

Unlocking

ALPHA IN

currency benchmarks

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The thinking at CIBC Asset Management is that a dynamic approach to currency benchmarks has the potential to unlock tremendous value that currently goes largely untapped. When institutional investors with a global portfolio initially consider their currency exposure merely as a question of whether or not to hedge, we prefer to shift the focus toward a more thorough understanding of the appropriate benchmark. We can then provide a framework to introduce elements of dynamic currency benchmark management, which yields significant returns at little cost.

TO HEDGE OR NOT TO HEDGE, THAT'S NOT THE QUESTION

When it comes to currencies, the first question that institutional investors with a global portfolio tend to ask is: 'should we hedge or not, and if so, by how much?' If the currencies in the portfolio are positively correlated with the underlying assets – which, more often than not, are dominated by domestic stocks and bonds – then they should be mostly hedged back into the base currency. The implicit logic is that the positive correlation tends to boost overall portfolio volatility. If one accepts that, over time, currencies are a zero-sum game, and as a result their expected long-term return is zero, then risk-reduction is the primary objective. If, on the other hand, the currencies in the portfolio are negatively correlated with its underlying assets, then they should be left mostly

unhedged, because the currency exposure in fact diversifies the portfolio and lowers its risk.

In practice, the starting point will be a 50% hedge ratio, which will be adjusted up or down, based on where the correlation lies between foreign currencies and overall benchmark returns. More often than not, recent experience with currency gains or losses will also play a role (even though it should not) in setting a benchmark hedge ratio. Exhibit 1 illustrates where US-, Japan- and Euro area-based investors probably stand. It shows the correlation between the home currency – dollar, yen and euro, respectively – versus an index-weighted basket of foreign currencies and a domestic portfolio of half bonds and half equities. Exhibit 1 shows rolling three-year correlations based on monthly changes for a period of nearly 20 years (please see the technical endnote for information about the data used in this article).

Exhibit 1 suggests that Japan- and US-based investors should have a tendency to leave their currency exposure alone, while euro area-based investors will have the greatest incentive to hedge.

CURRENCY EXPOSURE MISCONCEPTIONS

The problem with the hedging question is that it illustrates two misconceptions that are almost universal among institutional investors.

The first is that currency exposure must somehow be tied to the underlying asset exposure. Implied in the question 'should I hedge or not?' is the assumption that – regardless of the answer – the optimal currency exposure will be a product of either the asset benchmark (i.e. 0% to 100% of the benchmark weight, depending on the choice of hedge ratio) or the underlying assets themselves. We strongly challenge this view and will

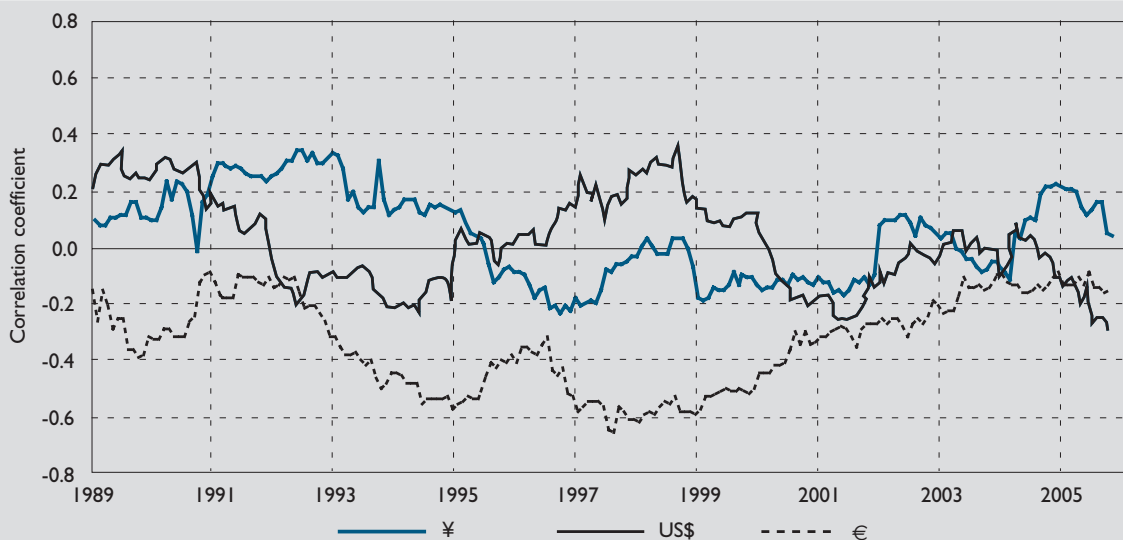
explain why tying benchmark currency exposure to underlying asset exposure makes little investment sense.

The second is that benchmarks must be set for the very long-run. It is typical for benchmark optimisation to be done using financial and economic data of the past 25 years with a view to choosing a benchmark that will be set in stone. There is conceptually nothing wrong with looking at as much historical data as possible to form a benchmark. However, it is wrong to believe that what was 'optimal' for the past 25 years will be so for the next three, four, five or six years.

The best currency example we can give to illustrate this last point is the path of the Japanese yen, which tripled in value versus the US dollar from 1971 to 1988, but stood at the end of 2005 at exactly the same level as 17 years before. In 1988, a Japanese investor extrapolating the trend of the past 25 years would have been tempted to set his foreign currency benchmark at zero (or fully-hedged). Rather, the right approach would

Correlation of base currency with domestic portfolio (monthly correlation, three-year moving average)

Exhibit 1



Source: CIBC Asset Management

have been to ask: 'are the past 25 years representative of the environment we are about to experience for the next five, 10, or 25?'

HOW TO PICK THE RIGHT CURRENCY BENCHMARK

The CFA Institute provides us with useful information about choosing the right benchmark, starting with the 1998 'Benchmark and Performance Attribution Subcommittee Report'. The following is quoted directly from the report.

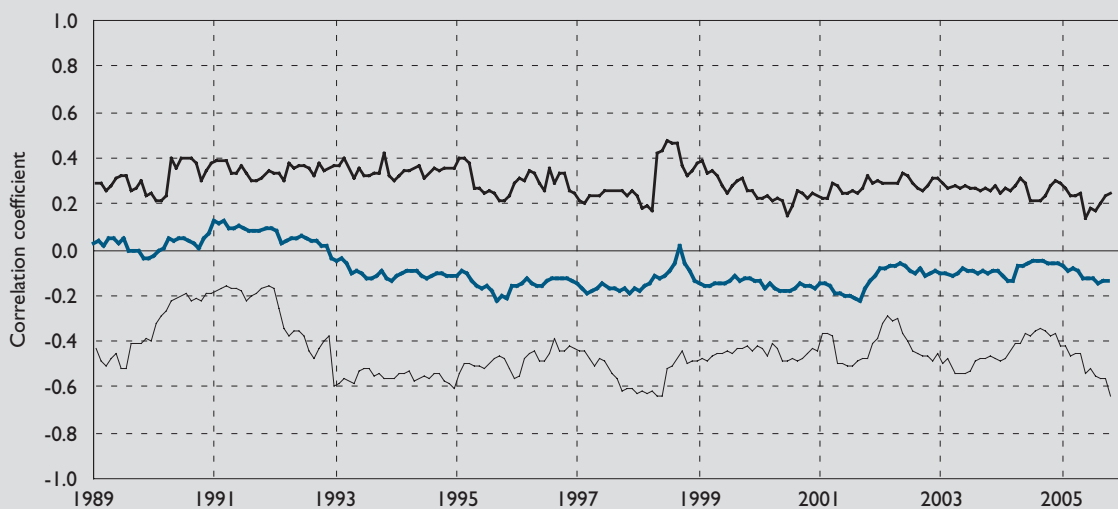
"While AIMR here does not make a recommendation in favour of the unhedged or the hedged benchmark, we do regard the determination of currency exposure in the benchmark as an important fiduciary responsibility. Investors should, in addition, aim to analyse the effects of currency movements and currency decisions separately from the underlying assets."

This last point is extremely important. It can be shown, in fact, that exchange rate returns are quite independent of underlying relative asset returns (which is not to say that currency returns are independent of absolute asset returns, as highlighted in Exhibit 1). We focus here on relative asset returns because exchange rates are a relative price (between two currencies). This is best illustrated with Exhibits 2 and 3. They show the correlation between exchange rate movements and the respective underlying relative asset movements. For example, is the yen-dollar exchange rate correlated with the performance of Japanese equities relative to US equities? If the answer is no, then there is little basis for tying yen and dollar exposure to the respective exposure to Japanese and US equities.

To construct these Exhibits, we matched all the possible currency pairs in the developed market universe with their respective relative markets for equities (Exhibit 2) and bonds (Exhibit 3). In all, 24 exchange rate-equity

Correlation of exchange rates and relative equity returns
(monthly correlation, three-year moving average with high-low range)

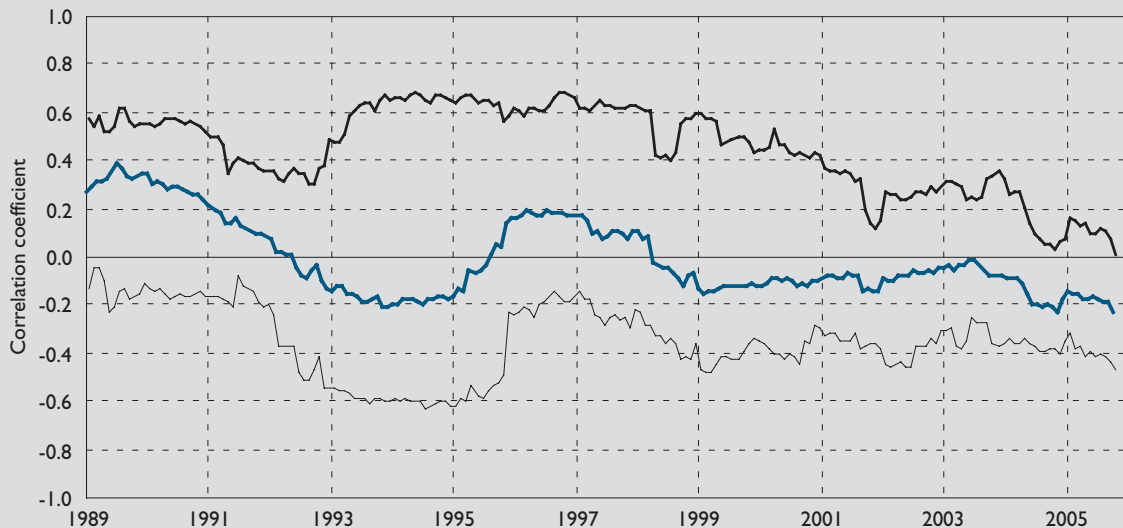
Exhibit 2



Source: CIBC Asset Management

Correlation of exchange rates and relative bond returns
(monthly correlation, three-year moving average with high-low range)

Exhibit 3



Source: CIBC Asset Management

(or exchange rate-bond) pairs were tested. The thick line in the middle represents the average correlation observed over trailing three-year windows. The thin lines above and below represent, at any given time, the pairs with the highest and lowest correlations. It must be noted that these 'extreme' pairs change all the time and that no one pair defines the extremes throughout this sample.

We make three observations:

- The average correlation is relatively stable and very close to zero for both equities and bonds. This is especially true over the past 10 years.
- The range from highest to lowest correlation is narrow (plus or minus 0.4 around -0.1 , on average). Interestingly, we note that even the highest correlations fail to reach levels of significance in the 0.6-0.7 area or beyond.
- Exchange rates and relative market returns are becoming less and less correlated over time, shown by the gradual decline in correlation dispersion.

Based on this evidence, we conclude that there is little empirical basis for tying benchmark currency exposure to underlying asset benchmark exposure, either in full (unhedged benchmark) or in part (partially hedged benchmark). Rather, benchmark currency exposure should be determined independently of underlying asset benchmarks.

THE FAILURE OF MEAN-VARIANCE OPTIMISATION

This is where we run into serious methodological problems. When optimising the weights of a portfolio of assets, the mean/variance approach is typically used. This works because over time all asset classes have a positive, albeit sometimes very low, return. In contrast, currencies do not have systematic positive return. Individual exchange rates may exhibit sustainable, long-run positive returns. But currency baskets rarely do. In theory,

nominal effective exchange rates should have zero mean return; it is, after all, a 'zero-sum game'. As a result, even statistically positive past returns should not necessarily be used as reasonable expected returns in optimisation work (back to our earlier example of the yen).

In the world of mean-variance optimisation, this is a big problem because currency volatility will dwarf any small, expected return associated with it. As a result, a standard portfolio optimiser delivers an odd currency benchmark heavily weighted in the currency with the highest return (observed or expected) and the currency with the most negative correlation to overall portfolio returns. This can be disastrous, first because an optimal benchmark will tend to be concentrated in only one or two currencies and, second, because average overall portfolio assets tend to trend up in value, and picking a currency with a negative correlation probably entails picking a currency with a long-run negative return as well.

ONE SOLUTION: A DIVERSIFIED CURRENCY BENCHMARK

To circumvent this problem, we recommend increasing the diversification of the currency benchmark, where a minimum currency weight is assigned to each currency in the universe at the expense of the currencies with the largest weights.

The diversified currency benchmark brings three notable benefits.

It is generally less risky than adopting an asset-linked currency benchmark

The reason is simple: equity and bond benchmarks have the bulk of their weight in the US, Japan and the euro area. As a result, an investor will invariably have the bulk of the currency exposure made up of the other two (or three) major currencies. This lack of diversification brings more volatility, especially since collectively the currencies of smaller markets are not more volatile than those of bigger markets.

It generally yields higher returns than an asset-linked benchmark

Smaller markets tend to offer a small interest rate premium that is not offset by systematic currency depreciation (i.e. there is a natural interest rate bias in spot currency returns). A diversified benchmark implies reducing exposure to 'low interest rate' major currencies in favour of 'higher interest rate' second-tier currencies.

It gives active currency managers more breadth, allowing them to capture as much alpha as possible

Many portfolios remain constrained by the inability to establish net short currency positions (or hedge ratios in excess of 100% or less than 0%). For currencies like the Norwegian krone or the New Zealand dollar, which have weights close to zero in either equity or bond index benchmarks, there is no room to express an otherwise profitable over/underweight strategy. For all portfolios that remain bound by this constraint, the diversified currency benchmark is the way to go.

The combination of the above points means that the diversified benchmark will be superior – less risk, more return, increased alpha potential. Exhibit 4 summarises our findings.

MANAGING THE CURRENCY BENCHMARK

Active currency managers have over time posted a collective information ratio of about 0.5, net of fees. This is higher than traditional long-only stock or bond managers. If active currency managers can extract so much value, it must be true that currencies are not that hard to forecast, especially given that they offer so little breadth. Even including emerging market currencies, the universe is less than 40 currencies, versus thousands of individual stocks or hundreds of bonds. Even the most simple currency strategies, such as moving average cross-overs and carry trades are shown to consistently add value, albeit not very much.

Portfolio profiles with index-weighted and diversified currency benchmarks (1986-2005)

Exhibit 4

	Japanese portfolio		US portfolio		Euro area portfolio	
	Index	Diversified	Index	Diversified	Index	Diversified
Volatility	10.59	10.44	10.50	10.37	11.41	11.41
Return	5.99	6.11	10.24	10.29	9.95	10.30
Information ratio	0.57	0.58	0.98	0.99	0.87	0.90

- (1) Each portfolio is made up of 75% domestic assets and 25% foreign assets.
- (2) Index uses capitalisation weights to determine benchmark currency exposure and diversified uses diversified benchmark currency weights.
- (3) With the exception of (2) both portfolios are identical and unhedged.
- (4) All calculations include spot and carry, where applicable.

Source: CIBC Asset Management

Most participants in the currency market are not in pursuit of profit, but rather are there simply for transactional needs. This leaves a lot of additional return on the table for active managers.

HOW A DYNAMIC BENCHMARK WORKS

Dynamic benchmark management is not a new concept. It has been extensively discussed in recent articles, especially as it relates to stocks and bonds. The process is straightforward. At multi-year intervals, it requires answering a simple valuation question: relative to the entire period over which the benchmark was developed, is a particular asset class over-, under- or fairly-valued? If it is overvalued, then we can reasonably expect future, multi-year returns to be below average. In contrast, if it is undervalued, the opposite is likely to be true. Benchmark weights are then duly adjusted for the next three, four or five years.

Would it not have made sense to lower the equity benchmark in 2000, when equities were clearly overvalued by every historical measure? Similarly, would it not have made equal sense to lower the bond benchmark in 2003, when the average G7 bond yield was less than 3%? Today, of course, matters are less clear because equities and bonds may not appear extremely over- or undervalued. Assessing currency valuation is no different; it is hard, but by no means impossible.

To test this approach, we used a very basic, intuitive approach: mean reversion. At five-year intervals, we compared a foreign currency relative to the portfolio's base currency. If the current exchange rate was above the average rate of the past five years, we reduced its benchmark weight by two percentage points (this is akin to increasing the hedge ratio). In contrast, if it was below its average rate of the past five years, we increased its benchmark weight by two percentage points (again, akin to lowering the hedge ratio). We stuck with this decision for five years, until the

Added value from dynamic currency benchmark management

Exhibit 5

If the domestic portfolio resides in:

	Japan	US	Euro area
Added value	0.31%	0.51%	0.34%
Correlation with:			
Unhedged portfolio	0.27	0.03	-0.14
Hedged portfolio	-0.02	0.00	-0.13
Diversified benchmark	0.17	0.03	-0.14

(1) Correlations are calculated using monthly returns over the entire sample period.

Source: CIBC Asset Management

next review cycle came up. This yielded a stream of gains and losses, which are summarised in Exhibit 5.

By using a simple mean-reversion approach to dynamically manage a currency benchmark, we generated excess returns in all three portfolios ranging between 0.31% and 0.51% (annualised). This in no way encroaches on active currency managers from adding alpha on a short-term basis, because it only consists of one small benchmark adjustment every five years. It does not detract from long-term portfolio optimisation either, because the currency weights on average are little changed. What it does achieve, however, is to capture excess returns for that in-between territory where neither benchmark selection nor active managers play a dominant role.

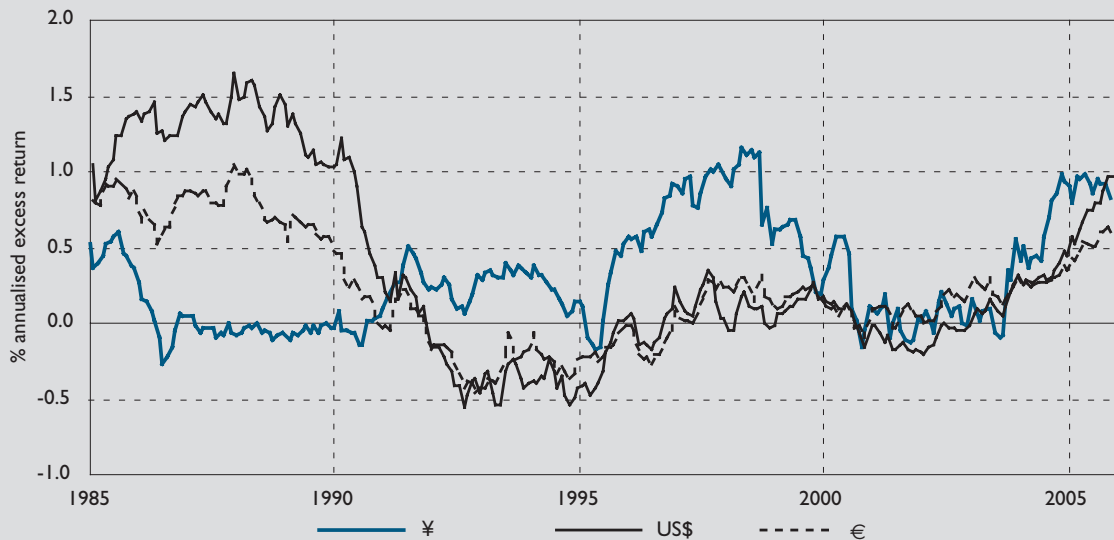
Does this excess return come at the expense of greater portfolio volatility? The bottom half of Exhibit 5 gives the answers. For yen-based investors, there is a trade-off as this approach increases overall benchmark portfolio risk, except in the case when benchmark currency exposure is heavily

hedged. For dollar-based investors, it is essentially a free lunch, as excess returns exhibit no correlation with any benchmark portfolio. For euro-based investors, the news gets even better, since the positive excess returns that are generated also serve to lower overall portfolio benchmark volatility, indicating a very significant efficiency gain.

Looking at the monthly breakdown provided in Exhibit 6, we see that these benefits are not evenly distributed through time. Each line on the Exhibit represents the trailing, five-year excess returns (annualised) that this strategy yields. Here, Japanese investors fare very well, with virtually no significant drawdown. Dollar- and euro-based investors underwent a slightly negative period in the first half of the nineties, but otherwise did very well. The episodic nature of the excess returns does not come as a big surprise; this approach is only expected to pay off when currencies reach valuation extremes. The rest of the time, excess returns should be closer to zero, and this is where active tactical managers have a big role to play.

Return impact on overall portfolio of dynamic benchmark
(five-year moving average, % excess return, annualised)

Exhibit 6



Source: CIBC Asset Management

CONCLUSIONS

We observe that this approach would have yielded very handsome dividends in the past five years, suggesting that value-investing in currencies remains alive and well. Our most important observations from this exercise are:

- Investors need to consider adopting a currency benchmark that is independent of underlying asset exposure. This is difficult, because many still think of the currency decision as a hedging decision.
- The long-term benchmark decision will be ultra-sensitive to expected returns. Our suggestion is to assume those to be at, or close enough to, zero and adopt the superior diversified benchmark.
- Currencies experience long valuation cycles, so

the benchmark should be adjusted at the margin.

This dynamic approach to currency benchmarks, as with any other asset class, has the potential to unlock tremendous value that currently goes largely untapped.

In our dynamic currency benchmark example, we used the crudest, simplest approach. A lot more research needs to go into using more sophisticated valuation metrics. This is where both the active manager community (the fundamental-based ones, at least) and the academic community can add a lot of value. Our own internal work has so far yielded extremely promising results, which we are happy to share with our clients. Another avenue of research consists in varying the dynamic cycle of adjustment: is a five-year-cycle optimal? Should it be longer, shorter? Is it better to do this gradually or in steps? Clearly, there are enough questions to keep quantitative analysts busy for years to come.

Technical note:

Data: All data in this article were provided by Datastream. Money market interest rates are three-month Libor. Spot exchange rates are the British pound bid WMRH 11:00 GMT fixing. Equity returns are computed using the MSCI World Index. Bond returns are computed using the JPMorgan Global Bond Index, with some missing data filled out with Datastream government bond indices. All data are month-end. The countries in the sample are the index members of the two relevant indices, with the exception of Hong Kong, Singapore, New Zealand, Norway and Denmark. Together, these countries account for 1.9% and 0.8% of the equity and bond indices used, respectively.

Sample: The data sample covers the period from December 1985 to October 2005, just two months shy of 20 years (238 months). The key limitation came from the bond index data, which lacks a long history for many countries.

Calculations: Synthetic euro indices, interest rates and exchange rates were constructed using data for constituent member countries. For the exchange rate and interest rates, country data was weighted according to OECD GDP weights. For equity and bond returns, the relevant capitalisation weights were used. For aggregate data over the period, 2005 index weights were used. This was done for two reasons. First, the purpose of the work is to derive conclusions to help future decisions. As a result, past index weights lose much of their relevance. Secondly, it made return and correlation

analysis easier to interpret since it was not biased over time by the mixed effect of changing weights.

Any calculation errors remain the authors'.



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