

Interpreting signals  
from the global economy  
and financial markets

# Decoder



## In Focus

- The new pension system warrants a fresh look at currency hedging. With fewer regulatory constraints, decisions can be more based on the economics.
- For a European investor hedging currency risk can substantially reduce portfolio volatility, but there can be too much of a good thing.
- In the case of the USD, it makes sense to hedge bonds, and hardly hedge equities.
- For all the historical periods we've looked at, the optimal hedge ratios per asset class added up to the optimal hedge ratio at the portfolio level.

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## The effects of FX

Many prices are sticky in the economy, but not the price of major foreign currencies. Exchange rates tend to fluctuate and do so 24 hours per (working) day. Currency movements can be large and even wipe out any positive returns in local currency. So global investors need to decide to what extent they want to hedge currency risks. The new Dutch pension system warrants a fresh look at currency hedging. We look at the case of the USD. Our main question is which hedge ratio is associated with the lowest volatility per asset class and total portfolio. The companion Decoder “Dollar forecasts” considers what is the most likely path for the greenback over several years. Note that the focus of this Decoder is risk reduction. Other relevant issues for FX hedging decisions – e.g. liquidity or behavior during crisis – are not discussed.

### New rules

In the current pension system (‘FTK’), any exposure to FX-risks requires pension funds to set aside reserves (‘VEV’ or Vereist Eigen Vermogen) to cover potential losses. This renders FX-hedging attractive. In the long run, FX-risks are unrewarded. Therefore it makes more sense to allocate risk budget towards assets that earn a risk premium, like equities. Things change with the new pension system. As we move from Defined Benefit to Defined Contribution, the system no longer works with a required reserve and its associated standard model. Pension funds can use their own models and base FX-hedging on economics rather than regulatory requirements.

### How to hedge?

So the central question becomes: which degree of FX-hedging is optimal for the ultimate pension outcomes? Strategically, it is hard to imagine FX as a long term return driver for major currencies. So the question boils down to volatility. To which extent does FX-hedging bring volatility in euro’s down? Can we determine an optimal hedge ratio per asset class? And do the optimal hedge ratios per asset class result in an optimal hedge ratio for the portfolio as a whole? We will turn to those questions below, using the example of the EUR/USD in recent decades.



## In Figures

### Volatility US bonds per hedge ratio

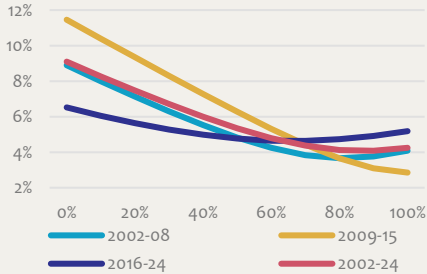
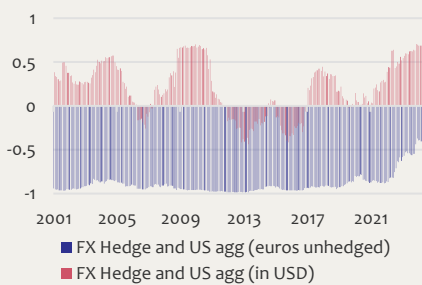


Chart shows the volatility (y-axis) of US bonds (US agg) for different hedge ratios (x-axis) and time periods. The optimal hedge ratio – with hindsight – is different for all time periods but always north of some 70%.

### Correlation bond returns with FX hedge



24 month rolling correlation between the bond returns (US agg) and the return on the USD hedge. The blue bars take into account the European perspective and uses the unhedged euro returns. The red bars look at the correlation of bond returns in dollars with the USD hedge. The strong negative correlation from the European perspective is explained by currency movements dominating overall volatility.

### Volatility MSCI World per hedge ratio

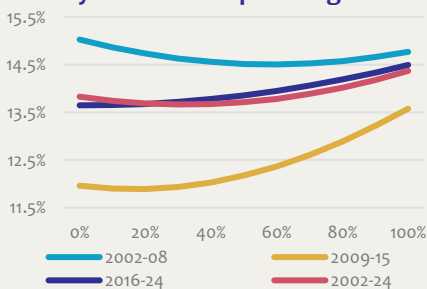


Chart shows the volatility of the MSCI World for different hedge ratios and time periods. The optimal hedge ratio – with hindsight – is different for all time periods but mostly south of some 50%.

Data: Macrobond, Bloomberg, APG AM.

We choose not to look at the impact of FX-hedging on historical returns. In the long run, currency movements are a wash. Over shorter time horizons, with the benefit of hindsight, hedging looks like a bad decision in cases the dollar went up and a good decision when it went down. But that's only the luck of the draw.

One should not judge a decision just by its outcome. Poker players call that 'resulting', football coaches call it 'score board journalism'. On strategic time horizons one should not expect any return from FX exposure, but this can be different over the medium term. An overvalued currency is more likely to depreciate over a number of years. This can become relevant if investors are contemplating any changes to the strategic FX hedge ratio. The implementation path can be informed by it.

### US Bond moves

Hedging the USD can bring down the volatility of bond returns considerably for euro investors (see chart top left). Between 2002 and 2024 bond volatility could be more than halved – from 9.1% to 4.1% – by hedging the USD for 90%. The optimal hedge ratio and the impact on volatility varies per time period. Especially between 2009 and 2015 hedging reduced volatility. A 100% hedge would have compressed volatility from 11.5% to 2.9%. From 2016 until now the impact is less impressive. A 70% hedge could only bring volatility down from 6.5% to 4.6%. Still, in all time periods, hedging helped. Another thing to note is that most of the time, getting the hedge ratio roughly right is good enough. Around the optimal hedge ratio, the curve is rather flat. Being 10% too high or low would have hardly mattered in terms of additional volatility.

A key factor explaining why hedging works, is the negative correlation between the USD/EUR currency return hedge and unhedged bond returns. Most of the time, until 2018 or so, the unhedged bond returns in euro's display a strong negative correlation with the returns on the dollar hedge (the blue bars in the second chart on the left). Simply put: US bond volatility for euro investors was dominated by volatility in EUR/USD. The picture has changed somewhat in the last few years when correlation got less negative. This is to do with changing drivers for bond volatility: strong movements in interest rates played a bigger role. The red bars capture the correlation between (US agg) bond returns in dollars and currency movements. Sometimes it is positive, sometimes negative, but overall the correlation is weak. This illustrates the point that there has been no 'self-hedging' of bonds that Europeans investors have been able to take advantage off.

### Global stocks and FX

Stocks are real assets. So one would expect price shocks – like an FX-shock – to be dampened somewhat. If the dollar falls considerably, certainly a dollar of profit will be worth less for European investors. But it may well be that there is more profit as foreign earnings of a US company are converted into more dollars (assuming the company doesn't hedge its FX-exposures, in which case it will lose money on the hedge). Apart from this so-called translation effect, business may pick up because it becomes more competitive. So equity should be partly self-hedging. Hedging all of the currency risk would then *add* to volatility.

So what do we see in practice? Indeed, generally, hedging all of the FX-exposure leaves the equity portfolio more volatile than no hedging at all (see third chart). At any rate, one should not expect wonders from hedging. Hitting the optimal hedge ratio (40%) over the period 2002-24 would have reduced volatility of the MSCI World, but only by a whisker – from 13.8% to 13.7%. During the 2002-08 episode there was a bit more room to suppress an otherwise high level of volatility – from 15% to 14.5% – if one would have hedged 60%. However, that ratio would have added to volatility in the following period. Hedging 20% would have been best for 2009-15. Doing 60% would have brought up volatility from 11.9% to 12.4%.



### Volatility MSCI US per hedge ratio

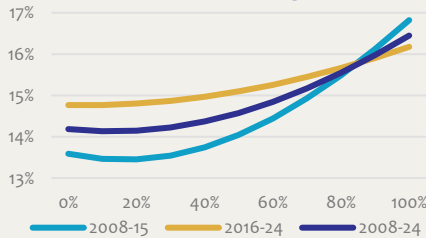
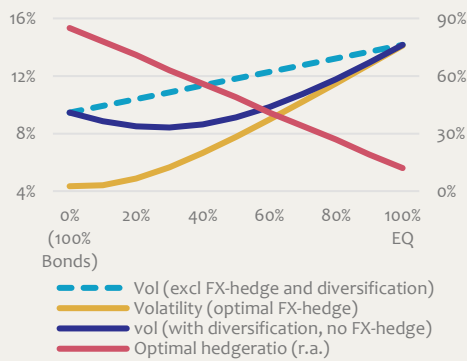


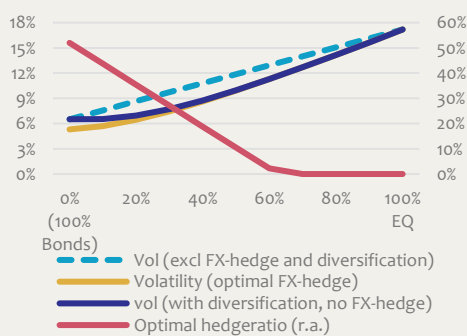
Chart shows the volatility of the MSCI US for different hedge ratios and time periods. The optimal hedge ratio – with hindsight – is different for all time periods but always less than 20%.

### Volatility varying mixes and FX-hedges



In the

### 2020-24 is a special case



In the period 2020-24 the optimal hedge ratio was lower, and so was the reduction in volatility. One would even arrive at negative ratios for equity heavy portfolios.

Data: Macrobond, Bloomberg, APG AM.

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So in general, it makes sense to hedge global stocks in moderation. The benefits it brings in terms of lower volatility are limited and uncertain. One actually might be adding to volatility – albeit also on a small scale.

### The American case

Does that conclusion change if we only look at US equities? Of course, the MSCI World is dominated by American stocks, but isolating them could in theory change the results. It seems the conclusion only gets stronger for this sub-selection. We only have the relevant data available since 2008, but what we see is that optimal hedge is low: 20% for 2008-15, 0% for 2016-24. For the whole period it is 10%, which shaves off 5 bps from annual volatility. Again, a higher hedge ratio risks adding to volatility. One can ask oneself: why bother?

### A portfolio look

We are going to look into the question of the optimal FX-hedge at a portfolio level. Can we simply take the optimal FX-hedge ratios at the asset class level and weight them by portfolio weights? As a matter of fact, it seems we can.

To establish this, we look at a portfolio of three assets: US bonds, US stocks and the return on the EUR/USD hedge. Stocks and bonds add up to 100%, while the FX-ratio can be anywhere between 0 and 100%. We look at covariance and volatility in different historical periods and determine the optimal hedge ratio for different stock-bond combinations. The second chart on the left shows the results for the period 2008-24. We'll walk through it.

The dark blue line shows portfolio volatility for different mixes of stocks and bonds. On the left, the portfolio is all bonds, no equities. On the right, it's all equities. One can see that adding equities to the mix brings volatility down up to the point of a 70/30 mix. These are the benefits of diversification. If stocks and bonds were perfectly correlated, the light blue dashed line would have held. Adding an FX-hedge can diminish portfolio volatility further. The red line depicts the optimal hedge ratio, starting at not quite 90% (right axis) for the portfolio with only bonds. The yellow line shows the volatility that results. When the portfolio consists of mainly bonds, hedge ratios have to be high and the volatility reduction is considerable. When the portfolio is heavy on equities it is the other way around: the optimal hedge is low, with little impact.

We have done this optimization exercise for different sub-periods and arrive at similar conclusions. Only one period is a bit different: 2020-2024 (results in bottom chart). In this period the optimal FX-ratios are lower for all portfolios, starting at 50% for an all bonds mix and reaching negative levels for equity heavy mixes. The volatility reduction is very limited. Note that this was a period of considerable interest rate volatility. Above, we have already seen that the strong negative correlation between unhedged bond returns in euros and the FX-hedge broke down because of that.

**“FX-hedging can actually add to volatility**

An important finding is that the optimal hedge ratio actually is a straight line. So indeed one can weigh the optimal hedge ratios for individual asset classes by their portfolio weights (and arrive at the red line in the middle chart). Obviously, the impact of the FX-hedge on volatility is not linear, but the linearity of the optimal hedge ratio makes life easier for policy makers. For performance purposes, one can actually attribute the FX-hedge to an asset class. Even if a 100% FX-hedge on the fixed income portfolio would be a bit too high, and a zero hedge of the equity portfolio would be a bit too low, the impact on volatility is limited. Especially on a total portfolio level, things would more or less even out.

