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# Style Investing and Tax Efficiency

Building a More Tax Efficient Global Equity Portfolio for Australian Investors

## Executive Summary

Style or factor-based equity strategies have become increasingly popular in recent years, and the styles themselves — such as Value, Momentum and Quality — have been researched and documented in the finance literature for several decades in numerous empirical studies. These studies have been predominantly focused on the expected gross returns of styles; however, for tax-sensitive investors, the critical input for investment decisions are the returns net of transaction costs and taxes. Though transaction costs are a common concern, taxes may have a much greater effect on the net returns received by investors. This paper evaluates the performance of long-only style-based equity strategies after accounting for these real-world frictions and concludes that style investing — when efficiently implemented in a tax-aware manner — is indeed worth pursuing. We first consider the after-tax returns of single-style strategies and of a naïve mix of single-style strategies. We then assess the tax sensitivity of an integrated multi-style portfolio construction approach. We find that an integrated approach to combining styles may not only improve pre-tax performance, but it can also potentially result in significantly improved after-tax outcomes. Furthermore, the expected after-tax returns of an integrated-style portfolio may be significantly improved via a tax-aware approach that anticipates the tax consequences of portfolio rebalancing decisions.

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# Style Investing

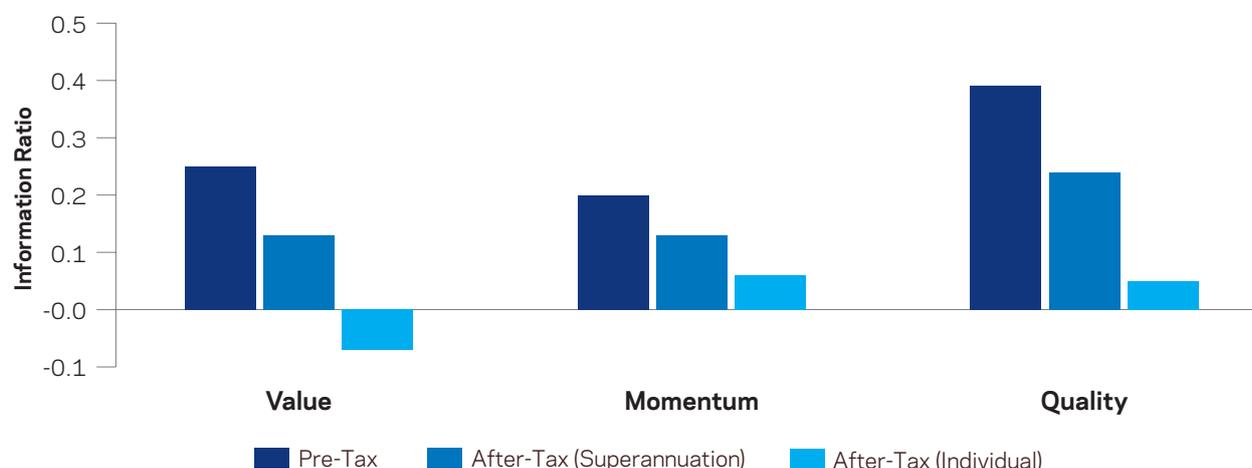
Long-only style-based equity strategies sit somewhere on the spectrum between passive and traditional active management. These strategies build highly diversified portfolios in which benchmark-relative active tilts are systematically applied to provide exposure to styles or factors such as Value, Momentum or Quality.<sup>1</sup> While many other styles have been put forward by researchers, we focus on these three due to their robust out-of-sample performance across different markets and asset classes and their direct applicability within liquid global equity markets.<sup>2</sup>

The results in this paper are derived from strategy simulations run over the period

from February 1993 to December 2016 in the MSCI World (Ex Australia) index constituent universe and compared to the MSCI World (Ex Australia) index.<sup>3</sup> The pre-tax benchmark-relative performance for single-style strategies Value, Momentum and Quality, and the effect of taxes on their performance, is shown in Figure 1a.

It may be observed from Figure 1a that in the sample analysis all styles outperform the index after transaction costs before accounting for tax costs. For a taxable investor, however, the after-tax returns are the critical input for investment decisions. Shifting the focus to after-tax performance, we find

**Figure 1a**  
**Hypothetical information ratios of single-style strategies**



Source: AQR. Data is for the period February 1993 through December 2016. Please see the Appendix for an explanation of the hypothetical data. The universe is the MSCI World Ex Australia index. Returns are heavily discounted, net of transaction costs but gross of fees. Information Ratio is calculated as the Annualized Excess Return divided by Tracking Error. For illustrative purposes only and not representative of an actual portfolio that AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed herein.

- 1 In this analysis Value is defined using book-to-price, earnings-to-price, forecasted earnings-to-price, cash-flow-to-enterprise value, and sales-to-enterprise value; Momentum is defined using total return, residual return, earnings announcement return, analysts' revisions, earnings momentum, and margin growth; Quality is defined using accruals and inventory changes, distance to default, earnings and cash flow volatility, gross margin levels, and profitability ratios.
- 2 We focus our analysis on style equity portfolios; however, these portfolios are essentially reduced forms of (and therefore may be considered a proxy for) more traditional active equity strategies seeking alpha, which tend to provide implicit exposure to these styles. Furthermore, other styles exist that could be included; however, this analysis is intended to be representative rather than comprehensive.
- 3 The Appendix provides details on methodology and tax rate assumptions.

that the benchmark-relative performance of stand-alone style strategies is weakened substantially. For a superannuation investor, the stand-alone style strategies continue to outperform the index on an after-tax basis, but the information ratios drop by approximately 30 to 50 percent depending on the style. For an individual investor, taxes present a larger challenge: Momentum and Quality continue to outperform the passive benchmark after-tax, but the information ratios drop by approximately 65 percent and 85 percent respectively, while in this simulation Value now underperforms the passive benchmark after accounting for taxes (i.e., the Value portfolio's information ratio drops by more than 100 percent after taxes). There is also a change in the relative performance ranking of stand-alone styles for superannuation and individual investors, with Momentum's relative ranking improving after taxes in the sample analysis.

This change in rankings is driven by the better tax efficiency of Momentum as compared to Value or Quality over the sample period, which is evidenced in Figure 1a. The relative tax efficiency of these styles may be explained by the character of returns earned by each sample portfolio. Over the sample period, the stand-alone style portfolios earn less dividend income than the benchmark; however, Momentum earns the least in dividend income and hence pays the least in (high) dividend tax. With regard to capital gains, Momentum tends to generate fewer net short-term capital gains, instead realizing most net capital gains as long-term capital gains, which incur lower tax costs. Meanwhile, Value and Quality both tend to realize a greater proportion of their net

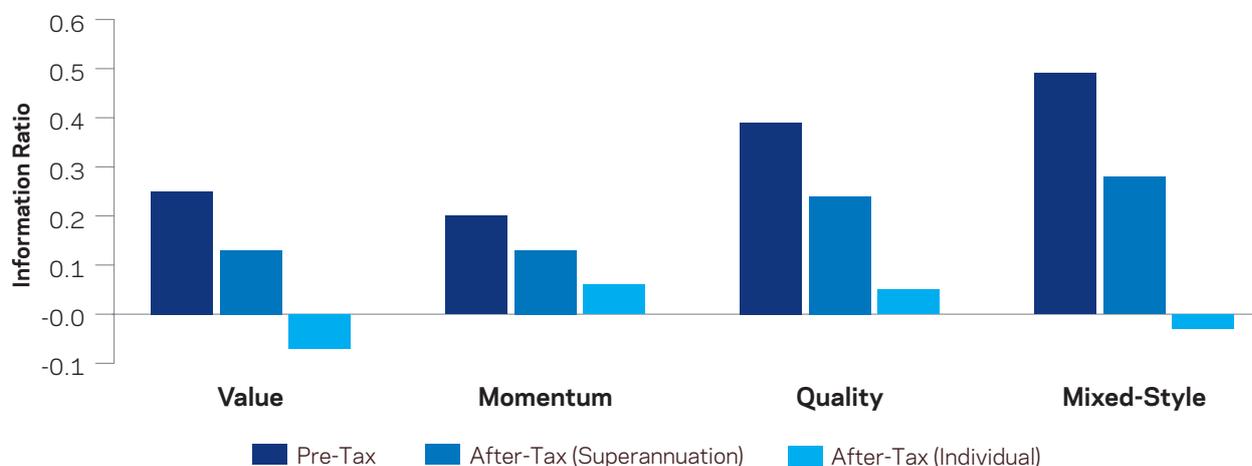
gains as short-term capital gains, and hence both portfolios incur greater tax costs and are less tax efficient.<sup>4</sup>

## Can we improve performance by combining style strategies?

There are two popular approaches to incorporating styles in a long-only equity portfolio: the “mixed strategy” and the “integrated strategy.” Under a mixed approach, the investor builds a multi-style strategy by allocating capital to separate style strategies, each commonly based on a single-style ranking. In this analysis we assume that the mixed approach combines stand-alone-style portfolios that do not allow for pass-through of losses (e.g., commingled funds). The latter approach integrates styles directly within the portfolio construction process, by first aggregating style rankings into an overall score for each security and then building a single portfolio based on this overall score. As previously documented in “Long-Only Style Investing: Don't Just Mix, Integrate” (Fitzgibbons et al., 2017), there exists both a theoretical basis and empirical evidence that the integrated approach is a more effective way to harvest long-only style premia. Integrating styles in long-only portfolio construction has a first-order effect on performance, generating benefits by avoiding stocks with offsetting style exposures and including stocks with balanced positive style exposures. An integrated approach also improves trading efficiency and reduces turnover by netting trades that would have been executed in a mix of stand-alone single-style strategies.

4 See Appendix for tax decomposition of the stand-alone-style portfolios. Israel and Moskowitz (2012) find similar results for the relative tax efficiency of Value and Momentum styles, and Santodomingo, Netmitchinov and Li (2016) find similar results for Value, Momentum, and Quality.

**Figure 1b**  
**Hypothetical information ratios of single-style and mixed-style portfolios**



Source: AQR. Data is for the period February 1993 through December 2016. Please see the Appendix for an explanation of the hypothetical data. The universe is the MSCI World Ex Australia index. Returns are heavily discounted, net of transaction costs but gross of fees. Information Ratio is calculated as the Annualized Excess Return divided by Tracking Error. For illustrative purposes only and not representative of an actual portfolio that AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed herein.

We now consider the effects of allocating to a mix of single-style strategies. We denote this strategy by “mixed-style” in Figure 1b.<sup>5</sup> Putting aside tax considerations for the moment, it may be observed in this sample that combining styles by allocating to a mix of single-style strategies results in better pre-tax risk-adjusted performance in comparison to the stand-alone style strategies. This is most likely a direct result of increased style diversification: the information ratio increases because the tracking error of the multi-strategy portfolio declines due to low or negative correlations among individual strategies. As with the stand-alone style portfolios, however, the performance of the mixed-style portfolio is significantly weakened on an after-tax basis, with a roughly 45 percent drop in the information ratio for superannuation investors

and a greater than 100 percent drop in the information ratio for individual investors (i.e., the mixed-style portfolio underperforms the passive benchmark after taxes).

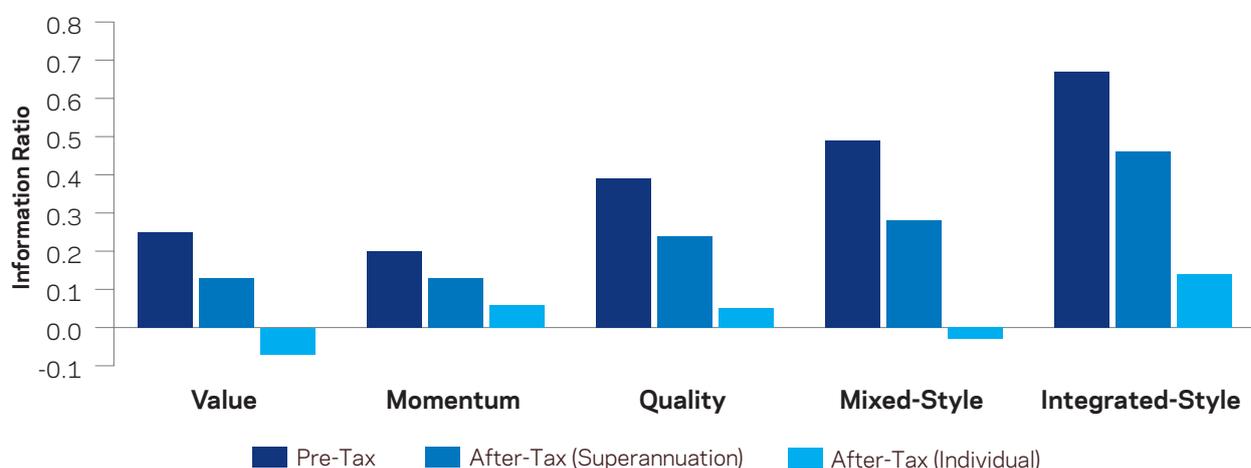
## What if we integrate styles?

As is shown in Fitzgibbons et al. (2017), combining styles in an integrated manner may result in materially better pre-tax outcomes as compared to mixing stand-alone single-style strategies. Again, however, the critical consideration for a taxable investor is whether these integration benefits remain after accounting for tax costs.

It can be observed in Figure 1c, where the integrated strategy is denoted by “integrated

5 The mixed strategy allocates to the stand-alone strategies as follows: 40 percent Value, 40 percent Momentum, 20 percent Quality.

**Figure 1c**  
**Hypothetical information ratios of single-style, mixed-style and integrated-style strategies**



Source: AQR. Data is for the period February 1993 through December 2016. Please see the Appendix for an explanation of the hypothetical data. The universe is the MSCI World Ex Australia index. Returns are heavily discounted, net of transaction costs but gross of fees. Information Ratio is calculated as the Annualized Excess Return divided by Tracking Error. For illustrative purposes only and not representative of an actual portfolio that AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed herein.

style,” that both the pre-tax and after-tax results in this sample are markedly improved for integrated-style portfolios, for superannuation and individual investors alike.<sup>6</sup> The improvement in after-tax performance is driven by two factors, both an increase in pre-tax return and an increase in tax efficiency. While tax costs incurred in a mixed-style portfolio result in a roughly 45 percent reduction in the information ratio for superannuation investors and a greater than 100 percent reduction for individual investors over the period assessed, for integrated-style portfolios these reductions fall to roughly 30 percent and 80 percent respectively.<sup>7</sup>

The improvement in tax efficiency when moving from a mixed to an integrated portfolio construction approach is due to the fact that the taxes paid in a long-only active equity portfolio are dominated by exposure to the benchmark and turnover. Both the mixed and integrated portfolios target the same beta and turnover, and as such there will be no substantial difference in the taxes paid in each portfolio. Hence, though both simulated portfolios are tax-agnostic, the integrated portfolio is more tax efficient as it generates higher pre-tax returns than the mixed portfolio but incurs similar tax costs.

6 The integrated portfolio allocates to the styles using the same weights as the mixed portfolio: 40 percent Value, 40 percent Momentum, 20 percent Quality. Both portfolios have an ex-post tracking error of 3 percent.

7 The relative tax efficiency of these portfolios is time varying, yet we find that an integrated approach to blending styles is consistently more tax-efficient than a mixed approach.

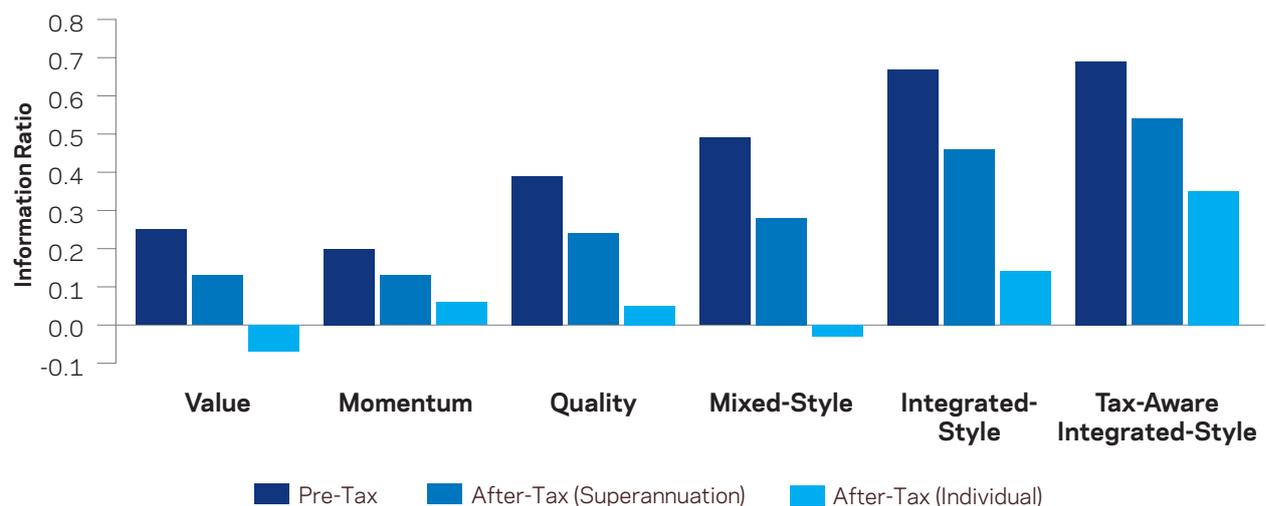
## Can a tax-aware approach improve performance?

Incorporating tax awareness into a global equity portfolio management process involves some logistical challenges including maintaining tax lot information and incorporating this information into the investment process.<sup>8</sup> AQR has developed systems that collect and track tax lot information and incorporate that information into the portfolio rebalancing process to create an informed investment process that can optimize the tax impact of gains exposure within an equity portfolio. The effect of incorporating tax awareness into the investment process is illustrated in Figure 1d.

It can be seen that the after-tax returns of integrated-style strategies can be improved

by a tax-aware approach and that this can be achieved while preserving performance for tax-exempt investors.<sup>9</sup> Again we can look to quantify this improvement by comparing the performance tax drags of the two sample portfolios. While tax costs incurred in the tax-agnostic integrated-style portfolio result in a roughly 30 percent and 80 percent reduction in the information ratio for superannuation and individual investors respectively, for the tax-aware portfolio, these reductions fall to roughly 20 percent and 50 percent. That is to say, the tax drag of integrated-style portfolios is reduced by roughly one-third under a tax-aware approach, or in other words, the tax-aware integrated-style portfolio is roughly 1.5 times more tax-efficient than the tax-agnostic portfolio for both superannuation and individual investors.

**Figure 1d**  
**Hypothetical information ratios of single-style, mixed-style, integrated-style and tax-aware integrated-style strategies**



Source: AQR. Data is for the period February 1993 through December 2016. Please see the Appendix for an explanation of the hypothetical data. The universe is the MSCI World Ex Australia index. Returns are heavily discounted, net of transaction costs but gross of fees. Information Ratio is calculated as the Annualized Excess Return divided by Tracking Error. For illustrative purposes only and not representative of an actual portfolio that AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed herein.

<sup>8</sup> As detailed in "Tax-Aware Management of Global Equities" (Dunn and Wills, 2008).

<sup>9</sup> Sialm and Sosner (2018) find similar results for Value-Momentum integrated strategies.

## Where do tax savings come from?

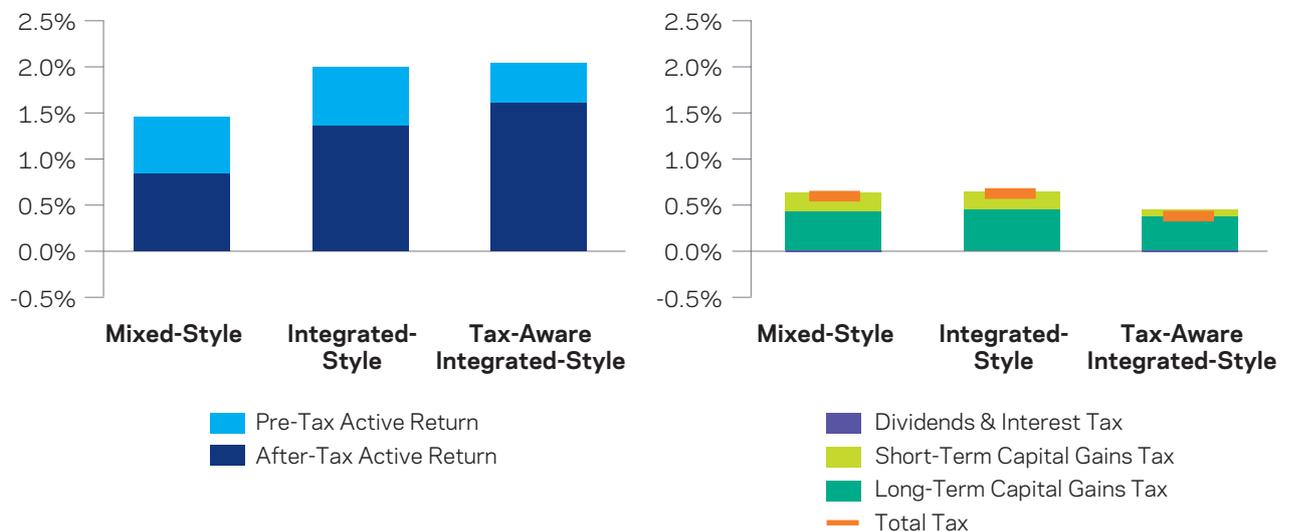
The previous section has demonstrated that for superannuation investors, roughly 45 percent of a mixed-style portfolio's outperformance over the benchmark is given up via the additional tax costs incurred. An integrated approach reduces this active tax drag to roughly 30 percent, and this is further reduced to approximately 20 percent by a tax-aware integrated approach.

The active tax drag is even more substantive for individual investors, with greater than 100 percent of a mixed-style portfolio's outperformance over the benchmark given up via the additional tax costs incurred.

An integrated approach has the potential to reduce the active tax drag to roughly 80 percent, and this is further reduced to approximately 50 percent by a tax-aware integrated approach.

Figures 2a and 2b help explain the improvement in tax efficiency for superannuation and individual investors, respectively, as we move from a mixed portfolio to an integrated portfolio and finally to a tax-aware integrated portfolio. The figures show the before- and after-tax active returns along with the active-tax decomposition (i.e., a breakdown of tax costs in excess of those paid on the MSCI World Ex Australia benchmark portfolio) under the three multi-style approaches.<sup>10</sup>

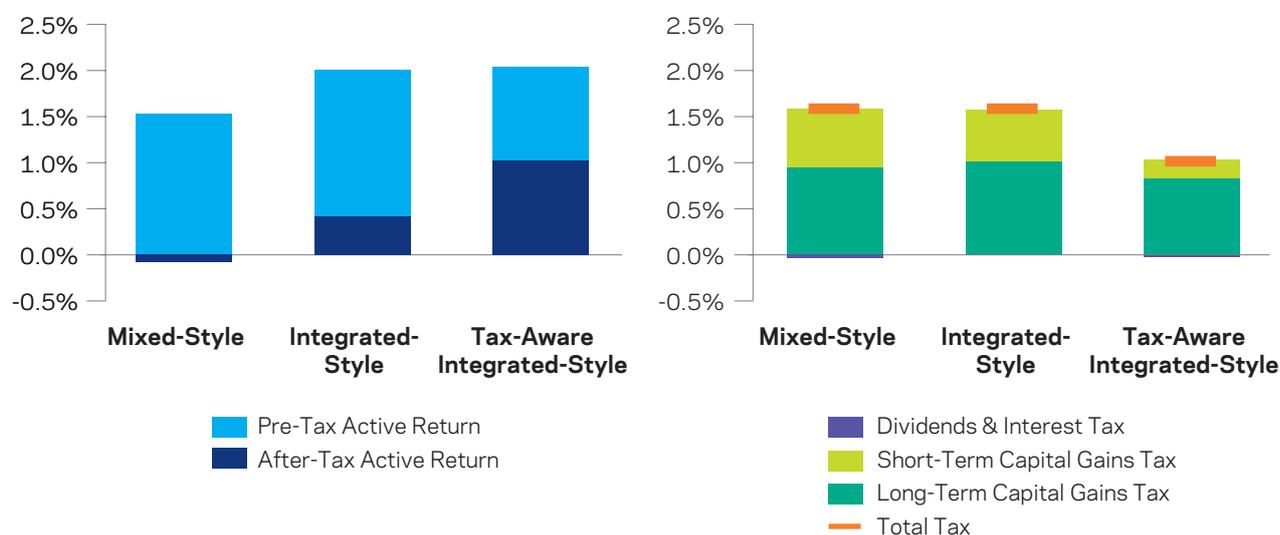
**Figure 2a**  
**Hypothetical active-tax decomposition (superannuation)**



Source: AQR. Data is for the period February 1993 through December 2016. Please see the Appendix for an explanation of the hypothetical data. The universe is the MSCI World Ex Australia index. Returns are heavily discounted, net of transaction costs but gross of fees. For illustrative purposes only and not representative of an actual portfolio that AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed herein.

<sup>10</sup> All three hypothetical portfolios shown have a realized tracking error of 3 percent to ensure comparability of non-risk-adjusted returns.

**Figure 2b**  
**Hypothetical active-tax decomposition (Individual)**



Source: AQR. Data is for the period February 1993 through December 2016. Please see the Appendix for an explanation of the hypothetical data. The universe is the MSCI World Ex Australia index. Returns are heavily discounted, net of transaction costs but gross of fees. For illustrative purposes only and not representative of an actual portfolio that AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed herein.

It can be seen in both Figures 2a and 2b that as we move from a mixed to an integrated approach, the active tax costs do not differ greatly (and, in fact, marginally increase) and that the improvement in tax efficiency is primarily driven by an increase in pre-tax return. Conversely, as we move from an integrated to a tax-aware integrated approach, the improvement in tax efficiency is primarily driven by a decrease in the

total active-tax costs, while the pre-tax return remains largely unchanged.

Figures 2a and 2b also illustrate the effect of AQR's tax-aware portfolio construction on active tax liabilities. As we move from a tax-agnostic to a tax-aware integrated approach, we observe a reduction in both short-term and long-term capital gains taxes, while the effect on dividend and interest tax is marginal.<sup>11</sup>

<sup>11</sup> The negligible effect on dividend income tax is because of AQR's approach to tax awareness, which does not attempt to minimize dividend income. We take this approach because of the style drift introduced by minimizing dividend income, which can materially change the risk and return profile of the portfolio. We find that minimizing capital gains exposure (and ignoring dividends) improves after-tax returns across all styles without incurring large tracking error or style drifts. However, we find that dividend yield minimization is detrimental to after-tax returns for all equity styles except Momentum (see "How Tax Efficient Are Equity Styles?" [Israel and Moskowitz, 2012]). In the case of Value and to a lesser extent Quality, which tend to have high dividend exposure, a reduction in dividends is equivalent to a reduction in Value or Quality style.

The potential tax-awareness benefit is primarily driven by two elements:

1. **The aging of capital gains from short term to long term creates a *permanent tax benefit* and largely eliminates short-term capital gains.** Instead of selling out of an unattractive position within a 12-month period and realizing a short-term capital gain, the investor holds it past the 12-month mark and then sells it, realizing a lower tax cost.<sup>12</sup>
2. **The deferral of a significant portion of long-term gains to future periods creates a *temporal tax benefit*, where current tax liabilities are reduced but deferred tax liabilities are increased by the same amount.** This benefit is highly valuable because current tax savings can be reinvested in profitable strategies such that post-liquidation value increases despite the increase in future tax liabilities.<sup>13</sup>

Figures 2a and 2b show long-term and short-term capital gains after netting. In Figure 3 we break out realized gains and losses to more clearly demonstrate the effects of tax awareness.

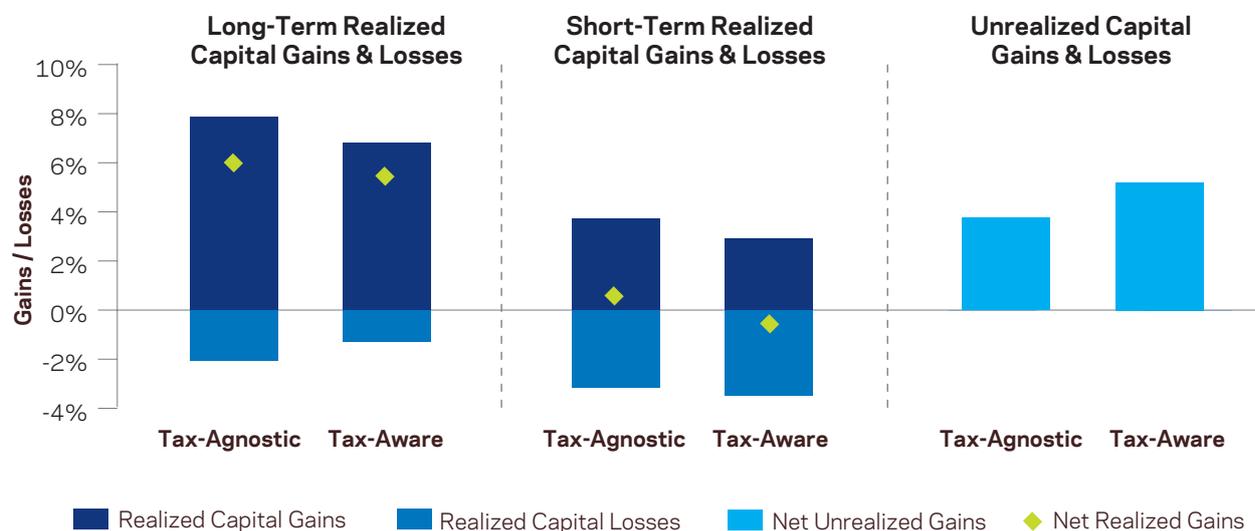
- Long-term capital gains are reduced as a result of deferring these to future periods; however, long-term capital losses are also reduced. The combined effect is a reduction in net realized long-term capital gains under a tax-aware approach.
- Short-term capital gains are reduced as a result of aging, while short-term capital losses continue to be realized in a tax-aware approach because they help offset highly taxed short-term capital gains. The combined effect is a clear reduction in net realized short-term capital gains (and, in fact, results in net realized short-term capital losses).

A tax-aware approach therefore has the potential to reduce current tax costs by reducing net realized capital gains; however, future tax liabilities may also increase due to the deferral of long-term capital gains. This is demonstrated by the increase in total unrealized capital gains in Figure 3. A net benefit is derived, however, because current tax savings can be reinvested such that post-liquidation value increases despite the increase in future tax liabilities.

12 For this reason, tax awareness generally leads to a reduction in turnover. If applied aggressively, this approach has the potential to lower pre-tax return expectations. For example, holding on to an unattractive position for several days to avoid realizing a short-term capital gain is less likely to affect pre-tax returns than holding on to an unattractive position for several months. AQR's approach to tax awareness penalizes tax liabilities created by portfolio rebalancing, and by scaling up or down the importance of this penalty during the portfolio construction process, it is possible to calibrate the level of tax aversion such that tax liabilities are minimized while preserving pre-tax return expectations. See "Tax-Aware Management of Global Equities" (Dunn and Wills, 2008) for additional details.

13 New investors into a commingled fund should consider the tax implications of potential capital gains exposure (PCGE), which Morningstar defines as an "estimate of the percent of fund's assets that represent gains. PCGE measures how much the fund's assets have appreciated, and it can be an indicator of possible future capital gain distributions." Tax awareness will tend to increase the potential capital gain exposure since more capital gains are deferred.

**Figure 3**  
**Hypothetical realized gains and losses of integrated-style portfolios**



Source: AQR. Data is for the period February 1993 through December 2016. Please see the Appendix for an explanation of the hypothetical data. The universe is the MSCI World Ex Australia index. Returns are heavily discounted, net of transaction costs but gross of fees. For illustrative purposes only and not representative of an actual portfolio that AQR currently manages. Hypothetical data has inherent limitations, some of which are disclosed herein.

## Implementation choices matter

With ever-increasing competition in global markets and low return expectations from equities going forward, implementation efficiency is of paramount importance to investors. This trend is reflected in the increased attention given to style- or factor-based investing, though few have considered the viability of these approaches from an

after-tax perspective. Our research indicates that style investing has the potential to deliver attractive after-tax returns if it is implemented in an integrated manner. Furthermore, our research demonstrates that tax-aware rebalancing may significantly improve the after-tax outcomes of integrated-style strategies for both superannuation and individual investors.

# Appendix

## Details of Methodology

This section describes the methodology we use in the simulation in the main body. All the returns in the paper are heavily discounted, net of transaction costs but gross of fees.

### Alpha Model

Portfolios begin with the AQR Multi-Style Model, which yields stock-level alphas. The model is built over the universe of stocks in the MSCI World Ex Australia benchmark and combines Value, Momentum and Quality style factors.

In this analysis Value is defined using book-to-price, earnings-to-price, forecasted earnings-to-price, cash-flow-to-enterprise value, and sales-to-enterprise value; Momentum is defined using total return, residual return, earnings announcement return, analysts' revisions, earnings momentum, and margin growth; Quality is defined using accruals and inventory changes, distance to default, earnings and cash flow volatility, gross margin levels, and profitability ratios.

Value, Momentum and Quality strategies are designed to take overweights in the assets with the strongest style attributes and underweights in the assets with the weakest style attributes. The Multi-Style Model allocates 40 percent, 40 percent and 20 percent weight to the Value, Momentum and Quality styles, respectively.

## Portfolio Methodology

All strategies are rebalanced monthly over the period from February 1993 to December 2016. Integrated strategies target 3 percent tracking error to the MSCI World Ex Australia benchmark. Stand-alone-style strategies target 10 percent tracking error to the MSCI World Ex Australia benchmark. Portfolios are long-only and constrain beta to the benchmark to be between 0.98 and 1.02. For strategies that are tax aware, the optimizer incorporates tax implications of trades into the portfolio construction process.

“Mixed”-strategy returns are computed using the monthly returns of stand-alone strategy portfolios, combined at 40 percent weight in Value, 40 percent weight in Momentum and 20 percent in Quality. “Integrated”- and “Tax-Aware Integrated”-strategy returns are simulated using the Multi-Style Model. Transaction costs are assessed monthly.

The simulation incorporates transaction costs ranging between 0.11 percent and 0.16 percent p.a. across the various portfolios (as estimated by a proprietary transaction cost model) and constrains one-sided turnover to 5 percent (average of buys and sells divided by portfolio value) per month.

There are numerous factors related to markets in general or to the implementation of any specific trading program, which cannot be

fully accounted for in the preparation of simulated performance results, all of which can adversely affect actual trading results. A discount factor of 50 percent has been applied to simulated returns in excess of the benchmark to account for such uncertainties.

### Tax Accounting and Tax Rate Assumptions

We model two investor types, a superannuation investor and an individual investor.

The simulation assumes taxes on dividends are paid once a year at tax year-end and are taxed at 15 percent and 45 percent for superannuation and individual investors, respectively. Franking credits are not a part of the dividend tax calculation because we model global ex Australia equity strategies.

Long-term and short-term realized capital gains are first netted: If the net is positive, taxes are paid for the year, and if the net is negative, losses are carried forward to the next year. The simulation assumes that short-term and long-term gains are taxed at 15 percent and 10 percent respectively for a complying super fund and at 45 percent and 22.5 percent respectively for an individual investor. The Medicare levy applicable to some individual investors is not considered in this analysis.

All taxes are shown in excess of the taxes paid on the MSCI World Ex Australia benchmark.

During the sample period, the tax cost associated with holding the benchmark averaged 0.43 percent p.a. for superannuation investors (where 0.33 percent comes from dividends and 0.10 percent from capital gains) and 1.22 percent p.a. for individual investors (where 0.99 percent comes from dividends and 0.23 percent comes from capital gains).

Tax-aware portfolios are constructed using superannuation investor tax rates on long-term and short-term capital gains. After-tax returns on such portfolios are then computed using, alternatively, superannuation fund and individual investor applicable tax rates. All tax accounting respects the rules of superannuation fund taxation.

### Gains and Losses of Stand-Alone-Style Portfolios

The following table contains the active gains and losses relative to the MSCI World Ex Australia benchmark portfolio for the Value, Momentum and Quality strategies, as defined in the Alpha Model section of this appendix, for the time period from February 1993 to December 2016.

| Active Gains and Income  | Value | Momentum | Quality |
|--------------------------|-------|----------|---------|
| Long-Term Capital Gains  | 3.96% | 4.40%    | 3.96%   |
| Short-Term Capital Gains | 1.97% | 0.52%    | 1.53%   |
| Dividends and Interest   | 0.69% | -0.91%   | -0.36%  |

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