

Currency Hedging U.S. Equities: A Practical Tool for Global Investing

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When investing in the U.S. stock market, non-U.S. investors take on both equity risk and currency risk. Adverse moves in exchange rates can dramatically affect investment outcomes. Currency hedging is one technique that is designed to take currency risk out of the equation when investing in the U.S. market from overseas.

This paper examines the mechanics and the potential benefits of currency hedging, using the U.S. equity market as an example, from the perspective of international investors. We explore the impact of currency risk on performance, the methodology of the S&P 500[®] Currency Hedged Indices, as well as key factors to consider when overlaying a currency hedge on a portfolio.

IMPACT OF CURRENCY RISK ON PERFORMANCE

Currency risk can threaten returns as a result of changes to foreign exchange rates. In Exhibit 1, we compare the historical performance of the [S&P 500](#) calculated in U.S. dollars with its counterpart in Japanese yen. The only difference between these two return series is the reporting currencies, thereby representing the currency risk impact. Please see the appendix for the performance of the S&P 500 denominated in other major Asian currencies.

Exhibit 1: The S&P 500 versus the S&P 500 (JPY)



Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 2004, to Aug. 31, 2020. Index level rebased to 100 on Dec. 31, 2004. Index performance based on monthly net total return. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

The impact of currency risk can be substantial at times.

The impact of currency risk can be substantial depending on the magnitude of dislocation in the currency market. Exhibits 1 and 2 show that returns of the S&P 500 in U.S. dollars versus the S&P 500 in yen differ noticeably between June 2007 and January 2012, and between September 2012 and July 2015.

Exhibit 2: The S&P 500 versus the S&P 500 (JPY) – Two Scenarios

SCENARIO	PERIOD	USD/JPY CHANGE (%)	S&P 500 RETURN (%)	S&P 500 (JPY) RETURN (%)
JPY-Based Investors Lost from the USD Depreciation	From June 30, 2007, to Jan. 31, 2012	-38.26	-6.38	-42.19
JPY-Based Investors Gained from the USD Appreciation	From Aug. 31, 2012, to June 30, 2015	59.25	52.23	142.43

Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 2004, to Aug. 31, 2020. Index performance based on monthly net total return. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

Currency risk should be carefully taken into consideration.

During the first period, the U.S. dollar depreciated significantly relative to yen, thus a yen-denominated investor would have received negative currency return, decreasing the gains that could have been derived from investing in S&P 500. However, during the second period, the U.S. dollar appreciated against the yen, so a yen-based investor would have benefitted from positive currency returns, magnifying the expected investment outcomes.

A non-U.S. investor who wishes to avert divergence from investment objectives should carefully take currency risk into consideration.

INTRODUCTION TO CURRENCY HEDGING

Currency hedging entails entering into currency forward contracts in order to protect against currency exchange rate fluctuations. We use the stylized example of the S&P Currency Hedged Indices to demonstrate the mechanics of currency hedging.

Currency hedging is an operation of entering into currency forward contracts to protect against exchange rate fluctuations.

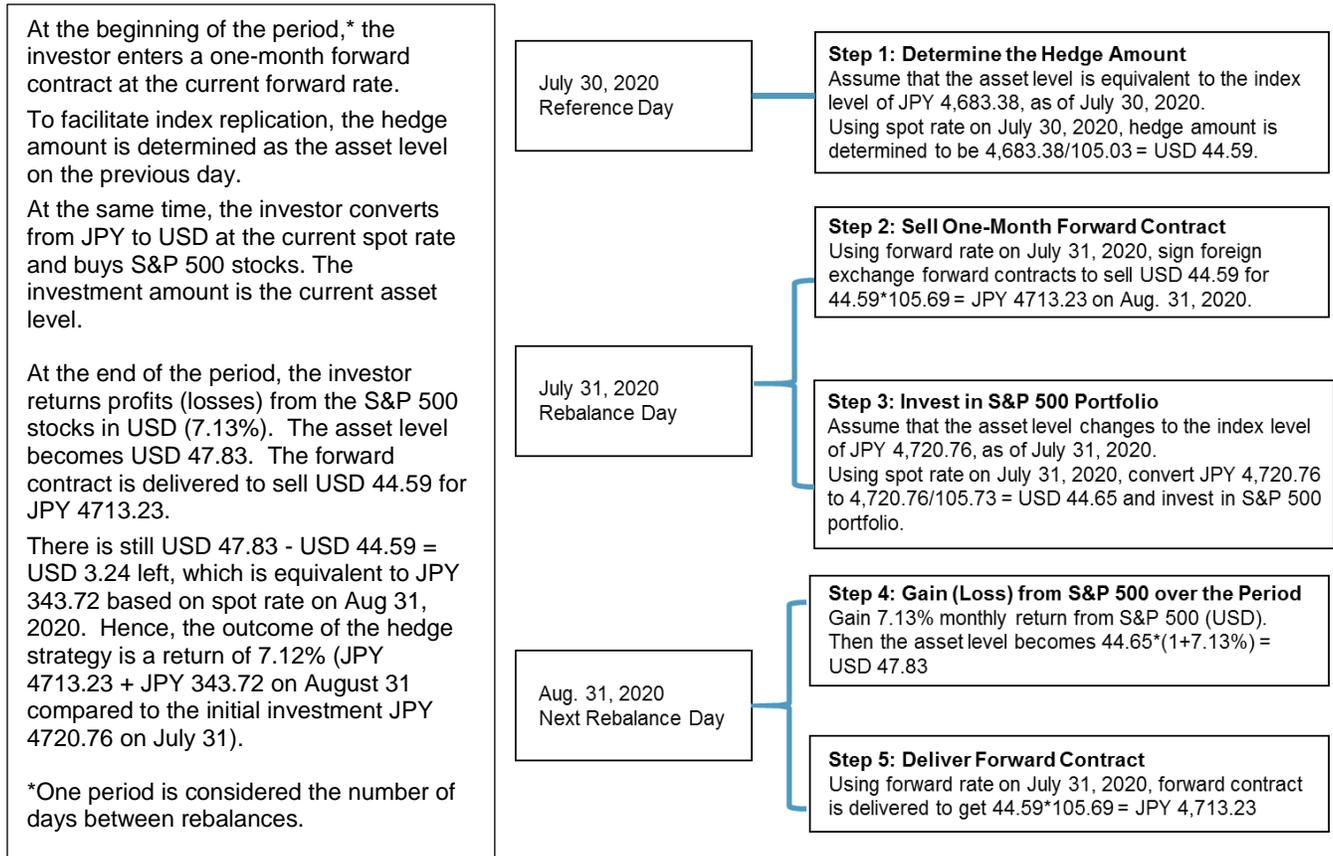
Methodology of Standard Currency Hedged Indices

As shown in Exhibit 3, we assume hedging takes place at the beginning of a period and enters one-month forward contracts, rolling them continuously at the end of each month.¹ The value at the end of each month reflects profits and losses from the hedged position incurred during the month.

¹ S&P Dow Jones Indices also offers daily currency hedged indices for clients who require benchmarks with more frequent currency hedging. Please refer to the [S&P Dow Jones Indices Index Mathematics Methodology](#).

Exhibit 3: Illustration of Standard Currency Hedging Methodology

DATE	S&P 500	S&P 500 (JPY)	S&P 500 YEN HEDGED	SPOT RATE	FORWARD RATE
Reference Date July 30, 2020	5878.17	3179.17	4683.38	105.03	104.99
Rebalance Date July 31, 2020	5923.70	3225.31	4720.76	105.73	105.69
Next Rebalance Date Aug. 31, 2020	6346.27	3465.68	5056.94	106.05	106.00
Return from July 31, 2020, to Aug. 31, 2020 (%)	7.13	7.45	7.12	-	-



Source: S&P Dow Jones Indices LLC. Data from July 30, 2020, to Aug. 31, 2020. Index performance based on monthly net total return. Past performance is no guarantee of future results. Table and chart are provided for illustrative purposes.

Outcome of Currency Hedging

Exhibit 4 illustrates the effects of currency hedging by comparing the S&P 500 in USD, JPY, and yen hedged. There are three points to note.

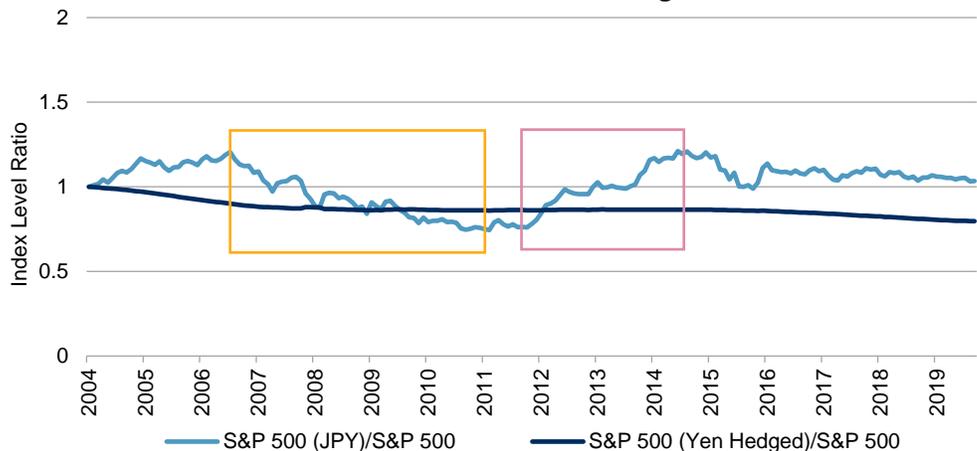
First, the hedging outcome varies according to the direction of currency movement. The periods of June 2007-January 2012 and August 2012-June 2015 provide two types of examples.

Second, for investors whose objective is to isolate currency risk from equity exposure, the yen hedged index effectively reduced the currency risk, especially in short and medium terms.

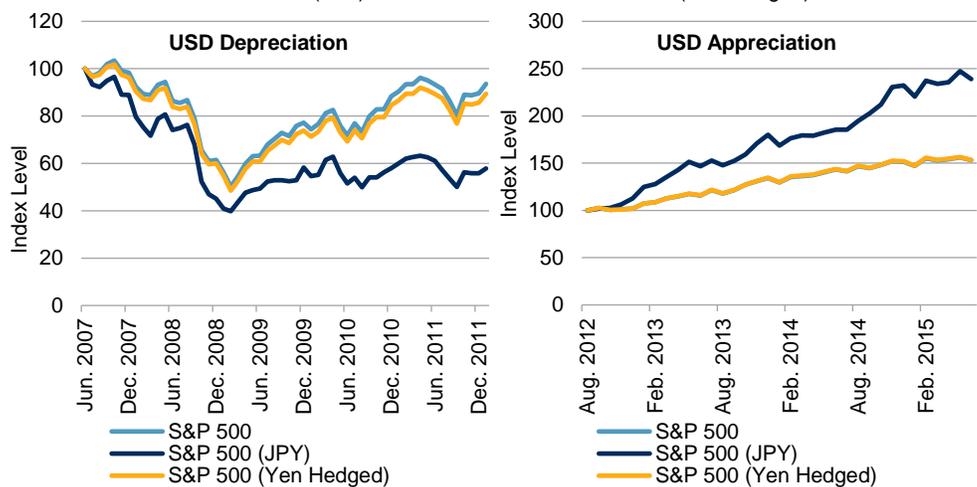
Third, the yen hedged index did not provide returns exactly equal to those of the S&P 500, which would be available to a U.S. investor. Part of the reason is that the monthly rolling of forward contracts does not result in a perfect hedge, and the other part is due to hedging cost.

Exhibit 4: The S&P 500 versus the S&P 500 Yen Hedged

Hedging outcomes can vary according to the direction of currency movement.



The JPY hedged index effectively reduced currency risk.



Imperfect hedging can explain some performance divergence between the S&P 500 and the currency hedged index.

Source: S&P Dow Jones Indices LLC. Data from Dec. 31, 2004, to Aug. 31, 2020. Index level rebased to 100 at the start of each period. Index performance based on monthly net total return. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

OVERLAYING CURRENCY HEDGE ONTO AN INVESTMENT

Non-U.S. investors are seeking U.S. equity exposure and therefore need to formulate a view on currency expectations and determine whether, when, and how to incorporate the currency hedge strategy. The answers would depend on various factors, like investment objectives, base currencies, risk tolerance, and macro views. Here we discuss two important factors that influence whether to overlay a currency hedge onto an investment portfolio: cost of carry and correlation between the S&P 500 and the foreign exchange rate.

International investors are faced with the decisions of whether, when, and how to incorporate a currency hedged strategy.

Cost of Carry

Short-term interest rate differential is the difference between short-term rates in domestic and foreign countries.

While currency hedging strategies intend to minimize unwanted currency risk by removing exposure to the spot rate, the risks associated with carry may arise. Cost of carry is the forward-spot differential as the percentage of the spot rate and reflects the hedging cost. The cost of carry can be either positive or negative and is a function of two factors: interest rate differential and cross-currency basis.

Short-term interest rate differential is the difference between short-term rates in domestic and foreign countries. When investors wish to hedge for foreign currency exposure, they implicitly pay the foreign cash rate and receive the domestic cash rate, known as the covered interest parity (CIP).² As a result, investors residing in countries with low interest rates that want to hedge the risk of currencies from countries with high interest rates would need to sell the local currency at a discount and incur a carry cost at the inception of the hedge.

Cross-currency basis is the additional cost investors pay to buy and sell currencies forward, on top of the interest rate differential.

Cross-currency basis is the additional cost investors pay to buy and sell currencies forward, on top of the interest rate differential. This factor largely depends on imbalances between supply and demand across different currencies.

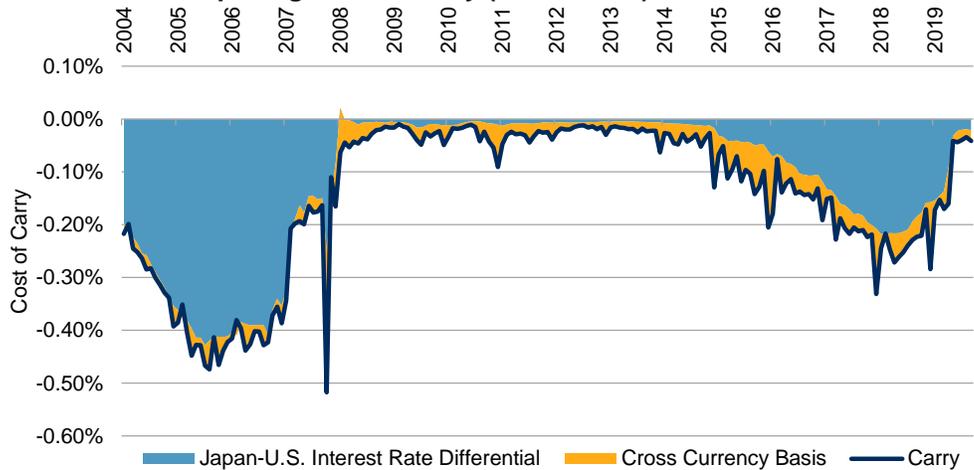
From the point of view of yen-based investors, interest rate differentials expanded in recent years up until March 2019, causing hedging costs to rise (see Exhibit 5). The interest rate differential between the U.S. and Japan grew as a result of diverging central policy between the U.S. Federal Reserve and Bank of Japan. For the cross-currency basis over the observed period (in yellow), 96.3% of months were negative due to strong net demand for U.S. dollars globally from December 2004 to August 2020.

The carry cost for yen-based investors has been compressed significantly, while currency volatility has increased sharply.

With interest rate differentials narrowing to five-year lows as the Federal Reserve responded to the economic downfall brought on by COVID-19, the carry cost for yen-based investors compressed significantly, while currency volatility increased sharply. In a market environment like this, Japanese investors may consider revisiting their currency hedging strategies.

² The following equation holds under CIP, $(1 + \text{short-term interest rate in country A}) / (1 + \text{short-term interest rate in country B}) = \text{Forward exchange rate} / \text{Current spot exchange rate}$.

Exhibit 5: Decomposing Cost of Carry (USD to JPY)



Source: S&P Dow Jones Indices LLC, FactSet. Data from Dec. 31, 2004, to Aug. 31, 2020. U.S. short-term interest rate is measured by the ICE-LIBOR USD 1-Month. Japan short-term interest rate is measured by the ICE-LIBOR JPY 1-Month. Cross-currency basis is calculated as the differential between CIP and market forward rate as a percentage of the CIP rate. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

Currency hedging can profoundly change the risk/return profile of the S&P 500 for international investors.

The Japanese yen is generally regarded as a “safe-haven” currency, as it generally appreciates during times of market instability.

Unhedged exposure to the S&P 500 might help to dampen market drawdowns for investors whose domestic currency is not considered a safe haven.

Correlation between the S&P 500 and Foreign Currencies

While currency hedging can mitigate the impact of foreign exchange rate changes on foreign investment returns, investors can have varying experiences depending on the investment portfolio and the investor’s local currency.

For example, investors tend to view the Japanese yen as a “safe-haven” currency, which generally appreciates during times of market instability. Exhibit 6 shows that from March 2006 to August 2020, the correlation between the JPY/USD currency rate and the S&P 500 was -0.22, and beta to the S&P 500 was -0.13. During months in which the S&P 500 experienced negative returns, the Japanese yen appreciated by 1.10% on average, thereby exacerbating the loss faced by yen-based investors. This observation brings unique benefits for JPY hedged U.S. products, as a hedging strategy could help to bring a degree of mitigation of extreme price swings.

On the other hand during the same negative months, the South Korean won (KRW) and Australian dollar (AUD) depreciated by an average of 1.89% and 2.16%, respectively (see Exhibit 6). Therefore, unhedged exposure to the S&P 500 might help dampen market drawdowns for investors whose domestic currency is not considered a safe haven.

The falling U.S. dollar led to greater losses for yen-based investors.

Exhibit 6: Correlations between Monthly Return of Foreign Exchange Rates and U.S. Equities

CATEGORY	JPY/USD	KRW/USD	AUD/USD
Correlation to the S&P 500	-0.22	0.54	0.62
Beta to the S&P 500	-0.13	0.41	0.54
Average Change When the S&P 500 Experienced Negative Returns (%)	1.10	-1.89	-2.16

Source: S&P Dow Jones Indices LLC. Data from March 31, 2006, to Aug. 31, 2020. Calculation based on monthly net total return. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

During the 2008 Global Financial Crisis, the S&P 500 posted -37.45% for the year, while both the South Korean won and the Australian dollar depreciated against the U.S. dollar, by 25.68% and 20.6%, respectively. The rising U.S. dollar naturally cushioned the losses for Korean and Australian investors. On the other hand, during the same period, the Japanese yen appreciated against the U.S. dollar by 23.24%. The falling U.S. dollar led to greater losses for yen-based investors. Employing a currency hedging strategy has historically reduced drawdown and volatility for Japanese investors (see Exhibit 7).

Employing a currency hedging strategy has historically reduced drawdown and volatility for Japanese investors.

Exhibit 7: Hedged and Unhedged Indices Performance in 2008

CATEGORY	S&P 500 (KRW)	S&P 500 (KRW HEDGED)	S&P 500 (AUD)	S&P 500 (AUD HEDGED)	S&P 500 (JPY)	S&P 500 YEN HEDGED
2008 PERFORMANCE						
Currency Movement	KRW Depreciated 25.68%		AUD Depreciated 20.6%		JPY Appreciated 23.24%	
Return (%)	-15.83	-40.71	-21.22	-38.05	-49.24	-37.62
Difference (%)	-	-24.89	-	-16.83	-	11.62
LONG-TERM PERFORMANCE						
Annualized Return (%)	10.19	7.99	8.40	9.41	7.87	7.30
Annualized Volatility (%)	13.10	15.39	12.62	15.37	19.21	15.02

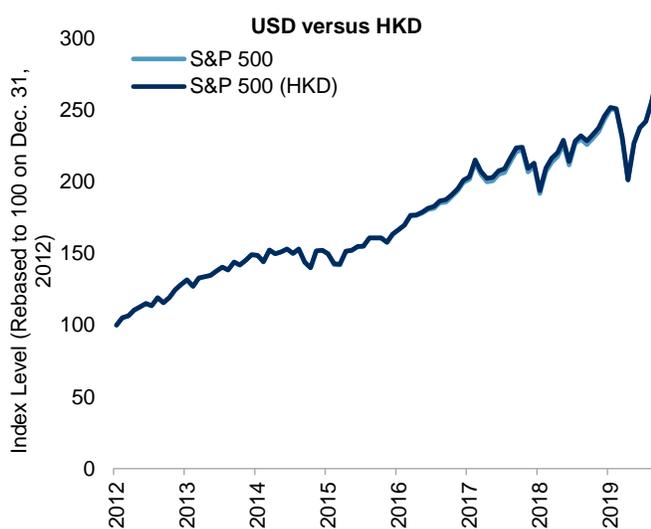
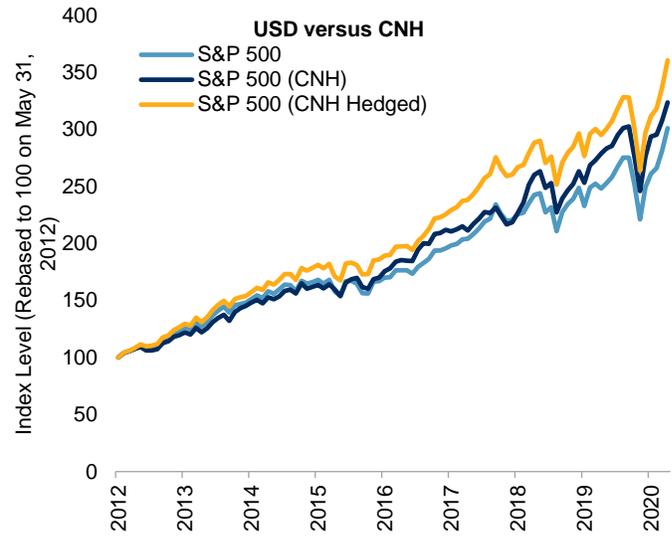
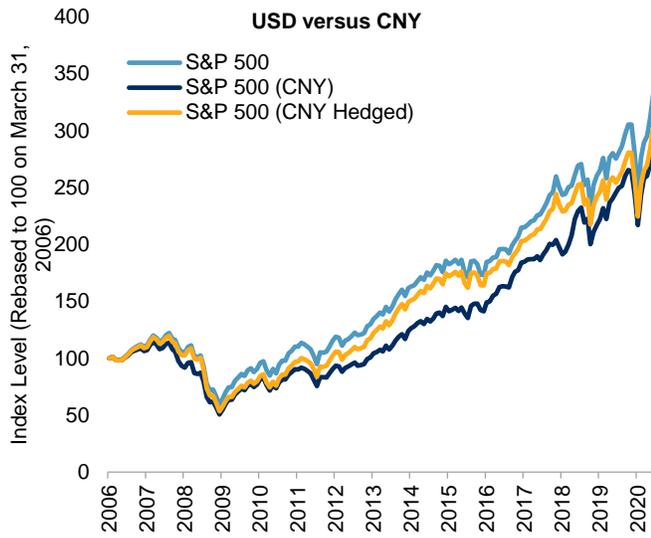
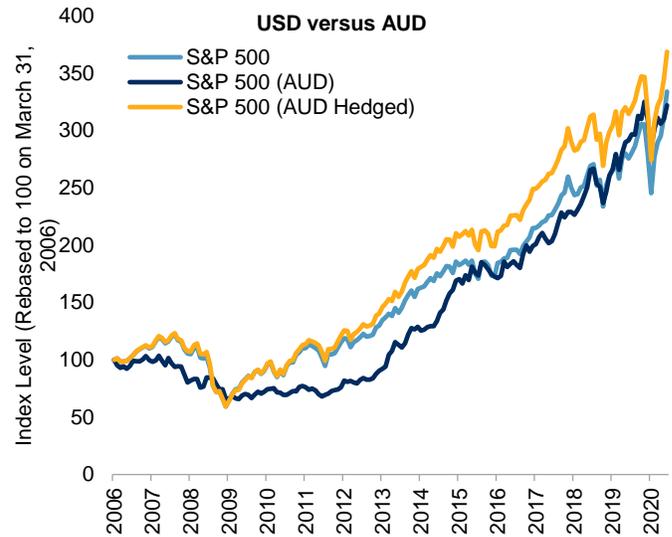
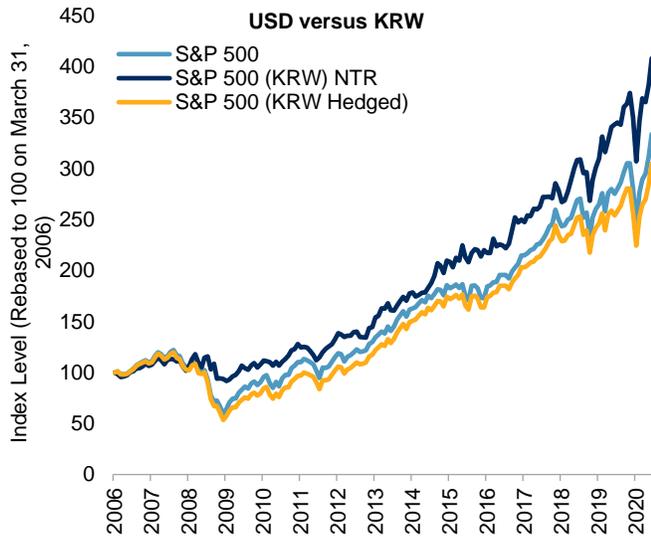
Source: S&P Dow Jones Indices LLC. Data for 2008 performance from Dec. 31, 2007, to Dec. 31, 2008, and for long-term performance from March 31, 2006, to Aug. 31, 2020. Calculation based on monthly net total return. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

For international investors, deciding whether and when to hedge currency exposure is critical.

CONCLUSION

For investors based outside the U.S., returns of hedged or unhedged U.S. equity portfolios tend to differ meaningfully over time. Thus, for international investors, deciding whether and when to hedge currency exposure is critical. In addition to formulating a view on future currency movements, two additional considerations are hedging cost and the mutual interaction between the portfolio and foreign currencies. The S&P Currency Hedged Indices act as transparent, replicable benchmarks for currency hedged strategies.

APPENDIX: THE S&P 500 VERSUS THE S&P 500 IN MAJOR ASIAN CURRENCIES



Source: S&P Dow Jones Indices LLC. Index level of S&P 500 (HKD) from Dec. 31, 2011, to Aug. 31, 2020. Index level of S&P 500 (CNH) from May 31, 2006, to June 30, 2020. Data for other indices from March 31, 2006, to June 30, 2020. Calculation based on monthly net total return. Past performance is no guarantee of future results. Charts are provided for illustrative purposes.

PERFORMANCE DISCLOSURE

The S&P 500 Yen Hedged was launched April 20, 2009. The S&P 500 (AUD Hedged) was launched August 23, 2013. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at www.spdji.com. Past performance of the Index is not an indication of future results. Prospective application of the methodology used to construct the Index may not result in performance commensurate with the back-test returns shown.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the Index is set at a fixed value for calculation purposes. The Launch Date designates the date upon which the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its datafeed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

The back-test period does not necessarily correspond to the entire available history of the Index. Please refer to the methodology paper for the Index, available at www.spdji.com for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Another limitation of using back-tested information is that the back-tested calculation is generally prepared with the benefit of hindsight. Back-tested information reflects the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities, fixed income, or commodities markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

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