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Demystifying negative screens:

The full implications of ESG exclusions

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Demystifying negative screens: the full implications of ESG exclusions

Screening out investments that do not meet environmental, social or governance (ESG) criteria is superficially simple but fraught with practical challenges. Understanding the complexities and biases screens create before they are implemented and appropriately assessing performance afterward is crucial for investors. In this paper, we investigate the pitfalls when implementing different screens.

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Executive summary

Negative screens that sieve investments on environmental, social and governance grounds remain critical to many investors. One-tenth of the assets we manage exclude companies based on their involvement in controversial products or services. Widely-used broader definitions put the share of screened investments closer to one-fifth of all professionally managed assets[1]. And screening continues to grow, with assets subject to screening having increased by 16% annually over the last four years[2].

Of course, negative screening is only one aspect of sustainable investment, and serves a different purpose to activities such as integration and engagement. While the last two are designed to help investors reach better investment outcomes, exclusion policies reflect investors' choices to avoid activities they consider unpalatable. We firmly believe ESG integration and engagement, effectively implemented, can lead to better investment decisions. We recognise, however, that this is not the only concern for many investors, and so the practical considerations presented by screening almost certainly warrant more attention than they currently receive.

Even if decisions on screens are taken separately from investment analysis, it is vital to understand their effect on investment goals. Typically, this is discussed in terms of the impact of screening on historical performance, a rear-view focus that distracts from more important questions. History tells us there is no reason to expect exclusions to systematically reduce long-term returns. But by increasing volatility and inhibiting investment styles, choices over how exclusions are applied and defined can make it significantly harder for managers to execute certain strategies.

1 Global Sustainable Investment Review 2016, Global Sustainable Investment Alliance.

2 Global Sustainable Investment Review 2016 as above.

The chart in Figure 1 shows the extent to which typical negative exclusions constrain managers. Implementing screens may be mechanical, but assessing their impact on portfolios is a complex task.

In this paper we explore the role of screening, the activities typically targeted, the different ways that exclusions are defined, and their effects on investment strategies. Our aim is to help both those investors with exclusion policies already in place and those considering them to understand the options available and the full implications of their choices.

Screening remains very popular in general

As suggested, over 20% of globally invested assets exclude companies involved in controversial activities, a statistic that comes from the most recent Global Sustainable Investment Review[3] (Figure 2), while our own experience is not wildly dissimilar at 10%[4] (although our cluster munitions exclusions apply to all investments globally). And the role of screening continues to grow, with the global value of assets adopting screens rising at an annual rate of 16% for the last four years and the value of European excluded assets more than doubling since 2011[5] (Figure 3). While integration, engagement and other sustainable investment policies are quickly catching up, it is clear that negative screening remains a popular investor choice[6].

3 Global Sustainable Investment Review 2016, Global Sustainable Investment Alliance.

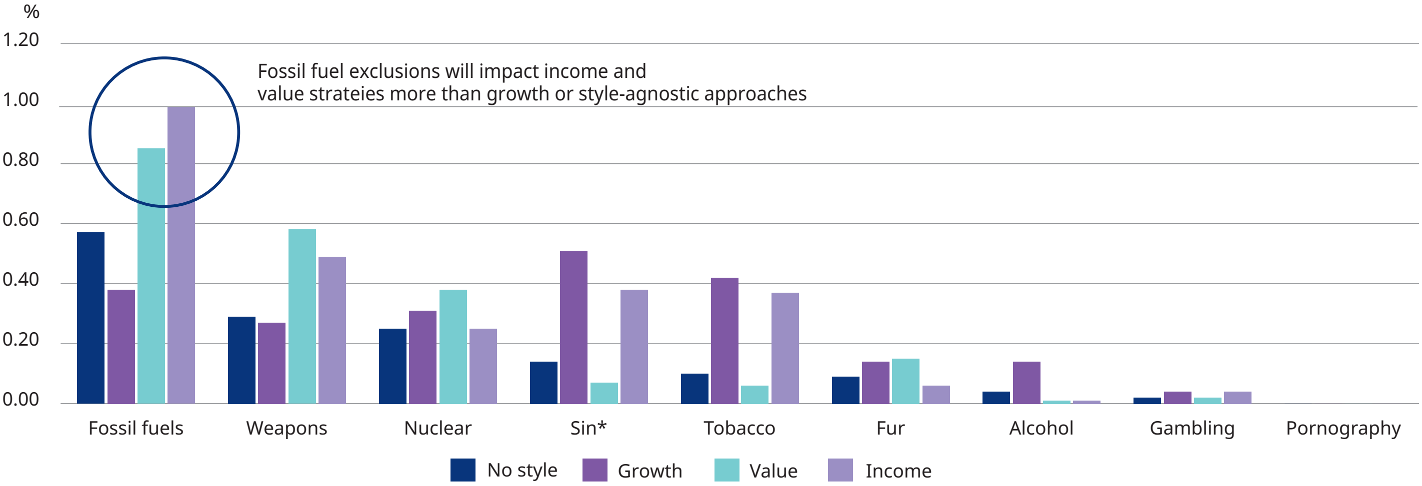
4 The criteria used by GSIA to determine exclusionary screening are unclear, but likely often include firm-wide exclusions, which we do not include in our assessment of client decisions.

5 Eurosif SRI Study 2016 (SRI stands for sustainable and responsible investment).

6 Global Sustainable Investment Review 2016, Global Sustainable Investment Alliance.

Figure 1: Different exclusions can have very different impacts on investment strategies

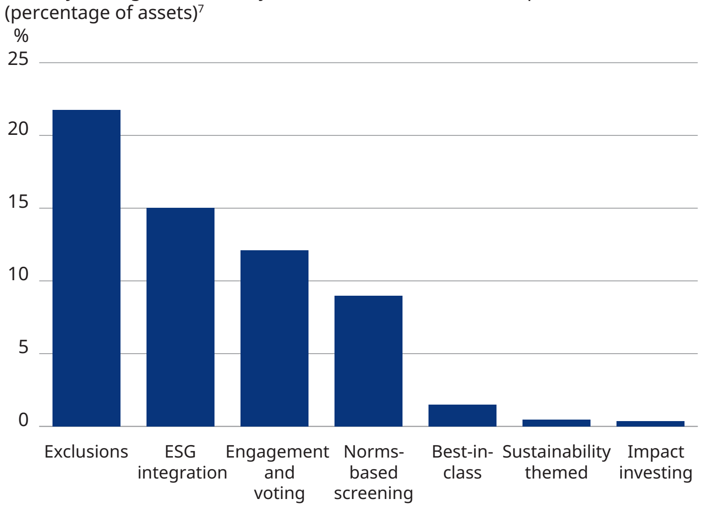
Tracking error of screened MSCI World Index and MSCI World style indices relative to the unconstrained MSCI World Index and MSCI World style indices over the last 20 years.



*Sin stocks include tobacco, alcohol, gambling and pornography. Exclusions for fossil fuels and all sin stocks are based on a 10% revenue exposure, as defined by MSCI. Exclusions for weapons, fur and nuclear are based on business involvement, as defined by MSCI. Strategy execution impact is represented by tracking error, calculated as the standard deviation of the differences between screened and unconstrained index returns. Style index based on MSCI style criteria and constituents. The 'no style' strategy represents the standard MSCI World Index. The value and growth strategies considered only those stocks included in the MSCI Global Value or Growth indices, respectively, and the income strategy considered only those stocks with a dividend yield greater than 4%. Index returns calculated using quarterly rebalancing of the MSCI World Index over the last 20 years, resulting in slight differences from the true performance of the index. Source: Datastream and Schroders, as at 30 June 2017.

Figure 2: Exclusions remain the most popular sustainable investment policy...

Globally managed assets subject to sustainable investment policies (percentage of assets)[7]

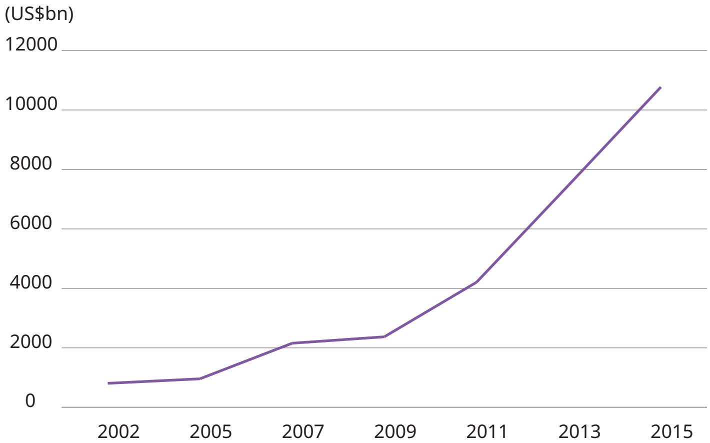


Source: Global Sustainable Investment Alliance (GSIA), 2016.

7 An overview of the different Sustainable Investment activities and terms is provided in our report: *Understanding sustainable investment and ESG terms* (Schroders, 2017).

Figure 3: ...which is reflected in the growth of assets subject to negative screening

European assets with screens



Source: Eurosif, 2016.

But some individual screens are more popular than others

The screens we apply for clients, like those used by the wider industry, typically focus on traditional "sin" industries, such as tobacco, gambling, alcohol, pornography, or those involved in the manufacture and sale of weapons (Figure 4). Yet exclusions are generally specific to individual clients and their values. For instance, Sharia-compliant funds exclude businesses selling or producing pork or those involved in lending. Similarly, attitudes toward nuclear power, animal testing and genetically modified organisms vary from strong support to high resistance. These opinions differ both regionally and nationally and are often reflected in the screens applied in different countries (Figure 5).

Our Global Investor Survey highlights changing attitudes towards negative screens

Much of this pressure to apply screens is coming from the ultimate beneficiaries of the investments themselves. In 2017, Schroders commissioned a global survey of around 20,000 individual investors to ask their views on sustainability in investment decisions, among other topics*. The results of the survey highlight the growing awareness of the role of companies in society, and the importance investors attach to aligning their financial decisions with their values.

*Schroders Global Investor Study 2017

Many see divestment as a mechanism to drive change in business strategies, activities and practices. Over 35% of respondents to our survey said they would or do invest in funds that exclude fossil fuels for positive societal impact (Figure 6). But while starving companies of capital may appear to be a powerful lever, we would argue that divestment offers only limited leverage as few of the industries targeted rely on equity capital to fund growth. Indeed, typically, they return a significant share of their earnings to investors. As a result, selling (or not buying) shares in the secondary market has limited impact on their funding, which is largely organic[8].

Other investors view – or justify – divestment on investment grounds. Just over 30% of respondents to our Global Investor Survey say they would avoid fossil fuels due to concerns over profitability. We consider this the least powerful reason to divest: while several industries targeted for exclusion have long-term structural liabilities, these are typically well understood and recognised in valuations.

8 "Stranded assets and the fossil fuel divestment campaign: what does divestment mean for the valuation of fossil fuel assets?", Atif Ansar, Ben Caldecott and James Tilbury, Stranded Assets Programme, University of Oxford Smith School of Enterprise and the Environment, 2013.

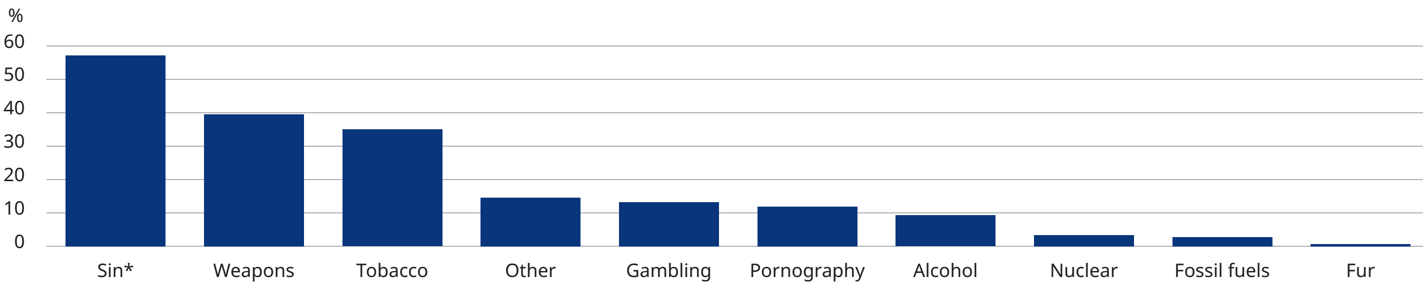
Interest in fossil fuel and tobacco divestment is rising

Despite these shifting attitudes, it is clear that opposition to particular business practices on ethical grounds and therefore an unwillingness to benefit financially from these activities remains the principal driver of negative screens. This sort of pressure to divest is only going to grow. Change.org, the non-profit-making online campaign platform, currently has 31 petitions on oil, gas and coal divestment seeking signatures and Google searches for divestment terms continue to rise, with interest in fossil fuels and tobacco particularly high (Figure 7).

While fossil fuel exclusions are currently small, high interest in this option means the value of screened assets is growing quickly from a low base. Rising concerns over climate change have driven dramatic divestment in oil, gas and coal, with globally screened assets more than doubling from $2.6 trillion to $5.4 trillion over the last two years (Figures 8 and 9).

Figure 4: "Sin" stocks and weapons dominate the screens we apply for clients...

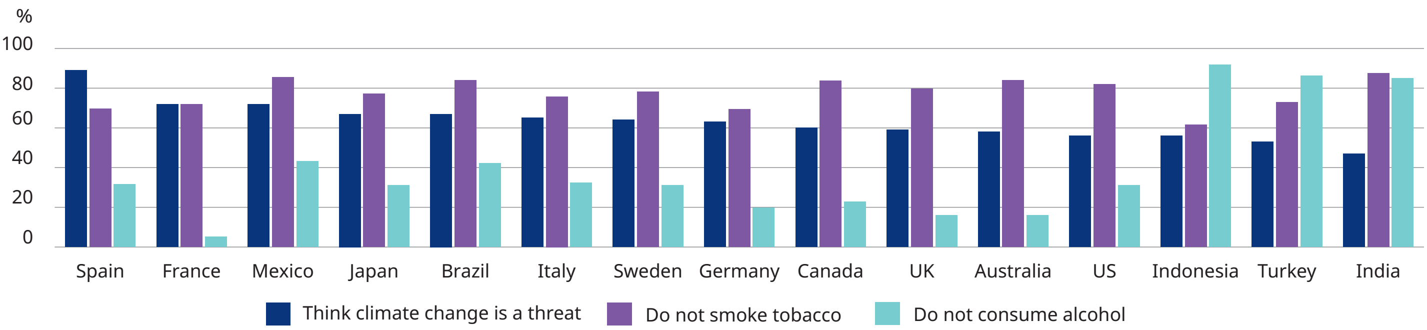
Percentage of negatively screened funds



*Sin stocks include tobacco, alcohol, gambling and pornography. Source: Schroders, 2017. Data as at 30 June 2017.

Figure 5: ...but consumer views and practices vary by country

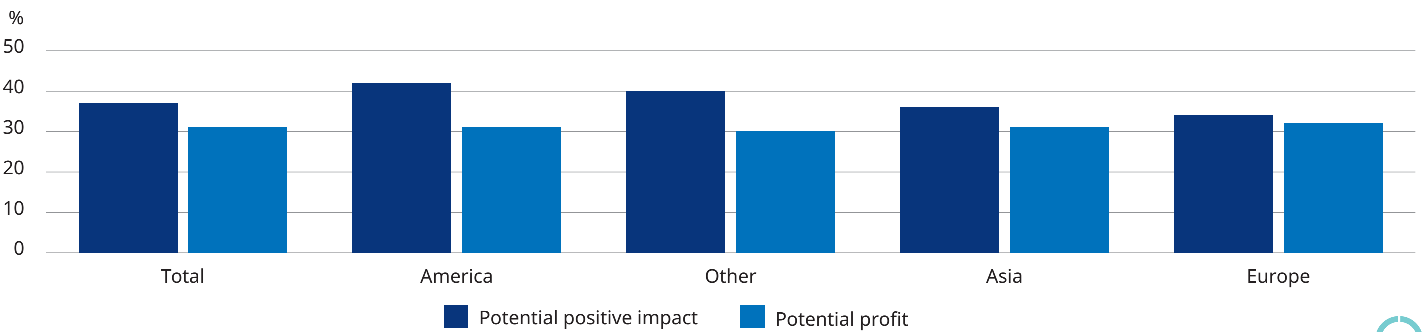
Percentage of consumers



Source: Leading Global Security Threats, Pew Research Center, 2017; Global Health Observatory Indicator Views, World Health Organisation, 2017; and Schroders, 2017.

Figure 6: Investors' decision to exclude fossil fuels seems to be more about morals than money

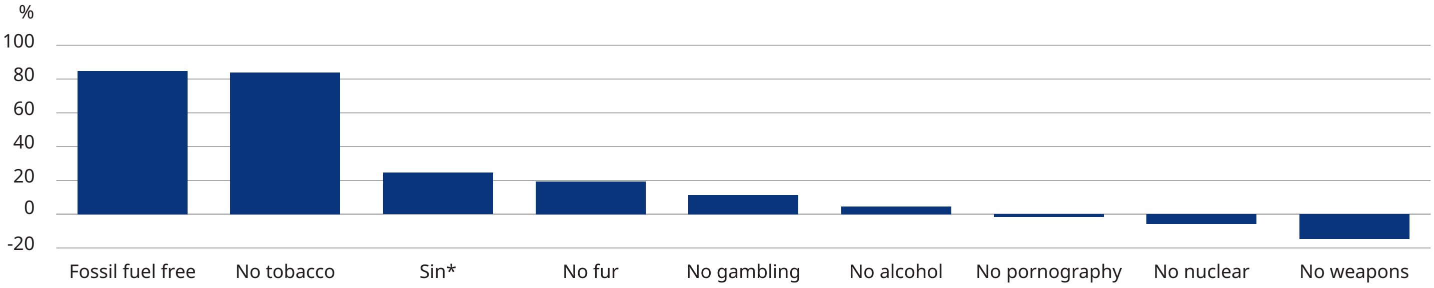
Reasons for investing in in fossil-fuel-free funds (percentage of respondents)



Source: Schroders, 2017.

Figure 7: Fossil fuels and tobacco seem to be the main preoccupations for divestment searchers on Google

Percentage change in Google search interest for different screens over the last five years



*The sin search takes the average of the tobacco, alcohol, gambling, and pornography searches.
Google search interest represents the yearly average search interest relative to the highest point for the given region and time. Source: Google and Schroders, 2017.

The size of asset owners restricting fossil fuel investments has been particularly noteworthy recently. Alongside universities and local governments, major financial institutions, such as Norges Bank Investment Bank, which runs Norway's government pension fund, and Allianz, the German insurance group, have also made commitments to divest (Figure 10).

On the other hand, tobacco divestment has been a longer-term trend, with high profile institutions like CalPERS (California Public Employees' Retirement System) having avoided companies associated with tobacco since 2000 (Figure 10). The growth in recent years has seen other large institutions lead the way, with insurers AXA and Aviva, plus a range of sovereign wealth funds and certain pure fund managers all choosing to divest. In total, around $4 billion of previously-held positions have been divested from tobacco companies in the last four years[9].

9 "Insurers join pension plans in filtering out tobacco stocks", Oliver Ralph, *The Financial Times*, 2017.

Figure 8: Religious, charitable and government investors have led the way in fossil fuel divestment...

Global fossil fuel divestment by asset owner (US$trn)*

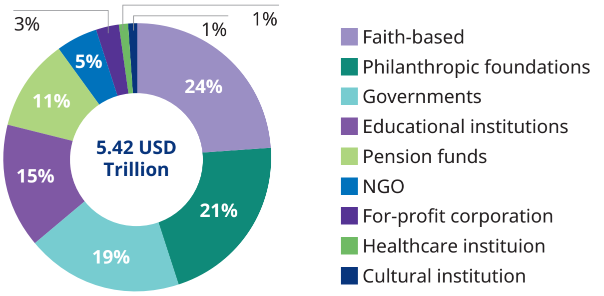
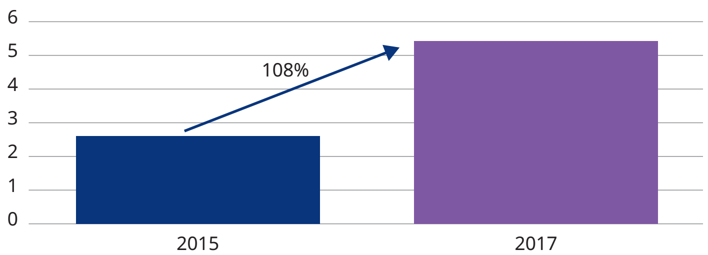


Figure 9: ...helping to double the amount of investment rejected

Change in fossil fuel divestment

(US$trn)



*The figures shown are based on the value of institutions' assets under management (AUM) that have made full or partial divestment commitments. Source: Fossil Free Divestment Commitments. Data from September 2015 and August 2017.

Figure 10: Selected major global asset owners are now applying a variety of different screens

Asset Owner	Exclusions	AUM (USD billion)*
Allianz	Coal, weapons	1968
AXA	Tobacco, fossil fuels	1265
Government Pension Fund Norway	Coal, nuclear weapons, tobacco, human rights, corruption	893
Kuwait Investment Authority	Gambling, alcohol	592
Aviva	Fossil fuels	556
CalPERS	Coal, tobacco, human rights	306
Malaysian Employee Provident Fund	Alcohol, gambling, adult entertainment, tobacco	170
AP7	Nuclear weapons, human rights	34

*Assets under management (AUM) shown represent the total AUM of the asset owner as at year end 2016. Asset owners may have divested fully or partially from the exclusions listed, and positions may have subsequently changed.

Concerns over the impact of businesses on societies are rising, as is investors' willingness to take action to reflect those concerns. The trend can be seen in the increasingly wide adoption of negative screening and divestment by large and influential asset owners.

Focusing narrowly on returns can be deeply misleading

The performance costs of screening tobacco have received a lot of attention recently. According to the London Business School and Credit Suisse, tobacco companies outperformed the wider US and UK markets by more than 3% annually between 1900 and 2014[10]. In the light of that, few would be surprised that, since the early 2000s, both CalPERS and the Norwegian Government Pension Fund have missed investment profits of $1.94 and $3 billion respectively from screening tobacco stocks[11].

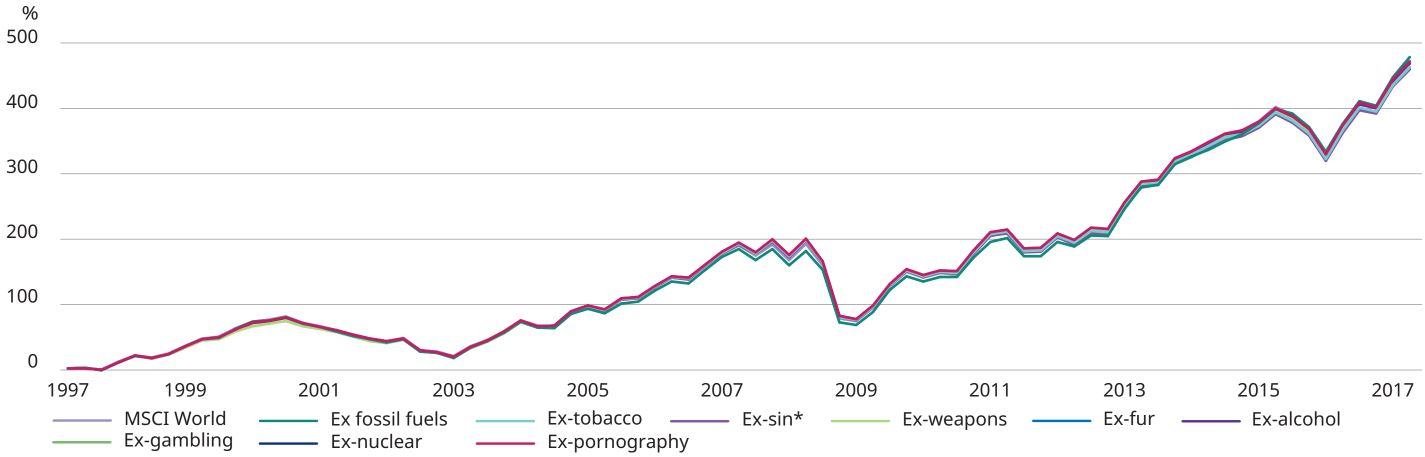
10 Credit Suisse Global Investment Returns Yearbook 2015
11 "Dumping tobacco cost Norwegian oil fund $1.9bn", *Financial Times*, 17 April 2016.

The former announced in 2016 that it was re-examining its exclusion policy, but ultimately decided to retain tobacco screens for its investments.

Anecdotal evidence like this is, however, not the best way to assess the performance of screens. Looked at in a wider context, exclusions do not have a huge impact on returns. For example, although tobacco companies have outperformed the MSCI World global benchmark by 87% over the last ten years, because the sector accounts for just 1.7% of the index, the difference between the standard and tobacco-free index is negligible. The same is true for fossil fuels, where, despite the fact that recent market weakness has been driving sector underperformance, the impact on the index of exclusions is small. Across the spectrum of common exclusions, screening makes only a small difference to long-run returns (Figure 11).

Figure 11: Screens make only a minimal difference to long-run index performance...

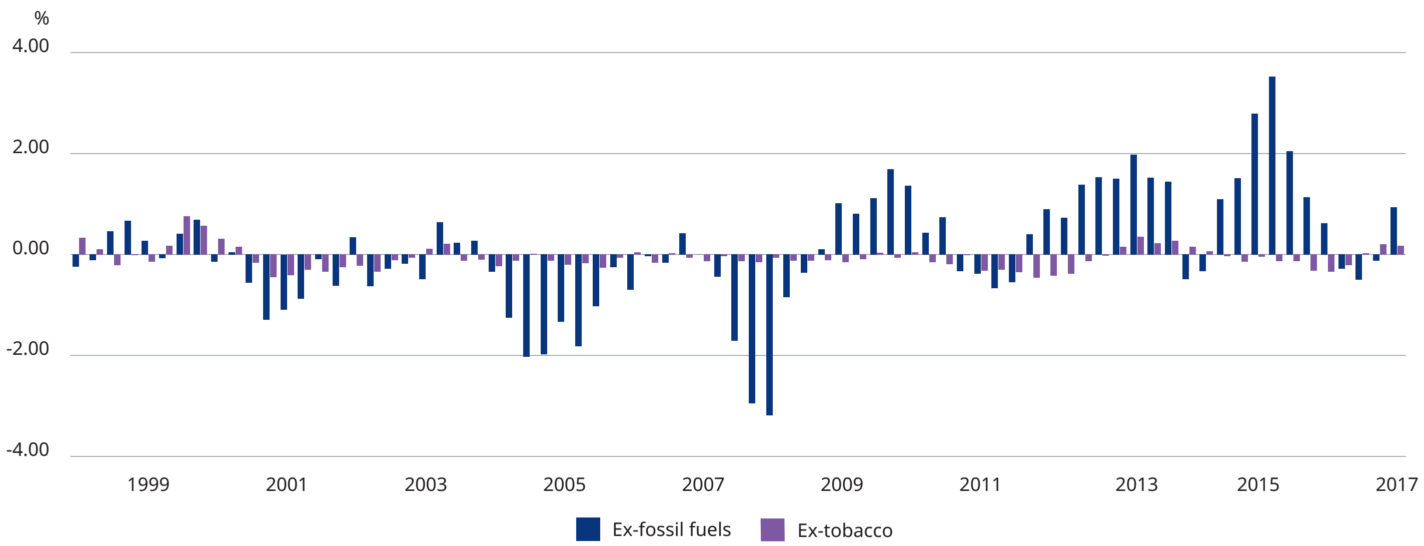
Cumulative return of MSCI World Index with different screens applied



*Sin stocks include tobacco, alcohol, gambling and pornography. Exclusions for fossil fuels and all sin stocks are based on 10% revenue cut off, as defined by MSCI. Exclusions for weapons, fur and nuclear are based on business involvement, as defined by MSCI. Index returns calculated using quarterly rebalancing of the MSCI World Index over the last 20 years, resulting in slight differences from the true performance of the index. Past performance is not a reliable indicator of future results, prices of shares and the income from them may fall as well as rise and investors may not get the amount originally invested. Source: Datastream and Schroders, 2017, as at 30 June 2017.

Figure 12: ...but can have a substantial impact over shorter periods of time

One-year rolling return of MSCI World Index with tobacco and fossil fuel screens relative to the unconstrained benchmark



Exclusions for fossil fuels and tobacco are based on 10% revenue cut off, as defined by MSCI. Index returns calculated using quarterly snapshots of the MSCI World Index over the last 20 years, resulting in slight differences from the true performance of the index. Past performance is not a reliable indicator of future results, prices of shares and the income from them may fall as well as rise and investors may not get the amount originally invested. Source: Datastream and Schroders, 2017, as at 30 June 2017.

Importantly, while the long-term performance impact of exclusions is usually minimal, more substantial variation can exist over short periods of time. Different screens can exhibit periods of materially stronger or weaker performance relative to the standard benchmark, depending on the market environment (Figure 12).

The effects of screens on short-term performance reflect their sensitivity to the macroeconomic factors which drive returns. Our proprietary risk analysis tool, PRISM, sheds some light on the conditions under which different screens are likely to perform well or badly[12]. The chart in Figure 13 shows the expected influence of a variety of market factors on the performance of the MSCI World Index with a number of popular screens applied.

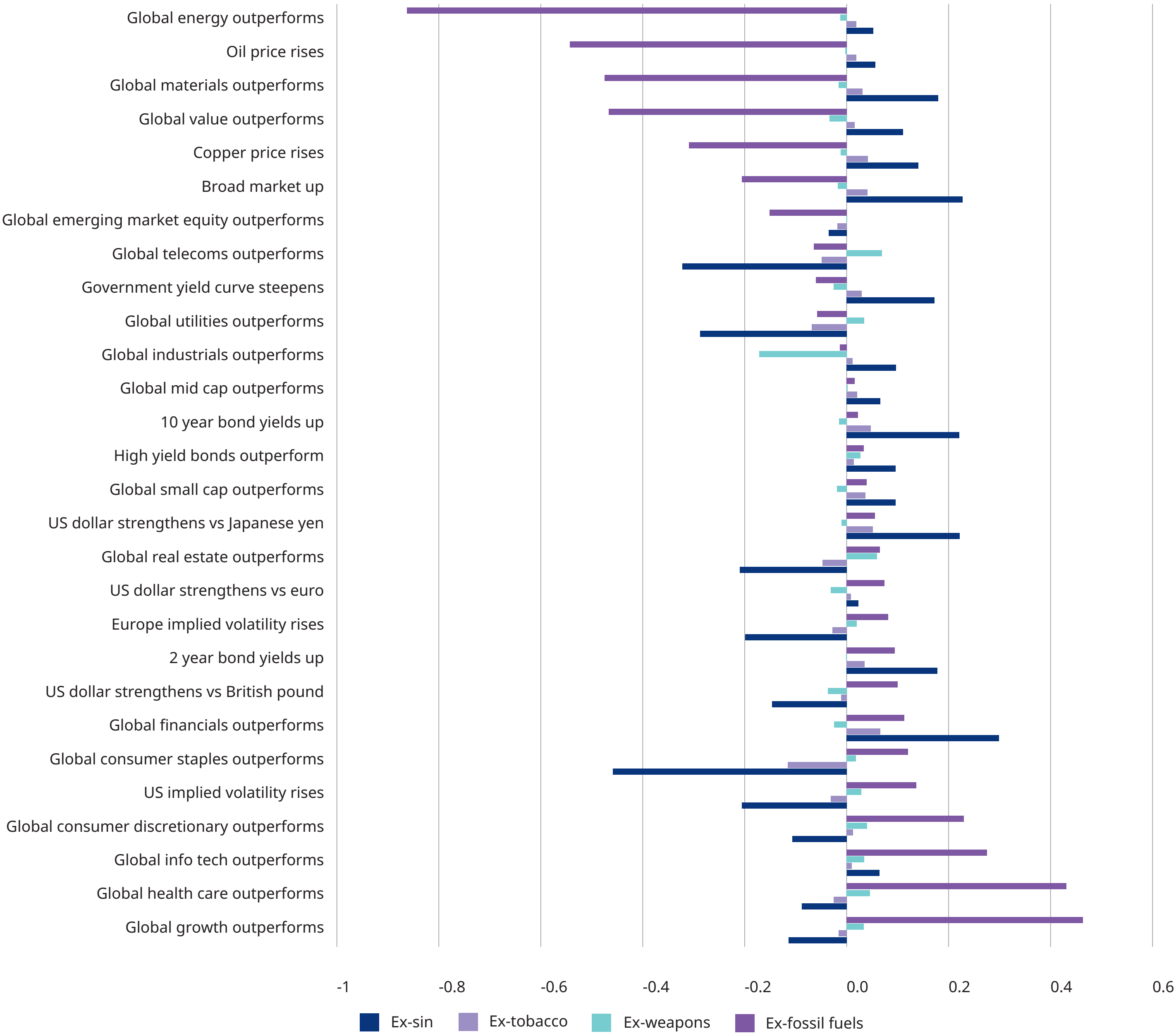
12 PRISM uses statistical analysis to assess the relationship between a range of macro factors and equity market returns.

Screens that remove more of the investible universe generally exhibit bigger performance effects. For example, strong energy sector returns will, not surprisingly, lead funds that exclude fossil fuels to underperform, but, less obviously, higher bond yields are associated with underperformance by funds which screen out "sin" stocks. These influences typically have limited persistent impact, but in the short term they can be significant.

This potential for short-term variation means it is vital to dissect portfolio performance into those elements attributable to the shrunken universe from which securities are drawn, and those related to managers' skills in drawing from that universe. If screens result in a significant difference between the performance of the investible universe and the fund benchmark, recognising that impact is especially important in assessing managers' performance.

Figure 13: Different market factors affect the screened universe in very different ways

Predicted return of screened MSCI World Index after a one standard deviation move in the listed factors, relative to the unconstrained MSCI World Index



*Sin stocks include tobacco, alcohol, gambling and pornography. Exclusions for fossil fuels and all sin stocks are based on 10% revenue cut off, as defined by MSCI. Exclusions for weapons, fur and nuclear are based on business involvement, as defined by MSCI. Past performance is not a reliable indicator of future results, prices of shares and the income from them may fall as well as rise and investors may not get the amount originally invested. Source: Schroders, as at 30 June 2017.

In principle, creating bespoke benchmarks which also exclude screened companies offers a solution, but the complexities of doing so generally undermine their value. Rather, we believe investors are better served by recognising the likely impacts of screens on short-term performance before embarking on a chosen screening strategy, and then considering these effects when evaluating their managers.

Screens can have a heavy impact on specific investment strategies

Although most screens have little impact on long-term performance, they can still place severe constraints on investors' ability to execute their investment strategies. This challenge applies to both active strategies and passive factor strategies.

The difficulties are greatest where the tracking error – a measure of the discrepancy between the benchmark performance and screened universe performance[13] – is largest. The tracking error is typically big when large proportions of the benchmark are removed, or when the excluded stocks are more volatile. Although often used to gauge how closely index funds track their benchmarks, this measure can also be used as an indication of the constraints imposed on managers.

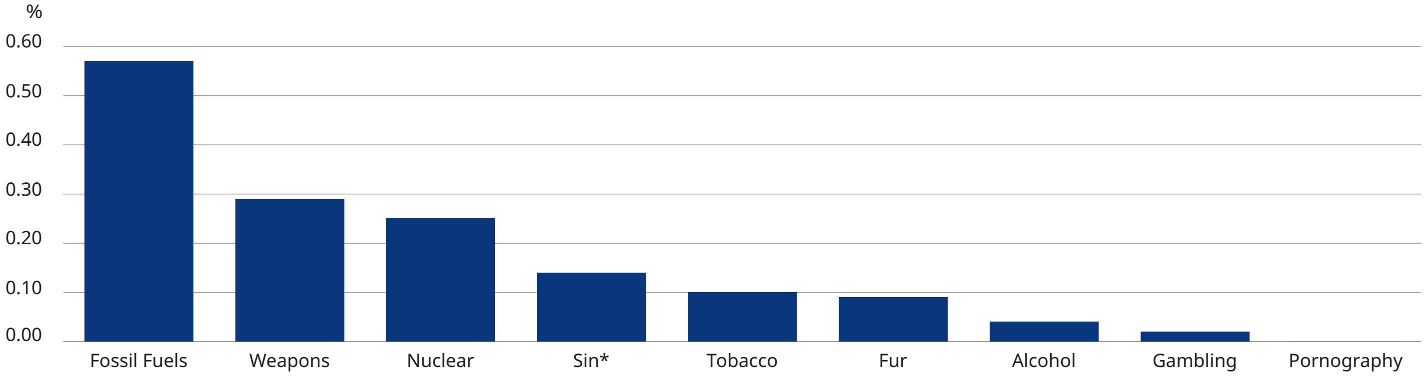
The tracking errors of the screened MSCI World Index against the unconstrained benchmark over the last 20 years show large differences (Figure 14). Variation for fossil fuels, weapons and nuclear screens are particularly high, owing to the weight of companies removed from the benchmark. Higher tracking errors imply managers will face greater challenges when constructing portfolios and executing strategies. This is principally due to the reduced size of the available investment universe from which companies can be selected.

The effect of screens on specific investment strategies can be even more pronounced. For example, insofar as tobacco companies and utilities typically pay sizeable dividends, income funds will be more disrupted by their exclusion than broad market funds. Although determining exclusion policies and selecting investment products are separate questions with different goals – and often performed by different arms of the same organisation – the effect of the first on the second can be important.

13 Tracking error is calculated as the standard deviation of the differences between the screened universe and unconstrained index returns.

Figure 14: The performance of a screened universe can differ substantially from the benchmark

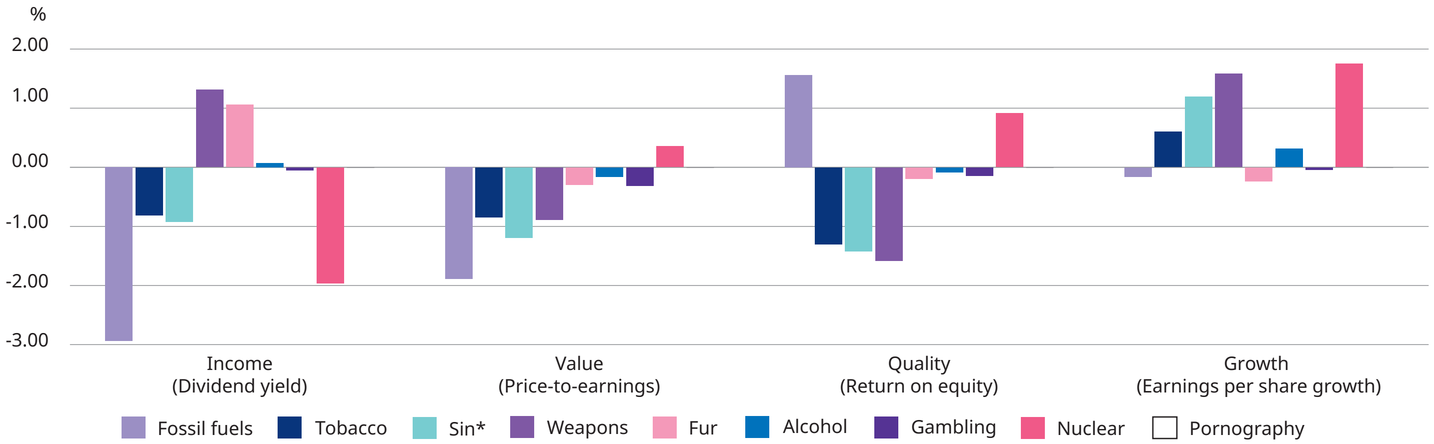
Tracking error of screened MSCI World Index relative to the unconstrained benchmark over the last 20 years



*Sin stocks include tobacco, alcohol, gambling and pornography. Exclusions for fossil fuels and all sin stocks are based on 10% revenue cut off, as defined by MSCI. Exclusions for weapons, fur and nuclear are based on business involvement, as defined by MSCI. Index returns calculated using quarterly rebalancing of the MSCI World Index over the last 20 years, resulting in slight differences from the true performance of the index. Past performance is not a reliable indicator of future results, prices of shares and the income from them may fall as well as rise and investors may not get the amount originally invested. Source: Datastream and Schroders, as at 30 June 2017.

Figure 15: Screens can have a big impact on the characteristics of the investible universe

Percentage change in average quarterly financial ratios of screened MSCI World Index over the latest 15 years



*Sin stocks include tobacco, alcohol, gambling and pornography. Exclusions for fossil fuels and all sin stocks are based on 10% revenue cut off, as defined by MSCI. Exclusions for weapons, fur and nuclear are based on business involvement, as defined by MSCI. Source: Datastream and Schroders, as at 30 June 2017.

The chart in Figure 15 shows the percentage change in various average quarterly financial ratios of the MSCI World Index when different exclusions are applied over the latest 15-year period. While the fossil fuel screen substantially reduced the average quarterly dividend yield of the index, weapons exclusion caused the yield to increase. Compounded over time, these quarterly adjustments will materially affect the ability of managers to achieve their income targets.

These effects will clearly create actual and potential constraints on managers. The chart in Figure 16 looks at the tracking error impact of common screens on growth, value and income strategies over the last 20 years using MSCI style criteria and constituents[14]. We recognise that individual managers have different approaches to each of these styles that may vary significantly from MSCI's. Higher tracking error impacts reflect greater constraints on managers' abilities to execute their chosen strategy.

14 The value and growth strategies in the chart included only those stocks in the MSCI Global Value or Growth Indexes, respectively, while the income strategy included only those stocks with a dividend yield greater than 4%. Screens were then applied to each of these indexes to examine the relative effects of exclusions on each strategy.

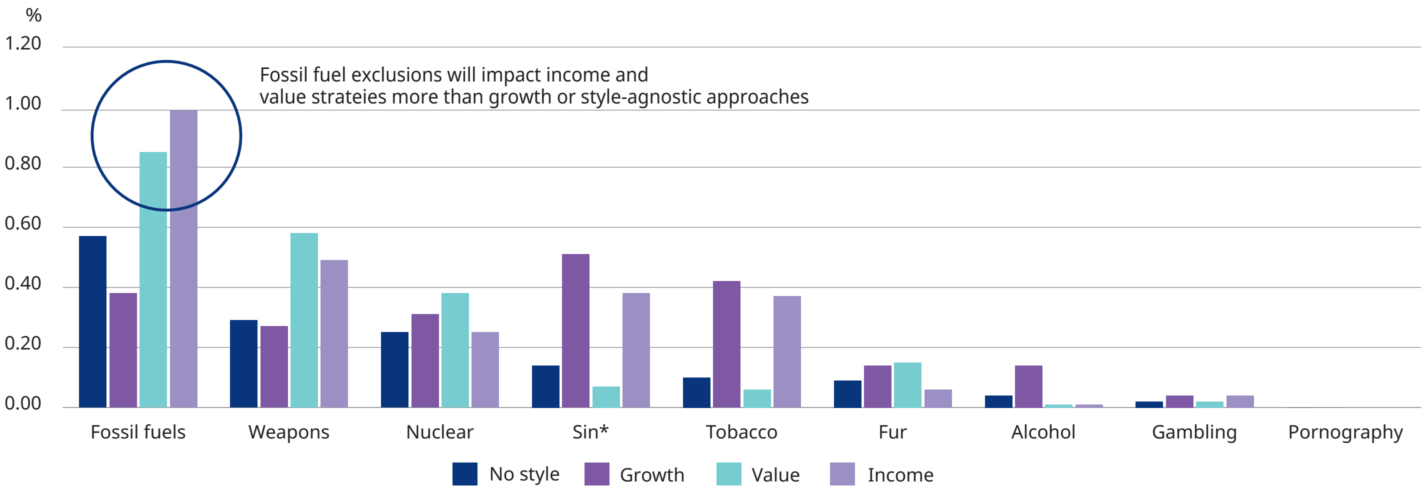
The analysis highlights the markedly different effects of screens on different investment styles. For example, the tracking error impact of fossil fuel screening is twice as large on value strategies as on growth, reflecting the relatively low multiples on which much of the fossil fuel sector currently trades. The effect on income strategies is even more pronounced, due to the high dividends paid out by the sector.

The impact of a sin screen over the last 20 years highlights a similar point. While the tracking error effect of a sin screen on growth and income strategies is higher than the effect on the full MSCI World index with no style applied, the effect is slightly lower when the screen is applied to value strategies. Similar variation in tracking error impact – and the associated strategy execution constraints – can be seen across the range of screens examined. It is typically greatest when large proportions of the benchmark are removed, or when the excluded stocks are particularly influential.

Geographic boundaries also have important implications. We have used the broad MSCI World Index in this paper, reflecting the impact of screens on global markets. Applying exclusions to narrower, local markets can exacerbate the effects. For example, large cap UK strategies are limited to around 100 stocks. Companies exposed to

Figure 16: Different screens can have very different impacts on different investment strategies

Tracking error of screened MSCI World Index and MSCI World style indices relative to the unconstrained MSCI World Index and MSCI World style indices over the last 20 years.



Percentage of respective MSCI World style index removed when applying typical screens

Strategy	Fossil fuels	Weapons	Nuclear	Sin*	Tobacco	Fur	Alcohol	Gambling	Pornography
No style	8.9%	7.1%	7,6%	3.6%	1.7%	3.0%	1.2%	0.4%	0.0%
Growth	1.7%	3.5%	2.7%	2.5%	0.9%	2.5%	1.0%	0.3%	0.0%
Value	6.3%	3.1%	4.4%	0.9%	0.7%	0.5%	0.1%	0.1%	0.0%
Income	2.4%	0.4%	1.1%	0.7%	0.5%	0.1%	0.1%	0.1%	0.0%

*Sin stocks include tobacco, alcohol, gambling and pornography. Exclusions for fossil fuels and all sin stocks are based on 10% revenue cut off, as defined by MSCI. Exclusions for weapons, fur and nuclear are based on business involvement, as defined by MSCI. Style index based on MSCI style criteria and constituents. The 'no style' strategy represents the standard MSCI World Index. Index returns calculated using quarterly rebalancing of the MSCI World Index over the last 20 years, resulting in slight differences from the true performance of the index. Percentage of index removed based on index as at 30 June 2017. Source: Datastream and Schroders, as at 30/06/2017.

fossil fuels represent 14% of that market, but 28% of the income stocks in the FTSE 100 Index, a far higher proportion than for a typical, more diversified index. This presents sizeable challenges to UK income managers applying fossil fuel restrictions.

It is clear that screens can have a significant impact on managers' abilities to execute the specific strategies for which they are selected. Understanding how chosen exclusions align with and affect these wider investment goals before screening decisions are made is therefore essential.

Details matter when implementing screens

The analysis in this report describes the impacts of screening in abstract terms using standard criteria. In reality, there are many ways to translate exclusion principles into the objective rules required for rigorous implementation. At the sharp end of implementing and maintaining screens it is clear that discrepancies in the specific criteria used for apparently similar exclusion policies can result in very different exclusion lists. A careful and thoughtful approach to screen definitions, and an understanding of their different implications, is therefore vital. Some investors have developed their own exclusion lists, but most turn to managers to help translate investment beliefs and policies into concrete exclusion rules. In general, there are two approaches to implementing exclusions:

1. **Industry classification** – Defining exclusions based on companies' sector classification provides a comprehensive, consistent and straightforward approach, but lacks flexibility and can miss companies with diverse business portfolios.
2. **Company exposures** – Focusing on companies' actual exposures to specific activities, using share of revenues for instance, provides a more granular view. Defining screens according to the share of company revenues from specific activities captures companies whose portfolios span a range of markets, but on the other hand puts a heavy reliance on third party organisations – whether financial, like MSCI and Bloomberg, or specialists in sustainability, like Vigeo Eiris – to provide accurate and comprehensive analysis.

Industry classifications are binary, black and white criteria where the key consideration is the sectors to be included. Company exposures are more nuanced. Decisions over how to treat companies with only a marginal exposure to an activity or those that are indirectly exposed through associated industries (such as retailers of harmful products) create a long list of choices and outcomes.

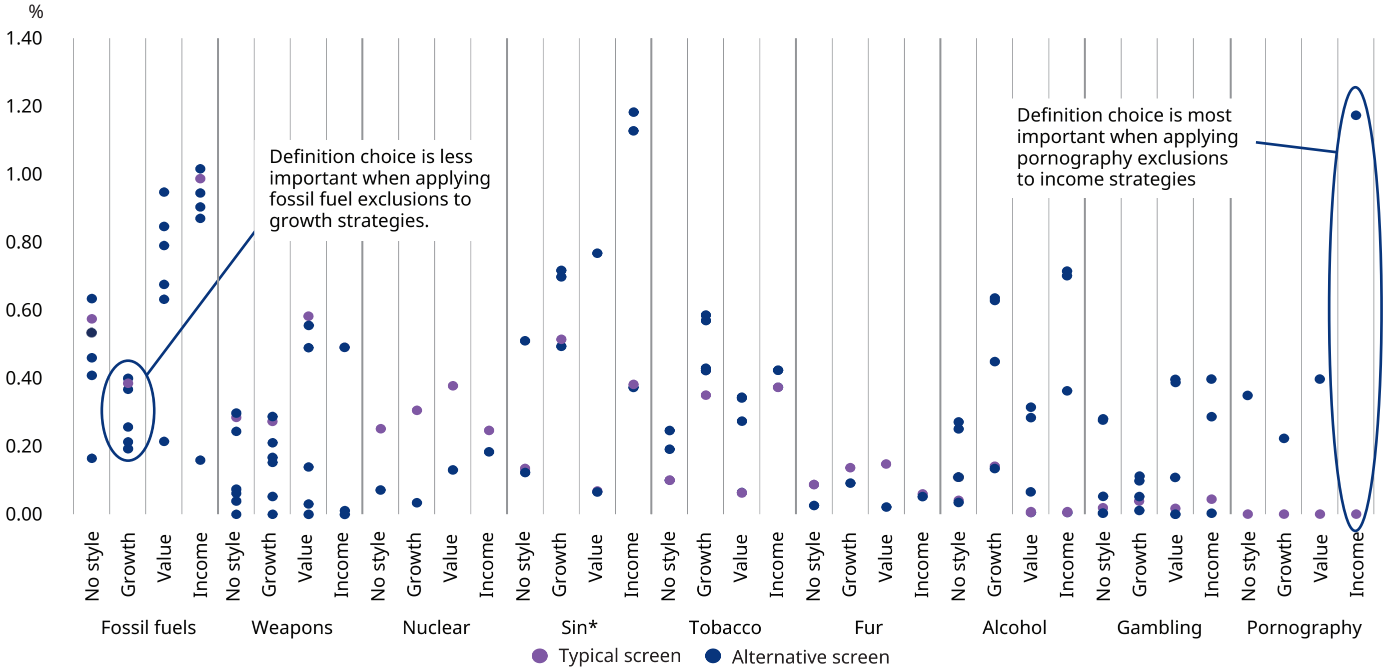
For example, screening weapons companies on the basis of any revenue they receive from weapons-related activities will result in auto manufacturers being excluded through their provision of engines for military trucks. Similarly, pornography screens can reject telecommunication companies due to their fractional income from streaming. Higher thresholds mitigate against unintended outcomes, but also dilute the strength of the exclusions. We typically consider exposure levels of around 5-10% of sales as being appropriate, although the final level must ultimately reflect investors' own inclinations.

Screen definition decisions can significantly alter exclusion lists and investment results

These definitional decisions are not trivial. They can significantly alter the size and nature of any exclusion list. An MSCI tobacco screen that excludes companies with any tie to the sector removes 111 companies from the MSCI World

Figure 17: The sensitivity of definition choice depends on the screen and strategy adopted

Range of 20-year tracking errors of MSCI World Index and MSCI World style indices resulting from different screen definitions relative to the unconstrained benchmarks.



*Sin stocks include tobacco, alcohol, gambling and pornography. Typical screens for fossil fuels and all sin stocks are based on 10% revenue cut off, as defined by MSCI. Typical screens for weapons, fur and nuclear are based on business involvement, as defined by MSCI. The alternative screen definitions used are shown in the appendix. Style indices based on MSCI style criteria and constituents. The 'no style' strategy represents the standard MSCI World Index. Index returns calculated using quarterly rebalancing of the MSCI World Index over the last 20 years, resulting in slight differences from the true performance of the index. Source: Datastream and Schroders, as at 30 June 2017.

Index, whereas a screen based on a GICS[15] classification expels just six. By the same token, an MSCI screen for companies generating any revenues from fossil fuels excludes 182 companies, while a GICS screen excludes only 111.

Just as different screens affect the ability of mangers to execute strategies in varying ways, so too do different screen definitions. For example, while the average quarterly dividend yield for the MSCI World index over the last 15 years reduces by 3.5% when excluding companies exposed to any revenue from fossil fuels, it reduces by just 0.15% when only restricting companies with revenues from coal.

The chart in Figure 17 shows the range of tracking error impacts on strategies as a result of different screen definitions. The wider the range of tracking errors, the more sensitive the screen is to definitional choice. For example, the choice of definition is particularly important when applying pornography exclusions to an income strategy. On the other hand, fossil fuel definitions make very little difference when searching for growth stocks.

Different data providers can produce very different exclusion lists

Screening relies heavily on a handful of information sources from independent firms. At Schroders, we use a wide range of sources, including MSCI, Vigeo Eiris and Bloomberg, as well as more focused analyses, such as those from Carbon Underground, a sustainable agriculture group. It is important to recognise differences in the assessments made by these organisations.

The charts below show how, for a number of identical or closely related criteria, two widely-used ESG data providers offer very different exclusion lists. A large proportion of this difference can be explained by coverage, with certain providers offering data and analysis on a wider set of companies than others. In Figure 18, the universe covered by Provider A is 3,300 companies, whereas Provider B covers 8,425. But even allowing for the fact that much of the variation in exclusion lists is caused by differences in the number of companies covered by each provider, there were often large disparities among the precise companies excluded by each when only considering the 2,851 companies commonly covered by both. This is reflected in the exclusion consistency of the different screens[16] (Figure 19).

15 Global Industry Classification Standard, developed by MSCI and Standard & Poor's.

Fur exposure provides a good example. While one provider excludes 120 companies, the other excludes just 47. Moreover, despite the well-defined nature of the screen, with both providers aiming to exclude companies involved in the manufacture or sale of fur products, only 28% of all companies screened were common to both. One provider excludes Walmart, the other eBay.

Although the criteria for a screen may be concretely worded, the "answers" each firm provides invariably rely on judgement. There is no shortcut to experience and familiarity with the strengths, weaknesses and suitability of different information sources. Clients should ensure managers are aware of these intricacies.

Active management can add more value than passive when applying screens

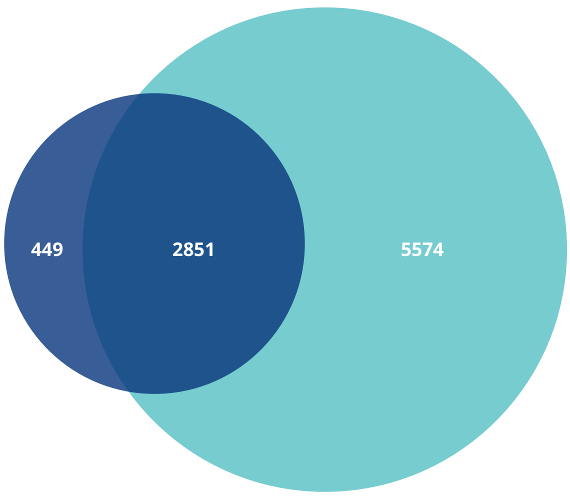
The issues raised in this report apply to both passive index and factor strategies, on the one hand, and actively managed funds, on the other. With the former a screen will alter the index; with the latter the investible universe from which managers make selections is curtailed.

While passive strategies have no levers available to them to mitigate the impact of a chosen screen, active managers are better able to adapt (Figure 20 on next page). Consider fossil fuels as an example. We have shown that excluding fossil fuels puts pressure on both value and income-focused strategies, as it reduces the range of investible high-yielding and value stocks. Passive products cannot offset the negative effects of these exclusions on the dividend yield from their portfolio.

16 Exclusion consistency reflects the percentage of companies commonly covered by two providers that were excluded by both providers.

Figure 18: Different data providers have very different company coverages...

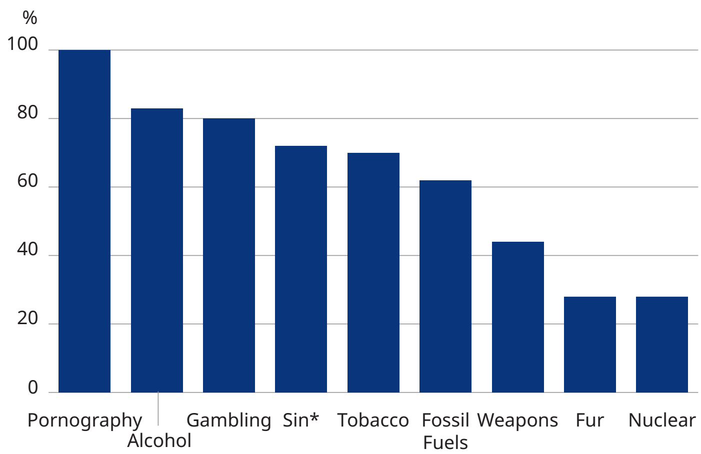
Total universe of companies covered by two different data providers



Source: anonymous data providers and Schroders, as at 17 November 2017.

Figure 19 ...and can reach very different conclusions about the companies they commonly cover

Percentage of commonly covered companies excluded by both providers for different screens



*Sin stocks include tobacco, alcohol, gambling and pornography. Exclusions for fossil fuels and all sin stocks are based on 10% revenue cut off. Exclusions for weapons, fur and nuclear are based on business involvement. Source: anonymous data providers and Schroders, as at 17 November 2017.

Active managers have more flexibility. They can look for other high-yielding and value-style stocks with similar financial profiles to mitigate the biases introduced by the screen. Active managers are also better placed to refine screening criteria to more accurately reflect investors' goals – for example, the choice between fossil fuel revenues and reserves.

Screening is superficially simple, but actually fraught with practical challenges. Understanding the complexities and biases screens create before they are implemented and appropriately assessing performance afterwards is critical. A manager who can recognise the pitfalls and help the investor define the most appropriate screen is essential.

Figure 20: Decisions made throughout the screening process can significantly impact investment outcomes

Screen selection is the first stage of the screening process. There are **three main reasons** for adopting a particular screen: (1) ethical values and stakeholder pressure; (2) encouraging change; and (3) potential profit. The first is most suited to the use of screens, while engagement and ESG integration are often more effective for the other two.

Fossil fuels | **Tobacco** | **Sin** | **Weapons** | **Fur** | **Alcohol** | **Gambling** | **Nuclear** | **Pornography**

A key decision with any investment is the **choice between active and passive management.** This choice is particularly important when applying exclusions for two interconnected reasons:
(1) **the flexibility** available when applying a screen and (2) **the potential investment effects.**

Passive ETF* index

If opting for passive, the choice of investment is **restricted to indexes** applying the chosen screen – e.g. MSCI World ex Tobacco. It is hard to alter the screen or style, so the excluded holdings cannot be replaced to offset any negative effects.

Performance determined by the screen

Actively managed fund

With unique actively managed funds, the investor can **refine the screen definition to more accurately reflect their investment goals – e.g. fossil fuel revenue vs reserves.** Analysis of the strategies best suited to the screen under varying market conditions is also possible, helping investors to **find the optimal investment style** for their chosen screen – **e.g. value vs growth.**

Growth | **Value** | **Income**

GICS | **% Revenue** | **Any tie**

If a screen will likely inhibit the ability of investors to meet their end investment goals – e.g. to exclude fossil fuels but also to generate high income – it is possible for **active managers to offset downside effects – e.g. by buying non-fossil fuel firms with similar income-yielding effects.**

Performance determined by the screen and the manager's ability to counteract any ill effects

*Exchange-traded fund. Source: Schroders, 2017.

Appendix: A close look at different screening options

Alcohol

Alcohol screens can be defined by sector classification, industry involvement or revenue exposure. Sector classification typically uses the Brewers and Distillers & Vintners GICS classifications. While these classification screens exclude most companies involved with alcohol, they often fail to exclude more diversified beverage manufacturers. The screen can capture any activity or only those companies involved in production or supply. The "any activity" screen will exclude diversified retailers, but revenue thresholds can be set to avoid this result.

9%
% of screened Schroders funds

5%
Growth in Google search interest

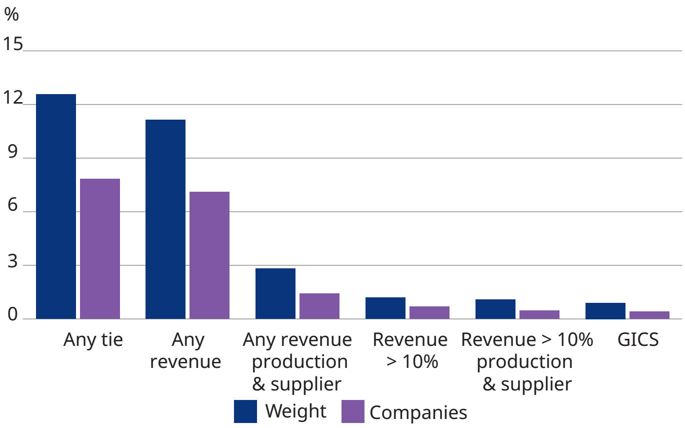
Growth
Strategy most impacted

83%
Consistency between data providers

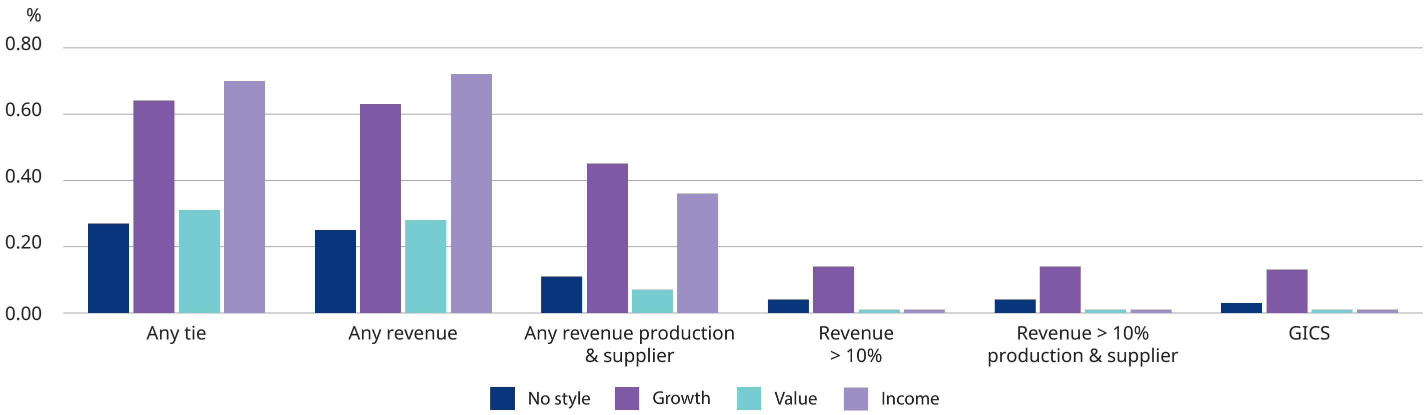
Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
Kuwait Investment Authority	592
Malaysian Employee Provident Fund	165
Wespath Investment Management	21

% Benchmark excluded by different definitions



Style tracking error



*Assets under management (AUM) shown represent the total AUM of asset owner as at year end 2016. Asset owners may have divested fully or partially, and positions may have subsequently changed. Definitions based on widely applied exclusions and as defined by MSCI. Source: Datastream and Schroders, as at 30 June 2017.

Fossil fuels

Fossil fuel screens can be quite diverse due to the different perspectives on the industry. At the broadest level, investors can screen using the Energy GICS classification or any involvement by a company in the business. These are quite comprehensive definitions, but will exclude oil & gas service companies and other indirect market participants. More refined screens aiming to capture only those companies producing substantial quantities of fossil fuels can use a revenue threshold of 20-50% or focus solely on reserves. Screens can also be applied to exclude certain fossil fuels, such as coal or tar sands.

3%
% of screened Schroders funds

85%
Growth in Google search interest

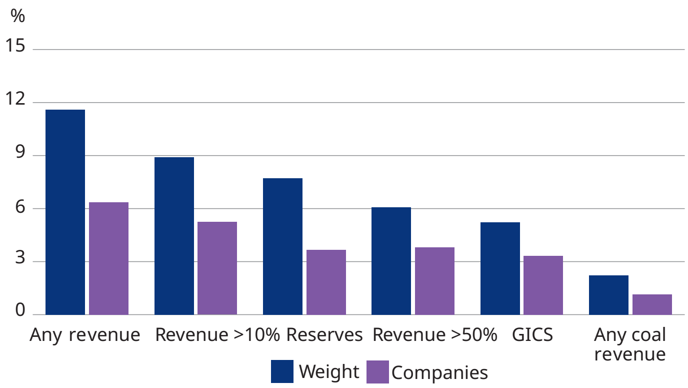
Income
Strategy most impacted

62%
Consistency between data providers

Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
AXA	1,265
Government Pension Fund Norway	893
Aviva	556
CalPERS	306

% Benchmark excluded by different definitions



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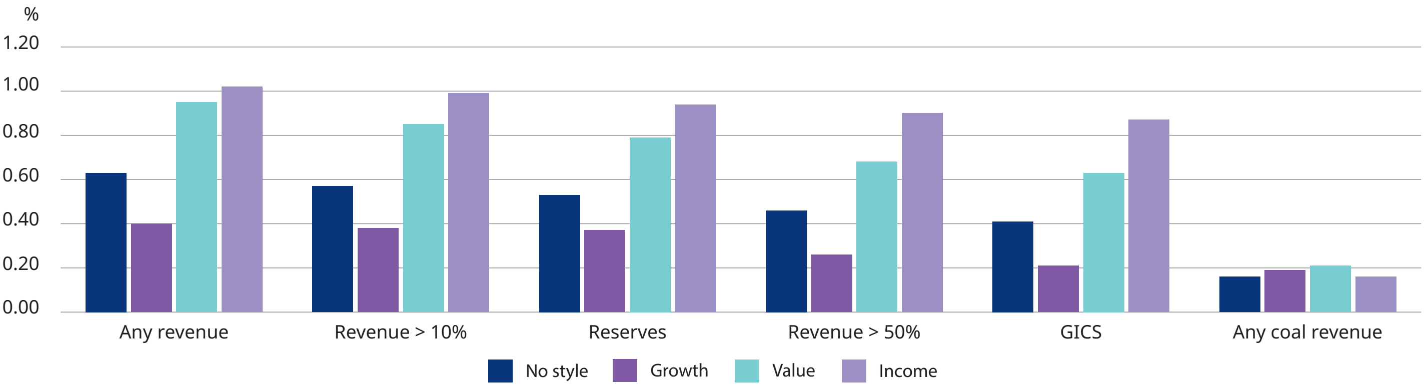

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Fur

The key decision when screening for fur is whether to exclude retailers as well as producers. This is important as the result is not trivial: a retail involvement screen will exclude large retailers such as Amazon.com and eBay, while a screen for producers will not. Company disclosures on involvement with fur are often limited. As a result, providers of screens must often make a judgement as to how much involvement should be critical.

1%
% of screened Schroders funds

19%
Growth in Google search interest

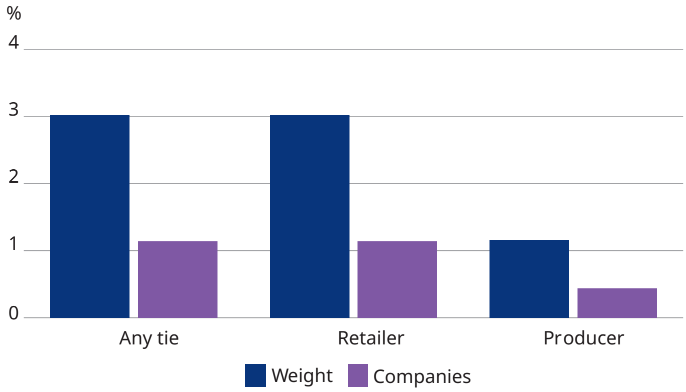
Growth
Strategy most impacted

28%
Consistency between data providers

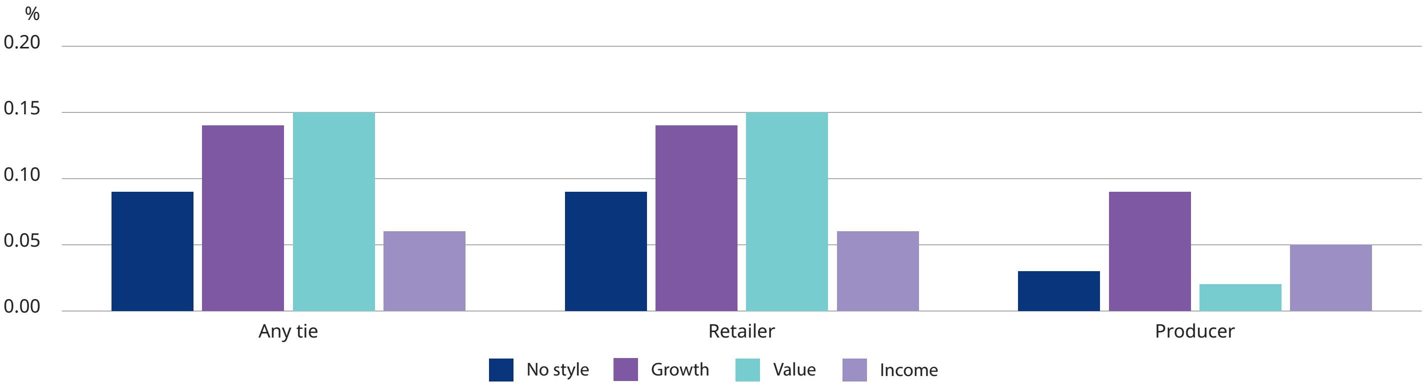
Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
ABN AMRO	339
Triodos Bank	3
RSPCA	<1

% Benchmark excluded by different definitions



Style tracking error



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Gambling

Gambling screens can be defined by sector classification, industry involvement or revenue exposure. Sector classification typically uses the Gaming and Casinos GICS classification. While this excludes most companies, it may fail to exclude more diversified entertainment and leisure companies, such as hotels. The screen can capture any activity or only those companies that are involved in operations and licensing to avoid excluding diversified service providers. Revenue thresholds can be set to avoid excluding these diversified providers.

13%
% of screened Schroders funds

11%
Growth in Google search interest

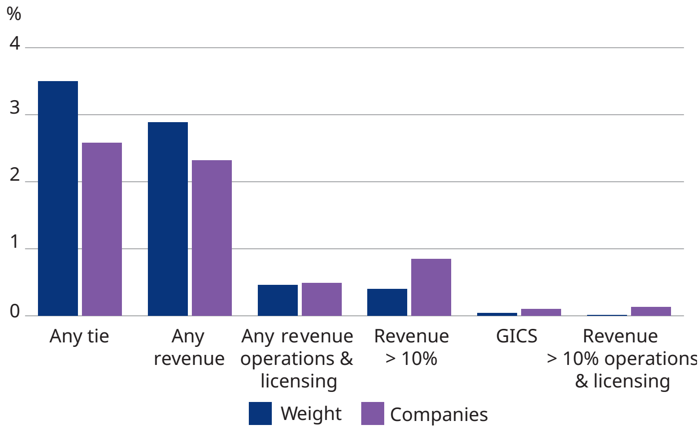
Income
Strategy most impacted

80%
Consistency between data providers

Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
Kuwait Investment Authority	592
Malaysian Employee Provident Fund	165
TPT Retirement Solutions	11

% Benchmark excluded by different definitions



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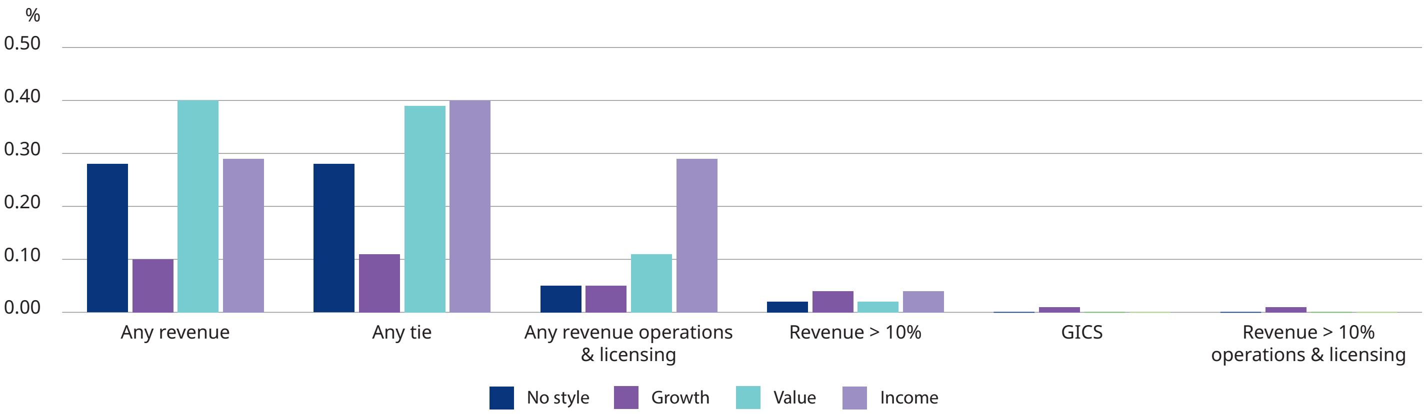

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Nuclear

Nuclear exclusions are focused on nuclear power as opposed to weapons. The main decision here concerns whether any involvement or a revenue threshold is used. A higher threshold will ensure diversified utilities are still investible. A threshold based on any revenue or a simple involvement tie would exclude a significantly larger number of power companies.

3%
% of screened Schroders funds

-6%
Growth in Google search interest

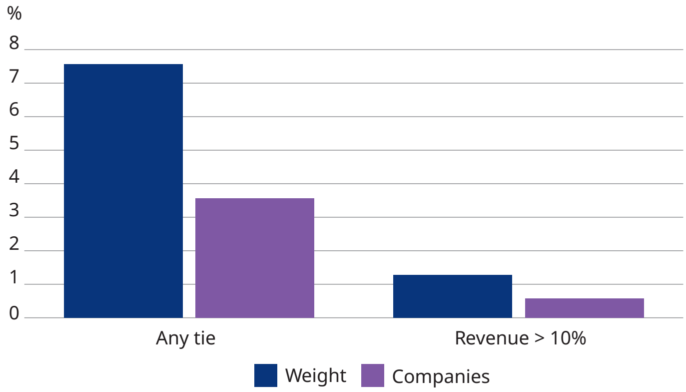
Value
Strategy most impacted

28%
Consistency between data providers

Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
Parnassus Investments	24
Trillium Asset Management	2

% Benchmark excluded by different definitions



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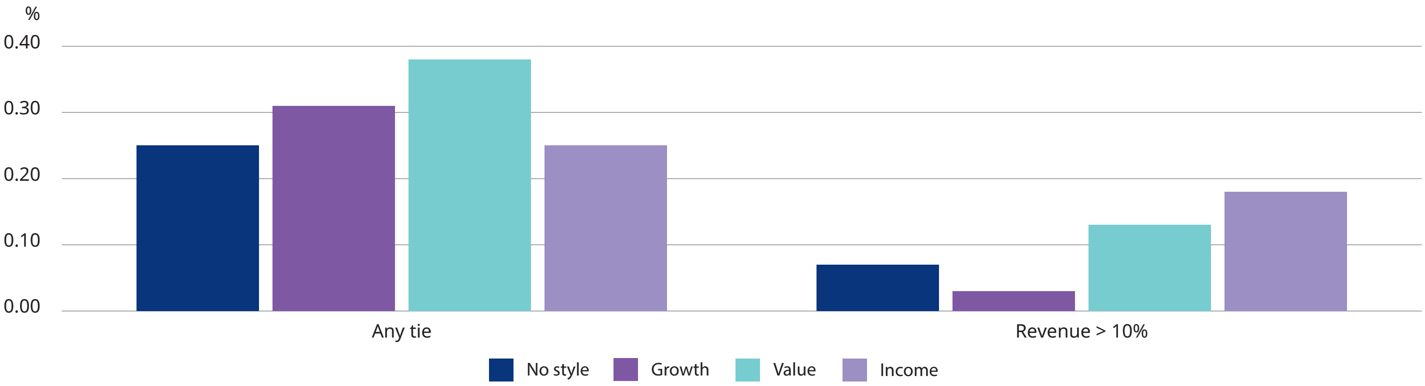

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Pornography

Pornography screens are typically defined by revenue threshold. This threshold is commonly set at between 5% and 10% of turnover. If the definition is set to exclude companies with any revenue exposure, the screen will often catch the telecommunications sector owing to the marginal revenues that it generates from this activity.

12%
% of screened Schroders funds

-2%
Growth in Google search interest

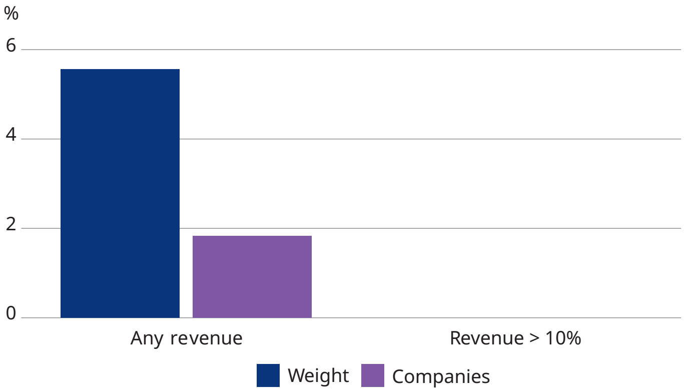
Income
Strategy most impacted

100%
Consistency between data providers

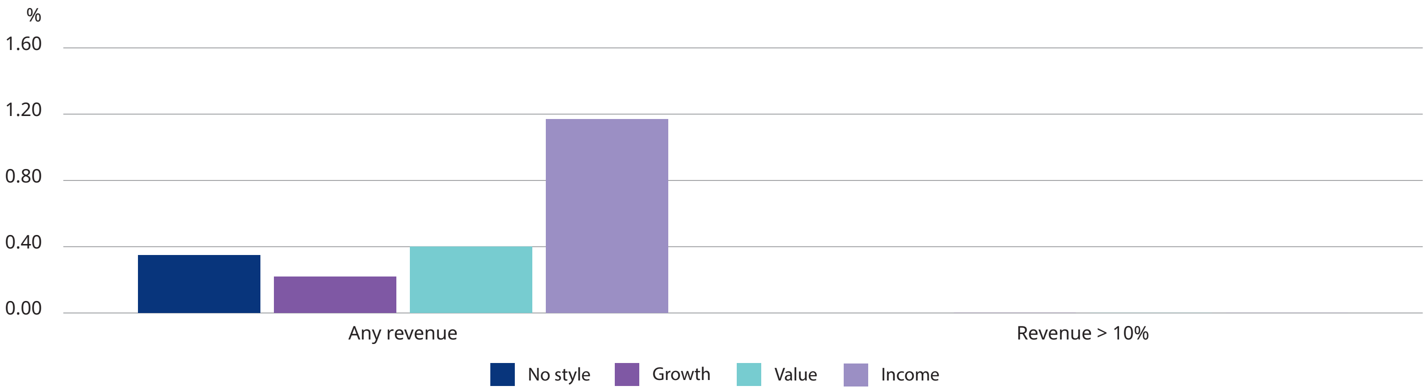
Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
Malaysian Employee Provident Fund	165
Wespath Investment Management	21
Tridios Bank	3

% Benchmark excluded by different definitions



Style tracking error



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Sin

Sin screens capture companies exposed to alcohol, gambling, pornography and tobacco. The encompassing nature of this screen means that various approaches exist, similar to those for the individual screens. The key challenge arises when screening is based on revenues. Here investors must choose whether to exclude on total exposure – thus where a company generates, say, 2% of revenues from each activity, 8% overall, it is omitted – or on the basis of an individual element – say, where a company generates at least 5% of revenue from any one of the activities screened.

57%
% of screened Schroders funds

25%
Growth in Google search interest

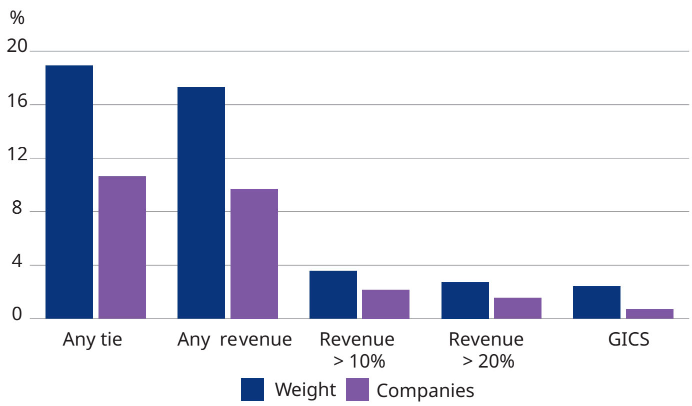
Growth
Strategy most impacted

72%
Consistency between data providers

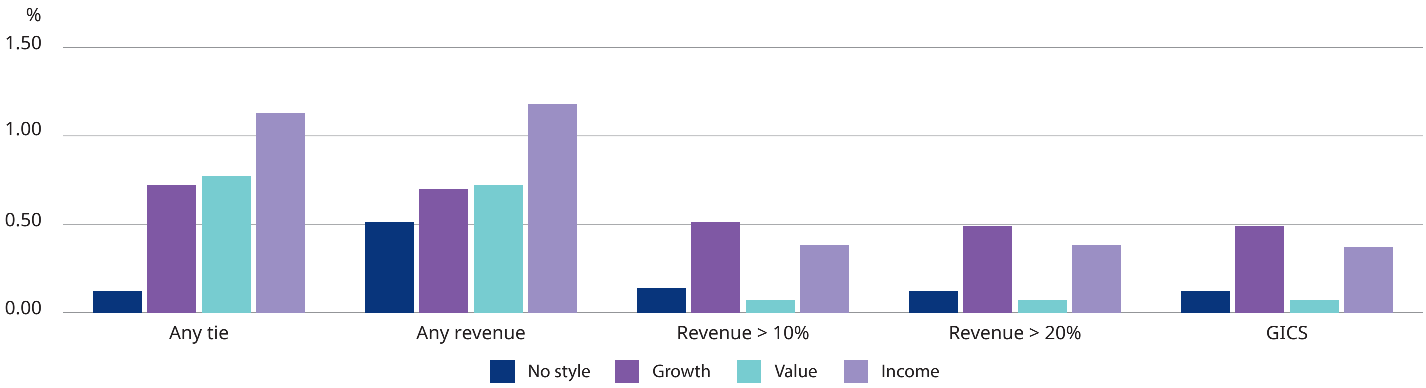
Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
Malaysian Employee Provident Fund	165
Wespath Investment Management	21
Tridios Bank	3

% Benchmark excluded by different definitions



Style tracking error



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Tobacco

Tobacco screens can be defined by sector classification, industry involvement or revenue exposure. Exclusion by GICS sector is the most common, with most tobacco companies focused on tobacco production alone. Industry involvement can be defined as any company with tobacco-related activity or only those companies involved in production or supply. The latter screen will avoid excluding retailers. Revenue thresholds can also be set at appropriate levels to avoid excluding retailers.

35%
% of screened Schroders funds

84%
Growth in Google search interest

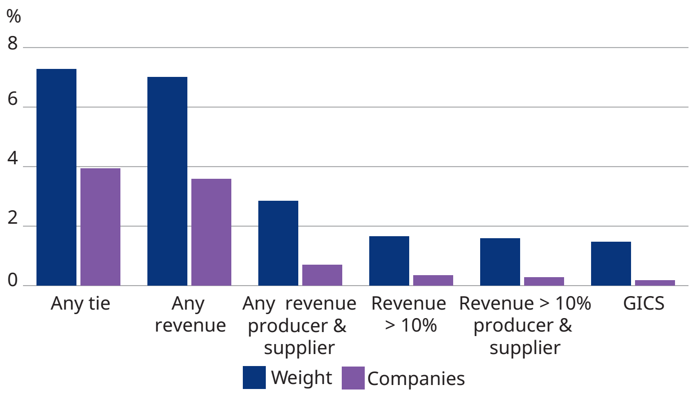
Growth
Strategy most impacted

70%
Consistency between data providers

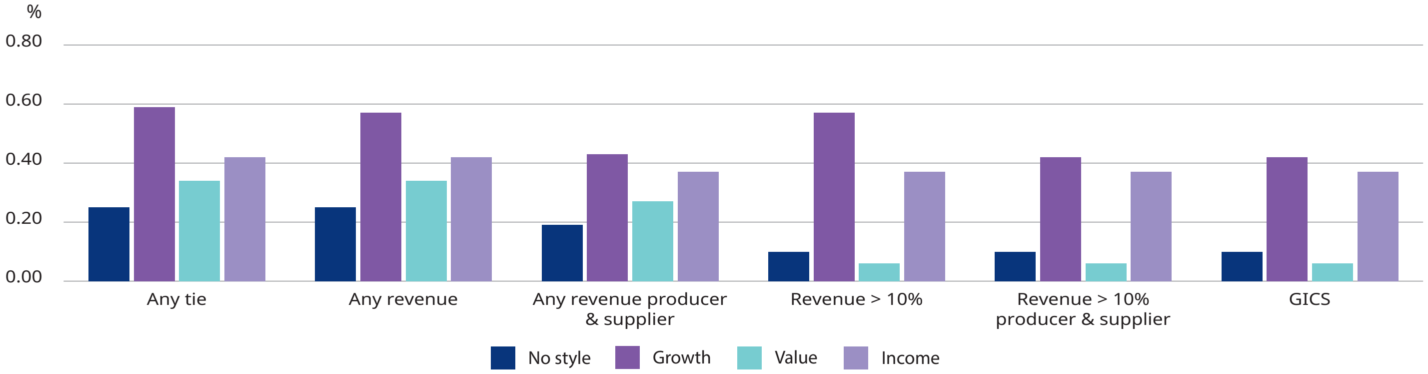
Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
AXA	1,265
Government Pension Fund Norway	893
CalPERS	306
AMP Capital	168
Fonds de Reserve pour les Retraités (FRR)	38

% Benchmark excluded by different definitions



Style tracking error



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Weapons

Weapons screens can vary substantially according to different views of the industry. Controversial weapons (such as cluster munitions and biological and chemical weapons) and nuclear weapons are the most commonly screened. Broader weapons screens are also applied, but these can exclude companies like auto manufacturers due to their role in providing military engines. Screens can also distinguish between companies that manufacture weapons and those that sell them.

40%
% of screened Schroders funds

-15%
Growth in Google search interest

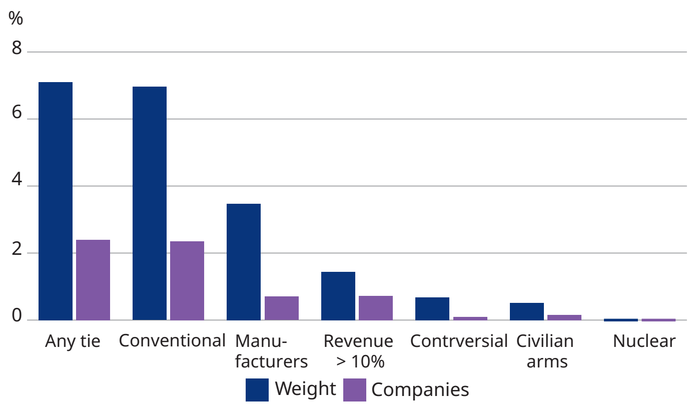
Income
Strategy most impacted

44%
Consistency between data providers

Selected asset owners adopting screen

Asset owner	AUM (USD billion)*
Allianz	1,968
Nordea	340
Wespath Investment Management	21
Spoorwegpensioenfonds	16

% Benchmark excluded by different definitions



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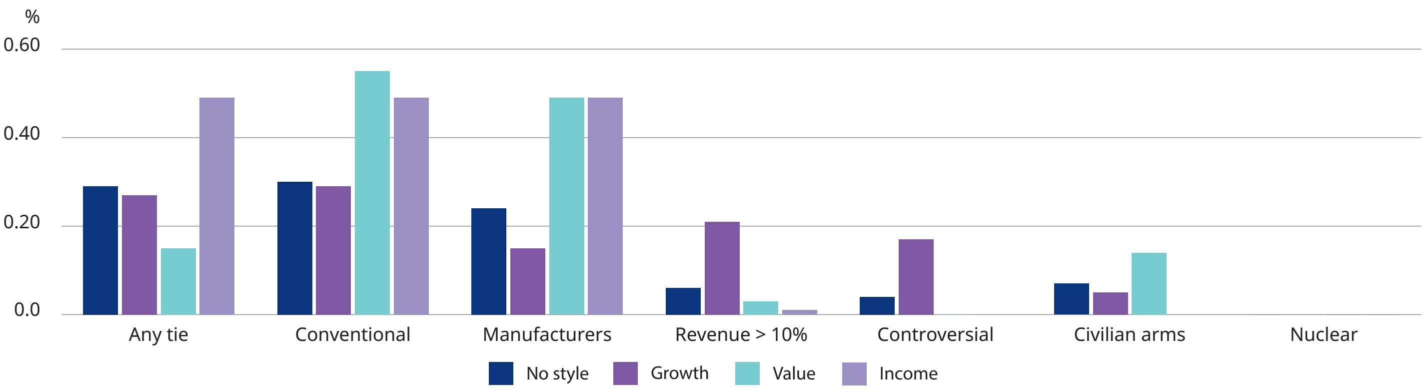

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