



Olivier d'Assier, Axioma Inc.

Olivier d'Assier is Managing Director, Asia Pacific for Axioma Inc. He is responsible for the performance, strategy, and commercial success of Axioma's operations in Asia Pacific and is a member of the firm's global Executive Committee. He joined Axioma in 2006 and oversaw its internationalization with the opening of offices in Singapore, Hong Kong, London, Geneva, and Sydney. In the process, he brought Axioma's key innovations to the Asia Pacific marketplace via the development of Asian-centric products. Before joining Axioma, Mr. d'Assier spent seven years at Barra Inc. as VP for Asia Pacific and President of Barra Japan.

HARVESTING FACTOR PREMIA DOWN UNDER

Author name

Introduction

In this paper, we use the medium horizon variant of Axioma's newly released Australian fundamental factor model (AXAU4 – MH) to analyse and compare four smart beta ETFs listed on the Australian Stock Exchange (ASX), tickers: AUSE, VHY, RDV, and IHD. These have been relabelled WTDF, VGHY, RSHD, and ISDH respectively. All four contain the investment objective to harvest the high-dividend yield factor premium in ASX listed shares for their investors. Given that all the funds have less than 1% of their weight outside the S&P/ASX 200 (the index), we will be analysing these ETFs in active space against that index as well as a pure dividend yield factor return as defined by a factor mimicking portfolio.

ETF Description

WTDF (Ticker: AUSE)

Investment objective: WisdomTree Australia Dividend Fund seeks to track the investment results of dividend-paying companies in the Australian equity market.

ETF overview: The WisdomTree Australia Dividend Index is a fundamentally weighted index that measures the performance of high-dividend yielding companies in Australia. The ETF is comprised of dividend paying companies incorporated in Australia with a minimum market capitalization of \$1.0 billion. The ETF is comprised of the ten largest qualifying companies from each sector ranked by market capitalization. Available history: Aug 2011 - Aug 2017

VGHY (Ticker: VHY)

Investment objective: The Vanguard Australian Shares High Yield ETF seeks to track the return of the FTSE ASFA Australia High Dividend Yield Index before taking into account fees, expenses and tax.

ETF overview: The ETF provides low-cost exposure to companies listed on the Australian Securities Exchange (ASX) that have higher forecast dividends relative to other ASX-listed companies. Security diversification is achieved by restricting the proportion invested in any one industry to 40% of the total ETF and 10% for any one company. Australian Real Estate Investment Trusts (A-REITS) are excluded from the index. Available history: Jul 2015 - Aug 2017

RSHD (Ticker: RDV)

Investment objective: The Russell Investments High Dividend Australian Shares ETF seeks to track the Russell Australia High Dividend Index, which comprises Australian blue-chip companies with a bias towards those that have a high expected dividend yield but also meet other characteristics including: a history of paying dividends; dividend growth and consistent earnings.

ETF overview: The Fund invests in a diversified portfolio of Australian shares and trusts listed on the ASX, with the aim of delivering income, through higher dividends and franking credits, as well as capital growth to investors. History: Jan 2011 - Aug 2017

ISHD (Ticker: IHD)

Investment objective: The iShares S&P/ASX Dividend Opportunities ETF aims to provide investors with the performance of an index, before fees and expenses, composed of high yield Australian common stocks listed on the ASX.

ETF overview: The index it tracks, the S&P/ASX Dividend Opportunities Accumulation Index, provides exposure to 50 ASX listed stocks that offer high dividend yields while meeting diversification, stability and tradability requirements. Available History: Dec 2015- Aug 2017

Figure 1. Cumulative dividend yield FMP return during each fund's history

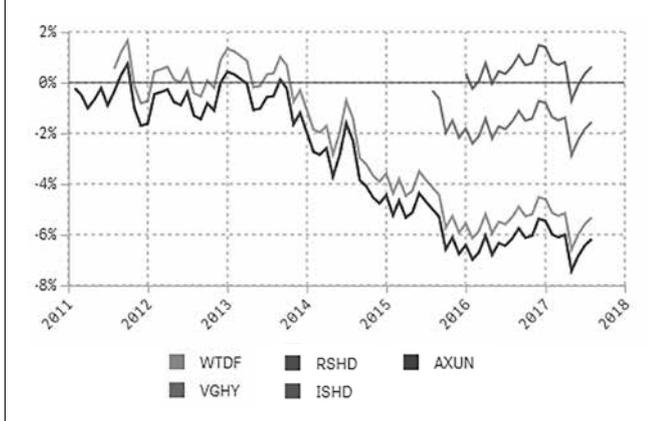


Figure 2. Cumulative active return for each fund

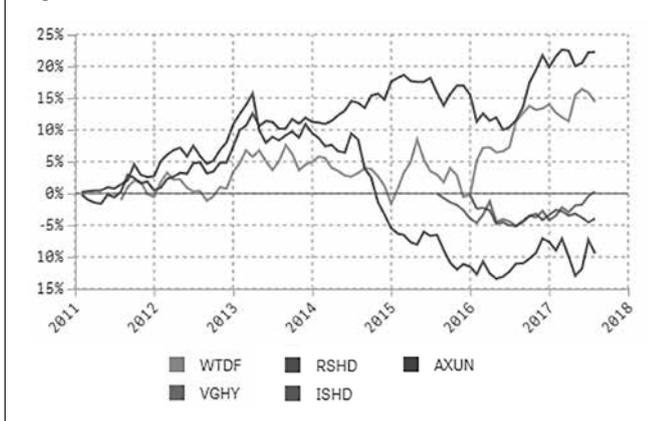
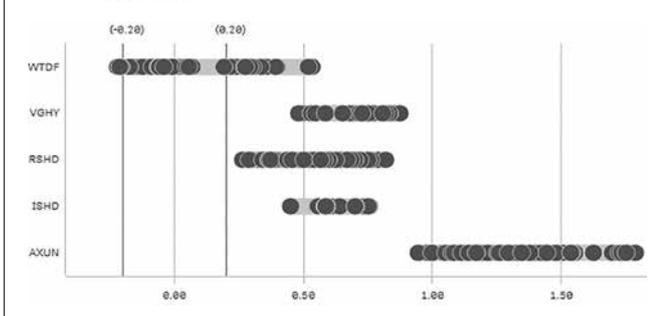


Figure 3. Active return summary

Portfolio	Active	Factor	Specific	Styles	Sectors
WTDF	1.35%	0.89%	0.46%	-0.97%	1.87%
VGHY	0.13%	0.72%	-0.58%	-0.77%	1.50%
RSHD	1.95%	2.55%	-0.60%	0.66%	1.88%
ISHD	-2.23%	-2.17%	-0.06%	-0.02%	-1.96%
AXUN	-0.89%	-0.45%	-0.44%	-1.22%	0.77%

Figure 4. Dispersion of active exposures to the dividend yield factor for each fund



Additionally, we have constructed an optimized long-only, fully invested, and unconstrained portfolio (AXUN) with the sole objective of maximizing our exposure to the dividend yield factor in our model with a constraint to remain below 4% (average of the four ETFs) of active risk against the index (which doubles as our investment universe in our monthly rebalancing). The reason for not constraining this strategy on non-target factors is to let the optimizer pursue dividend yield exposure wherever it may be, allowing the risk model to determine the appropriate risk/return trade-off. By doing this we hope to learn more about the nature of this factor premium in Australia and the company it keeps by looking at the active style and sector exposures selected by the optimizer.

Since all five portfolios (four ETFs + the AXUN) target the capture of the dividend yield premium, we would expect their active performance versus the index (the index's DY exposure = 0.025) to track the factor return itself. Figure 1 shows the cumulative factor return for the dividend yield factor in our AXAU4-MH model, adjusted for each of the portfolio's history.

Spoiler Alert: Given these cumulative factor returns we would expect AXUN, WTDF, and VGHY to have similarly negative active returns at the end of the period, and ISHD to have a neutral to slightly positive one. This is entirely acceptable since the stated objective of the strategies is not to outperform the index but to capture the target factor premium. Figure 2 shows what we got instead!

And while we are at it, let's lay down some of the other expectations we may have about a portfolio designed to deliver this (or any) factor premium. We would expect this portfolio to have a large (as large as possible) and constant positive exposure to the target factor. Conversely, we would expect only negligible exposure to non-target factors with the exception of those factors whose returns are strongly correlated (positively or negatively) with our target factor. Even then, we would expect those exposures to be of a lower magnitude (on average) than our target factor given the fleeting nature of those correlations. We would certainly want to see restraint on the loadings of non-target factors that are also highly risky (e.g. size, volatility, and momentum). On sector allocation, we would expect those sectors with a penchant for our target factor to be overweight, while those with an aversion to it to be underweight. The rest of the sector allocation should be driven by the correlation matrix for risk minimization purposes (given our Active Risk constraint of 4%). At the top level, we would expect factors, and styles in particular, to drive most of the returns of this smart beta portfolio.

Figure 3 shows the annualized active return for all five strategies, along with the contributions from factors, specific return, styles, and sectors. Active returns range from an almost 2% outperformance for RSHD (!), to a greater-than 2.2% underperformance for ISHD (!). This lack of consistency is unexpected given the similarity of the labels on these investment products. Additionally, the even greater absolute divergence in the factor return component seems to indicate that they are not harvesting the same factor return, or at the very least strongly disagree on where to find it. Notice the large contribution from sector bets, but there is nothing in the funds' descriptions about sector tilts.

Style Analysis

The dividend yield (DY) factor in the AXAU4 model is calculated as the sum of the dividends paid (excluding non-recurring, special dividends) over the most recent year, divided by the average total issuer market capitalization computed over the last 30 calendar days, then standardized. While this definition varies slightly from the ones in the investment

description of each of the ETFs, this difference isn't material enough to explain some of the (unexpected) results we describe in figure 4.

Figure 4 shows the dispersion of each fund's active exposure to the DY factor during the history available. Three of the four ETFs (VGHY, RSHD, and ISHD) all have a moderate-to-high active exposure to the DY factor versus the index throughout their history. WTDF, however, has on average a low active exposure to the DY factor and even clocks a negative active exposure for a not insignificant portion of the time, despite its stated objective to "Gain targeted Australian equity exposure to high dividend yielding companies". Given the negative return we have seen above from the FMP returns, a negative active exposure to this factor could help explain some of the (unexpectedly) positive active return for this fund over the index. Regardless of the outcome, we are not getting the factor exposure we seek through the WTDF ETF. In fact, plotting WTDF's active returns against our DY FMP returns shows no relation at all, with a correlation coefficient of only 0.03.

In sharp contrast, the optimized portfolio (AXUN) consistently has the highest active exposure to the DY factor, achieving more than twice the average exposure of its peers. Plotting the monthly active returns of the AXUN against the FMP returns, yields a moderate-to-strong relationship with a correlation coefficient of 0.57.

Digging further into our style factor exposures we discover three other styles on which WTDF differs widely from the rest of our dividend strategies. Figure 5 shows the same active exposure dispersion for the size (top), value (middle), and volatility (bottom) factors across our five funds respectively. While there is broad agreement across four of the funds that harvesting dividend yield does not require a size or volatility bias - but does come with a slight active exposure to value most of the time - WTDF shows a strong preference for a small-cap bias, a neutral stance on value, and a positive active exposure to volatility. Volatility and size are the first and second most risky style factors in our AXAU4-MH model respectively (by contrast, dividend yield is the third least risky). This begs the question, why would you load on two risky factors having nothing to do with the one you seek to harvest? Furthermore, one cannot accuse WTDF of style drift, as these contrarian exposures are persistent throughout the entire history available. Based on this information alone, one could be tempted to conclude that instead of trying to harvest dividend yield, WTDF actively seeks to avoid it.

Staying on WTDF, we noticed that its style factor return contribution to active return was very negative at -0.97%. Given our knowledge of the dividend yield factor's annualized return of -0.85% during that time, a cursory look at the headline contribution from Figure 1 might lead us to think this was to be expected. But if we look at the contribution to style returns from dividend yield, we see a positive 0.10% contribution, which goes against the observed factor return for this period. How did WTDF achieve a similar style factor return as the factor it seeks to track without a strong exposure to it?

Figure 6 shows the contribution to style return from five of the more influential factors for this group. Notice how WTDF's small-cap bet paid off (accidentally) but the one on volatility didn't. Neither did the bet against the Leverage factor where WTDF was also a contrarian versus the other four funds who were mostly neutral on this factor. So overall, while WTDF's aggregate style factor return contribution matches the sign of the dividend yield factor return, it was not achieved because of it, and reflects a very different set of style exposures than our earlier stated expectations.

The value factor has become more and more negatively correlated with the dividend yield factor during the period under review, and especially so since the start of 2016 (see Figure 7). As a result, we have seen the AXUN's exposure to value rise from a neutral 0.12 at the end of February 2013, to 0.32 in August 2017, perhaps as a mean to gain even more exposure to the dividend yield factor without incurring a higher risk (DY Exposure rose from 0.98 to a high of 1.5 during this period).

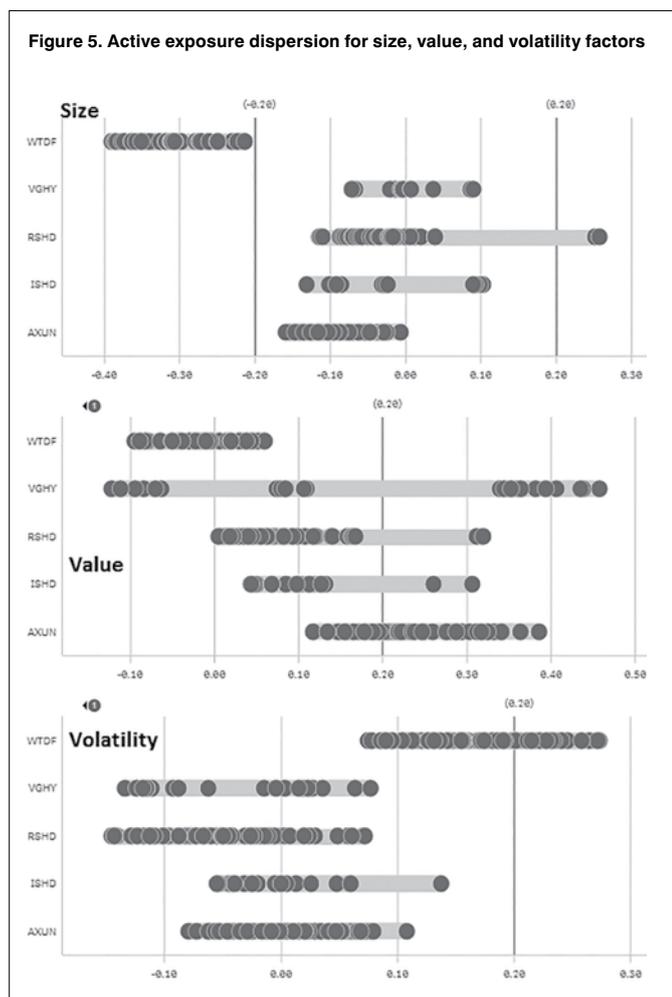


Figure 6. Partial list of style factor returns (annualized)

Portfolio	Div Yield	Size	Value	Volatility	Leverage
WTDF	0.10%	0.56%	-0.07%	-1.18%	-0.29%
VGHY	-0.37%	-0.06%	0.26%	0.21%	-0.19%
RSHD	-0.45%	-0.11%	0.42%	0.32%	0.14%
ISHD	0.05%	0.14%	0.31%	-0.04%	-0.05%
AXUN	-1.36%	0.14%	0.65%	-0.10%	0.25%

Figure 7. Cumulative factor return for dividend yield and value

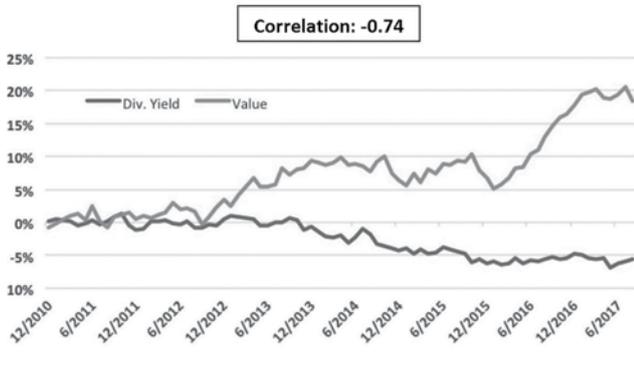


Figure 8. Active exposure to value factor

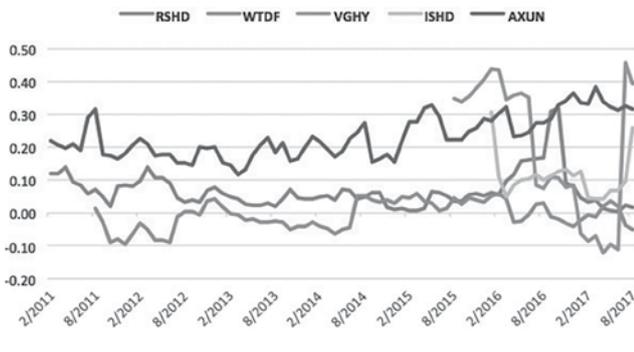


Figure 9. Annualized style factor contributions to active return*

Style1	WTDF	Style2	VGHY	Style3	RSHD	Style4	ISHD	Style5	AXUN
Total	-0.97%	Total	-0.77%	Total	0.66%	Total	-0.02%	Total	-1.22%
SI	0.56%	FX	0.60%	MS	0.72%	FX	0.40%	VA	0.65%
MS	0.20%	VA	0.26%	VA	0.42%	VA	0.31%	PR	0.44%
EM	0.14%	VO	0.21%	VO	0.32%	GR	0.25%	MS	0.37%
DY	0.10%	GR	0.16%	LE	0.14%	LI	0.24%	LE	0.25%
PR	0.06%	LI	0.09%	LI	0.04%	SI	0.14%	SI	0.14%
GR	0.01%	SI	-0.06%	GR	0.03%	PR	0.08%	LI	-0.03%
VA	-0.07%	EM	-0.09%	PR	0.01%	DY	0.05%	EM	-0.07%
FX	-0.12%	LE	-0.19%	FX	-0.06%	VO	-0.04%	FX	-0.10%
MO	-0.15%	MS	-0.24%	EM	-0.10%	LE	-0.05%	VO	-0.10%
LI	-0.22%	PR	-0.28%	SI	-0.11%	MO	-0.14%	GR	-0.18%
LE	-0.29%	DY	-0.37%	MO	-0.31%	EM	-0.47%	MO	-1.24%
VO	-1.18%	MO	-0.84%	DY	-0.45%	MS	-0.79%	DY	-1.36%

*See Figure 17 for definition of style factors used.

The other three funds, VGHY, RSHD, and ISHD, all benefitted from their average exposure to value being positive in the latter years but Figure 8 shows that their path does not reflect the same kind of discipline or relationship with dividend yield as the AXUN portfolio during that period.

As stated at the start of this paper, our expectations were for smart beta funds with a similar label to have a similar active style return footprint, even when looking across funds on a contemporary basis. Figure 9 shows the annualized contribution to active return from each style factor ranked from highest to lowest contributor for each fund. Even for funds with a similar history, there are vast differences in their style contributions.

Sector Analysis

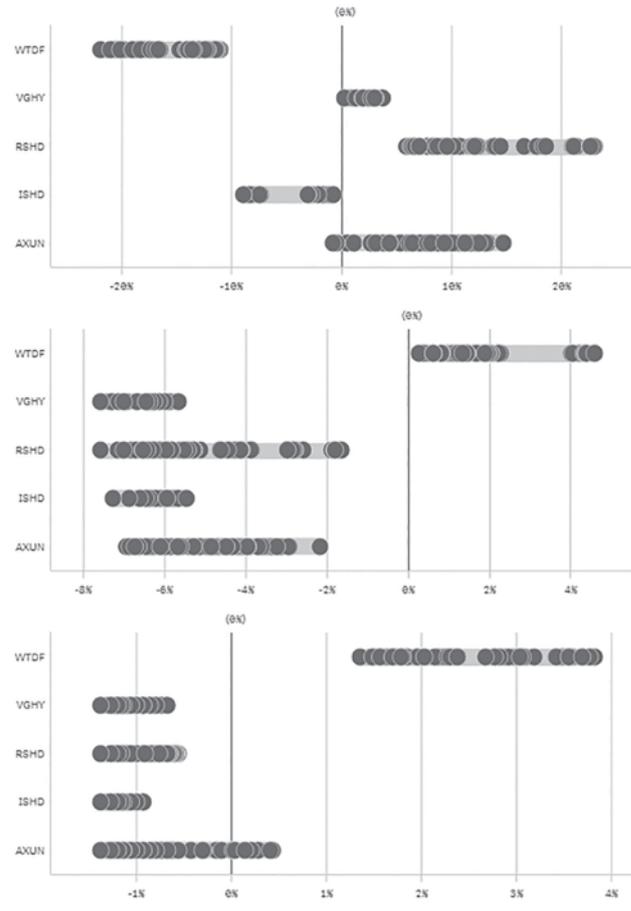
Just as with styles, there was disagreement on which sectors represented the best hunting grounds for dividend yield. Again, we find that the WTD fund had strong contrarian views from the other four funds on some key sectors. Figure 10 shows the annualized contribution to active return from sectors as a whole as well as three individual sectors: financials, health care, and information technology.

Figure 11 shows the dispersion of each fund's exposure to these three sectors (financials on top, health care in the middle, and IT at the bottom). In each case, WTDF is alone in its views regarding the availability of dividend yield in that sector. By far the largest contrarian bet WTDF makes is in the financial sector, with a large and

Figure 10. Annualized contribution to active return

Portfolio	Sectors	Financials	Health Care	Info Tech
WTDF	1.87%	-0.21%	0.16%	0.06%
VGHY	1.50%	-0.15%	0.37%	0.01%
RSHD	1.88%	0.53%	-0.12%	-0.00%
ISHD	-1.96%	-0.15%	0.13%	-0.01%
AXUN	0.77%	0.31%	-0.17%	0.00%

Figure 11. Active exposure dispersion for financials, healthcare, and IT sectors



constant underweight during the entire period. The two funds that remained overweight in that sector, RSHD and AXUN, were handsomely rewarded for that exposure. Both also balanced that exposure with an underweight in Materials which also paid off.

As shown in Figure 3, all funds reported a significant positive contribution to active return from their sector exposures, with the exception of ISHD which saw a negative 1.96% return. Despite this top level similarity, as with their style factor returns, all exhibited very different sector return contributions, even funds with similar histories. Figure 12 shows the sector contribution to active return, ranked from highest to lowest contributor, for each fund. Notice how telcomm, energy, and utilities had a very different return contribution across WTD, RSHD, and AXUN, all funds with a similar history.

Stock Selection Analysis

In this section we take a look at each fund from the point of view of their stock selection decisions. Here we avoid the issue of timing by looking at all assets held and not held by the fund at any time during its history and accounting for each assets contribution during that time. This allows us to compare all the funds in the same way one by one. We will focus on WTD, RSHD, and the AXUN.

The tables in Figure 13 present some stock selection metrics for these three funds. The first three columns look at assets held and benchmark/universe assets not held. We gather metrics on the number of positive versus negative contributors as well as the aggregate contribution of these sub-groups and compute the relative hit rates (a.k.a. batting average) for each fund. In the last three columns, we isolate the fund's 'high-conviction' bets, defined as having an active weight greater-than 1 standard deviation of all active weights in the fund (i.e. the top and bottom 16% of bets) and collect similar metrics. In doing this we hope to isolate the manager's skill in picking winners and losers separately, as well as get a good sense for when high conviction is being rewarded.

All three funds seem to have skill at picking winners, especially high-conviction winners, and to a lesser extent losers, but all three score low on their choice for high-conviction losers.

Next, for each fund, we regressed every asset's active weight (held and not held) against its contribution to active return. All except VGHY scored well, with ISHD having the highest R-square of 0.48 albeit with the shortest history. WTD scored 0.41, RSHD 0.43, AXUN 0.35, and VGHY only 0.08. Since these are all systematic strategies, we are not giving much weight to this section of the analysis which is more appropriate for professed stock pickers and high-conviction / high-concentration funds.

Another metrics often looked at for stock analysis has to do with concentration and how much contribution to total active return is delivered with the top ten holdings in the fund. Figure 14 shows the percent of total portfolio weight from the top ten holdings in each fund as well as the associated contribution to total active return for these holdings.

WTD is the least concentrated fund with its top ten holdings totalling only 25% of the total fund weight, however, perhaps it is that lack of conviction which caused these assets to contribute negatively to the fund's total active return. The other four funds have a concentration of between 54-67% for their top ten holdings, but only three (RSHD, ISHD, and AXUN) managed a positive contribution to total active return from this effort.

Finally we look at the correlation across active holdings between the funds to gain an understanding of how similar these portfolios are to each other. Although these are not portfolios constructed by bottom-up stock pickers, they all have a similar label.

Figure 12. Sector contributions to active returns*

Sector1	WTD	Sector2	VGHY	Sector3	RSHD	Sector4	ISHD	Sector5	AXUN
Total	1.87%	Total	1.50%	Total	1.88%	Total	-1.96%	Total	0.77%
MA	1.83%	IN	1.04%	MA	0.60%	UT	0.39%	TE	0.70%
CD	0.40%	UT	0.62%	FI	0.53%	RE	0.20%	FI	0.31%
HC	0.16%	HC	0.37%	EN	0.32%	HC	0.13%	MA	0.22%
IT	0.06%	RE	0.28%	UT	0.21%	EN	0.12%	EN	0.17%
IN	0.06%	EN	0.22%	TE	0.20%	IT	-0.01%	UT	0.13%
CD	0.04%	IT	0.01%	CD	0.17%	IN	-0.12%	IT	0.00%
UT	-0.01%	MA	-0.03%	CD	0.04%	CD	-0.15%	CD	0.00%
TE	-0.04%	CD	-0.14%	IN	0.02%	FI	-0.15%	CD	-0.02%
RE	-0.17%	FI	-0.15%	IT	0.00%	CD	-0.36%	RE	-0.09%
FI	-0.21%	TE	-0.21%	RE	-0.09%	TE	-0.86%	HC	-0.17%
EN	-0.23%	CD	-0.49%	HC	-0.12%	MA	-1.15%	IN	-0.48%

*See Figure 18 for definition of sector factors used.

Figure 13. Stock selection analysis for WTD, RSHD, and AXUN

Metrics	WTD						
	Held	Not Held	Total	O-W	U-W	Neutral	Total
Number Assets	109.00	214.00	323.00	27.00	13.00	283.00	40.00
Number +ve Contrib	64.00	115.00	179.00	24.00	2.00	153.00	26.00
Number -ve Contrib	45.00	99.00	144.00	3.00	11.00	130.00	14.00
Hit Rate (%)	58.72	53.74	55.42	88.89	15.38	54.06	65.00
Total +ve Contrib (%)	9.52	0.90	10.42	5.32	0.53	4.57	10.42
Total -ve Contrib (%)	-6.68	-2.40	-9.07	-0.92	-4.13	-4.02	-9.07
Total Contribution (%)	2.85	-1.50	1.35	4.40	-3.60	0.55	1.35

Metrics	RSHD						
	Held	Not Held	Total	O-W	U-W	Neutral	Total
Number Assets	98.00	240.00	338.00	22.00	12.00	304.00	34.00
Number +ve Contrib	46.00	130.00	176.00	21.00	5.00	150.00	26.00
Number -ve Contrib	52.00	109.00	161.00	1.00	7.00	153.00	8.00
Hit Rate (%)	46.94	54.17	52.07	95.45	41.67	49.34	76.47
Total +ve Contrib (%)	5.74	0.95	6.69	4.48	0.41	1.81	6.69
Total -ve Contrib (%)	-3.54	-1.20	-4.74	-0.20	-1.01	-3.53	-4.74
Total Contribution (%)	2.19	-0.24	1.95	4.28	-0.61	-1.72	1.95

Metrics	AXUN						
	Held	Not Held	Total	O-W	U-W	Neutral	Total
Number Assets	153.00	181.00	334.00	17.00	18.00	299.00	35.00
Number +ve Contrib	77.00	82.00	159.00	12.00	7.00	140.00	19.00
Number -ve Contrib	76.00	98.00	174.00	5.00	11.00	158.00	16.00
Hit Rate (%)	50.33	45.30	47.60	70.59	38.89	46.82	54.29
Total +ve Contrib (%)	8.32	0.63	8.94	4.83	0.74	3.38	8.94
Total -ve Contrib (%)	-6.59	-3.25	-9.83	-0.53	-2.14	-7.16	-9.83
Total Contribution (%)	1.73	-2.62	-0.89	4.31	-1.41	-3.79	-0.89

Figure 14. Top ten holdings by weight and their contribution to total active return

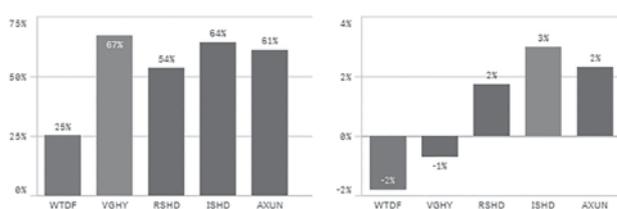


Figure 15 shows the correlation across the five funds at the active weight level. As we have noted before, WTDF has the lowest average correlation with the other four funds. While the average correlation level for each fund remains low-to-moderate (between 0.29-0.34), some funds seem to be moderately positively correlated to each other. VGHY has a correlation of 0.54 with both ISHD and AXUN, and RSDH has a correlation of 0.53 with AXUN.

As mentioned before, since these are systematic strategies without individual stock alphas involved, it is doubtful that stock selection played a big part in portfolio construction (at least it was not mentioned in the documentation). These strategies were the results of screening processes on systematic signals, but this analysis can serve as an example of what to look at in a portfolio built by a stock-picker with specific alphas at the individual security level.

Conclusion

We used a fundamental multi-factor model with a dividend yield style factor to analyse four listed High Dividend ETFs in Australia. Given the similarity in their investment objectives and investment universes, we expected to find similarities in their quantitative footprint. Instead, their performance showed a dispersion level which cannot be explained by randomness alone (see Figure 16). This lack of consistency, both with each other as well as with the factor they aimed to track, was confirmed at all levels of the analysis – total active return, style & sector exposures, and asset selection. Not only did active returns not match the target factor return, but the contributions to active returns also defied expectations. Investors looking for a disciplined factor-harvesting product would do well to remember that what they will get in return may not necessarily be what it says on the tin and not to select a fund based on its name alone. **FS**

Figure 15. Active weight correlation across funds

Portfolio	Q	WTDF	VGHY	RSHD	ISHD	AXUN
Average		0.11	0.34	0.33	0.29	0.32
WTDF	-		-0.03	0.28	0.17	0.02
VGHY		-0.03		0.33	0.54	0.54
RSHD		0.28	0.33		0.20	0.53
ISHD		0.17	0.54	0.20		0.20
AXUN		0.02	0.54	0.53	0.25	

Figure 16. Predicted active correlation across funds based on holdings as of Aug 31st 2017

Correl.	WTDF	VGHY	RSHD	ISHD	AXUN
WTDF	1.00	0.08	0.13	0.36	0.07
VGHY	0.08	1.00	0.05	0.80	0.58
RSHD	0.13	0.05	1.00	-0.09	0.45
ISHD	0.36	0.80	-0.09	1.00	0.45
AXUN	0.07	0.58	0.37	0.45	1.00

Figure 17. Definition of style factors

Code	Style factor name
DY	Dividend yield
EM	Emerging market sensitivity
FX	Exchange rate sensitivity
GR	Growth
LE	Leverage
LI	Liquidity
MO	Medium-term momentum
MS	Market sensitivity
PR	Profitability
SI	Size
VA	Value
VO	Volatility

Figure 18. Definition of sector factors

Code	Sector name
CD	Consumer discretionary
CS	Consumer staples
EN	Energy
FI	Financials
HC	Health care
IN	Industrials
IT	Information technology
MA	Materials
RE	Real estate
TE	Telecomm
UT	Utilities