
75	PGGM	Netherlands	180,669 (1)	181,924
76	Nuveen investments	US/UK	171,714	174,358
77	Swiss Life Asset Managers	Switzerland	170,566	152,164
78	Baillie Gifford & Co.	UK	166,924	147,602
79	TCW	US	166,390	134,382
80	Caisse de dépôt et placement du Québec	Canada	164,366	161,145
81	Janus Capital Group	US/UK	161,411 (1)	150,584
82	Santander Asset Management	Spain	158,760	161,329
83	Lazard Asset Management	US	154,464	147,340
84	Russell Investments	US/UK	151,964	151,690
85	La Banque Postale Asset Management	France	150,090 (1)	149,392
86	Standish Mellon Asset Management*	US	143,755	137,208
87	Nikko Asset Management Europe	Japan/UK	141,504	127,192
88	Pictet Asset Management	Switzerland/UK	139,094	133,928
89	Putnam investments	US/UK	135,776	129,630
90	Bridgewater Associates	US	134,000	147,000
91	Bank J. Safra Sarasin	Switzerland	133,014	122,536
92	DIAM International	Japan/UK	131,784	116,483
93	AQR Capital Management*	US	131,004	100,780
94	First State Investments	Australia/UK	130,767	129,104
95	American Century Investments	US/UK	129,270 (2)	120,212
96	Itaú Asset Management	Brazil	122,911 (3)	122,911
97	Talanx Asset Management	Germany	122,700 (4)	106,600
98	Eastspring Investments	Singapore	120,945	93,120
99	Swedbank Robur	Sweden	118,851	90,000
100	Helaba Invest	Germany	118,220	107,599
101	MN	Netherlands	117,634	111,064
102	Lyxor Asset Management	France	117,600	94,200
103	Lord, Abbett & Co.	US	115,562	127,170
104	Royal London Asset Management	UK	114,664	106,932
105	Zürcher Kantonalbank	Switzerland	113,027	47,468
106	Harris Associates*	US	112,800	108,700
107	Henderson Global Investors	UK	110,636 (1)	104,580
108	GAM	UK/Switzerland	109,498	102,604
109	Kohlberg Kravis Roberts & Co.	US	109,411	81,009
110	Danske Capital	Denmark	107,911	107,413
111	AMP Capital	Australia	106,160	102,005
112	Achmea Investment Management	Netherlands	101,957	-
113	GE Asset Management	US	101,491	96,122
114	Union Bancaire Privée	Switzerland	101,138	82,051
115	BBVA Asset Management	Spain	100,041 (5)	93,063
116	KBC Asset Management	Belgium	100,007	94,646
117	Artisan Partners	US/UK	97,928 (5)	89,169
118	Sumitomo Mitsui Asset Mngt. Co.	Japan	96,720	91,914
119	Investec Asset Management	South Africa/UK	96,558	92,849
120	SURA Asset Management	Mexico/Colombia	94,353	-
121	Hartford Investment Mngt. Co.	US	94,170	90,520
122	Candriam Investors Group	Belgium	94,078	80,034

©IPE Research

(1) As at 30/09/15 (2) As at 31/08/15 (3) As at 31/12/14 (4) As at 31/03/16 (5) As at 30/06/15 (6) As at 31/03/15 (7) As at 31/01/16 (8) As at 30/06/14 (9) As at 01/03/16 (10) As at 30/04/15 (11) As at 29/02/16 (12) As at 30/09/14

* Total also included in figure for parent company. See directory for details.

† Figures now include total value of assets on which LGIM earns ad valorem fees including notional derivative positions and advisory assets.

FINANCIAL TIMES

14 January/15 January 2017

BlackRock and Vanguard reap largest inflows in their history

• Rivalry rife between competing ETFs • Investors leave active management

MILES JOHNSON AND CHRIS FLOOD
LONDON

The two largest asset managers, BlackRock and Vanguard, enjoyed the largest inflows in their history last year as a record sum moved into low-cost passive investments at the expense of traditional actively-managed funds.

BlackRock, the largest asset manager, said that it took in total net inflows of $202bn in 2016, as its total assets under management rose 11 per cent year-on-year to stand at $5.14tn.

Vanguard, which unlike BlackRock is not publicly listed and instead is owned by its clients, rather than shareholders, attracted $315.3bn of net new money last year, an increase of 23.2 per cent on 2015. Vanguard's total assets under management reached $3.9tn, a year-on-year rise of 14.7 per cent.

Both managers enjoyed record ETF inflows in 2016, tightening their grip on the market. Vanguard's ETF inflows rose 14.4 per cent to $96.8bn while new business for BlackRock's iShares arm increased by 7.7 per cent to about $140bn. While both BlackRock and Vanguard possess sizeable active fund businesses, their growth has been driven by growing disenchantment among investors with the poor performance of traditional active fund managers. This has driven money away from rivals into cheaper passive investment products such as exchange traded funds and index trackers.

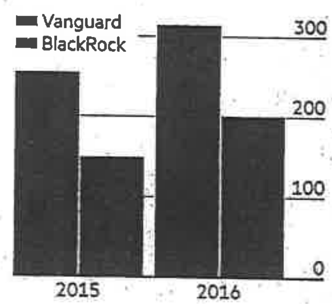
Competition between Vanguard and BlackRock is intense in the exchange traded fund industry, where both are fighting a price war to win market share.

Their growing dominance of the ETF industry, with BlackRock and Vanguard together taking 60.4 per cent of last year's ETF inflows, is heaping pressure on their smaller competitors.

Ben Johnson, director of global ETF research for Morningstar, the data provider, said it was hard for smaller ETF managers with fewer resources "to replicate BlackRock and Vanguard's tactics. Scale is a massive competitive advantage in the ETF industry, unlike active fund management where growing in size has often proved the enemy of performance".

Record breaking growth for big asset managers

Net investor inflows ($bn)



Source: companies

Larry Fink, BlackRock chairman and chief executive, trumpeted his group's ability to offer a greater range of options across both active and passive products was helping it draw client money.

"Our job is not to say one of active or passive is better, it is to find the best solution for the client," he said. "We are the only business with our range of passive and active products across a spectrum of asset classes, so we can have deeper conversations with our clients."

Yet while inflows of client money were up, BlackRock's revenues and profits fell compared with 2015. Revenues for the year fell by 2 per cent compared with 2015, and operating income came in at $4.57bn, also dropping by 2 per cent year-on-year. Net income dropped 5 per cent from 2015 to 2016 to stand at $3.172bn, and diluted earnings per share fell 2 per cent for the year to $19.29.

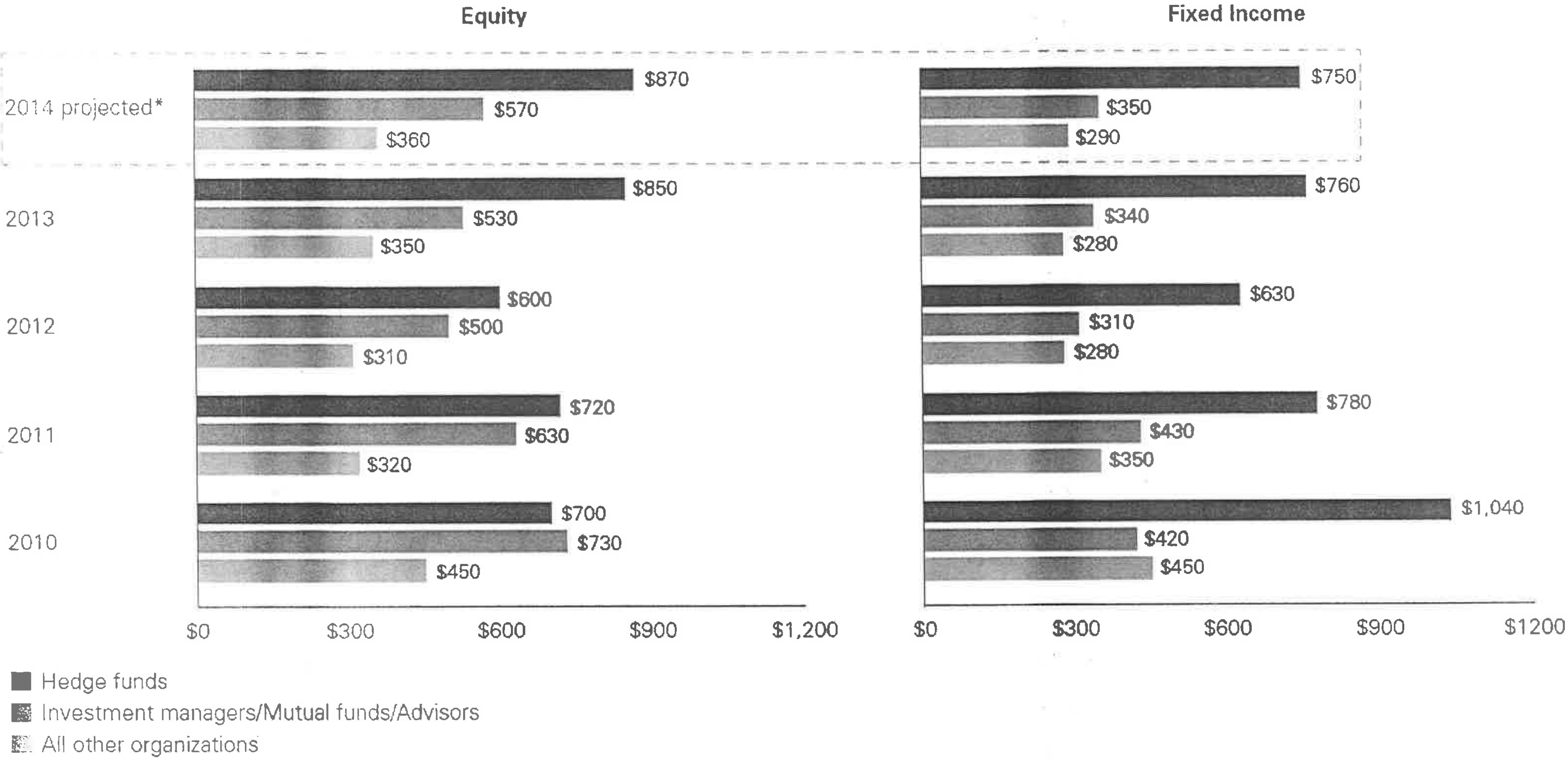
BlackRock did manage to defend its operating margin over 2016, which rose by 10 basis points to 41 per cent compared with 2015, an increase it attributed to keeping expenses and other costs low.

Bill McNabb, Vanguard chairman and chief executive, said its ownership structure meant it could offer the cheapest products. "Our structure ensures that we can, as a result of scale and flows, continue to return value to investors in the form of lower costs."

Historical and Projected Compensation for Senior Buy-Side Investment Professionals

By Type of Firm

(in $U.S. 000s)



Note: "All other organizations" includes weighted average results from banks, insurance companies, government agencies, and other.
Source 2010–13: Greenwich Associates U.S. Equity and Fixed-Income Investors Studies
Source 2014: Johnson Associates projections on changes from Greenwich Associates 2013 data

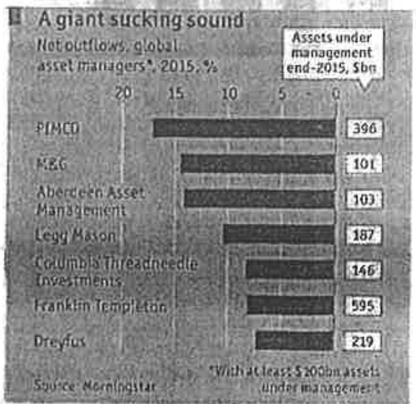
3/26/2016

Asset managers

The tide turns

NEW YORK

Consumers are finally revolting against an outdated industry



FOR decades looking after other people's money has been a lucrative business. Profit margins in the asset-management industry were 39% in 2014, according to BCG, a consultancy, compared with 8% in consumer goods and 20% in pharmaceuticals. The industry's global profits in 2014 were an estimated $102 billion, allowing firms to pay those picking stocks in the American equity market an average salary of around $690,000 a year. Better yet, asset-management is growing fast: the industry looks after $78 trillion worldwide, and could shepherd over $100 trillion by 2020.

Yet the outlook for many asset managers is grim. The industry is being reshaped by low-cost competition. At the same time falling markets are shrinking assets under management, and thus fees levied as a percentage of those assets. Regulators, meanwhile, are trying to prevent consumers from being sold inappropriate products, which are often the most lucrative.

The biggest challenge confronts so-called active managers, who promise to earn returns that are higher than the market benchmark (the S&P 500, for example) by picking investments judiciously. Very few manage to do so: a study by Standard & Poor's, which compiles the S&P 500 index, among other things, found that 91% of active managers in emerging-market equities failed to beat the relevant index over ten years, and that 95% of active bond managers underperformed.

This is hardly surprising: the average manager is likely to do no better than the market, before fees. Once fees are subtracted, therefore, active managers are likely to underperform. Morningstar, a data provider, has found that high fees are indeed a predictor of underperformance.

Low blow

When markets are rising, clients may not notice the impact of fees, protecting asset managers' profits. But last year most markets were flat or lower. McKinsey, a consultancy, says profit margins and growth fell at the majority of American asset-management firms in 2015. Paul Smith of the CFA Institute, an association of investment advisers, says, "Now the tide has gone out and the emperor has no clothes."

That may help explain some big recent withdrawals (see chart). Actively managed funds in America saw outflows of more than $100 billion last year, even as $400 billion flowed into "passive" funds that aim simply to track an index, according to Morningstar. It did not help that resource-rich countries hit by falling commodity prices sold assets owned by their sovereign-wealth funds to compensate for lost revenue. Firms that specialise in emerging-market equities did especially badly, with Aberdeen suffering an outflow of 14% and Ashmore 19%.

Regulation and technology are adding to the challenges for incumbents. In the wake of the financial crisis, regulators focused on the banks. Now they are looking at asset managers, with everything from the transparency of their fees to the liquidity of their investments under the spotlight. In America, the Department of Labour plans to introduce rules later this year obliging most financial professionals to suggest investments that are not just "suitable", as current regulation has it, but "in the best interest" of customers. That will make it difficult to recommend investments in funds which pay the advisers a commission. A similar reform took effect in Britain in 2013. Account statements will also tell customers how much they are paying in fees.

Such rules will have a big impact on business models. A greater number of wealthy investors will start choosing their own funds, which should benefit online retail platforms, predicts PricewaterhouseCoopers, an accountancy firm. Advisers will no longer have an incentive to push expensive products of dubious merit, which should boost low-cost products such as passive funds.

Meanwhile, institutional investors are reducing the number of managers they deal with. RPMI Railpen, a British pension fund, has gone from 20 external equity managers in 2013 to seven today. According to a survey by State Street, a financial-services group, four out of five pension funds plan to increase in-house asset management. Investors are also reconsidering their exposure to high-charging hedge-fund and private-equity managers. CALPERS, a big Californian pension fund, has dumped its hedge-fund managers. PGGM, which manages Dutch pension money, has halved what it pays for infrastructure investments since 2008, mostly by investing directly. Some pension funds are clubbing together to negotiate lower fees.

Technology also means that the strategies of active managers can be replicated at much lower cost. Take value managers, who claim to be able to beat the market by picking cheap shares. A computer program can comb the market for stocks that look cheap relative to their profits, asset values, or dividends; investors have no need to worry that the active manager might lose focus or change style. When it comes to choosing between asset markets, robo-advisers, using computer models, can help investors manage their wealth for a very low fee. Earlier this month Goldman Sachs, a big bank, became the latest big financial firm to buy one.

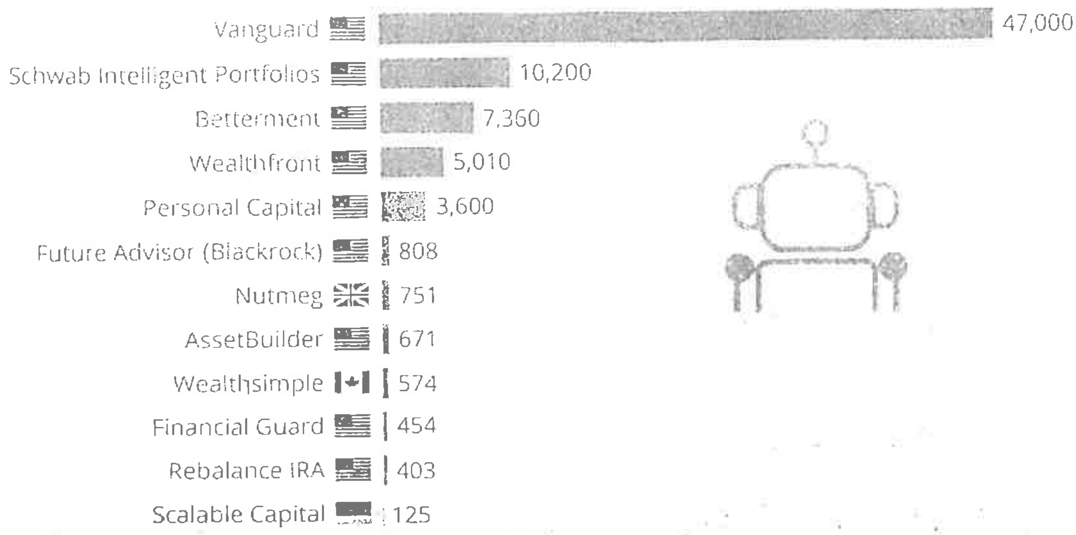
Fees for active equity funds are falling slowly, dropping by 4% for retail investors between 2012 and 2014, according to BCG. But the competition from passive managers is intense. Fees on passive equity funds for retail investors dropped by a fifth over the same period, as operating costs keep falling. As a percentage of assets, expenses at Vanguard, a specialist in tracker funds, now average 0.18% a year, a fifth of what they were in 1975.

Retail investors increasingly choose one-stop-shops, such as Vanguard. These investors are buying cheap exchange-traded funds (tracker funds that trade on the stockmarket) or all-in-one multi-asset funds (a mix of shares, bonds and other investments), rather than trusting equity specialists. Passive powerhouses like Vanguard and BlackRock, both of which also sell actively managed funds, are the main beneficiaries of the upheaval in the industry. In 2015 they captured almost half of the industry's net inflows. There is also hope for newcomers: in China, some tech firms have become asset managers, earning custom from their prominent and trusted brands. A fund launched by Alibaba in 2014 quickly raised $90 billion from more than 100m investors.

Some star active managers, such as Bridgewater, a hedge fund, will continue to win business. But those that do badly will see their assets wither further, as withdrawals compound poor returns. For investors, this is good news: the industry may finally start benefiting them as much as it does managers. ■

America Is The Realm Of The Robo-Advisor

Top Robo-Advisors by assets under management (in million U.S. dollars)



Information based on latest available data, as of February 2017; We do not claim completeness of the information given

Sources: Statista estimates based on company information, Press Releases, Graphiq, Nerdwallet, CNBC, Business Insider

Industry heavyweights put faith in robo-advisers

Managers of exchange traded funds are hoping the industry is on the cusp of a revolution that will transform how institutional investors and retail customers buy their products.

This comes in the form of the low-cost automated online investment services, known as robo-advisers, that are springing up rapidly across the US, Europe and Asia.

All use ETFs as the building blocks of their investment portfolios, which could expand retail investors' ability to access the products.

"Robo-advice offers massive opportunities for ETF providers to increase sales," says Stephen Wall, a London-based analyst at Aite, the consultancy.

Assets managed by robo-advisers are minuscule today but they are predicted to grow rapidly.

US-based robo-advisers will manage $2.2tn by the end of 2020, according to a forecast published last year by AT Kearney, the consultancy, which also predicted that fund managers with no access to robo-advisers could lose up to $90bn annually in revenues by 2020 if they cut fees to compete in a price war with robo-advisers.

Asset managers, banks and brokers are all looking at the threat to their existing business models and the opportunities robo-advice presents.

Some have already taken action. BlackRock and Vanguard, the two largest asset managers, saw the opportunity and moved into the robo-advice market last year. They have been joined by banks and other asset managers such as Charles Schwab, Invesco, Fidelity, UBS and Goldman Sachs.

But companies will have to move quickly to compete with the might of BlackRock and Vanguard. BlackRock last year acquired the US robo-adviser FutureAdvisor and has signed robo-advice partnership agreements with RBC, the Canadian bank, BBVA Compass, the US bank, and Saxo Bank in Europe.

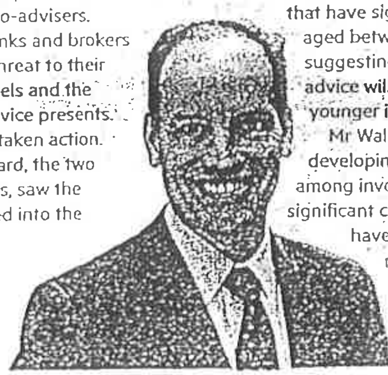
Michael Gruener, co-head of sales in Europe for iShares, the ETF arm of BlackRock, says there are a "large number" of other robo-advice partnerships in the pipeline. "ETFs and robo-advice make a good marriage," he says.

Launched in 2015, Vanguard's Personal Advisor Services has become the largest robo-advice provider with around $41bn in assets, according to Vanguard. It is a hybrid model that combines human advisers and robo-advice.

Frank Kolimago, head of Personal Advisor Services, says that two-thirds of the clients that have signed up to service are aged between 55 and 75, suggesting the appeal of robo-advice will not be limited to younger investors.

Mr Wall, however, says that developing trust in robo-advice among investors remains a significant challenge. "Most investors have simply never heard of robo-advice and have little idea of what it offers."

Chris Flood

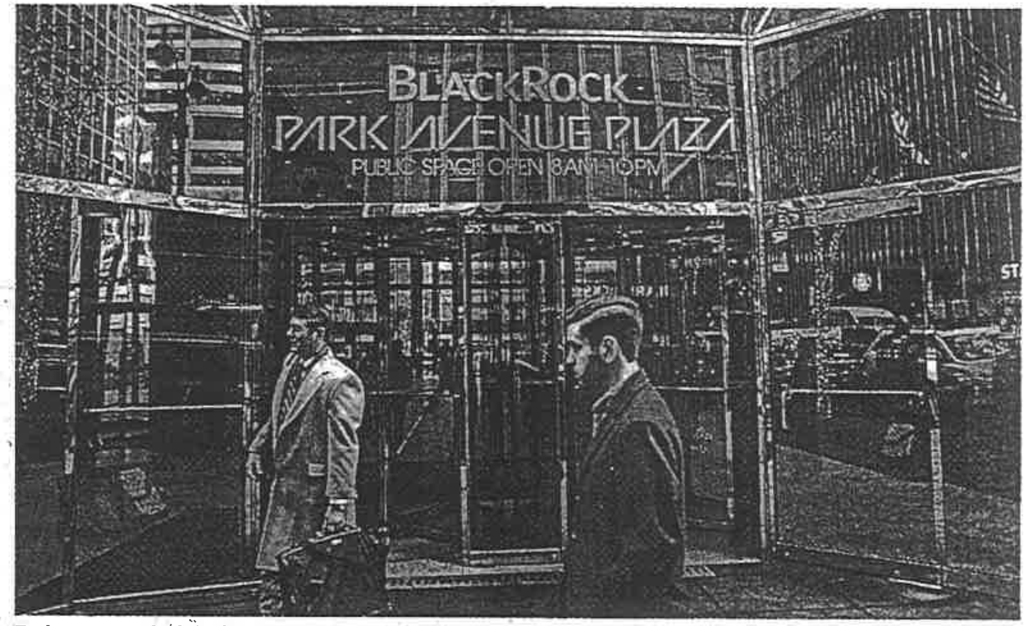


Frank Kolimago: the majority of our robo-adviser clients are over 55

Sep 12, 2016 FT

Robo-advice turns heads of leading fund houses

Automation ETF providers say their products are ideal for the trend, writes *Attracta Mooney*



Early starter: BlackRock's 2015 purchase of a robo-adviser hinted at its vision of future advice — Victor J. Blue/Bloomberg

During the summer of 2015, BlackRock made a purchase that caught the attention of rival asset managers.

The world's largest fund house bought FutureAdvisor, a so-called robo-adviser, in a deal that pointed to the possible future importance of automated online investment services for financial advice.

Robo-advisers typically use low-cost exchange traded funds or index funds to construct portfolios. BI Intelligence, a researcher, predicts such systems will grow rapidly in the coming years and control $8tn in assets by 2020, as investors seek out cheaper ways to invest.

As the owner of iShares, the world's largest ETF provider, BlackRock is well positioned to benefit if robo-advisers do become mainstream.

Michael Gruener, BlackRock's co-head of ETF and index sales for Emea territories, says: "I really believe that we're only 1 per cent done," adding that digital investment services will soon be the norm.

In the 18 months since BlackRock's purchase of FutureAdvisor, some rival ETF providers have doubled down on their efforts to acquire or build their own robo-advice services.

Deutsche Asset Management, owner of ETF business DB X-trackers, is working on its own automated-advice solution, which is due to launch by March. Kai Bald, head of digital at Deutsche Asset Management, says: "We are convinced that robo-advisers will have a major share of the wealth market in the future, and since they are mostly using ETFs, that's beneficial for ETF providers."

Jo McCaffrey, head of product development for Emea territories at SPDR, the world's third-largest ETF provider, describes robo-advice as a "tremendously positive development for the industry". SPDR, a division of US bank State Street, has not purchased a robo-adviser. But Ms McCaffrey says the company is looking at ways to tap into demand for online investment systems.

Source, a European ETF provider with €21bn in assets under management, has also not made any moves to buy a robo-adviser. But the company sees robo-advice as a growing distribution channel for its ETF products.

Matt Johnson, head of Emea at Source, says demographic and wealth trends are likely to cement robo-advisers' growth. He argues millennials are the first generation who have grown up with the internet and they may prefer cheaper online services to traditional wealth managers. This should drive growth in robo-advisers and consequently ETFs, he says.

Such views are backed up by a survey conducted last year by Legg Mason Global Asset Management. It found that 85 per cent of UK-based millennials were comfortable with robo-advice compared with 37 per cent of investors aged 40 to 75.

But others caution the predicted rise of robo-advice may not be entirely smooth. Some traditional asset managers have argued that automated advice, where investors are asked a few simple questions before being recommended investments, could result in consumers choosing inappropriate products.

At the same time, many robo-advisers have struggled to turn a profit, sparking fears of high failure rates. Bruce Moss, director at eValue, a consultancy, says: "A lot of robo-advisers are destined not to do very well. You have to have a big brand and customer base to make it work."

Others argue that even if robo-advice attracts investment interest, this will not necessarily benefit ETFs. Some robo-advisers have looked beyond to active funds.

RiskSave Technologies, a robo-adviser set to be launched this year, will be advocating the use of individual stocks rather than funds. Daniel Tammas-Hasting, chief executive of RiskSave, says: "The next step in robo-advice is to move beyond ETFs."

But ETF providers insist they remain best placed to profit from the growth of robo-advice. "ETFs are cheaper [than active funds] and have the advantage of higher liquidity," says Deutsche's Mr Bald.

THE WALL STREET JOURNAL.

Tuesday, September 8, 2009 C9

Some Funds Stop Grading on the Curve

BY ELEANOR LAISE

Last year, a typical investment portfolio of 60% stocks and 40% bonds lost roughly a fifth of its value. Standard portfolio-construction tools assume that will happen only once every 111 years.

With once-in-a-century floods seemingly occurring every few years, financial-services firms ranging from **J.P. Morgan Chase & Co.** to **MSCI** Inc.'s MSCI Barra are concocting new ways to protect investors from such steep losses. The shift comes from increasing recognition that conventional assumptions about market behavior are off the mark, substantially underestimating risk.

Though mathematicians and many investors have long known market behavior isn't a pretty picture, standard portfolio construction assumes returns fall along a tidy, bell-curve-shaped distribution. With that approach, a 5% or 6% stock-market return would fall toward the fat middle of the curve, indicating it happens fairly often, while a 2008-type decline would fall near the skinny left tail, indicating its rarity.

Recent history would suggest such meltdowns aren't so rare. In a little more than two decades, investors have been buffeted by the 1987 market crash, the implosion of hedge fund Long-Term Capital Management, the bursting of the tech-stock bubble and other crises.

Please turn to page C9

Continued from page C1

Investors using standard asset-allocation approaches have been hammered. Last year, all their supposedly diversified investments plummeted in unison. In short, the underlying assumptions failed.

"We got blindsided by some developments that weren't accounted for by the models we were using," says Clark McKinley, a spokesman for the giant pension fund California Public Employees' Retirement System, or Calpers. As a result, the fund is looking at incorporating an extreme-events model into its risk-management approach.

Many of Wall Street's new tools assume market returns fall along a "fat-tailed" distribution, where, say, last year's nearly 40% stock-market decline would be more common than previously thought.

Fat-tailed distributions are nothing new. Mathematician Benoit Mandelbrot recognized their relevance to finance in the 1960s. But they were never widely used in portfolio-building tools, partly because the math was so unwieldy.

Morningstar's Ibbotson Associates unit in recent months built fat-tailed assumptions into its Monte Carlo simulations, which estimate the odds of reaching retirement financial goals. More than nine million individual retirement-plan participants have access to Ibbotson's Monte Carlo tool.

The new assumptions present a far different picture of risk. Consider the 60% stock, 40% bond portfolio that fell about 20% last year. Under the fat-tailed distribution now used in Ibbotson's tool, that should occur once every 40 years, not once every 111 years as assumed under a bell-curve-type distribution. (The last year as bad as 2008 was 1931.)

Insulation from extreme market events doesn't come cheap. **Allianz** SE's Pacific Investment Management Co., or Pimco, which systematically hedges against extreme market events in several mutual funds launched last year, says the hedges may cost investors 0.5% to 1% of fund assets a year. Pimco uses a variety of derivatives and other strategies to hedge the funds.

"You're spending some of your upside to buy the insurance" against catastrophic losses, says Vineer Bhansali, a Pimco managing director.

Among the Pimco products applying the hedges are target-date funds, aimed at retirement savers. The firm plans to launch more funds that employ the approach in the next few years, Mr. Bhansali says.

The fat-tailed assumptions can lead to quite conservative portfolios.

Another potential pitfall: Number-crunchers have a smaller supply of historical observations to construct models focused on rare events. "Data are intrinsically sparse," says Lisa Goldberg, executive director of analytic initiatives at MSCI Barra.

Even so, the firm this year offered pension plans and other large clients a beta, or prerelease, version of its new risk-management model, which seeks to account for more extreme market events. The company plans to include the model in risk-management products to be released next year.

As Wall Street relies on ever-more-complex mathematical models to manage money, a new breed of uber-wonks is gaining influence. Pimco's Mr. Bhansali, for example, holds a doctorate in theoretical particle physics from Harvard University and runs 50-mile to 100-mile super-marathons. And MSCI's Ms. Goldberg, an inventor of the firm's credit-risk and extreme-risk models, is also a professor at the University of California, Berkeley and has a penchant for the "beautiful mathematical subject" of extreme value statistics.

The fat-tailed assumptions sometimes lead to quite conservative portfolios that cushion investors on the downside but also sharply curtail the upside. **Smart Portfolios** LLC last year launched the **Aston Dynamic Allocation Fund**, which uses fat-tailed distributions and other complex formulas to assume more-frequent occurrence of market shocks. In the 12 months ending Sept. 4, the fund is down 0.5%, compared with a 16% decline for the Standard & Poor's 500-stock index, thanks to hefty allocations to Treasurys and cash. But as markets have rallied in the past three months, it has risen only 4%, compared with 8% for the S&P.

In times of upheaval, "we don't sit there and take it like a man. We run for the hills," says Bryce James, the firm's president.

Many of the new tools also limit the role of conventional risk measures. Standard deviation, proposed as a risk measure by Nobel Prize-winning economist Harry Markowitz in the 1950s, can be used to gauge how much an investment's returns vary over time. But it is equally affected by upside and downside moves, whereas many investors fear losses much more than they value gains. And it doesn't fully gauge risk in a fat-tailed world.

A newer measure that gained prominence in recent decades ignores potential gains and looks at downside risk. That measure, called "value at risk," might tell you that you have a 5% chance of losing 3% or more in a single day, but doesn't home in on the worst downside scenarios.

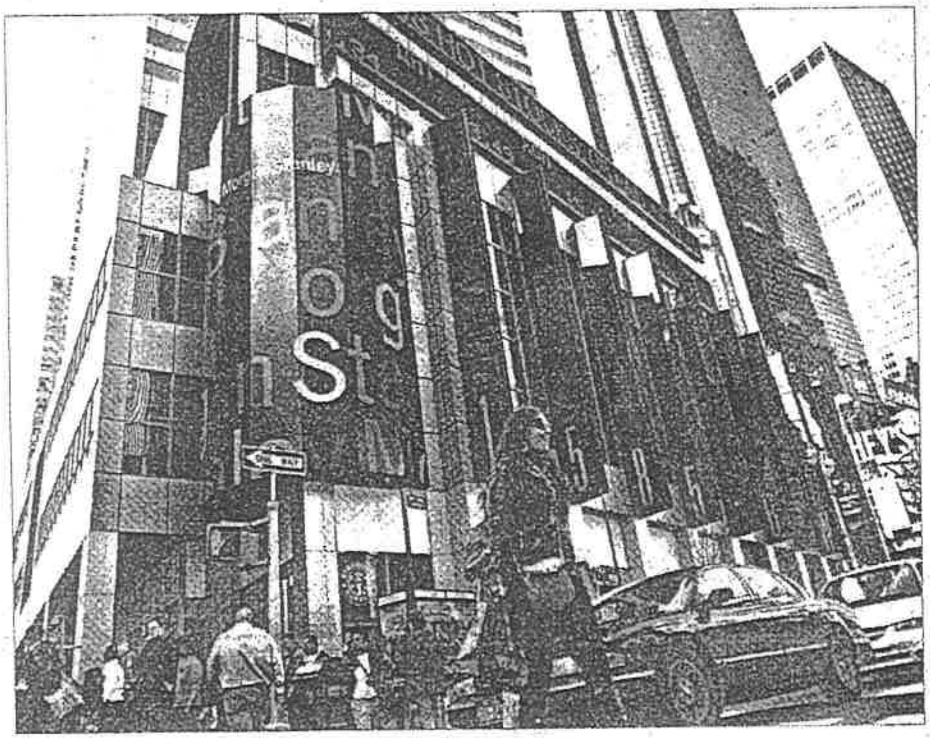
To focus on extreme risk, many firms have begun using a measure called "conditional value at risk," which is the expected portfolio loss when value at risk has been breached. In other words, if value at risk says you have a 5% chance of losing 3% or more in a single day, but you have lost 4% before lunch, conditional value at risk helps estimate your expected loss on this very bad day. Firms such as J.P. Morgan and MSCI Barra are employing the measure.

Pimco's Mr. Bhansali is unimpressed. Since it is so difficult to forecast extreme events, investors should focus on their potential consequences rather than the probability they will occur, Mr. Bhansali says.

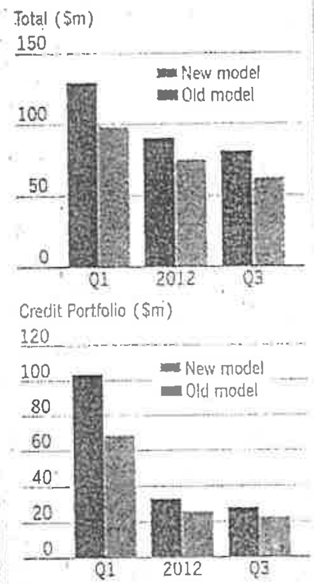
As for comprehensive measures of risk, he says, "they fail you in many cases when you need them the most."

M Stanley shows the 'flaky' side of value at risk model

By Tracy Alloway in New York



Morgan Stanley
Average trading value-at-risk*



* A measure of the bank's potential one-day loss

Source: company FT Graphic Photo: Bloomberg

Morgan Stanley has reignited a debate over how investment banks measure daily trading risks after it adjusted its own benchmark of potential losses in a move that boosts its reported capital buffers.

The bank said it had changed its so-called value at risk, or VaR model as it announced third quarter results yesterday.

The VaR models played a key role in the run-up to the recent financial crisis. The models attempt to gauge how much money a bank is likely to make or lose from trading, but were criticised for failing to anticipate big movements in markets.

They have come under renewed scrutiny in the wake of JPMorgan's $7bn trading loss. The bank changed its VaR model multiple times before and after it discovered the massive derivatives trades undertaken by its so-called "London whale."

Under new rules, banks are prohibited from trading for their own books but they still assume trading risk on behalf of clients.

Morgan Stanley's change cut its average VaR in the third quarter to $63m instead of the $82m it would have been under its old model. That means under the new model the bank expects to lose no more than $63m in a single trading day, within a certain probability, rather than $82m under the old model.

"It all goes to point out, again and again and again, how malleable and manipulable and flaky VaR can be," said Pablo Triana, a professor at ESADE Business School. "Just change weights on data and, *voilà*, you are perceived as less risky and you can be more leveraged."

Ruth Porat, Morgan Stanley's chief financial officer, said that the bank had changed the VaR model to be more heavily weighted to one-year historical data. The model was previously geared towards four-year data.

"We've been running this model and the prior model in parallel since 2011, which gives us a high level of comfort from the model," Ms Porat also told analysts yesterday. "It's been approved by regulators."

Even so, the change in the model gave a "modest benefit" to the bank's regulatory capital ratios in the quarter, Ms Porat said. The lender's capital ratio under the Basel III rules rose to more than 9 per cent, helped by earnings and the bank's efforts to offload assets that attract higher risk-capital weightings.

While the bank swung to a loss in the third quarter because of a large accounting adjustment, underlying revenues were stronger than in the previous quarter and adjusted earnings of 28 cents a share beat analysts' estimates of 25 cents a share.

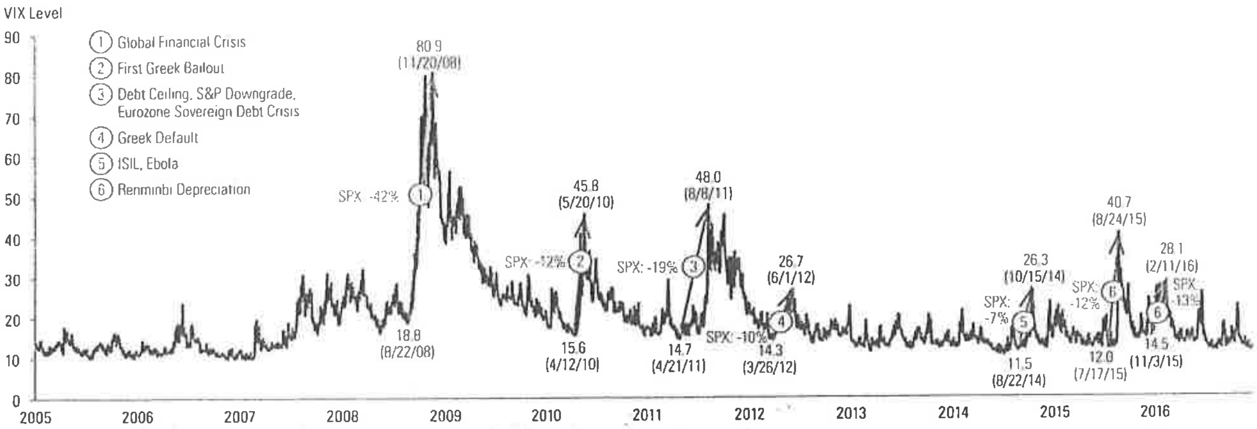
Nonetheless, analysts and market observers were keen to dissect the bank's VaR shift.

"You can appreciate the idea of changing a VaR model; it gets people's attention these days," Mike Mayo, a bank analyst at CLSA said at yesterday's conference call.

Lex, Page 12
Swings to loss, Page 14

Exhibit 19: US Equity Volatility

Spikes in equity volatility have corresponded with major global shocks.



Data through December 31, 2016.

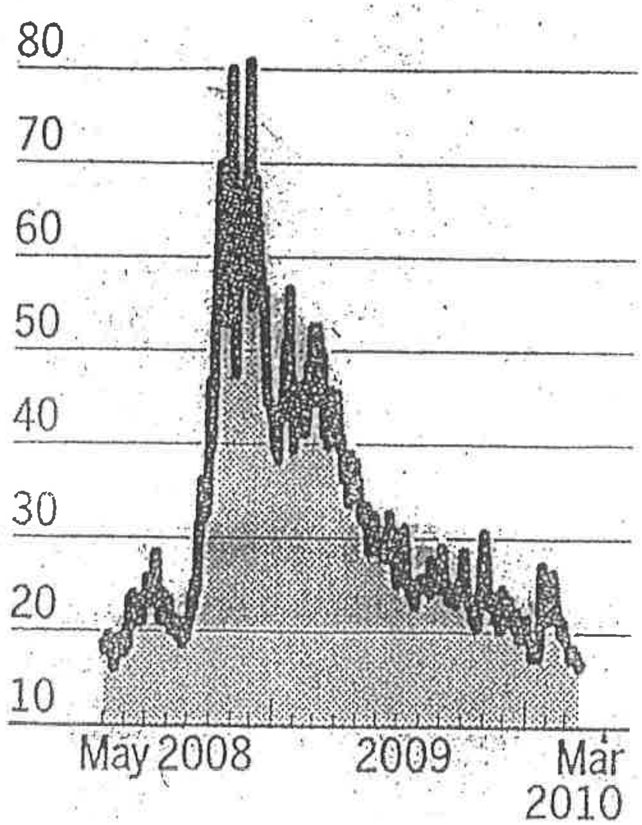
Note: The red arrows show the S&P 500's (SPX's) peak-to-trough declines around each episode.

Source: Investment Strategy Group, Bloomberg

Source: Jan 2017 Goldman Sachs Investment Strategy Group

US stock market volatility

CBOE VIX index



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Odds-On Imperfection: Monte Carlo Simulation

Financial-Planning Tool Fails to Gauge Extreme Events

By Eleanor Laise

If one had asked a financial adviser 18 months ago for retirement-planning guidance, there is a good chance he would have run a "Monte Carlo" simulation. This calculation method, as it is commonly used in financial planning, estimates the odds of reaching retirement financial goals.

But there is little chance your Monte Carlo simulation, named for the gambling mecca, would have highlighted a scenario like the market slide just seen. Though these tools typically run a portfolio through hundreds or thousands of potential market scenarios, they often assign minuscule odds to extreme market events. Yet these extreme events seem to be happening more often.

Some industry participants and academics are pushing to improve the Monte Carlo tools' ability to highlight the risk of major market slides.

There is no standard Monte Carlo approach, but the method is nothing new. It was used during World War II to help develop the atomic bomb. By the late 1990s some financial-services firms, like T. Rowe Price Group Inc., had introduced Monte Carlo tools aimed at individuals.

Monte Carlo simulation has wide appeal, and is used in online tools offered by firms like Fidelity Investments and by independent retirement planners. The financial-services industry provides retirement planning, in part, because it attracts clients and boosts fee income.

Here is how a typical Monte Carlo retirement-planning tool might work: The user enters information about his age, earnings, assets, retirement-plan contributions, investment mix and other details. The calculator crunches the numbers on hundreds or thousands of potential market scenarios, guided by assumptions about inflation, volatility and other parameters.

It then spits out a "success rate," which shows the percentage of market scenarios in which the investor had money remaining at the end of his estimated life span. In many cases, the consequences of failure—say, running out of money at age 80—aren't laid out.

Many providers of the tools argue that it is a significant improvement over the traditional retirement-planning approach, which typically involves assuming some set market return, say 8% for U.S. stocks, year after year, an assumption considered unrealistic by academics and financial pros.

The questions about Monte Carlo tools reflect broader concerns about mathematical models for

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gauging portfolio risks.

These models were supposed to help quantify and manage the risks of mortgage-backed securities, credit-default swaps and other complex instruments. But given the events of the past couple of years, it appears that the models often gave big institutions, as well as small investors, a false sense of security.

Now, some investors have decided that if risk can't be accurately measured, they will just have to play it safe. Jeff McComas, a chemical engineer in Woodbury, Minn., has used six or seven Monte Carlo calculators and found that none highlighted the possibility of a scenario like the recent market downturn. The lesson: "The future is so unknown that your prudent choice is to save as much as you can now and live below your means," said Mr. McComas, 39 years old.

Some financial advisers are equally skeptical. "I take whatever probability of failure that comes out of your Monte Carlo simulation and add 20 percentage points," said William J. Bernstein, author of "The Four Pillars of Investing."

Critics emphasize that the problem isn't Monte Carlo itself, but the assumptions that go into it. Since no standard approach exists, one user might plug in a range of assumptions on interest rates, inflation or volatility that is different from another user.

Also controversial is that many Monte Carlo simulations assume that market returns fall along a bell-curve-shaped distribution. That means a high probability may be assigned to, say, a stock-market return of 5%, which would fall toward the middle of the bell, and negligible odds assigned to a 54% decline, which would fall near the extreme edge, or "tail."

"In a bell-shaped curve the probability of getting one of these extreme outcomes we're seeing is basically zero," said Paul Kaplan, vice president of quantitative research at Morningstar Inc.

While a bell-curve model indicates there is almost no chance of a greater than 13% monthly decline in the Standard & Poor's 500-stock index, such declines have happened at least 10 times since 1926, according to a report by Mr. Kaplan.

Some Monte Carlo models, like the one used by Financial Engines, assign higher odds to extreme market events than the bell-curve distributions. Even so, "I would not claim we have the magical ability to accurately predict very infrequent events," said Christopher Jones, the firm's chief investment officer.

Some firms are considering revising Monte Carlo models to reflect a world where big market swings happen more often. Morningstar last year tweaked its asset-allocation software offered to institutional investors, allowing users to choose a bell-curve-shaped distribution or a "fat-tailed" distribution, which assigns higher probabilities to extreme market events. The company is exploring using this model in more products, Mr. Kaplan said.

Laurence Kotlikoff, a Boston University economics professor who developed the ESPlanner financial-planning software, and Richard Fullmer, senior portfolio strategist at Russell Investments, said they also are considering offering clients Monte Carlo scenarios that incorporate fatter-tailed distributions.

The choice could make a difference in an investor's retirement plans. While a bell-curve model shows a negligible risk of a greater than 50% decline in the S&P 500 over extended time periods, a fatter-tailed model assigns it a probability of 4% or 5%, odds high enough to grab the attention of risk-adverse investors, according to Mr. Kaplan's report.

Some industry participants and academics are pushing for Monte Carlo tools to more clearly illustrate the scarier scenarios. In a recent paper, Moshe Milevsky, associate finance professor at York University's Schulich School of Business in Toronto, proposed a calculation that Monte Carlo tools could use to show a retirement plan's vulnerability to extreme market events.

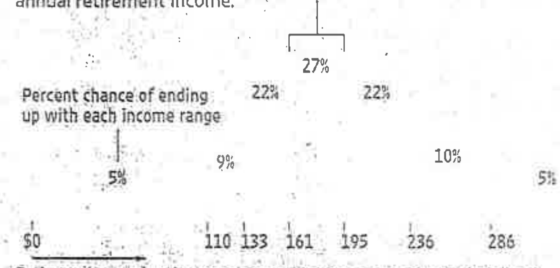
Some industry participants also are trying to set standards that could help Monte Carlo tools more accurately capture extreme market events. The Retirement Income Industry Association in 2007 issued a set of principles noting that the calculators should run a large number of scenarios.

The ideal models run tens of thousands or hundreds of thousands of scenarios, which help gauge extreme events at the tail end of the distribution, observers said. Yet some tools run only 1,000 scenarios or just several hundred.

—Neal Templin contributed to this article.

Retirement Odds Too Sunny?

Popular Monte Carlo financial-planning tools, which estimate the chances of achieving retirement goals, are under fire as too optimistic. This one, from Financial Engines, projects that the odds are strongest that a retiree would achieve $161,000–195,000 in annual retirement income.



Pretax retirement income estimated for a 50-year-old single man, earning $250,000 yearly with a $1 million portfolio split evenly between stocks and bonds. Analysis assumes the investor makes the maximum 401(k) contribution and retires at age 65.

Source: Financial Engines