Renovation of the Global Reserve Regime:
Concepts and Proposals

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RENOVATION OF THE GLOBAL RESERVE REGIME
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The subject of this paper is one about which I have written before,[1] but this paper goes further than those published previously. It contemplates the gradual transformation of the global reserve regime by making the IMF's quasi-currency, the SDR, the primary reserve asset of the international monetary system, which was the objective adopted when the SDR was introduced in 1969.

Some History

The proposal itself is not new. In the late 1970s, the staff of the International Monetary Fund proposed the creation of a so-called substitution account, into which foreign official holders of US dollars could deposit some of their dollars in exchange for claims denominated in SDRs. The Fund's staff did not go further, to suggest ways in which those claims might function fully as reserve assets by being transferable between participating governments in exchange for various national currencies, which might then be used for intervention in foreign-exchange markets, redemptions of sovereign debt, or other purposes.

The original proposal foundered, however, when potential users of the Account insisted that the United States take sole responsibility for maintaining the SDR value of the dollars deposited in the Account – a requirement that was summarily rejected by the United States, although voluminous simulations that I ran at the time as a consultant to the US Treasury suggested that the costs would not be very large, given past values of the dollar in terms of the SDR.

Thereafter, the proposal lay dormant for nearly three decades. In late 2009, however, the Governor of the People's Republic of China revived it in a much-quoted

* An earlier version of this paper was presented at the International Workshop held at the Institute for European Studies of the University of British Columbia in June 2010.

[1] See, e.g., Kenen (2010).

speech. His country holds some $2.4 trillion of foreign-exchange reserves, largely in US dollars, and he was understandably interested in ways to prevent a future depreciation of the dollar from eroding the value of those reserves in terms of other currencies. But before I address myself to the properties and potential uses of a Substitution Account, let me say a few words about the present currency-composition of global reserves insofar as it is revealed by the available data.

The Composition of Currency Reserves

As you probably know, the International Monetary Fund collects quarterly data on currency composition of reserves and publishes those data. A summary of the most recent data will be found on the last page of the handout on *The Currency Composition of Official Foreign-Exchange Reserves.* There, you will see that the dollar and euro account for almost 90 per cent of so-called allocated reserves (those that are reported by currency to the IMF), with the share of the dollar more than twice as large as that of all other currencies taken together. But $3.5 trillion of foreign-exchange reserves are not broken down by currency, and 90 per cent of the unallocated reserves belong to emerging and developing economies. It is thus apparent that China does not report the currency composition of its reserves, though unofficial estimates suggest that some 70 per cent of that country's reserves are held in US dollars – which help to explain why China's Central Bank Governor is somewhat concerned about the value of the dollar.

How has the dollar fared over the last decade? Look at Table A of that handout, which compares the composition of currency reserves in 1999 and 2009. Clearly, the euro has gained at the expense of the dollar. Its share rose from about 18 percent in 1999, shortly after the euro was introduced, to 27 percent in 2009, and this phenomenon is equally evident in the data for advanced economies and for emerging and developing economies.

Yet a large part of the increase in the share of the euro, reflects exchange-rate changes. Turn to Table B of that handout, where I have recalculated the dollar value of euro reserves at current and constant exchange rates. Using current exchange rates, the share of the euro in the sum of dollar and euro reserves rises steadily, from 20.1 per cent in 1999 to 30.6 per cent in 2009. But when the dollar value of euro reserves is

recalculated at the 1999 exchange rate, it rises to a peak of 25.3 per cent in 2002 but winds up at only 23.4 per cent in 2009. I leave it to you to decide which is the more relevant number, the dollar value of euro reserves at current or constant exchange rates. But the difference is not trivial.

Looking to the Future

So much for history. Let's talk about the future. I suggest that we revisit the original proposal for a substitution account, not merely to provide protection against shifts in the relative values of reserve currencies, but as a first step toward a fundamental change in the international monetary system.

Consider a three-stage transformation of the reserve regime.

The First Stage The first stage would involve the creation of a Substitution Account along the lines contemplated thirty years ago, but might be open to deposits of euros as well as dollars. During this first stage, which should not last for more than, say, ten years, the United States and Eurozone countries might be obliged to assume a maintenance-of-value obligation but only for the limited duration of the first stage. In the case of the Eurozone countries, the SDR claims deposited with the Substitution Account might be held in the name of the European Central Bank rather than those of the individual EMU countries, but the modalities of participation by the Euro Area countries would have to be decided by those countries themselves.

During this first stage, new SDR allocations by the IMF would be made, as now, to individual members of the IMF, unless the member opted to have its new SDRs deposited in the Substitution Account. Provision might be made for a depositor having a need for dollar or euro reserves in excess of those it had not deposited with the Account to withdraw some of the dollars or euros it had deposited initially, but it would perhaps be appropriate to levy a modest charge on such withdrawals.[2]

[2] The possibility of withdrawals, as well as the possibility that the Account would be liquidated rather than transformed as suggested below, explains the need for the United States and the Euro Area countries to assume a maintenance-of-value obligation in respect of the dollars and euros deposited in the Account. (In the simulations discussed below, however, there are no euro deposits, only dollar deposits, but the simulations themselves illustrate various ways of maintaining the financial integrity of the Account, some of which would relieve the United States of sole responsibility for that task.)

The Second Stage The second stage would make the SDR claims on the Account freely transferrable between pairs of participating countries at the option of the government seeking to make the transfer. A government requiring dollars, euros or other currencies deposited initially in the Account, because the government's remaining reserves were too small to meet its immediate needs, would not cash in its SDR claims on the Substitution Account. Instead, it would be free to transfer some of its claims on the Account to the country issuing the currency that the original holder desired. The transfer would presumably be made at the then-prevailing exchange rate between the SDR and the currency of the country providing the currency. If, for example, Brazil needed dollars to intervene in the foreign-exchange market, it would transfer to the United States some of its SDR claims on the Substitution Account, receiving US dollars at the then-prevailing dollar price of the SDR.

The Third Stage The third stage would consolidate the Substitution Account with the SDR Department of the IMF, obliterating any remaining distinction between the two types of SDRs – those created by substitution and those create by period allocations – and would extend transferability to all members of the IMF, even those that had not deposited any of their reserves with the Substitution Account. At that point, the SDR would become a full-fledged reserve asset available to every IMF member, even those that had not deposited any of their dollar reserves with the Substitution Account, and even though SDRs could not be used directly for intervention in the foreign-exchange market.[3]

Simulating the Evolution of a Substitution Account

Look now at the handout entitled *Guide to Substitution Account Tables.* The tables in that handout do not deal with the three-stage evolution I have just proposed. They deal instead with the evolution of a Substitution Account created in 1980, the year

[3]Nugée (2010) argues that the SDR cannot be full-fledged reserve currency unless private entities are free to hold it, and Julius (2010) appears to hold the same view, yet the unlimited transferability of SDR claims on the Substitution Account in exchange for national currencies would render that requirement otiose. A government needing a national currency for purposes of intervention or repaying debt would have ready access to that currency *via* the full transferability of SDR denominated claims on the books of the IMF. It would be necessary, however, for all members of the IMF to accept SDR claims on the Account from other IMF members in exchange for those members' currencies.

in which the original proposal for a Substitution Account was rejected, and asks how costly it would have been to maintain the financial integrity of a Substitution Account through 2008, the last year for which complete data were available when I undertook the calculations shown in the handout.

Table 1 deals with a regime in which the United States would have assumed sole responsibility for maintaining the financial integrity of the Account. The first three columns of the table display the relevant historical data – the dollar value of the SDR, the SDR interest rate, and the US interest rate (represented by the US Treasury bill rate). The fourth column lists the amounts in the Account at the end of each year, assuming that the Account was opened in 1980 with dollar reserves amounting to $500 billion. (This amount grows gradually at the US interest rate.) The next column shows the equivalent SDR amount, which grows gradually at the SDR interest rate, and the sixth column shows the dollar value of the SDR amount, at the then-current dollar value of the SDR. (A depreciation of the dollar in terms of the SDR raises the dollar value of the SDR amount absolutely and relative to the dollar amount in the Account.) The annual US interest payment, based on the dollar amount in the Account, is shown in the next column. It is not counted as a cost to the United States, which would have had to pay interest on the dollar reserves involved if they had not been deposited in the Account.

The penultimate column of Table 1 lists the 'deficiency payments' that the United States would have been obliged to make in years when the number of dollars in the Account was smaller than the dollar value of the SDR amount in the Account. And the final column of the table lists the cumulative dollar cost of the deficiency payments, including the interest cost to the United States of making those payments. The discounted dollar sum of the deficiency payments, using the average US interest rate over the whole period, works out at $133.5 billion – not an insignificant amount.

Table 2 describes a different regime. It posits the creation of a Substitution Account Reserve Fund (SARF) into which the United States, the depositors, or both together, would make an annual contribution totaling one per cent of the dollar amount in the Account. Whenever the dollar amount in the Account would be smaller than the dollar value of the SDR claims on the Account, the SARF would make good the

difference. In years when the assets of the SARF are insufficient to make the necessary payments, the SARF borrows from the IMF itself, repaying its debt to the Fund from subsequent annual payments to the SARF. The cumulative cost of the payments to the SARF is larger than the cumulative dollar cost shown in Table 1. But the cost to the United States would be considerably small than in Table 1 if half of each annual payment to the SARF was made by the depositors rather than the United States.

Table 3 is modeled on Table 2, but the annual payment to the SARF is reduced from one per cent of the dollar amount in the Account to only 0.75 per cent, reducing the cumulative cost of the annual payments to the SARF from $733 billion in Table 2 to $550 billion, but also reducing the net assets of the SARF at the end of 2008 from $258 billion to $75 billion, an amount that may be inadequate to deal with future 'deficits' in the Substitution Account.

Finally, Table 4 leaves the annual payment to the SARF where it was in Table 3, at three-quarters of one per cent per year but requires the SARF to cover only half of any gap between the number of dollars in the Account and the dollar value of the SDR amount. As a result, there is $42 billion shortfall in the Substitution Account at the end of 2008. In Tables 2, 3, and 4, of course, the cost to the United States would depend on the division of the annual payments to the SARF between the United States and the countries depositing dollars in the Substitution Account.

I conclude with three *caveats*:

First, the initial contribution to the Substitution Account used in my simulations, $500 billion, was nearly equal to the global total of dollar reserves in 1980 and is therefore too large, because participation in the Substitution Account would be voluntary, and no country is likely to deposit all of its dollar reserves in the Account.

Second, the terminal dollar holdings of the Account in 2008, at $2,735 billion, are nearly equal to the global total of *allocated* dollar reserves at the end of 2009 shown in Table A of the handout on the currency composition of official foreign-exchange reserves, but it is far smaller than the grand total foreign-exchange reserves, including the very large quantity of unallocated reserves, which presumably includes the huge reserves of China. If a Substitution Account were created today, however, it might well contain initially a quantity of currency reserves larger than $3,000 billion.

Third and most importantly, I am far from convinced that the United States would readily assume the huge contingent obligation that it would have to assume with regard to dollars deposited in a Substitution Account. At a meeting I attended on the eve of the Hamburg Summit, the then Secretary of the Treasury dismissed the whole notion abruptly, and I went back to my office at the Treasury somewhat disappointed. But if I were in his shoes today, I too might be worried about the size of the contingent obligation that the United States might have to assume and the difficulty of persuading the US Congress to approve the necessary legislation. But it has been fun to play around with the idea.

References

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The Currency Composition of Official Foreign-Exchange Reserves

The two tables attached to this note summarize the evolution of official foreign-exchange reserves from 1999 through 2009. They are based on data compiled and published by the International Monetary Fund (the so-called COFER tables).* As the reporting of these data is voluntary, unlike data on member countries' total reserves, they are quite incomplete. At the end of 2009, foreign-exchange reserves totaled $8,087 billion, of which only $4,566 billion are allocated by currency. (The numbers strongly suggest that China is one of the countries that does not provide data on the currency composition of it reserves.)

The first table compares data for two years, 1999 and 2009, showing the shares of the dollar and euro in the reported total of official foreign-exchange holdings. The share of the dollar has fallen over this interval, modestly in the case of the advanced countries' reserve holdings but more sharply in the case of the developing countries' holdings. There is, of course, no way to know how the inclusion of China's huge reserves would alter the story.

The second table traces the year-by-year evolution of officially reported dollar and euro reserves. When the euro reserves are valued at current exchange rates, the share of the euro in the subtotal of dollar and euro reserves is seen to rise sharply, from 20.1 per cent of the subtotal in 1999 to 30.6 per cent in 2009. But when euro reserves are valued at a constant dollar-per-euro exchange rate (the end-1999 rate in this instance), the euro's share rises only slightly, from the same 20.1 per cent to only 23.4 per cent. Thus, most the increase in the euro's share is attributable to the evolution of the euro-dollar exchange rate; which rose from 1.007 dollars per euro in 1999 to a peak of 1.460 dollars per euro in 2007 and ended at 1.441 in 2009.

*An abbreviated version of the COFER table for the end of 2009 is attached.

Table A. Currency Composition of Official Reserves, End of Year, 1999 and 2009

Thousand billion of dollar equivalents	1999	2009	Share of Allocated Reserves 1999	Share of Allocated Reserves 2009	Percentage Change
Total Foreign Exchange Holdings					
Allocated reserves	1,380	4,567	--	--	230.9
US dollars	980	2,838	71.0	62.1	189.6
Euros	247	1,250	17.9	27.4	406.1
All other currencies	152	479	11.0	10.5	215.1
Unallocated reserves*	131	3,520	--	--	2587.0
Advanced Economies					
Allocated reserves	997	2,386	--	--	139.3
US dollars	702	1,570	70.4	65.8	123.6
Euros	174	577	17.5	24.2	231.6
All other currencies	121	239	12.1	10.0	97.5
Unallocated reserves	111	350	--	--	215.3
Emerging & Developing Economies					
Allocated Reserves	382	2,181	--	--	470.9
US dollars	278	1,268	72.8	58.1	356.1
Euros	73	673	19.1	30.9	821.9
All other currencies	31	240	8.1	11.0	674.2
Unallocated reserves*	291	3,170	--	--	989.3

Source: International Monetary Fund, *Currency Composition of Foreign Exchange Reserves* (COFER).

*Presumably includes China, which had reserves in excess of $2,400 billion at the end of 2009.

Table B. Euro Reserves as Percentage of Dollar *plus* Euro Reserves

End of Year	Dollars per Euro	Dollar Reserves	Dollar Value of Euro Reserves: Current Exchange Rate	Dollar Value of Euro Reserves: 1999 Exchange Rate	Euro Percentage: Current Exchange Rate	Euro Percentage: 1999 Exchange Rate
1999	1.0070	979.8	246.9	*245.2*	20.1	*20.1*
2000	0.9388	1079.9	277.7	*295.8*	20.5	*21.5*
2001	0.8901	1122.4	301.0	*338.2*	21.1	*23.2*
2002	1.0485	1204.7	427.3	*407.5*	26.2	*25.3*
2003	1.2597	1465.7	559.2	*443.9*	27.6	*23.2*
2004	1.3538	1751.0	658.5	*486.4*	27.4	*21.7*
2005	1.1842	1902.5	683.8	*577.4*	26.4	*23.3*
2006	1.3197	2171.1	831.9	*630.4*	27.2	*22.5*
2007	1.4603	2641.6	1082.3	*741.1*	29.1	*21.9*
2008	1.3919	2699.1	1112.2	*799.1*	29.2	*22.8*
2009	1.4406	2837.8	1250.0	*867.7*	30.6	*23.4*

Source: International Monetary Fund, *Currency Composition of Foreign Exchange Reserves* (COFER). Reserve data in billions of dollars or dollar equivalents.

Note: At the end of 2009, the dollar and euro together accounted for 90 per cent of all allocated reserves when measured at current exchange rates, but for only 51 per cent of total currency reserves. The difference between these numbers reflects the fact that reporting is voluntary, and some $3,500 billion of currency reserves were unallocated at the end of 2009, with China accounting for about $2,400 billion.

Currency Composition of Official Foreign Exchange Reserves
Billions of US dollars at end 2009

World	
Total foreign exchange holdings	8,087
Allocated reserves	4.567
In US dollars	2,838
In euros	1,250
In pounds sterling	194
In yen	138
In other currencies*	147
Unallocated reserves	3,520
Advanced Economies	
Total foreign exchange holdings	2,736
Allocated reserves	2,386
in US dollars	1,570
in euros	577
in pounds sterling	67
in yen	96
in other currencies*	76
Unallocated reserves	350
Emerging and Developing Economies	
Total foreign exchange holdings	5,351
Allocated reserves	2,180
in US dollars	1,268
in euros	673
in pounds sterling	128
in yen	41
in other currencies*	71
Unallocated reserves	3,170

*Incluldes Swiss francs

Detail may not add to total because of rounding

Guide to Substitution Account Tables

Table 1 describes a regime under which the United States would be exclusively responsible for maintaining the solvency of the Account, by making 'deficiency payments' to the Account whenever the dollar amount in the Account fell below the dollar value of the SDR claims on the Account. The cumulative cost of those payments, including accumulated interest costs incurred by the United States would be $481 billion (but the present discounted value at the inception of the account would be $133.5 billion – not a small amount).

Table 2 describes a regime under which a Substitution Account Reserve Fund (SARF) would be established at the outset, into which the United States, the depositors, or the two jointly, would make a contribution to the SARF equal to one per cent of the dollar amount in the Account. Should the SARF run out of funds, as it does in this simulation, it would borrow from the IMF and repay its debt to the Fund thereafter. The cumulative cost to the United States of this regime would be its share of the $733 billion cumulative cost of the annual payments to the SARF.

Table 3 replicates the simulation displayed in Table 2 but reduces the annual contribution to the SARF to three-fourths of one per cent of the dollar amount in the Account. Otherwise, it is identical to Table 1. This regime would reduce substantially the cumulative cost of the regime, which would fall from $733 billion to $550, but it would leave the SARF with net assets of only $95 billion, compared to $258 billion in Table 2, a balance that might require the SARF to borrow substantial amounts from the IMF in the future, given the very large size of the Substitution Account at the end of the simulation.

Table 4 replicates the principal features of Table 3, but SARF payments to the IMF would be limited to only half of any difference between the dollar amount in the Account and the dollar value of the SDRs. This arrangement would not greatly reduce the cumulative cost of sustaining the solvency of the Account, which would have a dollar shortfall of $41 billon at the end of the simulation, and there would be similar shortfalls in the early 1990s. This regime, moreover, would not greatly reduce the cumulative cost of payments to the SARF, as they would fall by only $12 billion.

Table 1. Substitution Account with Solvency Maintained by US Deficiency Payments; dollar and SDR amounts in billions

End of Year	US$ per SDR	SDR Interest Rate	US Interest Rate	Dollar Amount in SA	SDR Amount in SA	Dollar Value of SDR Amt	US Interest Payment	US Deficiency Payment	Cumulative Dollar Cost to US*
1980	1.30	9.1	11.2	500.0	384.6	500.0	0.0	0.0	0.0
1981	1.18	12.7	14.4	572.0	433.5	511.5	72.0	0.0	0.0
1982	1.10	11.2	10.8	633.8	482.0	530.2	61.8	0.0	0.0
1983	1.06	8.6	8.9	690.2	523.5	554.9	56.4	0.0	0.0
1984	1.02	8.9	9.8	757.8	570.1	581.5	67.6	0.0	0.0
1985	1.02	7.8	7.7	816.2	614.5	626.8	58.4	0.0	0.0
1986	1.18	6.4	6.2	866.8	653.8	771.5	50.6	0.0	0.0
1987	1.30	5.9	6.0	918.8	692.4	900.1	52.0	0.0	0.0
1988	1.35	6.3	6.9	993.7	736.0	993.7	63.4	11.5	11.5
1989	1.28	8.3	8.4	1077.1	797.1	1020.3	83.5	0.0	12.5
1990	1.35	9.1	7.7	1174.1	869.7	1174.1	82.9	14.0	27.4
1991	1.37	7.7	5.5	1283.2	936.6	1283.2	64.6	44.5	73.4
1992	1.41	6.3	3.5	1403.9	995.6	1403.9	44.9	75.8	151.8
1993	1.39	4.6	3.1	1447.6	1041.4	1447.6	43.5	0.2	156.7
1994	1.43	4.3	4.4	1553.3	1086.2	1553.3	63.7	42.0	205.6
1995	1.52	4.6	5.7	1727.0	1136.2	1727.0	88.5	85.2	302.5
1996	1.45	3.9	5.1	1815.1	1180.5	1711.7	88.1	0.0	318.0
1997	1.37	4.1	5.2	1909.5	1228.9	1683.6	94.4	0.0	334.5
1998	1.35	4.1	4.9	2003.1	1279.3	1727.0	93.6	0.0	350.9
1999	1.37	3.5	4.8	2099.2	1324.1	1814.0	96.1	0.0	367.7
2000	1.32	4.4	6.0	2225.1	1382.3	1824.7	126.0	0.0	389.8
2001	1.27	3.4	3.5	2303.0	1429.3	1815.2	77.9	0.0	403.4
2002	1.30	2.2	1.6	2339.9	1460.8	1899.0	36.8	0.0	409.9
2003	1.41	1.7	1.0	2363.3	1485.6	2094.7	23.4	0.0	414.0
2004	1.47	1.8	1.4	2396.4	1512.3	2223.1	33.1	0.0	419.8
2005	1.47	2.6	3.2	2473.0	1551.7	2280.9	76.7	0.0	433.2
2006	1.47	3.7	4.9	2594.2	1609.1	2365.3	121.2	0.0	454.4
2007	1.54	4.1	4.5	2711.0	1675.0	2579.6	116.7	0.0	474.9
2008	1.59	2.6	1.4	2748.9	1718.6	2732.6	38.0	0.0	481.5

Discounted dollar sum of deficiency payments using average US interest rate: 133.5

*Includes interest paid by United States at US Treasury Bill Rate on cumulative amount of deficiency payments

Table 2. Substitution Account with Substitution Account Reserve Fund (SARF) and Annual Contributions at 1.0 per cent of Dollar Amount in Substiution Account
Interest earned or paid by SARF at US Treasury Bill Rate; dollar and SDR amounts in billions

End of Year	US$ per SDR	SDR Interest Rate	US Interest Rate	Dollar Amount in SA	SDR Amount in SA	Dollar Value of SDR Amt	US Interest Payment	Annual Payment to SARF	Deficiency Payment by SARF	Net Assets of SARF*	Cumulative Cost of Payments to SARF**
1980	1.30	9.1	11.2	500.0	384.9	500.0	0.0	5.0	0.0	5.0	5.0
1981	1.18	12.7	14.4	571.8	433.6	510.0	71.8	5.7	0.0	11.4	11.4
1982	1.10	11.2	10.8	633.3	482.1	529.8	61.6	6.3	0.0	19.0	19.0
1983	1.06	8.6	8.9	689.5	523.5	557.0	56.2	6.9	0.0	27.6	27.6
1984	1.02	8.9	9.8	757.1	570.2	582.2	67.6	7.6	0.0	37.9	37.9
1985	1.02	7.8	7.7	815.7	614.8	627.7	58.5	8.2	0.0	48.9	48.9
1986	1.18	6.4	6.2	865.8	654.1	769.2	50.2	8.7	0.0	60.6	60.6
1987	1.30	5.9	6.0	917.4	692.5	899.5	51.5	9.2	0.0	73.4	73.4
1988	1.35	6.3	6.9	994.0	735.7	994.0	63.1	9.9	13.5	74.9	88.4
1989	1.28	8.3	8.4	1077.4	796.6	1021.2	83.4	10.8	0.0	91.9	106.6
1990	1.35	9.1	7.7	1174.0	869.0	1174.0	83.4	11.7	13.3	97.5	126.6
1991	1.37	7.7	5.5	1282.4	936.1	1282.4	64.9	12.8	43.5	72.3	146.4
1992	1.41	6.3	3.5	1400.5	994.7	1400.5	45.0	14.0	73.1	15.7	165.5
1993	1.39	4.6	3.1	1445.7	1040.8	1445.7	42.9	14.5	2.4	28.3	185.0
1994	1.43	4.3	4.4	1551.1	1085.5	1551.1	62.9	15.5	42.6	2.5	208.6
1995	1.52	4.6	5.7	1719.8	1135.2	1719.8	87.6	17.2	81.0	-61.2	237.6
1996	1.45	3.9	5.1	1808.2	1179.5	1709.0	88.4	18.1	0.0	-46.2	267.9
1997	1.37	4.1	5.2	1902.2	1227.5	1681.6	94.0	19.0	0.0	-29.6	300.8
1998	1.35	4.1	4.9	1995.4	1277.9	1726.5	93.2	20.0	0.0	-11.1	335.5
1999	1.37	3.5	4.8	2090.6	1322.4	1811.7	95.2	20.9	0.0	9.3	372.4
2000	1.32	4.4	6.0	2216.1	1381.1	1817.5	125.4	22.2	0.0	32.0	416.9
2001	1.27	3.4	3.5	2293.2	1428.4	1808.3	77.1	22.9	0.0	56.0	454.4
2002	1.30	2.2	1.6	2330.6	1460.4	1897.0	37.4	23.3	0.0	80.2	485.1
2003	1.41	1.7	1.0	2354.3	1484.5	2090.1	23.8	23.5	0.0	104.6	513.6
2004	1.47	1.8	1.4	2387.1	1511.7	2223.7	32.7	23.9	0.0	129.9	544.6
2005	1.47	2.6	3.2	2463.7	1551.1	2281.6	76.6	24.6	0.0	158.7	586.7
2006	1.47	3.7	4.9	2583.2	1608.3	2365.9	119.5	25.8	0.0	192.3	641.0
2007	1.54	4.1	4.5	2698.1	1673.5	2573.8	115.0	27.0	0.0	227.8	696.5
2008	1.59	2.6	1.4	2735.1	1716.3	2723.8	37.0	27.4	0.0	258.3	733.4

*Negative values represent SARF debt to IMF (includng interest on accumulated debt).
**Cumulated dollar contributions plus interest at US Treasury Bill rate; the costs of the regime to the United States would depend on the allocation of of costs between the United States and the depositors, were the costs to be divided.

Table 3. Substitution Account with Substitutiion Account Reserve Fund (SARF) and Annual Contribution at 0.75 per cent of Dollar Amount in Substitution Account
Interest earned or paid by SARF at US Treasury Bill Rate; dollar and SDR amounts in billions

End of Year	US$ US$ per SDR	SDR Interest Rate	US Interest Rate	Dollar Amount in SA	SDR Amount in SA	Dollar Value of SDR Amt	US Interest Payment	Annual Payment to SARF	Deficiency Payment by SARF	Net Assets of SARF*	Cost of Payments to SARF**
1980	1.30	9.1	11.2	500.0	384.9	0.0	0.0	3.8	0.0	3.8	3.8
1981	1.18	12.7	14.4	571.8	419.9	545.9	71.8	4.3	0.0	8.6	8.6
1982	1.10	11.2	10.8	633.3	473.3	558.5	61.6	4.7	0.0	14.2	14.2
1983	1.06	8.6	8.9	689.5	526.3	578.9	56.2	5.2	0.0	20.7	20.7
1984	1.02	8.9	9.8	757.1	571.5	605.8	67.6	5.7	0.0	28.4	28.4
1985	1.02	7.8	7.7	815.7	622.4	635.5	58.5	6.1	0.0	36.7	36.7
1986	1.18	6.4	6.2	865.8	671.0	684.4	50.2	6.5	0.0	45.5	45.5
1987	1.30	5.9	6.0	917.4	713.9	842.4	51.5	6.9	0.0	55.0	55.0
1988	1.35	6.3	6.9	994.0	756.0	982.8	63.1	7.5	13.5	52.8	66.3
1999	1.28	8.3	8.4	1077.4	803.6	1084.9	83.4	8.1	0.0	65.3	79.9
1990	1.35	9.1	7.7	1174.0	870.3	1114.0	83.4	8.8	13.3	65.9	94.9
1991	1.37	7.7	5.5	1282.4	949.5	1281.9	64.9	9.6	43.5	35.7	109.8
1992	1.41	6.3	3.5	1400.5	1022.7	1401.0	45.0	10.5	73.1	-25.6	124.1
1993	1.39	4.6	3.1	1445.7	1087.1	1532.8	42.9	10.8	2.4	-17.9	138.8
1994	1.43	4.3	4.4	1551.1	1137.1	1580.6	62.9	11.6	42.6	-49.6	156.5
1995	1.52	4.6	5.7	1719.8	1186.0	1696.0	87.6	12.9	81.0	-120.6	178.2
1996	1.45	3.9	5.1	1808.2	1240.5	1885.6	88.4	13.6	0.0	-113.2	200.9
1997	1.37	4.1	5.2	1902.2	1288.9	1868.9	94.0	14.3	0.0	-104.8	225.6
1998	1.35	4.1	4.9	1995.4	1341.9	1838.4	93.2	15.0	0.0	-95.0	251.6
1999	1.32	3.5	4.8	2090.6	1396.9	1885.8	95.2	15.7	0.0	-83.8	279.3
2000	1.32	4.4	6.0	2216.1	1445.8	1904.1	125.4	16.6	0.0	-72.3	312.7
2001	1.27	3.4	3.5	2293.2	1428.4	1885.4	77.1	17.2	0.0	-57.6	340.8
2002	1.30	2.2	1.6	2330.6	1460.4	1854.7	37.4	17.5	0.0	-41.0	363.8
2003	1.41	1.7	1.0	2354.3	1484.5	1929.8	23.8	17.7	0.0	-23.8	385.2
2004	1.47	1.8	1.4	2387.1	1511.7	2131.5	32.7	17.9	0.0	-6.2	408.4
2005	1.47	2.6	3.2	2463.7	1551.1	2281.6	76.6	18.5	0.0	12.1	440.0
2006	1.47	3.7	4.9	2583.2	1608.3	2365.9	119.5	19.4	0.0	32.0	480.8
2007	1.54	4.1	4.5	2698.1	1673.5	2460.0	115.0	20.2	0.0	53.7	522.4
2008	1.59	2.6	1.4	2735.1	1716.3	2643.1	37.0	20.5	0.0	74.9	550.1

*Negative values represent SARF debt to IMF (includng interest on accumulated debt).
**Cumulated contributions plus interest at US Treasury Bill rate; the costs of the regime to the United States would depend on the allocation of of costs between the United States and the depositors, were to the costs to be divided.

Table 4. Substitution Account Reserve Fund (SARF) with Annual Contribution at 0.75 per cent of Dollar Amount in Substitution Account and Deficiency Payments Limited to Half the Gap between the Dollar Amount and the Dollar Value of the SDR Amount
Interest earned or paid by SARF at US Treasury Bill Rate; dollar and SDR amounts in billions

End of Year	US$ per SDR	SDR Interest Rate	US Interest Rate	Dollar Amount in SA	SDR Amount in SA	Dollar Value of SDR Amt	US Interest Payment	Annual Payment to SARF	Deficiency Payment by SARF	Net Assets of SARF*	Cumulative Cost of Payments to SARF**
1980	1.30	9.1	11.2	500.0	384.9	500.0	0.0	3.8	0.0	3.8	3.8
1981	1.18	12.7	14.4	571.8	433.6	510.0	71.8	4.3	0.0	8.6	8.6
1982	1.10	11.2	10.8	633.3	482.1	529.8	61.6	4.7	0.0	14.2	14.2
1983	1.06	8.6	8.9	689.5	523.5	557.0	56.2	5.2	0.0	20.7	20.7
1984	1.02	8.9	9.8	757.1	570.2	582.2	67.6	5.7	0.0	28.4	28.4
1985	1.02	7.8	7.7	815.7	614.8	627.7	58.5	6.1	0.0	36.7	36.7
1986	1.18	6.4	6.2	865.8	654.1	769.2	50.2	6.5	0.0	45.5	45.5
1987	1.30	5.9	6.0	917.4	692.5	899.5	51.5	6.9	0.0	55.0	55.0
1988	1.35	6.3	6.9	987.2	735.7	994.0	63.1	7.4	6.8	59.5	66.2
1989	1.28	8.3	8.4	1070.0	796.6	1021.2	82.8	8.0	0.0	72.5	79.8
1990	1.35	9.1	7.7	1159.5	869.0	1174.0	82.8	8.7	6.6	80.2	94.7
1991	1.37	7.7	5.5	1253.0	936.1	1282.4	64.1	9.4	29.4	64.6	109.3
1992	1.41	6.3	3.5	1348.8	994.7	1400.5	44.0	10.1	51.8	25.2	123.3
1993	1.39	4.6	3.1	1418.0	1040.8	1445.7	41.3	10.6	27.9	8.7	137.7
1994	1.43	4.3	4.4	1515.4	1085.5	1551.1	61.7	11.4	35.8	-15.4	155.0
1995	1.52	4.6	5.7	1660.3	1135.2	1719.8	85.6	12.5	59.2	-63.0	176.2
1996	1.45	3.9	5.1	1745.6	1179.5	1709.0	85.3	13.1	0.0	-53.1	198.4
1997	1.37	4.1	5.2	1836.4	1227.5	1681.6	90.8	13.8	0.0	-42.1	222.5
1998	1.35	4.1	4.9	1926.4	1277.9	1726.5	90.0	14.4	0.0	-29.7	247.8
1999	1.37	3.5	4.8	2018.2	1322.4	1811.7	91.9	15.1	0.0	-16.0	274.8
2000	1.32	4.4	6.0	2139.3	1381.1	1817.5	121.1	16.0	0.0	-0.9	307.3
2001	1.27	3.4	3.5	2213.8	1428.4	1808.3	74.4	16.6	0.0	15.7	334.6
2002	1.30	2.2	1.6	2249.9	1460.4	1897.0	36.1	16.9	0.0	32.8	357.0
2003	1.41	1.7	1.0	2272.8	1484.5	2090.1	22.9	17.0	0.0	50.2	377.6
2004	1.47	1.8	1.4	2304.4	1511.7	2223.7	31.6	17.3	0.0	68.1	400.2
2005	1.47	2.6	3.2	2378.4	1551.1	2281.6	74.0	17.8	0.0	88.2	430.9
2006	1.47	3.7	4.9	2493.7	1608.3	2365.9	115.4	18.7	0.0	111.2	470.5
2007	1.54	4.1	4.5	2604.7	1673.5	2573.8	111.0	19.5	0.0	135.6	510.9
2008	1.59	2.6	1.4	2682.2	1716.3	2723.8	35.7	20.1	41.8	115.8	538.0

Dollar shortfall in Substitution Account at end of 2008: $41.6 billion.

*Negative values represent SARF debt to IMF(including interest on accumulated debt).

**Cumulated contributions plus interest at US Treasury Bill rate; the costs of the regime to the United States would depend on the allocation of of costs between the United States and the depositors, were they to be divided.