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Comparing Value Factor Performance in Global Equity Markets

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AUTHORS

Tamura Hiromichi
Head of Investment Research, APAC
+81 (3) 4563 6321
Hiromichi.tamura@lseg.com

Alex Chen
Head of Index Research, APAC
+852 2164 3206
alex.chen@lseg.com

Introduction[1]

In recent years, Value has underperformed other factors in global equity markets. However, the sources of Value performance are not identical. The purpose of this analysis is not to identify the reasons for the slump in Value, but to analyze its performance by region and the differences in the sources of Value performance.

- The analysis shows that over the last 20 years, conventional Value in the US has been "bulked up" by returns attributable to non-Value factors and industries, with the return contribution of Value itself being low.
- In contrast, in Asian developed countries (excluding Japan) and emerging markets, conventional Value was mainly attributed to Value itself.
- Over the past two decades, conventional Value has shown positive premiums in five regions, but when observed in “pure” Value terms (which exclude the impact of non-Value factors), the US had almost zero returns.

[1] This paper is the English adaptation of “A Comparison of Value Factor Performance in Global Equity Markets, Securities Analysts Journal Japan, 59 (3), March 2021.”

Executive summary

The Value effect has been discussed in academia for some time. For example, research such as Fama and French (1993), and Lakonishok, Shleifer and Vishny (1994) show Value as a risk premium, and the tendency to over- (under-) value investments in good (poor) performing companies are sources of the Value effect. Value strategies have traditionally been highly popular among quantitative systematic funds, partly because the Value factor has been discussed in academia[2]. However, since the global financial crisis (GFC) in 2008, Value has generally been in a slump, hence the reasons for the recent downturn being debated by not only market participants, but also in academic circles[3].

The purpose of this analysis is not to identify the reasons for the decline in Value, but to provide an exhaustive analysis of how Value has performed globally. In general, there is a consensus that Value has underperformed in the most recent period, but the extent of loss has varied by region and period. Here, we use a unified and objective methodology to define the Value factor return and perform several analyses. Factor returns are frequently defined in terms of quantile portfolio spread returns or regression coefficients, but they do not reflect all of the sample data, or are difficult to invest in. Also, defining "Value" is a topic in itself. We avoid these pitfalls by using the FTSE Russell methodology to define factor returns and the FTSE Russell definition of Value (a combination of E/P, CF/P and country relative S/P).

In addition, we also focus on the performance of "pure" Value. Needless to say, Value is influenced by specific sectors, or even other factors (Quality, Momentum, Low Volatility, Size, etc.). It could be argued that Value includes those correlations. But it is also interesting to see how "pure" Value behaves, without any sector or other factor influences. Here, we have analyzed the performance of the pure Value factor in its "investable" form. Specifically, we used the FTSE Russell's Target Exposure approach, discussed later, to create and analyze factor returns on a "pure" basis, neutralizing the influence of sectors and other factors (called off-target). We observed differences in Value returns by region, construction method (i.e., conventional or pure), return driver and regime.

[2] In general, there are several indications that systematic investment strategies tend to concentrate on similar strategies because successful strategies in simulations against historical data tend to be adopted, and results in subsequently bad excess returns.

[3] For example, Lev and Srivastava (2019) point out that one of the reasons for the slump in Value is the inappropriate accounting and valuation of intangible assets, especially for growth stocks.

2. Data and methodology

We use the following data and methods for this analysis:

2.1 Coverage and period

From the FTSE All-World Index (large & mid) universe, we analyzed the data from Japan, the United States, Europe, Asia Pacific (excluding Japan), and Emerging Markets over a 20-year period, from September 29, 2000 to September 30, 2020.

2.2 Definition of Value and other factors

There are various definitions of Value, including B/P, E/P, dividend yield or CF/P, to name a few. How to define Value is an important topic in itself, but we have used a combination of E/P, CF/P and S/P. This is the definition of Value in the FTSE Global Factor Index Series and represents a combination of commonly used Value metrics. Table 1 shows the definitions of other factors, including Value.

Table 1: Definitions of factors

Factor	Definition	Direction[4]
Value	Earnings Yield, Cash Flow Yield and Country Relative Sales to Price Ratio	+
Size	Log of Full Market Capitalization	-
Quality	ROA, Change in Asset Turnover, Accruals and Leverage	+
Momentum	Cumulative 11-month return (excluding most recent month)	+
Low volatility	Standard deviation of 5 years of weekly returns	-

Source: FTSE Russell.

2.3 Tilt method

When examining factor effects, we used the "tilt" approach, which adjusts the weights of individual stocks according to the value of their factor exposures. This is also a standard methodology in our factor index construction. Specifically, as shown in Equation (1), we multiply the starting market capitalization-weighted index weights $W_{i,M}$ by the Value factor scores $S_{i,Val}^{p}$ (between 0 and 1) to calculate the new weight W_i after tilt.

$$W_i = W_{i,M} \times S_{i,Val}^{p} \quad (1)$$

Where

W_i New weights after factor tilt

$W_{i,M}$ Initial market capitalization-weighted index weight

$S_{i,Val}^{p}$ Value factor scores

p Tilt power (intensity)

[4] "-" indicates small size and low volatility, with higher factor values.

To calculate factor scores, the raw factor measures are normalized to values with a mean of 0 and a standard deviation of 1 (Z-score) and then converted to values from 0 to 1, using the cumulative normal distribution function. As the Value factor consists of three sub-factor measures, a stock's initial Value factor Z-score is formed by taking the average of its individual sub-factor Z-scores. The averages are then normalized again to form the overall Value factor Z-score, which are then converted to Values from 0 to 1. Finally, the new weight W_i (after the tilt) is readjusted, so that the total portfolio weight is 1.

This tilt method can be expanded to multi-factors. Factors, other than Value (like Size or Momentum), ESG scores or industry and country weight constraints can all be converted to tilts and multiplied repeatedly to create an index to achieve multiple objectives simultaneously, as shown in Equation (2).

$$\boldsymbol{w_F} = \boldsymbol{w_{Mcap}} \times \underbrace{\boldsymbol{S_{Val}^{n}} \times \ldots \times \boldsymbol{S_{Mom}^{p}}}_{\textit{Factor}} \times \underbrace{\boldsymbol{S_{Res}^{q}} \times \ldots \times \boldsymbol{S_{Em}^{r}}}_{\textit{ESG}} \times \underbrace{\boldsymbol{S_{Beta}^{s}}}_{\textit{Beta}} \times \underbrace{\boldsymbol{C} \times \boldsymbol{I}}_{\textit{Country \& Industry}} \qquad \textbf{(2)}$$

In Equation 2, additional implementation properties (e.g., level of investment capacity, maximum stock weight limits and turnover) may also be expressed and controlled as additional multiplicative tilts. Again, the final weight $\boldsymbol{w_F}$ is readjusted, so that the total weight is 1.

In this study, the "conventional" Value index is constructed by applying a single tilt to the Value factor (p=1) to the underlying market-cap index weights. Country (industry) weights are not neutralized, but constrained to be within in a relative range, so as to avoid extreme underweighting or overweighting.

2.4 Definition of factor return

The factor return is defined as the difference between the tilt portfolio return and the underlying market capitalization-weighted index return.

2.5 Sector classifications

We use the Industry Classification Benchmark (ICB), which groups companies into 10 industries at top level[5].

2.6 Target Exposure

As mentioned in the previous section, one element of this paper is the performance of "pure" Value. In order to observe "pure" Value without the influence of sectors and other factors, we used the Target Exposure method, which reverses the order of the Tilt described earlier[6]. In the tilt approach, the weight of a stock is calculated by determining the factor scores and the tilt strength p. In the Target Exposure method, the desired factor exposure at the portfolio level is first determined, and then the numerical solution of the tilt strength p that achieves that factor exposure is obtained and the weight of the stock is calculated. In this study, the "pure" Value index is constructed by achieving the same level of active Value exposure observed in the

[5] The new ICB, which has been extended to 11 industries, is applied to FTSE Index Series from March 2021.

[6] For details, see FTSE Global Factor Index Series Ground Rules.

"conventional" Value index, no active exposure to Quality, Volatility, Momentum, Size and market beta and neutral country and industry[7] exposure.

3. Results and discussions

3.1 Descriptive statistics of universe data

To assess the trends of Value factor performance in global markets, we draw from market-cap weighted indexes for a representative set of markets and regions to include the US, Developed Europe, Japan, Developed Asia Pacific (excluding Japan), and the Emerging Markets and construct a Value and a "pure" Value portfolio for each. Each market or region is represented by its large and mid-cap index, which is the primary investment universe for institutional investors.

Table 2 summarizes the performance, risk measures and holding level characteristics for each benchmark universe. In the 20 years ending September 30, 2020, the US exhibited the highest risk-adjusted return, while Japan recorded the lowest. All regions suffered over 50% maximum drawdown due to the GFC. From a concentration perspective, Emerging Markets are most diversified, as measured by the average number of stocks, while Developed Asia Pacific (ex Japan) is the least diversified. In terms of global presence, the US occupies nearly 50% of the All-World universe by index weight on an average basis, followed by Developed Europe, which takes just above 25%. The five regions, in aggregate, represent around 97% of the FTSE All-World Index, which aims to capture 90% of the global investable market capitalization.[8]

Table 2: Summary statistics of market-cap indexes by region

	US	Europe	Japan	Asia Pacific ex Japan	Emerging
Return (% p.a.)	6.54	4.39	2.29	8.15	8.66
Volatility (% p.a.)	15.08	18.46	17.62	19.65	21.64
Return / Risk Ratio	0.43	0.24	0.13	0.41	0.40
Max Drawdown (%)	-50.43	-58.91	-57.08	-60.44	-61.07
Average Number of Stocks	620	529	459	322	922
Average Top 10 Weights (%)	19.55	19.28	21.73	31.90	19.31
Average Weight in All-World (%)	49.19	25.09	8.45	5.37	8.79

Notes: Data is from September 29, 2000 to September 30, 2020. Markets are represented by FTSE USA, FTSE Developed Europe, FTSE Japan, FTSE Developed Asia Pacific ex Japan and FTSE Emerging indexes. Index performance is based on monthly gross total returns in JPY for Japan and gross total returns in USD for the remaining markets. Average Number of Stocks, Average Effective N, Average Top 10 Weight (%) and Average Weight in All-World (%) are based on the average index composition at each March and September semi-annual index rebalance.

Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

[7] All indexes were rebalanced in March and September of each year, in line with FTSE Russell standard indexes. Active exposure targets are attained at each rebalance but may drift apart as a result of relative price movements during the six-month period between rebalances.

[8] Refers to global developed and emerging markets as defined by FTSE Russell equity country classification process.

3.2 Performance of conventional Value and “pure” Value by region

Table 3 reports the performance measures (excess return) of conventional Value and “pure” Value in each region, over the whole sample period.

In all five regions, conventional Value recorded positive annualized excess returns, despite the wide disappointment over its poor performance in the last decade, e.g., in Blitz (2020). “Pure” Value, on the other hand, reveals the true nature of Value factor performance, which does not follow the observations for conventional Value. For the US, Japan and Asia Pacific ex Japan indexes, “pure” Value exhibited lower excess returns than conventional Value, while for the European and Emerging Market indexes, it produced higher excess returns. The performance differences mainly originate from the off-target factor exposures, active country and industry bets, and active market beta that conventional Value carries. The contributions to performance from these biases vary by region and by time period, which convolute the performance pattern of conventional Value. Overall, the t-statistics indicate that Value performance was more apparent in the Asia Pacific ex Japan region, than other regions, for both conventional Value and “pure” Value.

One striking finding is that after correcting for various style, industry and market bias, “pure” Value in the US registered a negative return over the whole sample period, which is 145 basis points per annum lower than conventional Value. This indicates that the Value premium in US equities is more fragile on a pure basis than on a conventional basis. Therefore, it is important to understand the underlying drivers of a conventional Value strategy, which will be further studied in following sections.

Another notable point is the difference in volatility between conventional Value and “pure” Value premiums. This is the tracking error between the conventional (or pure) Value index and the underlying market index. In all five regions, “pure” Value exhibited lower tracking error than conventional Value by over one percentage point. In markets where the Value performance was evident and arises primarily from Value factor exposure, it is possible to achieve a larger Value premium per unit of tracking error. This clearly demonstrates the benefit of neutralizing the off-target factor exposures and the country, industry and market biases, all of which are sources of active risk.

Table 3: Performance measures of conventional Value and "pure" Value

	US		Europe		Japan		Developed Asia Pacific ex Japan		Emerging	
	Return (% .a.) (t-stat)	Volatility (% p.a.)	Return (% .a.) (t-stat)	Volatility (% p.a.)	Return (% .a.) (t-stat)	Volatility (% p.a.)	Return (% .a.) (t-stat)	Volatility (%p.a.)	Return (% p.a.) (t-stat)	Volatility (% p.a.)
Conventional Value	1.38 (1.3)	5.06	0.15 (0.67)	5.25	1.48 (1.65)	4.34	1.81 (2.11)	3.82	0.76 (0.98)	4.35
"Pure" Value	-0.07 (0.07)	2.48	0.31 (0.91)	2.34	0.46 (0.93)	2.57	1.41 (2.76)	2.21	0.99 (1.75)	2.54
Market Index	6.54	15.08	4.39	18.46	2.29	17.62	8.15	19.65	8.66	21.64

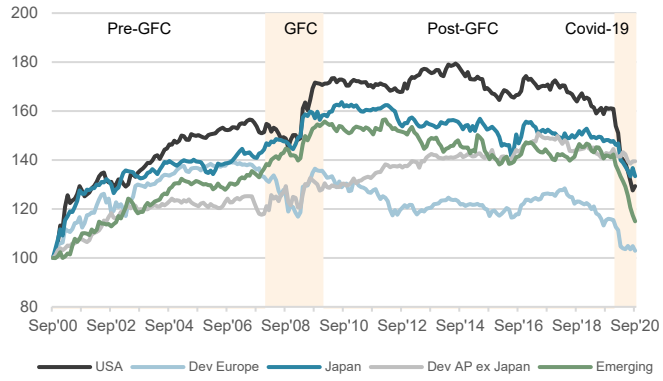
Notes: Data is from September 29, 2000 to September 30, 2020. Markets are represented by FTSE USA, FTSE Developed Europe, FTSE Japan, FTSE Developed Asia Pacific ex Japan and FTSE Emerging indexes.

Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

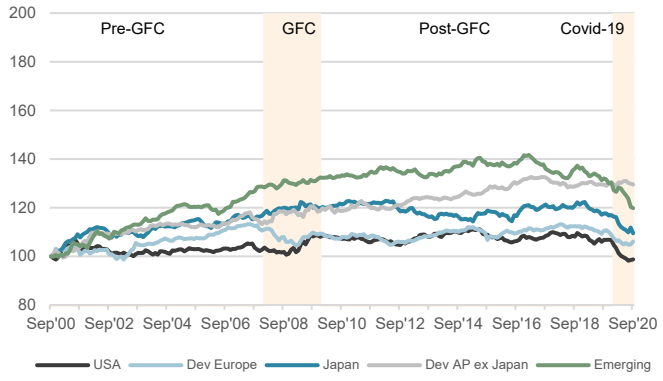
Figure 1 presents the cumulative performance of conventional and "pure" Value for each region. As shown, "pure" Value exhibited more stable performance than conventional Value.

Figure 1: Cumulative performance of conventional Value and "pure" Value

Panel A: Cumulative conventional Value performance



Panel B: Cumulative "pure" Value performance



Notes: Data is from September 29, 2000 to September 30, 2020. Shaded zone denotes regimes which are defined at the following section.

Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

3.3 Performance of conventional Value and pure Value by regimes

We examine the trend in Value factor performance by dividing the sample period into four secular regimes: pre-GFC (October 2000 to December 2007); GFC (2008 to 2009); post-GFC (2010 to 2019) and COVID-19 (January 2020 to September 2020). Table 4 provides the performance measures of conventional and "pure" Value for each region and regime. The GFC and COVID-19 periods can be considered unusual scenarios, and we therefore focus on the pre-GFC and post-GFC periods.

Table 4 shows that for both conventional Value and "pure" Value performance diminished post-GFC compared with pre-GFC. However, there are regional differences in the extent of the decline in factor returns. On a conventional basis, Japan, the US and Europe are down about 6% from pre-GFC to post-GCF, while on a pure basis, Japan is down by 2.45%, Europe by 1.58% and the US by 0.52%. We have already noted that "pure" Value in the US over the last two decades has exhibited trivial average returns, but interestingly in the US, "pure" Value performance has been less affected post-GFC.

Table 4: Performance of conventional Value and pure Value by regimes

Panel A: Performance measures of conventional Value by regimes

	US		Europe		Japan		Asia Pacific ex Japan		Emerging	
	Return (%p.a.) (t-stat)	Volatility (% p.a.)	Return (%p.a.) (t-stat)	Volatility (% p.a.)	Return (%p.a.) (t-stat)	Volatility (% p.a.)	Return (%p.a.) (t-stat)	Volatility (% p.a.)	Return (%p.a.) (t-stat)	Volatility (% p.a.)
Pre-GFC (2000 - 2007)	6.00 (2.94)	5.19	4.42 (2.34)	5.06	5.27 (3.01)	4.46	2.73 (1.83)	3.19	5.33 (2.91)	3.98
GFC (2008-2009)	5.54 (1.27)	7.97	0.80 (0.49)	9.20	3.74 (1.38)	5.17	3.83 (0.93)	8.02	6.01 (2.09)	4.79
Post-GFC (2010-2019)	-0.66 (-0.52)	2.98	-1.68 (-1.02)	3.85	-0.74 (-0.42)	3.57	1.29 (1.48)	2.83	-0.87 (-0.42)	3.79
COVID-19 (2020)	-21.00 (-3.48)	7.01	-10.00 (-1.73)	6.79	-9.43 (-1.67)	6.64	-3.29 (-1.04)	3.85	-18.86 (-7.58)	3.24
Return difference between pre- and post-FC	-6.66		-6.10		-6.01		-1.44		-6.20	

Panel B: Performance measures of pure Value by regimes

	US		Europe		Japan		Asia Pacific ex Japan		Emerging	
	Return (%p.a.) (t-stat)	Volatility (%p.a.)	Return (%p.a.) (t-stat)	Volatility (%p.a.)	Return (%p.a.) (t-stat)	Volatility (%p.a.)	Return (%p.a.) (t-stat)	Volatility (%p.a.)	Return (%p.a.) (t-stat)	Volatility (%p.a.)
Pre-GFC (2000 - 2007)	0.38 (0.45)	2.52	1.53 (1.66)	2.54	2.19 (2.37)	2.50	2.05 (2.04)	2.35	4.30 (3.72)	2.66
GFC (2008-2009)	2.28 (1.17)	3.62	-0.48 (0.03)	3.08	1.02 (0.70)	2.87	2.17 (0.91)	3.59	1.35 (1.12)	1.94
Post-GFC (2010-2019)	-0.14 (-0.12)	1.97	-0.05 (0.10)	1.94	-0.26 (-0.24)	2.29	1.00 (1.92)	1.74	-0.16 (-0.16)	2.11
COVID-19 (2020)	-7.94 (-3.24)	2.69	-2.28 (-1.02)	2.86	-6.21 (-1.72)	4.22	-0.60 (-0.51)	1.81	-7.97 (-2.49)	4.06
Return difference between pre- and post-GFC	-0.52		-1.58		-2.45		-1.05		-4.46	

Notes: Index performance is based on monthly data from September 29, 2000 to September 30, 2020. Markets are represented by FTSE USA, FTSE Developed Europe, FTSE Japan, FTSE Developed Asia Pacific ex Japan and FTSE Emerging indexes. Returns during COVID-19 are not annualized since the period is less than a year.

Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

3.4 Factor exposures of conventional Value and "pure" Value

It is well known that style factors are correlated with each other. As a result, a Value portfolio constructed with Value factor metrics in isolation will carry off-target factor exposures. Panel A of Figure 2 provides the average active factor exposures of the conventional Value indexes in each region.

- In most regions, the conventional Value indexes exhibit negative quality exposure (except for Asia Pacific ex Japan) and slightly negative low volatility exposure (except for Japan).
- In all regions, the conventional Value indexes show positive size (small cap) exposure and negative momentum exposure.

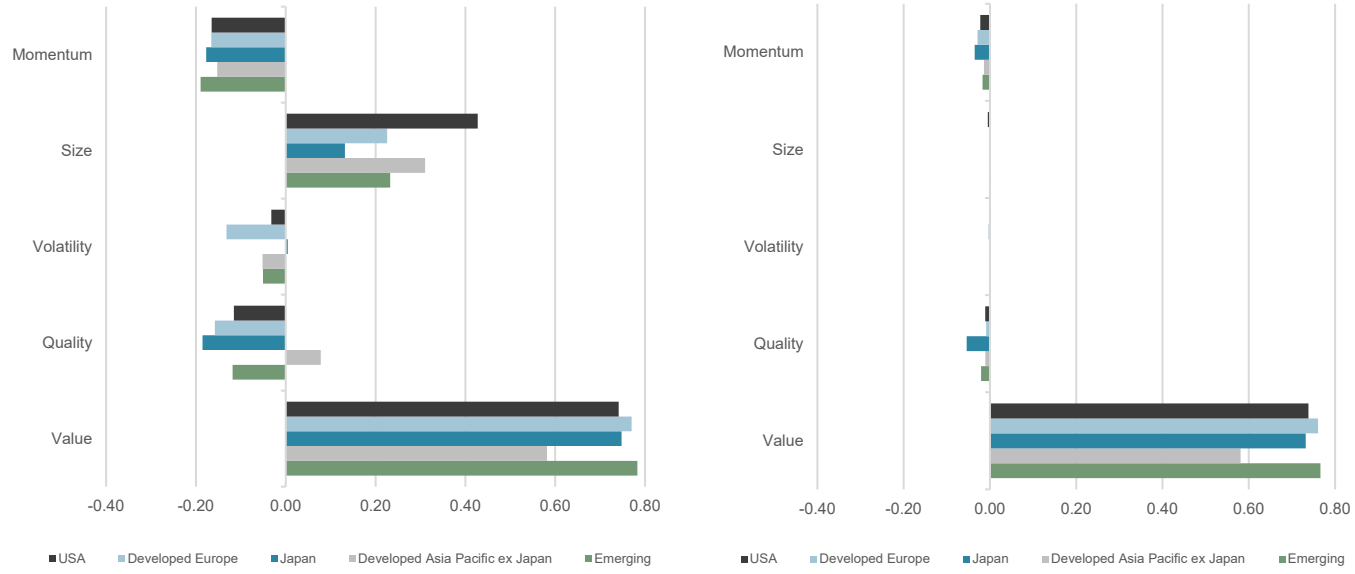
By and large, it echoes the traditional wisdom that a conventional Value portfolio tends to overweight stocks which are of lower quality, more volatile than the market, smaller in size and have fallen in price. In terms of country characteristics, we observe that US conventional Value has a relatively greater level of small-cap bias, while Europe conventional Value has a higher volatility, and Japan, a lower quality. It is important to bear in mind that these off-target factor exposures also drive the active return and risk of the conventional Value portfolio, besides the intended Value exposure.

Panel B of Figure 2 shows the average active factor exposures of the "pure" Value indexes in each region. By design the "pure" Value indexes have comparable levels of active exposure to Value, but no off-target factor exposures. The trivial average active off-target factor exposures (e.g., Quality and Momentum) result from the drift in index weights between semi-annual rebalances. The merit of this factor purity allows the "pure" Value index to capture the Value premium without distortions from other unintended style factors.

Figure 2: Active factor exposures of conventional Value and pure Value indexes

Panel A: Average active factor exposures of conventional Value indexes

Panel B: Average active factor exposures of pure Value indexes



Notes: based on monthly data from September 29, 2000 to September 30, 2020. Active factor exposure is measured as the difference of weighted average factor Z-scores between the conventional (or pure) Value index and underlying market index.

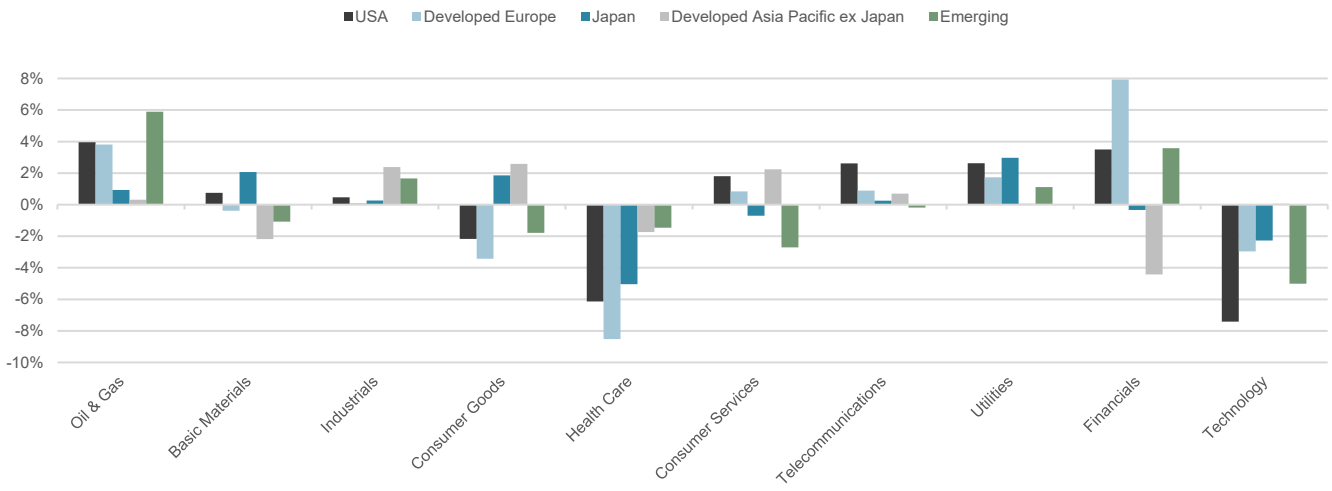
Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

3.5 Active index weights of conventional Value indexes

Since the relative cheapness of stocks across industries varies, it is natural for conventional Value index to take active industry bets. Figure 3 presents the average active industry weights of conventional Value indexes for each region. It is interesting that there is a regional consensus on certain industries, as well as notable discrepancies. For example, Oil & Gas, Industrials and Utilities are overweight on an average across all regions, while Health Care is consistently underweight across all regions. Technology is also underweight in all regions, with the exception of Asia Pacific ex Japan. Conversely, Financials exhibit high regional disparity; overweight in US, Europe and Emerging Markets and underweight in Japan and Asia Pacific ex Japan[9].

[9]More recently Financials have exhibited relative Value across the globe as are overweight in all five regions in 2020.

Figure 3: Average active industry weights of conventional Value indexes



Notes: Data is from September 29, 2000 to September 30, 2020. Average active index weights are based on index composition post March and September semi-annual reviews.

Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

3.6 Performance attribution of conventional Value and "pure" Value

Having discussed the off-target factor exposures and active industry weights embedded in the conventional Value indexes, it is important to understand their implications for portfolio performance. The use of a series of capitalization-weighted cross-sectional regressions (see Fama and MacBeth [1973], and Davis and Menchero [2010]), permits the attribution of excess return to common style, industry and country factors. The process determines factor returns in each period through regressing the returns of stocks in the underlying index against their style factor, country and industry exposures. It follows that the factor return contribution is the product of the active factor exposure and factor return.

Table 5 presents the performance attribution results of conventional Value in Panel A and "pure" Value in Panel B respectively.

- In the case of US conventional Value, the contribution of Value to total excess return is minimal. Instead, excess return arises mainly from the Size and Volatility factors.
- Similarly in Europe and Japan, Size exposure contributes substantially to excess return, being second only to Value in terms of contribution. In contrast the contribution of Size in Asia Pacific ex Japan and Emerging Markets is slightly negative.
- It is also worth noting differences in the contribution by industry: The US had the largest industry contribution among the five regions, suggesting that the stock price performance of FAANGS and other large growth companies had a strong impact on US Value returns.

In the case of "pure" Value, the contribution from Value factor is close to that of conventional Value due to matched Value factor exposures during rebalance and clearly illustrates that the excess return arises primarily from Value exposure, when off-target factor exposures are neutralized.

Table 5: Performance attribution of conventional Value and pure Value

Panel A: Contributions to excess returns of conventional Value indexes

%	US	Europe	Japan	Asia Pacific ex Japan	Emerging
Country	-	-0.28	-	0.02	0.59
Industry	0.25	0.10	0.13	0.16	0.09
Style factors	1.28	1.22	1.37	1.60	0.69
Value	-0.03	0.88	0.76	1.25	1.29
Quality	-0.13	-0.21	-0.12	0.22	-0.20
Volatility	0.45	0.19	0.17	0.35	0.06
Size	0.74	0.54	0.72	-0.03	-0.13
Momentum	0.25	-0.17	-0.16	-0.18	-0.32
Stock Specific	-0.09	-0.52	0.10	-0.12	-0.01
Total Excess	1.44	0.79	1.60	1.77	0.90

Panel B: Contributions to excess returns of pure Value Indexes

%	US	Europe	Japan	Asia Pacific ex Japan	Emerging
Country	-	-0.01	-	0.00	0.04
Industry	0.07	0.03	0.01	0.01	0.05
Style factors	0.20	0.91	0.76	1.30	1.24
Value	0.06	0.93	0.71	1.21	1.34
Quality	0.02	-0.01	0.05	-0.01	-0.06
Volatility	0.03	0.03	-0.02	-0.01	-0.01
Size	-0.02	-0.01	-0.01	0.04	0.00
Momentum	0.11	-0.04	0.03	0.07	-0.04
Stock Specific	-0.23	-0.43	-0.24	0.08	-0.26
Total Excess	0.04	0.48	0.54	1.36	1.00

Notes: based on annualized monthly arithmetic returns from September 29, 2000 to September 30, 2020. Markets are represented by FTSE USA, FTSE Developed Europe, FTSE Japan, FTSE Developed Asia Pacific ex Japan and FTSE Emerging indexes.

Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

3.7 Performance attribution comparison between before and after GFC

In the previous section, we performed a factor attribution analysis of both conventional and “pure” Value and discussed the sources of Value return in different regions. In this section, we observe how the results of the attributions differ before and after the GFC. Especially, we would like to pay particular attention to the post-GFC pattern, since Value factor returns worsen after the GFC.

Table 6 shows the performance attribution before the GFC (2000-2007) and Table 7 shows the performance attribution after the GFC (2010-2019). As can be seen from Panel A of Table 6, the total excess return of Value is positive in all regions. In particular, we can see that the US has the largest return at 5.59%. However, in terms of the contribution of Value itself, the US has the lowest at 1.67%. In other words, the conventional Value of the US was boosted by the "off-target" factors such as size and industry. This is the same as the result of the full-period analysis observed earlier. Consistent with this observation, on a “pure” Value basis in Panel B of Table 6, the excess return on Value in the US is 0.42% – the lowest among the five regions.

Next, we observe the attribution after the GFC in Table 7. Looking at the attribution of conventional Value in Panel A of Table 7, we can confirm that the excess return of Value is negative in four of the five regions, except in Asia Pacific ex Japan. However, when we look at the contribution of Value, only the US (-0.24%) and Japan (-0.10%) are negative, while the other regions are positive. In particular, the total Value of Europe is negative (-1.25%), despite a Value contribution of +0.3%.

The common denominator for each region over this period is the negative contribution of momentum. In particular, Europe had a particularly large negative momentum contribution of -0.64%. In addition, although not shown in this table, momentum exposures were negative in all five regions. In other words, it is possible to interpret that conventional Value after the GFC tended to have negative momentum exposures, and that the "momentum contribution" from positive factor returns of momentum in the market caused it to underperform even more significantly. Conversely, without the negative contribution of momentum and other factors during this period, the loss in Value would not have been as large. Looking at the “pure” Value attribution in Panel B of Table 7, the negative excess returns are smaller than in the conventional Value, and slightly positive in Europe.

Table 6: Performance attribution of conventional Value and pure Value (before GFC)

Panel A: Contributions to excess returns of conventional Value indexes (before GFC)

%	US	Europe	Japan	Asia Pacific ex Japan	Emerging
Country	-	0.00	-	0.02	1.25
Industry	1.27	1.18	0.64	-0.12	1.64
Style factors	4.18	3.33	3.93	2.77	2.07
Value	1.67	1.99	2.27	2.07	3.10
Quality	-0.14	-0.17	0.16	0.20	-0.23
Volatility	0.17	0.43	0.12	0.13	0.21
Size	1.96	0.64	1.92	0.53	-0.24
Momentum	0.51	0.45	-0.54	-0.15	-0.76
Stock Specific	0.13	-0.10	0.41	-0.47	-0.53
Total Excess	5.59	4.40	4.99	2.20	4.43

Panel B: Contributions to excess returns of pure Value indexes (before GFC)

%	US	Europe	Japan	Asia Pacific ex Japan	Emerging
Country	-	-0.01	-	-0.02	0.15
Industry	0.08	0.07	-0.03	-0.01	0.13
Style factors	1.91	2.11	2.40	2.08	2.96
Value	1.79	2.08	2.21	1.97	3.07
Quality	0.02	-0.02	0.09	-0.04	-0.04
Volatility	0.05	0.05	0.01	-0.08	-0.04
Size	-0.06	-0.04	0.01	0.10	0.03
Momentum	0.11	0.04	0.08	0.13	-0.06
Stock Specific	-1.57	-0.60	-0.17	-0.27	0.44
Total Excess	0.42	1.56	2.20	1.78	3.68

Notes: based on annualized monthly arithmetic returns from September 29, 2000 to December 30, 2007. Markets are represented by FTSE USA, FTSE Developed Europe, FTSE Japan, FTSE Developed Asia Pacific ex Japan and FTSE Emerging indexes.

Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

Table 7: Performance attribution of conventional Value and pure Value (after GFC)

Panel A: Contributions to excess returns of conventional Value indexes (after GFC)

%	US	Europe	Japan	Asia Pacific ex Japan	Emerging
Country	-	-0.29	-	0.15	0.56
Industry	-0.16	-0.49	-0.24	0.24	-0.38
Style factors	-0.33	-0.09	-0.35	0.69	-0.51
Value	-0.24	0.30	-0.10	0.76	0.27
Quality	-0.15	-0.10	-0.34	0.18	-0.15
Volatility	0.14	0.08	0.20	-0.03	-0.12
Size	0.07	0.27	-0.02	0.05	-0.13
Momentum	-0.15	-0.64	-0.08	-0.27	-0.37
Stock Specific	0.03	-0.39	0.12	0.20	-0.16
Total Excess	-0.46	-1.25	-0.47	1.27	-0.49

Panel B: Contributions to excess returns of pure Value indexes (after GFC)

%	US	Europe	Japan	Asia Pacific ex Japan	Emerging
Country	-	-0.01	-	0.02	0.01
Industry	0.03	-0.04	0.03	-0.01	-0.03

Style factors	-0.26	0.29	-0.14	0.79	0.14
Value	-0.23	0.35	-0.10	0.74	0.26
Quality	0.00	0.00	0.01	0.02	-0.02
Volatility	-0.03	-0.01	-0.04	-0.01	-0.04
Size	0.00	-0.02	0.00	0.01	-0.02
Momentum	0.01	-0.03	-0.01	0.03	-0.03
Stock Specific	0.16	-0.19	-0.07	0.26	-0.23
Total Excess	-0.07	0.06	-0.18	1.05	-0.11

Notes: based on annualized monthly arithmetic returns from December 31, 2009 to December 31, 2019. Markets are represented by FTSE USA, FTSE Developed Europe, FTSE Japan, FTSE Developed Asia Pacific ex Japan and FTSE Emerging indexes.

Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

4. Conclusions

In this study, we analyzed the global Value factor performance using a systematic and investable methodology. The conventional Value indexes created using a fixed tilt approach exhibited a positive premium in each of the five regions for the 20 years, ending September 2020. However, in sub-periods, the conventional Value indexes showed a diminished Value premium post-GFC, compared with pre-GFC. The conventional Value indexes carry off-target factor exposures and industry bets, which contribute to active performance and risk. An extreme case is the US, where the Value factor contribution to conventional Value performance over the whole sample period is small. In Japan, US, and European countries, the impact of returns attributable to the small size bias was not negligible. We also confirm that compared to other regions, US Value had a larger return attributable to industry effects.

We created “pure” Value indexes based on the FTSE Russell Target Exposure approach. The “pure” Value indexes exhibited lower tracking error than the conventional Value indexes in all regions, after correcting for off-target factor exposures and country/industry bets, as well as active market beta. Surprisingly, the “pure” Value premium was found to be close to zero in the US market during the 20-year period, although it was still positive in the remaining four regions examined.

By splitting the sample period into four regimes, we observed that the performance of “pure” Value diminished post-GFC, compared with pre-GFC. One of the interesting findings is that in US equities – the center of the GFC – “pure” Value performance has been less affected post-GFC. In the post-GFC, the negative performance of conventional Value in most regions was accompanied by the negative contribution of momentum, which pushed down the performance of conventional Value in all regions. In fact, on a “pure” Value basis, the "degree of loss" was smaller than that of conventional Value, as there was little contribution from off-targets including momentum, and the “pure” Value in Europe showed a slightly positive return. Thus, the "landscape" of Value performance differs greatly depending on whether it is viewed in conventional or “pure” form. This is an important perspective in constructing an investment strategy.

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+44 (0) 20 7866 1810

North America
+1 877 503 6437

Asia-Pacific
Hong Kong +852 2164 3333
Tokyo +81 3 4563 6346
Sydney +61 (0) 2 8823 3521

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