Global Asset Allocation

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Overview

Introduction

Investing in international assets has been widely demonstrated to provide significant diversification benefits, effectively separating and reducing risk. In this report, our objective is to provide recommendations for constructing an optimal international portfolio.

Our methodology involves developing portfolios for both the short term (1 year) and the long term (3 and 5 years). Specifically, for the short term, we utilize Tactical Asset Allocation (TAA) guided by a Momentum model. For the long term, we adopt Strategic Asset Allocation (SAA) based on the World CAPM model.

Additionally, our portfolio includes a diverse range of assets from various countries, inciuding both developed and emerging markets also with both stocks and bonds to fully utilize the power of diversification and achieve a well-balanced investment strategy.

Developed countries

USA

- The U.S. stock market responded positively to the 2024 presidential election results, reflecting investor optimism about the administration's pro-growth agenda. Key indices, such as the S&P 500, have experienced gains driven by expectations of favorable corporate tax policies and regulatory reforms. However, the flattening yield curve signals investor caution, indicating awareness of potential economic headwinds, including global uncertainties and slower long-term growth.
- In the bond market, inflation remains a critical factor, with the rate currently at 3.2%, still above the Federal Reserve's target. The administration's policies, such as tax cuts, could amplify consumer demand and potentially fuel inflationary pressures, keeping investors alert to the risk of rising yields. The Federal Reserve is likely to maintain a cautious stance, holding interest rates steady in the short term while closely monitoring inflation trends. These dynamics will influence fixed-income markets, requiring investors to balance risks and opportunities amid changing monetary and fiscal policies.

Japan

Japan's stock market has been gaining attention as the country emerges from three decades of deflation, supported by several favorable factors. The return of inflation has boosted confidence across industries, while a weak yen has enhanced the competitiveness of Japanese exporters, benefiting sectors like manufacturing. Government policies aimed at attracting global investment and the Bank of Japan's accommodative monetary stance have further bolstered market optimism.

Recent data highlights strong corporate investment as a key growth driver, with capital expenditures increasing in areas such as software, R&D, and land acquisition. Notably, real investment surged by 8% , reflecting the strength of Japan's economic recovery and reinforcing the positive outlook for its stock market.

Australia

59% of Australian business leaders expecting a recession in 2024, Challenges such as rising costs from inflation (impacting 74% of businesses) and concerns over rising interest rates remain critical for both equity and bond markets.

Canada

Canada's stock market in 2024 presents opportunities driven by key sectors such as renewable energy, natural resources, technology, and infrastructure. Rising demand for clean energy, innovation, and urban development positions these industries for growth, attracting investor interest. Recovery in the latter half of the year, supported by monetary easing and improved global conditions, is expected to bolster market performance. However, we should remain mindful of potential risks, including slower economic growth compared to other advanced economies and global market dependencies.

Germany

Germany's economy has narrowly avoided a full-blown recession over the past year, but significant challenges persist. Weak export demand, high energy costs, and rising wages have compressed corporate margins, driving the industrial sector into recession.

The Bundesbank highlights profound structural challenges impacting medium-term growth. These include ongoing economic weakness and structural shifts, which are expected to elevate default risks for non-financial corporations. A significant increase in corporate insolvencies is anticipated in the coming year, with elevated default risks likely to persist into 2025. These factors underscore a challenging economic environment for Germany, requiring structural reforms and adaptation to address long-term vulnerabilities.

UK

The United Kingdom's economy is expected to see modest growth in and 2025, with GDP projected to rise by 1.3%, respectively. Inflation is set to moderate to 2.3% in 2025, while unemployment remains stable at around 4.4%-4.5%. Public borrowing is forecasted to decrease from £116.1 billion to £104.6 billion, reflecting fiscal consolidation efforts. This stable macroeconomic environment is likely to support the UK stock market, particularly in sectors sensitive to inflation trends and economic recovery, such as consumer goods and financials. However, persistent current account deficits and inflationary pressures may weigh on investor sentiment. Overall, the outlook is cautiously optimistic, with gradual recovery providing a mixed but resilient foundation for equity markets.

Singapore

Singapore's economy grew by a robust 5.4% year-on-year in Q3 2024, driven by strong semiconductor demand and precision engineering output, surpassing forecasts. In response, the Ministry of Trade and Industry (MTI) revised the 2024 GDP growth forecast to 3.5%, up from 2.0%-3.0%. Growth in 2025 is expected to moderate to 1.0%-3.0% amid global uncertainties, including U.S.-China trade tensions. The Monetary Authority of Singapore (MAS) has maintained its current monetary policy, anticipating inflation to ease to around 2% by year-end, with future adjustments depending on inflation trends.

Emerging Markets

Brazil

Brazil's economy showed resilience in Q2 2024, with real GDP rising 2.1% year-over-year in May. The labor market tightened further, with unemployment falling to 6.7% in August, the lowest since 2014, and employment growing 2.8% year-over-year. Wage growth exceeded 9% for the fourth consecutive month. However, economic growth slowed to an annualized 1.1% in May, partly due to flooding in Rio Grande do Sul. Modest interest rate cuts by the central bank, from 13.75% to 13.5%, reflect caution over inflation risks. While the economy shows strength in services and labor markets, challenges like sectoral disparities and cautious monetary easing remain.

India

India's economy has demonstrated remarkable resilience, with a GDP growth of 8.15% year-over-year in fiscal year 2023–2024, surpassing market expectations. This marks the third consecutive year of robust growth, averaging 8.3% annually, driven by strong domestic demand and government reforms. The labor market has shown improvements, with emerging sectors contributing to job creation and consumer spending. Looking ahead, experts forecasts a GDP growth of 7.0%–7.2% for 2024–2025, bolstered by increasing consumer spending, especially in rural areas, as inflation subsides and agricultural output improves following favorable monsoon conditions. However, challenges such as inflationary pressures and global economic uncertainties persist, necessitating continued policy support and structural reforms to sustain growth momentum.

South Africa

South Africa's economy faces challenges in 2024 but shows potential for recovery in 2025. GDP stood at $377.8 billion in 2023, with a per capita GDP of $6,006.45. Annual GDP growth was 0.3% in Q1 2024, with growth projected to rise to 1.4% in 2025-2027, up from 1.0% in 2024. The South African Reserve Bank's recent 25-basis-point rate cut to 7.75% signals an improved inflation outlook. While recovery remains modest, investors should monitor economic policies and global trends for future opportunities.

China

As of 2024, China's economy shows steady growth, supported by stable indicators. The consumer price index (CPI) rose by 0.3% year-on-year in October 2024, while the producer price index (PPI) declined by 1.3%, signaling mild inflationary pressure. The urban surveyed unemployment rate remained stable at 5.0% in Q3. To stimulate growth, the People's Bank of China reduced the one-year loan prime rate (LPR) to 3.55% and the five-year LPR to 4.20%. Looking ahead to 2025, the IMF forecasts CPI growth of 2.0%, aligning with the central bank's target, while unemployment is expected to remain at 5.0%. Monetary policy is likely to stay accommodative, with minor adjustments as needed.

These conditions provide a supportive environment for China's stock market. Meanwhile, the bond market may see lower yields as accommodative policies sustain liquidity, attracting investors seeking stability in government and high-grade corporate bonds. Overall, balanced inflation, steady employment, and supportive monetary policies are expected to foster continued growth in both equity and fixed-income markets.

Asset Allocation Recommendation

We combine statistical methods with our economic insights to formulate asset allocation recommendations across different investment horizons. For the 1-year horizon, we use the Momentum model as the foundation to construct the portfolio, while for the 3- and 5-year horizons, we adopt the World CAPM model as the basis for formulation.

Using these models, we estimate the predicted returns for each asset and apply optimization techniques to construct portfolios tailored to each investment horizon. However, some of the predictions deviate from our economic observations. To address these discrepancies, we adjust the portfolios based on our analysis of current economic conditions.

For instance, in the long-term horizon, the model recommends allocating approximately 34% and 30% to the U.S. market. To avoid over-concentration in a single country, we limit this allocation to 20%. Additionally, while our model predicts a very small proportion for U.S. bonds, we have chosen to allocate 5% to them. This decision reflects our belief that U.S. bonds are among the safest in the world and may hold significant value in the future. Furthermore, we have decided to exclude Germany from the portfolio altogether in short term and allocate 0.0005% in long term, as it is the only country in our analysis currently experiencing unfavorable economic conditions.

For the short-term horizon, we made significant adjustments to the allocations in emerging markets. For instance, while the predicted returns for Brazil, China, and South Africa are quite poor, we believe Brazil is likely to perform well based on our economic analysis, so we allocate 3% to it. For China and South Africa, we still want them included in the portfolio but at minimal levels, assigning 0.01% and 0.005%, respectively.

Meanwhile, India shows strong predicted returns. However, to mitigate risk, we limit the allocation to 15%, as we do not want excessive exposure to emerging markets. With the reduction in India's proportion, the allocation to the U.S. market increased to around 40%. To diversify risk further, we also limit the U.S. allocation to 20%, ensuring a more balanced and diversified portfolio.

TABLE I: Portfolio weights for each horizon

	1 year	3 year	5 year
Australia	9.77%	24.17%	13.82%
Canada	0.27%	13.76%	14.15%
Germany	0%	0.005%	0.005%
Japan	1.97%	13.19%	13.12%
Singapore	1.59%	2.13%	1.86%
UK	8.88%	0.53%	2.53%
USA	20%	20%	20.00%
Brazil	3%	9.54%	3.19%
China	0.01%	0.37%	0.68%
India	15%	0.12%	1.28%
South Africa	0.005%	6.35%	7.19%
Australia Bond	15.43%	4.51%	9.63%
China Bond	7.26%	0.32%	7.54%
US Bond	16.79%	5%	5%

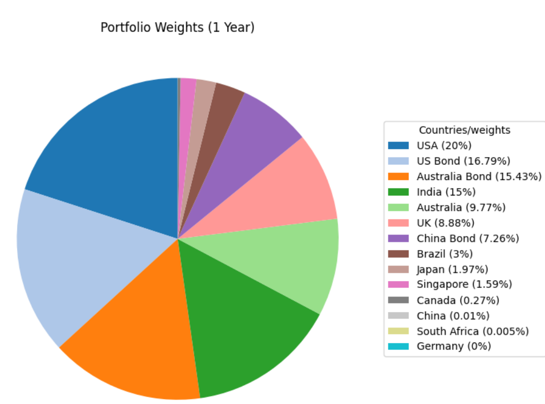

Fig. 1: portfolio weight 1 year

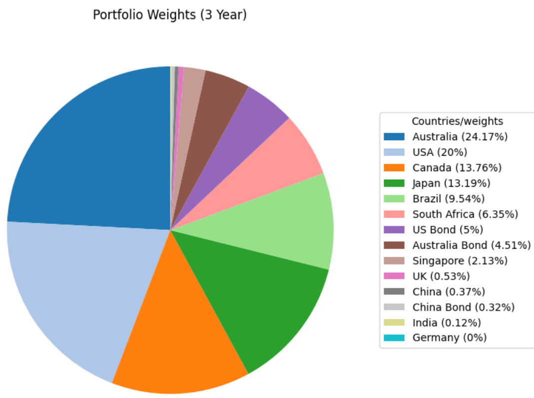

Fig. 2: portfolio weight 3 year

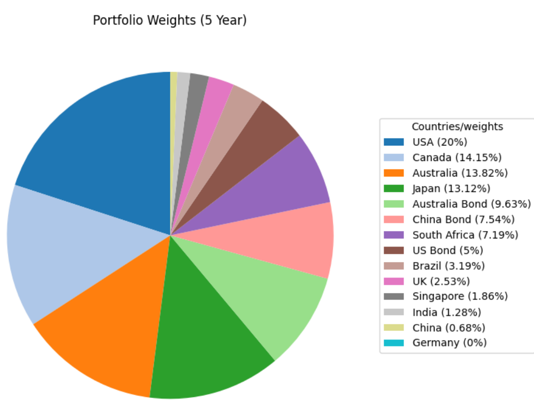

Fig. 3: portfolio weight 5 year

Conclusion

Based on our asset allocation analysis, we recommend that investors allocate a higher weight to fixed-income assets (bonds) in the short term. Our predictions indicate that bonds offer relatively low volatility compared to stocks with similar returns, making them a more stable choice. For the long term, however, we suggest increasing the weight of equities in the portfolio. This recommendation is based on our forecasts and economic observations, which highlight strong future performance in certain countries. To manage risk, we have also capped the weight of equities to ensure a balanced approach.

Additionally, we created three portfolio strategies tailored to different levels of risk aversion: Conservative (risk aversion level of 7), Neutral (risk aversion level of 3), and Aggressive (risk aversion level of 0.9). These strategies serve as a reference for investors to align their portfolios with their individual risk tolerance and investment objectives.

Finally, we emphasize that our asset allocation recommendations are derived from our forecasts and economic analyses. While these insights offer valuable guidance, we strongly encourage investors to stay informed and ready to adjust their strategies in response to evolving economic conditions.

TABLE II: Expected returns and risks for 1, 3, and 5 year horizons for three different risk aversion levels, Using risk aversion levels of 7, 3, and 0.9, we create Conservative, Neutral, and Aggressive portfolios, respectively.

	1 year		3 year		5 year	
	Return	**Risk**	**Return**	**Risk**	**Return**	**Risk**
Conservative	8.33%	8.28%	5.47%	7.09%	7.86%	5.55%
Neutral	9.09%	9.87%	7.36%	11.84%	10.56%	12.64%
Aggressive	9.89%	11.05%	9.41%	18.52%	12.95%	19.61%

Appendix-1 Methodology

To construct portfolio we do following steps

- We collected all stock price data from the MSCI website. For the world market portfolio, we selected the ACWI index, as global markets have become increasingly financially integrated in recent years. Including emerging markets in our portfolio further enhances the relevance and comprehensiveness of our analysis.
- Next, we forecast returns for various assets using different models tailored to each investment horizon. We then apply optimization methods, combined with adjustments based on our economic observations, to construct the final portfolio.

Strategic asset allocation (SAA)

World CAPM

since we are forecasting for long term , therefore we assume UH holds ,then the ICAPM becomes World CAPM

⧫ **Suppose UH holds:**

$$\mathbb{E}[\Delta I_{S,t,DC/FC}] = Ifp_{t-1,DC/FC}$$

Then, the ICAPM becomes:

$$\begin{aligned}\mathbb{E}[r_i] &= r_F^{DC} + \beta_i \mathbb{E}[r_{WM} - r_F^{DC}] \\ &\quad + \sum_{k=1}^{K} \gamma_k \mathbb{E}[\Delta I_{S,DC/FC_k} - Ifp_{DC/FC_k}]\end{aligned}$$

Simplified:

$$\mathbb{E}[r_i] = r_F^{DC} + \beta_i \mathbb{E}[r_{WM} - r_F^{DC}]$$

now we run this regression to get beta.

$$E(r) = \alpha + \beta r_{WM} + \varepsilon$$

once we get the parameter , then we use random forest method to estimate the risk premium of the world market ,and then plug into this model to get the predicted return for assets. For bonds, we use this model to forecast return:

$$\mathbb{E}[r_i] = r^{FC} - D \cdot \mathbb{E}[\Delta r^{FC}] + \Delta I_{S,DC/FC}$$

we get risk free rate from website and then use time series to forecast the future rate and for the exchange rate movement we use forward and spot rate to calculate and then put it into this model to get the predicted return.

Tactical Asset Allocation (TAA)

Momentum Model

To forecast short term return we use Momentum model.

$$r_{M_{t+1}} = \alpha + \beta_0 r_{M_t} + \beta_1 r_{M_{t-1}} + \cdots + \beta_k r_{M_{t-k}} + \varepsilon_{t+1}$$

We utilize data from the past three years to apply this model. Once all the parameters are determined, we use them to predict future returns. However, we observed that some of the predicted returns in emerging markets are notably poor. To address this, we made adjustments to the portfolio weights to ensure true diversification(refer to the "Asset Allocation Recommendation" section for details), creating a balanced and meaningful international portfolio.

Portfolio Optimization

$$\min_{\{w_1,\ldots,w_N\}} \{\sigma^2[r_p]\} = \min_{\{w_1,\ldots,w_N\}} \left\{ \sum_{i=1}^{N} w_i^2 \sigma_i^2 + \sum_{i \neq j} w_i w_j \sigma_i \sigma_j \rho_{ij} \right\}$$

s.t.

$$\sum_{i=1}^{N} w_i \mathbb{E}[r^i] = \mathbb{E}[r_p]$$

$$\sum_{i=1}^{N} w_i = 1$$

We use this optimization method to construct our optimal portfolio, ensuring that all asset weights are greater than zero. This restriction reflects the practical challenges most individual investors face when attempting to short assets. By inputting our forecasted returns, the standard deviation of each asset, and the covariance and correlation between assets, we calculate the weights for the optimal portfolio. Additionally, we make adjustments to some asset weights based on our economic analysis (refer to the "Asset Allocation Recommendation" section for details).

Table 1: Momentum regression coefficients for 1-year forecast

Country	R^2	α (Alpha)	β_0 (Beta 0)	β_1 (Beta 1)
Australia	0.0976	0.0048	-0.2008	-0.2694
Canada	0.0982	0.0027	-0.3279	-0.1143
Germany	0.0050	0.0007	0.0345	0.0005
Japan	0.0183	0.0021	-0.0332	0.0247
Singapore	0.0273	0.0014	-0.1670	-0.0050
United Kingdom	0.0215	0.0023	-0.1331	0.0841
USA	0.0501	0.0079	-0.1959	-0.1534
Brazil	0.0666	0.0254	-0.2608	-0.1889
China	0.0263	-0.0083	-0.1314	-0.1185
India	0.0745	0.0087	0.1361	-0.2705
South Africa	0.0316	0.0001	-0.1076	-0.1488

Table 2: 3-Year Regression Results

Country	**Intercept**	**Beta**	R^2
Australia	-0.0025	1.1675	0.7583
Canada	-0.0013	0.9923	0.8381
Germany	-0.0035	1.2157	0.8213
Japan	-0.0025	0.9045	0.8242
Singapore	-0.0023	0.7755	0.5178
United Kingdom	0.0005	0.7817	0.6352
USA	0.0018	1.0387	0.9627
Brazil	-0.0035	0.9145	0.3149
China	-0.0101	0.5846	0.0934
India	0.0052	0.6051	0.4334
South Africa	-0.0017	1.1134	0.4710

Table 3: **5-Year Regression Results**

Country	**Intercept**	**Beta**	R^2
Australia	-0.0070	1.3171	0.8273
Canada	-0.0028	1.1199	0.8687
Germany	-0.0065	1.2220	0.8549
Japan	-0.0029	0.7753	0.7196
Singapore	-0.0073	0.9166	0.6243
United Kingdom	-0.0051	0.9270	0.7378
USA	0.0028	1.0301	0.9667
Brazil	-0.0171	1.4159	0.4645
China	-0.0069	0.5385	0.1187
India	0.0037	0.8993	0.5283
South Africa	-0.0071	1.2199	0.5710

Table 4: Expected returns and Volatilities of forecasted years

Assets	**1 year**		**3 year**		**5 year**	
	returns	**volatility**	**returns**	**volatility**	**returns**	**volatility**
Australia	5.61%	15.75%	9.33%	22.32%	12.94%	25.57%
Canada	3.87%	11.54%	7.93%	18.04%	11.08%	21.22%
Germany	0.671%	12.1%	9.72%	22.33%	13.39%	23.34%
Japan	3.47%	11.93%	7.23%	16.58%	9.97%	16.14%
Singapore	1.86%	12.99%	6.2%	17.94%	8.53%	20.48%
UK	3.35%	10.81%	6.25%	16.33%	8.88%	19.06%
USA	8.14%	9.39%	8.31%	17.62%	11.92%	18.5%
Brazil	-4.09%	15.47%	7.31%	27.13%	9.99%	36.69%
China	-9.25%	29.46%	4.66%	31.85%	5.6%	27.6%
India	9.89%	14.04%	4.84%	15.3%	7.35%	21.85%
South Africa	0.00794%	17.16%	8.9%	27.01%	12.41%	28.51%
Australia Bond	3.26%	4.42%	4.26%	5.66%	6%	4.93%
china Bond	1.03%	1.09%	1.03%	1.06%	5.83%	1.35%
US Bond	3.88%	4.04%	1.74%	4.7%	-1.934%	4.27%