

INVESTMENT NEWSLETTER

“

How can investors make an informed decision about whether and when to hedge currency exposures?

TO HEDGE OR NOT TO HEDGE?

OCTOBER 08, 2020 | Dimensional

Many investors take a global perspective when building portfolios to achieve their investment goals. With the benefits of greater diversification and an expanded opportunity set come exposure to foreign currencies. For investors with unhedged foreign investments, when their home currency appreciates, it has a negative impact on returns; when it depreciates, the impact is positive. How can investors make an informed decision about whether and when to hedge currency exposures?

Using data on 12 developed markets from 1985 to 2019, recent research by Dimensional develops and tests a framework for evaluating the impact of currency hedging on expected returns and volatility for global equity and fixed income portfolios. An important takeaway for investors is that currency hedging decisions should depend on their asset allocations and investment goals.

The impact of currency hedging on volatility depends mostly on the magnitude of asset volatility relative to currency volatility. Stocks tend to be more volatile than currencies and drive the overall volatility of a global equity portfolio. Currencies, however, are more volatile than bonds and dominate the overall volatility of a global bond portfolio. Hence for investors with high allocations to stocks, hedging currencies does not meaningfully reduce return volatility. In contrast, for investors with high fixed income allocations, currency hedging is an effective way to reduce portfolio volatility.

Currency hedging is among the many aspects to consider when building global portfolios.

The study also confirms that monthly currency returns are largely unpredictable and not reliably different from zero on average, so hedging decisions based on predictions of currency movements are unlikely to add value. Another implication is that forward currency premiums (discounts), which are based on observable currency spot and forward rates, contain reliable information about differences in expected return between unhedged and hedged securities. Therefore, a dynamic hedging strategy can increase expected returns by selectively hedging the currency exposure in markets where the forward currency premium is positive and leaving the currency exposure unhedged otherwise. This approach does not substantially increase portfolio volatility when the majority of investments are in equities and can be appropriate for fixed income investors who are willing to accept more volatility in pursuit of higher expected returns.



Currency hedging is among the many aspects to consider when building global portfolios. We believe a robust framework backed by rigorous research, like the one shown in this study, can help investors make well-informed decisions to better achieve their investment goals.

Source: Dimensional Fund Advisors LP Weston Wellington, a Vice President with Dimensional, is one of the firm's market research experts. He works closely with financial advisors in the US, Canada, Europe, and Australia.

This information is intended for educational purposes and should not be considered a recommendation to buy or sell a particular security. Named securities may be held in accounts managed by Dimensional.

The information in this document is provided in good faith without any warranty and is intended for the recipient's background information only. It does not constitute investment advice, recommendation, or an offer of any services or products for sale and is not intended to provide a sufficient basis on which to make an investment decision. It is the responsibility of any persons wishing to make a purchase to inform themselves of and observe all applicable laws and regulations. Unauthorized copying, reproducing, duplicating, or transmitting of this document are strictly prohibited. Dimensional accepts no responsibility for loss arising from the use of the information contained herein.

"Dimensional" refers to the Dimensional separate but affiliated entities generally, rather than to one particular entity. These entities are Dimensional Fund Advisors LP, Dimensional Fund Advisors Ltd., Dimensional Ireland Limited, DFA Australia Limited, Dimensional Fund Advisors Canada ULC, Dimensional Fund Advisors Pte. Ltd, Dimensional Japan Ltd., and Dimensional Hong Kong Limited. Dimensional Hong Kong Limited is licensed by the Securities and Futures Commission to conduct Type 1 (dealing in securities) regulated activities only and does not provide asset management services.

Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual portfolio. © 2020 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved.

Dimensional Fund Advisors LP is an investment advisor registered with the Securities and Exchange Commission.

Investments involve risks. The investment return and principal value of an investment may fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original value. Past performance is not a guarantee of future results. There is no guarantee strategies will be successful.

Diversification neither assures a profit nor guarantees against loss in a declining market.

WHY WORRY ABOUT SURVIVORSHIP BIAS?

OCTOBER 12, 2020 | Dimensional

For actively managed US equity mutual funds over the period from 1991 to 2020, survivorship bias overstates the median fund alpha by 0.60% per year: The median fund alpha is -0.84% per year among surviving funds compared to -1.44% per year among both surviving and non-surviving funds.

Our research suggests that survivorship bias overstates the median fund alpha by roughly 50% compared to the survivorship bias-free median

Analyzing the performance of mutual fund managers is popular among financial researchers for the many insights it provides about markets. However, the usefulness of inference from fund returns depends critically on data quality. Because non-surviving funds tend to have poorer performance than surviving funds, studies that examine only surviving strategies suffer from an upward bias in returns known as “survivorship bias.”

Our research suggests that survivorship bias overstates the median fund alpha by roughly 50% compared to the survivorship bias-free median (here, alpha refers to performance after accounting for exposures to known drivers of expected returns). It also nearly doubles the proportion of funds that earn a reliably positive alpha.

IMPACT OF SURVIVORSHIP BIAS ON FUND ALPHA

Survivorship bias matters for two reasons: Funds are often liquidated or merged, and non-surviving funds tend to perform worse than surviving funds. We quantify the effects of survivorship bias using a sample of actively managed US equity mutual funds from the Morningstar Direct database (see the data appendix for the detailed sample-selection criteria). The sample period is January 1991 to June 2020.¹

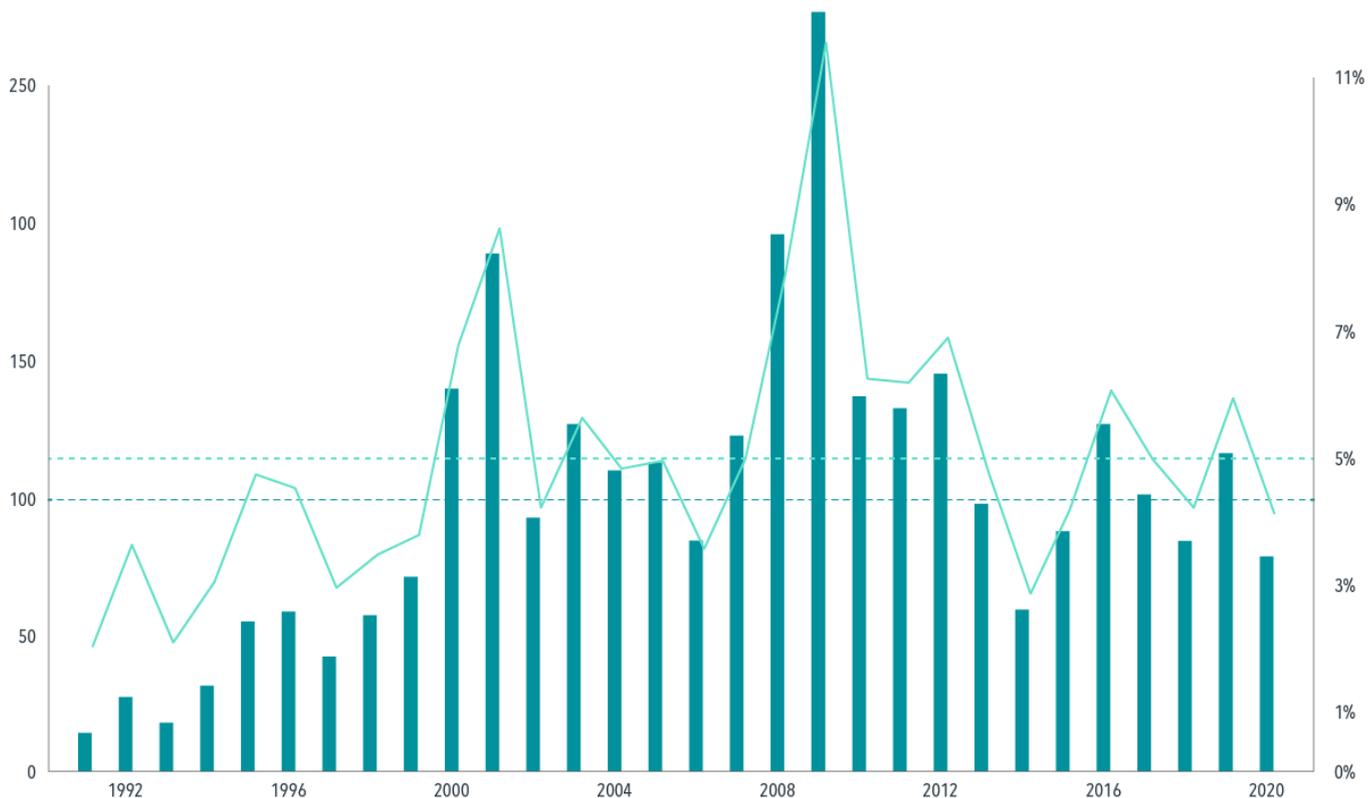
Exhibit 1 shows that, on average over the sample period, about 100 US equity funds were liquidated or merged each year, which is about 5% of the funds available at the beginning of any given year. Disappearances reach a high in 2009, when 275 funds were liquidated or merged, which is 11.5% of the funds in existence at the beginning of 2009.

To measure performance, we estimate each fund’s alpha (α) using the Fama/French fivefactor model. This allows us to control for differences in performance due to exposures to known drivers of expected returns; namely, the market, size, value, profitability, and investment factors. Each α estimate is based on a fund’s entire history of monthly returns, net of all fees and expenses, during the sample period.²

Studies of mutual fund performance should consider the full distribution of outcomes rather than individual fund results. The large number of funds in the sample (1,557 survivors and 2,545 non-survivors in total) means we are likely to observe extreme α estimates—both positive and negative—by chance alone. As such, we compare the full distribution of α estimates with and without survivorship bias to assess and quantify the impact of the bias on fund alpha.

EXHIBIT 1 | Disappearing Act

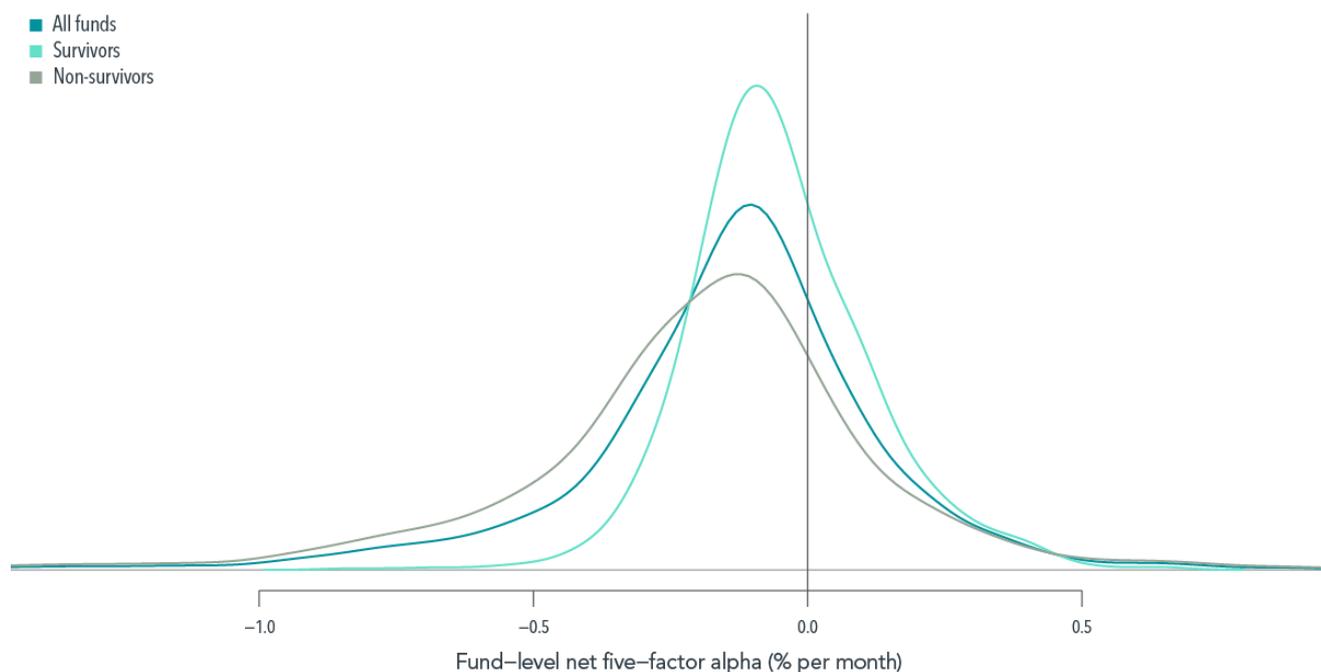
- Liquidations and mergers (Left)
- Liquidations and mergers relative to beginning-of-year survivors (Right)



This figure shows fund liquidations and mergers over time. The horizontal dotted lines are time-series averages. The sample is actively managed, US-domiciled, USD-denominated, US-equity invested, open-end mutual funds in the Morningstar Direct database, excluding index funds and fund-of-funds. Data are monthly. The sample period is January 1991 to June 2020.

Exhibit 2 shows the probability distribution of α estimates for all funds as well as separately for surviving and non-surviving funds. Among survivors, the median α estimate is negative: -7 basis points (bps) per month. That is, the median surviving fund underperformed relative to the five-factor model. Including non-surviving funds worsens the picture, as the median α estimate among all funds is -12 bps per month. Survivorship bias thus overstates the median α estimate by 5 bps per month (60 bps per year), or roughly half the magnitude of the survivorship-bias free median.³ The negative median α estimate for all funds is consistent with most studies on active mutual fund performance.⁴

EXHIBIT 1 | Survivorship Bias



	Percentiles							Mean	$t_{\alpha} > 2$
	1%	5%	10%	Median	90%	95%	99%		
Survivors	-0.43%	-0.29%	-0.23%	-0.07%	0.16%	0.24%	0.40%	-0.05%	4.4%
All Funds	-1.22%	-0.68%	-0.47%	-0.12%	0.16%	0.24%	0.61%	-0.15%	2.4%
Non-survivors	-1.40%	-0.80%	-0.59%	-0.17%	0.16%	0.29%	0.70%	-0.20%	1.3%

The figure shows the distribution of individual funds' monthly alpha estimates based on the Fama/French (2015) five-factor model. The table shows selected percentiles and summary statistics for the distribution of monthly alpha estimates. The sample is actively managed, US-domiciled, USD-denominated, US-equity invested, open-end mutual funds in the Morningstar Direct database, excluding index funds and fund-of-funds. Funds are included in the sample upon first passing an assets-under-management (AUM) threshold of \$5 million measured in June 2020 US dollars. To mitigate incubation bias, we exclude funds with a first monthly return within the last 5 years of the sample period. We also exclude funds with fewer than 12 months of returns during the sample period to ensure that we can estimate a fund's five-factor alpha. Once a fund is included in the sample, we keep it until it is either liquidated or merged or we reach June 2020. Surviving funds are those still available at the end of June 2020. Data are monthly. The sample period is January 1991 to June 2020.

The performance distribution for non-survivors is to the left of that for survivors (the median for non-survivors is -17 bps per month) and has a more pronounced left tail. This implies that survivorship bias understates the left tail of the performance distribution. For instance, the 1st, 5th, and 10th percentiles are, respectively, -43, -29, and -23 bps per month for surviving funds but -122, -68, and -47 bps per month for all funds. Turning to the right side of the performance distribution, survivorship bias also overstates the likelihood of a positive investment outcome. Looking only at survivors, 4.5% of funds earn a reliably positive α estimate, i.e., one with a t-statistic above⁴.

Considering both surviving and non-surviving funds, this proportion is roughly cut in half: Just 2.44% of all funds earn an α estimate that is more than two standard errors above zero, which is below the 3.2% we would expect by chance for this sample.⁵

WHAT CAN WE LEARN FROM THE QUANTIFICATION OF SURVIVORSHIP BIAS?

Survivorship bias overstates good performance and understates bad outcomes. Our study highlights

the importance of inference based on survivorship-bias free data. For researchers, this means using comprehensive data sets that cover the returns of both surviving and non-surviving strategies.

For investors, our results suggest that one should evaluate any given fund manager based on their full set of funds, including funds that are no longer available for investment—otherwise a seemingly stellar track record may, in fact, be an incomplete and biased reflection of reality.

Given the noise in security returns and the volatility of premiums, however, past performance is not sufficient to evaluate a fund manager. Researchers and investors should also consider other aspects of the manager, such as their underlying investment philosophy, the robustness in their strategy design, and the efficiency in their portfolio management and trading. All these traits are important in delivering a good investment experience and helping investors achieve their goals.

1. Morningstar Direct records the date of fund liquidations and mergers starting from October 1990. Our research suggests that the database is free from survivorship bias starting from January 1991.
2. One of our sample selection criteria is that funds must have at least 12 months of returns. This introduces a slight survivorship bias but ensures that we can estimate a fund's five-factor α .
3. A rank-sum test rejects that the median α estimate among survivors is the same as that among non-survivors ($p = 0.00$). The results are similar using means: The mean α estimate is -5 bps per month among survivors but -15 bps per month among all funds and a two-sample t-test with unequal variances rejects that the mean among survivors is the same as that among non-survivors ($t = 17.03$).
4. See Carhart (1997), Fama and French (2010), Linnainmaa (2013), and Meyer-Brauns (2016).
5. Following the methodology of Fama and French (2010), we obtain a by-chance distribution of fund α as the average of 10,000 bootstrapped simulation runs. A simulation run is a random sample (with replacement) of 354 months drawn from the 354 calendar months from January 1991 to June 2020. For each simulation run, we regress, fund by fund, benchmark-adjusted (zero- α) fund returns on the five factors of Fama and French (2015), dropping funds that are in the simulation run for less than 12 months.

REFERENCES

- Carhart, Mark M. 1997. "On Persistence in Mutual Fund Performance," *Journal of Finance* 52, no. 1: 57–82.
- Fama, Eugene F., and Kenneth French. 2010. "Luck versus Skill in the Cross-Section of Mutual Fund Returns." *Journal of Finance* 65, no. 5: 1915–1947.
- Fama, Eugene F., and Kenneth French. 2015. "A Five-Factor Asset Pricing Model." *Journal of Financial Economics* 116, no. 11: 1–22.
- Linnainmaa, Juhani T. 2013. "Reverse Survivorship Bias." *Journal of Finance* 68, no. 3: 789–813.
- Meyer-Brauns, Philipp. 2016. "Mutual Fund Performance through a Five-Factor Lens." Dimensional Fund Advisors white paper.



Investment Update is published monthly by OBS Financial. All articles provided by Dimensional Fund Advisors, Morningstar, or OBS Financial. Information has been obtained from sources believed to be reliable, but its accuracy and completeness, and the opinions based thereon, are not guaranteed and no responsibility is assumed for errors and omissions. Nothing in this publication should be deemed as individual investment advice. Consult your personal financial adviser and investment prospectus before making an investment decision. Any performance data published herein are not predictive of future performance. Investors should always be aware that past performance has not been shown to predict the future. If in doubt about the tax or legal consequences of an investment decision it is best to consult a qualified expert. OBS Financial is a Registered Investment Advisor with the Securities and Exchange Commission.

101397 | C20-16833 | 10/2020 | EXP 10/31/2021

CONTACT US 419 482 4500 | Marketing@obsmail.com | www.obsfs.com