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A Synthetic International Unit of Account for the 21st Century

Lok-Sang Ho

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Abstract

This paper introduces an indexed unit of account that represents a unit of real purchasing power. Commodity prices and bonds quoted or denominated in this unit will allow real prices and real interest rates to become more transparent. The real prices of commodities are shown to be Granger-caused by the US dollar's effective exchange rate indicating presence of speculation. Quoting commodity prices in real terms in the synthetic unit of account makes real prices more transparent. Moreover, since settlement can be in any currency movement in the exchange value of the USD becomes irrelevant.

1. Introduction

Mr Zhou Xiaochuan, the governor of the People's Bank of China, wrote on the Central Bank's website in 2009 calling for the replacement of the US dollar by an alternative "international reserve currency that is disconnected from individual nations and is able to remain stable in the long run."(March 23, 2009) The ideal international reserve currency *should have a stable value*, and should be able to help "*safeguard global economic and financial stability*."

Mr Zhou then proposes that the SDR might be "the light in the tunnel for the reform of the international monetary system." According to him, "the SDR has the features and potential to act as a super-sovereign reserve currency," and the international community should "actively promote the use of the SDR in international trade, commodities pricing, investment and corporate book-keeping." Hoguet and Tadesse (2011) have ably demonstrated the feasibility and benefits of using the SDR for denominating bonds. While "An investor can synthetically replicate the weights

of an SDR-denominated bond," "a security denominated in SDRs is self-rebalancing and is likely to minimize rebalancing costs."(p.165)

While the SDR shows promise, any suggestion that the US dollar might be replaced by an alternative global reserve currency any time soon is probably unfounded. With so many stakeholders who are used to the US dollar now, the inertia against any change is formidable. Indeed, globally 63.75% of the foreign exchange reserves of central banks consists of US dollar assets in the second quarter of 2015, up from 61.46% in the same quarter in 2012. [1] Even with the admission of the Chinese RMB into the SDR in October 2016, the supremacy of the US dollar as the world's top reserve currency is not changed. While the RMB will carry a weight of 10.92% in the basket, that of the US dollar in the SDR will still take on a weighting of 41.73%, down only from 41.90%.[2]

Is the SDR really "the light in the tunnel for the reform of the international monetary system"? According to the press release of the IMF after it reviewed the valuation of the SDR in 2010, "The weights assigned to these currencies continue to be based on the value of the exports of goods and services by the member (or by members included in a monetary union) issuing the currency and the amount of reserves denominated in the respective currencies that are held by other members of the IMF."[3] This principle was reaffirmed in 2015.[4] Given the prevalence of the US

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[1] https://www.gfmag.com/global-data/economic-data/economic-dataforeign-exchange-reserves?page=2

[2] http://www.imf.org/external/np/sec/pr/2015/pr15543.htm

[3] Press release No. 10/434, IMF, November 15, 2010

dollar as the predominant international currency under the criteria stated the US dollar will continue to be over-represented in official reserve holdings for a long time to come. Given the reference to official reserve holdings in determining the currency weights in the SDR, there is just no way out of the dominance of the US dollar. Given the way the SDR is designed, it will never reduce the predominance of the US dollar in international trade and finance.

Against this background, perhaps it is time to revisit the idea of a brand new synthetic unit of account. This idea was floated by Eichengreen and Hausmann in 2003. They proposed an inflation-indexed basket of currencies of emerging and developing countries. The original purpose of that proposal was modest, in order that "claims on a large and diversified group of emerging-market economies can be denominated," allowing for "more efficient international diversification of risks and a reduction in financial fragility."(p.3) We will argue that a synthetic unit of account based on major currencies, and indexed against inflation in their respective domestic economies, can revolutionize international trade and international finance, and will enhance economic efficiency and equity. This unit of account can be called the World Currency Unit.

Section 2 will present a brief introduction to the subject of synthetic unit of account from a historical perspective, and highlight the key properties of the World Currency Unit. **Section 3** will show that using the WCU for the quotation of

[4] "Directors agreed that in order for the SDR basket to reflect the characteristics of currencies rather than members, the currency-based approach applied since 2000 to monetary unions should be applied to all currencies when determining currency weights." Press Release No. 15/543, December 1, 2015

commodities and the denomination of bonds should improve the efficiency and stability of commodity markets and capital markets. In **Section 4** it is demonstrated that individual countries—particularly smaller open economies that are subject to large capital flows relative to their sizes—can peg their currencies to the currency basket underlying the WCU under a regime of "*managed fixed exchange rates*"—which allows adjustments in the peg only upon demonstrated changes in economic fundamentals. A summary of the key findings appears in the Conclusions under **Section 5**.

2. Desirable Properties of a Synthetic Unit of Account

Irving Fisher (1911) had pointed to one gross idiosyncrasy in commerce in his classic work *The Purchasing Power of Money*. There he wrote:

> We have standardized every other unit in commerce except the most important and universal unit of all, the unit of purchasing power. What business man would consent for a moment to make a contract in terms of yards of cloth or tons of coal, and leave the size of the yard or the ton to chance? Once the yard was the girth of a man. In order to make it constant, we have standardized it. …. At first we could not standardize units of electricity because we had no adequate instruments for measuring those elusive magnitudes. But as soon as such measuring devices were invented, these units were standardized…. With the development of index numbers…and the device of adjusting the seigniorage according to those index numbers, we now have at hand all the materials for scientifically standardizing the dollar and for realizing the

> long-coveted ideal of a "multiple standard" of value. In this way it is within the power of society, when it chooses, to create a standard monetary yardstick, a stable dollar.[5]

Thus to Fisher indexing is the key to creating a standard monetary yardstick, and indexing against inflation appears unavoidable, in order to achieve "stable value"—a central characteristic Zhou deemed highly desirable in an international reserve currency. Today, because we live in a globalized world, the need for stable purchasing power against global output implies a need for consideration of multiple currencies and of multiple price indices.

A recent proposal for a synthetic unit of account was made by Hovanov *et.al.*(2004) who aimed at searching for a "minimum variance currency basket." The authors cited Adam Smith who noted: "…a commodity which is itself continually varying in its own value can never be an accurate measure of the value of other commodities."(Smith, 1976, p.48) However, Hovanov *et.al.*, having noting that it is impossible to find a universally traded good with constant exchange value "across time, space, and economic systems," went on to search for a second best: a "low-volatility (i.e., low-risk), multi-currency numeraire for a fixed set of currencies and for a fixed period of time."(p.1489) Utilizing a quadratic optimization framework, and using numerical methods, they succeeded in finding optimal weights for currencies that allowed the construction of a "stable aggregate currency" which

[5] This paragraph can be found here:
http://oll.libertyfund.org/titles/1165#Fisher_0133_1376

was shown to have lower volatility and lower correlations with its components than the SDR.

A synthetic unit of account that is viable needs to be transparent and understood. Only so will it help improve the efficiency of the markets. Although Hovanov *et.al.*(2004) found the weights for a currency basket whose variance of value is minimized over a period, computation is based on a complicated optimization procedure using historical data within a specific period, and there is no guarantee that their derived weights will ensure minimal variance over other periods. The lack of transparency evidently reduces its appeal. More important, since there is no indexing against inflation, their proposed currency basket does not represent stable purchasing power over time.

Money is a unit of account, a store of value, and a medium of exchange, but these functions are all related, and are founded on the unit having stable value. Following Fisher's logic, the preferred unit of account is therefore a unit that has stable value in a substantive sense. Ho (2000) proposed one version of the "World Currency Unit" that purports to be stable in value. Using the GDP of some base year as weights will, however, become increasingly untenable as time passes. This paper proposes to change the weights annually as new GDP data become available. As GDP data are subject to revision, we propose to use GDP lagged two years as weights. These weights offer the advantages of being apolitical and transparent.[6] More importantly,

[6] Eichengreen and Hausmann(2003) in their proposal for an inflation-indexed basket of currencies of emerging and developing countries also proposed to use GDPs, albeit at purchasing power parity.

because each underlying currency is indexed against inflation and its value in terms of real purchasing power is therefore stable.

3. The Proposed Synthetic Unit of Account

As Ho (2012) argued, using GDP weights for a "benchmark currency basket" can be justified as conforming to the gravity model. Countries with a larger GDP will draw more imports directly or indirectly. Ho derived the effective exchange rate of any currency by comparing the normalized value of that currency against a "benchmark basket of normalized currencies" using GDP weights. Real effective exchange rates are derived by multiplying with the ratio of the country's price index to the weighted price index of benchmark currency countries.[7] Normalization renders the normalized exchange rate of any currency in the base year against the USD equal to 1 in the base year. It is derived by dividing the time series of exchange rates by the exchange rate against the USD in the base year.

Ho's GDP weights are lagged two years to minimize the effects of revisions. The benchmark currency basket comprises the US Dollar, the Euro, the Yen, the Pound Sterling, the Canadian Dollar, and the Australian Dollar. With the RMB now admitted into the SDR basket, it will make sense to include the RMB in the benchmark currency basket as well.

This paper suggests that the synthetic unit of account can be simply derived by indexing the benchmark currency basket against inflation: more accurately by

[7] The effective exchange rates must first be multiplied to a price index ratio to become real effective exchange rates. See Ho(2012).

indexing each constituent currency in the basket against the inflation of the respective country. Global inflation-linked bonds have been reported to command a market capitalization of over 2.2 trillion dollars in 2011.[8] With the advent of the synthetic unit of account, global inflation-linked bonds based on the WCU will become more attractive.

To summarize this section, we have defined an unindexed currency basket called the "benchmark currency basket" (BB) as a lagged GDP-weighted currency basket of standardized or normalized currencies. Following Ho(2000) we call the inflation-indexed benchmark currency basket the World Currency Unit. The price of WCU can be quoted in any currency, regardless of which currency in which it is quoted, the unit represents how much of one currency—any currency—is needed to buy a basket of "global output"—sourced from different countries in proportion to the sizes of the GDPs.

While the SDR is reweighted every five years, the WCU is reweighted against GDPs every year. While it may be thought that the weights should be based on GDPs in PPP dollars, we argue that nominal GDP in USD calculated at market exchange rates will serve better as weights. First, purchasing power parity exchange rates are dominated by non-traded goods and services that are priced very differently from country to country. For international trade and finance non-traded goods and services are of little relevance. Secondly, nominal GDPs are far more transparent and more timely in availability. Third, empirical testing shows that effective

[8] See Ahmedov et.al. "Global inflation-linked bonds a wise pick," in Financial Times, November 14 2011.

exchange rate indices based on yearly reweighting of the benchmark currency basket work generally better than one based on less frequent reweighting.[9] The WCU compiled based on annual reweighting reflects ongoing changes in "economic gravities" and represents a significant improvement over Ho (2000), which defined the WCU without allowing a change in GDP weights.

We will write the formula for the valuation of the WCU(base year 0) at time t in year T as:

$$\sum_i \frac{GDP_{i(T-2)}.e_{i(T-2)}}{\sum GDP_{j(T-2)}.e_{j(T-2)}} \cdot \frac{e_{it}}{e_{i0}} \frac{P_{it}}{P_{i0}} \qquad [4]$$

P_{it}/P_{i0} "reflates" any currency according to the consumer price index. If P_{it}/P_{i0} is equal to 1.5, that means the CPI in country i at time t has gone up by 50% since the base year 0. An additional 50% of the currency for country i is necessary to preserve the purchasing power.

[4] is based on arithmetic weighting. Alternatively, we can write a formula for the valuation of the currency basket at time t in year T using geometric weights.

$$e_w = \prod_i (e_{it}/e_{io})^{Wi}$$

where W_i is the percentage of country i's GDP in the total GDP of the countries represented in the currency basket. Under this formula, the percentage change of e_w over time is equal to the sum of percentage changes of the currencies weighted by the GDP.

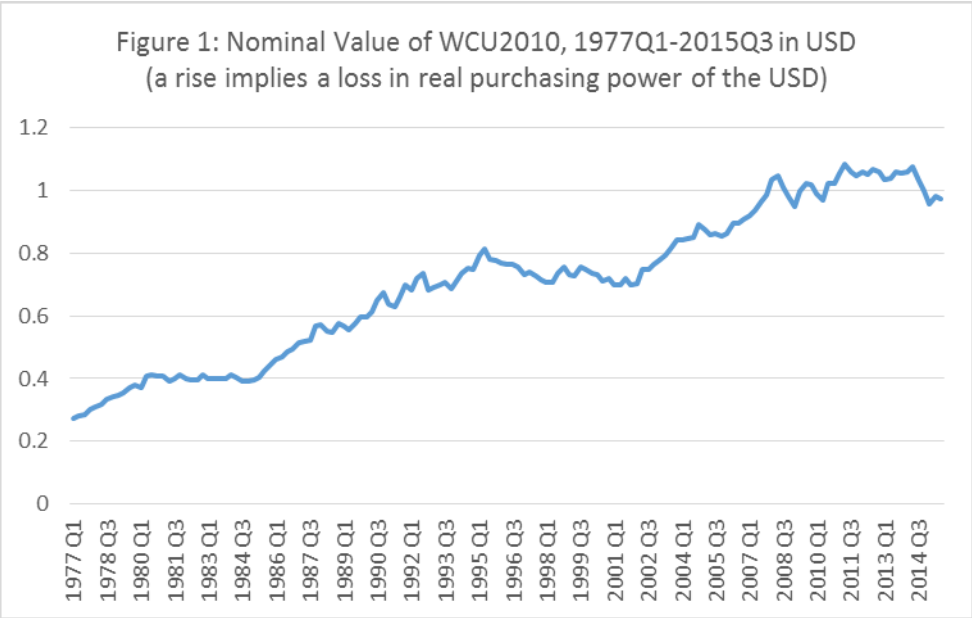
The formula for the valuation of the indexed currency basket at time t in year T using geometric weights will be:

[9] These tests are not reported here.

Price of WCU in USD = $\prod_i (e_{it} P_{it}/e_{io}P_{io})^{Wi}$

Testing shows that actual results using geometric weights are not much different from results using arithmetic weights. Since there is very little to gain using geometric weights, while arithmetic weights are easier to understand we would retain the formula based on arithmetic weights.

Figure 1 shows that the nominal value of the WCU (base year 2010) has been rising indicating that the real purchasing power of the US dollar has declined significantly since 1977, when the series began. As it turns out, this secular decline in the purchasing power of the US dollar is mainly due to inflation, and not so much because of the depreciation of the currency vis-à-vis other currencies.[10]



4. The Benchmark Currency Basket and the WCU May Improve Market Efficiency and Stability

[10] As Appendix shows, the exchange value of the US dollar against the benchmark basket of currencies fluctuates but has not really depreciated over the longer term.

From **Table 1**, we may note that in the past, when the US dollar was strong against the WCU, the US was typically in some form of recession or there was some kind of financial crisis occurring somewhere. There are three possible reasons behind this. One is that the US dollar is typically strong when the Fed adopts a tight monetary policy. Tight money tends to depress the US economy and often also the global economy. The other is that with the US dollar being the predominant currency of international settlement, any confidence crisis tends to encourage hoarding of US dollar-denominated assets while triggering a depressing effect on the global economy at the same time. The strengthening of the US dollar tends to depress the US economy even more by hurting the competitiveness of US exports. Finally, since many countries choose to peg their currencies to the US dollar, when the US dollar gains strength, they also suffer a loss of competitiveness.

Table 1: Episodes of Real Appreciation of the US Dollar against the WCU basket

Period	**% Real Appreciation against the WCU2010**	**% Change in US GDP in chained 2005 dollars**	**Remark**
1980Q3-1981Q2	5.3%(3 qtrs)	-0.4% from 1980Q1-Q4	US recession
1981Q4-1982Q3	4.3%(3 qtrs)	-2.9% from 1981Q3-82Q1	US recession
1984Q1-1984Q4	5.7%(3 qtrs)	+3.6% in 1984Q1-1984Q4	No growth in HK; Low growth among Asian economies; US had expansionary fiscal policy through tax cuts and increased spending from the late 70s through 1985
1990Q4-1991Q2	6.7%(2 qtrs)	-1.4% 1990Q2 to 1991Q1	US recession

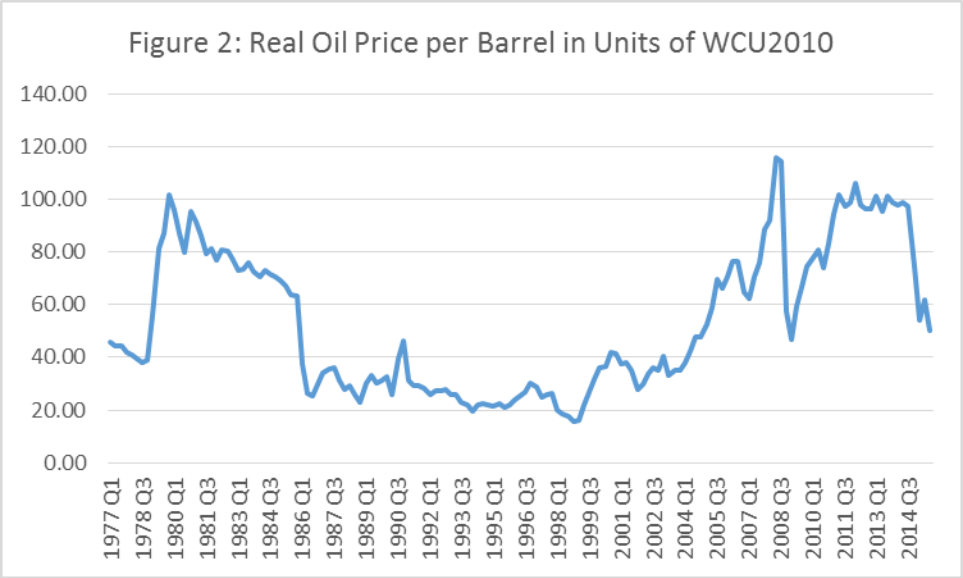
1995Q2-1998Q2	14.9%(12 qtrs)	Cumulative 12.93% 1995Q2-1998Q2#	Asian Financial Crisis from 1997; US interest rates much lower than Asian interest rates and were declining.
1999Q3-2001Q2	8.0%(7 qtrs)	+0.0 in 2000Q4-01Q3	Mild US Recession
2008Q2-2009Q1	10.6%(3 qtrs)	-3.9% from 2008Q2 to 09Q2	Deep US Recession

Note: This appears to be an exceptional episode in which the US enjoyed robust growth amid a strong USD. But US interest rates ranged from 5 to 6% and were falling.amid inflation rate of 2 to 3%.

The unprecedented strength of the US dollar against the WCU ahead of and during the Asian Financial Crisis probably played a part in the crisis.(Ho, 2003). Many of the Asian currencies were to some extent tied to the US dollar (Kawai, 2008). During the time and ahead of the crisis, many of the Asian economies had double-digit nominal interest rates, reflecting a risk premium for possible depreciation, while the US had much lower interest rates of only around 5-6%. Such high interest rates were considered necessary to prevent a depreciation of their currencies. These high interest rates punished those who behaved well and who invested in productive enterprises. They had to compete with speculators who bet with borrowed money seeking profit for themselves and risking “other people’s money” when their bets turned sour. While relatively low interest rates and strong asset prices kept the US growing, the double whammy of high real interest rates and high real exchange rates hit the Asian economies hard.

The Asian economies would certainly have done much better if their currencies, instead of tying to the US dollar, had been tied to the benchmark currency basket

underlying the World Currency Unit. Tying with the inflation-indexed unit may over the long run lead to a significant loss in competitiveness when other currencies are not indexed against inflation. If the Asian currencies had tied with the unindexed currency basket instead of pegging to the USD, the effective exchange rate would have stabilized (Ho, 2012) and the AFC could have been avoided.



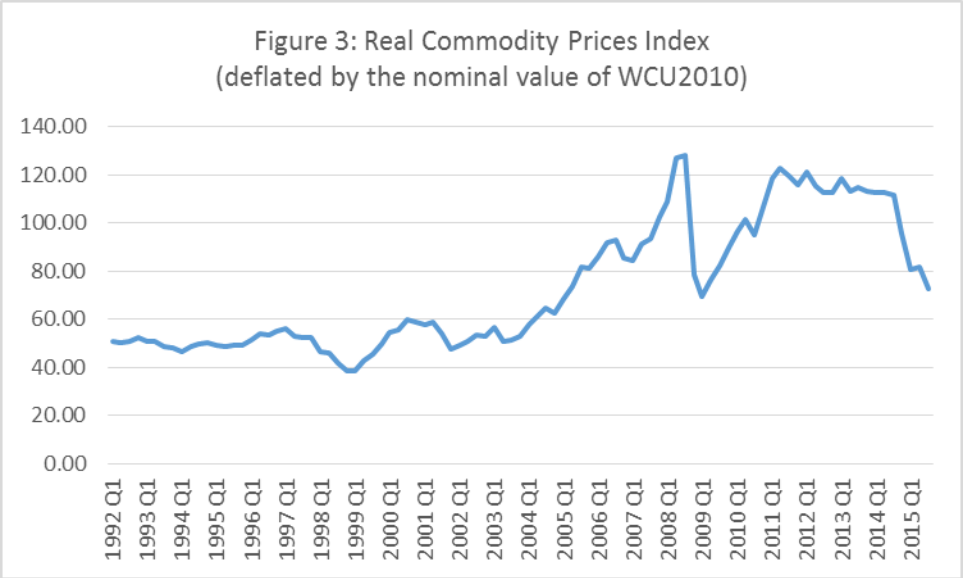


Figure 2 and **Figure 3** show the wild swings in the real price of oil over 3 decades and real general commodity prices over almost two decades. We divide the

nominal prices of oil per barrel and the commodity price index[11] by the current US$ values of the WCU2010(i.e., the WCU with base year at 2010) to obtain the real oil price and a real commodity price index. There is evidence that the swings of the real prices of commodities are related to the changes in the nominal value of the US Dollar in which prices are quoted. When the US dollar weakens, speculators interpret this as a signal for future inflation and start buying commodities. A cointegration test indicates that the real price of oil (nominal price divided by the price of WCU2010 in USD) and the real Commodity Price Index from International Financial Statistics (again the raw index divided by the price of the WCU2010) are each cointegrated with the US dollar exchange rate and the OECD output index. (**Table 2**) The US dollar effective exchange rate is derived as 1(the exchange value of the US dollar against the US dollar) divided by the value of the benchmark basket(the exchange value of the basket against the US dollar). US dollar depreciation is found to raise the real price of oil and the real CRB index. This would appear strange to someone trained in the classical tradition which believes that real prices should reflect real demand and real supply. Movement in a nominal value is not supposed to have an effect on real prices. The statistical results, however, suggest that movements in the exchange value of the US dollar may have implications on speculative behavior, probably through effects on expectations.

A recent paper by Irwin, S. H. and D. R. Sanders (2010), raised doubts about the role of speculation driving commodity prices. They pointed to a possible logical

[11] Crude oil price and commodity price are from International Financial Statistics (IFS), IMF: http://data.imf.org/?sk=5DABAFF2-C5AD-4D27-A175-1253419C02D1&ss=1390030109571F

inconsistency within the bubble argument which inferred speculative money inflows to commodity futures markets as driving up demand. "With equally informed market participants, there is no limit to the number of futures contracts that can be created at a given price level. Index fund buying in this situation is no more 'new demand' than the corresponding selling is 'new supply.'" These critics' argument is however flawed because although demand and supply positions in the futures market always balance out, prices are the equilibrating factor that finally brings the short and long positions into balance, and speculation affects both supply and demand in the futures market. Irwin and Sanders also argued that futures contracts rarely involve the actual delivery of physical commodities and so should not affect spot prices. But if futures prices have gone up, physical suppliers will certainly have the incentive to hold supplies off the spot market for delivery at a later day. These critics also noted that stocks were declining, not building, in most commodity markets over 2006-08 when prices were shooting up. To them, this is inconsistent with a price bubble, which is believed to be associated with speculators stockpiling the target commodity (large "reservation demand"). The problem with this argument is that it assumes that stocks are given, and out of the given stocks, either the commodity is sold in the spot market or withheld as stocks. But stocks are NOT given. *In a highly speculative market with expectations of a price jump in the future, producers may cut back their production from the normal production trajectory* (not necessarily a physical decline in production over time), *leading to BOTH a decline in stocks held by wholesalers and a rise in spot prices*.

Causality Tests

Table 2. Pairwise Granger Causality Tests Between Real Oil Price and Real Commodity Price on the One Hand and The USD Relative Exchange Rate (1/BB) on the Other Hand

Sample: 2001Q1 2015Q3
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DREUSD does not Granger Cause DROP	56	5.43204	0.0073
DROP does not Granger Cause DREUSD		2.90416	0.0639
DREUSD does not Granger Cause DCOMMPI	56	6.83641	0.0023
DCOMMPI does not Granger Cause DREUSD		2.91677	0.0632

Note: Crude oil price and commodity price are from International Financial Statistics (IFS), IMF: http://data.imf.org/?sk=5DABAFF2-C5AD-4D27-A175-1253419C02D1&ss=1390030109571 REUSD is relative exchange rate of the USD and is a measure of the effective exchange rate of the USD. Real prices are obtained by deflating with the nominal value of the WCU(2010). "D" is a first difference operator on respective variables.

Table 2 presents the results of a Granger causality test to test if movement in the US dollar effective exchange rate (defined as the normalized nominal exchange rate of the US dollar relative to a basket of currencies) has any effect on the real price of oil and real commodity prices. DREUSD is the first difference or the change in the "relative exchange rate of the USD", relative exchange rate being the normalized exchange value of the USD divided by the value of the benchmark basket of normalized currencies. The null hypothesis that DREUSD does not Granger-cause a change in the real oil price (DROP) can be rejected at 1% level. This suggests that a change in the effective exchange rate of the US dollar does Granger-cause a change in the real oil price. A similar result is obtained with regard to the real commodity price index.

Table 3. Testing Cointegration between LnROP and LnCOMMPI, Log of Benchmark Basket LnREUSD and LnOGDP

Null Hypothesis	Alternative Hypothesis	Test Statistics	p-value
Real Oil Price 2001Q1 – 2015Q3			
Trace tests:		Trace Value	
r = 0	r > 0	36.50**	0.0360
r≦ 1	r > 1	17.03	0.1314
λ max tests:		λ max Value	
r = 0	r = 1	19.47	0.1187
r = 1	r = 2	13.56	0.1124
Real Commodity Price Index 2001Q1-2015Q3			
Trace tests:		Trace Value	
r = 0	r > 0	37.27**	0.0294
r≦ 1	r > 1	15.93	0.1778
λ max tests:		λ max Value	
r = 0	r = 1	21.34*	0.0676
r = 1	r = 2	12.25	0.1720

Note: the Real Oil Price and the Real Commodity Price Index are each obtained by dividing the nominal price and price index with the nominal value of the "World Currency Unit".

Table **3** provides results of a cointegration test on key variables (all being integrated of order one, I(1)). The length of the lag in each case was determined to be 1 using the AIC. With one cointegrating vector (r = 1) among each group of the three key variables, as determined by λmax or trace statistics, the normalized cointegrating relationships, the ECM(-1) terms and R^2 in the VEC model are shown in **Table 4**. All coefficients carry the expected signs. The long run coefficients of lnBB are the elasticity of the real oil price and that of the CRB index (in WCU) with respect to the value of the benchmark currency basket. The results suggest that the real oil

price would roughly increase (decrease) by 4.6% with a 1% depreciation (increase) of the benchmark currency basket against the US dollar.

Table 4. Long Run Cointegrating Relations and VECM results: Real Oil and Real Commodity Prices against Relative Exchange Rate and OECD GDP

LnROP	LnCOMMPI	**LnREUSD**	**LnOGDP**	**ECM(-1)**	**R^2**
1	--	8.8006 (5.8322)***	-0.9100 (-36.0905)***	-0.1395 (-2.8002)***	0.3559
--	1	6.8880 (5.7734)***	-0.9595 (-48.5521)***	-0.1107 (-3.0111)***	0.4254

Note: *** & ** denotes significance at 1% and 5% level respectively

Note: In this representation, a positive coefficient signals negative effect and a negative coefficient signals positive effect on the dependent variable which carries unity as the coefficient.

Crude oil price and Commodity price are from International Financial Statistics (IFS), IMF: http://data.imf.org/?sk=5DABAFF2-C5AD-4D27-A175-1253419C02D1&ss=1390030109571

The OECD real GDP Index is from OECD.Stat: http://stats.oecd.org/"

If spot real prices reflect the interaction between real supply and real demand, as suggested in the classical world, real prices are not supposed to fluctuate wildly from day to day, as neither real supply nor real demand should jump around with every move in the exchange value of the US dollar.[12] Yet the evidence from **Table 4** suggests otherwise. It seems clear that even spot prices cannot be free of speculation. If the US dollar is losing purchasing power, buying commodities will appear to be a good hedge against loss of purchasing power. If real prices are expected to rise in the future on account of this substitution from money into real commodities, commodity suppliers may even withhold their supplies from the spot market. It is the unique role of the US dollar as the world's international settlement currency plus

[12] In a communication with the author during the early 1980s, Milton Friedman insisted that in the classical world a change in a nominal variable cannot have an effect on a real variable. Our results here shows that commodity markets do not operate according to the classical assumptions.

the ebbs and flows of inflation fears that combine to drive speculation in commodities. *If the commodity prices are quoted in the WCU and payable in any currency, then one currency's depreciation need not cause a rush into commodities, thus avoiding the disruptive effect of exchange rate movements on the real economy.*[13]

Another problem with quoting commodity prices in US dollars is that the real price is less transparent than if they are quoted in the WCU. When prices are quoted in US dollars, traders only observe a change in the nominal price of the commodities. They need to work out the real price by referring to inflation and exchange rate data. To the extent that greater transparency makes markets more efficient, quoting commodity prices in the WCU will contribute toward more efficient commodity markets. Moreover, quoting commodity prices in the WCU is fairer to both consumers and producers, both of whom will then face less uncertainty over the real price they are paying or receiving. Similarly, when bonds are denominated in the WCU, real interest rates are transparent, and creditors and debtors will not have to worry about inflation being different from what is expected. With bond issuers in different countries all issue bonds denominated in the WCU rather than in different currencies, the global bond market becomes more integrated, making for greater efficiency. Because buyers of "global bonds" denominated in WCUs enjoy the protection from global inflation indexing and the benefit of exchange risk diversification, they will accept lower yields on the bonds that they buy. This implies a lower borrowing cost for issuers of such global bonds. With

[13] Commodity Futures Trading Commission Chairman Gary Gensler is convinced speculators played a key role in the run-up of oil prices in 2008. See *Wall Street Journal*, July 30 and August 6, 2009.

WCU-denominated bonds available, savers can better avoid risks arising from exchange rate movements or from unexpected inflation. Savers are also less likely to add to the formation of asset price bubbles or currency bubbles (Miller and Weller, 1990), as WCU-denominated bonds offer an alternative to the purchase of real estate or securities denominated in specific currencies.

5. Monetary Union or *Managed Fixed exchange Rates*?

The launch of the Euro in 1999 promised to make history for humankind. It marked the unification of 11 currencies across Europe[14], and rekindled hope that perhaps one day there could be one single currency across the world. Indeed, shortly after the Euro's debut, the IMF hosted an economic forum on the subject: "One World, One Currency: Destination or Delusion?" on November 8, 2000.

This dream remains just as elusive, if not more so, today, however. Several countries, including the UK and Denmark, still refuse to join the Euro Zone, and at one point or another some Euro Zone countries have actually wondered whether they should revert to their national currencies.[15] The European debt crisis has further cast doubt on the viability of the euro zone under its present form. More and more countries have discovered that they may need independent monetary policy to deal with their problems.

[14] Greece was not among the original 11 countries in 1999 but adopted the Euro in 2001 prior to the circulation of the physical currency from January 2002.

[15] "Italy should bring back the lira, says minister," Philip Thornton reporting in *The Independent*, Saturday, 4 June 2005.

But the benefits of integration through sharing a common monetary unit are no less real because of the European debt crisis. Rose(2008) noted that although the empirical estimates of expansion of trade due to a currency union were typically much smaller than what he had initially estimated, they were still quite significant, ranging from 30% to 90%. Moshirian(2009) cited studies that showed that the Euro had reduced the "home bias" of investors, noting that "investors in Europe are gradually treating each of the 27 member countries as their own country"(p.6) Using a simulation model on the ASEAN+3 countries, Qin and Tan(2009) suggested that "a prospective currency union would reduce the aggregate inflation of the eight countries by 3-6%, increase the intraregional export and import growth by 16% and 10%, respectively, and dampen the volatility in the trade growth as well…"(p.1802)

It seems clear that, even though real currency unions will prove difficult, the world will still benefit from having a common *international unit of account*, one that stands for a unit of real global purchasing power, to serve as the basis for quoting commodity prices, for trade and general contracting, and more specifically for denominating bonds. As a unit of account the WCU will remove the predominance of the US dollar as a reserve currency, since bonds can be denominated in the WCU and since international transactions quoted in the WCU can be settled in any currency. The use of an international unit of account means that global capital can be priced using the same unit, thus enhancing transparency and comparability of prices and interest rates, contributing toward more efficient markets.

The WCU is not a currency issued by a central bank. But the WCU, as well as the unindexed benchmark currency basket underlying the WCU, can serve as a common anchor for national currencies. For these economies that peg their currencies to the common anchor, there is a quasi-currency union, with mutually fixed exchange rates. Under the "*Managed Fixed Exchange Rate Regime*," the rate at which a currency pegs with the common anchor corresponds to economic fundamentals, and may be adjusted if and only if these fundamentals have been found to have changed. Opting to call this regime "Managed Fixed Exchange Rates" rather than "Managed Floating Exchange Rates" is based on the consideration that the authorities should not allow market forces to drive an exchange rate to deviate from what is justified by the fundamentals. But if the fundamentals themselves change and call for an appreciation or depreciation, the peg should follow suit. The premise is that there exists "*optimal exchange rates*" that are consistent with economic fundamentals and that allows growth for all countries. There is an imperative to prevent market forces from driving exchange rates off these optimal exchange rates. In contrast, a managed float would allow the exchange rate to be swayed by international capital flows, with the proviso that the central bank may intervene when the movements are considered excessive, or fluctuation is allowed within some arbitrarily determined band.

For economies with relatively shallow financial markets flows of capital in and out of the economy can cause gyrations in the exchange rate under a freely floating

exchange rate regime and this could lead to serious disruptions to the economy.[16] Indeed this was what prompted the concept "Tobin tax." In general, economies that anchor their currencies to the WCU in its indexed form can expect to have very little inflation, as such anchoring implies very strict monetary discipline. It should be noted, however, that since in practice inflation is usually positive[17], a country that anchors its currency against an indexed unit of account may lose competitiveness against other countries that do not. To avoid this scenario a country may prefer to tie its currency to the unindexed benchmark currency basket BB instead. This can be demonstrated to be tantamount to pinning the currency down to a nominal effective exchange rate (Ho, forthcoming). The currency then will not appreciate or depreciate relative to the benchmark, but will lose purchasing power as a result of world inflation.

Logically, not every country can anchor its currency to the benchmark basket or the WCU. It has been implicitly assumed that larger economies such as the US, the Euro Zone, China, and Japan should continue to conduct their monetary policy independently, with more or less flexible exchange rates. Smaller economies, including Hong Kong, New Zealand, and Singapore, may choose to tie their currencies to the benchmark currency basket that should include the RMB when the yuan eventually becomes fully convertible and when price controls on the mainland have been further reduced.

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[16] Robert Mundell made reference to "lethal short term capital movements" at a conference on exchange rates organized by George M. von Furstenberg held in Bellagio in 2006.

[17] No inflation targeting country targets at 0 inflation, for example.

6. Concluding Remarks

This paper argues that the World Currency Unit is a useful synthetic unit of account that offers the prospect of serving as an anchor for the world's currencies. It can also serve as a logical unit for denominating bonds, offering much attraction to savers who want to protect their savings against the inroads of inflation and who desire protection from exchange risk. Presently some managed bond funds, such as the Parvest World Inflation-Linked Bond Fund,[18] do offer such advantages. But a standard synthetic unit of account will improve the transparency of returns and improve the efficiency of capital markets.

For borrowers whose incomes are in a single currency issuing WCU-denominated bonds does pose some exchange risks. One can, however, make the case that in a globalized world, users of capital should compete in the same pool of capital and should pay the global cost of capital. Borrowers unable to pay the global cost of the capital simply should not borrow. This happens whenever their investment fails to generate the requisite returns to pay such costs. Before the advent of a single global currency, which is quite improbable and perhaps implausible in the foreseeable future, issuing WCU-denominated bonds appears to be the best option closest to a unified global capital market.

Many developing countries suffer the "original sin" in that their borrowers may not be able to issue bonds in their own currencies due to a lack of confidence among investors (Eichengreen *et.al*., 2003). For such countries, borrowing in US dollars,

[18] http://www.trustnetoffshore.com/Factsheets/Factsheet.aspx?fundCode=A5FR5&univ=DC

euros, or in yen are the only alternatives, making them very vulnerable when there is an attack on their currencies. Because the WCU represents a diversified portfolio, borrowers may reduce their exposure from the fluctuations of a single currency if they issue WCU-denominated bonds. Denominating bonds in the WCU also protects bond issuers against the risk of fluctuations in the real cost of repayment arising from unexpected movements in the inflation rate. [19]

The paper also makes a case for "managed fixed exchange rates" that aim at keeping exchange rates at levels compatible with economic fundamentals, while allowing readjustment in the exchange rates upon evidence for changes in such fundamentals.

Acknowledgments

[19] Eichengreen., *et. al.*, put it nicely: "The original-sin school traces the problem… to the structure of global portfolios and international financial markets. It suggests that emerging-market economies are volatile because they find it difficult to denominate their obligations in units that better track their capacity to pay, such as the domestic currency or the domestic consumption basket. It suggests that this constraint derives in part from the structure of international portfolios and the operation of international financial markets. It points to forces that concentrate international portfolios and markets in a few major currencies – the dollar, euro, yen, pound and Swiss franc – and to the evidently limited appetite of international investors for adding additional currencies to their portfolios.

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Appendix

Figure 5 shows clearly that the un-indexed benchmark currency basket, which by definition was worth US$1 in 2000, was worth about US$1.25 in the late 1970s, similar to what it was worth in 2010, but there have been considerable fluctuations.