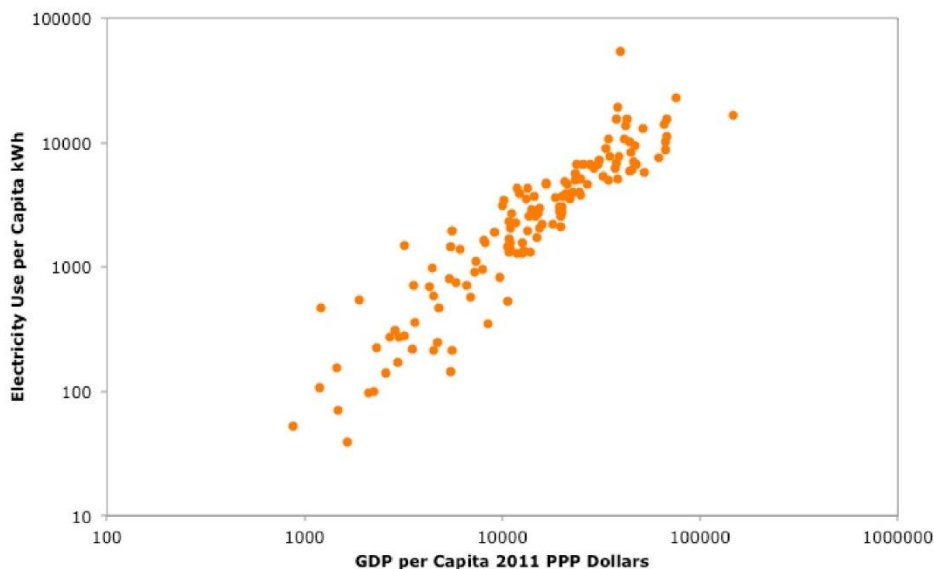


Financing the Energy Transition: Currency Risk and WPU Indexed Bonds

The urgency of taking steps to address climate change has been underlined by extended bouts of severe weather in many parts of the globe in 2023. The window to reach the goal of limiting global warming to 1.5 degrees centigrade is rapidly narrowing and may have vanished altogether. A global shift towards electricity for transportation, heating and cooling, industrial processes, and other uses of energy will be a fundamental part of the necessary shift from fossil fuels to renewable sources of energy.

Required electrification is **not** a trade-off between climate change and development. In fact, economic growth and development across countries is very closely tied to the growth of electric power use, as shown in Figure 1.

Figure 1. Per Capita Electricity Use and GDP (2014)



Stern, David, et. al. “The Impact of Electricity on Economic Development: A Macroeconomic Perspective”
University of California at Berkeley, 2019, <https://escholarship.org/content/qt7jb0015q/qt7jb0015q.pdf?t=psd398>

Building electric generation capacity will require multi-trillion-dollar investment in the APEC region. These will typically be in the form of large projects with payouts over decades. Financing these required investments will be a major challenge in most APEC economies. The first obstacle is the limited size of domestic bond markets in most developing and emerging economies, and markets for long-term bonds and especially limited. The second obstacle in many of these economies is high domestic interest rates. The commercial viability of long-term projects is highly sensitive to the interest rate. Even modest increases in long-term rates can doom otherwise viable projects.

While domestic financial resources can and should contribute to financing the energy transition, foreign finance will be absolutely essential in raising sufficient funds and interest rates that make projects viable. But relying on foreign finance creates the additional obstacle of foreign currency risk, since the revenue streams of infrastructure projects are in local currency. Foreign currency risk has been consistently identified as an obstacle to infrastructure investment in emerging markets and developing economies.

The recent development of external finance raised in local currency does not alter this conclusion. The number of economies able to borrow externally in foreign currency remains small, and volumes, particularly for long-term capital remain small. What's more, local currency debt is issued at domestic, not foreign, interest rates. It's crucial to recognize that, even when borrowing in domestic currency, foreign exchange risk does not disappear. It is reflected in the higher interest rates necessary for foreign creditors to bear the exchange rate risk.

There is no magic bullet that will eliminate foreign currency risk, short of the development and deepening of long-term domestic bond markets. But this has a time horizon at least as long as the energy transition, and a successful energy transition requires funds now.

While foreign currency risk cannot be eliminated, it can be reduced. Almost all external borrowing is denominated in a single currency. Most often this is the US dollar, but there are also external loans denominated in the currencies of other APEC members. The risk to the borrower – most recently illustrated by the sharp appreciation of the US dollar – is that the currency in which they borrowed externally appreciates not only against the local currency but also against foreign currencies generally.

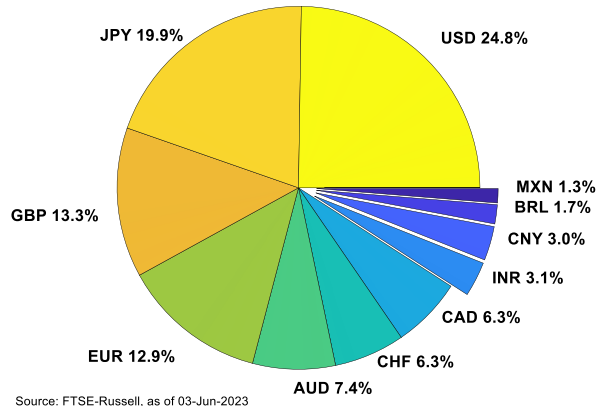
Fortunately, single currency foreign exchange risk can be greatly reduced by diversification across currencies. While the principle is clear, its application in the case of a foreign currency bond is not immediately obvious. Fortunately, reducing single currency borrowing risk does not require multi-currency borrowing. Instead, the currency risk of a bond servicing obligation can be reshaped easily and at low cost by indexing interest and principal repayments to a group (basket) of widely traded international currencies.

The World Parity Unit (WPU) index was designed for just such a purpose. After discussion with the foreign exchange departments of the major central banks¹, WPU was developed working with FTSE-Russell. FTSE-Russell is the world's largest index group and calculates the daily value of WPU against the major currencies based on the official 4 pm London fixing rates.

WPU is based on a basket of 11 widely traded international currencies, explicitly chosen to reduce overall currency volatility. WPU includes the seven most important developed market currencies, but also includes the currencies of four major emerging markets, Brazil, China, India, and Mexico. The goal of the World Parity Unit is to preserve investors' wealth over the long term and in global terms.

¹ Bank of England, Bank of Canada, Federal Reserve Bank of NY, Bank of Japan, Reserve Bank of Australia.

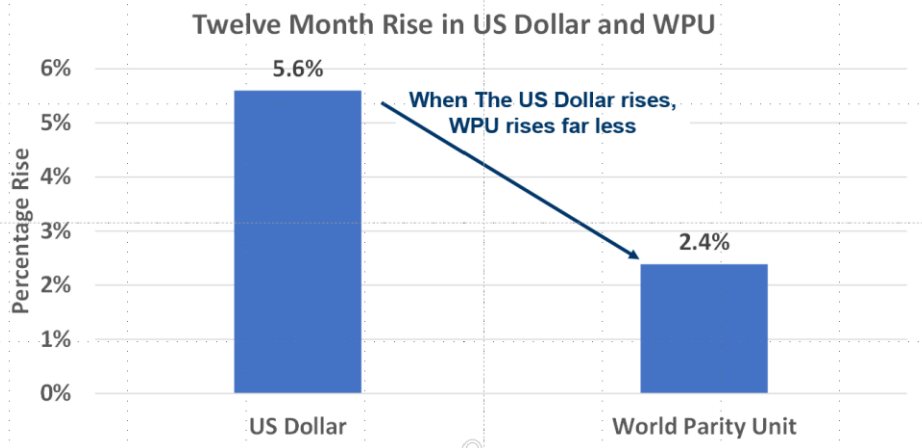
WPU Currency Basket



Borrowers can substantially reduce the volatility of repayment obligations due to single currency movements by issuing a bond where interest and principal repayment obligations are indexed the value of the WPU basket. Note that WPU is not a currency, and a WPU-indexed bond does not change the currency of borrowing or bond servicing. A US-dollar bond issue provides US dollars to the borrower, who in turn pays interest and makes principal payments in US dollars. Instead, dollar servicing amounts are adjusted based on the change of the WPU index over time.

The principle of indexation is well-established in bond markets, most commonly for inflation-indexed bonds. The legal and technical modifications of a bond contract to provide for WPU-indexation can be easily made.

In addition, the risk-reduction benefits of WPU-indexation for borrowers are very substantial. This is because WPU only has 24.8% US Dollar weight and also has 9.5% in emerging market currencies. Historically, when the US Dollar rose over twelve months against Asian currencies, the average rise was 5.6%. During these periods, the average rise in WPU was only 2.4%. So twice as much can be borrowed using WPU indexed bonds for the same currency risk as borrowing 100% in US Dollars.



This chart shows the average of twelve month *rises* in the US Dollar against a GDP weighted basket of six Asian currencies: India, Indonesia, Thailand, Vietnam, Malaysia and Philippines. Data: Monthly data from January 2004 through May 2023. World Bank, Refinitiv, MPG Calculations

Financing the energy transition in the APEC region will involve many challenges. But it is possible to substantially address one of the major challenges – foreign currency risk – through WPU-indexed bonds. Although the explanations in this short note were limited, there is much more information available on WPU².

² For FAQs and further information see www.MountainPacificInstitute.org.