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A tale of two decades for U.S. and non-U.S. equity: Past is rarely prologue

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U.S. equities outperformed their international counterparts by 8 percentage points per year on average over the 10 years ended December 31, 2019. However, our proprietary Vanguard Capital Markets Model (VCMM) suggests that this outperformance is unlikely to persist over the next 10 years.

This paper outlines our framework for assessing equity returns, uses that framework to explain historical U.S. and international equity returns, contextualizes the 10-year outlook in VCMM using the drivers of past returns, and highlights the implications for investors' portfolios.

A sum-of-parts framework for assessing equity returns

Equity returns are best considered using a sum-of-parts framework like the one proposed by Ferreira and Santa-Clara (2011), Bogle (1995), and Bogle and Nolan (1991, 2015) and expanded upon by Davis et al. (2018). With this framework, we can decompose prior returns or forecast future returns using an accounting identity in which equity returns are the sum of the following:

1. **Change in valuations.** Typically, equity valuation is measured by the price/earnings (P/E) ratio, but it can be articulated based on several different market-to-accounting statement metrics (e.g., price-to-book). Valuations can either contract (downward change) or expand (upward change).

2. **Earnings growth.** The denominator of the P/E ratio is earnings per share, which is a key metric of corporate profitability. If valuations are held constant, higher earnings growth rates will increase equity prices.

3. **Dividend yield.** This is equal to the earnings yield (also known as E/P) times the percent of earnings that companies distribute to shareholders as regular dividends (the payout ratio). It represents the cash return to investors.

4. **Foreign exchange return.** This return applies to foreign currency exposure that investors obtain by owning non-U.S. dollar denominated assets. It is driven by the appreciation or depreciation of the foreign currency relative to the investor's domestic currency.

IMPORTANT: The projections and other information generated by the VCMM regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from VCMM are derived from 10,000 simulations for each modeled asset class. Simulations are as of September 2020. Results from the model may vary with each use and over time. For more information, please see the back cover.

Figure 1 shows how these four drivers contributed to the outperformance of U.S. equities over the 10 years ended December 31, 2019.[1]

Explaining past results

Although the attribution shown in Figure 1 is revealing, it gives little context as to why U.S. equities outperformed their international peers. In this section, we seek to provide that context by looking at past relative performance for each of the four parts through the lens of economic and corporate drivers.

Changes in valuations

Any conceptual framework for the macro drivers of equity valuations is a combination of forward-looking views of fundamental macro variables such as inflation, interest rates, and economic growth, and psychological factors such as uncertainty in the macro environment and investor risk aversion. Though investor psychology is difficult to quantify, we find that a model that estimates equity valuations as a function of such fundamental factors can explain the high valuation of U.S. equities relative to equities of other developed-market countries.

In the case study for relative U.S. to European equity valuation, we estimate a model to examine the relationships between the relative valuation and differences in 10-year trailing inflation, 10-year nominal yields, 3-year trailing GDP growth, and 3-month equity volatility. Much of the variation in relative valuations is left unexplained, as the model doesn't capture psychological factors or all aspects of market composition. Even so, we can see from the close fit between actual and predicted valuations in **Figure 2** on page 3 that the macro environment does explain why U.S. valuations rose more quickly than their European counterparts.

Earnings growth

Earnings growth changes are the sum of changes in revenue growth and changes in profit margins. Our analysis shows that earnings have grown faster in the U.S. than they have in other countries because of higher GDP growth rates. A positive beta coefficient of 1 in the relationship between revenue growth and nominal GDP growth indicates that average revenue growth will equal economic growth over extended periods.[2] Over the past 10 years, nominal U.S. GDP growth has exceeded international growth by an average of 1.8 percentage points per year on a market-capitalization-weighted basis.[3]

Figure 1. Changes in valuations contributed the most to U.S. outperformance for the 10 years ended December 31, 2019
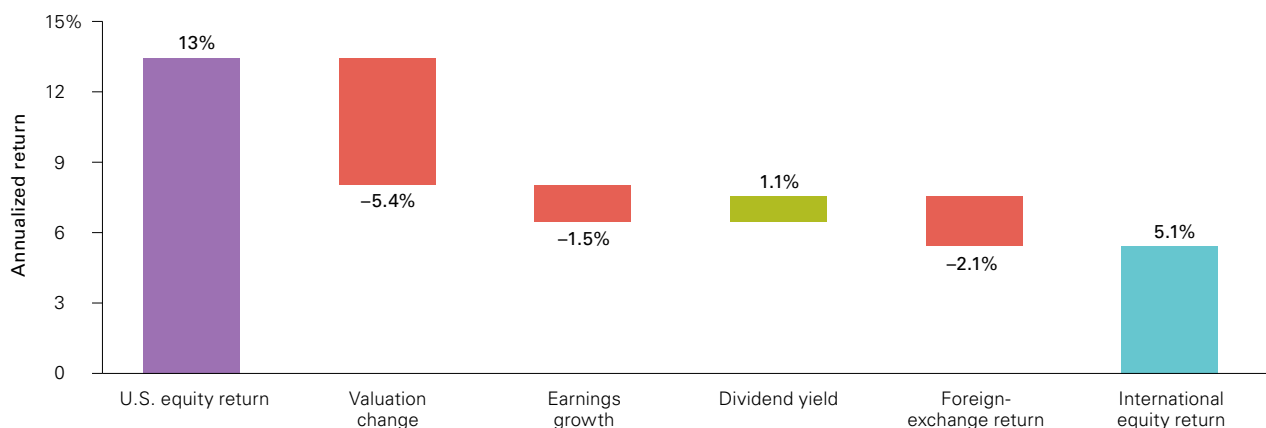
Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

Notes: Data cover January 1, 2010, through December 31, 2019. The U.S. equity return is represented by the MSCI USA Index return; the international equity return is represented by the MSCI ACWI ex USA Index return.

Sources: Vanguard calculations, based on data from Thomson Reuters Datastream and Global Financial Data.

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1 Throughout this paper, U.S. equities are represented by the MSCI USA Index; international equities, by the MSCI ACWI ex USA Index.

2 Based on ordinary least squares (OLS) regression of nominal year-over-year GDP and revenue growth rates, using data from the U.S. Bureau of Economic Analysis, Oxford Economics, and FactSet. For the U.S. regression, the intercept is 1.5 and the beta coefficient is 1.03; for the international regression, the intercept is −0.28 and the beta coefficient is 1.08. The intercept of U.S. regression captures sources of revenue growth from other economies. For both regressions, the beta coefficient is statistically significant at the 1% level.

3 Using MSCI ACWI ex USA Index weights for each year from 2010 to 2019 and year-over-year change in nominal GDP at current prices (in U.S. dollars). Our sources for our calculations were FactSet, the International Monetary Fund's World Economic Outlook database, and the U.S. Bureau of Economic Analysis.

Change in corporate profit margins is also an important driver of earnings growth. **Figure 3** shows U.S. profit margins going back to 1950; note the marked increase in the level of profit margins around 2000. This increase could be caused by globalization; it occurs less than 10 years after the North American Free Trade Agreement (NAFTA) went into effect and corresponds with both a rise in U.S. imports and exports as a percentage of GDP and China's inclusion in the World Trade Organization (WTO). Whatever the cause, average profit margins do seem to have reset higher over the past two decades, and one can argue that they will stay higher.

Although similar data series (in terms of length and consistency of approach) for other countries are difficult to obtain, it is possible to solve for the change in profit margins using the regression estimates for U.S. and international revenue growth detailed on page 2 and the earnings growth calculated for Figure 1. When we do so, we find that, consistent with Figure 3, profit margins in the U.S. are almost unchanged, growing modestly by 0.8% over the previous decade, whereas profit margins internationally grew by 3.0%.[4]

Figure 2. Macroeconomic factors explain the higher CAPE ratios in the U.S. compared with Europe
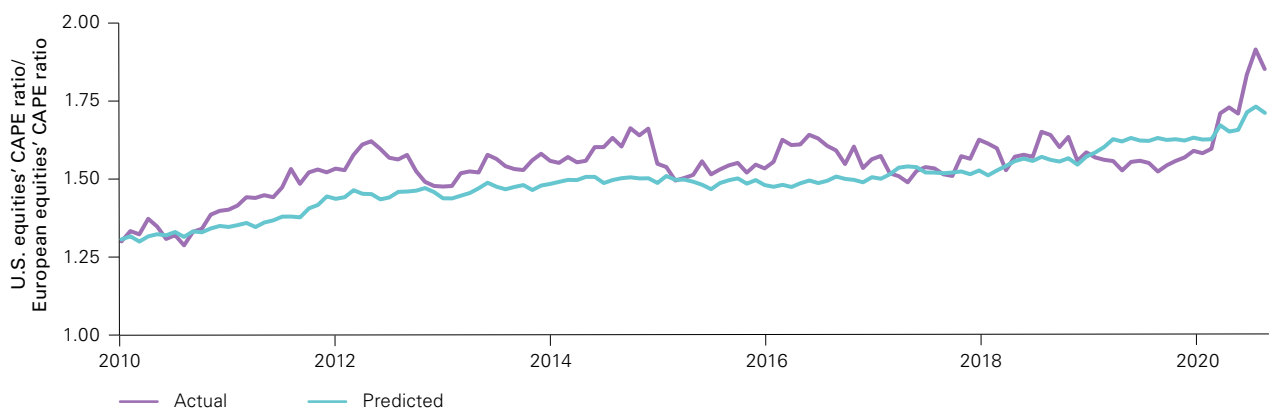
Notes: Data cover January 1, 2010, through September 30, 2020. The figure shows how the cyclically adjusted price-to-earnings (CAPE) ratio for U.S. equities, as represented by the MSCI USA Index, compared with the CAPE ratio for European equities, as represented by the MSCI Europe Index. Both the predicted and actual comparisons are shown. We used a vector autoregression model with four lags. The fact that both lines trend upward suggests that the predicted ratio of U.S.-to-European equity valuations (based on macroeconomic fundamentals) rose at the same rate as the actual ratio of the two region's CAPEs over the 10-year period.
Sources: Vanguard calculations, based on data from Thomson Reuters Datastream.

Figure 3. Corporate profit margins in the U.S. took a step up at the turn of the century
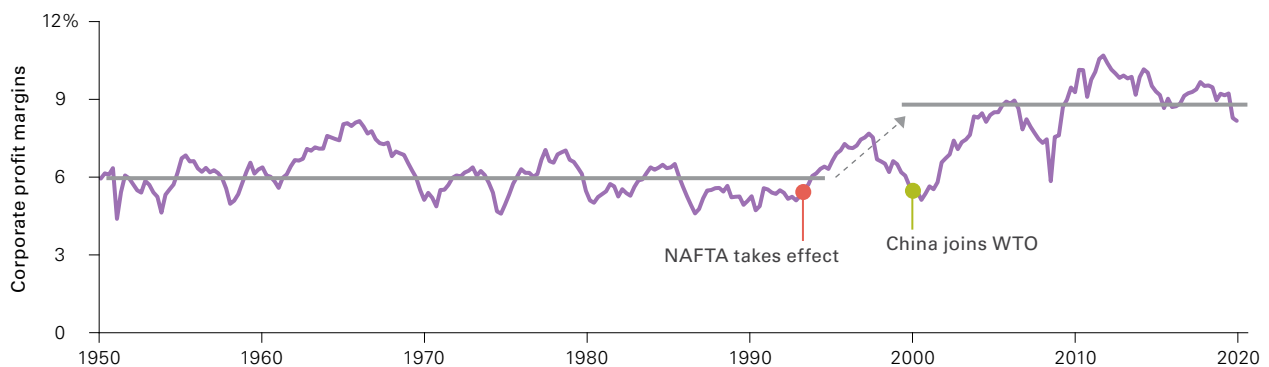
Notes: Data cover February 15, 1950, through May 15, 2020. Corporate profit margins are after tax and with inventory valuation adjustment and capital consumption adjustment.
Source: The U.S. Bureau of Economic Analysis.

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4 Nominal GDP growth was 3.7% in the U.S. and 1.9% for the market-capitalization-weighted countries in the MSCI ACWI ex USA Index during the 10 years ended December 2019. Using estimated revenue growth in a reordered equation for earnings growth whereby change in profit margins = earnings growth – revenue growth, we calculate that profit margins grew 0.8% in the U.S. and 3.0% internationally over the same period.

Taken together, our analyses of revenue and profit margins over the past decade are in line with the decomposition shown in Figure 1, where earnings growth contributes 1.5 percentage points to U.S. equity outperformance. On a relative basis, revenue grew 3.6 percentage points more per year in the U.S. compared with the rest of the world, thanks to higher GDP growth and revenue growth from abroad, while the change in profit margins was 2.2 percentage points less in the U.S. compared with the rest of the world.[5]

Dividend yield

Dividend yield is the product of earnings yield and the payout ratio, and the lower dividend yield in the U.S. over the past decade can be explained by both of these factors. The lower earnings yield (inverse of the P/E ratio) in the U.S. is the result of higher equity market valuations, and market composition is an important determinant of payout ratio. Over the past few decades, the growth tilt in U.S. broad market indexes relative to international peers has supported higher retained earnings and a 10% lower payout ratio in the U.S. compared with international markets.[6]

Foreign currency returns

The past 20 years of U.S. dollar performance can best be described as two divergent decades. For the 10 years ended December 31, 2010, dollar depreciation contributed 3% to a U.S.-based investor's return on non-U.S. assets. Over the next decade, on the other hand, dollar appreciation contributed a 1.5% loss to returns on international assets held by the same investor. Vanguard's fair-value framework for currencies suggests that trade, productivity, and interest rate differences explain most of the change in real exchange

rates (Aliaga-Díaz et al., 2019). As the U.S. economy expanded faster than its developed-market peers and U.S. asset prices rose, demand for U.S. dollars increased and the currency appreciated.

The next 10 years

The VCMM models the uncertainty in all sum-of-parts components and the asset returns to form a full probability distribution of projected return outcomes. As shown in Figure 4 on page 5, the sum-of-parts framework used earlier to decompose historical returns can also be used to explain our forward-looking expectation, which we define as the median of the projected return distribution. We expect higher international equity returns over the next decade compared with the last, and we believe that U.S. equity returns will be about 8 percentage points lower than the last decade on an annualized basis.
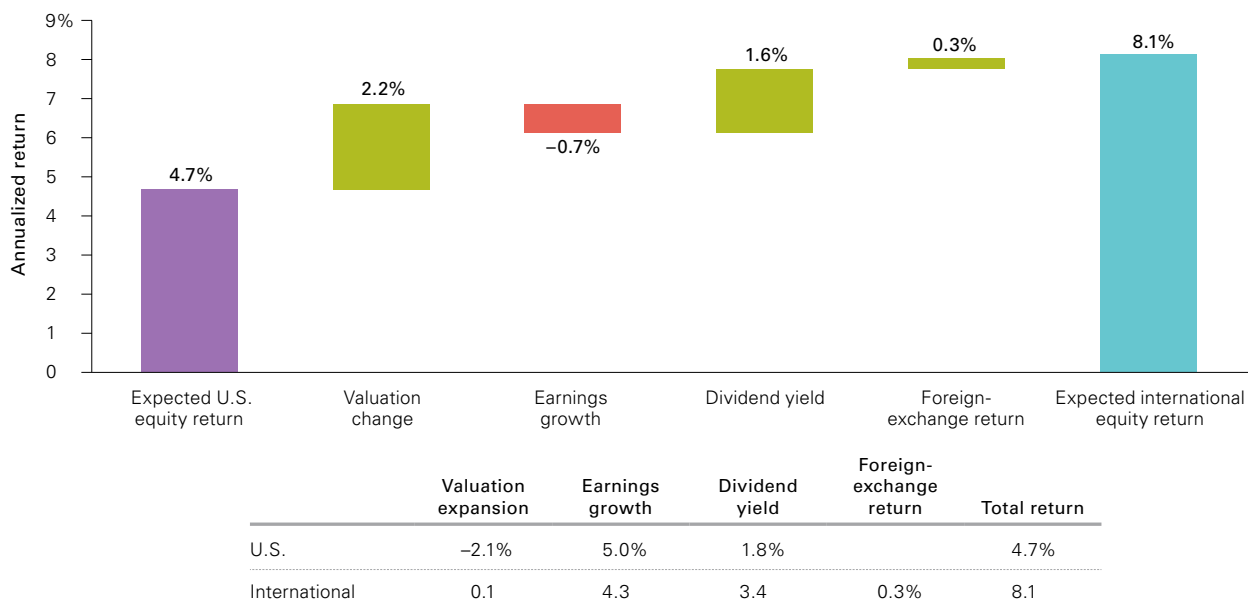
The lower return expectations for U.S. relative to international equity are mainly a function of the higher initial valuations in the U.S. Our reasoning here is based on the statistical relationship highlighted in Figure 5 on page 5 for both U.S. and international equities. The scatterplots in this figure show an inverse relationship between starting valuations, measured as the ratio of the broad equity market price to the 10-year rolling average of inflation-adjusted earnings, and future 10-year returns. In their research on forecasting stock returns, Davis et al. (2018) find evidence of mean reversion in equity valuations that is conditional on the inflation and interest rate environment.[7] Our expectation for valuation contraction in the U.S. over the next 10 years accounts for 2.2 percentage points of the difference in expected returns.

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5 A 1.8 percentage point revenue growth plus a 0.4 percentage point profit margin contraction in the U.S. equals an earnings growth differential of 1.4 percentage points—which is very close to the 1.5 percentage point differential shown in Figure 1.

6 Growth tilt trends are based on Morningstar Style Box weights for Vanguard Total Stock Market ETF and Vanguard Total International Stock ETF, which had growth allocations of 32% and 25%, respectively; the difference in the allocations was largely because of sector differences. (The Morningstar Style Box is a nine-square grid that provides a graphical representation of the "investment style" of stocks and mutual funds.)

7 These relationships are modeled using Vanguard's proprietary fair-value CAPE. See Davis et al. (2018) for details.

Figure 4. Valuation contraction in the U.S. is expected to drive excess returns internationally over the 10 years ended December 31, 2030


	Valuation expansion	Earnings growth	Dividend yield	Foreign-exchange return	Total return
U.S.	−2.1%	5.0%	1.8%		4.7%
International	0.1	4.3	3.4	0.3%	8.1

Notes: Forward-looking return estimates are from VCMM, as of September 2020, for the period October 1, 2020, through September 30, 2030. The U.S. equity return is represented by the MSCI USA Index return; the international equity return is represented by the MSCI ACWI ex USA Index return.

Sources: Vanguard calculations, based on data from Thomson Reuters Datastream and Global Financial Data.

Figure 5. Both U.S. and international equities show an inverse relationship between starting valuations and subsequent 10-year returns

Panel A. U.S. equities
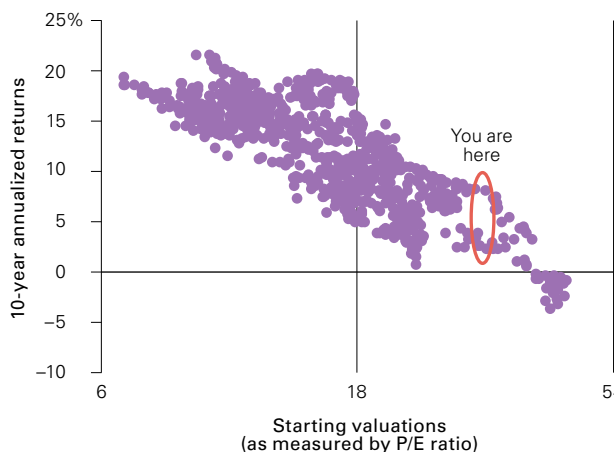
Panel B. International equities
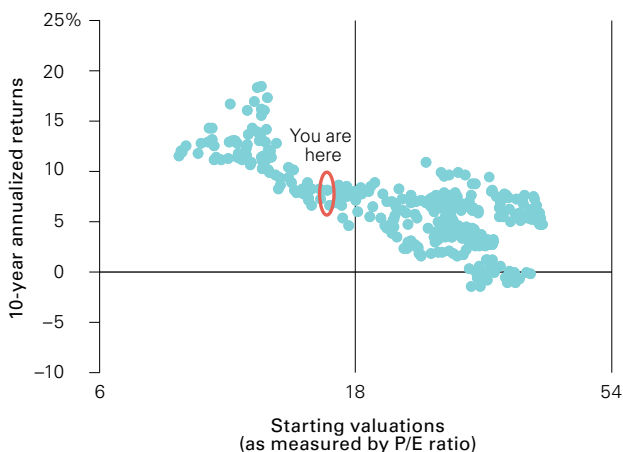
Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

Notes: For Panel A, data cover October 31, 1938, through September 30, 2010. For Panel B, data cover November 30, 1989, through September 30, 2020. Starting valuations are measured as the ratio of the broad equity market price to the 10-year rolling average of inflation-adjusted earnings (also known as the Shiller CAPE). For international equities, currency-adjusted returns are calculated by removing the effect of market-capitalization-weighted spot currency returns of the U.S. dollar relative to the Australian dollar, British pound, Canadian dollar, euro, and Japanese yen, on MSCI ACWI ex USA Index returns across time. Market-capitalization weights are based on the country composition of the MSCI ACWI ex USA Index. "You are here" marks the decade ended September 30, 2020.

Sources: For Panel A, Vanguard calculations, based on data from Standard and Poor's and Robert Shiller's website at aida.wss.yale.edu/~shiller/data.htm. For Panel B, Vanguard calculations, based on MSCI ACWI ex USA Index data from Thomson Reuters Datastream.

Our earnings growth outlook for the next decade is 5% in the U.S. and 4.3% internationally, down from the 6.3% and 4.8% we saw over the past decade. Our estimate uses the framework and model presented in the previous section on past results. Lower potential GDP will result in lower revenue growth. We expect U.S. profit margins to decline further, but (reflecting the benefits of globalization) only to their post-1990s average rather than the lower full historical average.[8] Figure 6 shows all of the inputs and outputs used in our estimate.

The valuation and earnings outlooks suggest that although equity valuations have historically displayed mean-reversion properties conditional on the macro-economic environment, our view does not require valuations to mean-revert. Figure 7 illustrates this for the U.S. by showing that even if interest rates remain low 10 years from now—which would provide support for equity valuations—less valuation contraction will likely be offset by lower economic and earnings growth over the same period.

Regarding our outlook for foreign exchange, we find that a framework that considers inflation and interest rates in projecting currency returns over a 10-year

**Figure 6. Global growth and globalization trends will drive earnings growth rates over the next decade**

	United States	International
Potential GDP	3.7%	4.2%
Revenue growth	5.3	4.3
Profit margin growth	−0.3	0.0
Earnings growth	5.0	4.3

Note: Data are as of October 2020.

Sources: Vanguard calculations, based on data from the U.S. Bureau of Economic Analysis, Oxford Economics, and FactSet. Potential GDP is from the International Monetary Fund's World Economic Outlook database. For details on model parameters, see Footnote 2 of this paper.

horizon is more practical than our fair-value model.[9] The VCMM uses inflation differentials according to purchasing power parity (PPP) conditions and real interest rate differentials (a proxy for real economic growth) to forecast currency returns. This approach suggests that dollar depreciation against the basket of international currencies will contribute an annualized positive return of 0.3% to international equities for an unhedged U.S. investor.

Figure 7. Low interest rates are associated with low GDP growth
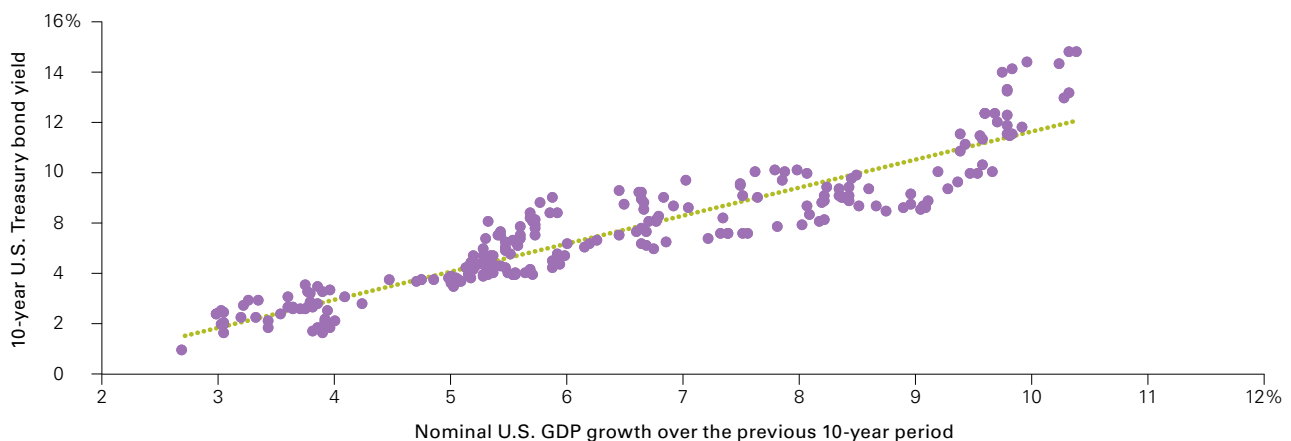
Note: Data cover January 31, 1962, through September 30, 2020.
Source: Vanguard calculations, based on data from Thomson Reuters Datastream.

**8** Additional research supporting Vanguard's house view on the future of globalization is forthcoming.
9 Such a fair-value approach also requires that we forecast the explanatory variables that drive fair values, which introduces additional uncertainty.

Accounting for the positive correlation between the two return series, **Figure 8** visualizes our outlook for 10-year relative performance by plotting each of the 10,000 VCMM simulated annualized returns for U.S. and non-U.S. equity on separate axes. The increasing share of blue dots from 2015 to 2020 suggests a growing likelihood of international equity outperformance relative to the U.S. market. That probability stands at 80% as of September 2020, compared with 65% in September 2015.

Figure 8. Likelihood of international equity outperformance

Panel A. September 2015: U.S. outperforms international in 3–4 out of 10 simulations
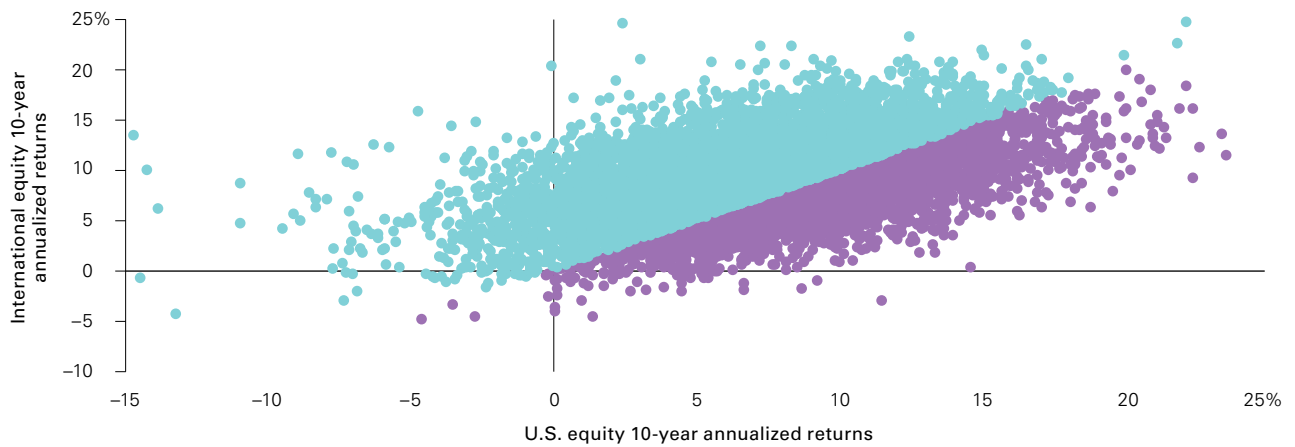
Panel B. September 2020: U.S. outperforms international in 2 out of 10 simulations

● U.S. equity outperforms
● International equity outperforms
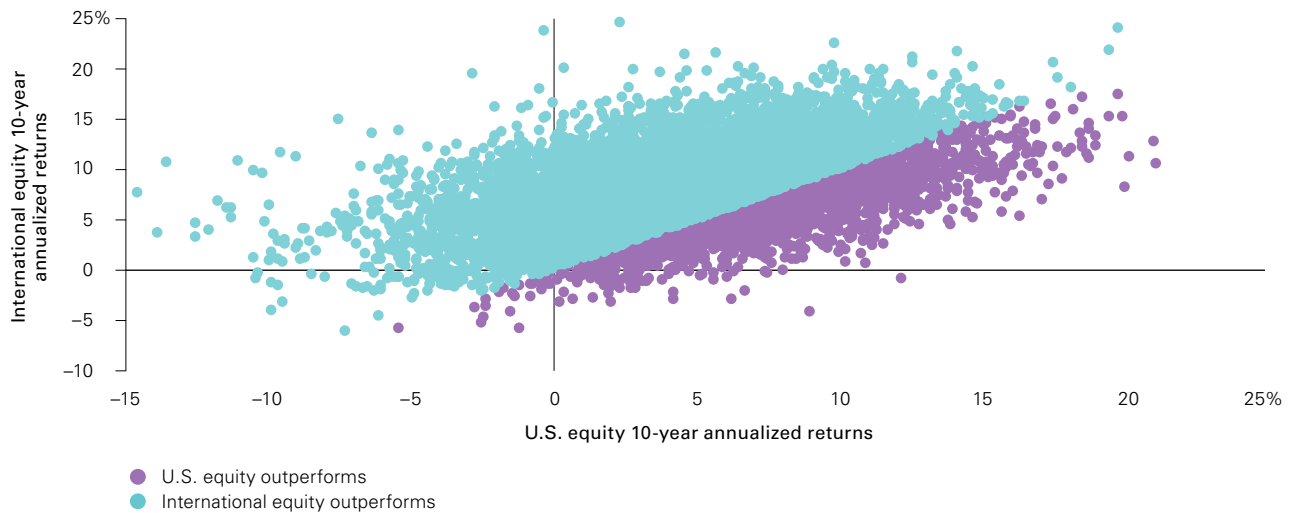
Note: Figure shows the results of 10,000 VCMM simulations for projected 10-year annualized returns as of September 2015 (Panel A) and September 2020 (Panel B).
Source: Vanguard.

Portfolio return outlook

Despite the high probabilities shown in Figure 8, the inherent uncertainty in our outlook supports a balanced equity allocation. **Figure 9** presents portfolio risk and expected return measures for five hypothetical 60% equity/40% bond portfolios in two future 10-year periods—one where U.S. equities outperform and one where international equities outperform.

The figure shows that for a 60/40 portfolio with a 100% U.S. allocation, a future where U.S. equities outperform would likely result in a return enhancement of 0.3–0.6 of a percentage point compared with more balanced portfolios—but a future where international equities outperform would result in a return shortfall of 0.8–1.4 percentage points.[10] Though uncertainty remains, a balanced portfolio that includes both U.S. and international equities would (at least) be expected to result in a more symmetrical pay-off. Investors who maintain a diversified equity portfolio might not achieve the best performance— but they do avoid the risk of choosing incorrectly and missing out on higher returns.

Beyond returns, it is also important to consider risk in the portfolio. Our analysis uses expected maximum drawdown—obtained by calculating the high to low point for each of the 10,000 VCMM simulation paths and taking the median—as the key risk metric.[11] We find that under both scenarios shown in Figure 9, the downside risk of a balanced equity allocation is as good or better than that of a 100% allocation to either U.S. or international equities.

Conclusion

The past 10 years have been tremendous for U.S. stocks relative to their international peers, largely because investors expected the U.S. to grow faster and it did. Now, however, higher valuations and slower earnings growth in the U.S. relative to the past decade make future outperformance unlikely. As a result, we expect that investors who maintain globally diversified equity portfolios will be rewarded in the years ahead.

Figure 9. Balanced equity allocations make sense, whatever the future holds

Panel A. Outcomes for 60/40 portfolios if U.S. equity outperforms
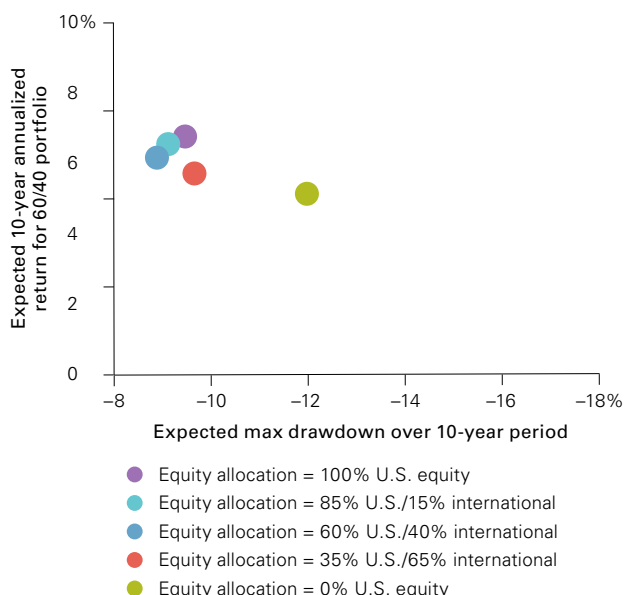
Panel B. Outcomes for 60/40 portfolios if international equity outperforms

- Equity allocation = 100% U.S. equity
- Equity allocation = 85% U.S./15% international
- Equity allocation = 60% U.S./40% international
- Equity allocation = 35% U.S./65% international
- Equity allocation = 0% U.S. equity
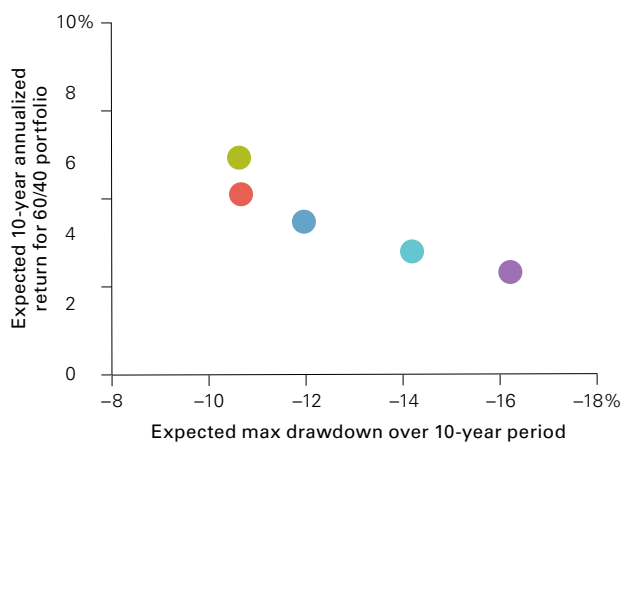
Notes: Forward-looking return estimates are from VCMM, as of September 2020. The expected maximum drawdown is the median of the differences between the high and low points of each VCMM simulation path.

Sources: Vanguard calculations, based on data from Thomson Reuters Datastream and Global Financial Data.

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10 Ranges are based on the 25th–75th percentile of the return distribution.

11 We believe that maximum drawdown—the median of the differences between the high and low points of each VCMM simulation path—represents a better view of the risk associated with equity allocations in a portfolio than standard deviation.

References

Aliaga-Díaz, Roger, Qian Wang, Giulio Renzi-Ricci, Asawari Sathe, and Jonathan Petersen, 2019. *Global Macro Matters— The U.S. Dollar at a Crossroads: Estimating Fair Value*. Valley Forge, Pa: The Vanguard Group.

Bogle, John C., 1991. Investing in the 1990s. *The Journal of Portfolio Management* 17(3): 5–14.

Bogle, John C., 1995. The 1990s at the Halfway Mark. *The Journal of Portfolio Management* 21(4): 21–31.

Bogle, John C., and Michael W. Nolan, 2015. Occam's Razor Redux: Establishing Reasonable Expectations for Financial Market Returns. *The Journal of Portfolio Management* 42(1): 119–134.

Davis, Joseph, Roger Aliaga-Díaz, Harshdeep Ahluwalia, and Ravi Tolani, 2018. Improving U.S. Stock Return Forecasts: A "Fair-Value" CAPE Approach. *The Journal of Portfolio Management* 44 (3): 43–55.

Ferreira, Miguel, and Pedro Santa-Clara, 2011. Forecasting Stock Market Returns: The Sum of the Parts Is More Than the Whole. *Journal of Financial Economics* 100(3): 514–537.

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. VCMM results will vary with each use and over time.

The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The Vanguard Capital Markets Model® is a proprietary financial simulation tool developed and maintained by Vanguard's primary investment research and advice teams. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S. money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the Vanguard Capital Markets Model is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta). At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data from as early as 1960. Using a system of estimated equations, the model then applies a Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

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