Applied philosophy
Factors in the fog of war

Hopes for a quick resolution to the Russia-Ukraine conflict were dashed again this week. We believe that in the short term the war will continue to drive financial markets and commodity prices. We envisage three scenarios on how the situation may develop (resolution, prolonged war, war plus energy crisis), which in turn imply different outcomes for global economic growth and inflation. We believe that markets will remain in flux until the situation clears and we analyse how these scenarios may impact our equity factor indices.

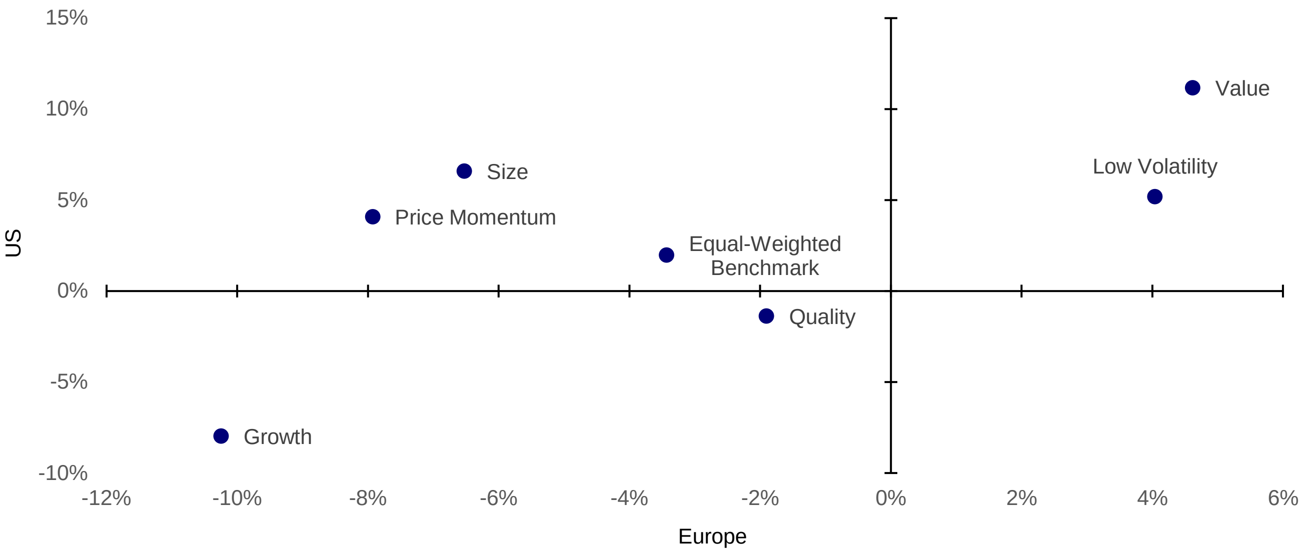
The conflict in Ukraine seems to be nearing a stalemate with no end in sight. However, most risk assets have returned to pre-invasion levels perhaps in the hope that the two sides may be able to reach a peace agreement. There may also be relief that the US Federal Reserve (Fed) raised its target rate by only 25 basis points, although the general rhetoric has been more hawkish since. Importantly, commodity markets have remained tight and driven by concerns around ongoing supply disruptions.

Higher commodity prices keep worries about inflation in the forefront of investors' minds. Moderating economic growth partly driven by falling real incomes casts a shadow over consumer spending raising the prospect of a period akin to stagflation. Nevertheless, we think that remains a tail risk alongside recession triggered by overly aggressive Fed tightening.

Still, rising inflation and lower growth is a difficult environment for financial assets. All global asset classes declined in the first quarter of 2022, apart from commodities, a real asset. This is consistent with our analysis of asset classes in periods of high and accelerating inflation (see here for the full report). Similarly, assets that have outperformed within each asset class are either relatively defensive, such as Japanese stocks or real estate, or have exposure to rising commodity prices, for example UK equities or Emerging Market (EM) real estate. We have observed a similar pattern in equity sector returns with resource-related sectors (energy, basic materials and utilities), non-healthcare-related defensives (food products, tobacco and telecommunications) and financials (boosted by rising rates) outperforming. We would expect these sectors to provide exposure to the value factor and low volatility, which have been the only two outperformers in both the US and Europe year-to-date (**Figure 1**). Can these two factors continue to outperform?

We think that in the short term, what happens in Ukraine will drive risk assets, and therefore equity factors. The impact of the conflict on commodity prices will also affect inflation rates and monetary policy. We outlined three scenarios for the war in the latest The Big Picture. In our view, markets have most probably priced in a war of attrition with elevated commodity prices and lower global GDP growth. Thus, we expect a resolution (either through Russian withdrawal or occupation of Ukraine) to be bullish for risk assets.

Figure 1 – Factor index relative performance year-to-date



Notes: Data as of 31st March 2022. Showing total returns of factor indices and the equal-weighted regional benchmark relative to the S&P 500 index in the US and the Stoxx 600 index in Europe since 31st December 2021. See appendix for factor index definitions. **Past performance is no guarantee of future results.**
Source: Refinitiv Datastream and Invesco

On the other hand, we would view an escalation and an energy crisis as bearish. We think that how our US and European factor indices may respond to these scenarios depends on their sector exposures and we compare how they have changed compared to their pre-pandemic situation.

Growth is the most concentrated factor index both in the US and Europe with their four largest sectors accounting for 73% and 63% of their constituents respectively. Unsurprisingly they are both dominated by technology, healthcare and industrial goods & services (mainly payment processors, professional services, specialist manufacturing and transportation). The main difference is the high exposure to retailers in the US, while the European index is more exposed to real estate.

Low volatility is the second most concentrated index in the US and the third in Europe with 64% and 50% in the top four sectors. Utilities, food, beverage & tobacco and insurance dominate in both regions. The main differences are that the US has a high exposure to industrial goods & services and it is most exposed to utilities, while real estate is the biggest sector in Europe. Also, sector exposures have become more concentrated in both regions since February 2020.

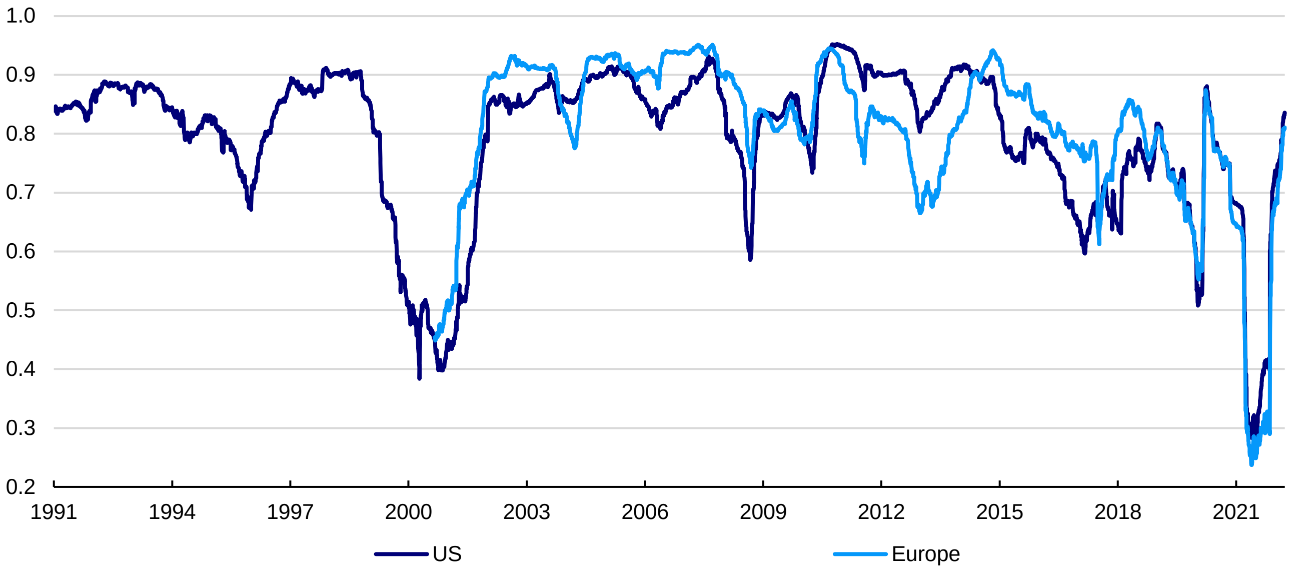
Price momentum has gone through perhaps the biggest reshuffle compared to February 2020. It is not only less concentrated in both regions, but the leading sectors have changed, and it is tilted more towards the value factor than growth (**Figure 2**). In the US, gone are the days of technology dominance. It remains in the top four, but has ceded its crown to energy, followed by healthcare and industrial goods & services. In Europe, the pre-pandemic top three of industrial goods & services, healthcare and real estate have all lost ground mainly to banks and energy. Our indices in both regions are more diversified than two years ago overlapping with both value and growth.

We have viewed quality as the steadier cousin of growth, which applies in the US, where our factor index is dominated by sectors which also feature heavily in the growth index, such as industrial goods & services, healthcare, technology and consumer products & services. However, our European index is less concentrated and its top four exposures include basic resources and financial services alongside industrial goods & services and consumer products & services.

In both the US and Europe, our size index is relatively well-diversified with their top four sectors accounting for less than 45% of constituents. Both of them are perhaps slightly more tilted more towards what we consider growth sectors with healthcare, consumer products & services and technology featuring prominently although our European index has a significant exposure to real estate.

Finally, value is still dominated by financials (banks, financial services and insurance) and utilities in the US, while real estate completes the top four in Europe. Its exposure to energy is much lower than in pre-pandemic times, so it may be a less useful hedge against rising inflation than before.

Figure 2 – Correlation between value and price momentum factor indices since October 1990



Notes: Data as of 31st March 2022. Showing the one-year correlation of daily total returns between our price momentum and value factor indices. The data starts on 1st January 1991 for the US and 1st September 2000 for Europe. See appendix for factor index definitions. **Past performance is no guarantee of future results.**
Source: Refinitiv Datastream and Invesco

At the moment it is not clear how the war will play out, and we expect continued rotation of factor leadership with low volatility remaining among the best performers. Ultimately, we think the prospects for global economic growth and inflation will be the most important influence on financial markets.

Before war broke out in Ukraine, our base case for 2022 was slowing economic growth and high, but moderating inflation. A prolonged war, which we believe markets have priced in for the moment, has similar implications, but would mean a more pronounced decrease in global GDP growth and more persistent inflation, in our opinion. Therefore, we would expect price momentum with its exposure to late-cyclicals and defensives to continue to outperform, especially if oil prices remain high. We think quality may also do well in this environment when the economic cycle is still intact, but risks are elevated.

If the war escalates, there is an energy crisis, or monetary policy settings become too restrictive, the global economy could be pushed into recession. In this case, we think a flight to safety would imply outperformance by the low volatility factor. On the other hand, a quick resolution to the crisis would boost hopes for a reacceleration of economic growth and a quicker moderation of inflation if energy prices normalise, in our view. We believe this could benefit the growth factor and size, especially if the pace of monetary tightening becomes more gradual than currently implied by markets.

Figure 3 – Asset class total returns (%, annualised)

Data as at 31/03/2022	Index	Current Level/RY	Total Return (USD, %) 1w	1m	QTD	YTD	12m	Total Return (Local Currency, %) 1w	1m	QTD	YTD	12m
Equities												
World	MSCI	712	0.5	2.2	-5.3	-5.3	7.7	0.3	2.6	-4.6	-4.6	9.2
Emerging Markets	MSCI	1142	0.5	-2.2	-6.9	-6.9	-11.1	0.2	-2.0	-6.1	-6.1	-9.6
China	MSCI	72	-1.0	-8.0	-14.2	-14.2	-32.5	-1.0	-7.7	-13.9	-13.9	-32.4
US	MSCI	4339	0.2	3.5	-5.2	-5.2	14.1	0.2	3.5	-5.2	-5.2	14.1
Europe	MSCI	1927	1.8	0.0	-7.2	-7.2	4.1	1.0	0.9	-5.2	-5.2	8.5
Europe ex-UK	MSCI	2364	2.1	0.0	-9.8	-9.8	1.4	1.0	0.6	-8.1	-8.1	5.5
UK	MSCI	1182	0.6	0.1	1.8	1.8	13.7	0.8	2.0	4.8	4.8	19.1
Japan	MSCI	3563	-0.1	-0.3	-6.4	-6.4	-6.1	-0.6	5.0	-1.4	-1.4	3.1
Government Bonds												
World	BofA-ML	1.48	0.4	-3.6	-6.5	-6.5	-7.6	0.1	-2.2	-4.7	-4.7	-3.9
Emerging Markets	BBloom	6.05	2.6	-1.9	-12.7	-12.7	-8.6	2.6	-1.9	-12.7	-12.7	-8.6
China	BofA-ML	2.72	0.6	-0.5	1.1	1.1	9.2	0.2	0.0	0.7	0.7	5.6
US (10y)	Datastream	2.33	0.2	-4.1	-7.0	-7.0	-2.8	0.2	-4.1	-7.0	-7.0	-2.8
Europe	Bofa-ML	0.84	0.9	-3.3	-7.4	-7.4	-11.4	-0.2	-2.4	-5.4	-5.4	-6.4
Europe ex-UK (EMU, 10y)	Datastream	0.51	0.8	-4.5	-8.3	-8.3	-12.1	-0.3	-3.6	-6.3	-6.3	-7.1
UK (10y)	Datastream	1.59	0.2	-3.5	-8.0	-8.0	-9.6	0.4	-1.7	-5.4	-5.4	-5.3
Japan (10y)	Datastream	0.21	0.8	-5.3	-6.2	-6.2	-9.5	0.2	-0.2	-1.2	-1.2	-0.6
IG Corporate Bonds												
Global	BofA-ML	3.09	0.7	-2.6	-7.5	-7.5	-6.2	0.4	-2.3	-6.9	-6.9	-4.7
Emerging Markets	BBloom	6.14	2.1	-5.0	-14.6	-14.6	-16.7	2.1	-5.0	-14.6	-14.6	-16.7
China	BofA-ML	3.58	0.6	-0.5	1.2	1.2	8.2	0.2	0.0	0.7	0.7	4.7
US	BofA-ML	3.64	0.6	-2.6	-7.7	-7.7	-4.3	0.6	-2.6	-7.7	-7.7	-4.3
Europe	BofA-ML	1.61	1.2	-2.3	-7.3	-7.3	-10.6	0.1	-1.4	-5.3	-5.3	-5.6
UK	BofA-ML	3.07	0.5	-3.0	-9.5	-9.5	-9.8	0.7	-1.2	-6.9	-6.9	-5.4
Japan	BofA-ML	0.51	0.6	-5.4	-5.8	-5.8	-9.1	0.0	-0.3	-0.7	-0.7	-0.1
HY Corporate Bonds												
Global	BofA-ML	6.36	0.9	-1.4	-6.0	-6.0	-4.7	0.7	-1.1	-5.5	-5.5	-3.5
US	BofA-ML	6.19	0.8	-0.9	-4.5	-4.5	-0.3	0.8	-0.9	-4.5	-4.5	-0.3
Europe	BofA-ML	4.52	1.5	-1.1	-6.9	-6.9	-8.3	0.4	-0.1	-4.8	-4.8	-3.1
Cash (Overnight LIBOR)												
US		0.33	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Euro Area		-0.65	-0.9	-1.8	-3.4	-3.4	-7.5	0.0	0.0	-0.1	-0.1	-0.6
UK		0.18	0.3	-1.4	-2.5	-2.5	-3.6	0.0	0.0	0.0	0.0	0.1
Japan		-0.09	-3.1	-5.6	-5.9	-5.9	-11.2	0.0	0.0	0.0	0.0	-0.1
Real Estate (REITs)												
Global	FTSE	2028	2.6	4.3	-3.4	-3.4	12.2	1.5	5.2	-1.2	-1.2	18.5
Emerging Markets	FTSE	1653	1.9	0.2	2.2	2.2	-15.5	0.8	1.2	4.5	4.5	-10.7
US	FTSE	3708	3.1	6.4	-4.2	-4.2	24.9	3.1	6.4	-4.2	-4.2	24.9
Europe ex-UK	FTSE	3474	4.3	-1.1	-7.9	-7.9	2.9	3.2	-0.1	-5.9	-5.9	8.7
UK	FTSE	1210	3.1	2.1	-5.3	-5.3	16.2	3.3	4.0	-2.5	-2.5	21.8
Japan	FTSE	2498	0.9	0.4	-3.4	-3.4	-8.1	0.3	5.8	1.9	1.9	1.0
Commodities												
All	GSCI	3694	-6.5	9.6	33.1	33.1	64.6	-	-	-	-	-
Energy	GSCI	627	-9.2	12.5	46.1	46.1	93.2	-	-	-	-	-
Industrial Metals	GSCI	2135	-2.4	7.0	17.7	17.7	39.9	-	-	-	-	-
Precious Metals	GSCI	2226	-0.9	2.7	6.7	6.7	11.9	-	-	-	-	-
Agricultural Goods	GSCI	608	-2.5	6.2	22.0	22.0	43.5	-	-	-	-	-
Currencies (vs USD)*												
EUR		1.11	0.6	-1.4	-2.7	-2.7	-5.7	-	-	-	-	-
JPY		121.70	0.5	-5.5	-5.4	-5.4	-9.0	-	-	-	-	-
GBP		1.32	-0.1	-1.9	-2.8	-2.8	-4.6	-	-	-	-	-
CHF		1.08	0.8	-0.7	-1.1	-1.1	2.3	-	-	-	-	-
CNY		6.34	0.4	-0.5	0.3	0.3	3.4	-	-	-	-	-

Notes: *The currency section is organised so that in all cases the numbers show the movement in the mentioned currency versus USD (+ve indicates appreciation, -ve indicates depreciation). **Past performance is no guarantee of future results.** Please see appendix for definitions, methodology and disclaimers.
Source: Refinitiv Datastream and Invesco

Figure 4 – Global equity sector total returns relative to market (%)

Data as at 31/03/2022	Global				
	1w	1m	QTD	YTD	12m
Energy	**0.1**	**4.1**	**28.4**	**28.4**	**27.5**
Basic Materials	**-0.7**	**4.1**	**12.9**	**12.9**	**8.0**
Basic Resources	-0.7	5.7	21.4	21.4	15.3
Chemicals	-0.7	1.7	2.3	2.3	-1.0
Industrials	**-0.6**	**-0.8**	**-3.1**	**-3.1**	**-5.7**
Construction & Materials	-0.6	-2.7	-7.0	-7.0	-6.5
Industrial Goods & Services	-0.5	-0.6	-2.6	-2.6	-5.6
Consumer Discretionary	**0.4**	**-1.7**	**-6.5**	**-6.5**	**-11.4**
Automobiles & Parts	2.7	1.8	-4.9	-4.9	2.1
Media	0.0	-3.9	-10.1	-10.1	-18.2
Retailers	-1.4	-0.2	-4.4	-4.4	-12.1
Travel & Leisure	1.2	-3.0	-1.0	-1.0	-17.3
Consumer Products & Services	0.7	-5.1	-11.6	-11.6	-13.9
Consumer Staples	**0.7**	**-3.2**	**1.2**	**1.2**	**-2.4**
Food, Beverage & Tobacco	0.8	-3.3	2.7	2.7	0.5
Personal Care, Drug & Grocery Stores	0.6	-3.1	-1.6	-1.6	-7.8
Healthcare	**0.6**	**2.0**	**-1.4**	**-1.4**	**0.4**
Financials	**-0.5**	**-0.5**	**5.0**	**5.0**	**5.2**
Banks	-1.0	-2.5	6.9	6.9	4.8
Financial Services	-0.2	1.1	0.3	0.3	6.4
Insurance	0.5	2.2	8.7	8.7	4.8
Real Estate	**1.6**	**1.0**	**-0.4**	**-0.4**	**-0.6**
Technology	**-0.8**	**-0.6**	**-7.9**	**-7.9**	**1.1**
Telecommunications	**0.1**	**-0.5**	**3.6**	**3.6**	**-4.9**
Utilities	**2.8**	**2.4**	**6.0**	**6.0**	**4.0**

Notes: Returns shown are for Datastream sector indices versus the total market index. **Past performance is no guarantee of future results.** Source: Refinitiv Datastream and Invesco

Figure 5a – US factor index total returns (%)

Data as at 31/03/2022	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-0.5	2.2	-12.2	-12.2	13.3	-0.7	-1.4	-8.0	-8.0	-2.0
Low volatility	1.9	5.6	0.4	0.4	19.0	1.7	1.8	5.2	5.2	2.9
Price momentum	-0.3	5.1	-0.7	-0.7	14.6	-0.6	1.3	4.1	4.1	-0.9
Quality	-1.7	0.6	-5.9	-5.9	10.7	-2.0	-3.0	-1.4	-1.4	-4.3
Size	0.4	0.7	1.7	1.7	10.5	0.1	-2.9	6.6	6.6	-4.5
Value	-0.4	1.9	6.1	6.1	18.4	-0.6	-1.7	11.2	11.2	2.4
Market	0.2	3.7	-4.6	-4.6	15.6					
Market - Equal-Weighted	0.4	2.6	-2.7	-2.7	13.1					

Notes: All indices are subsets of the S&P 500 index, they are rebalanced monthly, use data in US dollars and are equal-weighted. Growth includes stocks in the top third based on both their 5-year sales per share trend and their internal growth rate (the product of the 5-year average return on equity and the retention ratio); Low volatility includes stocks in the bottom quintile based on the standard deviation of their daily returns in the previous three months; Price momentum includes stocks in the top quintile based on their performance in the previous 12 months; Quality includes stocks in the top third based on both their return on invested capital and their EBIT to EV ratio (earnings before interest and taxes to enterprise value); Size includes stocks in the bottom quintile based on their market value in US dollars. Value includes stocks in the bottom quintile based on their price to book value ratios. The market represents the S&P 500 index. **Past performance is no guarantee of future results.**
Source: Refinitiv Datastream and Invesco

Figure 5b – European factor index total returns relative to market (%)

Data as at 31/03/2022	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	2.6	4.0	-15.5	-15.5	5.2	1.8	2.9	-10.2	-10.2	-3.5
Low volatility	1.4	2.0	-2.1	-2.1	13.4	0.6	0.9	4.0	4.0	4.0
Price momentum	1.4	3.8	-13.4	-13.4	-3.8	0.7	2.7	-7.9	-7.9	-11.8
Quality	0.8	1.0	-7.7	-7.7	6.6	0.0	-0.1	-1.9	-1.9	-2.2
Size	1.7	0.2	-12.0	-12.0	-2.6	0.9	-0.9	-6.5	-6.5	-10.7
Value	1.2	0.1	-1.6	-1.6	12.9	0.5	-1.0	4.6	4.6	3.6
Market	0.7	1.1	-5.9	-5.9	9.0					
Market - Equal-Weighted	0.9	0.1	-9.1	-9.1	2.6					

Notes: All indices are subsets of the STOXX 600 index, they are rebalanced monthly, use data in euros and are equal-weighted. Growth includes stocks in the top third based on both their 5-year sales per share trend and their internal growth rate (the product of the 5-year average return on equity and the retention ratio); Low volatility includes stocks in the bottom quintile based on the standard deviation of their daily returns in the previous three months; Price momentum includes stocks in the top quintile based on their performance in the previous 12 months; Quality includes stocks in the top third based on both their return on invested capital and their EBIT to EV ratio (earnings before interest and taxes to enterprise value); Size includes stocks in the bottom quintile based on their market value in euros; Value includes stocks in the bottom quintile based on their price to book value ratios. The market represents the STOXX 600 index. **Past performance is no guarantee of future results.**
Source: Refinitiv Datastream and Invesco

Figure 6 – Model asset allocation

	Neutral	Policy Range		Allocation	Position vs Neutral
Cash Equivalents	**5%**	**0-10%**		**10%**	
Cash	2.5%			10%	
Gold	2.5%			0%	
Bonds	**40%**	**10-70%**	↑	**32%**	
Government	25%	10-40%		**10%**	
US	8%			2%	
Europe ex-UK (Eurozone)	7%			2%	
UK	1%			0%	
Japan	7%		↓	2%	
Emerging Markets	2%		↑	4%	
China**	0.2%		↑	1%	
Corporate IG	10%	0-20%	↑	**20%**	
US Dollar	5%		↑	10%	
Euro	2%		↑	4%	
Sterling	1%		↑	2%	
Japanese Yen	1%		↑	2%	
Emerging Markets	1%			2%	
China**	0.1%		↑	1%	
Corporate HY	5%	0-10%	↓	**2%**	
US Dollar	4%		↓	2%	
Euro	1%		↓	0%	
Equities	**45%**	**25-65%**	↑	**50%**	
US	25%		↑	16%	
Europe ex-UK	7%			10%	
UK	4%			8%	
Japan	4%		↑	6%	
Emerging Markets	5%			10%	
China**	2%		↑	3%	
Real Estate	**8%**	**0-16%**	↓	**8%**	
US	2%		↓	0%	
Europe ex-UK	2%		↓	2%	
UK	1%		↓	0%	
Japan	2%		↓	2%	
Emerging Markets	1%			4%	
Commodities	**2%**	**0-4%**		**0%**	
Energy	1%			0%	
Industrial Metals	0.3%			0%	
Precious Metals	0.3%			0%	
Agriculture	0.3%			0%	
Total	**100%**			**100%**	

Currency Exposure (including effect of hedging)					
USD	48%		↑	35%	
EUR	20%		↓	20%	
GBP	7%		↓	11%	
JPY	15%		↓	13%	
EM	9%		↑	20%	
Total	**100%**			**100%**	

Notes: **China is included in Emerging Markets allocations. This is a theoretical portfolio and is for illustrative purposes only. See the latest The Big Picture document for more details. It does not represent an actual portfolio and is not a recommendation of any investment or trading strategy. Arrows indicate the direction of the most recent changes.
Source: Invesco

Figure 7 – Model allocations for Global sectors

	Neutral	Invesco	Preferred Region
Energy	**5.9%**	**Neutral**	**US**
Basic Materials	**4.3%**	**Overweight**	**Europe**
Basic Resources	2.4%	Overweight	Europe
Chemicals	1.9%	Neutral	US
Industrials	**12.7%**	**Overweight**	**US**
Construction & Materials	1.6%	Neutral	EM
Industrial Goods & Services	11.1%	Overweight	US
Consumer Discretionary	**15.5%**	**Neutral**	**US**
Automobiles & Parts	3.0%	Underweight	Japan
Media	1.2%	Underweight	Europe
Retailers	5.4%	Overweight	US
Travel & Leisure	1.9%	Overweight	US
Consumer Products & Services	4.0%	Neutral	Japan
Consumer Staples	**6.0%**	**Neutral**	**US**
Food, Beverage & Tobacco	3.9%	Neutral	US
Personal Care, Drug & Grocery Stores	2.1%	Neutral	Europe
Healthcare	**9.9%**	**Neutral**	**US**
Financials	**14.5%**	**Underweight**	**Japan**
Banks	7.2%	Underweight	Japan
Financial Services	4.8%	Overweight	Japan
Insurance	2.5%	Underweight	US
Real Estate	**3.4%**	**Overweight**	**Japan**
Technology	**21.0%**	**Overweight**	**US**
Telecommunications	**3.5%**	**Underweight**	**Japan**
Utilities	**3.2%**	**Underweight**	**Europe**

Notes: These are theoretical allocations which are for illustrative purposes only. They do not represent an actual portfolio and are not a recommendation of any investment or trading strategy. See the latest Strategic Sector Selector for more details.
Source: Refinitiv Datastream and Invesco

Appendix

Definitions of data and benchmarks for Figure 3

Sources: we source data from Datastream unless otherwise indicated.

Cash: returns are based on a proprietary index calculated using the Intercontinental Exchange Benchmark Administration overnight LIBOR (London Interbank Offer Rate). The global rate is the average of the euro, British pound, US dollar and Japanese yen rates. The series started on 1st January 2001 with a value of 100.

Gold: London bullion market spot price in USD/troy ounce.

Government bonds: Current levels, yields and total returns use Datastream benchmark 10-year yields for the US, Eurozone, Japan and the UK, and the Bank of America Merrill Lynch government bond total return index for the World and Europe. The emerging markets yields and returns are based on the Bloomberg Barclays emerging markets aggregate government bond index.

Corporate investment grade (IG) bonds: Bank of America Merrill Lynch investment grade corporate bond total return indices. The emerging markets yields and returns are based on the Bloomberg Barclays emerging markets aggregate corporate bond index.

Corporate high yield (HY) bonds: Bank of America Merrill Lynch high yield total return indices

Equities: We use MSCI benchmark gross total return indices for all regions.

Commodities: Goldman Sachs Commodity total return indices

Real estate: FTSE EPRA/NAREIT total return indices

Currencies: Global Trade Information Services spot rates

Factor index definitions

We focus on relatively large-cap stocks, as we suspect that most investors will be conscious of liquidity constraints when implementing such strategies. We have chosen six factors, that we think cover the classic definitions used by most investors. We aim to capture roughly a fifth of the market in each of our factor indices using the historical constituents of the STOXX 600 since August 1999 and the S&P 500 since September 1989, with monthly rebalancing. All our rankings are based on data in euros for Europe and in US dollars for the US. All factor indices are equal-weighted. We use the following definitions:

Growth: stocks in both the top third based on their 5-year sales per share trend and the top-third based on their internal growth rate (the product of the 5-year average return on equity and the retention ratio).

Low volatility: stocks in the bottom quintile based on the standard deviation of their daily returns in the previous three months.

Price momentum: stocks in the top quintile based on their performance in the previous 12 months.

Quality: stocks in both the top third based on their return on invested capital and the top third based on their EBIT to EV ratio (earnings before interest and taxes to enterprise value). This follows Joel Greenblatt's "magic formula" from his 2005 book: The little book that beats the market.

Size: stocks in the bottom quintile based on their market value.

Value: stocks in the bottom quintile based on their price to book value ratios.

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Data as of 31st March 2022 unless stated otherwise.

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