



CONSTRUCTIVE VIEWS ON PRODUCTIVITY

2022 contained no shortage of high-level events across the spectrum: military conflicts, continued pandemic, a bear market, inflation, aggressive monetary policy, and many more which continue into 2023. The importance of these notwithstanding, this article pivots to discuss a longer-term subject whose course has been influenced by 2022 and the era leading up to it: productivity. From the aftermath of the Great Financial Crisis (GFC) up to the start of COVID, productivity growth lagged longer-term averages and was not broadly dispersed throughout the myriad of sectors in the broader economy. Looking forward, factors on the supply side, which combined with demographic trends offer several avenues for new and productivity-enhancing capital expansion. After all last year's difficulties, it's nice to talk about something positive for a change!

Households and corporations still have substantially healthy balance sheets. Corporate cash levels are high, debt maturities are several years out, and leverage ratios are well below long-term trends. Banks in particular, the proverbial switch-board of capital, maintain excess capital thanks in part to controls set after the GFC. Good to know the funds are there, but who and what will the productivity come from? The US workforce is expected to get younger on average in the years to come, ushering in workers with a more natural proclivity to new technology and the potential for increased automation. This demographic transformation comes on the back of several recent years of increased venture capital funding bringing superior computing products to a more tractable labor market. More expensive financing via higher interest rates may also compel companies to leverage new technology to remain profitable.

The ingredients for productivity growth being there, where in particular might the capital expenditure money go? One of the offshoots more directly linked to the pandemic is the digitization of business models, wherein artificial intelligence and machine learning was originally substituted in for traditional R&D to help expedite the production of mRNA technologies, it has the potential for application across many other industries. Another is the adoption of hybrid or remote working, allowing increased labor mobility, reduced time lost to commuting, and more business start-ups bringing unique, new products to market. Spending on decarbonization from the Inflation Reduction Act, to come via fiscal and public/private partnership spending, also has the potential to add hundreds of billions of dollars to domestic output in new technologies. While other areas such as increases in defense and infrastructure spending also can bolster productivity, the economy-wide possibilities are varied and endless.

This article's optimistic hypotheses, which may take years to unfold, illustrate one of the benefits of a dynamic and open economy that is easily overlooked in stressful times: the potential for positive surprises. COVID's damages being what they are, many of the financial reactions to it when combined with other technological and demographic trends have the potential to positively transform economic lives for years to come. Such transformation arguably could not be as easily achieved in a more economically stagnant, sedate, or otherwise closed environment. Although the productivity gains we are hoping for are by no means guaranteed; the ingredients are there and the prospect reminds investors that the long-run can pack a lot of upside, even if the recent past has been anything but easy.¹

¹Source: Morgan Stanley Global Investment Committee Special Report by Lisa Shalett, The Next American Productivity Renaissance, January 4, 2023

GLOBAL ECONOMIC LANDSCAPE

- As expected by a consensus of forecasters, inflation as measured by CPI came down in December 2022 for a second month; 7.0% at the headline level and 6.0% at core. In turn, the Fed lowered the pace of rate hikes to 50 basis points at its December meeting, bringing the fed funds rate to 4.5%. While there is reason to be sanguine about inflation, sticky prices in services and the tightness of the labor market are wildcards which the Fed has explicitly cited as risks. Despite the Fed's hawkish rhetoric which raised the terminal rate and pushed out guidance on first rate cuts, the market discounted only 25 to 50 basis points more in hikes and aggressive rate cuts by June. With financial conditions quite loose, the Fed has room to deliver negative surprises².
- The rise in Treasury yields may well challenge the US Government's ability to finance operations. For example, as of year-end 2022, nearly 30% of US Government debt was scheduled to mature within one year and approximately another 20% has a maturity date of between one and three years. One implication is that increased borrowing costs will crowd out discretionary spending. Another is that the Treasury may seek to issue longer-term debt which, thanks to an inverted yield curve, entails lower borrowing costs³.
- According to a Federal Reserve Report in November 2022 ("What Happens in China Does Not Stay in China"), policy-driven increases in China's credit may provide a tailwind for energy and commodity prices. For example, the International Energy Agency noted that China's demand for oil dropped by the greatest amount in over three decades due to lockdowns. Factors such as a re-opening in travel, an uptick in property demand, combined with relatively low inventory levels of copper and aluminum have the potential to stoke demand⁴.

GLOBAL FINANCIAL MARKETS

- In 2022, persistent global inflationary pressures and coordinated central bank rate hikes led equities to decline to bear market lows and fixed income to experience the sharpest losses in decades. This was the first time in modern history where both US stocks and long-term bonds declined by double digits in a year. The traditional 60% stock/40% bond portfolio lost -16.1% in 2022, the worst return in more than 50 years⁵.
- The US Dollar retreated in value from its peak on September 28, 2022, suggesting that investors believe the Fed is near the end of its tightening cycle. This in turn has been viewed positively for Emerging Markets in terms of their ability to attract, compete in export markets, raise capital by issuing dollar-denominated debt, and otherwise develop economically⁶.
- Despite being viewed as an inflation-hedge, Real Estate Investment Trusts (REITs) saw their second worst year on record in 2022 (the worst being 2008), returning -24.5% versus -18.1% for the S&P 500. Although operating income growth was above historical averages, valuation metrics such as rising interest rates and credit spreads, as well as declining earnings expectations and falling private market valuations presented a formidable headwind for the sector⁷.
- Gold typically trades inversely with real, or inflation-adjusted, yields. Falling real yields support the yellow metal and rising yields on inflation-protection securities drive losses. With the 10-year US Treasury real yield having backed up by nearly 280 basis points in 2022 to 1.6% from an extremely negative

² Source: Morgan Stanley Global Investment Committee Weekly December 19, 2022

³ Source: Morgan Stanley Global Investment Committee Weekly January 9, 2023

⁴ Source: Morgan Stanley, A Few Things We're Thinking About, by Christopher Baxter, January 5, 2023

⁵ Source: Morgan Stanley, Client Commentary, January 2023

⁶ Source: Morgan Stanley, A Few Things We're Thinking About, by Christopher Baxter January 5, 2023

⁷ Source: Morgan Stanley, The REIT Cheat Sheet, North America by Ronald Kamden, January 3, 2023

position, it should have been a horrendous year for gold. However, demand has remained strong as shifting geopolitics and currency market turmoil have led central banks, especially those in China and Russia, to build their reserves⁸.

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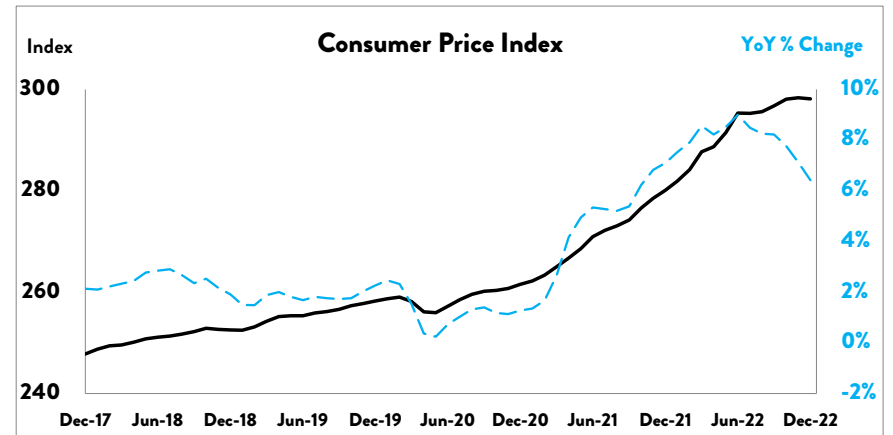
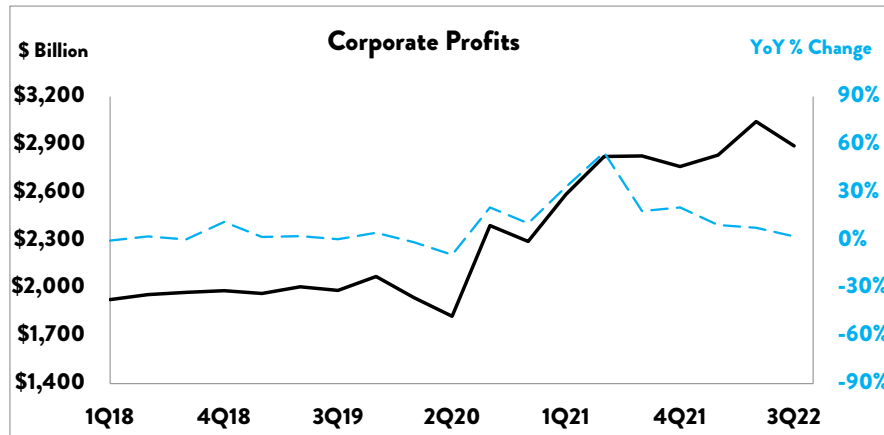
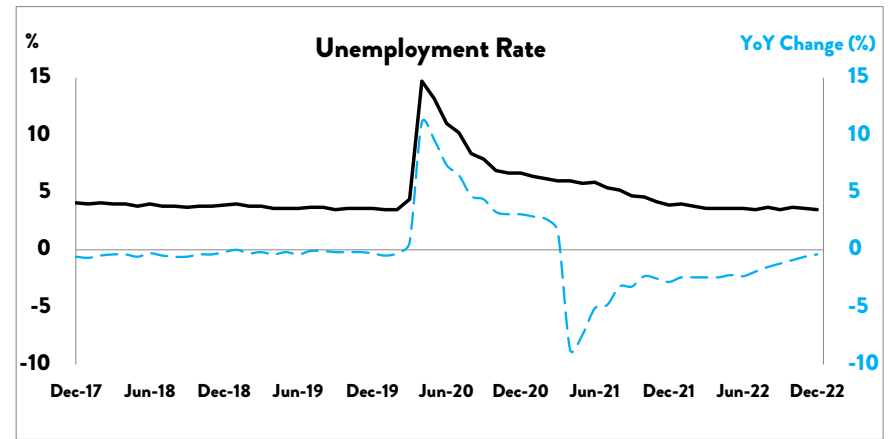
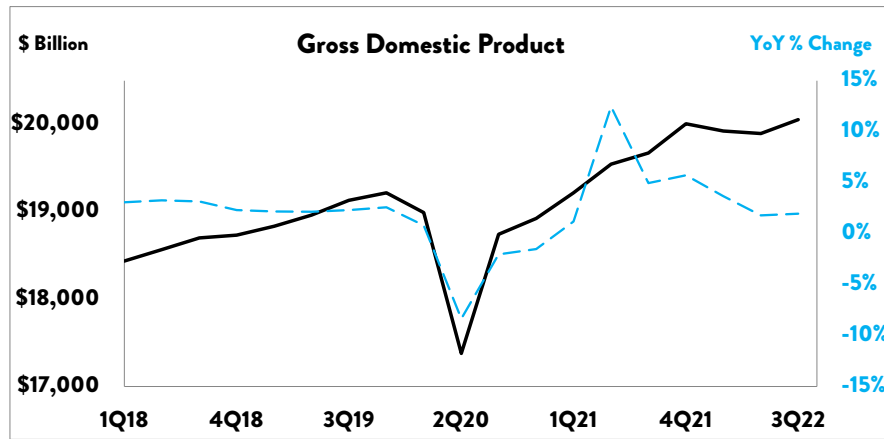
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⁸ Source: Morgan Stanley Global Investment Committee Weekly January 3, 2023

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4Q2022 Economic Data



Key: — Economic Series - - - Year-Over-Year Change

Labor Market Statistics (Monthly)					
Category	Recent	5-Yr High	5-Yr Low	5-Yr Avg.	Date
Jobs Added/Lost Monthly	223,000	4,505,000	-20,493,000	103,567	Dec-22
Unemployment Rate	3.5%	14.7%	3.5%	4.9%	Dec-22
Median Unemployment Length (Weeks)	7.5	22.2	4.0	11.2	Dec-22
Average Hourly Earnings	\$32.82	\$32.82	\$26.73	\$29.45	Dec-22

Source: Federal Reserve Bank of St. Louis and Bureau of Labor Statistics

Other Prices and Indexes (Monthly)					
Category	Recent	5-Yr High	5-Yr Low	% Off Peak	Date
Gas: Price per Gallon	\$3.17	\$4.84	\$1.80	-34.5%	Dec-22
Spot Oil	\$76.44	\$114.84	\$16.55	-33.4%	Dec-22
Case-Shiller Home Price Index	304.2	316.2	204.7	48.7%*	Oct-22
Medical Care CPI	552.3	557.4	480.8	14.9%*	Dec-22

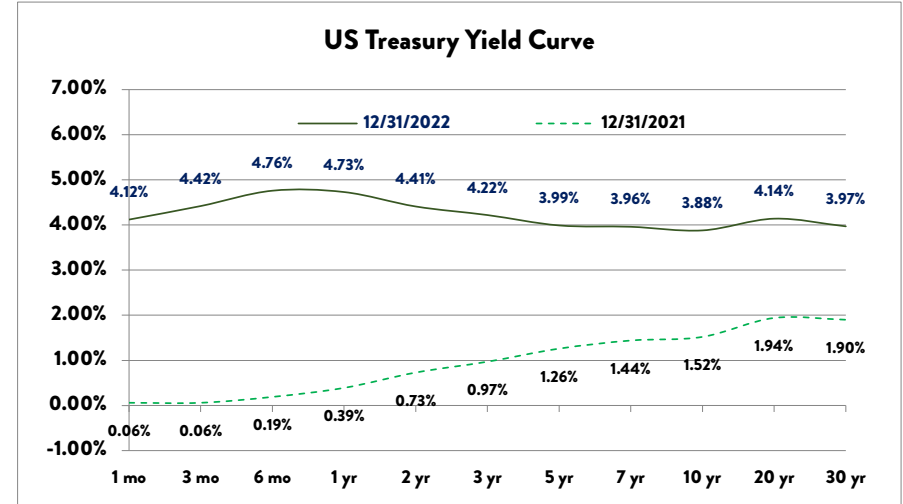
*% Off Low

Morningstar data as of 12/31/2022

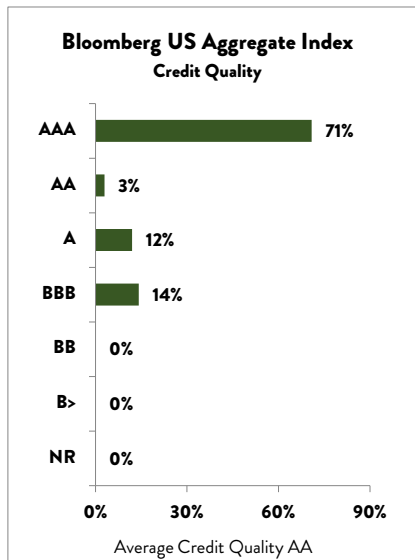
4Q2022 Bond Market Data

Index	QTR	YTD	1 yr.	3 yrs.	5 yrs.	10 yrs.
90-Day T-Bill	1.02%	2.05%	2.05%	0.82%	1.31%	0.79%
Bloomberg US Aggregate	1.87%	-13.01%	-13.01%	-2.71%	0.02%	1.06%
Bloomberg Short US Treasury	0.85%	0.98%	0.98%	0.66%	1.26%	0.80%
Bloomberg Int. US Treasury	1.02%	-7.77%	-7.77%	-1.39%	0.46%	0.69%
Bloomberg Long US Treasury	-0.59%	-29.26%	-29.26%	-7.40%	-2.20%	0.60%
Bloomberg US TIPS	2.04%	-11.85%	-11.85%	1.21%	2.11%	1.12%
Bloomberg US Credit	3.44%	-15.26%	-15.26%	-2.86%	0.42%	1.82%
Bloomberg US Mortgage-Backed	2.14%	-11.81%	-11.81%	-3.22%	-0.53%	0.74%
Bloomberg US Asset-Backed	0.81%	-4.30%	-4.30%	-0.11%	1.18%	1.23%
Bloomberg US 20-Yr Municipal	5.23%	-11.02%	-11.02%	-1.05%	1.37%	2.64%
Bloomberg US High Yield	4.17%	-11.19%	-11.19%	0.05%	2.31%	4.03%
Bloomberg Global	4.55%	-16.25%	-16.25%	-4.48%	-1.66%	-0.44%
Bloomberg International	6.81%	-18.70%	-18.70%	-5.94%	-3.07%	-1.64%
Bloomberg Emerging Market	6.59%	-15.26%	-15.26%	-3.89%	-0.42%	1.71%

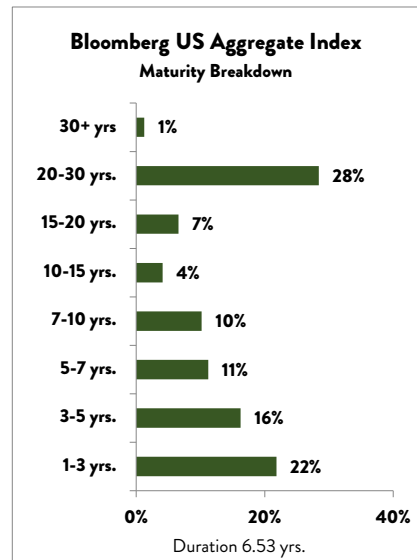
Source: Morningstar



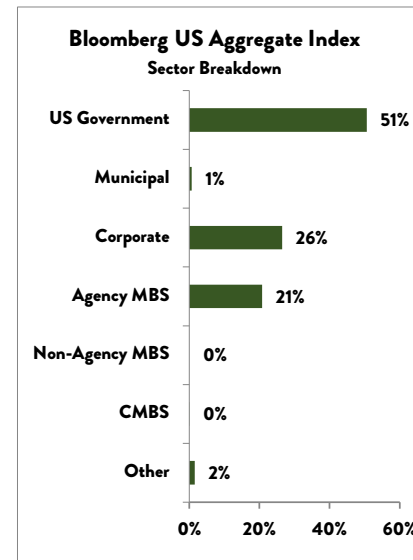
Source: Department of US Treasury



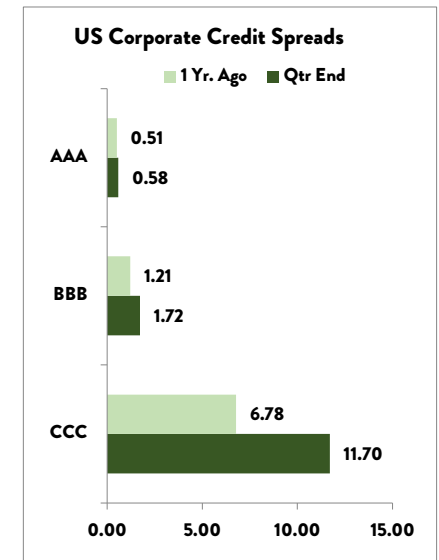
Source: Morningstar



Source: Morningstar



Source: Morningstar



Source: Federal Reserve / Bank of America

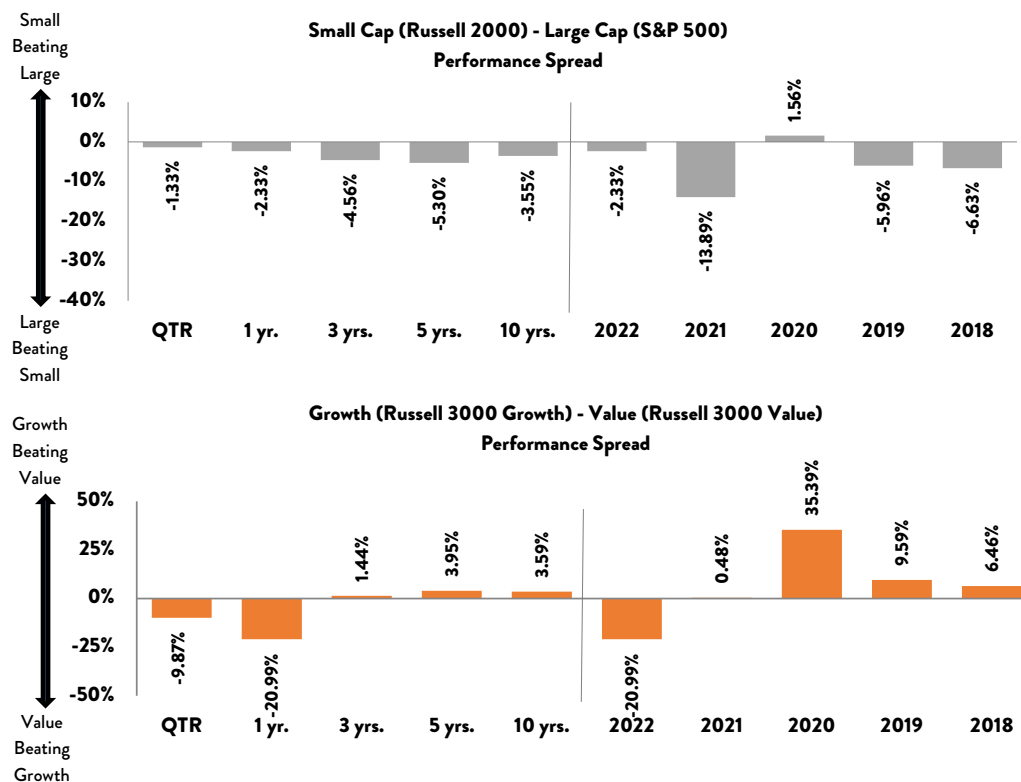
4Q2022 US Equity Market Data

Sectors Weights/Returns (ranked by quarter performance)

	Wgt.	Sector	QTR	YTD	1 yr.
S&P 500 Index	5%	Energy	22.81%	65.72%	65.72%
	9%	Industrials	19.22%	-5.48%	-5.48%
	3%	Materials	15.05%	-12.27%	-12.27%
	12%	Financials	13.61%	-10.53%	-10.53%
	16%	Health Care	12.80%	-1.95%	-1.95%
	7%	Consumer Staples	12.72%	-0.62%	-0.62%
	3%	Utilities	8.64%	1.57%	1.57%
	26%	Information Technology	4.74%	-28.19%	-28.19%
	3%	Real Estate	3.82%	-26.13%	-26.13%
	7%	Communication Services	-1.38%	-39.89%	-39.89%
10%	Consumer Discretionary	-10.18%	-37.03%	-37.03%	
S&P Midcap 400 Index	7%	Materials	21.92%	-2.73%	-2.73%
	14%	Consumer Discretionary	14.24%	-21.03%	-21.03%
	20%	Industrials	12.77%	-11.50%	-11.50%
	4%	Utilities	11.62%	-0.15%	-0.15%
	4%	Consumer Staples	11.59%	-0.77%	-0.77%
	4%	Energy	10.45%	36.62%	36.62%
	15%	Financials	9.57%	-3.04%	-3.04%
	12%	Information Technology	9.36%	-20.47%	-20.47%
	10%	Health Care	5.22%	-20.05%	-20.05%
	2%	Communication Services	4.31%	-20.39%	-20.39%
8%	Real Estate	3.74%	-26.35%	-26.35%	
S&P Smallcap 600 Index	5%	Energy	20.45%	47.89%	47.89%
	17%	Industrials	14.66%	-9.40%	-9.40%
	3%	Utilities	12.64%	-1.84%	-1.84%
	6%	Materials	11.51%	-6.09%	-6.09%
	13%	Consumer Discretionary	10.91%	-27.82%	-27.82%
	5%	Consumer Staples	9.76%	-6.47%	-6.47%
	8%	Real Estate	9.01%	-29.50%	-29.50%
	13%	Information Technology	8.09%	-22.36%	-22.36%
	18%	Financials	7.21%	-14.02%	-14.02%
	11%	Health Care	0.48%	-26.32%	-26.32%
2%	Communication Services	-3.18%	-34.46%	-34.46%	

Index Performance Data

Index	QTR	YTD	1 yr.	Annualized		
				3 yrs.	5 yrs.	10 yrs.
S&P 500	7.56%	-18.11%	-18.11%	7.66%	9.42%	12.56%
Russell 1000 Value	12.42%	-7.54%	-7.54%	5.96%	6.67%	10.29%
Russell 1000 Growth	2.20%	-29.14%	-29.14%	7.79%	10.96%	14.10%
Russell Mid Cap	9.18%	-17.32%	-17.32%	5.88%	7.10%	10.96%
Russell Mid Cap Value	10.45%	-12.03%	-12.03%	5.82%	5.72%	10.11%
Russell Mid Cap Growth	6.90%	-26.72%	-26.72%	3.85%	7.64%	11.41%
Russell 2000	6.23%	-20.44%	-20.44%	3.10%	4.13%	9.01%
Russell 2000 Value	8.42%	-14.48%	-14.48%	4.70%	4.13%	8.48%
Russell 2000 Growth	4.13%	-26.36%	-26.36%	0.65%	3.51%	9.20%
Russell 3000	7.18%	-19.21%	-19.21%	7.07%	8.79%	12.13%
DJ US Select REIT	4.76%	-25.96%	-25.96%	-1.37%	2.50%	5.74%



Source: Morningstar

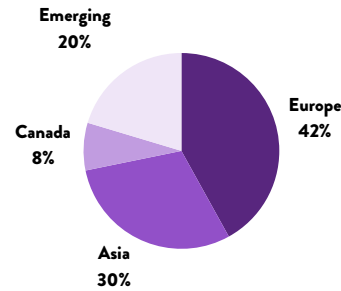
4Q2022 International Market Data

Index Performance Data (net)

Index (US\$)	QTR	YTD	1 yr.	3 yrs.	5 yrs.	10 yrs.
MSCI ACWI ex-US	14.28%	-16.00%	-16.00%	0.07%	0.88%	3.80%
MSCI EAFE	17.34%	-14.45%	-14.45%	0.87%	1.54%	4.67%
Europe	19.35%	-15.06%	-15.06%	1.35%	1.87%	4.58%
United Kingdom	16.98%	-4.84%	-4.84%	0.32%	0.96%	3.07%
Germany	24.57%	-22.34%	-22.34%	-3.01%	-3.02%	2.66%
France	22.19%	-13.33%	-13.33%	2.53%	3.41%	6.14%
Pacific	14.13%	-13.04%	-13.04%	-0.03%	0.95%	4.89%
Japan	13.23%	-16.65%	-16.65%	-0.99%	0.23%	5.55%
Hong Kong	18.21%	-4.71%	-4.71%	-1.05%	-0.29%	4.77%
Australia	15.68%	-5.25%	-5.25%	4.07%	4.05%	3.97%
Canada	7.42%	-12.87%	-12.87%	4.95%	4.06%	3.68%
MSCI EM	9.70%	-20.09%	-20.09%	-2.69%	-1.40%	1.44%
MSCI EM Latin America	5.73%	8.92%	8.92%	-4.79%	-1.08%	-2.15%
MSCI EM Asia	10.83%	-21.11%	-21.11%	-1.31%	-0.62%	3.55%
MSCI EM Eur/Mid East	1.25%	-35.34%	-35.34%	-9.53%	-4.07%	-4.02%
MSCI ACWI Value ex-US	15.70%	-8.59%	-8.59%	0.06%	-0.05%	2.72%
MSCI ACWI Growth ex-US	12.89%	-23.05%	-23.05%	-0.40%	1.49%	4.68%
MSCI ACWI Sm Cap ex-US	13.31%	-19.97%	-19.97%	1.07%	0.67%	5.24%

Regional Exposure

MSCI ACWI ex-USA

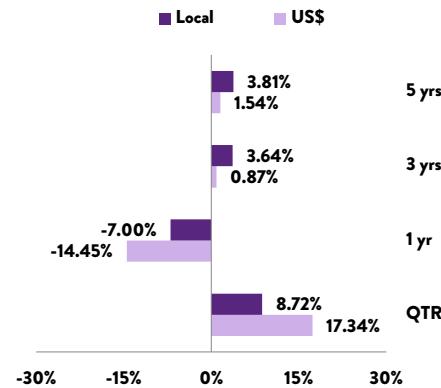


Top 10 Countries (MSCI AC World ex-USA)

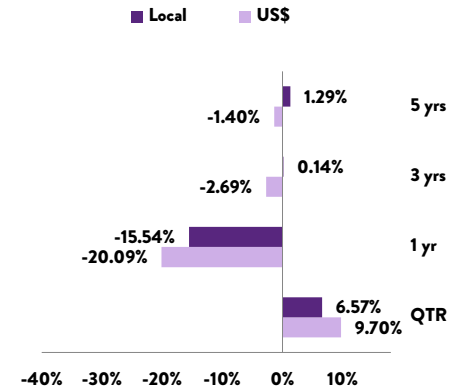
Japan	14%
UK	10%
China	9%
Canada	8%
France	8%
Switzerland	7%
Germany	5%
Australia	5%
India	4%
Taiwan	4%

Source: Morningstar

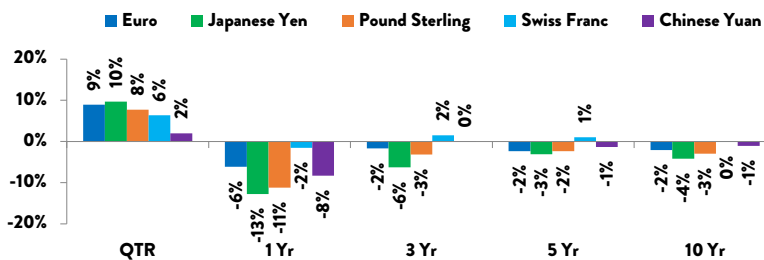
MSCI EAFE Index Return



MSCI Emerging Index Return



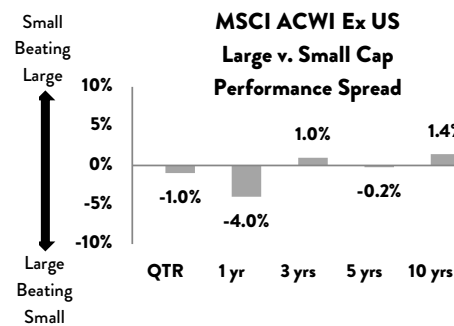
Foreign Currency v. US\$ Returns



Exchange Rates	QTR	3Q22	2Q22	1Q22	4Q21	3Q21
Japanese Yen	131.81	144.71	135.69	121.44	115.17	111.50
Euro	0.93	1.02	0.96	0.90	0.88	0.86
British Pound	0.83	0.90	0.82	0.76	0.74	0.74
Swiss Franc	0.92	0.98	0.96	0.92	0.91	0.93
Chinese Yuan	6.90	7.11	6.70	6.34	6.37	6.44

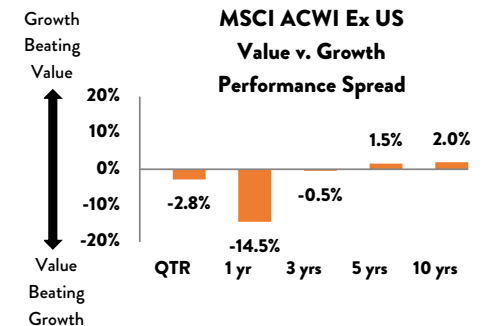
Source: Federal Reserve Bank of St. Louis

MSCI ACWI Ex US Large v. Small Cap Performance Spread



Performance Source: Morningstar

MSCI ACWI Ex US Value v. Growth Performance Spread



Historical Market Returns

Ranked by Performance

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	4Q22
Emerging Markets 39.42%	US Bonds 5.24%	Emerging Markets 78.51%	Small Cap 26.85%	Core Real Estate 14.96%	Emerging Markets 18.22%	Small Cap 38.82%	Large Cap 13.68%	Core Real Estate 13.95%	Small Cap 21.30%	Emerging Markets 37.28%	Core Real Estate 7.36%	Large Cap 31.49%	Small Cap 19.96%	Large Cap 28.71%	Commod. 16.09%	Intl 14.28%
Intl 16.65%	Global Bonds 4.79%	High Yield 58.21%	Mid Cap 25.48%	TIPS 13.56%	Mid Cap 17.28%	Mid Cap 34.76%	Mid Cap 13.21%	Large Cap 1.38%	High Yield 17.12%	Intl 27.19%	Cash 1.69%	Mid Cap 30.54%	Large Cap 18.40%	Commod. 27.11%	Core Real Estate 6.59%	Emerging Markets 9.70%
Commod. 16.23%	Cash 1.39%	Intl 41.45%	Emerging Markets 18.88%	US Bonds 7.84%	Intl 16.83%	Large Cap 32.39%	Core Real Estate 11.44%	US Bonds 0.55%	Mid Cap 13.79%	Large Cap 21.83%	US Bonds 0.01%	Small Cap 25.52%	Emerging Markets 18.31%	Mid Cap 22.58%	Cash 2.05%	Mid Cap 9.18%
Core Real Estate 14.84%	TIPS -2.35%	Mid Cap 40.48%	Commod. 16.83%	Global Bonds 5.64%	Small Cap 16.35%	Intl 15.29%	US Bonds 5.97%	Cash 0.03%	Large Cap 11.95%	Mid Cap 18.52%	Global Bonds -1.20%	Intl 21.51%	Mid Cap 17.10%	Core Real Estate 21.06%	High Yield -11.19%	Large Cap 7.56%
TIPS 11.64%	Core Real Estate -10.70%	Small Cap 27.17%	Core Real Estate 15.26%	High Yield 4.98%	Large Cap 16.00%	Global Balanced 14.46%	Small Cap 4.89%	TIPS -1.43%	Commod. 11.76	Global Balanced 15.87%	TIPS -1.26%	Global Balanced 18.86%	Global Balanced 13.93%	Small Cap 14.82%	TIPS -11.85%	Global Balanced 7.50%
Global Bonds 9.48%	Global Balanced -24.51%	Large Cap 26.46%	High Yield 15.12%	Large Cap 2.11%	High Yield 15.81%	Core Real Estate 12.95%	TIPS 3.64%	Global Balanced -1.45%	Emerging Markets 11.18%	Small Cap 14.65%	High Yield -2.08%	Emerging Markets 18.42%	TIPS 10.99%	Global Balanced 10.94%	US Bonds -13.01%	Small Cap 6.23%
Global Balanced 9.07%	High Yield -26.16%	Global Balanced 20.49%	Large Cap 15.06%	Cash 0.06%	Global Balanced 11.06%	High Yield 7.44%	Global Balanced 3.17%	Mid Cap -2.43%	Core Real Estate 7.76%	High Yield 7.50%	Large Cap -4.38%	High Yield 14.32%	Intl 10.65%	Intl 7.82%	Intl -16.00%	Global Bonds 4.55%
US Bonds 6.97%	Small Cap -33.79%	Commod. 18.91%	Intl 11.15%	Global Balanced -0.97%	Core Real Estate 9.76%	Cash 0.07%	High Yield 2.45%	Global Bonds -3.15%	Global Balanced 5.38%	Global Bonds 7.39%	Global Balanced -5.30%	US Bonds 8.72%	Global Bonds 9.20%	TIPS 5.96%	Global Bonds -16.25%	High Yield 4.17%
Mid Cap 5.60%	Commod. -35.65%	TIPS 11.41%	Global Balanced 9.40%	Mid Cap -1.55%	TIPS 6.98%	US Bonds -2.02%	Global Bonds 0.59%	Small Cap -4.41%	TIPS 4.68%	Core Real Estate 6.66%	Mid Cap -9.06%	TIPS 8.43%	US Bonds 7.51%	High Yield 5.28%	Global Balanced -16.40%	Commod. 2.22%
Large Cap 5.49%	Large Cap -37.00%	Global Bonds 6.93%	US Bonds 6.54%	Small Cap -4.18%	Global Bonds 4.32%	Global Bonds -2.60%	Cash 0.04%	High Yield -4.46%	Intl 4.50%	US Bonds 3.54%	Small Cap -11.01%	Commod. 7.69%	High Yield 7.11%	Cash 0.05%	Mid Cap -17.32%	TIPS 2.04%
Cash 4.44%	Mid Cap -41.46%	US Bonds 5.93%	TIPS 6.31%	Commod. -13.32%	US Bonds 4.21%	Emerging Markets -2.60%	Emerging Markets -2.18%	Intl -5.66%	US Bonds 2.65%	TIPS 3.01%	Commod. -11.25%	Global Bonds 6.84%	Cash 0.37%	US Bonds -1.54%	Large Cap -18.11%	US Bonds 1.87%
High Yield 1.87%	Intl -45.53%	Cash 0.16%	Global Bonds 5.54%	Intl -13.71%	Cash 0.08%	TIPS -8.61%	Intl -3.86%	Emerging Markets -14.90%	Global Bonds 2.09%	Commod. 1.70%	Intl -14.20%	Core Real Estate 4.41%	Core Real Estate 0.35%	Emerging Markets -2.54%	Emerging Markets -20.09%	Cash 1.02%
Small Cap -1.57%	Emerging Markets -53.33%	Core Real Estate -30.40%	Cash 0.15%	Emerging Markets -18.42%	Commod. -1.06%	Commod. -9.52%	Commod. -17.00%	Commod. -24.60%	Cash 0.25%	Cash 0.71%	Emerging Markets -14.58%	Cash 2.30%	Commod. -3.12%	Global Bonds -4.71%	Small Cap -20.44%	Core Real Estate -5.13%

Global Balanced is composed of 60% MSCI World Stock Index, 35% BBgBarc Global Aggregate Bond Index, and 5% US 90-Day T-Bills.

Source: Morningstar; Core Real Estate Source: NCREIF