Qontigo's Global Linked Model:

How to Turn Value *at* Risk into Value *from* Risk

By Olivier d'Assier

Introduction

In this research piece, we demonstrate the value of the Axioma Worldwide Equity Linked Factor Risk Model (WWLM4-MH or 'Global Linked Model') for solving two very common analytical problems when managing global portfolios. Global equity mandates are often broken into specialist mandates segregated by geography. For this case, we will assume that a global portfolio benchmarked against the STOXX Global 3000 has been allocated to three different managers: 50% of the AUM is placed in a US strategy, 40% is placed in a developed world ex-US strategy, and the remaining 10% is allocated to an emerging market strategy. Any global strategy factor tilts sought by the investor are assumed to be obtained via a completion overlay strategy and the global portfolio analysis presented here is based on an aggregation of three specialist mandates.

The first issue often raised by our clients when analyzing this global portfolio using a single model like the Axioma Worldwide Equity Factor Risk Model (WW4-MH or 'Global Model') is that the local nuances seem to be lost when aggregating three sets of exposures to local factors into one set of exposures to global factors[1]. This can lead to a misunderstanding of the individual strategies and how they might react to specific shocks. This, in turn, can lead to an erroneous risk-management focus, as well as an inefficient rebalancing exercise.

The second common issue has to do with the miscommunication that occurs between the specialist managers and the global investor as to the actual strategy being pursued, the factor exposures taken, and the sources of risk contributing to the portfolio's overall risk. This is a result of the global investor looking at the specialist portion of the global portfolio using a single global model, while the local specialist used a local/regional model to construct it. In essence, the single global model is looking for exposures to globally defined factors, while the local model will have calculated exposures based on locally defined factors. The miscommunication often centers on the allocation of the risk budget across style factor dimensions and how best to rebalance the local portion of the global portfolio to achieve new global portfolio risk budgeting goals.

To test the validity of Qontigo's Global Linked Model as a solution to these two problems, we constructed a monthly rebalanced (at month end) back-test of our multi-strategy global portfolio, starting in January 2015 and ending with the December 30, 2020 rebalancing. Each of the three individual strategies was optimized using the respective Axioma local model (i.e., US4-MH for the US strategy, DMxUS4-MH for the Developed World ex-US strategy, and EM4-MH for the emerging market strategy). The risk and performance of the aggregated global portfolio, benchmarked against the STOXX Global 3000 index, was then analyzed using both the single Global Model (i.e., AWW4-MH) and the new multi-region Linked Model (i.e., WWLM4-MH). The strategy is defined once, at the first rebalancing, and the weights of the three regional portfolios are then left to change with market performance. At each rebalancing, we simply realign each portfolio along the strategy's targeted style factor exposures, but do not reallocate any AUM across strategies.

For this paper, we will focus on the strategy differences between the two managers for the US and Developed World ex-US portfolios, as they represent 90% of the AUM and the Emerging Market portfolio's exposures are not material for our purpose. Each of the three managers uses relevant local risk models to construct these portfolios and has independent strategies that differ along the style factor dimension.

The US equity manager's strategy seeks to maximize exposure to the US4 Liquidity and US4 Volatility factors and minimize exposure to the US4 Earnings Yield and US4 Value factors, while at the same time keeping active (GICS) sector exposures to within +/-5% of its STOXX USA 900 benchmark, limiting the maximum weight of any

[1] See Melissa Brown's post "Capturing Regional Nuances with a Global Linked Model," for more details on this issue.

single asset to 5% of the portfolio, and incurring a maximum of 5% of predicted active risk, according to the US4-MH risk model (i.e., this manager likes large, volatile, non-value, high PE stocks—sound like any popular five-letter acronym we know?).

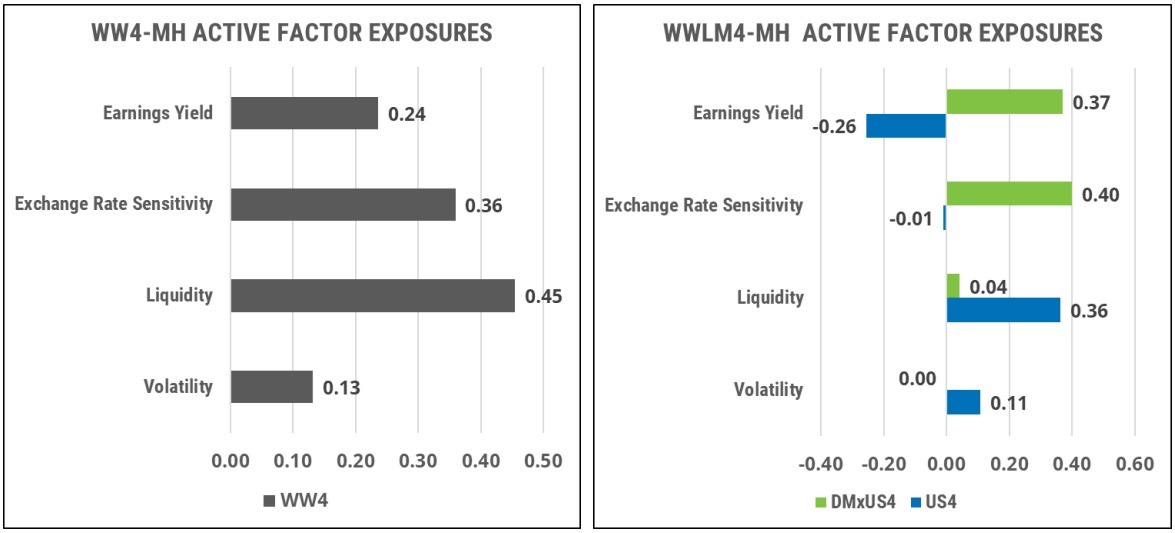
The developed world ex-US manager's strategy seeks to maximize exposure to both the DMxUS4 Earnings Yield and DMxUS4 Exchange Rate Sensitivity factors, while keeping active country exposure to +/- 8%, active (GICS) sector exposures to within +/-5% from its STOXX Developed Markets ex-US benchmark[2], limiting the maximum weight of any single asset to 5% of the portfolio, and incurring a maximum of 5% of predicted active risk, according to the DMxUS4-MH model (i.e., this manager likes low PE exporters).

The emerging markets manager seeks to maximize the exposure to EM Growth, EM Momentum, and EM Market Sensitivity factors, while keeping active country exposure to +/- 8%, active (GICS) sector exposures to within +/-5% from its STOXX Emerging Markets 1500 benchmark[3], limiting the maximum weight of any single asset to 5% of the portfolio, and incurring a maximum of 5% of predicted active risk, according to the EM4-MH model (i.e., this manager likes popular, high-beta, growth stocks).

Exposure Analysis: Now You See Me, Now You Don't

The charts in Figure 1 below highlight the five most significant style factor exposures for the aggregate portfolio. The chart on the left shows the exposures seen by the global risk manager using the single Global Model (WW4-MH). The chart on the right provides the local exposures seen by the two individual managers for the US and Developed World ex-US portfolios, using their respective local risk models (i.e., the US4-MH and the DMxUS4-MH models).

Figure 1 – Significant Style Factor Exposures



The nature of the of the first problem mentioned in the introduction becomes clear. With regard to Earnings Yield, the aggregate portfolio does not have just a single strategy targeting low PE stocks, as reported by the WW4-MH model (left chart), it has two distinctly different and opposing strategies to bet on high PE stocks in

[2] This custom benchmark was created by removing US assets from the STOXX Developed Markets 2400.
[3] This custom benchmark was created by excluding emerging market assets from the STOXX Emerging Market 1500 that are not covered by the STOXX Global 3000 benchmark.

the US and low PE stocks in developed markets ex-US, as reported by the WWLM4-MH linked model (right chart). Likewise, for the Exchange-Rate Sensitivity factor, the strong overall positive exposure to exporters reported by the WW4-MH model is really limited to the developed markets ex-US portfolio, and the US portfolios would not benefit from a weakening (local) currency, as accurately reported by the WWLM4-MH model. The strong preference for highly liquid stocks reported by the WW4-MH model is limited to the US manager; the developed ex-US manager has no such preference as reported by the WWLM4-MH model. The marginal preference for more volatile stocks than average reported by the WW4-MH model mainly comes from the US manager's strategy and not from the developed ex-US strategy, as reported by the WWLM4-MH model.

These local blind spots created by the aggregation of exposures in a single model can have significant consequences for both risk management and efficient portfolio management. It is obvious from looking at the local factor exposure report from the linked model that the same economic shock will have a very different impact on the US and the developed ex-US portfolios. Additionally, the simulated impact from this economic scenario on the global portfolio—estimated using the aggregated exposures from the single global model—would give the global investor an erroneous forecast of potential losses. This global expected loss/gain would then be relied upon for risk-management and rebalancing decision-making, leading to the misunderstanding issue we alluded to earlier. More specifically, if sources of risk are assumed to come from global factors instead of local ones, risk management then becomes a very blunt instrument (i.e., everything looks like a nail when you're holding a hammer).

Rebalancing I: De-Risking the Portfolio

In this section, we play the role of the global risk manager and simulate a de-risking rebalancing exercise for our aggregate portfolio. Our goal is to lower the active risk level of the portfolio, in the face of growing uncertainty in our return forecast due to the current stretched valuations and rising inflationary concerns. Using the Axioma Portfolio Optimizer™, we setup two rebalancing scenarios, one using the single Global Model (AXWW4-MH), and one using our new Linked Model (AXWWLM4-MH). We leave the country and sector constraints as they are, adjust our Active Risk constraint down from a target of 5% to 2.5%, and add an objective term to minimize transaction costs to obtain the most efficient rebalancing possible. Note that as of December 30, 2020, the predicted active risk of the portfolio was 3.5%, well below its active risk constraint.

Our expectation is that, because the Linked Model operates with a truer and more granular view of our local strategies, which encompass local style factor exposures and sources of risk, it will suggest more trades than the single Global Model, which is limited by a global factor view of the aggregate portfolio. Getting more trades, in this instance, should be welcome news, as it comes with the assumed benefit of better (more granular) risk management.

For this point-in-time rebalancing, both models were able to generate a solution that met all our constraints, and both reduced the predicted active risk of the portfolio to 2.5%. The single Global Model recommended a total of just 28 trades and just under 7% in two-way turnover for the portfolio. In contrast, the more granular Global Linked Model recommended 72 trades and just under 10% of two-way turnover.

Both models achieved their de-risking goals in the same manner. Both reduced the active exposure of the Volatility and Market Sensitivity factors to lower their contribution to total active risk to almost 0, and added more names to the portfolio to reduce overall specific risk. The single Global Model added 20 names to the portfolio and the more granular Global Linked Model added 54 names. But in both cases, the key style factor exposures that were part of our local strategies remained directionally intact.

The above rebalancing was quite simple and efforts to minimize transaction costs prevented the optimizer from excessively changing our initial strategies. But what about a case where we not only seek to lower our active risk, but want to make changes to our local strategies, in accordance with a new, more complex forecast?

Rebalancing II: Rebalance for New Forecast

Suppose our global investor receives a new economic forecast that calls for a sharp economic downturn, a weakening of local currencies against the global portfolio currency (USD), and a rapid cash outflow from equities, as investors rush for the exit and into cash for protection from inflationary pressures. A global investor with an exposure report from the single global WW4-MH model would rebalance the portfolio targeting a more positive exposure to the global earnings yield factor (i.e., flee to low PE stocks), neutralize exposure to the global Exchange-Rate Sensitivity factor (or even attempt to swing to a negative exposure given the forecast of a strengthening USD), increase the positive exposure to the global Liquidity factor, and swing the positive exposure to the global Volatility factor to a negative exposure. Additionally, the 5% active risk constraint[4] would be lowered to 3%, thereby de-risking the portfolio.

In contrast, a global investor using the WWLM4-MH linked model and wanting to rebalance the portfolio for this new economic forecast would be able to target local exposures during their rebalancing to better reflect this new forecast. This investor would know that only the US portfolio's negative exposure to the US4-MH Earnings Yield factor needs to be targeted in this rebalancing and not the developed ex-US portfolio. The investor would also know that only the developed ex-US portfolio has a strong positive exposure to the DMxUS4-MH Exchange-Rate Sensitivity factor and that no turnover should be incurred on the US portfolio for this purpose. As for increasing the defensive exposure to more liquid stocks, only the developed ex-US portfolio's exposure to the DMxUS4-MH Liquidity factor needs to be increased if desired, as the US portfolio already has a strong positive exposure to the US4-MH Liquidity factor. As with the WW4 rebalancing, we would also lower the active risk constraint from 5% down to 3%, thereby de-risking the portfolio.

Using the portfolio as of December 30, 2020, we executed this rebalancing exercise following the 'global-vs-local' logic described above, using the WW4-MH model for the global perspective and the WWLM4-MH model for the local one. In our rebalancing simulation we used an objective function to minimize our transaction costs to force both models to be as efficient as possible. We also used constraints to target our desired changes in style factor exposures reflecting our new economic forecast.

The table in Figure 2 below reports the risk metrics for the WW4-MH rebalancing. These results were achieved with only 64 trades and a two-way turnover of 23% of the portfolio's value. The total number of names held dropped negligibly from 257 names in the initial portfolio to 254 in the final one. All our constraints were met, we achieved a de-risking of the portfolio, and we completed our (global) style factor exposure changes. But what about our local style factor exposures? In rebalancing our aggregate portfolio along global style factors, did we jeopardize our desired changes to the local strategy style factor exposures?

[4] Note that this 5% risk budget was never achieved during the entire back-test and that the average predicted risk at each rebalancing was around 3.2% for the WW4 model and 3.4% for the WWLM4 model.

Figure 2 – WW4 Rebalancing Metrics (using WW4 for analysis)

WW4 REBALANCING METRCIS	Initial Exposure	Final Exposure	Delta	Initial Std. Dev. (%)	Final Std. Dev. (%)	Initial % of Variance	Final % of Variance	Delta (%)
Total Risk				21.29	20.72	100.00	100.00	0.00
Benchmark Risk				19.85	19.85	100.00	100.00	0.00
Total Active Risk				**3.31**	**3.00**	**100.00**	**100.00**	**0.00**
Specific Active Risk				2.58	2.43	60.94	65.52	4.58
Factor Active Risk				2.07	1.76	39.06	34.48	-4.58
WW4 - Style				1.87	1.71	31.20	26.28	-4.92
WW4 - Earnings Yield	**0.24**	**0.50**	**0.26**	**0.34**	**0.71**	**1.54**	**5.15**	**3.62**
WW4 - Exchange Rate Sensitivity	**0.36**	**0.01**	**-0.35**	**0.55**	**0.02**	**0.53**	**-0.06**	**-0.59**
WW4 - Liquidity	**0.45**	**0.50**	**0.05**	**0.97**	**1.07**	**12.79**	**13.93**	**1.14**
WW4 - Volatility	**0.13**	**0.11**	**-0.02**	**0.68**	**0.55**	**8.85**	**3.83**	**-5.02**
WW4 - Market Sensitivity	0.08	0.01	-0.07	0.52	0.05	6.57	0.41	-6.16
WW4 - Size	-0.06	-0.08	-0.02	0.31	0.40	-0.45	0.52	0.97
WW4 - Value	0.15	0.24	0.09	0.31	0.49	2.39	2.03	-0.36
WW4 - Medium-Term Momentum	0.03	0.06	0.03	0.20	0.35	-1.23	-0.69	0.54
WW4 - Growth	0.05	0.11	0.06	0.08	0.19	-0.20	-0.19	0.01
WW4 - Leverage	0.08	0.14	0.07	0.08	0.14	0.51	1.08	0.57
WW4 - Dividend Yield	-0.01	0.05	0.06	0.01	0.06	-0.09	0.41	0.50
WW4 - Profitability	0.00	0.03	0.03	0.00	0.05	0.00	-0.14	-0.14
WW4 - Country				0.52	0.70	-0.39	0.27	0.65
WW4 - Industry				1.01	0.90	11.82	9.90	-1.92
WW4 - Currency				0.39	0.53	-3.58	-1.97	1.60
WW4 - Local				0.00	0.00	0.00	0.00	0.00
WW4 - Market				0.00	0.00	0.00	0.00	0.00

The table in Figure 3 below reports the local style factor exposures of our WW4 optimal portfolio using the WWLM4 linked model. Recall the targeted local style factor exposure changes mentioned above. Were these changes met by using the single global model? Did any of the local style factor exposure changes contradict our desired ones?

Figure 3 – WW4 Rebalancing Metrics (using WWLM4 for analysis)

WW4 REBALANCING METRCIS (WWLM4)	Initial Exposure	Final Exposure	Delta	Initial Std. Dev. (%)	Final Std. Dev. (%)	Initial % of Variance	Final % of Variance	Delta (%)
Total Risk				20.38	19.85	100.00	100.00	0.00
Benchmark Risk				19.67	19.67	100.00	100.00	0.00
Total Active Risk				**3.42**	**3.11**	**100.00**	**100.00**	**0.00**
Specific Active Risk				2.47	2.37	52.03	58.20	6.17
Factor Active Risk				2.37	2.01	47.97	41.80	-6.17
WWLM4 - Style				2.11	1.64	34.55	23.45	-11.10
US4 Earnings Yield	**-0.26**	**-0.08**	**0.17**	**0.89**	**0.29**	**5.50**	**1.07**	**-4.43**
US4 Exchange Rate Sensitivity	**-0.01**	**-0.10**	**-0.09**	**0.03**	**0.28**	**0.07**	**1.56**	**1.49**
US4 Liquidity	**0.36**	**0.33**	**-0.03**	**1.13**	**1.03**	**13.23**	**12.52**	**-0.71**
US4 Volatility	**0.11**	**0.06**	**-0.05**	**0.88**	**0.51**	**5.45**	**-0.06**	**-5.51**
DMxUS4 Earnings Yield	**0.37**	**0.37**	**0.00**	**0.59**	**0.59**	**0.73**	**1.43**	**0.70**
DMxUS4 Exchange Rate Sensitivity	**0.40**	**0.19**	**-0.21**	**0.75**	**0.35**	**4.76**	**1.23**	**-3.53**
DMxUS4 Liquidity	**0.04**	**0.07**	**0.03**	**0.07**	**0.12**	**0.48**	**0.60**	**0.12**
DMxUS4 Volatility	**0.00**	**0.02**	**0.02**	**0.00**	**0.12**	**0.00**	**-0.14**	**-0.13**
All Other Local Styles						4.14	2.60	-1.54
WWLM4 Country				0.54	0.79	2.55	3.93	1.38
WWLM4 Industry				1.42	1.26	12.62	11.87	-0.75
WWLM4 Currency				0.39	0.53	-1.06	1.21	2.27
WWLM4 Local Market				0.15	0.58	-0.67	1.35	2.03

The positive exposure to Earnings Yield was achieved by keeping the positive exposure in the DMxUS portfolio and neutralizing the negative exposure in the US portfolio. We note that the US portfolio did not swing to a positive exposure. The positive exposure to the Exchange-Rate Sensitivity factor was reduced but by a combination of lowering the positive exposure in the DMxUS portfolio from +0.4 to +0.19 and turning the US portfolio's exposure from neutral to negative (-0.1). Given our scenario, this is not what we wanted. We sought to protect the portfolio from an appreciating USD by turning the positive exposure in the DMxUS portfolio to neutral or negative. As for the Liquidity factor exposure, our target was to increase that exposure by raising the exposure of the DMxUS portfolio (as the US portfolio already had a strongly positive exposure to the local Liquidity factor). Instead, we kept the exposure of the local Liquidity factor neutral in the DMxUS portfolio and slightly reduced it in the US portfolio, neither of which was the desired change. So, by using the Global Model, we did achieve our desired global style factor exposure change, but this was done at the expense of a complete alignment of the local factor exposure changes.

Figure 4 – WWLM4 Rebalancing Metrics (using WWLM4 for analysis)

WWLM4 REBALANCING METRCIS	Initial Exposure	Final Exposure	Delta	Initial Std. Dev. (%)	Final Std. Dev. (%)	Initial % of Variance	Final % of Variance	Delta (%)
Total Risk				20.38	19.77	100.00	100.00	0.00
Benchmark Risk				19.67	19.67	100.00	100.00	0.00
Total Active Risk				**3.42**	**3.00**	**100.00**	**100.00**	**0.00**
Specific Active Risk				2.47	2.42	52.03	65.05	13.02
Factor Active Risk				2.37	1.77	47.97	34.95	-13.02
WWLM4 - Style				2.11	1.56	34.55	18.03	-16.52
US4 Earnings Yield	**-0.26**	**0.20**	**0.46**	**0.89**	**0.70**	**5.50**	**3.05**	**-2.45**
US4 Exchange Rate Sensitivity	**-0.01**	**-0.01**	**0.00**	**0.03**	**0.02**	**0.07**	**0.06**	**-0.01**
US4 Liquidity	**0.36**	**0.07**	**-0.29**	**1.13**	**0.23**	**13.23**	**0.95**	**-12.28**
US4 Volatility	**0.11**	**0.00**	**-0.11**	**0.88**	**0.00**	**5.45**	**0.00**	**-5.45**
DMxUS4 Earnings Yield	**0.37**	**0.28**	**-0.09**	**0.59**	**0.45**	**0.73**	**1.51**	**0.77**
DMxUS4 Exchange Rate Sensitivity	**0.40**	**0.01**	**-0.39**	**0.75**	**0.02**	**4.76**	**-0.03**	**-4.79**
DMxUS4 Liquidity	**0.04**	**0.50**	**0.46**	**0.07**	**0.86**	**0.48**	**5.95**	**5.47**
DMxUS4 Volatility	**0.00**	**0.10**	**0.10**	**0.00**	**0.52**	**0.00**	**0.03**	**0.03**
All Other Local Styles						4.32	6.50	2.18
WWLM4 Country				0.54	1.41	2.55	7.50	4.96
WWLM4 Industry				1.42	1.06	12.62	9.21	-3.40
WWLM4 Currency				0.39	0.45	-1.06	1.00	2.06
WWLM4 Local Market				0.15	0.93	-0.67	-0.80	-0.12

The table in Figure 4 reports the metrics for the rebalancing done using the more granular linked model (WWLM4-MH). The negative exposure to the US Earnings Yield factor has been changed to a positive one, as targeted in our discussion above. Additionally, the positive exposure of the DMxUS portfolio has been maintained, albeit slightly reduced. The positive exposure of our DMxUS portfolio to the Exchange-Rate Sensitivity factor has been neutralized without making any changes to the existing US portfolio exposure to that factor. And the DMxUS portfolio's neutral exposure to the DMxUS Liquidity factor is now strongly positive. In short, using the more granular linked model we were able to affect changes to the local strategy that better reflected our new global forecast, while meeting all our global constraints.

Performance Attribution: Potato/Potahto

The second problem resulting from the use of a single global factor model to analyze this aggregate portfolio has to do with miscommunication between the local managers and the global risk manager when attributing performance. The table in Figure 5 shows the daily factor-based performance attribution summary for our aggregate portfolio, using the single global WW4 model from January 2015 through the end of December 2020.

We see that the aggregate portfolio outperformed its benchmark by 1.91% but that the factor bets, and specifically the style factor bets, did not pay off—in fact, they contributed negatively (-1.22%) to the strategy. The bet on low PE stocks contributed nothing to the performance of the aggregate portfolio. The strong bet on high Exchange-Rate Sensitivity stocks contributed only 11 bps to the 191 bps of total outperformance. And the bets on Liquidity and Volatility detracted 112 bps from the performance of the portfolio.

Figure 5 – Factor-Based Performance Attribution Summary (WW4-MH)

WW4-MH Source of Return	Contribution	Avg Exposure	Hit Rate	Risk	IR	T-Stat
Portfolio	**12.20%**			**15.70%**		
Benchmark	**10.29%**			**15.06%**		
Active	**1.91%**			**4.25%**	**0.45**	**1.11**
Specific Return	**3.13%**			**3.70%**	**0.85**	**2.09**
Factor Contribution	**-1.22%**			**2.01%**	**-0.61**	**-1.50**
Style	**-1.02%**			**1.74%**	**-0.59**	**-1.46**
Earnings Yield	**-0.04%**	**0.1728**	**51.95%**	**0.21%**	**-0.19**	**-0.46**
Exchange Rate Sensitivity	**0.11%**	**0.4014**	**52.60%**	**0.44%**	**0.24**	**0.60**
Liquidity	**-0.23%**	**0.3540**	**49.42%**	**0.69%**	**-0.33**	**-0.81**
Volatility	**-0.90%**	**0.2831**	**48.05%**	**0.98%**	**-0.91**	**-2.26**
Dividend Yield	-0.11%	-0.1531	49.22%	0.13%	-0.78	-1.93
Growth	-0.04%	0.2076	52.92%	0.18%	-0.20	-0.49
Leverage	-0.18%	0.2411	50.06%	0.18%	-1.01	-2.49
Market Sensitivity	0.09%	0.0842	50.58%	0.49%	0.19	0.46
Medium-Term Momentum	0.22%	0.0517	52.79%	0.22%	1.01	2.50
Profitability	0.06%	0.0432	51.30%	0.07%	0.80	1.98
Size	0.10%	-0.1784	49.87%	0.66%	0.15	0.36
Value	-0.11%	0.0488	48.44%	0.19%	-0.57	-1.42
Country	**-0.17%**	**-0.24%**		**0.76%**	**-0.23**	**-0.56**
Industry	**-0.03%**	**-0.24%**		**0.71%**	**-0.04**	**-0.10**
Currency	**-0.13%**	**0.00%**		**0.36%**	**-0.38**	**-0.93**
Local	**0.00%**	**0.01%**		**0.01%**	**0.14**	**0.35**
Market	**0.14%**	**-0.24%**		**0.13%**	**1.09**	**2.69**
Sectors	**-0.03%**	**-0.24%**		**0.71%**	**-0.04**	**-0.10**

Given this report, the global risk manager might be tempted to paint all the local managers with the same brush and take away their discretion on style factor active exposures in the next rebalancing, having reached the erroneous conclusion that they all lacked style factor selection skill—especially when it comes to Liquidity and Volatility.

We ran the same factor-based performance attribution on the aggregate portfolio using the more granular linked model, WWLM4-MH. The results are shown in Figure 6. In this report we see that the US manager has skill betting on the US4 Liquidity factor and the DMxUS manager has skill betting on the Exchange-Rate Sensitivity factor. The high PE (i.e., negative Earnings Yield) bet of the US manager did not pay off, but the low PE bet of the DMxUS manager did, although marginally. Neither manager seems particularly good at managing the Volatility exposure and this may be an area for further constraint at the next rebalancing.

In conclusion, based on this report, our global risk manager may restrain the US manager's ability to place bets on Earnings Yield and Volatility, and restrict the DMxUS manager from betting on Volatility. Instead, both might be told to reallocate their risk budgets toward their respective bets on Liquidity for the US manager, and Exchange-Rate Sensitivity for the DMxUS manager, to increase the active return these skills can deliver.

Figure 6 – Factor-Based Performance Attribution Summary (WWLM4-MH)

WWLM4-MH Source of Return	Contribution	Avg Exposure	Hit Rate	Risk	IR	T-Stat
Portfolio	12.20%			15.70%		
Benchmark	10.29%			15.06%		
Active	1.91%			4.25%	0.45	1.11
Specific Return	2.45%			3.06%	0.80	1.98
Factor Contribution	-0.54%			2.56%	-0.21	-0.52
Style	-0.57%			2.20%	-0.26	-0.64
US4 Earnings Yield	-0.05%	-0.2537	48.38%	0.64%	-0.08	-0.19
US4 Exchange Rate Sensitivity	0.06%	-0.0505	48.64%	0.12%	0.48	1.19
US4 Liquidity	0.32%	0.3426	47.99%	0.80%	0.41	1.00
US4 Volatility	-1.10%	0.1932	46.04%	0.94%	-1.17	-2.89
DMxUS4 Earnings Yield	0.13%	0.5392	48.77%	0.76%	0.18	0.44
DMxUS4 Exchange Rate Sensitivity	0.32%	0.5296	49.48%	0.89%	0.36	0.88
DMxUS4 Liquidity	-0.07%	0.0745	49.55%	0.15%	-0.46	-1.13
DMxUS4 Volatility	-0.38%	0.0833	46.49%	0.30%	-1.26	-3.12
All Other Local Styles	0.19%					
Country	-0.38%	-0.24%		0.77%	-0.49	-1.21
Industry	0.31%	-0.24%		1.09%	0.29	0.71
Currency	-0.14%	0.00%		0.36%	-0.38	-0.93
Local	0.24%	2.44%		0.36%	0.66	1.64
Sectors	0.31%	-0.24%		1.09%	0.29	0.71

As the above report will match what the local manager sees from their domestic risk model (i.e., US4 for the US manager and DMxUS4 for the DMxUS manager), there should not be a miscommunication when it comes to attributing performance from each to the aggregate portfolio. Both the local and global manager should be seeing the same results and agree on the decision-making process from those results.

Conclusion: From Risk Budgeting to Skill Budgeting

As the saying goes, beauty is in the eye of the beholder—which is perhaps another way of saying that perspective matters. Global risk managers are often limited in their choice of risk models when analyzing a global portfolio due to coverage issues. Often, the need to have a global view of risk outweighs the benefits of having a local one. Often the choice is to get a report with 100% coverage, or to get independent reports on local allocations of the global portfolio, without any insight into how these parts interact with each other. As we have seen, this compromise can often lead to misunderstanding and miscommunication between the global and local perspective as to the sources of risk driving return in the portfolio. This is not a compromise any global investor should have to make.

Qontigo's new Global Linked Model eliminates the need for this compromise buy giving risk managers a 'glocal' view of the world, combining the different local perspectives into a global one with full coverage and free of any loss of (local) insights. Risk management becomes efficient, benefitting from an accurate understanding of the local sources of risk driving return in the portfolio, and a clear communication at all levels of portfolio

management. This, in turn, helps global investors to more efficiently harvest local-manager skill through a more rigorous and transparent risk-management process.