



WOCU
Exchange is no longer foreign

The currency shock absorber

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1 Introduction

World trade and world finance heavily rely on a reference currency, the US Dollar. Very often business based in countries with a currency that is not easily convertible worldwide (or highly volatile) will price their goods in US Dollars. Similarly, all commodities traded worldwide are priced in a reference currency, usually the US Dollar. Using a reference currency - any reference currency – is not risk free. If an importer buys from an exporter goods or services priced in a third currency they both carry a currency risk.

The pricing of commodities is not just dependent on the economic fundamentals associated to the specific commodity (supply/demand, geopolitical events, etc.) but is also affected by the strength/weakness of the reference currency¹.

This white paper will show the stabilising effect of replacing a specific currency with a reference unit based on a basket of currencies – the WOCU².

The WOCU basket reflects the top twenty economies of the world³, it is regularly re-weighted on the third Thursday of May and November each year.

The re-weighting process is documented. It involves the use of IMF World Economic Output database, from which the GDP data is extracted. Changes in GDP are analysed and, as a result, recommendations are made to promote or demote countries and as a consequence to change the weight associated to each of the top 20 economies ranked by GDP.

Over the last 10 years a number of changes have taken place, for example:

- 🌀 The weight of the US GDP within the basket has fallen from 34% to 30%
- 🌀 The weight of the Japanese GDP has fallen from 15% to 10%
- 🌀 The weight of the Chinese GDP has risen from 4% to 10%
- 🌀 The Russian GDP has risen from a ranking of 19th out of 20 to 8th and then fallen back to 12th
- 🌀 Switzerland has been in the basket, then out and then back in again
- 🌀 Indonesia has joined the basket
- 🌀 Taiwan and Argentina have both left the basket

¹ OPEC usually discusses changing the pricing of oil away from the US Dollar each time there is an extended period of weakness of the US Dollar.

² The SDR – Special Drawing Right, this unit of accounting, created by the IMF in 1969, is also based on a basket of currencies; the composition of which has not changed very much and does not reflect the strength of the current major economies.

³ The proportion of world output of goods and services represented by these economies is at least 95%.

2 Taming Instability and Uncertainty

One of the main systemic issues in the ‘forensic’ reconstruction of WOCU scenarios to compare with a US Dollar reference is that we do not have quotes in WOCU. It sounds obvious but the exchange rate US Dollar/WOCU has volatility and therefore we artificially increase the volatility of all scenarios simply by converting US Dollar into WOCU. Moreover, as it is often mentioned in this document the pricing of commodity in US Dollar is not just based on the fundamentals behind that commodity, it also somehow includes the volatility of the US Dollar in a way that is difficult to separate. One ‘shock absorber’ effect we can only assume is that WOCU will remove (or at least greatly reduce) that dependency. It is very difficult to assess how much the strength and weakness of the US Dollar contributes to the volatility of any given commodity. However, it is safe to assume that the volatility calculated here is higher than what we would have in an actual ‘WOCU environment’.

The use of the US Dollar as a reference currency in international trade in general and more specifically in commodity trading, creates instability in long term trade contracts and complicates the forecast of the total cost or revenue.

In this white paper we shall examine three scenarios:

- A contract for the supply of goods (or services) between two countries; the contract lasts two years with 24 identical payments of an amount calculated in US Dollar. We shall look at the effect of converting the US Dollars into WOCU at a specific date and the changes in the total amount paid (or received) by replacing the amount in US Dollar with the relevant equivalent on the date the transaction takes place. This practically means that both parties hedge the currency risk with two one leg swaps that have the WOCU as the ‘connecting hub’. We shall look at the consequences for importer (or exporters) based in the territories of seven currencies (see Section 3, page 6 below). We shall also look at the implication of a company based in one country trading with seven others under a ‘hub’ model (all trades priced in WOCU and converted into the relevant currency by the other party) and the implication of a ‘graph’ model (all direct trades implying one foreign exchange activity per currency combination)
- Commodity trading. We examine the differences in pricing commodities in WOCU vs. US Dollar. We look at spot pricing for copper and aluminium over a period of five months. We also look at the difference for specific traders who have to pay for their trades in the equivalent value of their currency (the currencies selected are analysed in Section 3, page 6 below).

- We look in more detail at the procurement of a commodity (i.e. the actual purchase of a commodity), again we look at the ease of forecasting, the price stability and the volatility for both the seller of a commodity (We assume the seller to be a mining company based in a country where that commodity is actually mined or extracted) and a buyer. Although we look at a few specific combinations, we analyse buyers and sellers based in the territories of seven different currencies. This is a merger of the previous two scenarios, the main difference being a shorter period (five months instead of two years) and the variable amount because we keep fixed the quantity procured rather than the value of the transaction in US Dollars.

Currency volatility in trade is more than an exercise in foreign exchange trend analysis, it has important effects on costs (and revenues) forecasts and in profit analysis. 'Calling it the wrong way' when trying to hedge a currency risk may have serious effects on the profit margins. Therefore anything that promotes stability and lowers the difference between the forecast of the total amount paid (or received) at the beginning of a trade relationship and the actual amount of money that was paid (or received) when the contractual professional relationship ends can only increase the reliability of any forecast. Ironically, this may increase the risk appetite of businesses because they will be able to have more reliable forecasts and will be less affected by the volatility of currencies.

This white paper aims to show whether or not using the WOCU (a basket of currencies that is re-weighted twice a year) reduces the volatility of prices and therefore reduces the currency risk. In transactions that require a 'triangulation of currencies' it is a virtual 'shock absorber'. For this reason alone, the WOCU could be described as a 'benign derivative' that could become a strong component of a currency risk hedging policy.

3 Selecting the Currencies to analyse

The aim was to select the currencies to analyse in the three case studies. Each of these currencies obviously has a set of exchange rates with the US Dollar and the WOCU. Looking at the volatility of those exchange rates over a period will provide one of the information sets necessary to analyse the results of each case study. Exchange rates vary over a period of time. If we change the reference currency for a specific transaction (or base) that will take place over a period of time we introduce an element of volatility, at least because market and tradition have already built the volatility of the reference currency into the pricing trends typically used for that transaction (as is the case for commodity pricing, shipping, etc.) or because we are replacing a currency (the US Dollar) with a reference unit (a basket of currency) that has a more volatility factors than the currency it replaces.

The eight currencies are listed in the table below:

Volatility			
	USD	WOCU	Diff
AUD	0.17	0.23	33.64%
BRL	0.25	0.33	31.35%
EUR	0.05	0.04	-3.35%
GBP	0.06	0.07	25.22%
IND	2.43	2.37	-2.34%
RUB	3.17	4.40	38.74%
SGD	0.05	0.04	-27.78%
ZAR	1.03	1.39	34.85%

Table 1 - List of currencies and their volatility January to May 2010

The Euro, the Indian Rupee and the Singaporean Dollar have a lower volatility against the WOCU than against the US Dollar, for all the others the WOCU introduces a higher volatility than the US Dollar.

4 Case Study 1 – The Trade Stabilizer or ... who runs the currency risk⁴ ?

This case study shows how using the WOCU as a base currency for a long term contract with monthly deliveries (and monthly payments) shares the currency risks between exporter and importer and improves the overall volatility of the amounts paid or received. The contract assumes a reference currency, the US Dollar, and we compare what happens when the reference unit for the actual payment transaction is replaced with the WOCU. We shall look at the variations from the average and at the overall volatility calculated in the traditional statistical way⁵. The trend of the variations from the average in the US Dollar based transaction is compared with the trend in the WOCU based payment; the change in volatility between the two base units (US Dollar and WOCU) will give an indication of the effect of introducing the WOCU on the overall transactions across the timescale considered (two years).

Each currency is analysed in its relationship against the US Dollar and the WOCU, it is irrelevant whether we are talking of costs or revenues. This part of the case study is based on 24 payments of US Dollar 50,000 over a period of two years, the 'WOCU scenario' is examined based on the assumption that the price is set in WOCU at the exchange rate US Dollar/WOCU of 01/06/2008 ahead of the first delivery of 15/06/2008 and then remains fixed for the duration of the contract. We have based our scenario on 24 transactions of identical value in US Dollar; each transaction will take place on the fifteenth of each month irrespective of the day of the week, national holiday, etc.

⁴ All the exchange rates against the WOCU have been provided by WDX.

⁵ See Glossary.

4.1 Analysis for each currency

The volatility results are summarised in the table below:

Compared reduction in volatility			
	USD Base	WOCU base	Difference %
AUD	8,513	5,638	-50.99%
BRL	12,193	9,077	-34.33%
EUR	2,178	1,533	-42.07%
GBP	2,801	1,998	-40.19%
INR	120,121	67,823	-77.11%
RUB	153,167	122,673	-24.86%
SNG	2,566	1,107	-131.80%
ZAR	49,942	38,267	-30.51%

Table 2 - Summary volatility results replacing the USD with the WOCU

The eight currencies considered all present a lower volatility of monthly payment when the contract is specified in WOCU. Looking at the charts showing the deviation from the average monthly payment (see Appendix A), it is clear that the WOCU has overall smaller deviations (lower peaks and higher troughs).

This shows that in the case of a regular payment in a reference unit over a period of time, the WOCU – a basket of currency – acts as a ‘shock absorber’ of the currency risk compared to the US Dollar – a specific currency that can itself experience periods of strength or weakness.

The ‘shock absorber’ works differently depending on the currency. So, based on this case study, what is the WOCU and how can it be used?

The assumption is that the importer pays in the local currency the equivalent amount in WOCU and the exporter receives it in the equivalent of his local currency. However, WOCU is not an actual currency; it is a basket of currency. Based on what we have examined above, the WOCU could be considered the ‘hub’ of two single leg currency swaps that are not based on mutual exchange rate but where each ‘leg’ is valued according to the conversion rate between the local currency and the hub. Given the stabilising effect on the series of payments and on the reliability of the cost/revenue forecast it can most definitely be considered a benign and transparent derivative. Moreover, the reduction in volatility turns the WOCU into a hedging instrument to reduce currency risk that is independent from any ‘guesswork’ as to the future foreign exchange trends of any specific pair of currencies.

4.2 So... what do we need to implement this?

The main argument for the shock absorber effect is simplicity. However, in practical terms nobody can call their bank and ask for WOCUs (or at least not at the time of writing this).

The WOCU is a reference unit that provides a 'value' to a basket of currencies according to a weighting principle based on the strength of the GDP of the countries where these currencies are legal tender. So, for an Indian exporter to offer pricing in WOCU to its clients or for a Brazilian importer to be able to buy goods priced in WOCU, banks need to be offering conversion between local currencies and the WOCU.

Before the Euro, financial institutions were offering mortgages, savings and other products based in ECU⁶. Their clients were not actually buying ECU, the repayment or their savings were converted into the local currency according to the rate applicable on the day of the transaction. So the WOCU could be used in the same way, a reference unit that will help in hedging foreign exchange risk in international trade. The charts in Appendix A show that it is possible.

4.3 What happens after the facilities are made available?

The most interesting consequences of the availability of WOCU would be financing trade according to a HUB system. Both the importer and the exporter will not have to worry over which currency to put in the contract, the WOCU is the 'win win' compromise where both parties reduce their currency risk. The long term effect might be moving away from a 1-1 system of international payments towards a hub and spoke where the only currency to worry about is your own. When this happens the WOCU will become the benign derivative that has changed the financial order of world trade.

⁶ ECU – European Currency Unit, was a basket of the currencies of the European Community members states used as a unit of account and replaced by the EURO on 1st of January, 1999.

5 Case Study 2 – Trading in Commodities

Although many people trade in commodity contracts purely as a financial instruments and therefore make (or lose) money depending on their assessment of the changes in the direction of the value of a commodity (in itself determined both by laws of supply and demand of the commodity and by the strength or weakness of the US Dollar or of the other reference currency), even more people trade in the actual commodity and the instability of the price may actually damage their profit or the whole business⁷.

When the US Dollar is going through a weak period a lot of commodity producing countries start talking about the idea of moving away from the 'Dollar Standard'; very little has happened so far because any currency used as reference will have its own volatility and therefore the overall stabilising effect will just not happen. Replacing the US Dollar with a basket of currency, however, presents interesting features. First of all, statistically it is unlikely that political and economic factors may affect all the currencies in the same way and therefore movement within the basket will most likely be in different directions and that in itself points to more stability over time. Second, the US Dollar is not just affected by what happens in the United States, it is a currency that has enjoyed global convertibility for quite some time and therefore the state of the USA is only one of the factors influencing the strength of the US Dollar and the American government is not the only determinant of the amount of US Dollars in circulation globally, which is also a potentially destabilising factor.

This case study looks at the price of copper (currently quoted in US Dollar). The price of a commodity based in US Dollar contains two factors of volatility that are difficult to separate. The first one is the change in prices based on forecast of supply and demand (usually this price is also affected by geopolitical events in the producing country such as unrest, earthquakes, etc, that might affect the extraction or the delivery of the commodity) the second is the volatility of the base currency, in this case the US Dollar.

For this case study we have looked at the mean cash price for copper between 04/01/2010 and 28/05/2010, we have taken the quote of the first and last trading date of each week in the five months of 2010. In order to make the prices of WOCU independent from the value of the US Dollar we have taken the mean cash price of copper in US Dollar on 04/01/2010 as a base, converted it into WOCU and used that as a base for the WOCU pricing. Then we have calculated the percentage of change between two consecutive prices in US Dollar and have mirrored the change in WOCU. In this way we were removing the US Dollar volatility from the WOCU pricing.

⁷ in 2009 a sudden spike in the cost of oil, and consequently jet fuel, grounded a few promising new airlines forever

A surprising result is described in the chart below where we can clearly see that the trend of copper prices in WOCU (converted) almost completely overlap the trend in WOCU (recalculated), this is another evidence of the WOCU as 'shock absorber' of currency volatility:

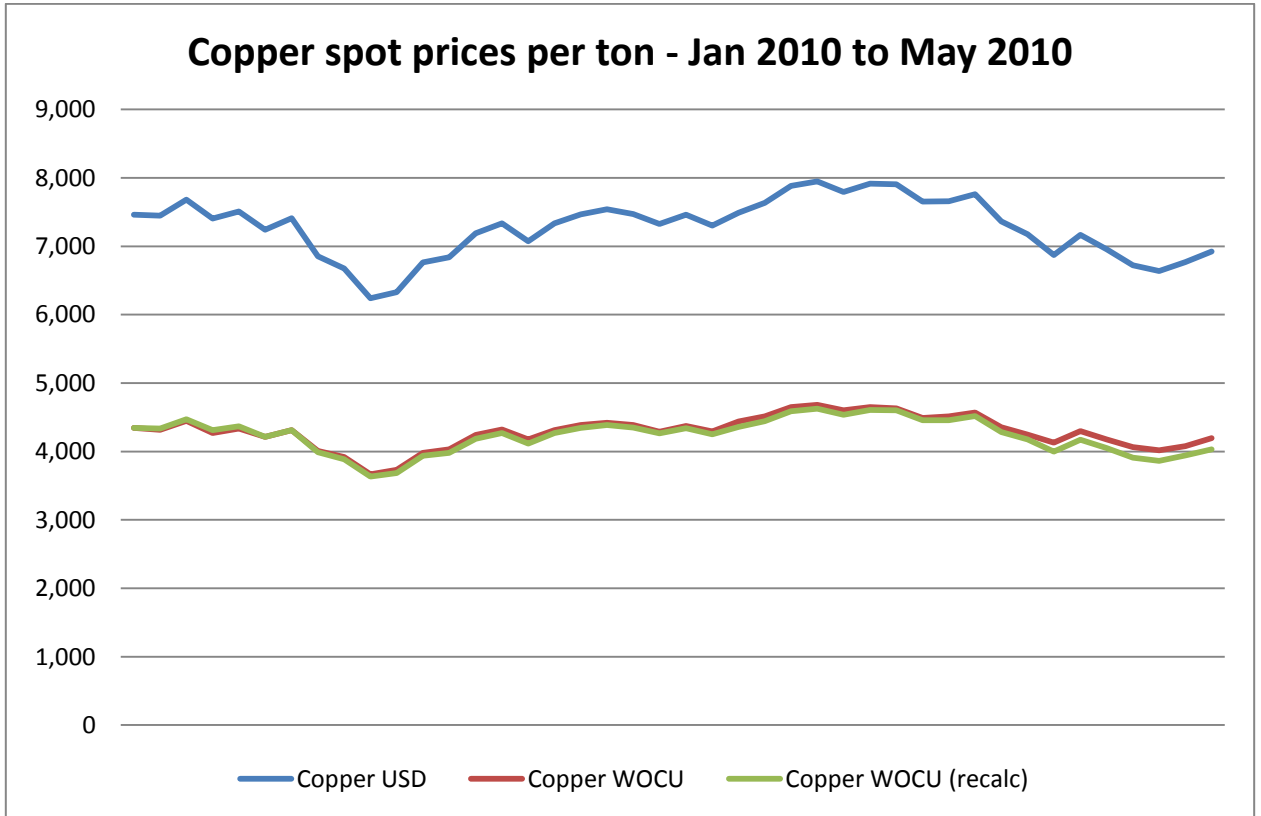


Chart 1 - Mean cash price January to May 2010

A similar result (the overlapping of the two WOCU trends) when we look at the deviation from the average:

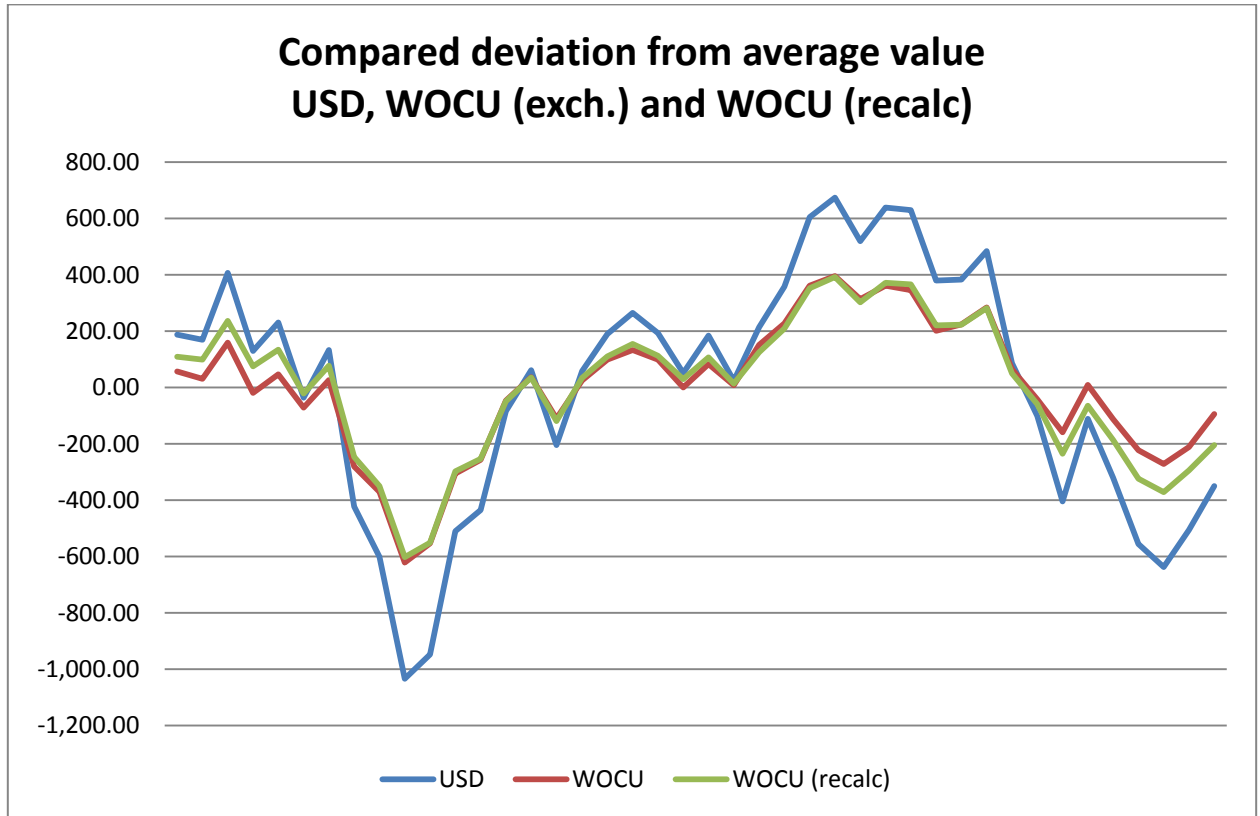


Chart 2 - Deviation from the average price (Jan to May 2010)

The chart clearly indicates lower ‘extremes’ for the WOCU showing a reduction of volatility.

Interestingly enough in both charts the WOCU price obtained by converting the US Dollar at the exchange rate of the day and the price obtained by mirroring the variations in price in US Dollars almost overlap.

The WOCU quotation presents a lower volatility (the US Dollar curve has higher peaks and lower troughs). In practical terms this case study clearly indicates that replacing a reference currency with a basket of currencies has a stabilising effect on the market. In this case the WOCU purely represents a unit of measure (in this case a price) which can be converted into any currency. Its stabilising effect represents the decoupling of the volatility specific to the commodity from the volatility associated with the reference currency.

6 Case Study 3 – Commodity Procurement

This is a merger of the two previous case studies we look at procuring 500 tonnes of aluminium alloy each fortnight for five months. The trade will happen on the last day of the week, every other week.

6.1 First half, stabilising the quotes for aluminium alloy.

This is the mirror image of the copper case study. The prices in US Dollar, WOCU and the recalculation of WOCU are indicated below:

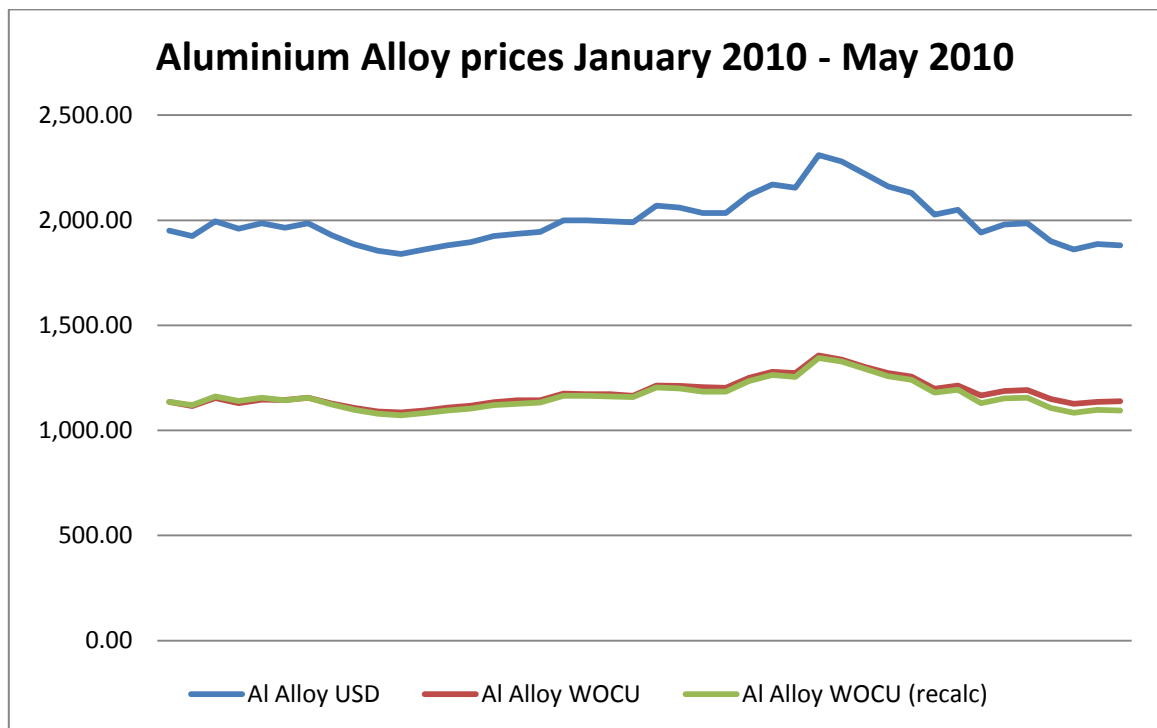


Chart 3 – Spot prices for Al Alloy between January 2010 and May 2010

Once again there is very little difference in the WOCU price determined by simply converting the US Dollar quote and the one recalculated by applying to the initial quote in WOCU the same price variations of the US Dollar prices. The difference in volatility illustrated in the chart below clearly confirms the ‘shock absorber’ effect of the WOCU:

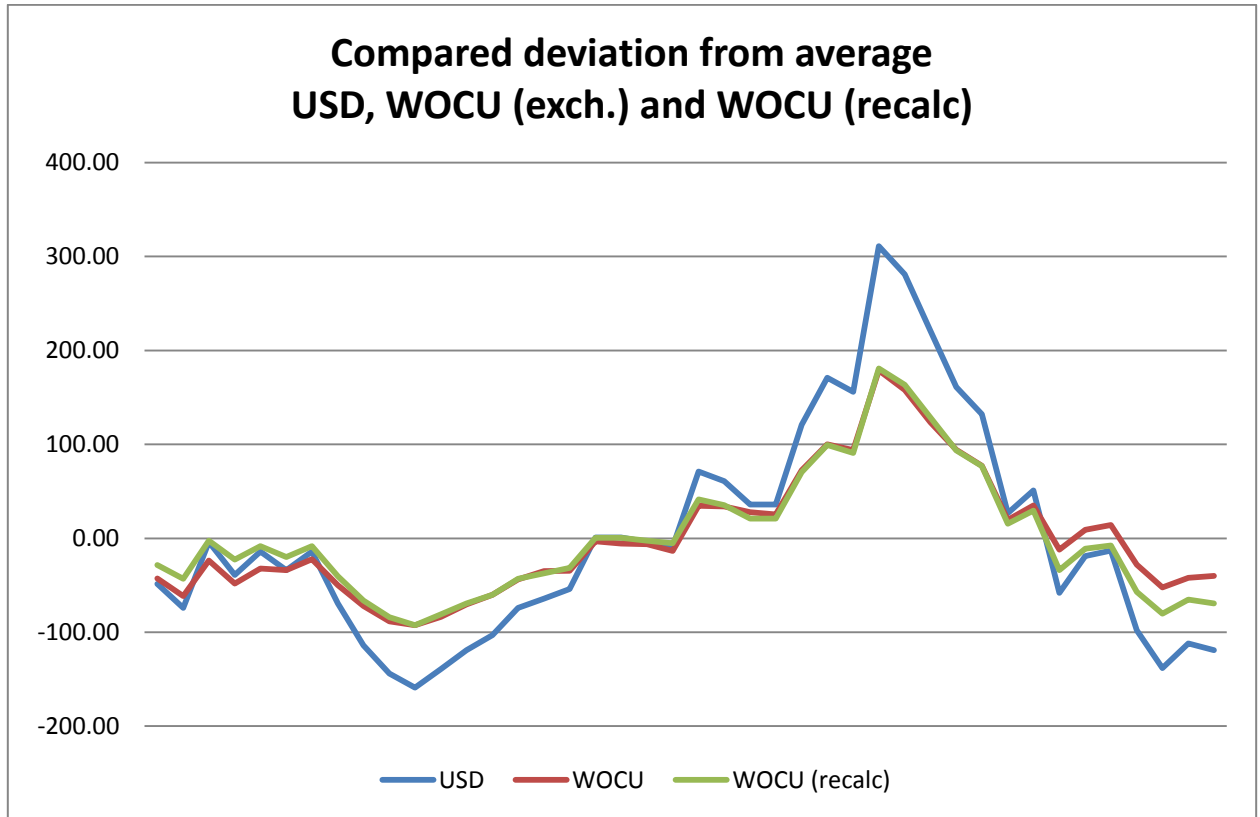


Chart 4 - Deviation from average for Al Alloy

6.2 Procuring the commodity, buying/or selling 500 tonnes at a time

This follows logic similar to that used in Case Study 1, except we have a base price that does not stay the same in the base reference unit. What stays the same is the amount of Aluminium Alloy supplied; the price will vary depending on the spot price of the day.

We have already established that pricing this commodity in WOCU increases the stability of the price. We also need to see what happens to companies that want to buy (or sell) aluminium based in a local currency and they take delivery of 500 tonnes at a time for 10 deliveries in five months (one every other week).

Before analysing the changes in volatility in moving from a US Dollar quote to a WOCU quote we need to take a look at the statistical volatility of the eight currencies examined in the period January to May 2010.

The table below shows the volatility of the exchange rate currency/US Dollar and currency/WOCU in the shorter period considered:

Volatility			
	USD	WOCU	Diff
AUD	0.03	0.04	30%
BRL	0.04	0.07	57%
EUR	0.03	0.04	21%
GBP	0.02	0.03	18%
IND	0.81	1.57	95%
RUB	0.59	0.85	44%
SGD	0.01	0.04	180%
ZAR	0.17	0.25	47%

Table 3 – Differences in volatility, period considered Jan 2010 – May 2010

The table below is a summary of the differences in volatility in price to buy 500 tonnes of Aluminium Alloy roughly every two weeks between January and May 2010:

Volatility			
	USD	WOCU	Diff
AUD	41,468	38,728	-6.61%
BRL	75,820	76,115	0.39%
EUR	49,357	45,326	-8.17%
GBP	40,535	38,357	-5.37%
IND	1,728,148	1,898,113	9.84%
RUB	1,168,282	1,194,327	2.23%
SGD	66,106	70,162	6.14%
ZAR	295,239	294,290	-0.32%

Table 4 - Differences in volatility between a USD base and a WOCU base

There is an apparent change in pattern, some currencies show an increase in volatility when the WOCU based prices replace those based on US Dollars. This does not contradict the 'currency shock absorber' of the WOCU because if we look at the difference in volatility of the exchange rates US Dollar/Currency and WOCU/Currency as indicated in Table 4 above we can see that the difference in volatility between the value in local currency from a US Dollar base and the value from a WOCU base is always much smaller in percentage than the difference in volatility between exchange rates.

This is more clearly illustrated in Chart 5 below where it is shown that the difference in volatility between pricing Aluminium Alloy in US Dollar and pricing it in WOCU is much smaller than the volatility introduced by the exchange rate US Dollar/WOCU:

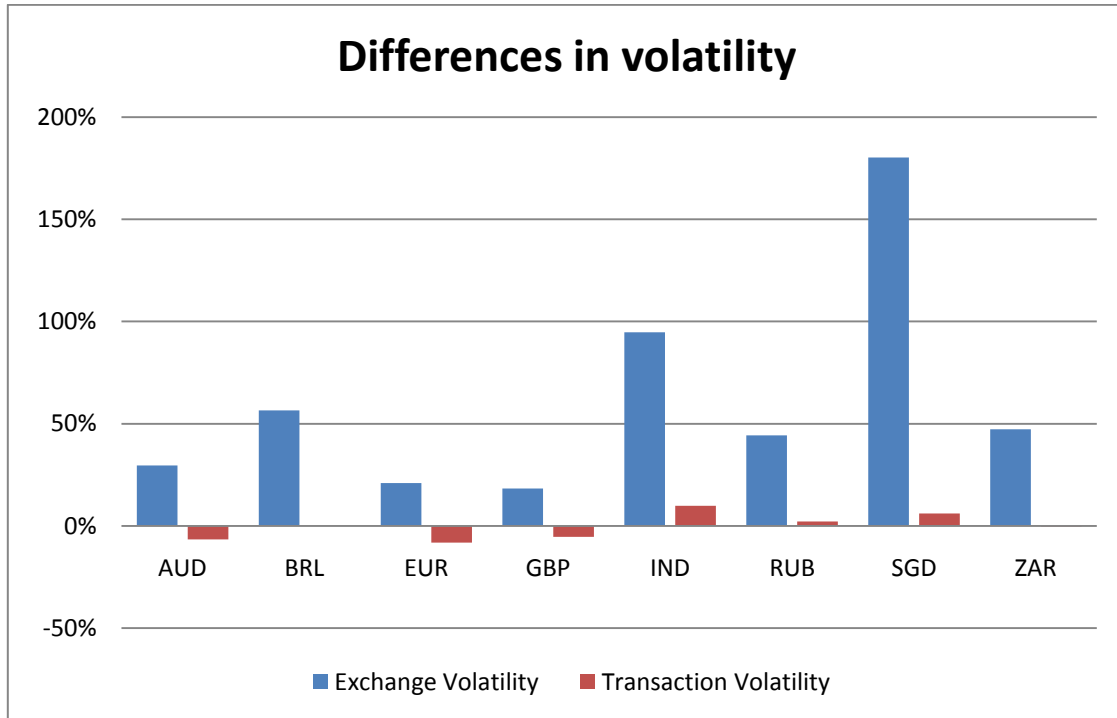


Chart 5 – Differences in volatility between exchange rates and between the pricing of 500 tonnes of Al Alloy

In some cases (Brazilian Real and Russian Ruble) it is barely noticeable and in three currencies (Australian Dollar, Euro, Pound and South African Rand) there is a reduction. Therefore the results of Case Study 1 (that was basically comparing 24 payments that were fixed in US Dollar or fixed in WOCU) are not necessarily contradicted in Case Study 3.

7 Conclusions

We have already established the benign effect of ‘WOCU the derivative’, what the case studies do not directly show is the transparency of the process, the algorithm and the weighting are well documented. Using the WOCU does not create any future liability both directly or indirectly.

The WOCU stabilising effect depends on two things the algorithm and its re-weighting. By using the countries with the top 20 GDPs and by re-assessing the weight of the currency of each country twice a year it will consistently stay a ‘well oiled shock absorber’ reducing the currency risk in several type of transactions.

The main improvements in risks however are not quantifiable. The WOCU will free the US Dollar from the problems of being a world reference currency issued by a specific country. The strength and weakness of the US Dollar have amplified effects on commodity producing countries, effects that these countries cannot control but can only react to. Using the WOCU as a reference will considerably decrease the effect given the presence of other currencies in the determination of the value of the basket.

8 Glossary

Volatility (or statistical volatility) is calculated as the standard deviation in a series. That is, if dev(i) represents the deviation from the average monthly payment, then the volatility is the square root of $\{[\text{dev}(1)^2 + \text{dev}(2)^2 + \text{dev}(3)^2 + \dots + \text{dev}(24)^2] / 24\}$ where 24 is the total number of payment (the number of payments).

LME – London Metal Exchange, this is the exchange where many base metals are traded. It also trades commodity derivatives (e.g. futures). Its reference currency is the US Dollar for the vast majority of metals.

9 About the Wocu, WDX the WDXI

The Wocu™ (**World Currency Unit**) is a standardised, apolitical, basket currency derivative quotation based on the real time exchange rates of the currency pairs of the world's top 20 nations as determined by IMF measures of GDP. The Wocu naturally takes into account changing economic power and commercial perception of currency values as an elegant, market driven solution to the need for a global reference currency.

Wocu quotations are delivered across financial networks and the Internet in real time from the unique Wocu algorithm which inputs trading prices of currency pairs from a broad spread of global sources to output the Wocu. The Wocu, its constituent currency pairs weighted in line with GDPs, is a generally less volatile currency unit than traditional currency pairs.

The Wocu balances and stabilizes currency risk, offering commercial advantage compared to the traditional use of the US Dollar to denominate international trade, acting as a natural currency shock absorber. It is applicable to most cross currency transactions and particularly international commodity trading. US Dollar agnostic (the US Dollar simply forms a weighted component of the Wocu) the Wocu offers sovereign nations an alternative to the US Dollar to price commodity exports and a standardised reference for holding currency reserves.

The Wocu's integrity, non-manipulation and standardisation is ensured by the WDX Institute, a wholly independent not-for-profit research body established by WDX. The WDXI independently monitors the Wocu and its constituent revisions, as determined by IMF GDP figures, every six months. The WDXI is also mandated to further research into the application of the Wocu and World currency baskets in general.

The Wocu is developed, owned and distributed by the WDX Organisation Ltd, a private company formed in 2009 and based in the heart of the City of London financial district, England. The Wocu was made available for commercial use on January 1, 2010. WDX wholly owns the Wocu algorithm including a pending U.S. patent application for the calculation method and technology behind the Wocu.

Wocu currency pair prices, information about WDX, the WDXI and other data can be found at www.wocu.com or www.wdxinstitute.org

10 About the Author

After a long career as Change Director and Strategist for major financial institutions Silvano Stagni decided it was time to achieve a better work/life balance and switched to writing. His experience in ‘bridging communication gaps’ between stakeholders is the basis of his style of writing and the choice of subjects he writes on. He has written extensively on disruptive concepts with an emphasis on practical examples and pragmatic implementation scenarios (in other words, what does it mean? and how does it work?). He has also written extensively on the impact of new banking regulations, cross border banking, banking in the developing world and risk strategies. He contributed white papers for regulatory and monetary issues behind electronic currency and other non-monetary type of payments to regulators in Asia and Europe. He has published several articles (both online and printed magazines) and contributed to many white papers and books.

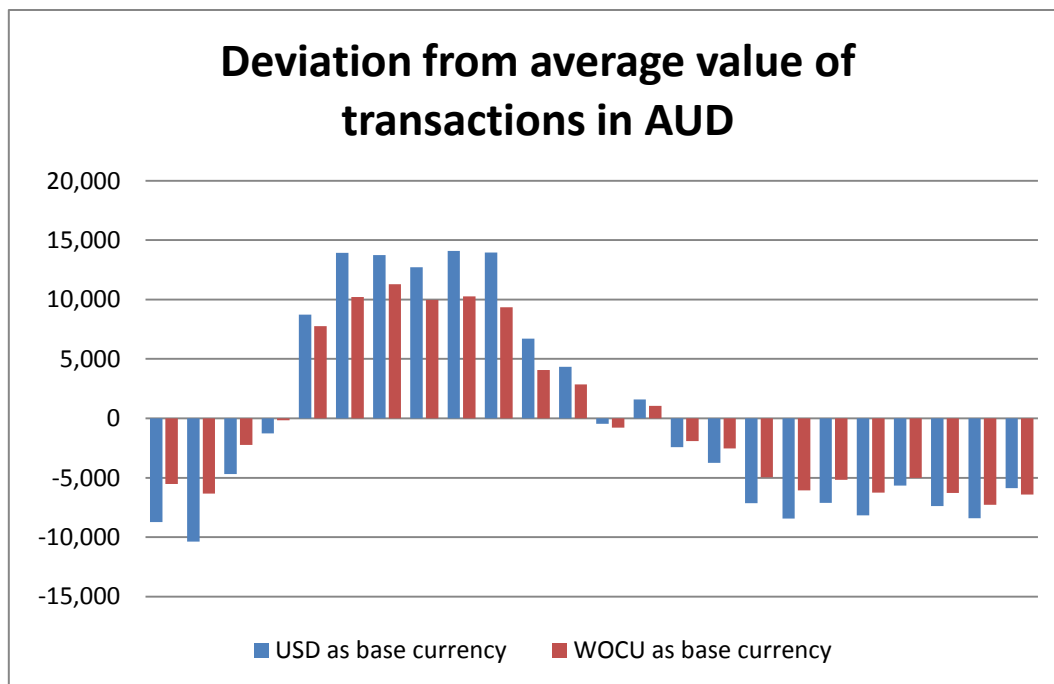
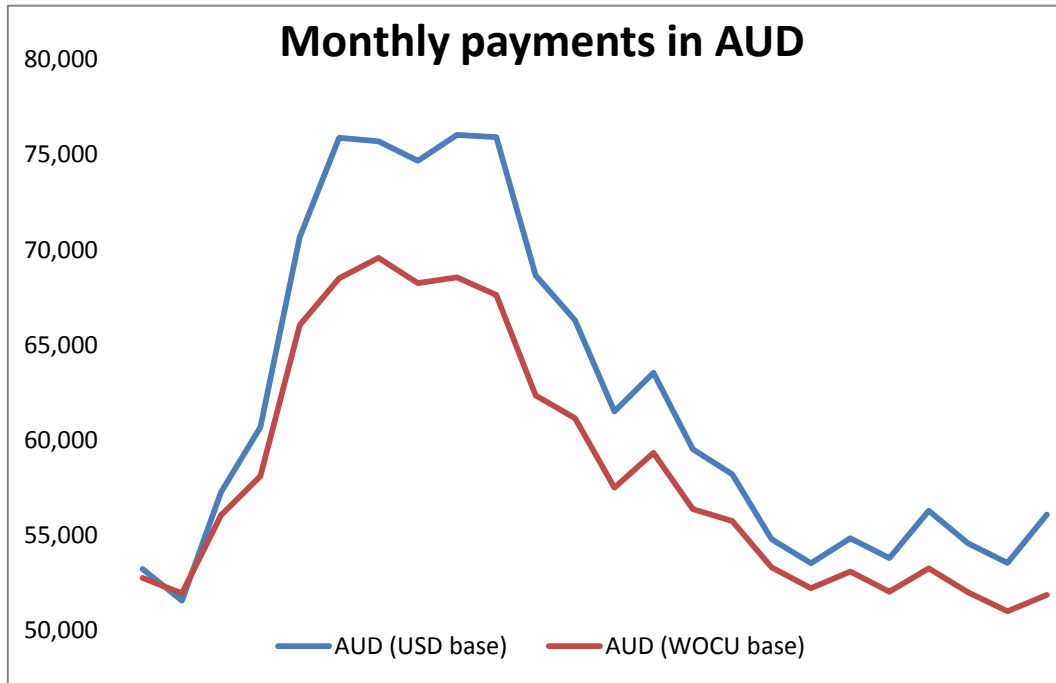
Further information can be found on www.stagni.net

For any question about this white paper (and for other things), please contact wocu@stagni.net

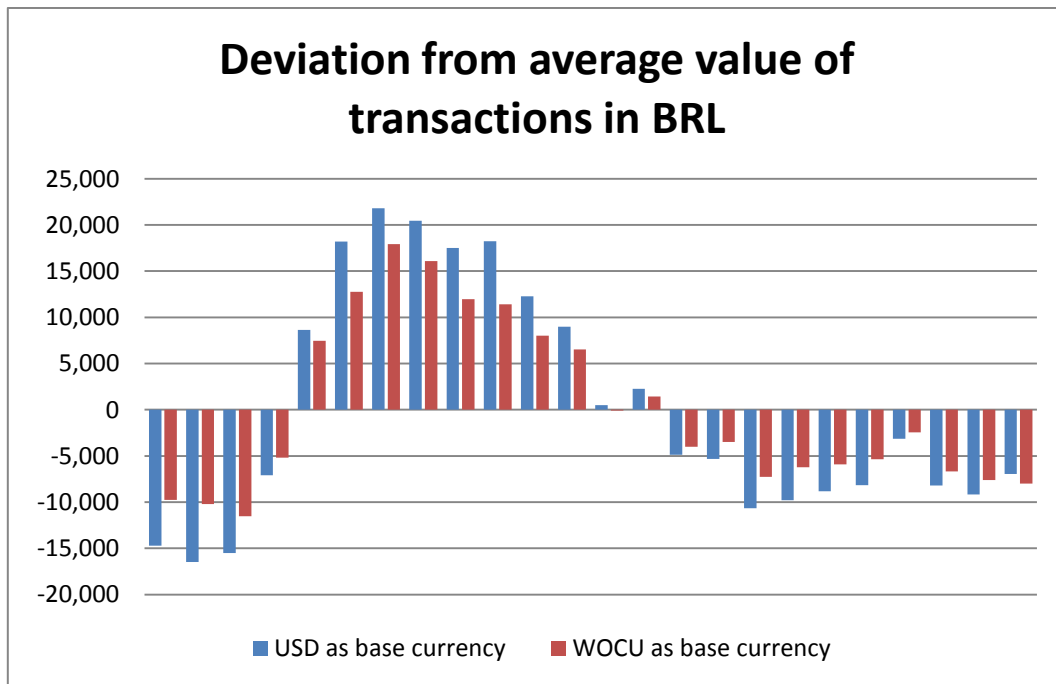
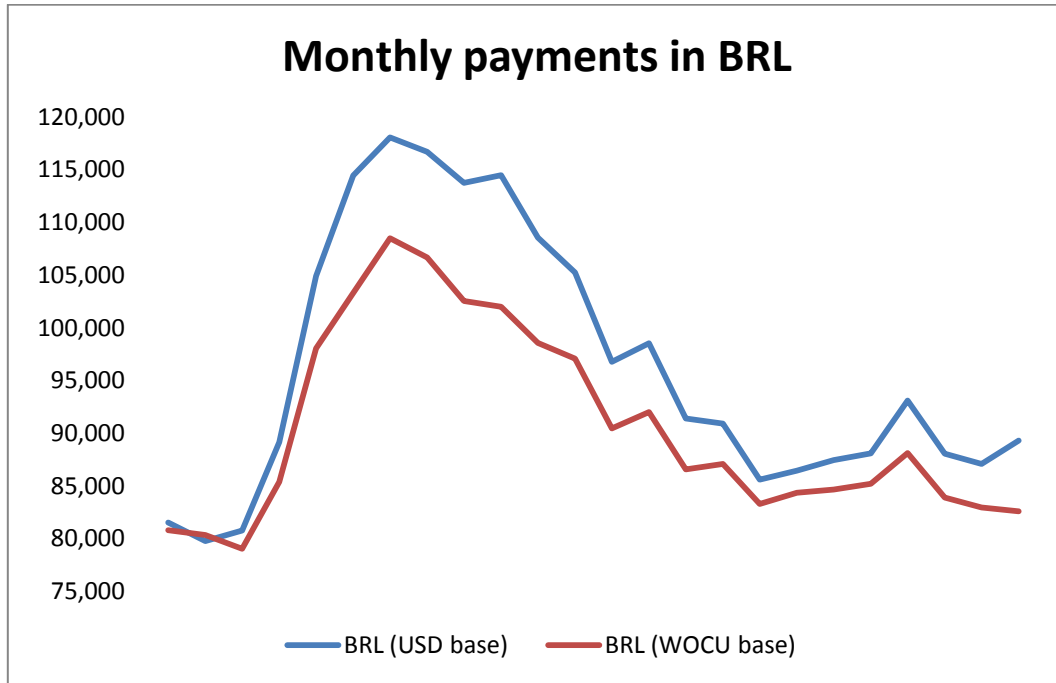
11 Appendix A – The currency charts

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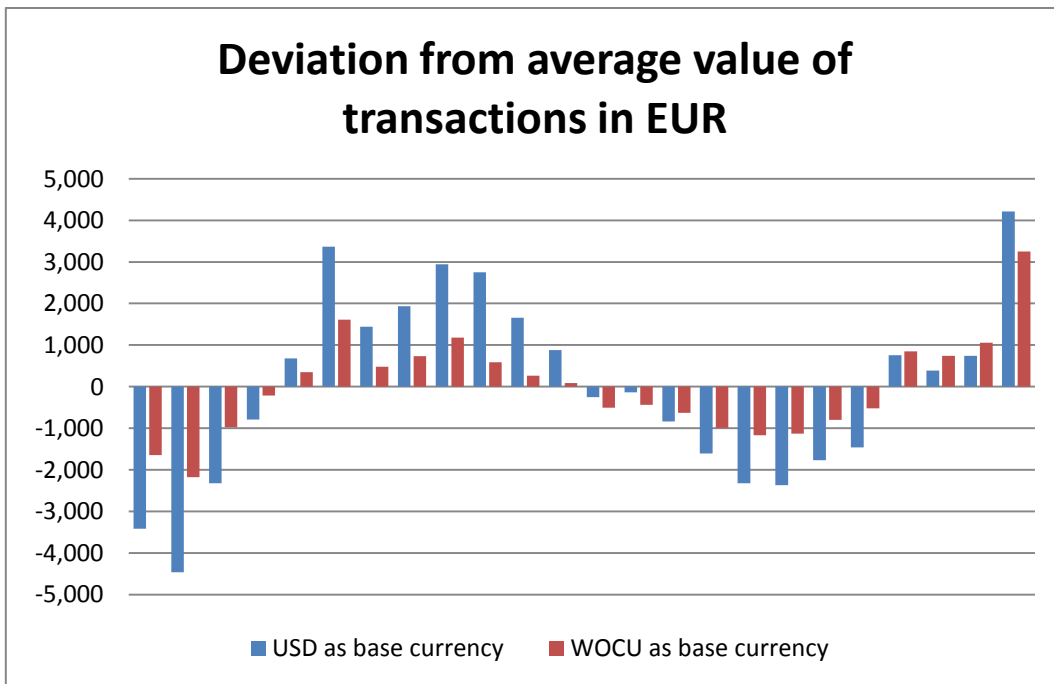
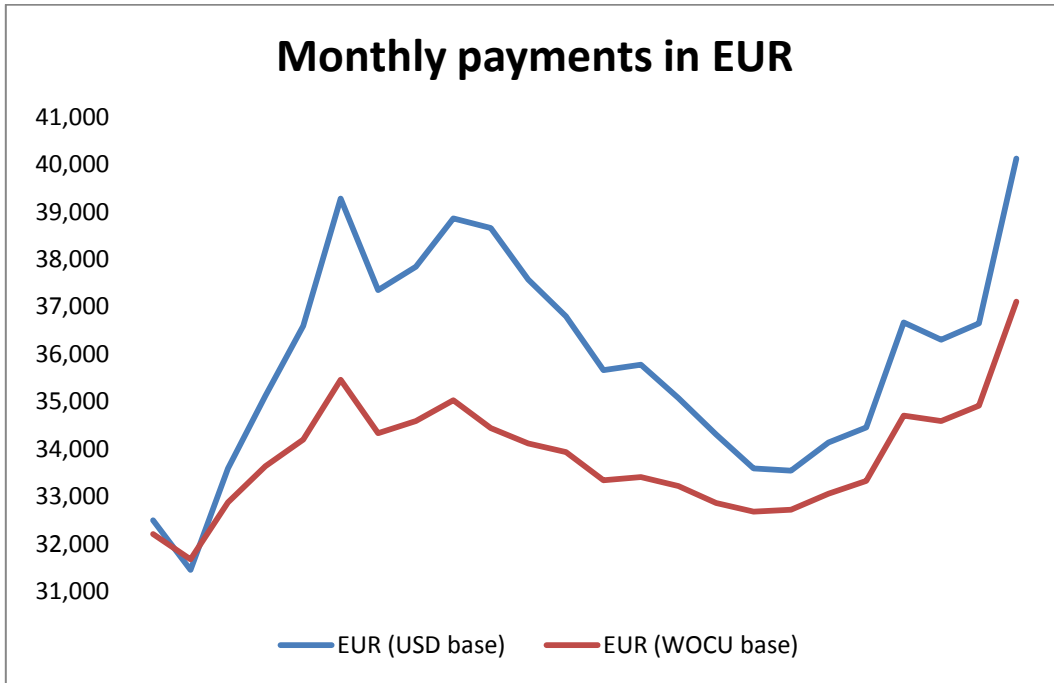
11.1 Australian Dollar



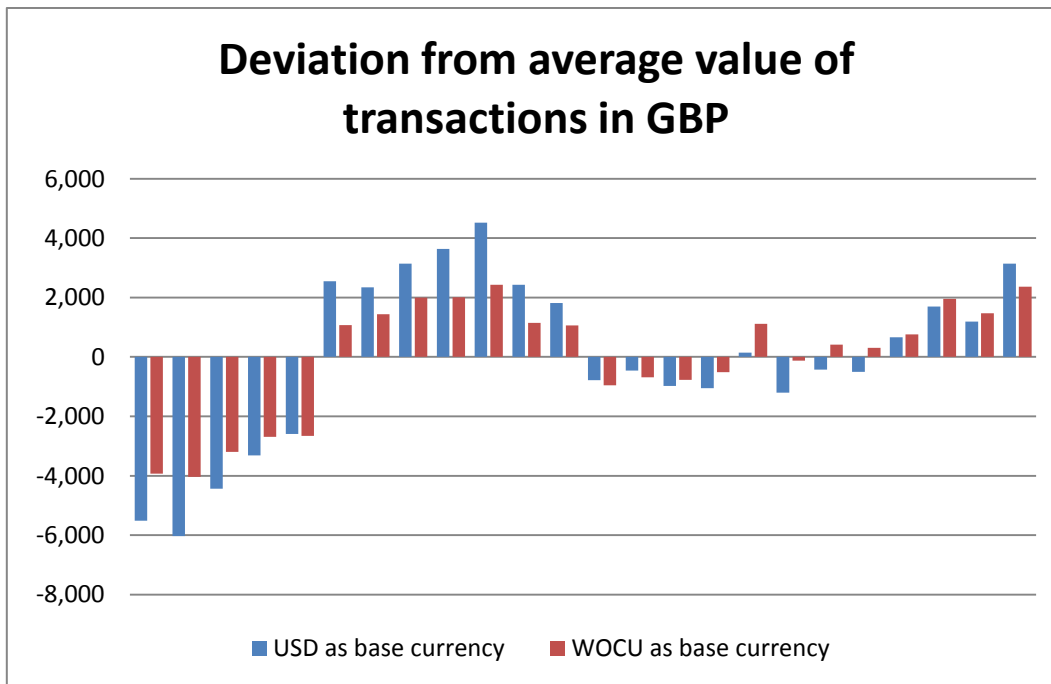
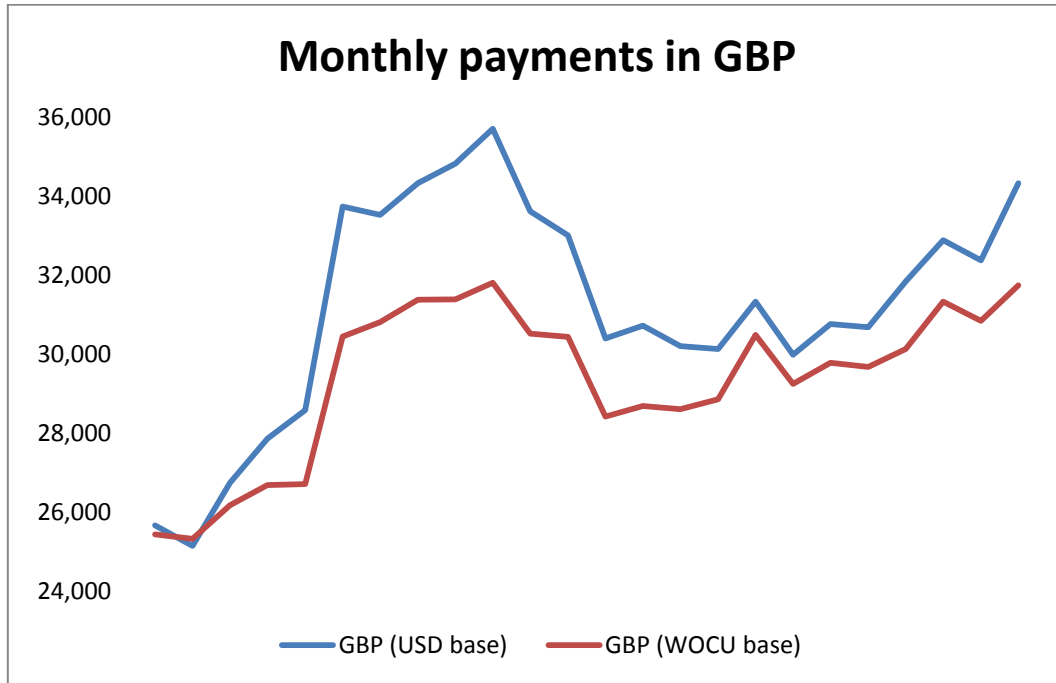
11.2 Brazilian Real



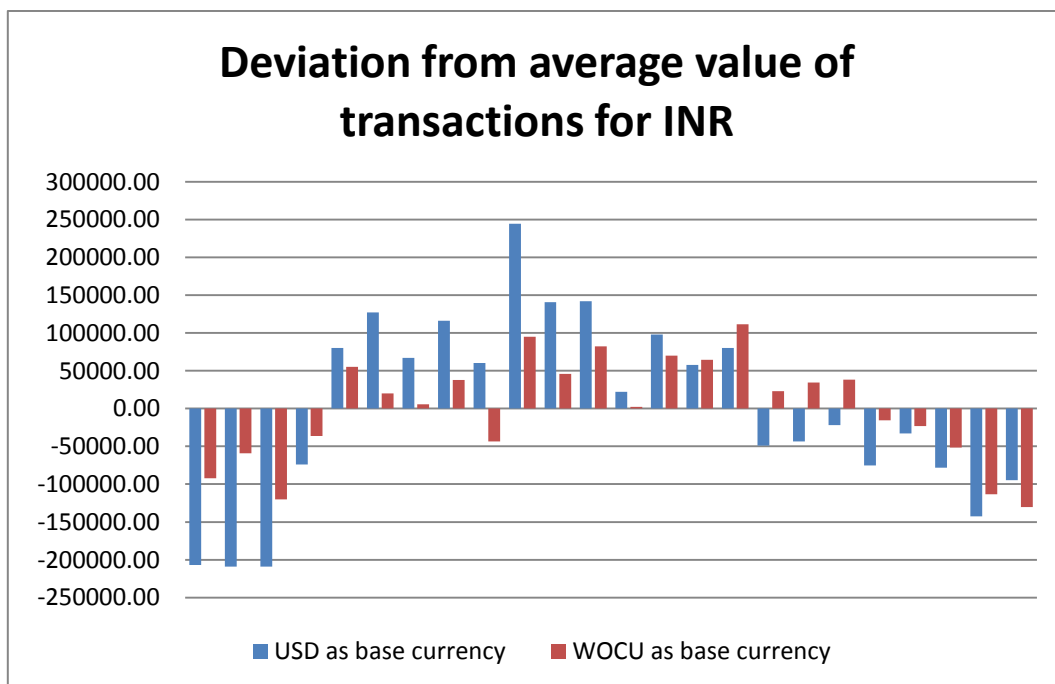
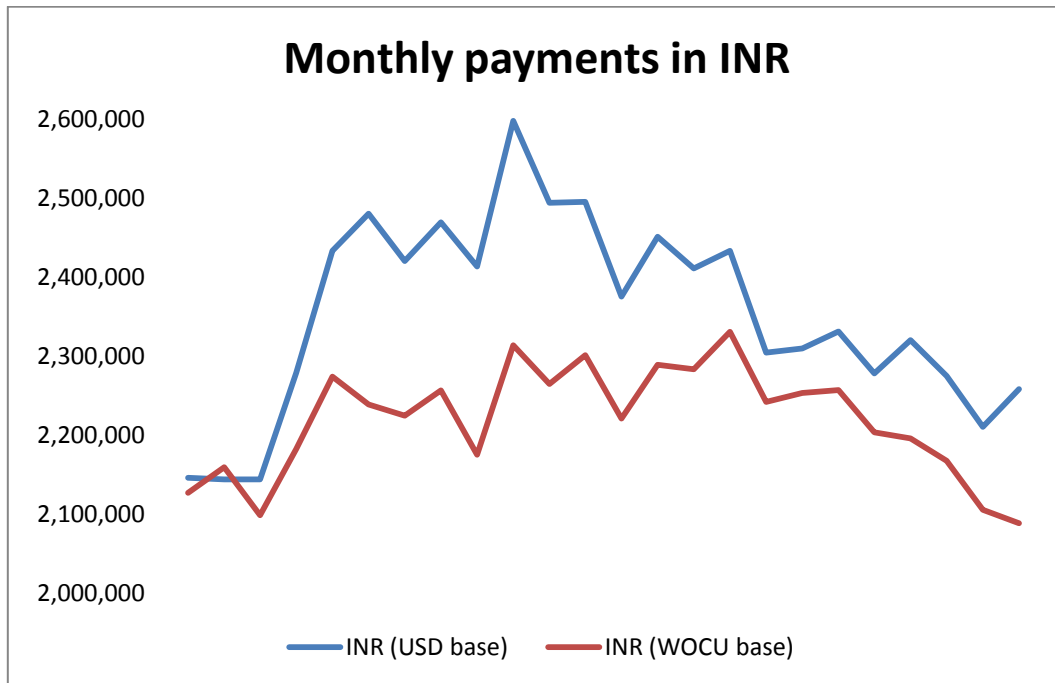
11.3 Euro



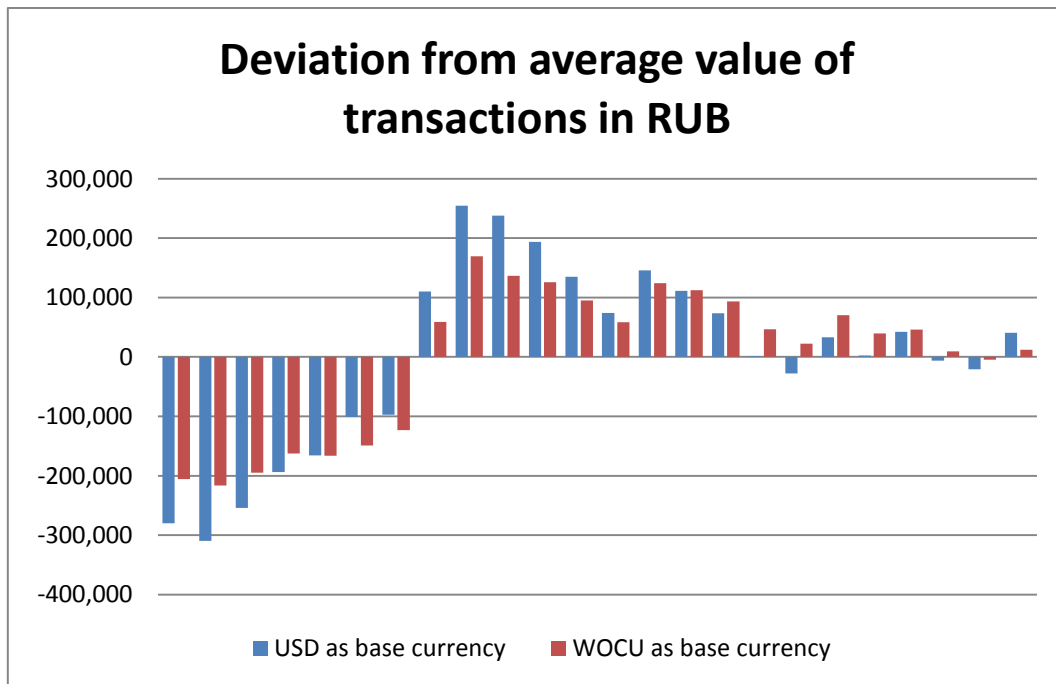
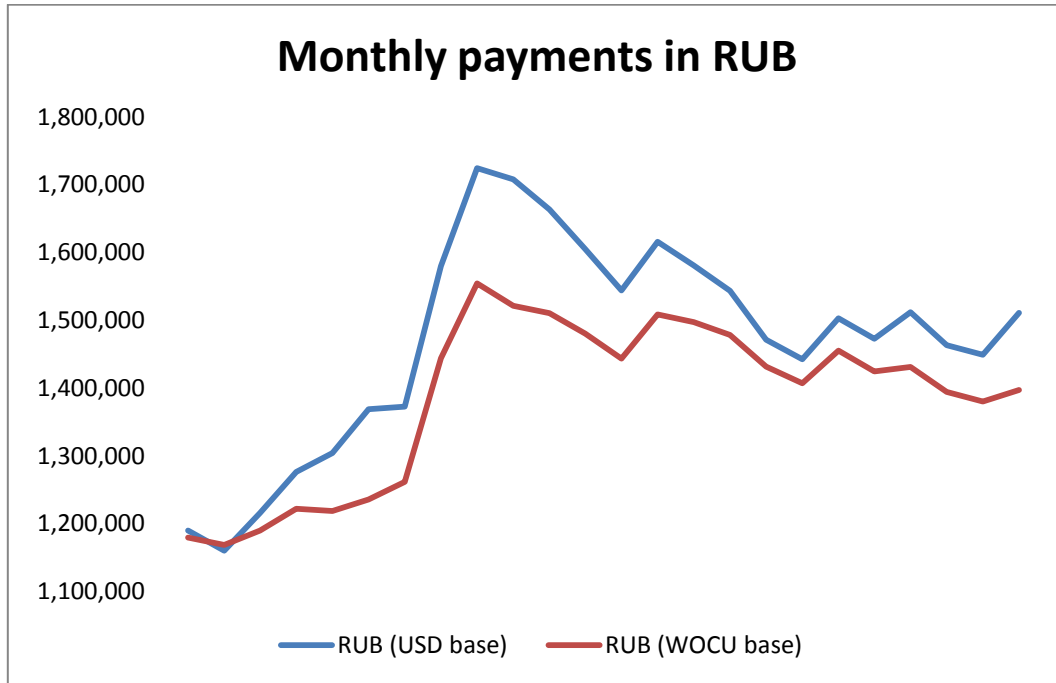
11.4 British Pound



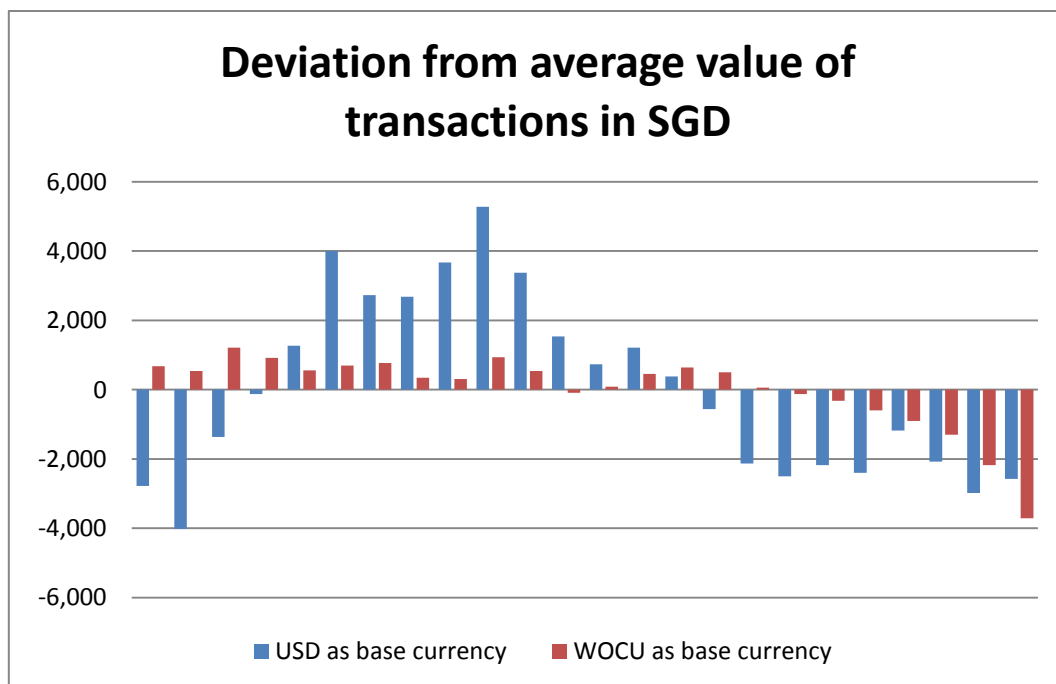
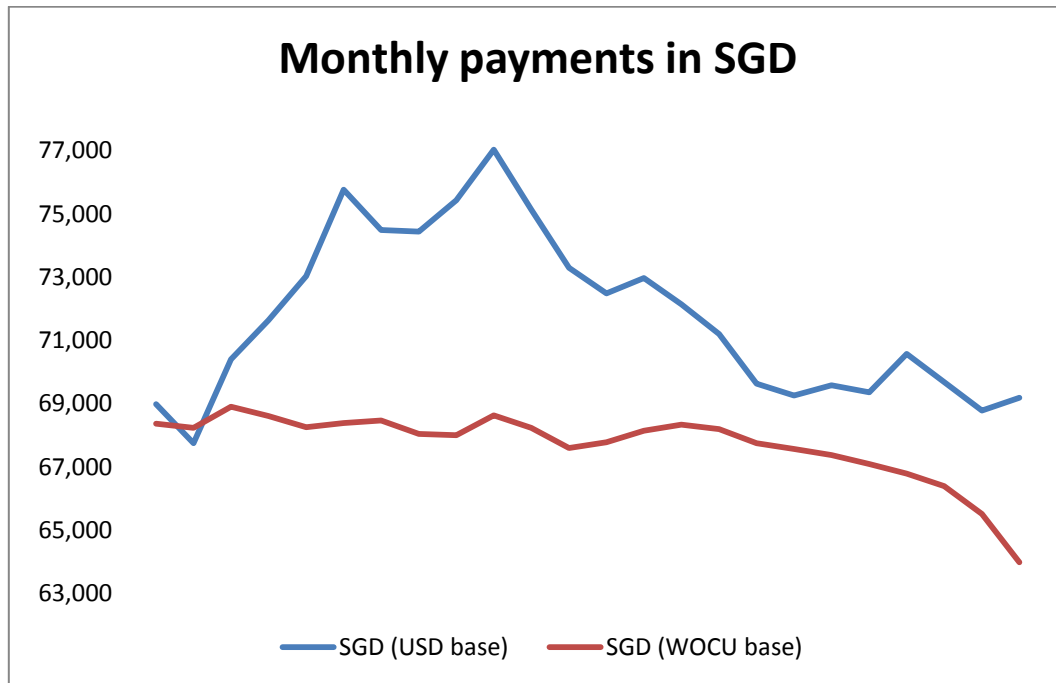
11.5 Indian Rupee



11.6 Russian Ruble



11.7 Singapore Dollar



11.8 South African Rand

