

Citi Global Wealth Investments

Global Strategy | Quadrant

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Rate Hikes+Energy Crisis = Extreme USD

We continue to look for a stall or recession for the world economy in 2023 as the usual lags between tighter monetary policy and economic weakening unfold. Our asset allocation remains unchanged with global equities 2% underweight and fixed income 1% overweight (gold and cash are the balance). Beneath these global aggregates, our asset allocation remains tilted toward defensive, higher-quality income generation with an overweight to US dollar assets.

While the Fed continues to tighten rapidly, future restraints on growth continue to accumulate. We believe investors should be patient to see this impact unfold before discounting either a swift economic recovery or a long-lasting (and debilitating) rise in inflation.

Severe declines in US home sales and surging goods inventories in recent months point to declines in production, trade and related employment in 2023. Virtually none of this economic decline has already unfolded in corporate profit measures or labor income.

As usual, markets in 2022 are leading economic developments. While we would expect corporate profits to grow and post a record high in 2022, we expect profits to decline about 10% in 2023. **Looking ahead, we would expect financial markets to bottom sometime in 2023, well before economic growth and profits show improvement.**

Despite forward looking markets, we still believe the June/August equity rally was premature. An inverted US Treasury yield curve has signaled recession ahead with a variable lag averaging 10 months since 1960. **Average US equity returns have been positive from the time the yield curve inverts and before recession ensues.** The S&P 500 has rallied as much as 23% before losses are typically suffered during half of a pending recession period. This observation seems important now as a strong bearish consensus emerges, expressed through historically high levels of equity and bond short positions. These can drive strong counter-trend rallies that aren't indicative of a new economic cycle.

Among the strongest consensus trades, the US dollar has had a one-sided rally in 2022 to date. The Fed has led other developed market central banks in tightening more abruptly in the year so far. Energy importers among developed market economies in Europe and Japan have also suffered a severe terms-of-trade shock as Russian gas imports have been cut off. Most emerging markets have been comparatively insulated with early rate hikes and strong commodity trade balances.

Europe's energy supply crisis may lead to a long-lasting drop in competitiveness. At the same time, natural gas prices tend to overshoot, with winter demand being highly unpredictable. While too soon to tell, it is possible that peak energy costs will be reached in the 2022/2023 winter with potentially excessive declines in European assets (which we currently underweight). If this results in a strong overshoot for the US dollar, conditions may be ripe for a reversal in 2023. This could impact our US-dollar-centric tactical asset allocation in the coming year.

In short, we believe wide, volatile ranges should be expected in the months to come given the scope of macroeconomic shocks and central bank policy tightening steps. Even after substantial global equity declines, we believe investors should tactically focus on the most reliable sources of return: sustainable dividend payouts and bond coupon income from the strongest investment grade issuers and governments. Evolving economic conditions and macro policies will alter this risk calculus in time.

The Global Investment Committee left its asset allocation unchanged today with equities underweight by 2% and fixed income 1% overweight. Gold remains 2% overweight, with cash at 1% underweight.

Beneath these global aggregates, our asset allocation remains tilted toward defensive higher-quality income generation. In global equities we overweight the most consistent US dividend growers by 3%. We also overweight global pharmaceuticals by 2%. We remain underweight cyclical regions across Europe, Japan and smaller company shares globally. In fixed income, our US investment grade bond overweight is about +12%, offsetting large underweights in Europe and Japan.

We continue to anticipate a central bank-led global stall or recession in 2023 followed by recovery in 2024. As was the case in 2022, markets are leading economic developments. While we would expect corporate profits to grow and post a record high in 2022, we expect profits to decline about 10% in 2023. Looking ahead, we would expect financial markets to bottom within 2023 before economic growth and profits show improvement.

US dollar strength against foreign currencies this year has augmented our equity performance directly, and played some indirect role in currency-hedged fixed income allocations. For example, we underweight Japanese equities, and the yen's 20% decline this year has meant a far worse decline in US dollars (please [see our latest CIO bulletin for discussion](#)). In fixed income, we generally take advantage of higher US dollar yield premia compared to other developed markets given the Federal Reserve's more advanced stage of policy tightening. This has meant a higher US dollar portfolio allocation for some non-US investors.

Looking ahead, US dollar strength may continue even as the accumulated impact of Fed tightening slows the economy. This is in line with past cycles when the dollar has risen even after fundamental performance drivers no longer improve. However, the extreme strengthening of the USD seems likely to reach a peak within the coming year. This will alter the investment landscape in many ways and suggests a period ahead in which our positive US bias may shift.

We expect the Fed will substantially conclude rate hikes this year, ending with a peak policy rate close to 4%. While we expect net US job declines of 1-2 million on sharply slower growth in 2023, a drop in US employment is not likely before year-end. Long-term bond yields have climbed in a “bear flattening” of late, but have not eclipsed levels reached in June. We see further room for yield curve flattening to continue toward 3% at the end of 2022 and 2.5% at the end of 2023.

Severe commodity and currency movements related to the war in Ukraine imply a harsh outlook for European energy importers and others around the world. The seasonal swings in energy demand and uncertain weather make the peak impact hard to predict. At the same time, spiking energy costs have already strongly influenced exchange rates and economically sensitive asset prices. As 2023 approaches, the Global Investment Committee will keenly observe if market dislocations present opportunities. However, our current asset allocation continues to seek to avoid such risks.

Higher real interest rates in the near term – and slowing economies in the future – present downside risks to commodity prices. This is even as supplies from Eastern Europe remain disrupted and could remain curtailed well beyond the year to come. Demand growth remains powerful for liquified natural gas (LNG) given a severe EU reduction of trade with Russia. Other fossil fuels will play a potent role in creating redundant energy supplies globally. We continue to believe the secular outlook is strong for commodities needed for transitioning to lower-carbon energy, such as EV metals. With this said, last month, we chose to eliminate a specific thematic overweight to these equities given our overall economic outlook and investment positioning. With that in mind, higher real interest rates and a stronger dollar in the near term will also pressure the price of gold. While gold might be a source of funds to add additional exposure to short-duration investment grade bonds (an asset we increased last month), we continue to value gold as a potential portfolio risk hedge given conditions we expect in the future.

In addition to substantial declines in value for bonds and equities, all asset markets have seen significantly elevated volatility this year. These moves included strong gains, such as the 18% rally in US equities from mid-June to mid-August. **We believe wide, volatile ranges should be expected in the months to come given the scope of macroeconomic shocks and policy tightening steps globally.** While our tactical asset allocation may not capture these rapid gains and losses, we believe it will adjust appropriately for the larger economic cycle. As such, even after substantial global equity declines, we believe investors should tactically focus on the most reliable sources of return: sustainable dividend payouts and bond coupon income from the strongest investment grade issuers and governments. Evolving economic conditions and macro policies will alter this risk calculus in time.

ASSET CLASSES | Global USD with Alternatives Level 3**FIXED INCOME**

Asset Class	2017	2018	2019	2020	2021	2022
Developed Sovereign						
Developed Investment Grade Corporates						
High Yield						
Emerging Market Sovereigns						

EQUITIES

Asset Class	Weight	Allocation
Developed Equities	55.0%	55.0%
Large Cap	35.0%	35.0%
US	20.0%	20.0%
Europe	15.0%	15.0%
Asia ex-Japan	0.0%	0.0%
Japan	0.0%	0.0%
Small and Mid Cap	20.0%	20.0%
US SMID Cap	15.0%	15.0%
Non-US SMID Cap	5.0%	5.0%
Emerging Market Equity	10.0%	10.0%
Thematic Equity*	5.0%	5.0%

CASH

COMMODITIES

*Thematic equities include, Cyber security, Fintech, Pharmaceuticals, Global Natural Resources and US Oilfield Services.

Please refer to the [Portfolio Allocations](#) for a comprehensive breakdown of the portfolios at each risk level.

-2 = very underweight | -1 = underweight | 0 = neutral |

1 = overweight | 2 = very overweight

Arrows indicate changes from previous GLC meeting

Time for Patience, Not Complacency

Why do we say today's data can mislead us over where the economy is headed?

Consider the example from the construction sector.

It takes 6-12 months to build a home to completion, but less than a day to cancel a sale.

Residential construction spending in the US has fallen about 2% thus far. The pace of new home sales has fallen 51%.

In last month's [Quadrant](#) we grasped for metaphors to describe the realities of the *time factor* in generating economic turning points: "Ships don't cross oceans as fast as investors can buy and sell securities." Perhaps more concretely, a home can't be built as fast as a property purchase can be cancelled (see figure 1).

Many observers couldn't grasp why global markets bottomed during the most severe quarter of global economic contraction on record in the second quarter 2020. Similarly, they saw no reason to relax their pessimism and reallocate to equities early in 2009 during what was still a historically severe contraction, missing the recovery ahead.

Financial asset values depend on future, not past cash flows. Therefore, investors must act to anticipate them. Economic recovery, when in sight, *need not already occur* for economically-sensitive assets to recover. Recessions need not already begin for investors to brace for them (see figure 2).

A drop in market prices alone is not sufficient for *immediate* recovery. If asset prices have over-reacted to economic challenges, they may offer good future returns. But one should not necessarily expect to realize these returns as fast as losses were generated when "ships are still out in the water." Turning back to the construction metaphor, "it takes longer to construct than to demolish."

Figure 1: New Home Sales Contract Signings off 51% vs New Homes Under Construction -0.1% to-date

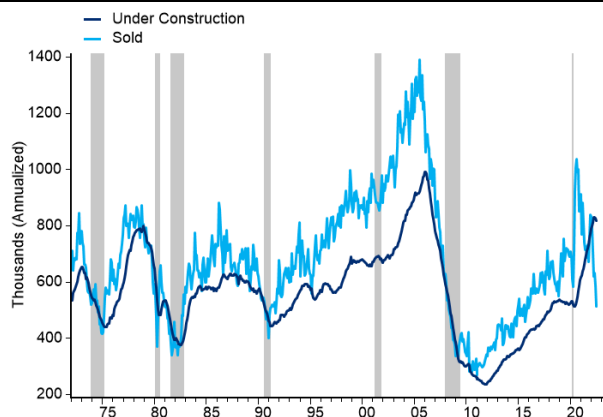


Figure 2: S&P 500 (Leading 6 months) vs EPS Y/Y%



Source: Haver FactSet and Bloomberg through September 13, 2022. Note: Shaded regions are recessions. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

The yield curve, the most reliable long-term leading indicator, points to a US recession in 2023.

US equity market returns have averaged +3% during periods when the yield curve has inverted but recession has not yet begun.

We see the potential for powerful trading rallies such as June/August, but this does not yet signal a new recovery cycle.

As figures 3-4 show, equity market declines of 20% or more (“bear markets”) associated with recessions last longer than those that occur for other (usually less consequential) reasons. But what about the periods *before* recessions occur?

The US yield curve has been the single most reliable long-term leading indicator of US economic contractions during the last 60 years. In the present case, its inversion reflects the deliberate desire of the Fed to constrain the economy (see figure 4). Yet what does this mean for the economy over the remainder of 2022? We see little more than a mild deceleration of coincident indicators such as employment (see figure 5).

During the average 10-month period when the US yield curve has inverted and the economy has *yet* to contract, US equity returns have averaged a positive 3% with rallies as large as 23% (see figure 7). However, during the subsequent six months of recession, average returns showed declines.

We emphasize this statistic after a 19% rally in US equities over the two months ending in mid-August which we believe prematurely discounted a stronger economic outlook than is ahead in the first half 2023. As discussed below, strong bearish positioning by investors – with the potential for significant short-covering rallies - may provide misleading views over the scope and duration of present challenges.

Figure 3: S&P 500 Bear Markets Associated With US Recession

Peak Date	Trough Date	Peak Price	Trough Price	Percent Loss	Number of Days**
5/29/1946	10/9/1946	19.3	14.1	-26.6	133
6/15/1948	6/13/1949	17.1	13.6	-20.6	363
7/15/1957	10/22/1957	49.1	39.0	-20.7	99
12/12/1961	6/26/1962	72.6	52.3	-28.0	196
11/29/1968	5/26/1970	108.4	69.3	-36.1	543
11/11/1973	10/3/1974	120.2	62.3	-48.2	630
11/28/1980	8/12/1982	140.5	102.4	-27.1	622
3/24/2000	10/9/2002	1527.5	776.8	-49.1	929
10/9/2007	3/9/2009	1565.2	676.5	-56.8	517
2/19/2020	3/23/2020	3386.2	2237.4	-33.9	33
Mean				-34.7	407
Median				-33.9	440

Figure 4: S&P 500 Bear Markets Not Associated With US Recession

Peak Date	Trough Date	Peak Price	Trough Price	Percent Loss	Number of Days**
2/9/1966	10/7/1966	94.1	73.2	-22.2	240
8/25/1987	12/4/1987	336.8	223.9	-33.5	101
1/3/2022	6/16/2022 (?)	4796.6	3666.8	-23.6	164
Mean				-23.6	168
Median				-23.6	164

Source: FactSet and Bloomberg through September 13, 2022. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

**Note, the number of days includes weekends and holidays

Figure 5: US Treasury Yield Curve (10-Year Less 1-Year Bill)

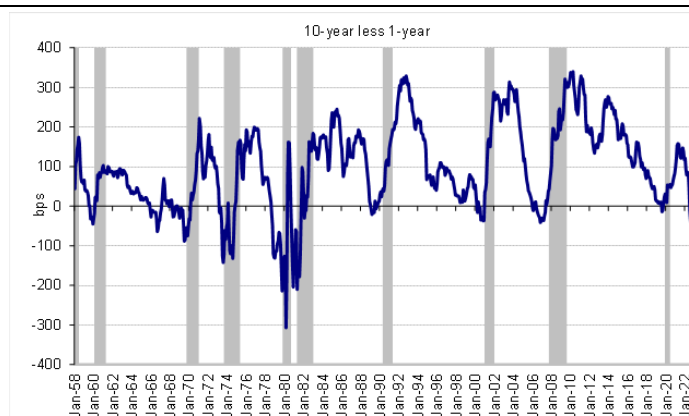
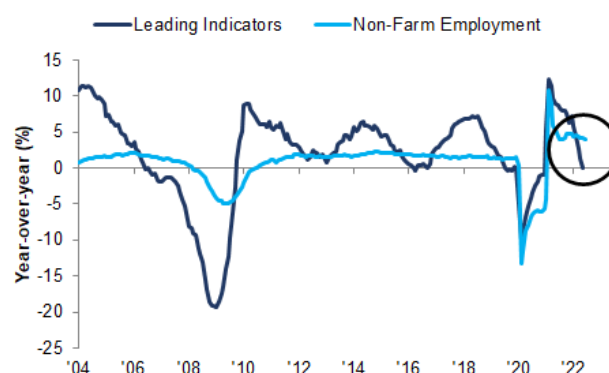


Figure 6: US Index of Leading Economic Indicators vs Employment Y/Y%



Source: Haver, FactSet and Bloomberg through September 13, 2022. Note: Shaded regions are recessions. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

Figure 7: S&P 500 Returns When the Yield Curve Inverts: Pre- and Post-Recession

Start of Inversion	End of Inversion or Prior to Recession Beginning	S&P 500		
		Performance During Period	Performance 6 mths After End of Inversion or Prior to Recession Beginning	Performance 12 mths After End of Inversion or Prior to Recession Beginning
Sep-59	Feb-60	-5.84%	1.50%	13.04%
Dec-65	Feb-67	-5.27%	7.91%	2.97%
Apr-68	Nov-69*	4.00%	-18.40%	-7.05%
Mar-73	Oct-73*	-3.04%	-16.60%	-31.76%
Sep-78	Dec-79*	4.50%	5.84%	25.77%
Sep-80	Jun-81*	7.22%	-6.60%	-16.46%
Feb-89	Sep-89	17.37%	-2.64%	-12.34%
Apr-00	Dec-00	-11.90%	-7.26%	-13.04%
Jan-06	May-07	22.62%	-3.23%	-8.51%
Aug-19	Sep-19	-0.12%	-13.17%	12.98%
Avg		2.95%	-5.27%	-3.44%
Median		1.94%	-4.92%	-7.78%

*Denotes inversion continued but recession began the following month

Source: Haver Analytics as of September 8, 2022. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

We would expect financial markets to bottom within 2023 before economic growth and profits show improvement.

For the time being, we believe investors should tactically focus on sustainable dividend payouts and bond coupon income from the strongest investment grade issuers.

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Chief Economist
Malcolm Spittler
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Central banks are tightening policies competitively at a time of a severe regional energy shock.

This difficult period for the economy ahead will not last a lifetime. As we discussed in our [Mid-Year Outlook](#), cyclical movements in asset prices very rarely influence the longer-term destination of the economy. As an example, the crash in technology shares in 2000-2002 meant little for the technology-driven economy of the generation that followed. From the low point in valuation, returns were *greatly augmented*.

Looking ahead, we would expect financial markets to bottom within 2023 before economic growth and profits show improvement. However, for the time being, even after substantial global equity declines, we believe investors should tactically focus on the most reliable sources of return: sustainable dividend payouts and bond coupon income from the strongest investment grade issuers and governments. Evolving economic conditions and macro policies will alter this risk calculus in time.

Prepare for World of Extremes, Rapid Change

Wars are inherently unpredictable. Sadly, they remind us that we must live with a variety of uncertain and unforecastable outcomes in designing and holding portfolios. This is because of consequences that reach well beyond the tragic loss of life.

Will Western Europe have Russian natural gas supplies again at any level? When might that be, if ever? There are many different possible scenarios for EU economies and ripples across the world at large (for close neighbors such as the UK most clearly).

What is the long-term impact on competitiveness for European industry? What positives does the conflict mean for alternative supplies from LNG to wind and solar? Where does this leave the economies least impacted, or able to access Russian oil at cheaper prices? Answers to these questions will evolve in time and won't be static.

Market participants are attempting to sort this all out in foreign exchange markets most clearly, with commodities developments and security issues driving a sharp revaluation of currencies (see figures 8-9). Complicating the matter, central banks are

competitively raising interest rates to combat inflation. Economies experiencing these shocks will have differing pain thresholds, and central banks have not synchronized their policies.

Figure 8: Plunging Euro
Euro Area Terms of Trade (Export Prices Relative to Import Prices) and Euro vs USD

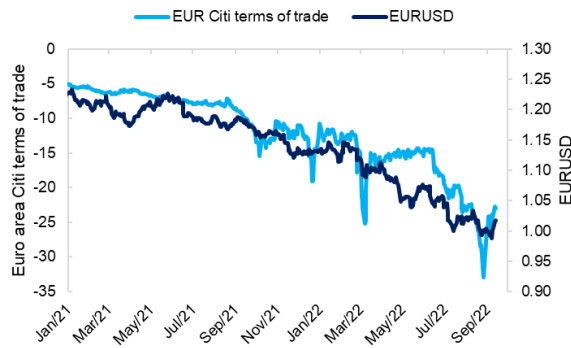
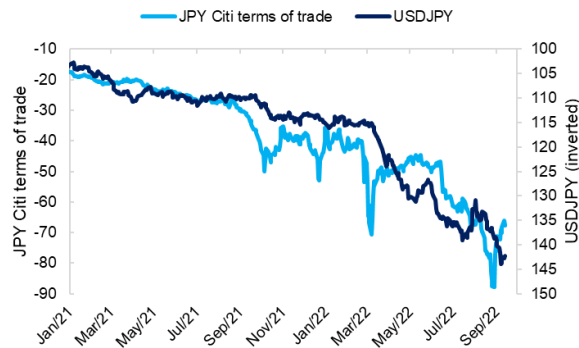


Figure 9: Plunging Yen
Japan Terms of Trade (Export Prices Relative to Import Prices) and JPY vs USD



Source: FactSet and Bloomberg through September 8, 2022. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

Still regionally determined, natural gas costs have had a profound impact on exchange rates already.

While we are cautious, this coming winter may determine if the reaction has been excessive and if the US dollar is overshooting vs Europe and Japan.

In the UK, new Prime Minister Liz Truss announced that the government would cap household energy bills at £2500 for two years with “equivalent” support for firms over the coming six months. Details of the plan remain sketchy, but it is assumed that the UK government will borrow money to subsidize utilities to provide energy at the lower cost to consumers - at whatever the cost. A ballpark figure may be £100billion. This cap acts like a price control. Unlike Germany, which is enforcing conservation, it is not a demand control.

Most importantly, it is not a supply control. Historical energy shocks such as the OPEC embargo of 1974 did not simply set a higher price, but limited energy supplies to levels that constrained economic activity. This caused a macro-level contraction among most oil importing economies. The Fukushima nuclear disaster in 2011 played out in a similar way locally in the Japanese economy.

The war in Ukraine almost certainly means a lengthy redirection of Russian energy supplies to Asian economies from Europe and probably some absolute loss or Russian gas output for a period of time. With prices evolving quickly (see figure 10), energy intensive industrial activity in Europe’s most costly regions will shutter and relocate to less costly regions. Energy supplies such as LNG, solar and wind power will expand to limit the damage (see figure 11). However, they cannot be built up as quickly as the valves on existing pipelines can be switched on and off.

**Figure 10: Extreme Local Cost Divergence
US Natural Gas Price vs German**

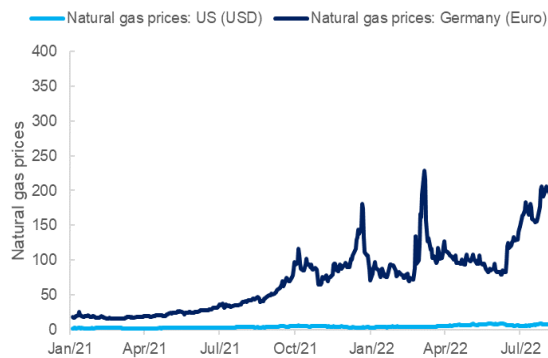
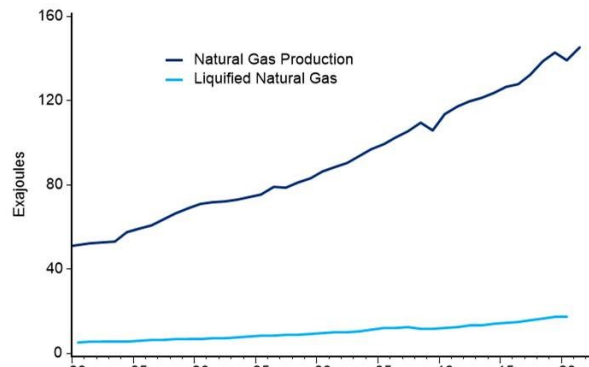


Figure 11: Global Liquefied Natural Gas vs Piped Gas Output



Source: Haver and Bloomberg through September 8, 2022.

The Larger Context for the Dual Energy/Rate Shock

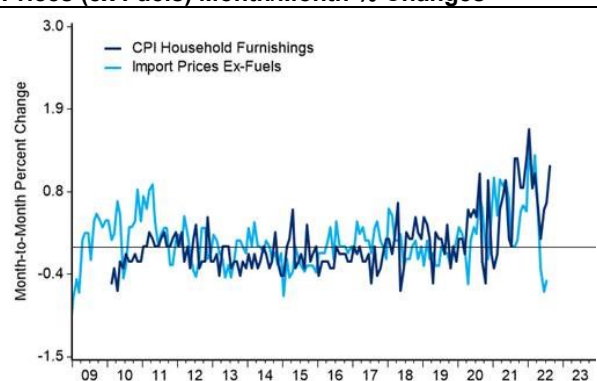
In the US and China, overall energy costs are now falling from early year peaks (see figure 12). This was not large enough to overwhelm ongoing upward pressure in shelter costs and strange spike in housing merchandise costs despite deflating import prices and weakening sales (see figure 13). With a 6.3% rise in the core US CPI over the past year – barely before the peak reached in the first quarter, markets are pricing in ever more aggressive action from the Federal Reserve, which could take short-term interest rates to 4% by year end (see figure 14).

Services prices - a component of the Index of Lagging Economic Indicators - continue to rise as expected. However, a very sharp and rapid rise in mortgage rates this year – coupled with 30% decline in home sales since the end of 2020 – appears set to sink home values in 2023 (see figure 15). Given the usual lag time it takes for a housing recession to impact shelter costs in the CPI, we expect this to lower US inflation measures sharply by mid-2023 into 2024.

Figure 12: Energy Contribution to headline US CPI



Figure 13: CPI for Household Furnishings vs Import Prices (ex Fuels) Month/Month % Changes



Source: Haver Analytics as of September 14, 2022. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

Figure 14: Fed Funds rate and Futures Price Level Pre- and Post August CPI

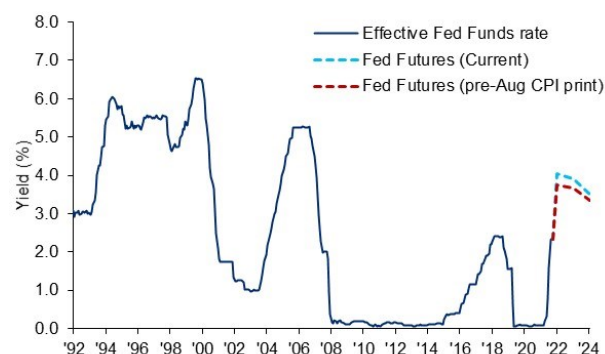
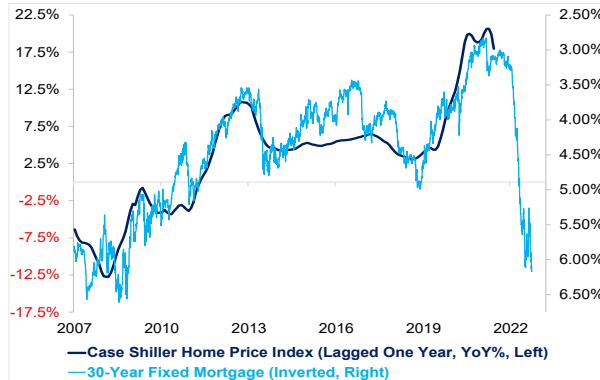


Figure 15: US Mortgage Rate (leading on year) vs Case-Shiller Housing Price Index Y/Y%



Source: Haver Analytics as of September 8, 2022. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

It did not take a very large interest rate advantage to set the US dollar skyrocketing in the early/mid 1980s

US employment is still growing faster than the working-age population. The Fed wants this to stop. As such, Fed Chairman Powell has signaled a willingness to raise rates 75 basis points for a record third consecutive time later this month. We see this somewhat akin to dosing a patient multiple times before the effects of the drug can even be felt. The one thing that appears increasingly likely from this “race to tighten fast” is that the Fed could reach its policy rate peak in 2022, perhaps with a rate of 4%.

Powell is not alone. The European Central Bank – which kept its key policy rate *negative* since 2014 – joined the “75 club” this month with others such as the Bank of Canada also following the Fed’s lead in tightening in very large steps.

Unfortunately for weaker economies and weaker currency zones such as the EU, the rate hikes might not stem capital outflows. Rate hikes simply can’t substitute for energy supplies.

Back to the 80s

Despite very different circumstances that we described in our [August 27th CIO Bulletin](#), the extremes of the early 1980s exchange rate environment *might* prove to be a useful analogy for currencies in the period ahead. Over a three-year period ending in mid-1983, the US inflation rate plunged 12 percentage points and real long-term interest rates rose 13%. Inflation in emerging markets didn’t collapse similarly. This set the stage for the largest historical bull market for the US dollar in history, peaking in 1985 and currency crises in Latin America (see figures 16-17). Interestingly, real interest rates and inflation followed the same path in the UK as in the US, yet the Pound also fell to a record nominal low of 1.05 to the US dollar by early 1985 as well. This culminated in the historic “Plaza accord” in which European governments and Japan agreed to strengthen their currencies.

Figure 16: US CPI vs Non-US CPI

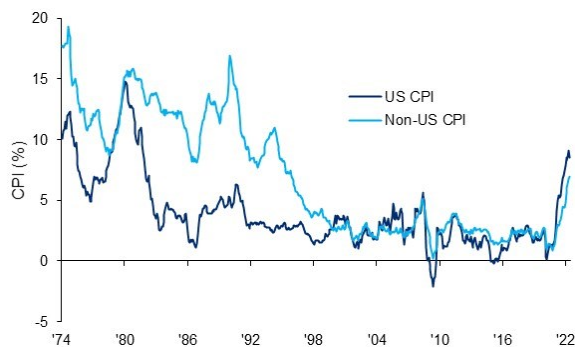


Figure 17: US Real Rate and Exchange Rates



Source: Haver Analytics as of September 8, 2022. Note: Shaded areas are recessions. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

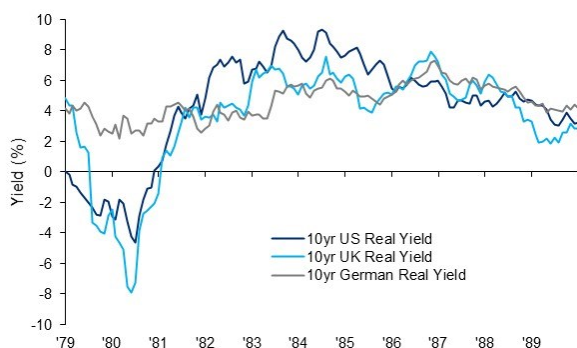
What interests us here in the comparisons to this extreme period are three things:

- 1) It only took modest positive real US yield premiums over other currency zones to generate extreme US dollar strength in the early 1980s (see figure 18).
- 2) In both the 1980s and early 2000s, the US dollar **continued to appreciate** even after the fundamental causes of the dollar surge had long ended. This historic observation may encourage some to press on with trend-following strategies that boost the US dollar.

In certain cases, regional currencies will simply not catch up to US yields. This means the US dollar provides “positive carry” for those who are short currencies. Most acutely, the Bank of Japan appears to be unwilling to raise interest rates as long as its current Governor remains until the spring of 2023. This assumption could be very risky if it proves incorrect or too many speculators cover short positions in the yen at the same time.

- 3) EM currencies weakened sharply in the 1980s and 1990s as the US tightened monetary policy. This was a result of higher inflation, weak local yields and in some cases, very vulnerable pegged currencies with insufficient resources to defend the pegs. In the present case, much of the EM currency world is benefiting from high commodity prices, pro-active central banks and market exchange rates. It is the DM currencies such as the Euro, Pound and Yen that appear vulnerable to a “terms of trade shock” and are devaluing in the face of a hawkish Fed.

Figure 18: 10yr Real Yields Across Key Developed Market Countries in 1980s



Source: Haver Analytics as of September 8, 2022.

Be Careful When it All Seems Obvious

We would be careful not to extrapolate some market extremes too far into the future.

A strong US dollar, a Hawkish Fed, a slowing world economic outlook, and acute European misery are all consensus expectations. Short positions in currencies have risen toward record highs favoring the dollar. Speculators and hedgers are also significantly short in US equity and US bond futures (see figures 19-21). Assets around the rest of the world are gripped with bearish expectations in areas we can't measure as directly. As we discussed in our forecast update ([August Quadrant](#)) this does not materially diminish the forthcoming economic impact of rapid central bank tightening steps. It does, however, lead to volatile markets with very strong short-covering rallies. Counter-trend rallies in currencies and equities could easily be large and convince some investors that the economic outlook has changed even when such an assumption is premature.

Figure 19: USD Net Long Speculative Futures Position and USD Index

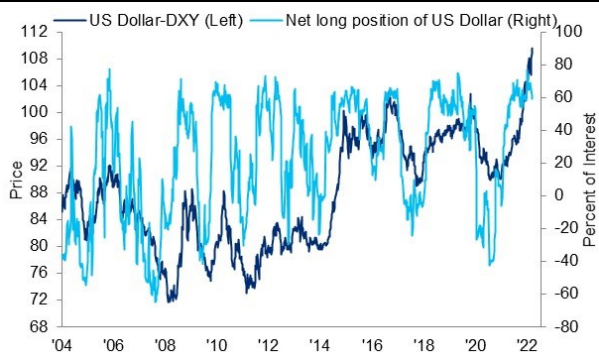
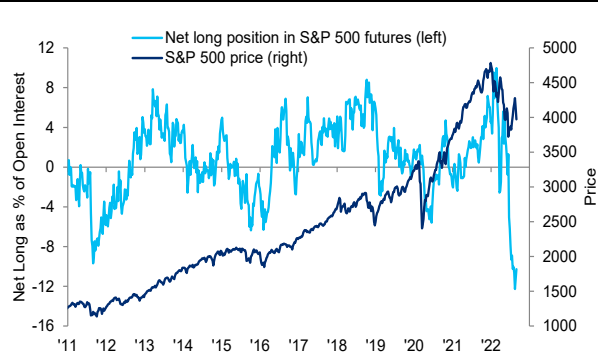
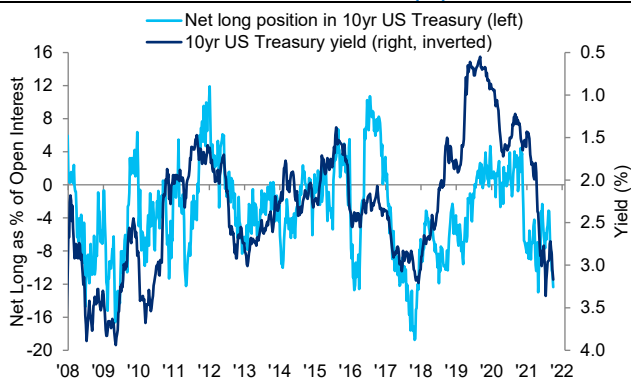


Figure 20: US Equity Futures Net Short Position vs S&P 500



Source: Haver Analytics as of September 8, 2022. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

Figure 21: US 10-Year Treasury Futures Net Short Position vs Yield (%)



Source: Haver Analytics as of September 8, 2022.

As one catalyst for a change of view, consider that natural gas has a history of extremely “reactive” pricing. Bidders for limited supplies often cause price spikes that jump far beyond the more lasting and routine price. In the US, which has not seen the historic price surge of Europe, natural gas price volatility is 156% that of crude oil (see figures 22-23). Natural gas has been such an unusually large driver of currencies. Yet a factor as unpredictable as coming winter temperatures could be the driver of extreme moves in currencies and broader asset markets.

Figure 22: US Natural Gas Price Benchmark: US\$ per million BTU

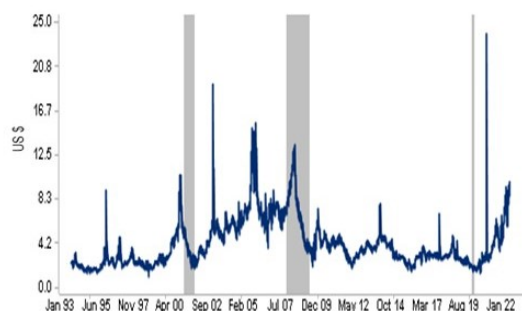
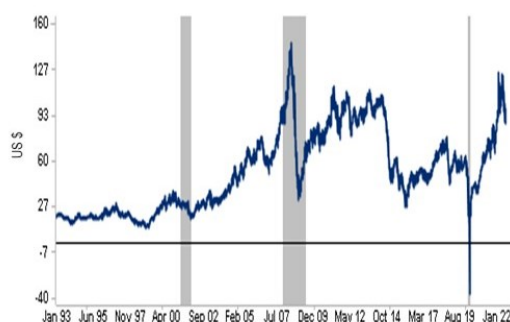


Figure 23: US WTI Crude Oil: \$ per Barrel



Source: Haver Analytics as of September 8, 2022. Note: Shaded areas are recessions.

Our USD-positive tactical investment strategy might need to shift in the coming year.

Conclusion: Time for Patience, Not Complacency

As we described in our latest [August Quadrant](#), we remain effectively overweight US dollar assets. While we are slightly underweight global equities and overweight global bonds, we have far higher weightings in US assets than non-US assets. This has benefited our portfolios as the US dollar returns of equity markets such as Japan (where we are underweight), have been dramatically worse measured in dollars than yen (see figure 24). For many non-US investors, unhedged US dollar bond holdings have added value simply through currency appreciation.

All of this creates the potential for change in the coming year. For now, our allocations continue to be cautiously aligned to earn US dollar income from the investment grade company bonds and equity dividends. As conditions evolve in 2023, these positions are unlikely to remain static. Foreign exchange considerations - which have helped our current allocations - need to be evaluated as the US dollar overshoots.

Figure 24: Year to Date (YTD) Returns across countries in local and USD dollars

Country / Region	YTD Return (local ccy)	YTD Return (USD)	YTD FX Return
Brazil	8.0	14.9	6.9
US	-17.1	-17.1	0.0
Canada	-8.7	-12.1	-3.4
Switzerland	-15.0	-21.1	-6.1
India	2.8	-4.2	-6.9
China (A shares)	-16.3	-23.5	-7.2
Australia	-1.5	-8.8	-7.3
Taiwan	-18.0	-26.2	-8.2
Korea	-20.4	-31.3	-10.9
Europe	-11.5	-23.0	-11.5
UK	4.1	-11.3	-15.4
Japan	-2.8	-21.7	-18.9

Source: Factset as of September 8, 2022. Note: MSCI country indices are used above. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. Past performance is no guarantee of future results. Real results may vary.

Portfolio allocations

This section shows the strategic and tactical asset allocations. The Quant Research & Global Asset Allocation (QRGAA) team creates strategic asset allocations (SAAs) using the [CPB Adaptive Valuations Strategy](#) (AVS) methodology on an annual basis. Global Investment Committee (GIC) provides underweight and overweight decisions to AVS's Global USD without Hedge Funds Risk Level 1 through Level 5 portfolios. QRGAA then creates tactical allocations for all other profiles or subprofiles such as Global USD with Hedge Funds and Illiquids PE & RE Level 2 through Level 5 portfolios. These sample portfolios included below reflect 2022 SAAs and the tactical over/under weights expressed at the September 14, 2022 GIC meeting.

Global USD with Hedge Funds and 15% Illiquids (PE & RE): Risk Level 2

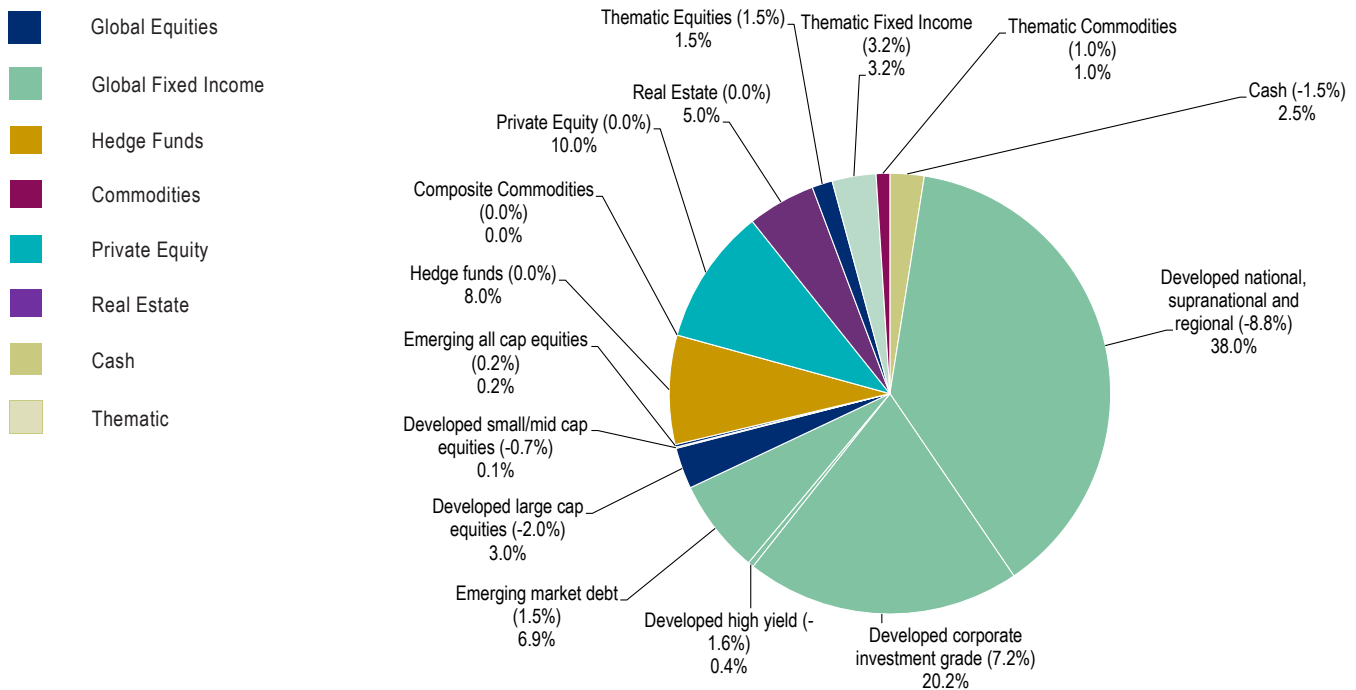
Risk Level 2 is designed for investors who emphasize capital preservation over return on investment, but who are willing to subject some portion of their principal to increased risk in order to generate a potentially greater rate of return on investment.

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	4.0	2.5	-1.5
Fixed Income	67.1	68.7	1.5
Developed Investment Grade	59.8	58.2	-1.6
US	34.2	43.5	9.2
Government	14.8	15.7	0.9
Inflation-Linked	2.1	2.3	0.2
Short	3.9	2.4	-1.6
Intermediate	6.1	6.3	0.2
Long	2.6	4.7	2.1
Securitized	10.9	12.0	1.2
Credit	8.6	15.8	7.2
Short	1.2	2.4	1.3
Intermediate	4.5	10.4	5.9
Long	2.9	2.9	0.0
Europe	19.5	12.3	-7.3
Government	15.2	7.9	-7.3
Credit	4.4	4.4	0.0
Australia	0.4	0.4	0.0
Government	0.4	0.4	0.0
Japan	5.6	2.1	-3.5
Government	5.6	2.1	-3.5
Developed High Yield	2.0	0.4	-1.6
US	1.5	0.4	-1.1
Europe	0.5	0.0	-0.5
Emerging Market Debt	5.4	6.9	1.5
Asia	0.9	2.0	1.1
Local currency	0.5	1.0	0.6
Foreign currency	0.5	1.0	0.5
EMEA	2.8	2.8	-0.0
Local currency	1.4	1.4	-0.0
Foreign currency	1.4	1.4	-0.0
LatAm	1.7	2.1	0.4
Local currency	0.8	0.8	-0.0
Foreign currency	0.8	1.3	0.4
Thematic Fixed Income	0.0	3.2	3.2
US Bank Loans	0.0	1.2	1.2
Preferreds	0.0	2.0	2.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	5.9	4.8	-1.0
Developed Equities	5.9	3.1	-2.7
Developed Large Cap Equities	5.1	3.0	-2.0
US	3.5	2.2	-1.3
Canada	0.2	0.1	-0.1
UK	0.2	0.1	-0.1
Switzerland	0.1	0.1	-0.1
Europe ex UK ex Switzerland	0.5	0.2	-0.3
Asia ex Japan	0.2	0.1	-0.1
Japan	0.3	0.1	-0.2
Developed Small/Mid Cap Equities	0.8	0.1	-0.7
US	0.4	0.1	-0.4
Non-US	0.4	0.0	-0.3
Emerging All Cap Equities	0.0	0.2	0.2
Asia	0.0	0.2	0.2
China	0.0	0.1	0.1
Asia (ex China)	0.0	0.1	0.1
EMEA	0.0	0.0	0.0
LatAm	0.0	0.0	0.0
Brazil	0.0	0.0	0.0
LatAm ex Brazil	0.0	0.0	0.0
Thematic Equities	0.0	1.5	1.5
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	1.5	1.5
Cyber Security	0.0	0.0	0.0
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	1.0	1.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	1.0	1.0
Gold	0.0	1.0	1.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Hedge Funds	8.0	8.0	0.0
Private Equity	10.0	10.0	0.0
Real Estate	5.0	5.0	0.0
Total	100.0	100.0	0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD with Hedge Funds and 15% Illiquids (PE & RE): Risk Level 2 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an underweight position of -1.0%, global fixed income has an overweight of +1.5%, cash has an underweight of -1.5% with gold overweight at +1.0%.

Within equities, developed large cap equities are at an underweight position of -2.0% and small/mid cap equities are at an underweight position of -0.7%. Emerging market equities have a slight overweight of +0.2%. Thematic equities have an overweight of +1.5%.

Within fixed income, developed investment grade has an underweight position of -1.6%; developed high yield has an underweight position of -1.6% and emerging market debt has an overweight position of +1.5%. Thematic fixed income has an overweight of +3.2%.

Hedge Fund allocation in the tactical portfolio is 8%. Private Equity and Real Estate allocations are 10% and 5%, respectively. All these three asset classes positionings are neutral.

Global USD with Hedge Funds and 15% Illiquids (PE & RE): Risk Level 3

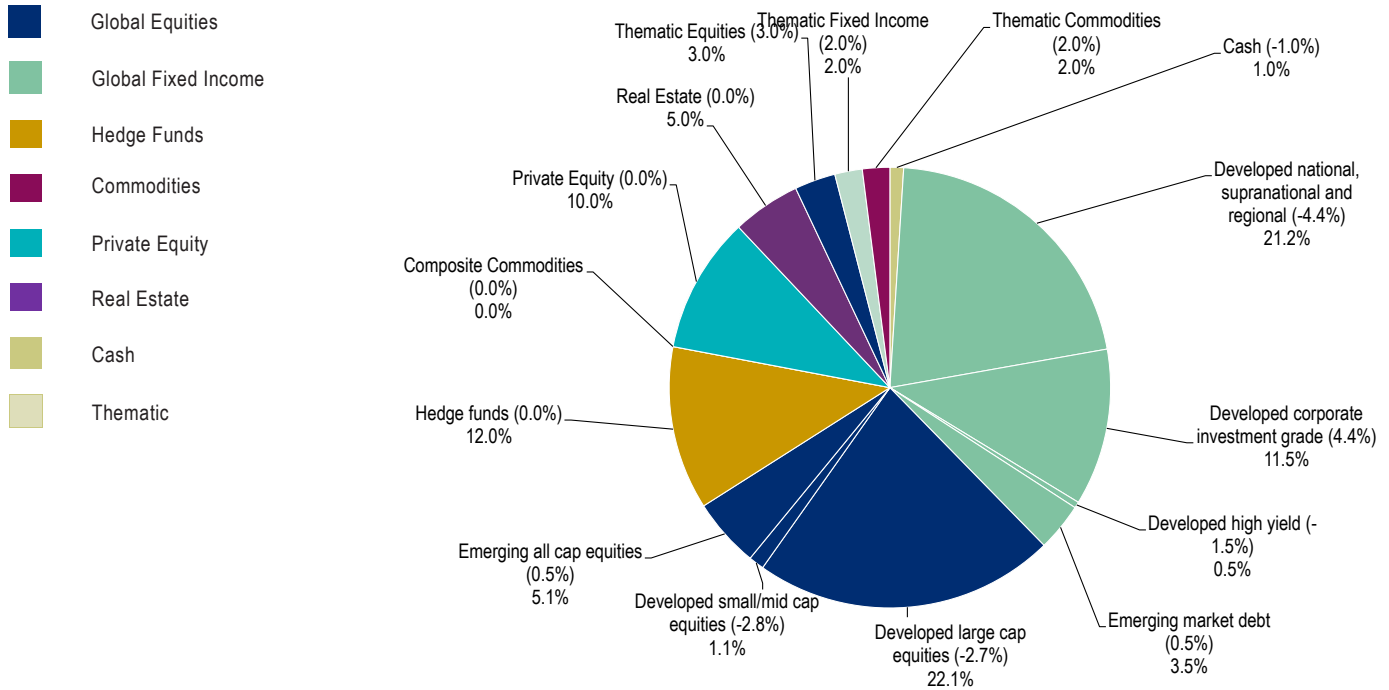
Risk Level 3 is designed for investors with a blended objective who require a mix of assets and seek a balance between investments that offer income and those positioned for a potentially higher return on investment. Risk Level 3 may be appropriate for investors willing to subject their portfolio to additional risk for potential growth in addition to a level of income reflective of his/her stated risk tolerance

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	2.0	1.0	-1.0
Fixed Income	37.7	38.7	1.0
Developed Investment Grade	32.7	32.7	0.0
US	18.7	28.7	9.9
Government	8.1	13.7	5.6
Inflation-Linked	1.1	2.2	1.0
Short	2.2	1.2	-0.9
Intermediate	3.3	6.8	3.5
Long	1.4	3.5	2.0
Securitized	5.9	5.6	-0.3
Credit	4.7	9.3	4.6
Short	0.6	1.7	1.0
Intermediate	2.5	6.1	3.6
Long	1.6	1.6	0.0
Europe	10.7	3.8	-6.9
Government	8.3	1.7	-6.6
Credit	2.4	2.2	-0.2
Australia	0.2	0.2	0.0
Government	0.2	0.2	0.0
Japan	3.1	0.0	-3.1
Government	3.1	0.0	-3.1
Developed High Yield	2.0	0.5	-1.5
US	1.5	0.5	-1.0
Europe	0.5	0.0	-0.5
Emerging Market Debt	3.0	3.5	0.5
Asia	0.5	1.0	0.5
Local currency	0.3	0.6	0.3
Foreign currency	0.3	0.5	0.2
EMEA	1.6	1.6	0.0
Local currency	0.8	0.8	0.0
Foreign currency	0.8	0.8	0.0
LatAm	0.9	0.9	0.0
Local currency	0.5	0.5	0.0
Foreign currency	0.5	0.5	0.0
Thematic Fixed Income	0.0	2.0	2.0
US Bank Loans	0.0	0.0	0.0
Preferreds	0.0	2.0	2.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	33.3	31.3	-2.0
Developed Equities	28.7	23.2	-5.5
Developed Large Cap Equities	24.7	22.1	-2.7
US	17.2	16.2	-1.0
Canada	0.9	0.8	-0.1
UK	1.0	1.0	-0.1
Switzerland	0.7	0.6	-0.1
Europe ex UK ex Switzerland	2.4	1.7	-0.7
Asia ex Japan	0.9	0.8	-0.1
Japan	1.7	1.1	-0.6
Developed Small/Mid Cap Equities	3.9	1.1	-2.8
US	2.2	0.8	-1.4
Non-US	1.7	0.4	-1.4
Emerging All Cap Equities	4.6	5.1	0.5
Asia	3.8	4.6	0.7
China	1.5	2.4	0.9
Asia (ex China)	2.3	2.1	-0.2
EMEA	0.4	0.2	-0.2
LatAm	0.3	0.3	-0.0
Brazil	0.2	0.2	-0.0
LatAm ex Brazil	0.1	0.1	-0.0
Thematic Equities	0.0	3.0	3.0
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	2.0	2.0
Cyber Security	0.0	1.0	1.0
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	2.0	2.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	2.0	2.0
Gold	0.0	2.0	2.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Hedge Funds	12.0	12.0	0.0
Private Equity	10.0	10.0	0.0
Real Estate	5.0	5.0	0.0
Total	100.0	100.0	0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD with Hedge Funds and 15% Illiquids (PE & RE): Risk Level 3 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an underweight position -2.0%, global fixed income has an overweight of +1.0%, cash has an underweight of -1.0% with gold overweight at +2.0%.

Within equities, developed large cap equities have an underweight position of -2.7% and developed small/mid cap equities have an underweight position of -2.8%. Emerging market equities have an overweight position of +0.5%. Thematic equities have an overweight position of +3.0%.

Within fixed income, developed investment grade debt has a neutral position; developed high yield has an underweight position of -1.5%; emerging market debt has an overweight position of +0.5%. Thematic fixed income has an overweight position of +2.0%.

Hedge Fund allocation in the tactical portfolio is 12%. Private Equity and Real Estate allocations are 10% and 5%, respectively. All these three asset classes positionings are neutral.

Global USD with Hedge Funds and 15% Illiquids (PE & RE): Risk Level 4

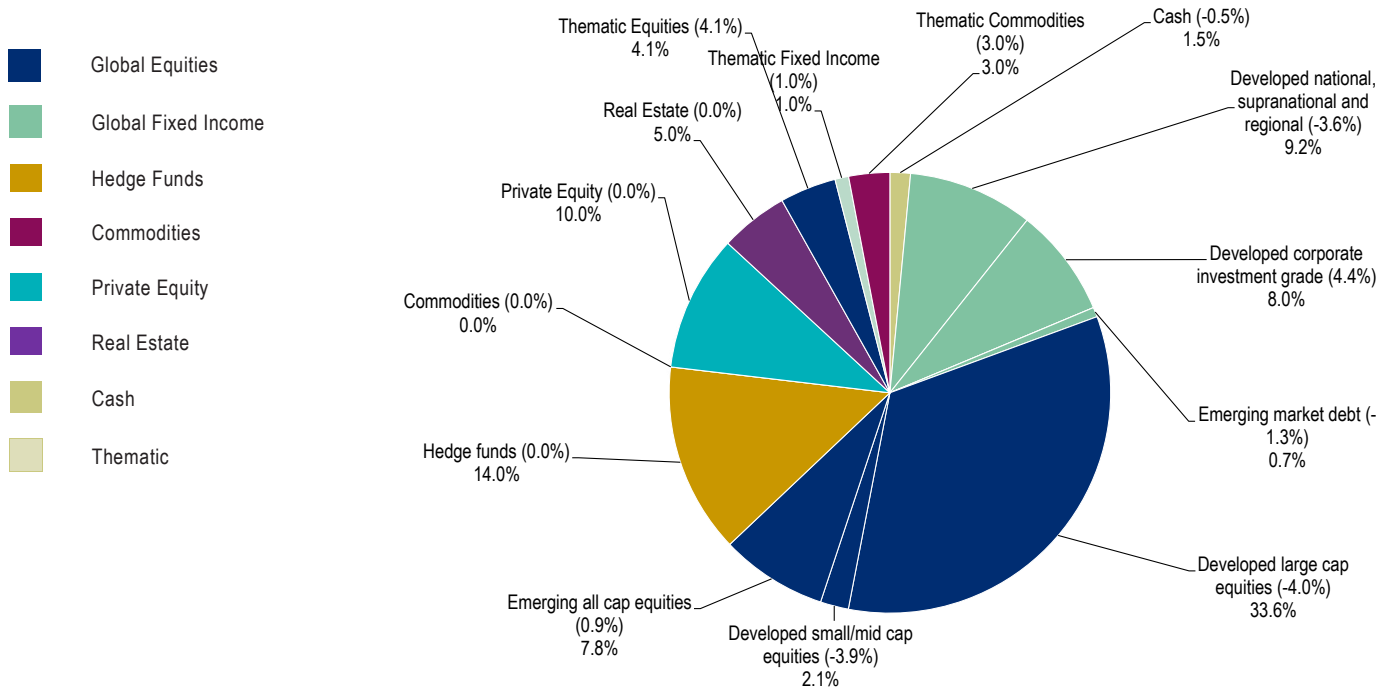
Risk Level 4 is designed for investors with a blended objective who require a mix of assets and seek a balance between investments that offer income and those positioned for a potentially higher return on investment. They are willing to subject a large portion of their portfolio to greater risk and market value fluctuations in anticipation of a potentially greater return on investment. Investors may have a preference for investments or trading strategies that may assume higher-than-normal market risks and/or potentially less liquidity with the goal (but not guarantee) of commensurate gains.

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	2.0	1.5	-0.5
Fixed Income	18.4	18.9	0.5
Developed Investment Grade	16.4	17.2	0.8
US	9.4	16.8	7.4
Government	4.0	8.6	4.6
Inflation-Linked	0.6	0.5	-0.0
Short	1.1	1.1	-0.0
Intermediate	1.7	4.3	2.6
Long	0.7	2.7	2.0
Securitized	3.0	0.4	-2.6
Credit	2.4	7.8	5.4
Short	0.3	2.0	1.7
Intermediate	1.2	5.5	4.2
Long	0.8	0.3	-0.5
Europe	5.4	0.4	-5.0
Government	4.2	0.2	-4.0
Credit	1.2	0.2	-1.0
Australia	0.1	0.0	-0.1
Government	0.1	0.0	-0.1
Japan	1.5	0.0	-1.5
Government	1.5	0.0	-1.5
Developed High Yield	0.0	0.0	0.0
US	0.0	0.0	0.0
Europe	0.0	0.0	0.0
Emerging Market Debt	2.0	0.7	-1.3
Asia	0.3	0.4	0.1
Local currency	0.2	0.2	0.1
Foreign currency	0.2	0.2	0.0
EMEA	1.0	0.0	-1.0
Local currency	0.5	0.0	-0.5
Foreign currency	0.5	0.0	-0.5
LatAm	0.6	0.3	-0.3
Local currency	0.3	0.0	-0.3
Foreign currency	0.3	0.3	-0.1
Thematic Fixed Income	0.0	1.0	1.0
US Bank Loans	0.0	0.0	0.0
Preferreds	0.0	1.0	1.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	50.7	47.7	-3.0
Developed Equities	43.7	35.7	-8.0
Developed Large Cap Equities	37.7	33.6	-4.0
US	26.2	25.4	-0.8
Canada	1.3	1.2	-0.1
UK	1.6	1.3	-0.3
Switzerland	1.0	0.6	-0.4
Europe ex UK ex Switzerland	3.6	2.2	-1.4
Asia ex Japan	1.3	1.2	-0.1
Japan	2.6	1.5	-1.0
Developed Small/Mid Cap Equities	6.0	2.1	-3.9
US	3.4	1.5	-1.8
Non-US	2.7	0.6	-2.1
Emerging All Cap Equities	7.0	7.8	0.9
Asia	5.8	7.1	1.2
China	2.3	3.8	1.5
Asia (ex China)	3.5	3.3	-0.2
EMEA	0.6	0.3	-0.4
LatAm	0.5	0.5	-0.0
Brazil	0.3	0.3	-0.0
LatAm ex Brazil	0.2	0.2	-0.0
Thematic Equities	0.0	4.1	4.1
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	2.8	2.8
Cyber Security	0.0	1.4	1.4
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	3.0	3.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	3.0	3.0
Gold	0.0	3.0	3.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Hedge Funds	14.0	14.0	0.0
Private Equity	10.0	10.0	0.0
Real Estate	5.0	5.0	0.0
Total	100.0	100.0	-0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD with Hedge Funds and 15% Illiquids (PE & RE): Risk Level 4 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an underweight position of -3.0%, global fixed income has an overweight of +0.5%, cash has an underweight of -0.5% with gold overweight at +3.0%.

Within equities, developed large cap equities have an underweight position of -4.0% and developed small/mid cap equities have an underweight position of -3.9%. Emerging market equities have an overweight of +0.9%. Thematic equities have an overweight of +4.1%.

Within fixed income, developed investment grade has an overweight position of +0.8%; developed high yield has a neutral position and emerging market debt has an underweight position of -1.3%. Thematic fixed income has an overweight of +1.0%.

Hedge Fund allocation in the tactical portfolio is 14%. Private Equity and Real Estate allocations are 10% and 5%, respectively. All these three asset classes positionings are neutral.

Global USD with Hedge Funds and 15% Illiquids (PE & RE): Risk Level 5

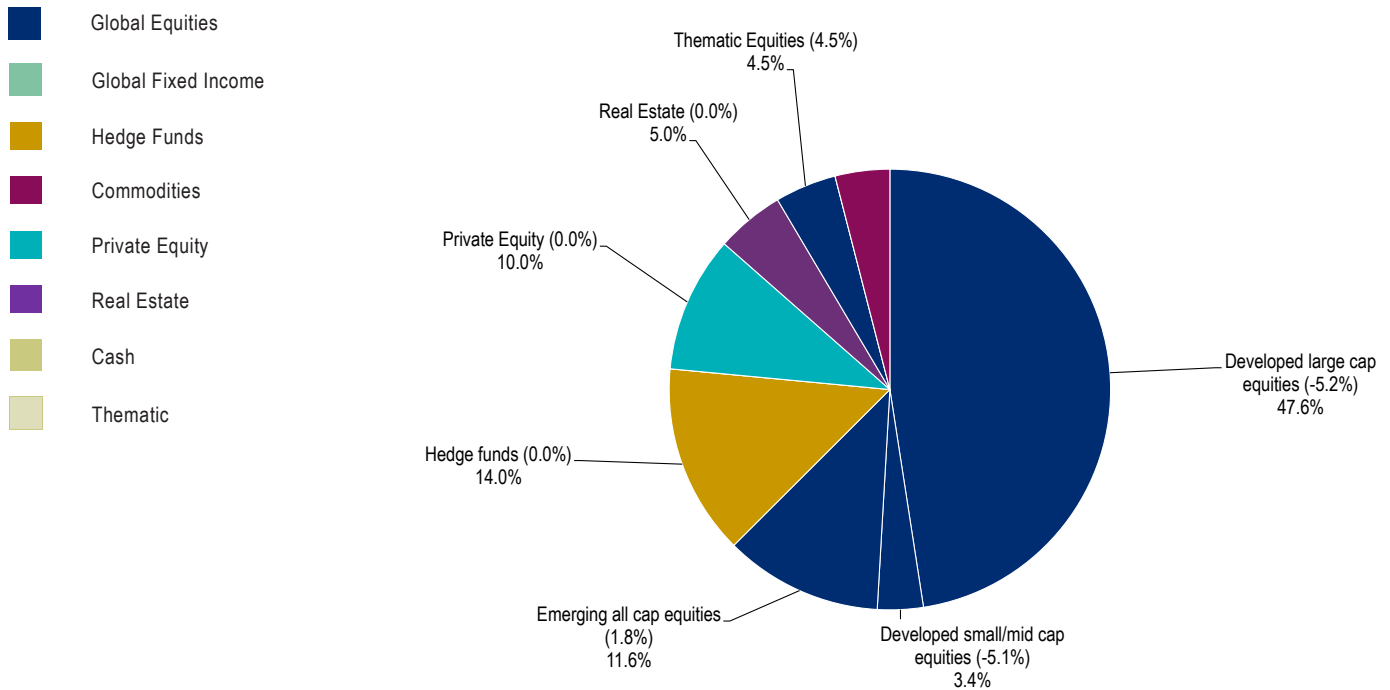
Risk Level 5 is designed for investors who emphasize return on investment. They are willing to subject their entire portfolio to greater risk and market value fluctuations in anticipation of a potentially greater return on investments. Investors may have a preference for investments or trading strategies that may assume higher than-normal market risks and/or potentially less liquidity with the goal (but not guarantee) of commensurate gains. Clients may engage in tactical or opportunistic trading, which may involve higher volatility and variability of returns.

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	0.0	0.0	0.0
Fixed income	0.0	0.0	0.0
Developed Investment Grade	0.0	0.0	0.0
US	0.0	0.0	0.0
Government	0.0	0.0	0.0
Inflation-Linked	0.0	0.0	0.0
Short	0.0	0.0	0.0
Intermediate	0.0	0.0	0.0
Long	0.0	0.0	0.0
Securitized	0.0	0.0	0.0
Credit	0.0	0.0	0.0
Short	0.0	0.0	0.0
Intermediate	0.0	0.0	0.0
Long	0.0	0.0	0.0
Europe	0.0	0.0	0.0
Government	0.0	0.0	0.0
Credit	0.0	0.0	0.0
Australia	0.0	0.0	0.0
Government	0.0	0.0	0.0
Japan	0.0	0.0	0.0
Government	0.0	0.0	0.0
Developed High Yield	0.0	0.0	0.0
US	0.0	0.0	0.0
Europe	0.0	0.0	0.0
Emerging Market Debt	0.0	0.0	0.0
Asia	0.0	0.0	0.0
Local currency	0.0	0.0	0.0
Foreign currency	0.0	0.0	0.0
EMEA	0.0	0.0	0.0
Local currency	0.0	0.0	0.0
Foreign currency	0.0	0.0	0.0
LatAm	0.0	0.0	0.0
Local currency	0.0	0.0	0.0
Foreign currency	0.0	0.0	0.0
Thematic Fixed Income	0.0	0.0	0.0
US Bank Loans	0.0	0.0	0.0
Preferreds	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	71.0	67.0	-4.0
Developed Equities	61.2	50.9	-10.3
Developed Large Cap Equities	52.8	47.6	-5.2
US	36.7	38.1	1.3
Canada	1.8	1.1	-0.7
UK	2.2	1.2	-1.0
Switzerland	1.5	0.7	-0.8
Europe ex UK ex Switzerland	5.1	2.6	-2.4
Asia ex Japan	1.9	1.8	-0.0
Japan	3.6	2.1	-1.5
Developed Small/Mid Cap Equities	8.4	3.4	-5.1
US	4.7	2.5	-2.2
Non-US	3.7	0.9	-2.8
Emerging All Cap Equities	9.8	11.6	1.8
Asia	8.2	10.4	2.2
China	3.3	5.5	2.2
Asia (ex China)	4.9	4.9	-0.1
EMEA	0.9	0.5	-0.4
LatAm	0.7	0.7	-0.0
Brazil	0.4	0.4	-0.0
LatAm ex Brazil	0.3	0.3	-0.0
Thematic Equities	0.0	4.5	4.5
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	3.0	3.0
Cyber Security	0.0	1.5	1.5
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	4.0	4.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	4.0	4.0
Gold	0.0	4.0	4.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Hedge Funds	14.0	14.0	0.0
Private Equity	10.0	10.0	0.0
Real Estate	5.0	5.0	0.0
Total	100.0	100.0	-0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD with Hedge Funds and 15% Illiquids (PE & RE): Risk Level 5 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an underweight position of -4.0% while gold has an overweight position of +4.0%. Global fixed income and cash both have neutral position.

Within equities, developed large cap equities have an underweight position of -5.2% and developed small/mid cap equities have an underweight position of -5.1%. Emerging market equities have an overweight of +1.8%. Thematic equities have an overweight of +4.5%.

Within fixed income, developed government debt, developed corporate investment grade, developed high yield and emerging market debt are all at neutral position.

Hedge Fund allocation in the tactical portfolio is 14%. Private Equity and Real Estate allocations are 10% and 5%, respectively. All these three asset classes positionings are neutral.

Global USD without Hedge Funds: Risk Level 1

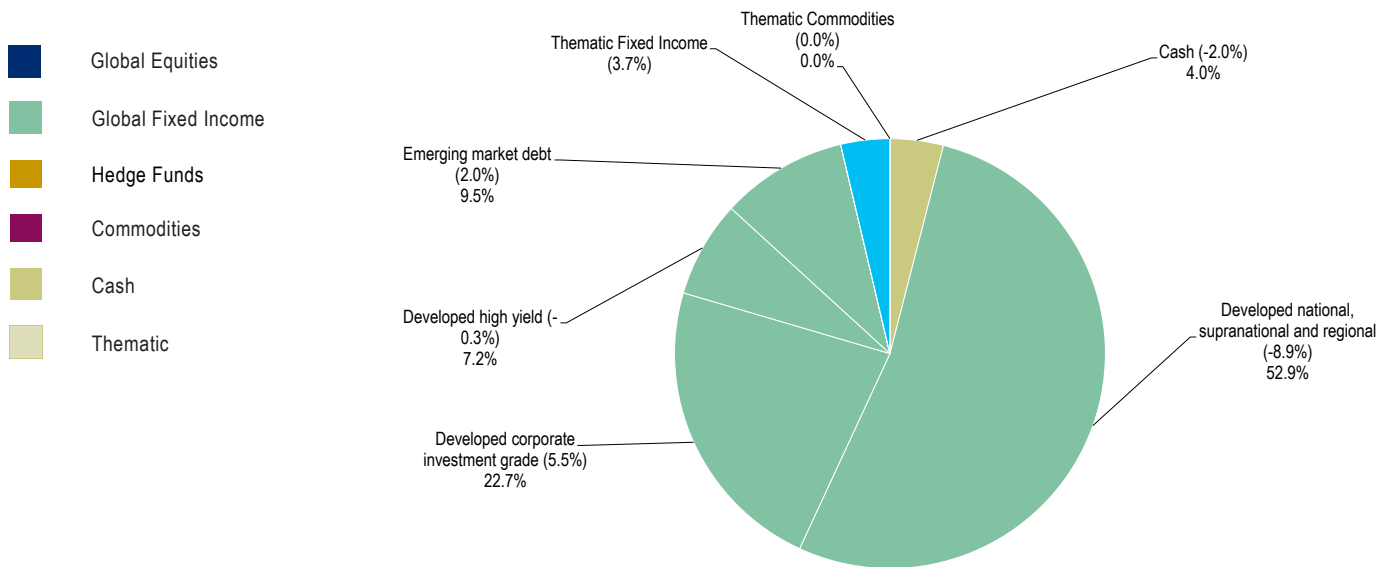
Risk Level 1 is designed for investors who have a preference for capital preservation and relative safety over the potential for a return on investment. These investors prefer to hold cash, time deposits and/or lower risk fixed income instruments.

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	6.0	4.0	-2.0
Fixed Income	94.0	96.0	2.0
Developed Investment Grade	79.0	75.6	-3.4
US	45.3	52.4	7.1
Government	19.5	20.1	0.6
Inflation-Linked	2.8	2.6	-0.2
Short	5.2	5.0	-0.2
Intermediate	8.1	7.1	-1.0
Long	3.5	5.5	2.0
Securitized	14.4	15.9	1.5
Credit	11.4	16.4	5.0
Short	1.6	2.6	1.0
Intermediate	6.0	10.0	4.0
Long	3.9	3.9	0.0
Europe	25.8	18.8	-7.0
Government	20.1	12.6	-7.5
Credit	5.8	6.3	0.5
Australia	0.5	0.5	0.0
Government	0.5	0.5	0.0
Japan	7.4	3.9	-3.5
Government	7.4	3.9	-3.5
Developed High Yield	7.5	7.2	-0.3
US	5.6	4.2	-1.4
Europe	1.9	3.0	1.1
Emerging Market Debt	7.5	9.5	2.0
Asia	1.3	2.6	1.3
Local currency	0.6	1.1	0.5
Foreign currency	0.6	1.4	0.8
EMEA	3.9	3.9	0.0
Local currency	2.0	2.0	0.0
Foreign currency	2.0	2.0	0.0
LatAm	2.3	3.0	0.7
Local currency	1.2	1.2	0.0
Foreign currency	1.2	1.9	0.7
Thematic Fixed Income	0.0	3.7	3.7
US Bank Loans	0.0	1.7	1.7
Preferreds	0.0	2.0	2.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	0.0	0.0	0.0
Developed Equities	0.0	0.0	0.0
Developed Large Cap Equities	0.0	0.0	0.0
US	0.0	0.0	0.0
Canada	0.0	0.0	0.0
UK	0.0	0.0	0.0
Switzerland	0.0	0.0	0.0
Europe ex UK ex Switzerland	0.0	0.0	0.0
Asia ex Japan	0.0	0.0	0.0
Japan	0.0	0.0	0.0
Developed Small/Mid Cap Equities	0.0	0.0	0.0
US	0.0	0.0	0.0
Non-US	0.0	0.0	0.0
Emerging All Cap Equities	0.0	0.0	0.0
Asia	0.0	0.0	0.0
China	0.0	0.0	0.0
Asia (ex China)	0.0	0.0	0.0
EMEA	0.0	0.0	0.0
LatAm	0.0	0.0	0.0
Brazil	0.0	0.0	0.0
LatAm ex Brazil	0.0	0.0	0.0
Thematic Equities	0.0	0.0	0.0
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	0.0	0.0
Cyber Security	0.0	0.0	0.0
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	0.0	0.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	0.0	0.0
Gold	0.0	0.0	0.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Total	100.0	100.0	0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD without Hedge Funds: Risk Level 1 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an overall neutral position, global fixed income has an overweight of +2.0%, cash has an underweight of -2.0%.

Within equities, developed large cap equities, developed small/mid cap equities and emerging market equities are all at neutral positions.

Within fixed income, developed investment grade debt has an underweight position of -3.4%; developed high yield has an underweight position of -0.3% and emerging market debt has an overweight position of +2.0%. Thematic fixed income has an overweight position of +3.7%.

Global USD without Hedge Funds: Risk Level 2

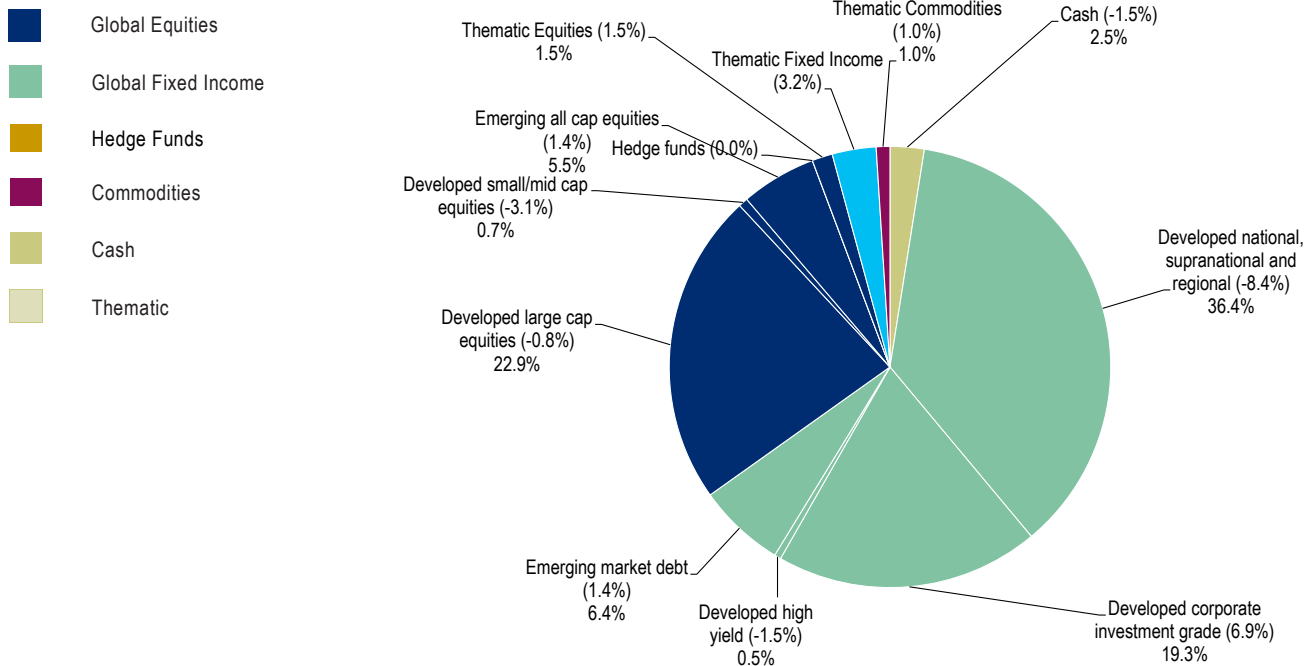
Risk Level 2 is designed for investors who emphasize capital preservation over return on investment, but who are willing to subject some portion of their principal to increased risk in order to generate a potentially greater rate of return on investment.

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	4.0	2.5	-1.5
Fixed Income	64.3	65.9	1.5
Developed Investment Grade	57.4	55.8	-1.6
US	32.9	41.7	8.8
Government	14.2	15.0	0.9
Inflation-Linked	2.0	2.2	0.2
Short	3.8	2.3	-1.5
Intermediate	5.9	6.0	0.2
Long	2.5	4.5	2.0
Securitized	10.4	11.5	1.1
Credit	8.3	15.1	6.9
Short	1.1	2.3	1.2
Intermediate	4.3	10.0	5.7
Long	2.8	2.8	0.0
Europe	18.8	11.8	-7.0
Government	14.6	7.6	-7.0
Credit	4.2	4.2	0.0
Australia	0.3	0.3	0.0
Government	0.3	0.3	0.0
Japan	5.4	2.0	-3.4
Government	5.4	2.0	-3.4
Developed High Yield	2.0	0.5	-1.5
US	1.5	0.5	-1.0
Europe	0.5	0.0	-0.5
Emerging Market Debt	5.0	6.4	1.4
Asia	0.8	1.9	1.0
Local currency	0.4	1.0	0.5
Foreign currency	0.4	0.9	0.5
EMEA	2.6	2.6	-0.0
Local currency	1.3	1.3	-0.0
Foreign currency	1.3	1.3	-0.0
LatAm	1.5	1.9	0.4
Local currency	0.8	0.8	-0.0
Foreign currency	0.8	1.2	0.4
Thematic Fixed Income	0.0	3.2	3.2
US Bank Loans	0.0	1.2	1.2
Preferreds	0.0	2.0	2.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	31.7	30.6	-1.0
Developed Equities	27.5	23.6	-3.9
Developed Large Cap Equities	23.7	22.9	-0.8
US	16.5	17.0	0.5
Canada	0.8	0.8	0.0
UK	1.0	1.0	0.0
Switzerland	0.7	0.6	-0.0
Europe ex UK ex Switzerland	2.3	1.6	-0.6
Asia ex Japan	0.8	0.8	0.0
Japan	1.6	1.1	-0.5
Developed Small/ Mid Cap Equities	3.8	0.7	-3.1
US	2.1	0.6	-1.5
Non-US	1.7	0.1	-1.5
Emerging All Cap Equities	4.2	5.5	1.4
Asia	3.5	5.1	1.6
China	1.4	3.0	1.6
Asia (ex China)	2.1	2.1	0.0
EMEA	0.4	0.1	-0.2
LatAm	0.3	0.3	0.0
Brazil	0.2	0.2	0.0
LatAm ex Brazil	0.1	0.1	0.0
Thematic Equities	0.0	1.5	1.5
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	1.5	1.5
Cyber Security	0.0	0.0	0.0
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	1.0	1.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	1.0	1.0
Gold	0.0	1.0	1.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Total	100.0	100.0	0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD without Hedge Funds: Risk Level 2 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an underweight position of -1.0%, global fixed income has an overweight of +1.5%, cash has an underweight of -1.5% with gold overweight at +1.0%.

Within equities, developed large cap equities have an underweight position of -0.8% while developed small/mid cap equities have an underweight of -3.1%. Emerging market equities have an overweight of +1.4%. Thematic equities have an overweight of +1.5%.

Within fixed income, developed investment grade has an underweight position of -1.6%; developed high yield has an underweight position of -1.5% and emerging market debt has an overweight position of +1.4%. Thematic fixed income has an overweight position of +3.2%.

Global USD without Hedge Funds: Risk Level 3

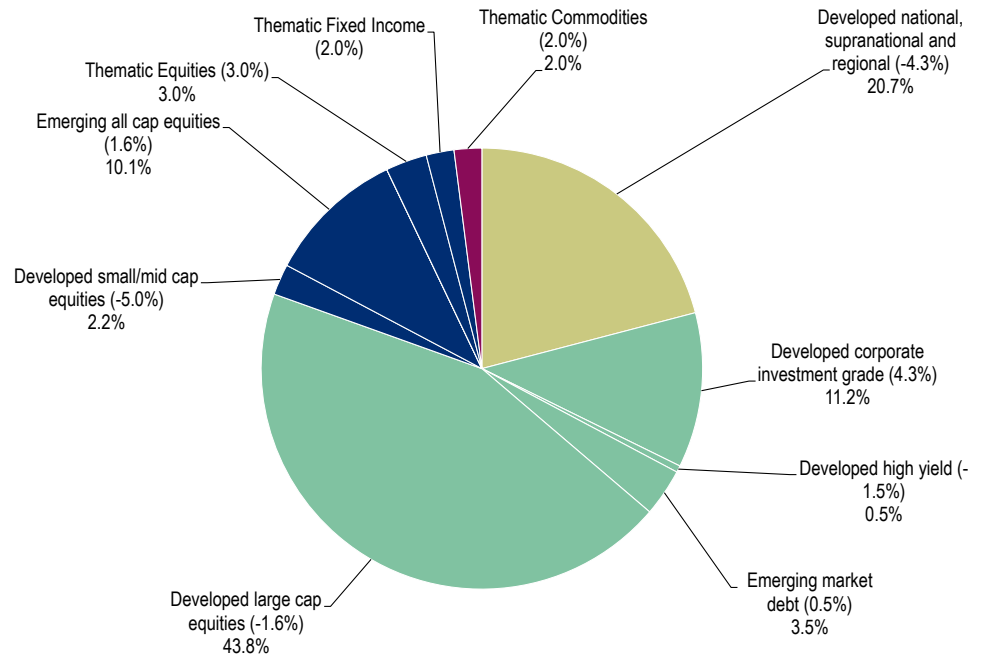
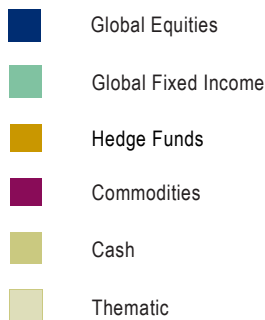
Risk Level 3 is designed for investors with a blended objective who require a mix of assets and seek a balance between investments that offer income and those positioned for a potentially higher return on investment. Risk Level 3 may be appropriate for investors willing to subject their portfolio to additional risk for potential growth in addition to a level of income reflective of his/her stated risk tolerance.

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	2.0	1.0	-1.0
Fixed Income	36.9	37.9	1.0
Developed Investment Grade	32.0	32.0	0.0
US	18.3	28.0	9.7
Government	7.9	13.4	5.5
Inflation-Linked	1.1	2.1	1.0
Short	2.1	1.2	-0.9
Intermediate	3.3	6.7	3.4
Long	1.4	3.4	2.0
Securitized	5.8	5.5	-0.3
Credit	4.6	9.1	4.5
Short	0.6	1.6	1.0
Intermediate	2.4	5.9	3.5
Long	1.6	1.6	0.0
Europe	10.5	3.8	-6.7
Government	8.1	1.6	-6.5
Credit	2.3	2.1	-0.2
Australia	0.2	0.2	0.0
Government	0.2	0.2	0.0
Japan	3.0	0.0	-3.0
Government	3.0	0.0	-3.0
Developed High Yield	2.0	0.5	-1.5
US	1.5	0.5	-1.0
Europe	0.5	0.0	-0.5
Emerging Market Debt	3.0	3.5	0.5
Asia	0.5	1.0	0.5
Local currency	0.3	0.6	0.3
Foreign currency	0.3	0.5	0.2
EMEA	1.5	1.5	-0.0
Local currency	0.8	0.8	-0.0
Foreign currency	0.8	0.8	-0.0
LatAm	0.9	0.9	-0.0
Local currency	0.5	0.5	-0.0
Foreign currency	0.5	0.5	-0.0
Thematic Fixed Income	0.0	2.0	2.0
US Bank Loans	0.0	0.0	0.0
Preferreds	0.0	2.0	2.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	61.1	59.1	-2.0
Developed Equities	52.7	46.0	-6.6
Developed Large Cap Equities	45.4	43.8	-1.6
US	31.6	32.1	0.5
Canada	1.6	1.6	-0.0
UK	1.9	1.9	0.0
Switzerland	1.3	1.2	-0.1
Europe ex UK ex Switzerland	4.4	3.4	-1.0
Asia ex Japan	1.6	1.6	0.0
Japan	3.1	2.1	-1.0
Developed Small/Mid Cap Equities	7.2	2.2	-5.0
US	4.0	1.5	-2.5
Non-US	3.2	0.7	-2.5
Emerging All Cap Equities	8.4	10.1	1.6
Asia	7.1	9.1	2.0
China	2.8	4.8	2.0
Asia (ex China)	4.2	4.2	-0.0
EMEA	0.8	0.4	-0.4
LatAm	0.6	0.6	0.0
Brazil	0.4	0.4	0.0
LatAm ex Brazil	0.2	0.2	0.0
Thematic Equities	0.0	3.0	3.0
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	2.0	2.0
Cyber Security	0.0	1.0	1.0
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	2.0	2.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	2.0	2.0
Gold	0.0	2.0	2.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Total	100.0	100.0	-0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD without Hedge Funds: Risk Level 3 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an underweight position of -2.0%, global fixed income has an overweight of +1.0%, cash has an underweight of -1.0% with gold overweight at +2.0%.

Within equities, developed large cap equities have an underweight position of -1.6% while developed small/mid cap equities have an underweight position of -5.0%. Emerging market equities have an overweight of +1.6%. Thematic equities have an overweight of +3.0%.

Within fixed income, developed investment grade debt has a neutral position overall; developed high yield has an underweight position of -1.5%; emerging market debt has an overweight position of +0.5%. Thematic fixed income has an overweight of +2.0%.

Global USD without Hedge Funds: Risk Level 4

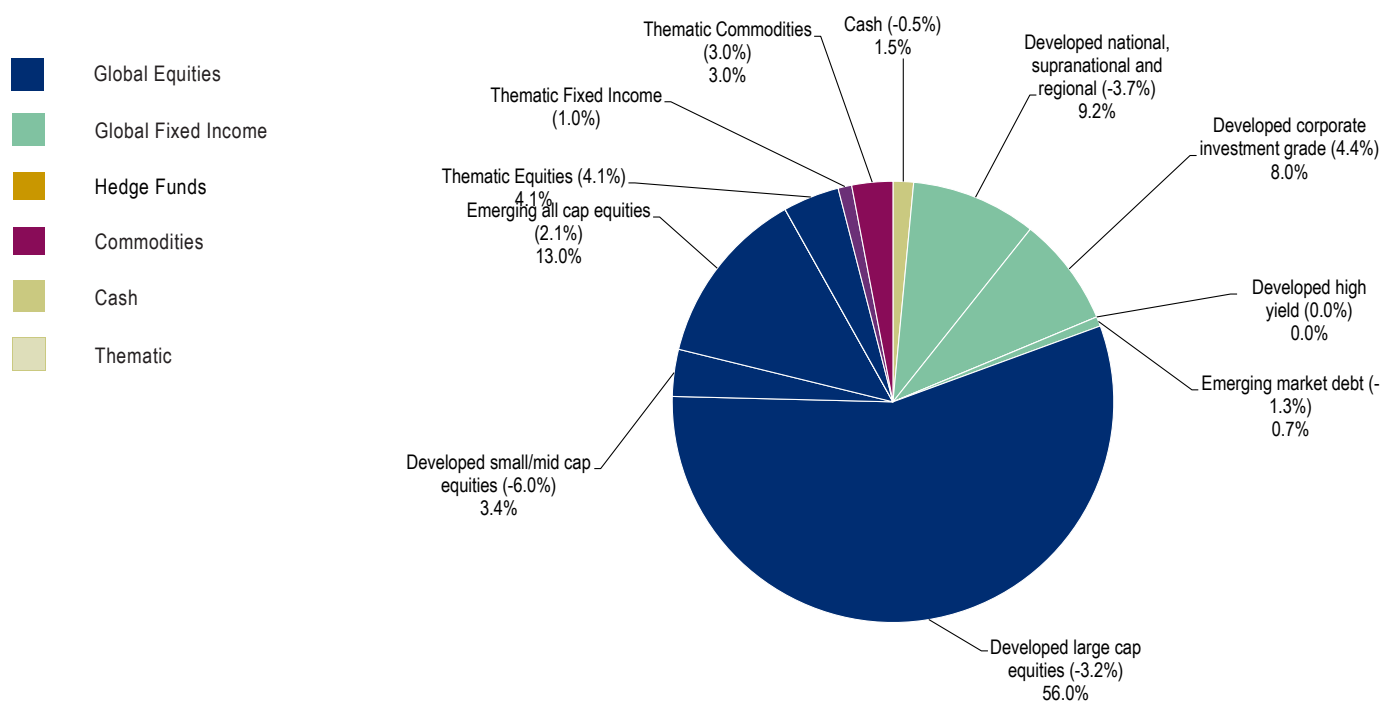
Risk Level 4 is designed for investors with a blended objective who require a mix of assets and seek a balance between investments that offer income and those positioned for a potentially higher return on investment. They are willing to subject a large portion of their portfolio to greater risk and market value fluctuations in anticipation of a potentially greater return on investment. Investors may have a preference for investments or trading strategies that may assume higher-than-normal market risks and/or potentially less liquidity with the goal (but not guarantee) of commensurate gains.

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	2.0	1.5	-0.5
Fixed Income	18.4	18.9	0.5
Developed Investment Grade	16.4	17.2	0.8
US	9.4	16.8	7.4
Government	4.1	8.6	4.6
Inflation-Linked	0.6	0.5	-0.0
Short	1.1	1.1	-0.0
Intermediate	1.7	4.3	2.6
Long	0.7	2.7	2.0
Securitized	3.0	0.4	-2.6
Credit	2.4	7.8	5.4
Short	0.3	2.0	1.7
Intermediate	1.2	5.5	4.2
Long	0.8	0.3	-0.5
Europe	5.4	0.4	-5.0
Government	4.2	0.2	-4.0
Credit	1.2	0.2	-1.0
Australia	0.1	0.0	-0.1
Government	0.1	0.0	-0.1
Japan	1.5	0.0	-1.5
Government	1.5	0.0	-1.5
Developed High Yield	0.0	0.0	0.0
US	0.0	0.0	0.0
Europe	0.0	0.0	0.0
Emerging Market Debt	2.0	0.7	-1.3
Asia	0.3	0.4	0.1
Local currency	0.2	0.2	0.1
Foreign currency	0.2	0.2	-0.0
EMEA	1.0	0.0	-1.0
Local currency	0.5	0.0	-0.5
Foreign currency	0.5	0.0	-0.5
LatAm	0.6	0.3	-0.3
Local currency	0.3	0.0	-0.3
Foreign currency	0.3	0.3	-0.1
Thematic Fixed Income	0.0	1.0	1.0
US Bank Loans	0.0	0.0	0.0
Preferreds	0.0	1.0	1.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	79.6	76.6	-3.0
Developed Equities	68.6	59.4	-9.2
Developed Large Cap Equities	59.2	56.0	-3.2
US	41.2	42.3	1.1
Canada	2.1	2.1	-0.0
UK	2.5	2.2	-0.3
Switzerland	1.6	1.0	-0.6
Europe ex UK ex Switzerland	5.7	3.7	-2.0
Asia ex Japan	2.1	2.1	0.0
Japan	4.0	2.6	-1.4
Developed Small/Mid Cap Equities	9.4	3.4	-6.0
US	5.3	2.5	-2.8
Non-US	4.2	0.9	-3.3
Emerging All Cap Equities	11.0	13.0	2.1
Asia	9.2	11.8	2.6
China	3.7	6.3	2.7
Asia (ex China)	5.5	5.4	-0.1
EMEA	1.0	0.5	-0.5
LatAm	0.8	0.8	0.0
Brazil	0.5	0.5	0.0
LatAm ex Brazil	0.3	0.3	0.0
Thematic Equities	0.0	4.1	4.1
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	2.8	2.8
Cyber Security	0.0	1.4	1.4
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	3.0	3.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	3.0	3.0
Gold	0.0	3.0	3.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Total	100.0	100.0	-0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD without Hedge Funds: Risk Level 4 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an underweight position of -3.0%, global fixed income has an overweight of +0.5%, cash has an underweight of -0.5% with gold overweight at +3.0%.

Within equities, developed large cap equities have an underweight position of -3.2% while developed small/mid cap equities have an underweight position of -6.0%. Emerging market equities have an overweight of +2.1%. Thematic equities have an overweight position of +4.1%.

Within fixed income, developed investment grade debt has an overweight position of +0.8%; developed high yield has a neutral position and emerging market debt has an underweight position of -1.3%. Thematic fixed income has an overweight position of +1.0%.

Global USD without Hedge Funds: Risk Level 5

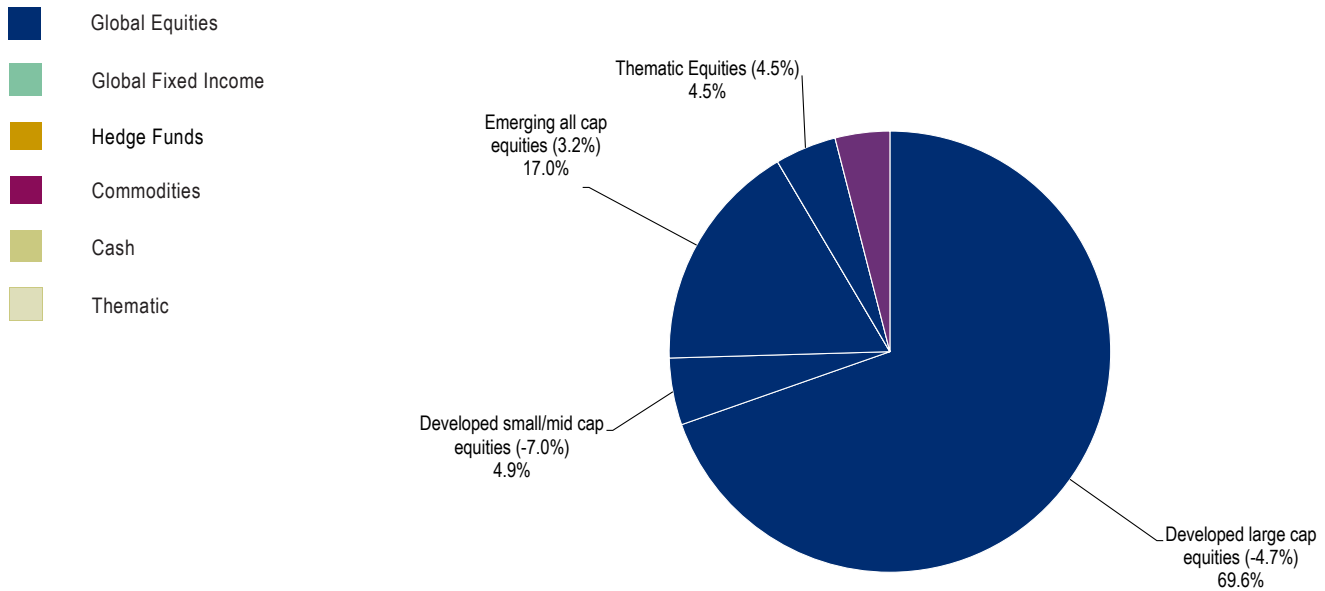
Risk Level 5 is designed for investors who emphasize return on investment. They are willing to subject their entire portfolio to greater risk and market value fluctuations in anticipation of a potentially greater return on investments. Investors may have a preference for investments or trading strategies that may assume higher than-normal market risks and/or potentially less liquidity with the goal (but not guarantee) of commensurate gains. Clients may engage in tactical or opportunistic trading, which may involve higher volatility and variability of returns.

Classification	Strategic (%)	Tactical* (%)	Active (%)
Cash	0.0	0.0	0.0
Fixed income	0.0	0.0	0.0
Developed Investment Grade	0.0	0.0	0.0
US	0.0	0.0	0.0
Government	0.0	0.0	0.0
Inflation-Linked	0.0	0.0	0.0
Short	0.0	0.0	0.0
Intermediate	0.0	0.0	0.0
Long	0.0	0.0	0.0
Securitized	0.0	0.0	0.0
Credit	0.0	0.0	0.0
Short	0.0	0.0	0.0
Intermediate	0.0	0.0	0.0
Long	0.0	0.0	0.0
Europe	0.0	0.0	0.0
Government	0.0	0.0	0.0
Credit	0.0	0.0	0.0
Australia	0.0	0.0	0.0
Government	0.0	0.0	0.0
Japan	0.0	0.0	0.0
Government	0.0	0.0	0.0
Developed High Yield	0.0	0.0	0.0
US	0.0	0.0	0.0
Europe	0.0	0.0	0.0
Emerging Market Debt	0.0	0.0	0.0
Asia	0.0	0.0	0.0
Local currency	0.0	0.0	0.0
Foreign currency	0.0	0.0	0.0
EMEA	0.0	0.0	0.0
Local currency	0.0	0.0	0.0
Foreign currency	0.0	0.0	0.0
LatAm	0.0	0.0	0.0
Local currency	0.0	0.0	0.0
Foreign currency	0.0	0.0	0.0
Thematic Fixed Income	0.0	0.0	0.0
US Bank Loans	0.0	0.0	0.0
Preferreds	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0

Classification	Strategic (%)	Tactical* (%)	Active (%)
Equities	100.0	96.0	-4.0
Developed Equities	86.2	74.5	-11.7
Developed Large Cap Equities	74.3	69.6	-4.7
US	51.7	55.7	4.0
Canada	2.6	1.6	-1.0
UK	3.1	1.7	-1.4
Switzerland	2.1	1.0	-1.1
Europe ex UK ex Switzerland	7.2	3.9	-3.3
Asia ex Japan	2.6	2.7	0.1
Japan	5.0	3.0	-2.0
Developed Small/Mid Cap Equities	11.9	4.9	-7.0
US	6.6	3.6	-3.0
Non-US	5.2	1.3	-4.0
Emerging All Cap Equities	13.8	17.0	3.2
Asia	11.6	15.2	3.6
China	4.6	8.1	3.5
Asia (ex China)	6.9	7.1	0.2
EMEA	1.3	0.8	-0.5
LatAm	1.0	1.0	0.0
Brazil	0.6	0.6	0.0
LatAm ex Brazil	0.4	0.4	0.0
Thematic Equities	0.0	4.5	4.5
Global Equity REITs	0.0	0.0	0.0
US Mortgage REITs	0.0	0.0	0.0
Global Healthcare	0.0	0.0	0.0
Global Pharma	0.0	3.0	3.0
Cyber Security	0.0	1.5	1.5
Fintech	0.0	0.0	0.0
Natural Resources	0.0	0.0	0.0
Oil Services	0.0	0.0	0.0
Commodities	0.0	4.0	4.0
Composite Commodities	0.0	0.0	0.0
Thematic Commodities	0.0	4.0	4.0
Gold	0.0	4.0	4.0
Thematic 2	0.0	0.0	0.0
Thematic 3	0.0	0.0	0.0
Thematic 4	0.0	0.0	0.0
Thematic 5	0.0	0.0	0.0
Total	100.0	100.0	0.0

Active = the difference between tactical and strategic allocations. Minor differences may result due to rounding.

Global USD without Hedge Funds: Risk Level 5 - Tactical Allocations



Figures in brackets are active allocations. All allocations are subject to change at discretion of the GIC of the Citi Private Bank.

Core Positions

Global equities have an underweight position of -4.0% while gold is overweight at +4.0%. Global fixed income and cash are both at neutral position.

Within equities, developed large cap equities have an underweight position of -4.7% and developed small/mid cap equities have an underweight position of -7.0%. Emerging market equities have an overweight of +3.2%. Thematic equities have an overweight position of +4.5%.

Within fixed income, developed government debt, developed corporate investment grade, developed high yield and emerging market debt are all at neutral position.

Asset Allocation Definitions

ASSET CLASSES	Benchmarked against
Global equities	MSCI All Country World Index, which represents 48 developed and emerging equity markets. Index components are weighted by market capitalization.
Global bonds	Bloomberg Barclays Capital Multiverse (Hedged) Index, which contains the government -related portion of the Multiverse Index, and accounts for approximately 14% of the larger index.
Hedge funds	HFRX Global Hedge Fund Index, which is designed to be representative of the overall composition of the hedge fund universe. It comprises all eligible hedge fund strategies; including but not limited to convertible arbitrage, distressed securities, equity hedge, equity market neutral, event driven, macro, merger arbitrage and relative value arbitrage. The strategies are asset-weighted based on the distribution of assets in the hedge fund industry.
Commodities	Dow Jones-UBS Commodity Index, which is composed of futures contracts on physical commodities traded on US exchanges, with the exception of aluminum, nickel and zinc, which trade on the London Metal Exchange (LME). The major commodity sectors are represented including energy, petroleum, precious metals, industrial metals, grains, livestock, softs, agriculture and ex-energy. The Thomson Reuters / Core Commodity Index is designed to provide timely and accurate representation of a long-only, broadly diversified investment in commodities through a transparent and disciplined calculation methodology.
Cash	Three-month LIBOR, which is the interest rates that banks charge each other in the international inter-bank market for three-month loans (usually denominated in Eurodollars).
Equities	
Developed market large cap	MSCI World Large Cap Index, which is free-float adjusted and weighted by market capitalization. The index is designed to measure the equity market performance of the large cap stocks in 23 developed markets. Large cap is defined as stocks representing roughly 70% of each market's capitalization.
All Country Ex US	MSCI All Country ex US, which is free-float adjusted and weighted by market capitalization. The index is designed to measure the equity market performance of the large cap stocks in all countries excluding the US.
US	Standard & Poor's 500 Index, which is a capitalization-weighted index that includes a representative sample of 500 leading companies in leading industries of the US economy. Although the S&P 500 focuses on the large cap segment of the market, with over 80% coverage of US equities, it is also an ideal proxy for the total market.
Europe ex UK	MSCI Europe ex UK Large Cap Index, which is free-float adjusted and weighted by market capitalization. The index is designed to measure large cap stock performance in each of Europe's developed markets, except for the UK
UK	MSCI UK Large Cap Index, which is free-float adjusted and weighted by market capitalization. The index is designed to measure large cap stock performance in the UK
Japan	MSCI Japan Large Cap Index, which is free-float adjusted and weighted by market capitalization. The index is designed to measure large cap stock performance in Japan.
Asia Pacific ex Japan	MSCI Asia Pacific ex Japan Large Cap Index, which is free-float adjusted and weighted by market capitalization. The index is designed to measure the performance of large cap stocks in Australia, Hong Kong, New Zealand and Singapore.
Developed market small and mid-cap (SMID)	MSCI World Small Cap Index, which is a capitalization-weighted index that measures small cap stock performance in 23 developed equity markets.
Emerging market	MSCI Emerging Markets Index, which is free-float adjusted and weighted by market capitalization. The index is designed to measure equity market performance of 22 emerging markets.
Bonds	
Developed sovereign	Citi World Government Bond Index (WGBI), which consists of the major global investment grade government bond markets and is composed of sovereign debt, denominated in the domestic currency. To join the WGBI, the market must satisfy size, credit and barriers-to-entry requirements. In order to ensure that the WGBI remains an investment grade benchmark, a minimum credit quality of BBB-/Baa3 by either S&P or Moody's is imposed. The index is rebalanced monthly.
Emerging sovereign	Citi Emerging Market Sovereign Bond Index (ESBI), which includes Brady bonds and US dollar -denominated emerging market sovereign debt issued in the global, Yankee and Eurodollar markets, excluding loans. It is composed of debt in Africa, Asia, Europe and Latin America. We classify an emerging market as a sovereign with a maximum foreign debt rating of BBB+/Baa1 by S&P or Moody's. Defaulted issues are excluded.
Supranationals	Citi World Broad Investment Grade Index (WBIG)—Government Related, which is a subsector of the WBIG. The index includes fixed rate investment grade agency, supranational and regional government debt, denominated in the domestic currency. The index is rebalanced monthly.
Corporate investment grade	Citi World Broad Investment Grade Index (WBIG)—Corporate, which is a subsector of the WBIG. The index includes fixed rate global investment grade corporate debt within the finance, industrial and utility sectors, denominated in the domestic currency. The index is rebalanced monthly.
Corporate high yield	Bloomberg Barclays Global High Yield Corporate Index. Provides a broad-based measure of the global high yield fixed income markets. It is also a component of the Multiverse Index and the Global Aggregate Index.
Securitized	Citi World Broad Investment Grade Index (WBIG)—Securitized, which is a subsector of the WBIG. The index includes global investment grade collateralized debt denominated in the domestic currency, including mortgage -backed securities, covered bonds (Pfandbriefe) and asset-backed securities. The index is rebalanced monthly. Moody's Baa Corporate Bond Index is an investment bond index that tracks the performance of all bonds given a Baa rating by Moody's Investors Service.

BAML US Corporate index (Bank of America Merrill Lynch) tracks the performance of US dollar denominated investment grade rated corporate debt publically issued in the US domestic market.

Other miscellaneous definitions

Asset Backed Securities (ABS) A security whose income payments and hence value are derived from and collateralized (or "backed") by a specified pool of underlying assets such as consumer credit card debt or auto loans.

Commercial Mortgage Backed Securities (CMBS) Commercial mortgage-backed securities (CMBS) are a type of mortgage-backed security that is secured by mortgages on commercial properties, instead of residential real estate.

High Yield Corporate Bonds (HY) High yield corporate bonds are bonds with a credit rating less than BBB- (S&P) or Baa3 (Moody's), and are debt securities issued by a corporation and sold to investors. The backing for the bond is usually the payment ability of the company, which is typically money to be earned from future operations.

Investment Grade Corporate Bonds (IG) Investment grade corporate bonds are bonds with a credit rating equal to or above BBB- (S&P) or Baa3 (Moody's), and are debt securities issued by a corporation and sold to investors. The backing for the bond is usually the payment ability of the company, which is typically money to be earned from future operations.

COVID-Cyclicals Financials, Industrials, Energy, Materials, Real Estate, Consumer Discretionary ex-Amazon.

COVID-Defensives IT, Health Care, Communication Services, Consumer Staples, Utilities, Amazon.

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Bond rating equivalence

Alpha and/or numeric symbols used to give indications of relative credit quality. In the municipal market, these designations are published by the rating services. Internal ratings are also used by other market participants to indicate credit quality.

Bond credit quality ratings

Credit risk	Rating agencies		
	Moody's ¹	Standard and Poor's ²	Fitch Ratings ²
Investment Grade			
Highest quality	Aaa	AAA	AAA
High quality (very strong)	Aa	AA	AA
Upper medium grade (Strong)	A	A	A
Medium grade	Baa	BBB	BBB
Not Investment Grade			
Lower medium grade (somewhat speculative)	Ba	BB	BB
Low grade (speculative)	B	B	B
Poor quality (may default)	Caa	CCC	CCC
Most speculative	Ca	CC	CC
No interest being paid or bankruptcy petition filed	C	D	C
In default	C	D	D

¹ The ratings from Aa to Ca by Moody's may be modified by the addition of a 1, 2, or 3 to show relative standing within the category.

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Mortgage-backed securities ("MBS"), which include collateralized mortgage obligations ("CMOs"), also referred to as real estate mortgage investment conduits ("REMICs"), may not be suitable for all investors. There is the possibility of early return of principal due to mortgage prepayments, which can reduce expected yield and result in reinvestment risk. Conversely, return of principal may be slower than initial prepayment speed assumptions, extending the average life of the security up to its listed maturity date (also referred to as extension risk).

Additionally, the underlying collateral supporting non-Agency MBS may default on principal and interest payments. In certain cases, this could cause the income stream of the security to decline and result in loss of principal. Further, an insufficient level of credit support may result in a downgrade of

a mortgage bond's credit rating and lead to a higher probability of principal loss and increased price volatility. Investments in subordinated MBS involve greater credit risk of default than the senior classes of the same issue. Default risk may be pronounced in cases where the MBS security is secured by, or evidencing an interest in, a relatively small or less diverse pool of underlying mortgage loans.

MBS are also sensitive to interest rate changes which can negatively impact the market value of the security. During times of heightened volatility, MBS can experience greater levels of illiquidity and larger price movements. Price volatility may also occur from other factors including, but not limited to, prepayments, future prepayment expectations, credit concerns, underlying collateral performance and technical changes in the market.

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