

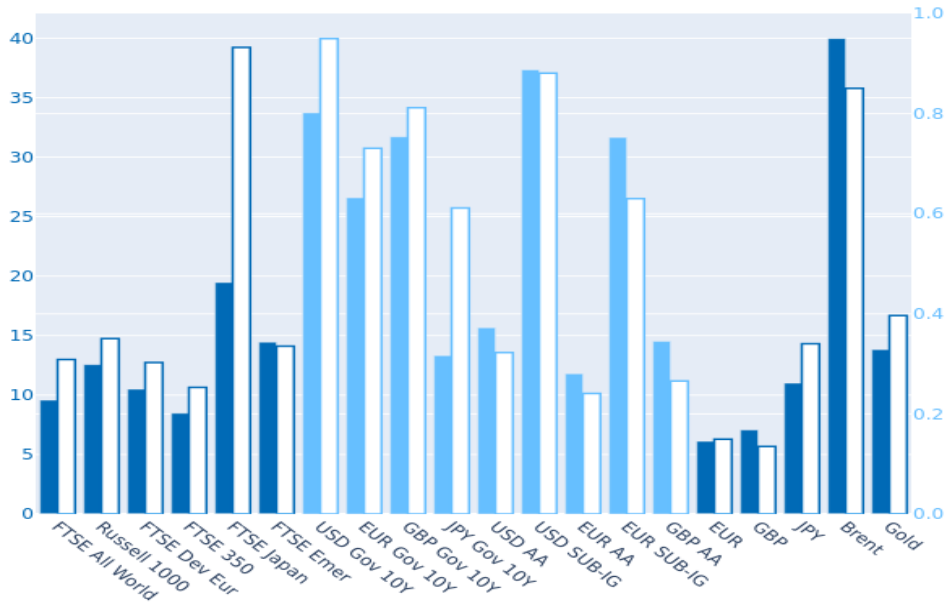
# Axioma Multi-Asset Class Risk Monitor

Figure 1. Factor Correlations (60 days) and Changes in Correlations (vs previous 60 days)



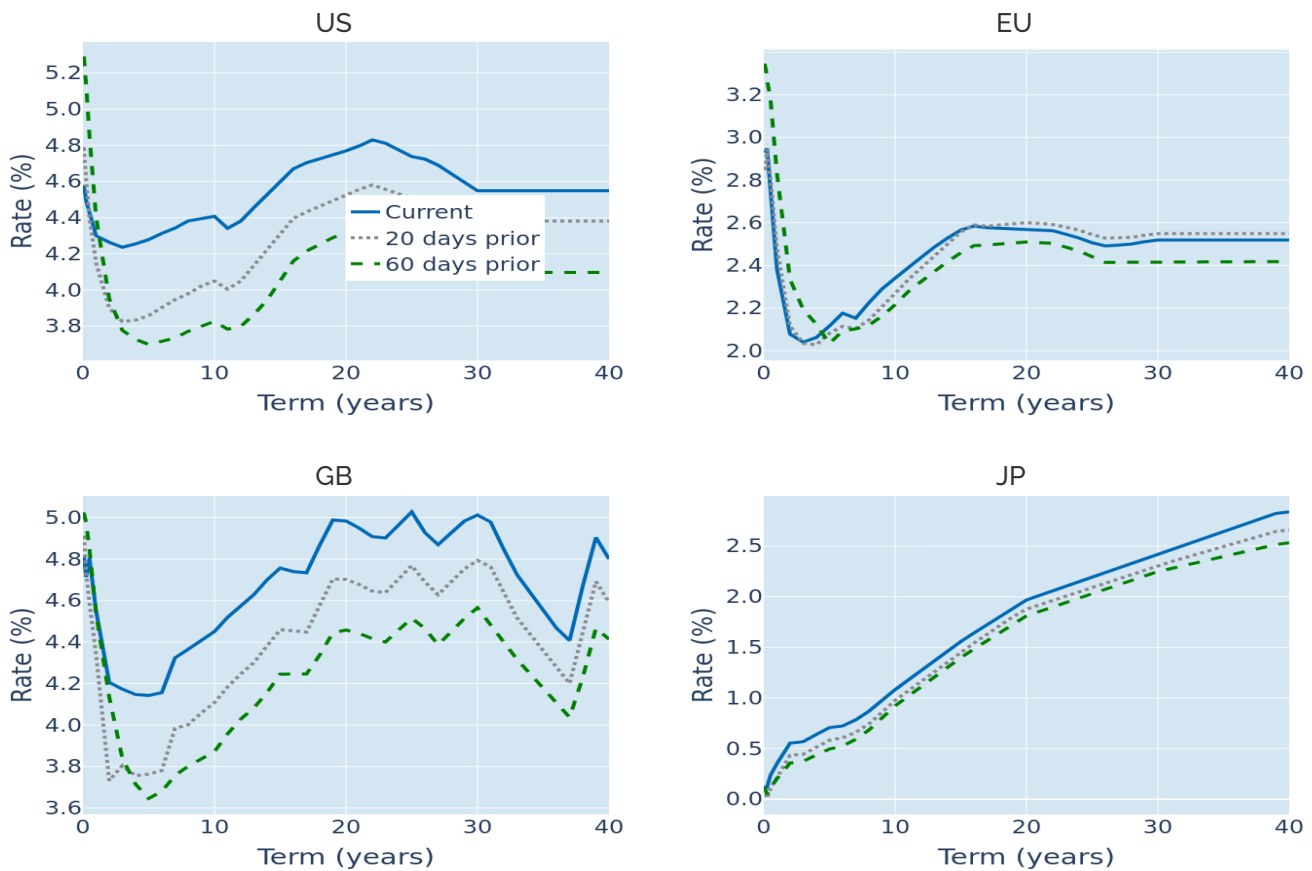
1. Correlations are unweighted and based on daily returns and changes in yield/spread over the past 60 business days. The lower left triangle of the matrix represents current correlations. The upper right triangle contains changes in correlation relative to the preceding 60 business day period.

Figure 2. Factor Volatilities (last 60 days vs previous 60 days)



2. Volatilities are unweighted and based on daily returns and changes in yield/spread over the past 60 business days. Yield and spread volatilities (light blue bars in the middle) are shown on a different scale (on the right hand side) compared to the return volatilities of equity indices, currencies and commodities. The white bars represent volatilities from the previous 60 business day period.

Figure 3. Government Zero Coupon Yield Curves



3. Zero coupon bond curves built from vanilla bonds issued by the respective sovereign. Eurozone curve represents minimal cost of funding and is primarily built from German, Dutch and Austrian debt, though exact composition can change depending on current funding costs across participating sovereigns in the Euro system. Dotted lines show curves 20 and 60 business prior.

Figure 4. 10Y Government Zero Coupon Yields

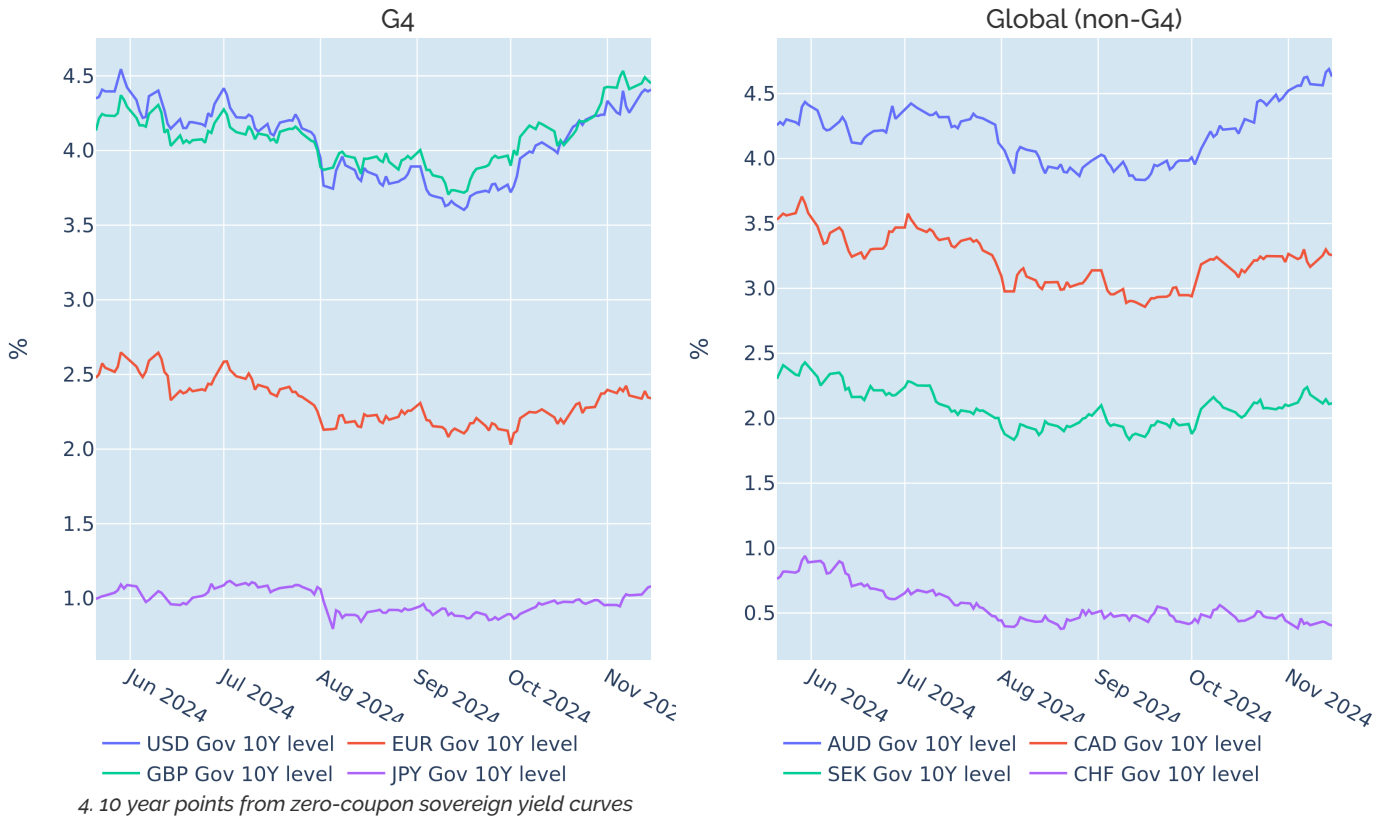


Figure 5. G4 Corporate Bond Spreads

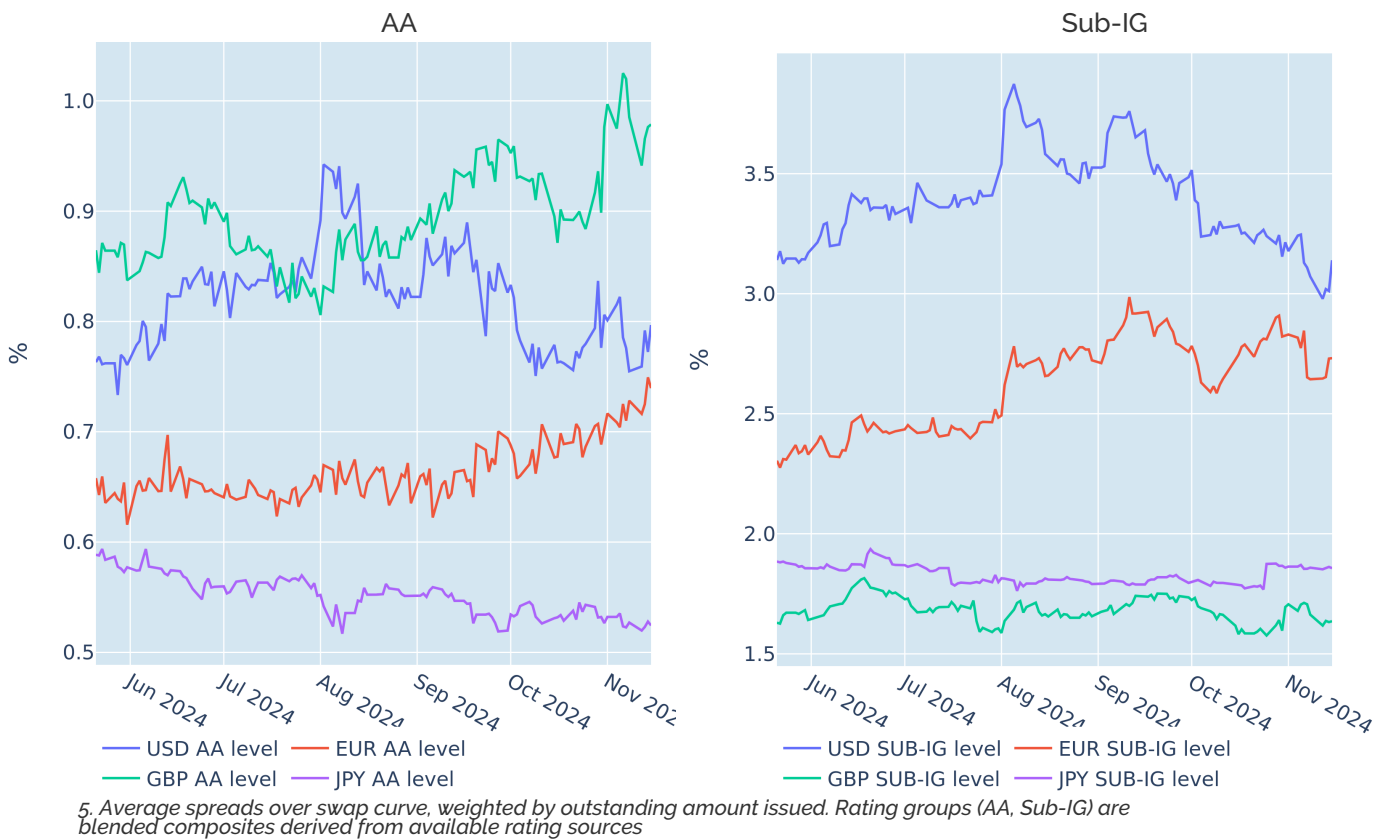
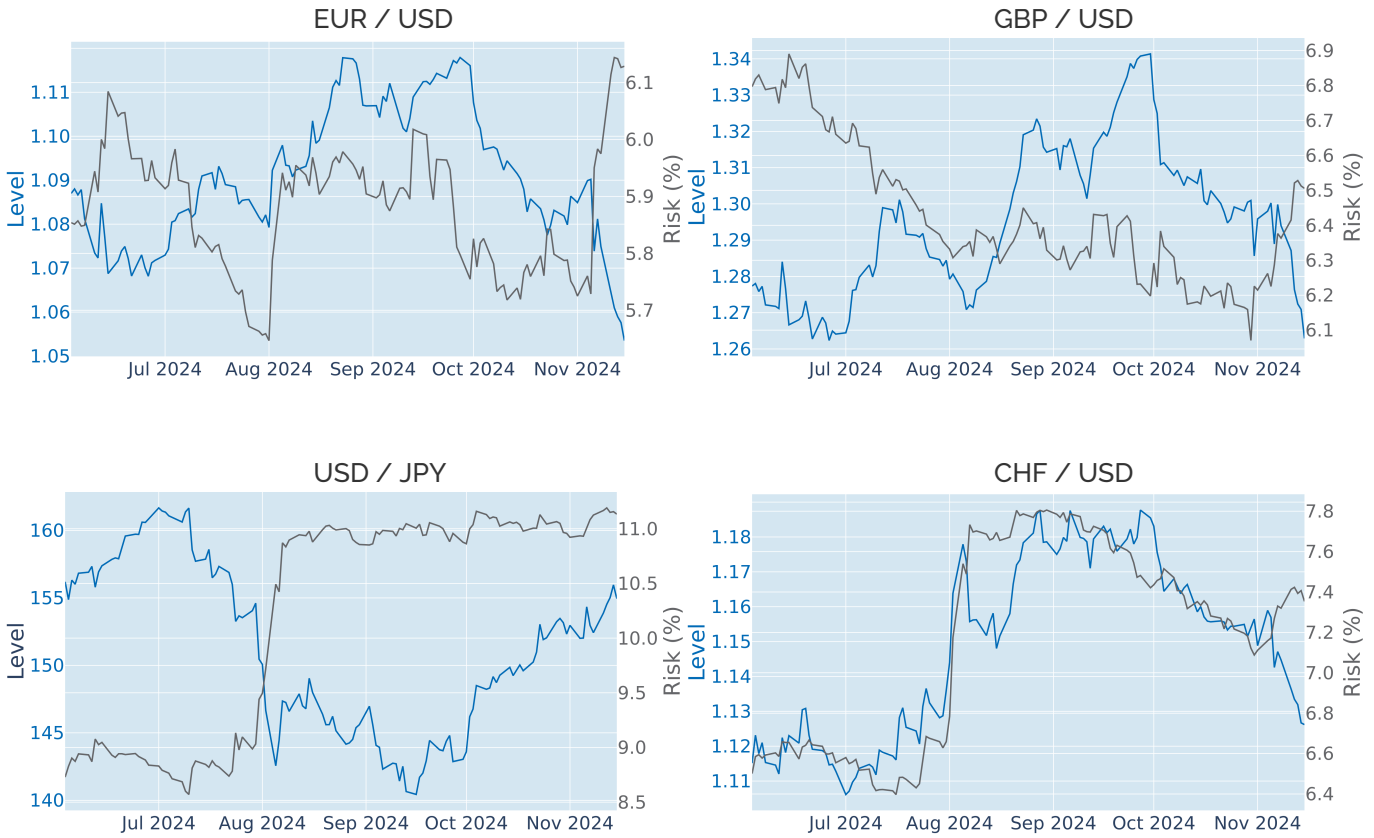


Figure 6. Exchange Rate and Predicted Risk



6. Currency risk as predicted by the Axioma short-horizon model

Figure 7. Model Portfolio Major Asset Class Weights vs Percent 60d Risk Contribution

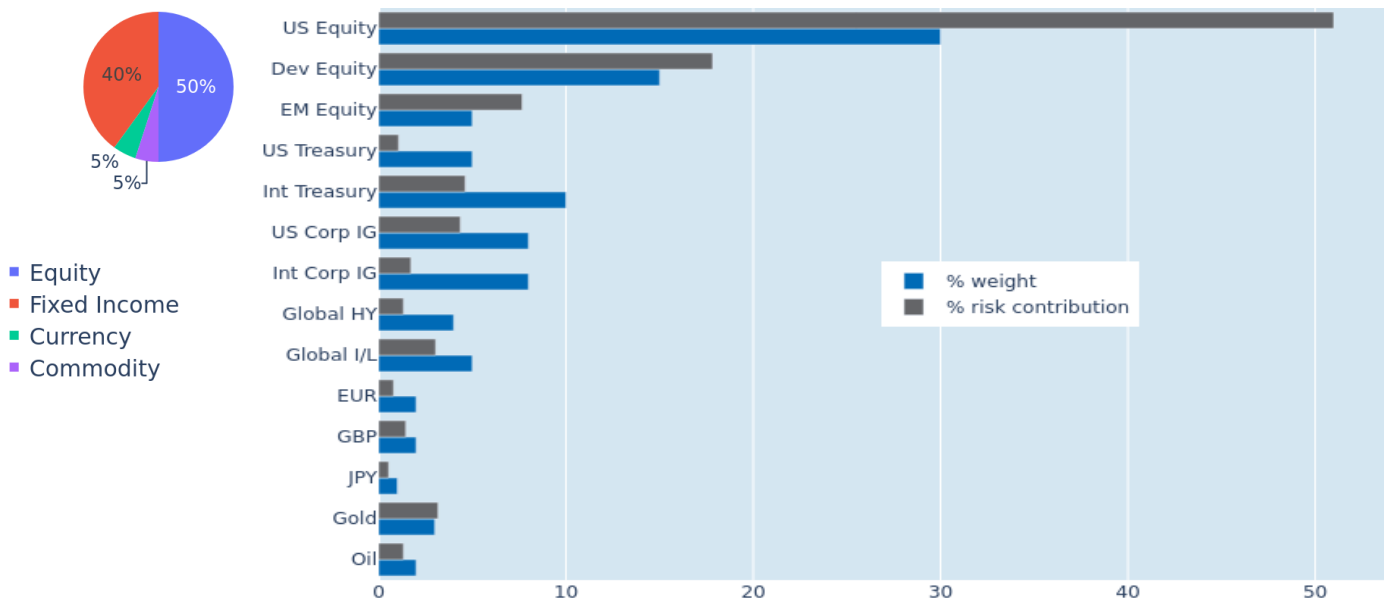


Figure 8. Asset Class Standalone Volatilities and Volatility Contributions

	% Weight	60d Std Dev (Standalone)	60d Std Dev (Weighted)	60d Std Dev Contribution	5y Std Dev (Standalone)	5y Std Dev (Weighted)	5y Std Dev Contribution
<b>Total</b>	<b>100</b>	<b>7.57</b>	<b>11.82</b>	<b>7.57</b>	<b>9.54</b>	<b>12.70</b>	<b>9.54</b>
<b>Equity</b>	<b>50</b>	<b>12.56</b>	<b>7.86</b>	<b>5.80</b>	<b>14.98</b>	<b>8.21</b>	<b>7.16</b>
US Equity	30	17.58	5.27	3.86	16.82	5.05	4.44
Dev Equity	15	11.77	1.77	1.35	15.83	2.37	2.16
EM Equity	5	16.40	0.82	0.58	15.73	0.79	0.55
<b>Fixed Income</b>	<b>40</b>	<b>5.23</b>	<b>2.29</b>	<b>1.21</b>	<b>6.64</b>	<b>2.90</b>	<b>1.81</b>
US Treasury	5	3.83	0.19	0.08	5.17	0.26	0.09
Int Treasury	10	7.85	0.78	0.35	9.99	1.00	0.66
US Corp IG	8	6.58	0.53	0.33	7.44	0.60	0.33
Int Corp IG	8	3.16	0.25	0.13	3.93	0.31	0.22
Global HY	4	5.00	0.20	0.10	6.27	0.25	0.20
Global I/L	5	6.73	0.34	0.23	9.54	0.48	0.31
<b>Currency</b>	<b>5</b>	<b>7.82</b>	<b>0.43</b>	<b>0.21</b>	<b>7.04</b>	<b>0.42</b>	<b>0.22</b>
EUR	2	8.19	0.16	0.06	7.07	0.14	0.08
GBP	2	8.25	0.17	0.11	8.32	0.17	0.11
JPY	1	10.09	0.10	0.04	10.67	0.11	0.02
<b>Commodity</b>	<b>5</b>	<b>18.91</b>	<b>1.24</b>	<b>0.34</b>	<b>18.23</b>	<b>1.17</b>	<b>0.36</b>
Gold	3	19.16	0.57	0.24	14.28	0.43	0.18
Oil	2	33.66	0.67	0.10	37.23	0.74	0.18

7.-8. Analysis is based on a multi-asset class model portfolio in Axioma Risk. Short-term risk numbers are based on daily unweighted returns over 60 business days. Long-term risk uses weekly returns over five years with a one-year half-life. Standard Deviation (Standalone) is the volatility of the bucket independent of the overall portfolio. Standard Deviation (Weighted) is standalone volatility multiplied with the bucket weight; it implicitly assumes perfect correlation between categories and does not take diversification effects from other asset classes into account. Standard Deviation Contribution takes covariances into account and contributions add up to total risk.

Figure 9. Volatilities and Contributions by Risk Type

	60d Std Dev (Standalone)	60d Std Dev (Weighted)	60d Std Dev Contribution	5y Std Dev (Standalone)	5y Std Dev (Weighted)	5y Std Dev Contribution
<b>Total</b>	<b>7.57</b>	<b>11.94</b>	<b>7.57</b>	<b>9.54</b>	<b>13.25</b>	<b>9.54</b>
FX	6.99	3.06	1.49	6.14	2.69	1.74
Equity	12.38	6.19	5.15	14.12	7.06	6.44
Inflation	2.88	0.14	0.04	3.65	0.18	0.02
Interest Rate	3.50	1.24	0.31	5.50	1.95	0.77
Issuer Credit	1.54	0.35	0.23	1.89	0.43	0.21
Vega	0.10	0.01	0.01	0.20	0.03	0.00
Commodity	18.91	0.95	0.34	18.23	0.91	0.36

Figure 10. Weighted Volatility Contributions by Risk Type.

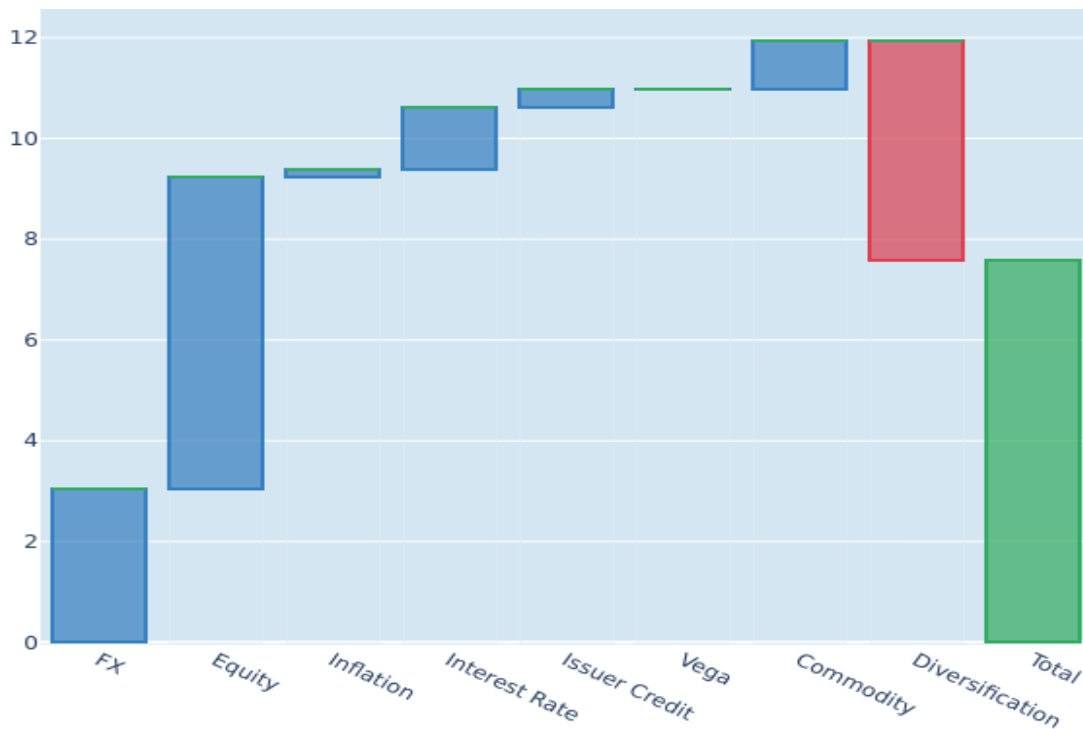
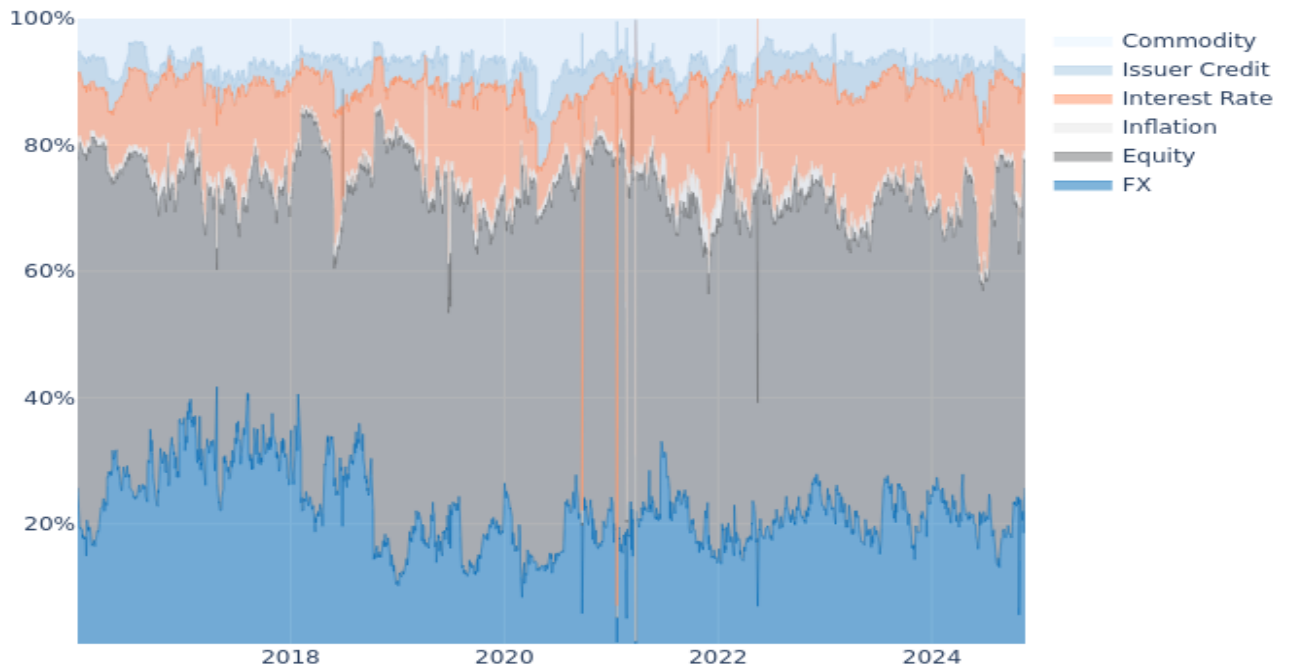


Figure 11. Percent Volatility Contributions over Time



9.-11. Analysis is based on a multi-asset class model portfolio in Axioma Risk. Short-term risk numbers are based on daily unweighted returns over 60 business days. Long-term risk uses weekly returns over five years with a one-year half-life. Standard Deviation (Standalone) is the volatility of the bucket independent of the overall portfolio. Standard Deviation (Weighted) implicitly assumes perfect correlation between categories and does not take diversification effects from other risk types into account. Standard Deviation Contribution takes covariances into account and contributions add up to total risk.

Figure 12. Model Portfolio Sample Stress Tests

	% Weight	SPX -10%	SPX -10% (2008)	Mkt. Selloff Aug 2015	Lehman Default	US 5Y rate +100bps	US 10Y rate +200bps	Oil +20%
<b>Total</b>	<b>100</b>	<b>-4.15</b>	<b>-4.01</b>	<b>-4.70</b>	<b>-20.33</b>	<b>-2.41</b>	<b>-5.08</b>	<b>1.94</b>
<b>Equity</b>	<b>50</b>	<b>-3.85</b>	<b>-4.06</b>	<b>-4.97</b>	<b>-15.67</b>	<b>-0.50</b>	<b>-0.98</b>	<b>1.03</b>
US Equity	30	-3.05	-3.21	-3.48	-9.08	-0.09	-0.14	0.43
Dev Equity	15	-0.62	-0.67	-1.02	-5.07	-0.38	-0.79	0.44
EM Equity	5	-0.18	-0.17	-0.48	-1.51	-0.03	-0.05	0.16
<b>Fixed Income</b>	<b>40</b>	<b>-0.20</b>	<b>0.15</b>	<b>0.25</b>	<b>-3.44</b>	<b>-1.72</b>	<b>-3.76</b>	<b>0.02</b>
US Treasury	5	-0.01	0.04	0.01	-0.02	-0.23	-0.48	-0.03
Int Treasury	10	-0.05	-0.01	0.14	-1.14	-0.53	-1.17	0.02
Global I/L	5	-0.04	0.01	-0.01	-0.71	-0.26	-0.56	0.04
US Corp IG	8	-0.07	0.11	-0.02	-0.48	-0.47	-1.02	-0.05
Int Corp IG	8	-0.01	-0.00	0.09	-0.50	-0.15	-0.32	0.02
Global HY	4	-0.03	0.00	0.05	-0.59	-0.09	-0.21	0.03
<b>Currency</b>	<b>5</b>	<b>-0.00</b>	<b>-0.01</b>	<b>0.11</b>	<b>-0.38</b>	<b>-0.14</b>	<b>-0.29</b>	<b>0.04</b>
EUR	2	0.00	-0.01	0.06	-0.25	-0.04	-0.10	0.02
GBP	2	-0.01	-0.02	0.01	-0.27	-0.04	-0.08	0.02
JPY	1	0.01	0.02	0.04	0.14	-0.05	-0.11	0.00
<b>Commodity</b>	<b>5</b>	<b>-0.09</b>	<b>-0.08</b>	<b>-0.09</b>	<b>-0.84</b>	<b>-0.05</b>	<b>-0.05</b>	<b>0.85</b>
Gold	3	-0.07	0.01	0.05	-0.16	-0.14	-0.28	0.12
Oil	2	-0.02	-0.09	-0.15	-0.67	0.08	0.23	0.73

12. Analysis is based on a multi-asset class model portfolio in Axioma Risk. Transitive stress tests, in which one factor is shocked and the other risk factors move in line with correlation structure over stated time period. If no specific period is stated, correlations are calibrated using a one-year lookback period