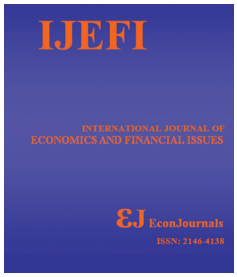


International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2015, 5(3), 780-785.

Special Drawing Right and Currency Risk Management

Khalifa Hassanain*

Research Division, Islamic Research and Training Institute/Islamic, Development Bank, P. O. Box 9201 Jeddah 21413, Kingdom of Saudi Arabia. *Email: khalifah55@hotmail.com

ABSTRACT

Special drawing right (SDR) valuation is done in terms of currency amounts of the four international reserve currencies, namely the US Dollar (USD), the Euro, the Japanese Yen and the pound sterling. Currencies included in the SDR calculations are determined on the basis of the value of export of goods and services over the past 5 years. The International Monetary Fund (IMF) Rule O-2(a) defines the value of the USD in terms of the SDR as the reciprocal of the sum of the equivalents in USDs of the amounts of the currencies in the SDR basket. Each USD equivalent is calculated on the basis of the middle rate between the buying and selling exchange rates at noon in the London market, or New York market or on the basis of euro reference rates published by the European Central Bank depending upon availability. For other currencies, SDR rates are based on SDR-USD rate and USD-other currency rate. Currency rates in terms of USD as reported by the issuing central banks is different from the SDR-USD rate based on London market, this difference cause the SDR to have different dollar values. It can potentially create spurious translation movements, even for a perfectly hedged position. In this study, we assess the impact of different exchange rate quotations for SDR calculations on SDR as a unit of account. Specifically we look at the long-run behavior and the short run dynamics of the difference between SDR as done by the IMF and on basis of London market and look at the implications for SDR as a unit of account and for currency risk management for multilateral development banks that use SDR as a unit of account.

Keywords: Special Drawing Right, Currency Risk, Multilateral Development Banks
JEL Classifications: F13, F31, F33, G32

1. INTRODUCTION

According to the International Monetary Fund (IMF), "the special drawing right (SDR) is an international reserve asset, created by the IMF in 1969 to supplement the existing official reserves of member countries." The SDR's value is based on a basket of key international reserve currencies and their weights reflect their relative importance in the world's trading and financial system over the previous 5 years period. The SDR could reduce portfolio variance and provide a convenient method of diversification in the management of risk for large institutional portfolios. This paper focuses on SDR as a unit of account and not as a reserve currency. SDR valuation has been guided by several long-standing principles, which aim to enhance the attractiveness of the SDR as a reserve asset. The SDR's value is based on a basket of key international reserve currencies and their weights reflect their relative importance in the world's trading and financial system over the previous 5 years period.

SDR, while mainly following the trend of the largest component (US Dollar [USD]), reduces the impact of the Dollar as principle reserve currency. It is to be noted that there are three main criteria for SDR basket composition as reported under the IMF's 2000 decision: The SDR basket comprises the four currencies that are issued by fund members (or by monetary unions that include fund members), whose exports of goods and services during the 5 years period ending 12 months before the effective date of the revision had the largest value, and that have been determined by the fund to be freely usable currencies in accordance with Article XXX (f), which reads:

"A freely usable currency means a member's currency that the fund determines are: (i) Widely used to make payments for international transactions, and (ii) widely traded in the principal exchange markets."

The percentage weight of each currency selected shall reflect reserves; the value of the balances of that currency held by the

monetary authorities of other members 10 at the end of each year of the relevant 5 years period ending 12 months before the effective date of the revision and the value of exports of goods and services of the members or monetary unions as defined in the method for currency selection.

The currencies and their weights in the valuation basket shall be reviewed every 5 years in order to keep the composition of the basket stable for at least that period of time, unless the Executive Board decides otherwise.

On the whole, it can be deduced that there are two elements underlying the three criteria above i.e., exports and freely usable currency. Exports indicate that countries or monetary unions are ranked based on export data and freely usable currency means when countries or monetary unions are ranked based on export data.

The valuation of SDR currency weights experiences various changes. This can be seen in the Table 1 which shows the currency amounts that are effective since January 01, 2011. To assist users of the SDR in preparing for the change over to the SDR valuation; the IMF has provided illustrative projections of the currency amounts. The value in USDs of one SDR is rounded to six significant digits.

The SDR unit of account could be used to price global trade, denominate financial assets, peg currencies, and keep accounts and official statistics. The SDR's basket characteristic provide a less volatile unit of account and store of value than its components when measured in domestic currency terms, thereby helping cope with exchange rate volatility for both the official and private sectors. These benefits are all the greater as the use of the SDR in both goods and asset markets is developed. Such development would allow the SDR to serve as a focal point for international monetary stability (IMS) evolution with a more efficient outcome than several segmented markets in various national currencies.

The basket could smoothly accommodate a greater role for emerging market currencies in the IMS, notably the RMB. In other words inclusion in the basket would allow holders of SDR denominated assets to acquire greater exposure to other currencies, and would create a dynamic conducive to financial deepening. This also depends on conditions for joining the basket, capital account liberalization in emerging markets. Generally, whilst the SDR composition is updated regularly to reflect the relatively importance of different currencies in global trade and finance, a system with a liquid market in SDR-denominated assets could flexibly accommodate the evolution of the IMS and mitigate the impact of any sudden shifts in demand for different currencies. However, expanding the basket too much could increase the complexity of the SDR and thus potentially reducing its attractiveness to reserve managers.

Table 1: Currency weights current and average since 2005

Currency	USD	Euro	JPY	GBP
Weight (current)	41.9	37.4	9.4	11.3
Average since 2005	42.95	35.7	10.2	11.15

International Monetary Fund (2010b), USD: US Dollar

Another question is related to the benefits of the SDR basket as compared to component currencies. The benefits are essentially depending on, (i) The frequency with which agents need to rebalance their portfolios; and (ii) the ease of access to the component currencies. More often than not, replicating the current basket is principally costless given the size, liquidity, and efficiency of global currency markets in the four component currencies; however, high frequency rebalancing (e.g., weekly or daily) could involve considerable costs.

It should be noted that inclusion of less easily available currencies would also enhance the basket's benefits compared to assembling its components. This would also include emerging market currencies in the basket as their shares in global trade and finance increase could enhance the attractiveness of the SDR by increasing its diversity and representativeness. Moreover, such process could facilitate a greater role for emerging markets in the IMS as well as support the financial deepening in those markets. However, going beyond a few additional currencies could mean adding currencies with low weight, or increasing complexity of transaction costs for those tracking the SDR basket or needing to hedge their exposure.

The objective of this study is to identify the potential impact of using different exchange rates in SDR valuation for institutions using SDR as unit of account and to study the adjustment pattern of the value of currency weights for currency risk management and the use of SDR as unit of account.

2. CURRENCY RISK MANAGEMENT AND SDR AS UNIT OF ACCOUNT

A common definition of exchange rate risk relates to the effect of unexpected exchange rate changes on the value of the firm (Madura, 1989). It is defined as the possible direct loss (as a result of an unhedged exposure) or indirect loss in the firm's cash flows, assets and liabilities, net profit and, in turn, its stock market value from an exchange rate move. The movement of foreign exchange rates that affect the value of the financial assets and liabilities denominated in foreign currencies results to currency risk. This occurs especially in the event financial institutions do not use hedging instruments to hedge its foreign currency.

To manage the exchange rate risk inherent in every multinational firm's operations, a firm needs to determine the specific type of current risk exposure, the hedging strategy and the available instruments to deal with these currency risks. Managing the exchange rate risk by hedging strategy is found to be an effective way to successfully reduce the exchange exposure. It provided many benefits including minimizing the effects of exchange rate movements, increasing the predictability of future cash flows and eliminating the need to accurately forecast the future direction of exchange rates.

Measuring the impact of exchange rate risk is an integral step for financial institutions to manage the movement. Several institutions

and multilateral development banks (MDBs) seek to minimize the potential fluctuation of the value of their net worth/equity denominated in SDR by matching to the extent possible, the currency composition of their net assets with the currency basket of the SDR.

Therefore, to measure the impact of exchange rate movements on a firm that is involved in foreign-currency denominated operations, i.e., the implied value at-risk (VaR) from the exchange rate movement, we need to identify the type of risks that a particular financial institution is exposed to and the amount of risk encountered (Hakala and Wystup, 2002).

Identification of the various types of currency risk, along with their measurement, is essential to develop a strategy for managing currency risk. In this respect, the three main types of exchange rate risk need to be identified are as follows:

Transaction risk means the cash flow risk. It deals with the effect of exchange rate that moves on transactional account exposure that is related to receivables (export contracts), payables (import contracts) or repatriation of dividends; translation risk, which is basically balance sheet exchange rate risk. It relates with the exchange rate movement to the valuation of a foreign financial institution which is subsidiary and, in turn, to the consolidation of a foreign subsidiary to the parent company's balance sheet; and economic risk, which reflects the risk to the firm's present value of future operating cash flows from exchange rate movements. In essence, economic risk concerns with the effect of exchange rate changes on revenues (domestic sales and exports) and operating expenses (cost of domestic inputs and imports) (Shapiro, 1996; Madura, 1989).

Nevertheless, measuring currency risk may be complex and difficult, at least with regards to the translation and economic risk (Van Deventer et al., 2004; Holton, 2003). At present, a widely-used method is the VaR model, (Papaioannou, 2006). Generally, VaR is defined as the maximum loss for a given exposure over a given time horizon with z % confidence. The VaR methodology can be used to measure a variety of types of risk, helping firms in their risk management. However, the VaR does not reflect the circumstances to the exposure for the (100 – z) % point of confidence, i.e., the worst case scenario. Absence of such definition on the maximum loss with 100% confidence, firms often set operational limits, such as nominal amounts or stop loss orders. This amount to additional value to VaR limits that reach the highest possible coverage (Papaioannou and Gatzonas, 2002).

3. VALUE-AT-RISK CALCULATION

The VaR measure of exchange rate risk is used by firms to estimate the riskiness of a foreign exchange position resulting from a firm's activities, including the foreign exchange position of its treasury, over a certain time period (Holton, 2003). The VaR calculation depends on the three following parameters:

The holding period, i.e., the length of time over which the foreign exchange position is planned to be held. The typical holding period is 1-day. The confidence level at which the estimate is planned to be made. The usual confidence levels are 99% and 95%. The unit of currency to be used for the denomination of the VaR.

Several institutions and MDBs seek to minimize the potential fluctuation in the value of their net worth/equity denominated in SDR by matching to the extent possible, the currency composition of their net assets with the currency basket of the SDR.

Institutions who hedge using SDR as unit of account can realign their current assets to SDR by computing the deviation between the net asset position and the SDR neutral position and decide accordingly whether they need to buy or sell currencies to stay within the neutral weights. Depending on their agreed policies, this could be done according to an agreed frequency such on daily or weekly basis.

The SDR's stability results from the fact that exchange rate shifts among the currency basket tend to offset one another depending on the degree of correlations among the component currencies.

Currency risk in this case, arises from the possibility that changes in foreign exchange rates affect the value of the financial assets and liabilities denominated in foreign currencies.

4. ISSUES FOR SDR ALIGNMENT

Despite the alignment currency risk approach, currency loss may occur under perfectly hedged positions. The potential causes for these losses in this case include:

For the other SDR currencies versus USD involved two exchange rates, one based on quotations from national authorities and one form noon London market rates.

The frequency of alignments and the tolerable range for deviation from neural weights may also matter.

This study attempt to identify the potential impact of using different exchange rates in SDR valuation for institutions using SDR as unit of account. We analyze the adjustment pattern of the value of currency weights for currency risk management and the use of SDR as unit of account.

5. METHODOLOGY AND DATA

We model change in currency weights as autoregressive-moving-average models using IMF valuation exchange rates and London noon market exchange rates and use the impulse response (IR) to track the adjustment pattern of currency weights. The result of the above exercise is used to generate potential guidelines for the SDR alignment. Policy for currency risk management for MDBs using SDR as unit of account.

The data used is daily London noon exchange rate data from February 07 to May 14 (USD, Euro, Yen and Pound) and the IMF exchange rates and neutral currency weighs for the same period.

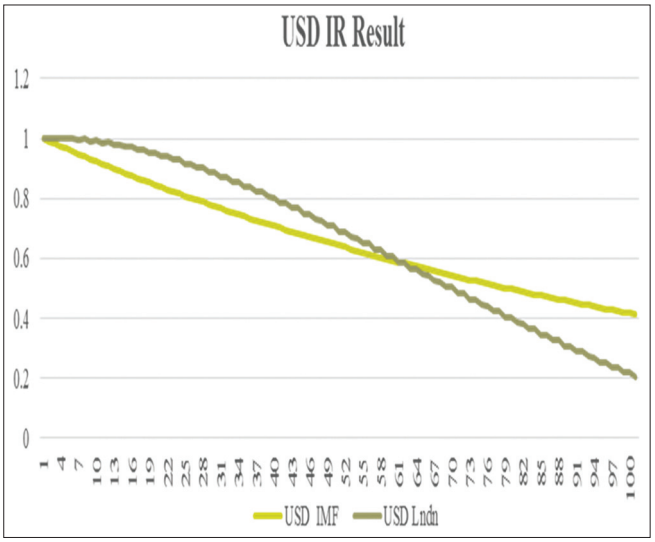
6. RESULTS

Graphs 1-4 show that for each currency weight, the IR is used to trace the response to a one-time shock in the innovation. A summary measure of how long it takes for the impact of a unit shock on each currency weight series to dissipate by half often employed in the literature is called the half-life. The half-lives are used to assess the stability of the exchange rate indices.

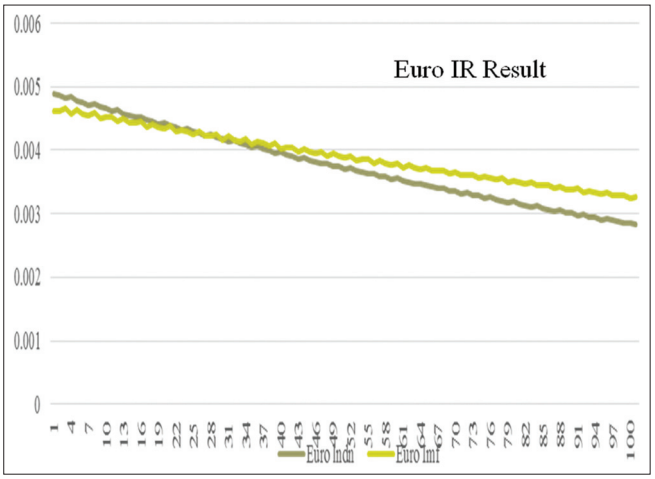
The dollar based currency weight based on London market rates dissipate by half and adjust faster than the IMF based weights. Recall the dollar share is the largest in the SDR basket (average 42.95 since 2006). The adjustment will normally take from 71 to 79 periods (days).

The Euro results also show London based weights adjusting faster. Half-life adjustment for both however, do not appear not even within 3 months, (weight 35.7).

Graph 1: US Dollar the impulse response result



Graph 2: Euro the impulse response result



The Pound results is close, again half-life adjustment for both however do not appear not even within 3 months.

The Yen result show that the IMF based result adjust faster but half-life adjustment for both do not appear not even within 3 months.

Table (Appendix 1) summarizes the adjustment of currencies based on these two methodologies i.e., IMF and London noon rates.

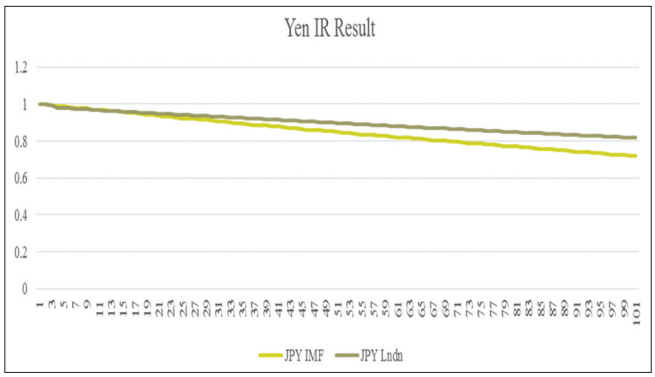
The confidence interval for the volatility of the SDR component currencies using both daily and monthly data are provided in Table 2. Currency alignment outside the confidence intervals (CIs) are therefore not recommended. Any deviations from the estimated CI's are temporary and the series will return back to the CI range. The distribution of the deviations is very symmetrical that is why we have a variance close to zero. The series exhibit equal magnitudes of positive and negative swings. Even though we will have preferred a series skewed to the left implying that losses are less likely to occur if we allow enough time for adjustment to take place losses will eventually by "canceled" out by gains. Therefore, policy maker are not encouraged to make frequent adjustment to the weights given that the series is normally distributed.

Table 2: The confidence interval for the SDR currencies

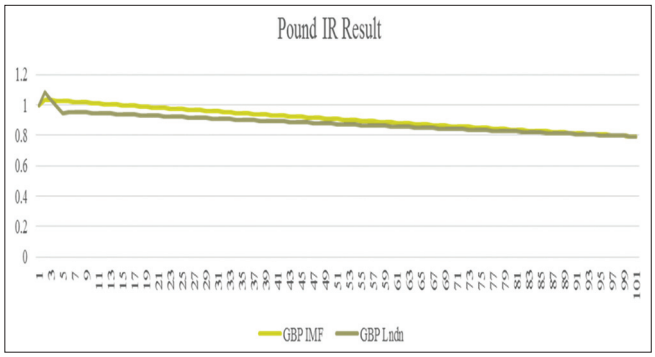
Number of observations	Euro 88	GBP 88	JPY 88	USD 88
90% confidence VaR	−0.10495	−0.24339	−0.18837	−0.00048
95% confidence VaR	−0.11169	−0.25613	−0.24985	−0.01385
99% confidence VaR	−0.12026	−0.26415	−0.26876	−0.02061

VaR: Value at-risk, SDR: Special drawing right

Graph 3: Yen the impulse response result



Graph 4: Pound the impulse response result



7. CONCLUSION

For institutions, that hedge against currency risk and institutions that rely more on currency alignment with SDR the policy implication is that the use of London (market) rate, can potentially minimize their losses. However, they face a potential problem with rating institutions for benchmarking with other institutions that uses IMF SDR rates.

For institutions that hedge using SDR as unit of account, relying on realigning their currency composition with SDR weights, the policy implication is to increase the time intervals for realignment with SDR and to expand the tolerable deviations for the neutral weights to minimize potential losses.

8. ACKNOWLEDGMENT

I would like to thank participants of the 24th International Conference of the International Trade and Finance Association, Kayseri, Turkey for comments. I would to thank the valuable research assistant work provided by Norsuria Binte Jani, Eman Adam and Musah Khalid.

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APPENDIX

Appendix 1

Date	USD IMF	USD LONDON	Date	USD IMF	USD LONDON	Date	USD IMF	USD LONDON
1	1	1	40	0.708073	0.80347	79	0.50134	0.403737
2	0.991361	1.003003	41	0.701817	0.785786	80	0.49717	0.401735
3	0.982723	1	42	0.695859	0.785118	81	0.492702	0.384051
4	0.973786	1.003003	43	0.689604	0.767434	82	0.488234	0.382049
5	0.965445	0.998665	44	0.683646	0.766433	83	0.484063	0.364698
6	0.956807	1.001335	45	0.677391	0.748415	84	0.479893	0.362696
7	0.948466	0.995662	46	0.671433	0.747414	85	0.475424	0.345345
8	0.940125	0.997998	47	0.665773	0.729062	86	0.471254	0.343343
9	0.931784	0.991325	48	0.659815	0.728061	87	0.467084	0.32666
10	0.923444	0.99366	49	0.653858	0.709376	88	0.462913	0.324324
11	0.915401	0.985986	50	0.648198	0.708041	89	0.459041	0.307975
12	0.907358	0.987654	51	0.642538	0.689356	90	0.45487	0.305639
13	0.899315	0.978979	52	0.636878	0.688021	91	0.450998	0.289623
14	0.89157	0.980647	53	0.631218	0.669336	92	0.446828	0.287287
15	0.883527	0.970971	54	0.625559	0.668001	93	0.442955	0.271605
16	0.875782	0.972639	55	0.620197	0.648982	94	0.439083	0.269269
17	0.868037	0.961962	56	0.614537	0.647648	95	0.43521	0.253921
18	0.860292	0.963297	57	0.609175	0.628629	96	0.431338	0.251585
19	0.852845	0.951952	58	0.603813	0.62696	97	0.427465	0.23657
20	0.845398	0.952953	59	0.598451	0.607941	98	0.42389	0.234234
21	0.837951	0.940607	60	0.593387	0.606273	99	0.420018	0.219553
22	0.830503	0.941608	61	0.588025	0.587254	100	0.416443	0.217217
23	0.823056	0.928595	62	0.582961	0.585586	101	0.412869	0.20287
24	0.815907	0.929263	63	0.577599	0.566567			
25	0.808758	0.915582	64	0.572535	0.564898			
26	0.801609	0.91625	65	0.567471	0.545879			
27	0.794459	0.901568	66	0.562705	0.544211			
28	0.787608	0.902236	67	0.557641	0.525526			
29	0.780459	0.887221	68	0.552875	0.523524			
30	0.773607	0.887221	69	0.547811	0.504838			
31	0.766756	0.871872	70	0.543044	0.502836			
32	0.760203	0.871872	71	0.538278	0.484151			
33	0.753351	0.855856	72	0.533512	0.482482			
34	0.746798	0.855522	73	0.528746	0.463797			
35	0.740244	0.839173	74	0.524278	0.462129			
36	0.733691	0.838839	75	0.519511	0.443777			
37	0.727137	0.821822	76	0.515043	0.441775			
38	0.720882	0.821488	77	0.510277	0.423757			
39	0.714626	0.804137	78	0.505809	0.421755			

IMF: International Monetary Fund, USD: US Dollar