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Asset Management

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Exploring the long-term consequences of passive investing in equities

# THE INDEXATION WAVE

1 The rise of passive investing and the misallocation of capital
2 Passive investing and its effects on corporate governance and ownership
3 The passive giants and their tightening grip on index providers

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# Overview

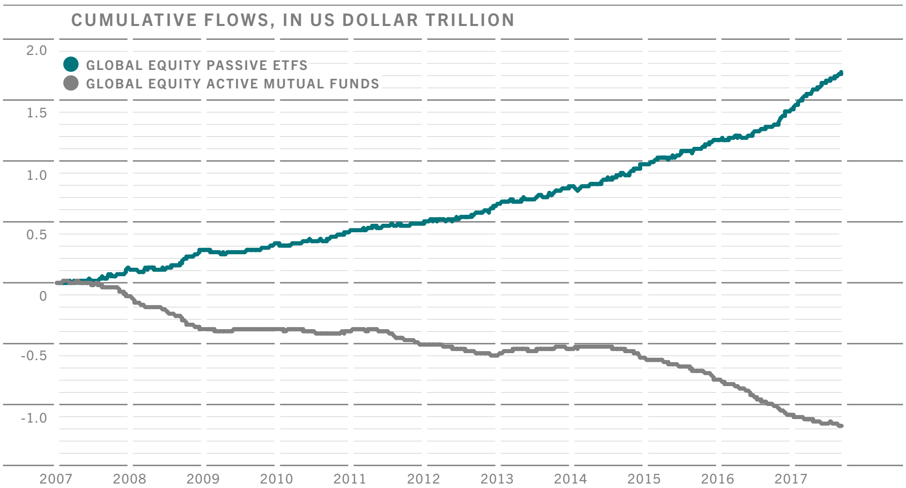
Rarely has the cost of investing come under such scrutiny. And rarely with such sustained intensity.

With most active equity portfolios having failed to beat their benchmarks since the 2008 debt crisis, regulators and investment consultants seem to have lost patience with the large number of funds whose persistent underperformance is matched by their persistently high fees.

So too has the financial press.

Passive investment supplants active

FIG.1




Source: EPFR;
data covering period 31.12.2007-30.09.2017

The growing disillusionment with actively managed funds and investment gatekeepers' focus on cost are transforming the financial landscape. Passive investing is now firmly in the ascendancy.

Since the end of 2007, passive exchange-traded funds (ETFs) have accumulated a net USD1.7 trillion of investment inflows. That contrasts with the USD1.2 trillion drained from actively managed vehicles over the same period (FIG.1).

From the perspective of an individual investor, the shift makes sense. Index-tracking funds charge lower fees. And it is also true that they have delivered better returns than the average actively managed fund after investment charges.[1]

Problems are sure to arise, though, if indexation becomes the dominant form of investment. In such a scenario, it is not clear the financial market will be able to allocate capital efficiently. Nor is it certain that corporate executives will be held to account. There is also the prospect of entire industries falling under the control of just a few passive investment firms – a development that could erode the pillars of the free-market economy and stifle innovation.

The enthusiasm for index-tracking is born out of regulators' and consultants' desire to control cost. That is a laudable goal. But the longer-term costs associated with the expansion of passive investment have not been properly assessed. If the majority of investors embrace them, index-trackers threaten to sabotage the very system upon which they were built.

1 This is, in fact, a mathematical certainty that has no bearing on the debate over whether skilled investment managers exist. As the portfolios of all investors who are active in a market are the market, their average return before costs must be equal to the market return. Once costs are taken into account, the average investor must underperform: there can be no skill, on average.

RENAUD DE PLANTA
CHAIRMAN, PICTET ASSET MANAGEMENT AND MANAGING PARTNER, PICTET GROUP

SUPRIYA MENON
SENIOR MULTI-ASSET STRATEGIST, PICTET ASSET MANAGEMENT

# 1

## The rise of passive investing and the misallocation of capital

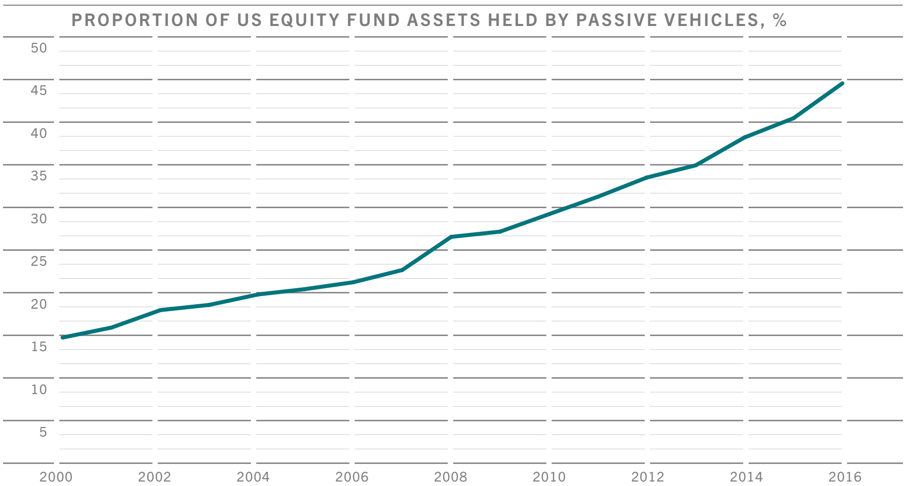
## Rise of passive investing and the misallocation of capital

The advocates of passive investing have compiled a long list of arguments to justify its expansion. Some are hard to dispute. Index-trackers charge lower fees than their actively managed counterparts. And their returns will beat those of the average active fund after portfolio management costs are taken into account.

Yet one of the other claims made by index-trackers' proponents – that passive investing's breakneck growth won't affect the way capital is allocated across the economy – is somewhat harder to rationalise. By definition, passive investors are indiscriminate buyers and sellers that pay no attention to the price, value or risk of a security.

Passive funds tighten their grip

FIG.2




Source: Morningstar;
data covering period 31.12.2007-30.09.2017

So if, as Moody's predicts, index-tracking becomes the primary form of investment in US equities in as little as four years,[2] it is difficult to see how a financial market dominated by investors on autopilot can ever be an efficient distributor of capital.

The misallocation of capital is already evident in one sector where passive vehicles account for the biggest share of trading activity – the commodities market. In a 2016 study, academics at the University of Washington, University of Utah and Washington University (St Louis) examined the effects of passive investing on both commodity prices and the firms that were heavily dependent on raw materials. The researchers found that, because of the enlarged footprint of passive investors, commodity prices had become detached from underlying trends in demand and supply. This, in turn, affected the cash flow, production costs and investment decisions of companies that are heavy users of agricultural products, metals and the like.[3]

If passive investing can weigh on business decisions by distorting the cost of companies' physical inputs, then it could do even more damage if it begins to affect their cost of capital and strategic planning.

The mechanics of index-tracking dictate that the shares of companies with large weightings in the major indices attract more investment flows irrespective of their underlying fundamentals.

This affords such firms substantial privileges.

Research shows benchmark inclusion alone can boost the valuation of a stock by up to 40 per cent,[4] making it much cheaper for index members to raise new equity. Less obvious but just as important, index membership can also cut firms' borrowing costs: the market capitalisation of a stock has been shown to have a strong bearing on the credit scoring models used by ratings agencies and debt syndication teams to price corporate bonds and loans.[5]

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2 The point at which 50 per cent of all equities' free-float is held in passive vehicles.

3 The *Economic Impact of Index Investing* Brogaard, J., Ringgenberg, M., Sovich, D. 2017

4 *The Index Premium and its Hidden Cost for Index Funds*, Petajisto, A., Journal of Empirical Finance, 18 (2): 271-288, 2011

5 Market valuation is a key component of most credit scoring models as it has an impact on affordable corporate debt level and, in turn, spending plans and investment rates. Such metrics feature in Moody's KHV model, the Heston model, Altman's Z-score model as well as other credit profiling systems used by the main ratings agencies.

But artificially low financing costs – while welcome in the short term – are a recipe for investment misallocation over the long run. Take the example of a benchmark constituent that is considering whether to invest in a large, long-term project. Able to finance itself more cheaply thanks to its privileged status, the firm's hurdle rate – the minimum return that project would need to generate to become commercially viable – is lower than the underlying fundamentals would suggest. As a result, it's conceivable that the company gets drawn into a venture that cannot cover its true cost of capital.

Equally troubling is how indexing might affect the investment decisions of firms excluded from the main benchmarks. In contrast to their index-held peers, these companies face abnormally high capital costs. And because they are penalised by higher hurdle rates, their otherwise viable projects are more likely to be shelved.

More broadly, these anomalies point to the problems that can surface if price discovery – the process through which buyers and sellers determine the equilibrium value of a security – breaks down. For information to be efficiently embedded into a stock price, the system needs sufficient numbers of active investors to set that price. It is a mechanism that serves as a public good.

But if active managers continue to be supplanted by passive investors at the present pace, asset prices will lose their fundamental underpinnings. There is already some evidence of this among stocks owned primarily by passive investors. Such securities are prone to greater – and more frequent – price swings. When money moves into or out of a tracker fund, the resulting flow creates buy or sell orders for all stocks that make up the index at the same time. As a consequence of this herding, index constituents begin moving in lockstep with one another, causing stocks' price movements to become detached from companies' underlying fundamentals.[6]

These irregularities in securities markets matter because stock prices influence activity in the real economy in a number of ways.[7]

To begin with, corporate boards – of both public and private companies – use stock prices to guide their decisions. Empirical evidence shows that when assessing whether to list their company, for instance, private firms tend to use external price signals more than internal ones when pricing initial public offerings. The same is true for other financial transactions such as venture capital deals and mergers and acquisitions.

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6 See *Active vs Passive Investing and the Efficiency of Individual Stock Prices*, Werners, R., Yao, T., May 2010

7 For a detailed discussion on the links between financial markets and the real economy, see *The real effects of financial markets*, Bond, P., Edmans, F., Goldstein, I, The Annual Review of Financial Economics, 4:2.1–2.22, 2012

Secondly, companies follow the market's price signals closely because they are party to contracts that are contingent on stock valuations – such as executive compensation packages.

Thirdly, businesses display a strong behavioural bias to use stock prices to guide strategic planning because they believe them to be the most efficient aggregator of economic information.

A world dominated by passive investors, then, looks unlikely to be a financial utopia. Serious misallocations of capital could well become the norm, creating asset bubbles on the one hand and leaving innovative firms deprived of funds on the other. None of this would be good for productivity or economic growth.

# 2

## Passive investing and its effects on corporate governance and ownership

## Passive investing and its effects on corporate governance and ownership

The growth of passive funds is often described as the democratisation of investment. But there's a paradox behind this glorious revolution. In diverting assets to index-tracking funds, investors inadvertently hand more power to a small number of the world's largest investment managers, to the possible detriment of the economy.

To understand why, it's necessary to look more closely at microeconomic forces at play in the investment industry and their effects on company ownership.

Passive oligopolies

FIG.3

% OF INDEX-TRACKING ETFS, FUNDS, OWNED BY LARGEST 3 PASSIVE FUND HOUSES (BLACKROCK, VANGUARD, STATE STREET)


Source: Broadridge;
covering period 31.12.2001-31.12.2016

In the active management business, money managers face constraints on their capacity to accumulate assets. The first is cost. As an actively managed fund gathers investments, it becomes increasingly complex to manage, requiring more analysts and risk management professionals. This limits how much an individual fund can grow. In other words, for active managers, economies of scale are in short supply.

A second obstacle to fund growth is liquidity. When actively managed portfolios grow in size, fund managers find it increasingly difficult to build positions in their favoured stocks. Doing so under these circumstances would risk pushing up the price of those securities relative to the rest of the market, which would make excess returns harder to come by.

None of this applies to passive investing. Here, commercial success and asset growth depend almost exclusively on a money manager's ability to cut costs. And the very largest firms are best placed to exploit these economies of scale.

Recent evidence suggests commoditisation is already in full swing. Our research shows that the passive investment business is fast evolving into an oligopoly, increasingly dominated by the largest providers of index-trackers, firms that also happen to be the world's three biggest investment companies – BlackRock, Vanguard and State Street.

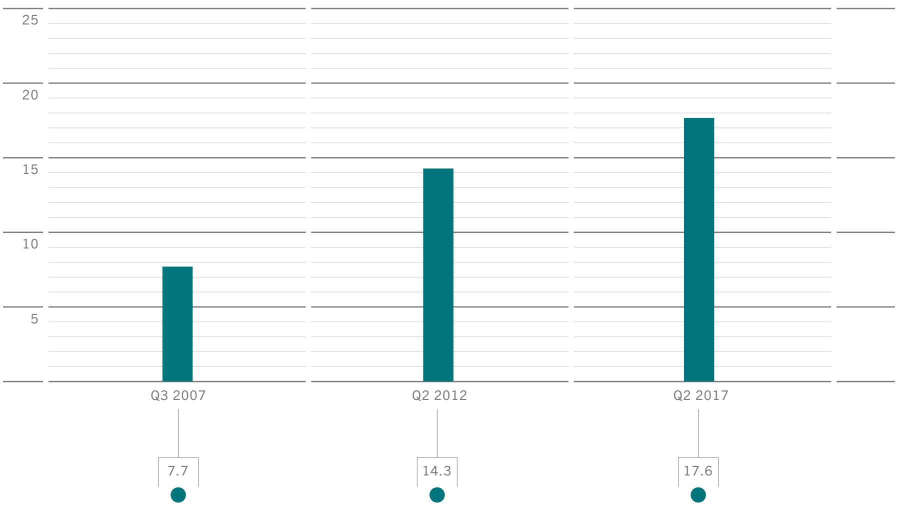
The trend is unlikely to reverse. The more assets these firms gather, the more they can reduce management charges and so continue their expansion.

This has serious implications. As the assets held in passive funds increase, a greater proportion of the globe's listed companies will fall under the control of the giants of the investment industry. Together, the Big Three already control 70 per cent of all passively held assets

The growing influence of the Big Three* passive money managers on listed firms

FIG.4

% OF STOCK OF LARGEST 100 FIRMS IN S&P 500 CONTROLLED BY WORLD'S THREE LARGEST INVESTMENT FIRMS, AGGREGATED




* Big Three: BlackRock, StateStreet and Vanguard

Source: Bloomberg; data covering period 30.09.2007-30.06.2017

worldwide. Their influence in the US is especially pronounced.

There, Vanguard, BlackRock and StateStreet collectively control almost 18 per cent of the largest 100 firms in the S&P 500 Index, up from just 7.7 per cent in 2007. Combined, these money managers would be the largest shareholder for more than 40 per cent of the 4,000 listed companies in the US.[8] On a capitalisation-weighted basis, that figure is far higher.

8 *Hidden Power of the Big Three? Passive index funds, re-concentration of corporate ownership and new financial risk*, Fichtner, J, Heemskerk, E, and Garcia-Bernardo, J, University of Amsterdam, Working Paper, October, 2016.

Some simple arithmetic suggests their influence is set to grow further. Should the current trend continue, the proportion of US equities held by passive vehicles will increase from approximately 45 per cent of all fund assets to 60 per cent, leaving the Big Three with about 50 per cent of the votes of S&P 500 constituents. At the present rate of growth, that could happen within seven years.

This ought to alarm anti-trust authorities. When a small group of passive shareholders – investors that have fewer incentives than active managers to hold corporations to account – control most or all of the companies in any given industry, two harmful developments are likely.

### Corporate governance at risk of deteriorating

The first is a deterioration in corporate governance standards. Index funds are, in a way, forced holders of the shares they own. Except in extreme cases, they will not vote with their feet, nor can they threaten to seek control of a failing company as an activist investor would. At the same time, because their individual holdings represent only a small proportion of their total investments, passive investment groups have little incentive to be an active owner. All this serves to weaken corporate oversight and governance standards.

Several studies have found evidence of this in the form of excessive executive pay. Researchers have discovered that within industries where share ownership was concentrated among a few large investment groups – the biggest of which are passive – the weaker the link between executive pay and firm performance. Academics have also determined that, after controlling for a range of factors, the rise of passive ownership has been responsible for a tenfold rise in the pay of CEOs relative to other top company executives.[9]

Separately, the OECD, which has documented a steady decline in the number of shareholders that engage directly with company management over recent decades, has warned that the rise of passive funds could amplify that trend. Institutions in Asia have also been vocal about the threats index funds present for corporate governance. In a report published in 2016,[10] Japan's Government Pension Investment Fund berated passive fund managers for not carrying out their stewardship duties. It said active managers exerted more influence on company boards than their passive counterparts.

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9 *Common ownership, competition and top management incentives*; Anton, M., Ederer, F. Gine, M. Schmalz, M., Ross School of Business 2016

10 See http://www.gpif.go.jp/en/topics/pdf/20170203_report_of_stewardship_activities_2016.pdf

These concerns have been echoed by Hong Kong's financial regulator, whose chief executive Ashley Alder warned earlier this year that incentives for good governance could "wither away" if passive investors don't make a greater effort to hold executives to account.[11]

### Indexation, common ownership and the formation of oligopolies

Poor governance is not the only damaging side-effect of the indexation oligopoly. A second and more pernicious one is the erosion of competitive forces in the economy. A growing body of academic evidence shows that as large passive investment groups have accumulated bigger controlling stakes in firms, the ownership of those companies has become concentrated among a smaller number of shareholders.

For a large listed company in the US today, the probability that one of its largest shareholders also owns the stock of a rival is around 90 per cent. Twenty years ago, it was just 16 per cent.

### Common ownership erodes competition

This development, known as common ownership, is not good for competition. After all, the overriding objective among common owners is to extract maximum profit from the industry they control, not the individual firms they own.

As the OECD observes: "An institutional investor with shareholdings in a substantial share of the market... may be incentivised to discourage aggressive competition, either by exercising their shares' voting rights or by exerting more tacit influence.

"Similarly, firm managers may take into account common ownership interests in decisions about pricing, other competition parameters, cooperation (e.g. joint ventures) and acquisitions."[12]

Empirical studies show these fears are well-founded. Academics have discovered that in industries whose listed companies are controlled by a small group of (predominantly passive) shareholders, firms tend to compete less with one another, hurting consumers in the process.[13]

11 See http://www.sfc.hk/web/TC/files/ER/PDF/Speeches/AIA_20170313.pdf

12 See: http://www.oecd.org/daf/competition/common-ownership-and-its-impact-on-competition.htm

13 This was a key finding reported in *Common ownership, competition and top management incentives*, Anton M., Ederer, F., Gine, M., and Schmalz, M. Ross School of Business, 2016

In the US airline sector, in which the biggest firms are owned by the same large, primarily passive institutional money managers, competition among carriers has dwindled, leading to a rise in passenger air fares.[14]

A similar situation is unfolding in US banking. Here, researchers have established a strong link between the accumulation of bank shares by a small group of index fund groups and a rise in deposit account servicing fees.

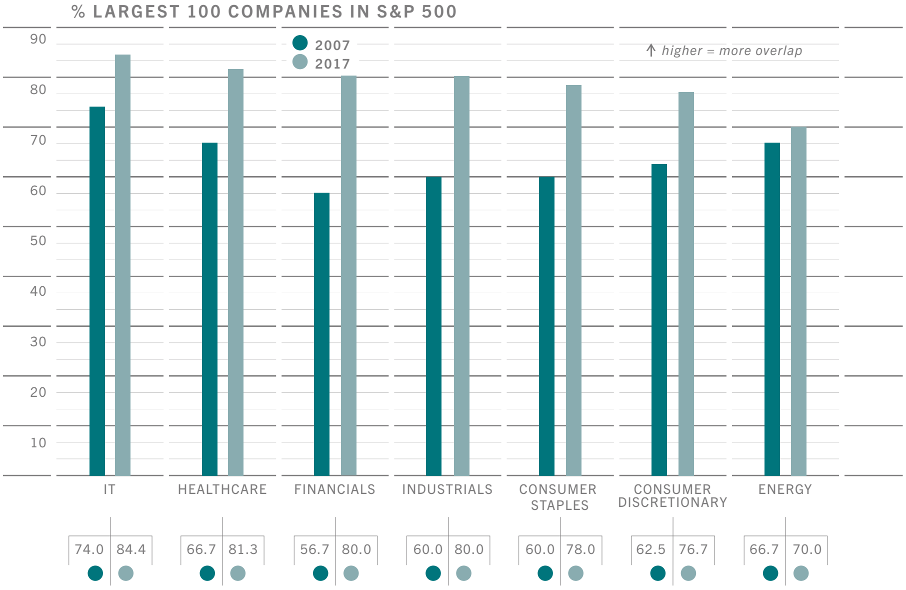
Our own analysis shows there are several industries that display the same ownership characteristics as airlines and banks. Using a metric we call the overlap ratio – which measures the extent to which individual companies within specific industries are controlled by the same institutional shareholders – we find that stock ownership has become more concentrated in almost every US industry in the past decade.[15] Concentration is most pronounced in information technology, healthcare, financials and industrials.

The connection between passive investing and common ownership manifests itself in other ways, too. In another analysis conducted by our strategists, we discover that larger-cap companies tend to exhibit higher levels of common ownership than smaller

Company ownership concentrated in the hands of the few

FIG.5

LEVEL OF CROSS-OWNERSHIP, BY INDUSTRY SECTOR, % LARGEST 100 COMPANIES IN S&P 500




Source: Bloomberg, Pictet Asset Management; data covering period 31.12.2007-30.09.2017.
Degree of concentration scaled from 0 to 100 for each sector.

14 An overview can be found in *Hidden Power of the Big Three? Passive index funds, re-concentration of corporate ownership and new financial risk*, Fichtner, J, Heemskerk, E, and Garcia-Bernardo, J, University of Amsterdam, Working Paper, October, 2016

15 This is a simplified version of the Hershmann-Herfindahl index of stock concentration. For a full explanation see page 20.

ones. That should not come as a surprise: passive equity funds in the US are primarily invested in large-cap stocks.[16]

Companies with fewer incentives to compete against one another naturally have fewer incentives to innovate, too. One study has found that, by accelerating common ownership, passive investing has been partly responsible for holding back business investment by some USD125 billion per year. That number, the researchers estimate, could rise to more than USD300 billion if passive vehicles end up controlling 50 per cent of all equities.[17]

## Rise of passive investing could speed up decline of competitive forces

The steady concentration of stock ownership comes at a critical point for the world economy. In fact, our analysis adds to a growing body of evidence chronicling a steady but persistent decline in competitive forces in corporate America over the past two decades. As many as three-quarters of industries in the US are more concentrated than they were at the end of the 1990s.

It's particularly worrying that this concentration of ownership has happened at a time when company formation is stalling across several industries. Over the past three years, the number of initial public share offerings in the US each year has fallen. In 2014, more than 300 US firms went public. In each of the three years since, fewer than 200 have done so. And with many more public firms opting to go private, the number of multinational companies listed on stock exchanges has more than halved in the past 20 years, from 7322 to just 3671.[18]

Set against this backdrop, the expansion of passive investing and the accompanying concentration of company ownership do not bode well for the functioning of the economy in future.

Passive dominance won't happen overnight, of course. It might be several years before the Big Three index-tracking powerhouses extend their influence outside the US. Yet, left unchecked, our analysis shows that the growth of indexing has the potential to further erode the competitive forces that underpin the market-based economy, one industry at a time.

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16 Currently, some USD3 trillion of the USD4 trillion of passively managedequities in the US are in S&P 500 index trackers. Source: Macro Risk Advisors, cited in Barron's, 1 August 2017; see http://www.barrons.com/articles/what-is-the-rise-of-passive-investing-doing-to-volatility-1501595758

17 *Declining competition and investment in the US*, Gutierrez, G, Philippon, T., New York University, 2017 https://www8.gsb.columbia.edu/faculty-research/sites/faculty-research/files/finance/Macro%20Lunch/IK_Comp_v1.pdf

18 *Declining competition and investment in the US*, Gutierrez, G, Philippon, T., New York University, 2017 https://www8.gsb.columbia.edu/faculty-research/sites/faculty-research/files/finance/Macro%20Lunch/IK_Comp_v1.pdf

# The overlap ratio – methodology

It is clear that the ownership of stocks has become more concentrated in at least a couple of respects. First, the largest shareholder groups in the world account for an increasing proportion of the total shareholder base.

Second, and perhaps of greater concern to anti-trust authorities, is higher cross-ownership within industry sectors. Various researchers have investigated this issue in particular sectors by calculating a modification of the Hershmann-Herfindahl index of concentration to reflect cross-ownership specifically (often referred to as the modified HH index).

We have constructed our own simpler illustration of cross-ownership, which we call the overlap ratio. We take the largest 100 companies in the S&P 500 Index and divide them into sectors. We then look at the top five shareholders for each company in the sector and calculate the extent of overlap.

We measured the concentration of stock ownership in any one industry along two dimensions – the proportion of equity held by the top five shareholders and the extent to which the same investors make up the top five. The ratio is calculated by dividing the total number of discrete shareholders that are the top five investors for every listed company in a sector by the total number of companies in the sector.

For instance, in an industry where there are five firms and only five total shareholders in the top 5, the degree of overlap would be the highest possible. Likewise, if there were twenty-five top 5 shareholders in total in this group, the overlap ratio would be the lowest possible.

# 3

## The passive giants and their tightening grip on index providers

## The passive giants and their tightening grip on index providers

In August 2017, The Economist published an article calling for greater scrutiny of the world's index providers.[19] Index-makers, the magazine argued, have acquired too much power. Not only has the indexation business become a cartel dominated by just three firms,[20] it said, but index providers' capital-shifting decisions were both subjective and, increasingly, at odds with market realities. More regulatory oversight was required.

At first glance, The Economist's case is a convincing one. The concentration of the indexation industry should indeed alarm regulators. Pronouncements on which countries or companies merit inclusion in – or exclusion from – market benchmarks can cause considerable ructions in the flow of international capital, affecting not only the prospects of companies but those of entire economies.

Yet, on deeper reflection, the authors' concerns were perhaps too narrowly targeted.

Index builders do not act of their own free will. Increasingly, they are influenced by the index-tracking powerhouses that purchase their products.

This shouldn't come as a surprise. Index construction firms generate revenue by licensing their indices to asset managers. In years gone by, those revenues were spread across a broad range of investment firms. But thanks to the increased heft of passive investment, that's no longer the case: the largest passive money managers now account for a far bigger percentage of index providers' fees.

That alters the balance of power. It gives the index user – rather than the provider – the ability to set the terms of engagement.

Given the trends unfolding elsewhere in the investment industry, this matters a lot. It points to a future in which the world's biggest investment groups not only control large swathes of the stock market but are also able to influence the composition of the very indices their products track.

But the large index fund providers are making inroads into indexation in more aggressive ways. Irked by the high fees they pay to use established benchmarks, they are edging towards self-indexing.

19 *Big Fingers*, The Economist, 25 August 2017

20 S&P Dow Jones, MSCI and FTSE Russell

Vanguard sowed the seeds of this trend more than five years ago when it replaced several of MSCI's indices with cheaper alternatives – a move which sent MSCI's shares tumbling by more than 25 per cent on the day the move was announced.

BlackRock has also removed Barclays indices from many of its passive fixed income funds, and has recently launched two ETFs that track its own range of "edge" indices.

Worryingly for the index makers, and possibly for the investment community as whole, the passive giants do not appear to have suffered commercially in dispensing with mainstream indices. Quite the opposite. Analysis from Bloomberg shows, for example, that BlackRock's family of fixed income ETFs have accumulated USD60 billion in assets since removing Barclays' benchmarks.

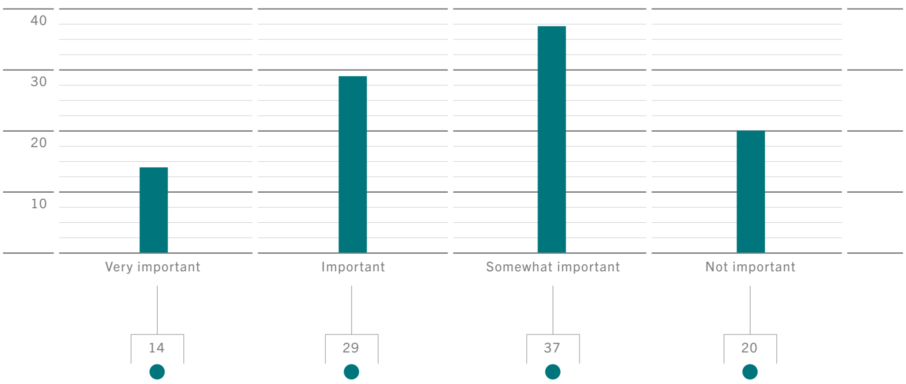
Also helping the Big Three gain the upper hand on index providers is the fact that financial advisers pay little heed to the index brand when selecting products to recommend to clients. Far more important, surveys have shown, is the brand behind the ETF itself.

So it would seem, then, that the big passive investment companies have it within their power to expand further into the indexation business. They also have a commercial incentive: cost. As Lyon

Most fund selectors not obviously swayed by index brand

FIG.6

% OF RESPONDENTS RATING IMPORTANCE OF INDEX BRAND IN CHOOSING ETFS




Source: Bloomberg, ETF.com

Blake, chief investment officer at State Street, the world's third largest passive manager, put it: "There's more pressure now than ever to consider something like self-indexing or other alternatives to keep costs lower".[21] But what might make sense to the biggest money managers might make less sense to the rest of the investment community, regulators included.

21 Financial Times, 24 May 2017

# Concluding remarks

It might be attractive to the individual investor, but passive equity investing is no panacea for the capital market's ills – perceived or otherwise. Perverse as it may seem, its continued expansion threatens to erode some of the underpinnings of the market-based economy.

There is already evidence that the economy is beginning to experience troubling side-effects in the form of inefficient capital allocation, poorer corporate governance and weaker innovation and competition.

So even if regulators and investment consultants are justified in their efforts to lower the cost of investing, this should not blind them to the systemic risks that are emerging as indexation tightens its grip on the capital markets.

Neither, we would argue, can investors.

If the investment community is to fulfil its duty as a guardian of the financial system, it will need to submit passive investing to much greater scrutiny. Paying due regard to the potential economic impact of the indexation wave could turn out to be as important to the investment decision-making process as environmental, social and governance considerations are today. None of this relieves the pressure on active managers to perform and offer better value to their clients. Nor does it deny the utility of passive investment. Index products offer several benefits to investors.

Nevertheless, while index-tracking appears to be an attractive, inexpensive investment option at first glance, deeper analysis suggests that, over the long run, its expansion could put economic sustainability at risk.

This is something investors should increasingly factor into their thinking as they assess the merits of index-tracking funds. Passive investing may be cheap, but could prove costly.

# Postcript: counter-arguments and rebuttals

Over the course of 2017, Pictet Asset Management has presented its observations concerning the side-effects of passive investing to numerous institutional investors, industry bodies and financial organisations.

Below we list the three most common counterarguments put to us during those discussions, and our rebuttals.

### Counterargument 1 Market's self-correction mechanism brings balance

If the rise of passive equity investing leads to widespread mispricing of listed assets, active investment managers will surely have more opportunities to generate excess returns. Their resulting commercial success will, in turn, prevent passive index-trackers from dominating the investment landscape.

**Rebuttal:** It is not clear that active managers will be in a position to fully exploit the anomalies arising from the expansion of indexing. The increase in index investing , academics have found, has led to an increase in trading costs, or more specifically, a widening in bid-ask spreads and a deterioration in market liquidity.[22]

This is problematic for actively managed funds, which tend to display a higher stock turnover than passive funds. Higher transaction costs will weigh disproportionately on the performance of active managers. Weaker managers will be at a particular disadvantage as their returns will not be high enough to offset higher transaction costs, potentially forcing them out of business.

As a consequence of higher transaction costs, the same ex-ante alpha results in a smaller ex-post (or net) alpha (i.e. alpha after transaction cost). In order to survive producing the same net alpha, active managers will need to spend more on stock research, to create a higher gross alpha, but for essentially the same net alpha after transaction costs. Put differently, for the same skill level the net alpha decreases.

22 *Is there a dark side to exchange-traded funds?* Israeli, D. Lee, C., Sridharan, S, 2016

This problem can only get worse, as more and more assets flow into index funds and as market liquidity deteriorates and bid-offer spreads widen further. In turn, the performance bar for active managers will ratchet higher. The surviving active money managers will be of higher quality in absolute terms, but on average will still only deliver index returns, given that the market index is an aggregation of all managers.

The notion of an "alpha eldorado" awaiting active managers stems from a misunderstanding of a key fact: alpha generation is a zero-sum game. This is particularly true in today's markets where over 90 per cent of trading volumes are generated by professional investors. Winners need losers, i.e. positive alpha generators need negative alpha generators to survive.

Having a smaller percentage of active managers in the markets will not change the nature of the zero-sum game. Higher transaction costs will reduce the average net alpha. And therefore the conclusion remains that active managers, after fees, will not find an alpha eldorado.

### Counterargument 2
### Indexation is a competitive marketplace

Competition within passive investing is alive and well – the expansion of factor-based indices and smart beta funds bears witness to the growing range of lower-cost investment options. This suggests you are exaggerating the influence of the Big Three passive ETF managers.

**Rebuttal:** The data we have analysed shows that the lion's share of investment into passive funds has flowed into vehicles tracking large-cap indices such as the S&P 500 index. Currently, some USD3 trillion of the USD4 trillion of passively managed equities in the US are in S&P 500 index trackers.[23] Furthermore, as we explain in part 2 of this paper, we have discovered a strong positive correlation between a company's market capitalisation and the narrowing of its shareholder base. Additionally, the mechanics of passive investing dictate that investments will continue to flow into the stocks of the very largest companies irrespective of their price.

23 Source: Macro Risk Advisors, cited in Barron's, 1 August 2017; see http://www.barrons.com/articles/what-is-the-rise-of-passive-investing-doing-to-volatility-1501595758

### Counterargument 3
### New investment opportunities

If listed companies excluded from mainstream benchmarks decide to go private, this shouldn't shrink investors' options. It will simply give rise to greater investment opportunities in the private sector.

**Rebuttal:** While it is plausible that any reduction in the availability of public assets will be offset by a corresponding rise in the range of private assets, investment in private equity can be prohibitively expensive for all but the most sophisticated investors. Performance and management fees are far higher than those for listed assets. Ironically, then, to the extent that passive investing leads to a reduction in the availability of listed assets, it could cause a rise in the aggregate cost of investing. Private assets are also less accessible for individual investors for regulatory reasons.

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