

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.B5.ew: an equal-weighted version of G.B5, targeting 25% stocks (VT), 25% real estate/REITs (REET), 25% commodities (GCC) and 25% in bonds (split equally between BND and BNDX). The portfolio is rebalanced every Dec. 31 to the equal-weight targets.

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 (VGI)
				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)
Alts	10%	Commodities	Commodities	5%	Wisdom Tree Continuous Commodity (GCC)	
		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.MOM: a proprietary strategy that uses price momentum as a risk-management tool. At the end of each month, each fund’s 10-month average (based on month-end prices) is calculated. If the current month-end price is above the 10-month average, the ETF position is risk-on. (*Note: 10-month average is based on a weighted moving average (WMA), which assigns greater weights to more recent data. This is similar to an exponential moving average (EMA) except that WMA, unlike EMA, only uses data within the rolling window – 10 months in this case.*) If the current month-end price equals or is below the 10-month average, the position is risk-off and the allocation for the ETF is moved to a “safe” asset: iShares Short Treasury Bond (SHV), a cash proxy. The risk assets are the 16 funds in G.B16 (see table above). Each fund’s allocation (which switches between a risk and risk-off asset per the rules above) is rebalanced to the target weights indicated for G.B16 every Dec. 31 (see table above). For purposes of rebalancing, risk signals are calculated after the close of each month-end’s trading and any fund changes are executed at the open of the following trading day.

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 allocation (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 allocation

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

Mean Reversion (MR)

A proprietary measure that calculates the percentile of the 5-year return relative to history. At the extremes, MR can be used as a proxy for evaluating the potential for mean reversion in an asset in the near-term future. The 5-year returns start in 2019 (calculated with price data beginning in 2014) and so the percentile rank reflects the current 5-year return in the context of that start date. Note, too, that the 5-year returns are calculated based on monthly (month-end) prices and reflect total returns. For data calculated intra-month in the current month, the latest daily price is used as a proxy for the month-end data. MR values range from 1 to 99. A 99 value indicates that the current 5-year return is at the highest level relative to the return history; a reading of 1 indicates the lowest 5-year return.

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.