

The World Currency Basket (WCB)

Stephen Jen & Fatih Yilmaz

November 30, 2012

***Bottom line:** The global economy and the financial markets have gone through dramatic changes in the last decade. Actions (e.g., globalization and the rise of cheap labour supply in EM) and reactions (e.g., low interest rate policies in the developed world in reaction to declining inflation rates in the 2000s) have culminated in the biggest global financial and economic crisis since the Great Depression. At the same time, longer-term structural changes (e.g., demographic shifts and changes in the geopolitical balance of hard power¹) are taking place and will exert persistent pressures on financial prices, and especially currencies. Will the dollar remain the dominant global currency in the world? Will the Euro exist in 10 years' time? Will Japan implode one day? Will China's rise remain smooth? All of these are complex issues. In this note, we focus on one question: To preserve one's wealth over time, what is the best long-term currency strategy? Keeping all the eggs in one basket, either in US dollars or in Euros, obviously does not make sense from a long-term perspective. Yet many funds are dollar-, euro-, or JPY-denominated and the portfolio managers only care about their returns in the denominated currency. Is this the right long-term strategy? If the answer is 'no,' what is the proper way to think about maintaining the long-term purchasing power of wealth? We introduce the concept of the World Currency Basket (WCB), whereby investors think not in terms of the dollar or the euro or the yen, but in WCB terms. This is a 'safe harbour' concept in currency management, one that we believe helps preserve the long-term purchasing power of the underlying portfolio. Without revealing specific currency weights in our WCB, very roughly speaking, the optimal weights on the 'Dollar Bloc', 'Euro Bloc, and the 'Mid or High Yield Bloc' of currencies should be around 40:30:30. (The currency weights within these blocs are more complicated and far from equally-weighted.) We believe*

¹ Please see our note 'Hard Power of Nations,' November 13, 2012.

funds without immediate liability commitments should consider adopting such a long-term safe harbor concept for their currency overlay. This idea applies especially to SWFs, endowments, and wealthy families that are trying to preserve their wealth over generations.

No currency is absolutely safe over the long-term. The changes in the global economy and the financial markets since 2001 have been breath-taking. The rise of China and EM has been an immense positive shock for the global economy, as the aggregate global economic growth was boosted while inflation suppressed. The inflation targeting framework that was popular in the developed countries for most of the 2000s offered the intellectual and political cover for most of the central banks in the world to run very easy monetary policies. The emergence of the credit bubble in the West and its subsequent collapse is history, familiar not only because it has just happened in the US and Europe, but familiar because Japan had an almost identical experience in the late-1980s and the early-1990s.

To fight the headwinds of private sector deleveraging, developed market central banks have adopted a strategy of financial repression and the US and Japanese governments have continued to rely on fiscal stimulus to offset the negative impact on aggregate demand. These stimulative policies themselves will ultimately have consequences further down the road: if the Fed and the BOJ print money with no end, what could happen to the dollar and the yen? Europe, on the other hand, has adopted a vastly different fiscal policy and it will be beyond interesting to see how the different fiscal and monetary policies will perform several years from now. Even though Europe's policies seem less reckless, there is still a distinct risk that the euro may not exist a generation from now.

In addition to the financial cycles and the business cycles, there are active and powerful secular trends that will also impinge on the financial markets and currencies. The hostile demographic trends in the developed countries are in stark contrast with the friendly demographic trends in some emerging economies. Further, the world's geopolitical balance of *hard* power is also changing fast: with China on an obvious ascent, Europe and Japan in an obvious descent, and the US' ability to respond to the rise of China being compromised partly because of the financial and economic challenges it faces.

In short, the world will likely remain rather unpredictable in the coming generation. No currency will be absolutely safe.

Putting all the eggs in one basket (or currency) cannot be the prudent long-term strategy. The purpose of this note is not to analyze the long list of financial, economic, and geopolitical shocks mentioned above, but to highlight what we believe is an under-appreciated issue: *from a long-term perspective, what should a fund's currency strategy be if the aim is to preserve the global purchasing power over time?*

Many pension funds have liabilities in their domestic currencies. So the scope for them to have a different currency overlay strategy for their assets is limited. But for SWFs that don't have a defined liability stream, and for endowments and wealthy families, what currencies they should hold their wealth in has huge consequences. The underlying basket of assets held in these portfolios should reflect the portfolio managers' views on the various equities, bonds, and alternative assets. However, should the funds' performance be measured and denominated in one currency, e.g., US dollar, the euro, or the yen? Our answer is a resolute 'no'.

We believe that, for these SWFs, endowments, and wealthy families, putting all the eggs in one basket/currency cannot be the best long-term strategy, given the long list of economic and political shocks we mentioned above. But if the better strategy is a currency basket of some sort, what should this basket be based on?

A World Currency Basket (WCB). We propose a WCB unit that might be a useful concept in this discussion. While several *ad hoc* currency basket concepts and ideas² exist, to our knowledge, this is the first basket approach which is based on robust analytic and statistical foundations.

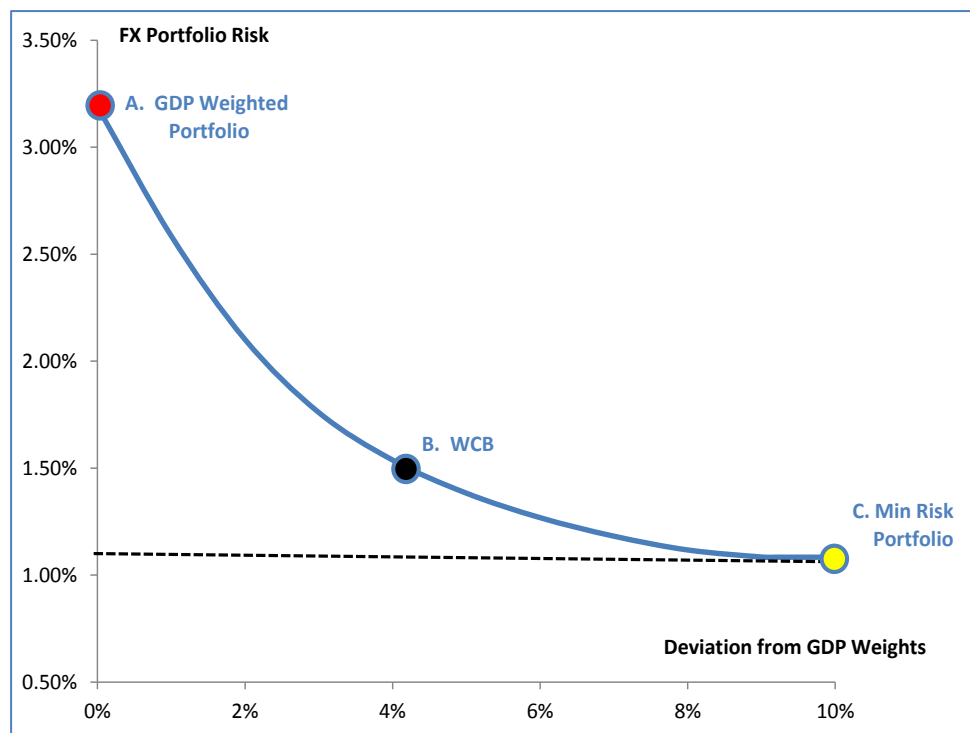
Let's start with the most popular and intuitive notion of a global currency basket. Most people might guess that a currency basket that reflects the GDP weights of the countries in the world is appropriate: the IMF's SDR (special drawing rights) is a version of the GDP-based currency weighting concept. While using the GDP weights may be a good way to capture the liquidity and the size of the various markets, we do not think this is the best benchmark, primarily because such an approach does not take advantage of the correlation

² For example, in the 1930s, John M. Keynes proposed the idea of an 'International Currency Unit.'

relationships between currencies. It can overweight or underweight important regions and countries grossly.

Figure 1 below helps illustrate our point.

Figure 1 GDP Weighted, WCB and Minimum Risk Portfolios



Source: SLJ Macro Partners, Bloomberg, Datastream

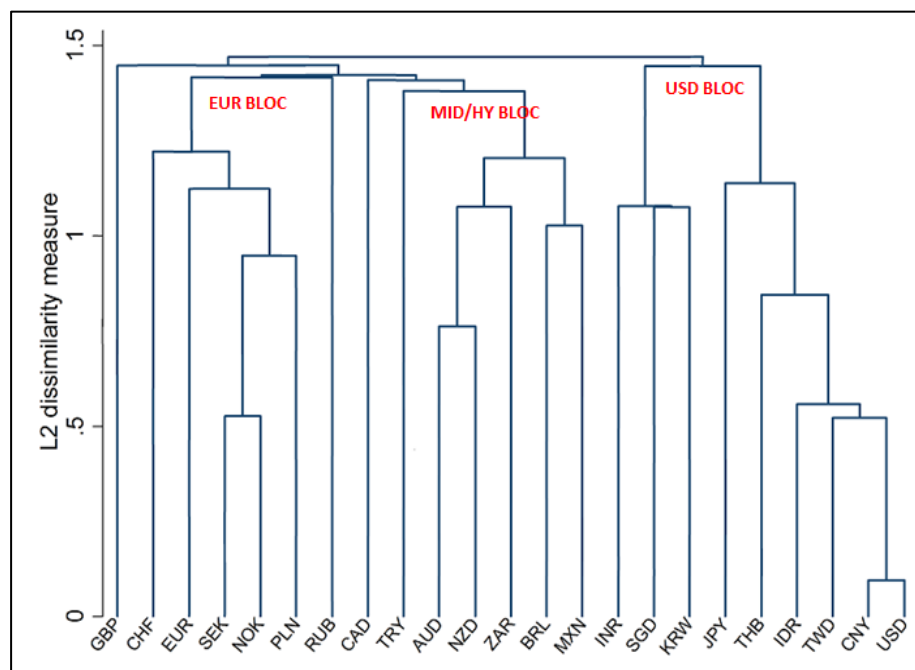
Because a GDP-based currency basket does not optimally take advantage of the correlation relationships between different currencies, it actually has quite high risk, i.e., running a GDP-based currency basket, such as the SDR, currently generates 3.2% of annualised portfolio risk. In other words, ignoring the correlation effects, exchange rate volatility could add to the volatility of the underlying portfolio by more than 3.0% a year. While a GDP-based currency basket concept is a good start, it has obvious short-comings.

We have constructed a ‘minimum risk currency portfolio’, by optimising the currency weights in a currency basket to minimize the currency portfolio volatility. If having as low volatility in the currency basket were one’s sole objective, one could deviate from the GDP-based currency basket to achieve a reduction in currency volatility. But this process, as the chart above suggests, can quickly reach a point of diminishing benefits, and some currencies may encounter liquidity problems. In other words, a large SWF cannot, and maybe should not, hold a lot of Philippine peso or Czech koruna. The WCB strikes a

balance between a GDP-based currency portfolio that has the best liquidity characteristics, and a minimum-risk portfolio. This is point B in the chart above.

A ‘currency family tree’: three currency blocs. An important concept in this WCB framework, as mentioned above, is the correlation characteristics of currencies. The chart below shows that, based on a *L2 dissimilarity measure*, the currencies of the world can be organized in a ‘currency family tree.’

Figure 2 Current Correlation Structure of Currency Markets



Source: SLJ Macro Partners, Bloomberg, Datastream

Here is how one can read the chart. SEK and NOK are close relatives, based on their historical correlation relationships. In turn, they are related to the EUR, and, CHF and GBP are their distant cousins. PLN and RUB also belong to the same family. We call this family on the left side of the global family tree the ‘Euro Bloc.’

Similarly, on the right side of the global family tree, the USD and CNY have been very correlated in the past. TWD has been a close relative to the CNY and the USD, but the JPY, KRW, SGD, and even INR all belong to the same family. We call this the ‘Dollar Bloc.’ Historically, the ‘Dollar Bloc’ currencies have had very different characteristics from those in the ‘Euro Bloc.’

In the middle of the global family tree, we have what we call ‘Mid-High Yield Bloc’ of currencies. They include the likes of AUD, ZAR, and BRL. They are, in this framework, the third family of currencies.

Portfolio weights and current risk-return characteristics. Our work indicates that trade-, money supply-, or GDP-weighted approaches can be significantly improved in terms of risk reduction or in Sharpe ratio terms. Figure 3 below presents the risk and yield characteristics for the three portfolios presented above.

Figure 3 Portfolio Weights and Risk- Return Profiles of Alternative Portfolios

PORTFOLIO RISK - RETURN	GDP	WCB	MIN RISK
FX RISK	3.2%	1.5%	1.1%
2Y SWAP YIELDS	1.8%	2.5%	2.0%
5Y SWAP YIELDS	2.1%	2.8%	2.4%

WEIGHTS	GDP	WCB	MIN RISK
G10	64%	56%	39%
Non-G10	36%	44%	61%
USD Bloc	58%	40%	49%
EUR Bloc	29%	31%	27%
MID/HY Bloc	13%	28%	24%

Source: SLJ Macro Partners, Bloomberg, Datastream

Not only does the GDP-weighted portfolio have 2 to 3 times higher currency risk than the WCB or Min Risk portfolios (i.e., 3.2% vol versus 1.5% and 1.1%), it also offers the least attractive yield profile (i.e., using the 2Y swap yields, a GDP-weighted basket has a carry of 1.8%, while the WCB has a 2.5% positive carry).

Further, the GDP-weighted currency basket is over-weight on the developed market currencies. While the GDP-weighted portfolio has 65% of its weights in G10 currencies and nearly 60% of its weight in the USD Bloc, the WCB we propose has 55% of the overall weight in G10 currencies, and only 40% of the overall weight in the USD bloc. The WCB puts 15% more weight in Mid Bloc currencies relative to the GDP-based portfolio. Furthermore, the minimum risk portfolio places less than 40% weight in G10 currencies altogether, 25% away from the GDP weights. The lesson here is that a GDP-based portfolio tends to

over-weight the G10 currencies, introduce greater volatility, and enjoy a lower positive carry.

The WCB construction in a nutshell. As we can only express currencies in relative terms, no objective absolute currency benchmark exists. As we mentioned earlier, the GDP-weighted approach (or other similar approaches) cannot take into account the correlation structure or the minimum risk portfolio that could be achieved. More generally, the ad hoc approaches have not been subject to efficient frontier and standard portfolio analyses. This is a problem because we cannot measure the location of a particular currency basket on the efficient frontier. And we cannot measure its absolute level portfolio risk relative to other possible admissible currency portfolios.

Our approach analytically transfers this measurement problem from a relative value currency space to an “imaginary” absolute value currency space. A key factor that facilitates this analytical mapping is a realistic assumption that the average long-term covariance for all currencies in the global system converges toward zero. In this imaginary currency space, we analytically recover an observable long-term risk matrix for global currencies without imposing a reference base currency or ad hoc weighting schemes. Such a risk matrix is normally not observable in practice. Once this long-term risk matrix is recovered, we make use of standard portfolio optimisation tools. In order to obtain a smooth yet dynamically adaptive WCB to developments in the global economic system, we use GARCH-family volatility (time domain) models and band-pass filtration (frequency domain) techniques for the calibration of our imaginary currency risk matrix.

Bottom line. We proposed a robust and objective WCB. Unlike other currency basket ideas, our approach does not impose ad hoc weights. Instead, the currency weights are objectively obtained from the data and the proprietary currency risk matrix we developed. We also provided evidence that both risk and return characteristics of the WCB can be significantly better than the GDP-weighted or other ad hoc basket approaches. Given the increased uncertainty about the global financial and monetary system, and on-going tectonic shifts taking place in the global economic structure, in our view an objective WCB concept can be helpful for several purposes: (i) the WCB can serve as a currency basket or passive currency benchmark to preserve long-term purchasing power; (ii) it is a robust safe-haven currency basket against different types of global shocks; and (iii) the WCB can also serve as an ideal long-term

currency benchmark to assess relative success of active currency management or active overlay programs.

Note: The overlay team at SLJ Macro Partners provides advisory and client-specific ideas for the WCB. Please contact research@sljmacro.com for further information.

DISCLAIMER

This research note is provided by SLJ Macro Partners LLP, a Limited Liability Partnership with Company Number: OC362504, registered in England with Registered Office Address 7 Clifford Street, London W1S 2WE. SLJ Macro Partners LLP is authorised and regulated by the Financial Services Authority (FRN 554074).

This commentary has been prepared by a member of SLJ Macro Partners LLP and may not be reproduced, redistributed or copied in whole or in part for any purpose. Neither this document, nor any copy or part thereof, may be distributed in any other jurisdictions where its distribution may be restricted by law and persons into whose possession the material comes should inform themselves about, and observe, any such restrictions.

The information and opinions provided in our research take no account of investors' individual circumstances and should not be taken as specific advice on the merits of any investment decision. No member of SLJ Macro Partners LLP accepts any liability whatsoever for any direct or consequential loss howsoever arising, directly or indirectly, from any use of our research or its contents.

This note is provided in accordance with s54(1) of The Financial Services and Markets Act 2000 (Regulated Activities) Order 2001, which provides that the giving of advice in this way is neither that of:

- (a) the regulated activity of giving advice; nor
- (b) leading or enabling persons to buy, sell, subscribe for or underwrite securities or contractually based investments.

SLJ Macro Partners LLP has taken all reasonable care to ensure that the information contained in this document is accurate at the time of publication, however no representation or warranty, express or implied, is made as to the accuracy, reliability or completeness of such information.