

The ETF Portfolio Strategist

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Strategy, Benchmark and Risk/Return Definitions

Strategy Benchmarks

US.60.40: US stocks (VTI)/bonds (BND) portfolio, rebalanced every Dec. 31 to a 60%/40% allocation.

GMI: an unmanaged global portfolio that holds the major asset classes in market-value weights. GMI represents a broadly defined opportunity set for conventional investing strategies and is presented as a passive benchmark that's theoretically the optimal strategy for the average investor with an infinite time horizon.

Major Asset Classes: Fund Proxies			
Stocks	US	US equities	Vanguard Total Stock Market (VTI)
	Foreign	Foreign devlp'd mkts equities	Vanguard FTSE Developed Markets (VEA)
		Emerging markets equities	Vanguard FTSE Emerging Markets (VWO)
Bonds	US	US investment grade bonds	Vanguard Total Bond Market (BND)
		US inflation-linked Treasuries	iShares TIPS Bond (TIP)
		US junk bonds	SPDR Bloomberg High Yield Bond (JNK)
	Foreign	Foreign devlp'd mkts gov't bonds	SPDR Bloomberg Int'l Treasury (BWX)
		Emerging markets gov't bonds	VanEck Vectors JPM EMLC Bonds (EMLC)
		Foreign gov't inflation-linked bonds	SPDR Citi Int'l Gov't Infl-Indexed Bonds (WIP)
		Foreign invest-grade corporates	Invesco Int'l Corporate Bonds (PICB)
		Foreign junk bonds	VanEck Vectors Int'l High Yield Bond (IHY)
Alts	Commodities	Commodities	WT Continuous Commodity (GCC)
	Real Estate	US REITs	Vanguard US Real Estate (VNQ)
		Foreign REITs/real estate	Vanguard Global ex-US Real Estate (VNQI)

G.B5: a twist on GMI that reduces fund holdings to five broadly defined funds that target global exposure to stocks (VT), US bonds (BND), international bonds ex-US (BNDX), global real estate (REET) and commodities (GCC). Target weights: 60% stocks, 15% US bonds, 15% international bonds ex-US (BNDX), 5% global real estate and 5% commodities. The overall asset allocation is 60% stocks, 30% bonds and 10% alternatives. The portfolio is rebalanced every Dec. 31.

Global Beta 5 (G.B5)			
Stocks	60%	Global	Vanguard Total World Stock Market (VT)
Bonds	15%	US	Vanguard Total Bond Market (BND)
	15%	Foreign	Vanguard Total International Bond (BNDX)
Alts	5%	Global	Wisdom Tree Continuous Commodity (GCC)
	5%		iShares Global REIT ETF (REET)

G.B16: an expanded version of G.B5 via 16 ETFs that slice and dice the world’s major asset classes into a more granular opportunity set – 16 betas in all. The overall allocation matches G.B5 weights: 60% stocks, 30% bonds, 5% real estate shares and 5% commodities. The portfolio is rebalanced every Dec. 31.

Global Beta 16 (G.B16)						
Stocks	60%	US	30%	Large cap	25%	Vanguard Total Stock Market (VTI)
				Small Cap	5%	iShares Core S&P Small-Cap (IJR)
		Foreign	30%	Europe	10%	Vanguard FTSE Europe (VGK)
				Asia ex-Japan	10%	iShares MSCI All Country Asia ex Japan (AAXJ)
				Japan	5.0%	iShares MSCI Japan ETF (EWJ)
				Latin America	2.5%	iShares Latin America 40 (ILF)
				Africa	2.5%	VanEck Vectors Africa Index ETF (AFK)
Bonds	30%	US	15%	US Government	5%	iShares 7-10 Year Treasury Bond (IEF)
				US Corp (inv grade)	5%	iShares iBoxx Invest. Grade Corporate Bond (LQD)
				US Junk	5%	SPDR Bloomberg Barclays High Yield Bond (JNK)
		Foreign	15%	Foreign Government	5%	SPDR Bloomberg Barclays Int'l Treasury Bond (BWX)
				Foreign Junk	5%	VanEck Vectors Int'l High Yield Bond (IHY)
				Emerging Markets	5%	VanEck Vectors JP Morgan EM Local Currency Bond (EMLC)
				Commodities	5%	Wisdom Tree Continuous Commodity (GCC)
Alts	10%	Real Estate	US REITs	2.5%	Vanguard Real Estate (VNQ)	
			Foreign REITs	2.5%	Vanguard Global ex-U.S. Real Estate (VNQI)	

Proprietary Strategies

G.B16.MINV: a proprietary strategy that uses an optimization algorithm to identify the lowest-variance portfolio (without cash) based on the G.B16 funds (see table above). The long-only portfolio is rebalanced weekly (end of trading week). No constraints for weights are imposed on the optimization.

G.B16.MDD: a proprietary strategy that uses drawdown as a risk-management tool – managed drawdown (MDD). If current drawdown falls below the 50th percentile (based on a rolling 50-day window), a risk-off signal is issued. A second filter applies before any tactical trading takes place: If the risk-off signal persists for each of the last two trading days in a given week, the risk asset is sold at the open on the first trading day of the next week and the proceeds are moved to the “safe” asset: iShares Short Treasury Bond (SHV), a cash proxy. Any trading events are based on prices at the open of a trading week from signals issued at the previous week’s close. The risk assets are the 16 funds in G.B16. Each fund’s weight (which switches between a risk and risk-off asset) is rebalanced to the target weights indicated for G.B16 every Dec. 31 (see table above).

G.B16.MVOL: a proprietary strategy that uses volatility (standard deviation) as a risk-management tool – managed volatility (MVOL). If return volatility (based on the trailing 10-day window) rises above the 99th percentile (calculated over the rolling 100-day period), a risk-off signal is triggered. A second filter applies before any tactical trading takes place: If the risk-off signal persists for each of the last two trading days in a given week, the risk asset is sold at the open on the first trading day of the next week and the proceeds are moved to the “safe” asset: iShares Short Treasury Bond (SHV), a cash proxy. Any trading events are based on prices at the open of a trading week from signals issued at the previous week’s close. The risk assets are the 16 funds in G.B16. Each fund’s weight (which switches between a risk and risk-off asset) is rebalanced to the target weights indicated for G.B16 every Dec. 31 (see table above).

Risk and Return Metrics

Returns (5 day ret %, YTD ret %, 1 yr ret %, 3 yr ret %, 5 yr ret %)

Total returns. Note: 3-year and 5-year performances are based on annualized results using daily prices
Note: ETFs are ranked by 5-year return within their category (US equities, foreign bonds, etc.)

Volatility (5yr Vol)

Trailing 5-year annualized standard deviation based on daily returns

Sharpe ratio¹ (5yr SR)

Trailing 5-year annualized Sharpe ratio (assuming a constant 0% risk-free rate) based on daily returns

Sortino ratio² (5yr SR)

Trailing 5-year annualized Sortino ratio (assuming a constant 0% minimum acceptable return) based on daily returns

Maximum Drawdown³ (Max DD)

Maximum drawdown for the trailing 5-year period

Current Drawdown (Curr DD)

Current drawdown

Momentum (MOM)

A proprietary measure of momentum strength/weakness, ranging from 0 (upside momentum is nil) to 1.0 (highest level of momentum strength). The ranking is based on the average of ten signals via moving averages and trailing return:

1. 50-day simple moving average
2. 100-day simple moving average
3. 200-day simple moving average
4. Ratio of 10-day simple moving average to 50-day simple moving average
5. Ratio of 50-day simple moving average to 100-day simple moving
6. Ratio of 50-day simple moving average to 200-day simple moving
7. Ratio of 100-day simple moving average to 200-day simple moving
8. Trailing 3-month return (63 trading days)
9. Trailing 6-month return (126 trading days)
10. Trailing 12-month return (252 trading days)

¹ Sharpe ratio quantifies the return per unit of risk (standard deviation) and so higher (lower) values equate with higher (lower) risk-adjusted return.

² Sortino ratio quantifies the return per unit of risk (downside semivariance) and so higher (lower) values equate with higher (lower) risk-adjusted return.

³ The maximum peak-to-trough decline incurred during the most recent trailing 5-year period.

Volatility (VOL)

A proprietary measure of return volatility ranging from 0 (relatively low volatility) to 1.0 (highest level of volatility). Relatively high (low) volatility is considered a high (low) risk profile. The ranking provides a first approximation for comparing how volatility compares on a relative basis across asset classes and within a given asset class. The ranking is based on the following ten metrics, which are averaged in the overall VOL score:

1. Ratio of trailing 20-day volatility/10-day EMA of trailing 20-day volatility
2. Ratio of trailing 20-day volatility/20-day EMA of trailing 20-day volatility
3. Ratio of trailing 20-day volatility/30-day EMA of trailing 20-day volatility
4. 10-day EMA of trailing 20-day volatility/20-day EMA of trailing 20-day volatility
5. 10-day EMA of trailing 20-day volatility/30-day EMA of trailing 20-day volatility
6. 10-day EMA of trailing 20-day volatility/40-day EMA of trailing 20-day volatility
7. 10-day EMA of trailing 20-day volatility/50-day EMA of trailing 20-day volatility
8. Trailing 10-day change in of trailing 20-day volatility
9. Trailing 20-day change in of trailing 20-day volatility
10. Trailing 30-day change in of trailing 20-day volatility