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An Analysis of Reserve Tranche Positions and Their Use

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Abstract

This paper analyzes the frequency and magnitude of the use by members of their reserve tranche positions since the Second Amendment of the Articles in light of key economic factors which may have influenced this use. After reviewing the characteristics of reserve tranche positions, the paper examines developments in these positions over the period 1979-1987 in relation to a number of indicators of balance of payments financing needs as well as to rate of return considerations. Lastly, the implications of actual and potential reserve tranche uses for the Fund's liquidity position are discussed.

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## I. Introduction

Reserve tranche positions are liquid claims of members on the Fund which arise in part from the payment of the reserve asset portion of quota subscriptions, but mostly from the use by the Fund in its transactions and operations of the currencies of members in strong balance of payments positions. Reserve tranche positions are included in members' own reserves as they can be drawn upon at any time in case of a balance of payments need. These positions have increased sharply in recent years, reflecting mainly the large-scale use of members' currencies by the Fund to meet the rapid expansion in the demand for Fund credit in 1980-84. The large size of reserve tranche positions and the fact that they represent a potential call on the Fund's usable resources are key elements in the management of these resources to maintain the liquidity of members' claims on the Fund.

The purpose of this study is to analyze the extent to which members have opted to hold or use reserve tranche positions since the Second Amendment of the Articles in April 1978 and the extent to which economic considerations may have influenced their preferences. This subject has operational significance as the decisions made by members in the course of managing their reserve portfolios to accept an increase in or to encash their reserve tranche positions have implications for the level and outcome of Fund operations. The paper is organized as follows: Section II reviews the origin and characteristics of reserve tranche positions, particularly following the implementation of the Second Amendment of the Articles in 1978. Section III reviews developments in reserve tranche positions and examines the extent to which the use by members of their reserve tranches may have been influenced by certain relevant economic factors, such as the magnitude of their external payments deficits, level of reserves, indebtedness to Fund, and the differential between the rate of remuneration on reserve tranche positions and rates of return on alternative reserve assets. This section also discusses some implications of actual and potential reserve tranche uses for the Fund's liquidity position. Section IV summarizes the discussion and draws some conclusions.

## II. Asset Characteristics of Reserve Tranche Positions

A reserve tranche position (known as the gold tranche position before the Second Amendment of the Articles) is defined as the amount by which a member's quota exceeds the holdings of its currency by the Fund, excluding those holdings representing the member's use of Fund

credit. 1/ These positions are partly created by the reserve asset payments made in connection with quota increases, as the reserve tranche position substitutes for or replaces the other reserve assets used by the member making the payment. 2/ However, by far the largest part of reserve tranche positions is created by the sale of members' currencies by the Fund to finance purchases, which are essentially credits extended through the Fund by members in sufficiently strong balance of payments and reserve positions to those needing balance of payments support. Thus, the extension of Fund credit involves a simultaneous increase in the claims on the Fund (reserve tranche position) of one or more members and in the liabilities to the Fund (use of Fund credit) of other borrowing members. Reserve tranche positions are also created by other uses of members' currencies by the Fund, such as for remuneration payments. On the other hand, repurchases made by debtor countries and payments for quota increases in other members' currencies reduce the reserve tranche positions of those members whose currencies are used. The use of SDRs by the Fund to finance the balance of payments needs of members also influences the size of reserve tranche positions, as such use basically substitutes for that of members' currencies in Fund activities, and vice versa. In sum, the level of reserve tranche positions is largely determined by Fund activities; members generally cannot at their own initiative increase these positions, 3/ although they can encash them in case of a balance of payments need.

As a reserve tranche position is part of a member's own reserves, a drawing on the reserve tranche constitutes the use of a reserve asset rather than the use of Fund credit. The use by a member of its reserve tranche position is simultaneously matched by an increase in the reserve tranche positions of other members whose currencies are drawn or by a reduction in the Fund's SDR holdings, if SDRs are acquired from the Fund. Thus, the aggregate level of members' reserve tranches will remain unchanged despite their use by members, unless the Fund's

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1/ Beginning February 1982, balances of the Fund's administrative (number 2) accounts with monetary authorities, to the extent that they are not in excess of one-tenth of one percent of a member's quota, are also excluded from the Fund holdings of a member's currency for the purpose of determining its reserve tranche position.

2/ To the extent that usable currencies of Fund members are used to pay the reserve asset portion of quota increases, the reserve tranche positions of the members issuing these currencies are reduced. SDRs have been used, however, for this purpose by the majority of members under the Eighth General Review of Quotas, thereby mitigating the negative impact on members' reserve positions.

3/ It should be noted that a creditor member can opt to receive remuneration in its own currency and, hence, enlarge its reserve tranche position. However, the magnitude of enlargements arising from these transactions is very small.

holdings of SDRs are purchased by members. In this latter case, no matching reserve tranche positions are created and the total of reserve tranche positions declines by the amount of the drawing.

A number of significant improvements have been made in the usability and liquidity of the reserve (originally gold) tranche position since the Fund was established. The Fund's gold tranche policy was formulated in a decision by the Fund's Executive Board in 1952 that provided an assurance that each member can count on receiving the overwhelming benefit of any doubt respecting drawings which could raise the Fund's holdings of its currency up to the level of its quota. 1/ In practice, the gold tranche was available for use by members and Fund procedures did not require drawing countries to pursue adjustment policies when using the gold tranche. The use of the gold tranche was, however, subject to challenge by the Fund, which acted as an impediment to the general acceptance of the gold tranche by members as a reserve asset. 2/ Under the First Amendment of the Articles in July 1969, it became possible for a member to use its reserve (gold) tranche on representation of a balance of payments need which was not subject to challenge by the Fund. 3/ Use of the reserve tranche was also exempt from the service charge of half of one percent which was in effect up to July 1969, and reserve tranche purchases have not at any time been subject to periodic charges. The exemption of reserve tranche drawings from charges also ensured equity between members whose reserve tranches are reduced through the use of their currencies by the Fund in repurchases, and those members which used reserve tranche positions at their own initiative. 4/

Before the Second Amendment of the Articles in April 1978, members were obliged to reconstitute their reserve positions up to 25 percent of their quotas by repurchasing earlier drawings because such drawings were subject to repurchase; only the "super gold" tranche position, which did not raise the level of the Fund's holdings of a member's currency above 75 percent of its quota, was not required to be repurchased under the Articles at that time. Since the Second Amendment, the obligation to repurchase a reserve tranche drawing was eliminated. As a result, once a reserve tranche position is drawn, it cannot be reconstituted for further use except when a member's currency

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1/ Decision No. 102-(52/11) of February 13, 1952.

2/ See "Reform of the Fund," Joseph Gold, Pamphlet Series No. 12, 1969, p. 16.

3/ The Fund, however, has the legal authority, which it has not exercised, to question the use of a reserve tranche position after it has been made on the ground that the member has not met the test of need under the Articles. See Joseph Gold, "Financial Assistance by the International Monetary Fund, Law and Practice," IMF Pamphlet Series, No. 27, Second Edition (1980), p. 27.

4/ See "Review of the Fund's Charges," SM/80/282 (12/24/80), p. 3.

is sold by the Fund or used by the Fund for other purposes, such as the disbursement of administrative expenditures. Reserve tranche purchases made before April 1978, however, were subject to repurchase after that date; these repurchases were completed in 1983.

In order to enhance the reserve asset characteristics of reserve tranche positions, members have been given the option to either retain or use them when making purchases under the Fund's regular and special credit facilities. Such an option was first permitted in September 1966 in connection with the increase in the Fund's holdings of a member's currency that arose from the use of the Compensatory Financing Facility; the exclusion of holdings related to uses of Fund resources from the calculation of a member's reserve tranche position has been extended since the Second Amendment to other facilities, culminating in May 1981 with the exclusion of drawings made under the credit tranche policy, the Extended Fund Facility, and the enlarged access policy. Hence, the calculation of reserve tranche positions since May 1981 excludes holdings of currencies emanating from all uses of Fund credit. The optional use of reserve tranche positions at the time of using Fund resources was also expected to enhance the Fund's income position. This is because the unremunerated portion of these positions did not have to be used, which avoided an increase in the remunerated positions of the countries with strong balance of payments positions whose currencies would have been sold by the Fund, or a reduction in the Fund's SDR holdings, had unremunerated reserve tranche positions been drawn.

In order to add further to the flexibility afforded to members in the management of their reserve tranches, it was decided that if the currencies of members indebted to the Fund whose balance of payments and reserve positions were considered sufficiently strong were to be sold in operational budgets or used in operational payments these members could attribute the reduction in the Fund's holdings of their currencies since May 1981 (February 1982 for use in payments) either to enlarge their reserve tranche positions or to discharge any of their outstanding purchases from the Fund. <sup>1/</sup> In case of purchases financed with borrowed resources, the attribution to reduce the repurchase obligation can only be made if the Fund is entitled to simultaneously repay the lenders. The option to enlarge the reserve tranche position cannot be exercised in cases where members are required to repay outstanding liabilities to the Fund under the guidelines for early repurchase.

The Fund pays remuneration on a "creditor position" (super gold tranche position before the Second Amendment), which is defined as the portion of the reserve tranche position equivalent to the amount by

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<sup>1/</sup> Annex to Decision No. 6774-(81/35) of March 5, 1981; and Decision No. 7059-(82/23) of February 22, 1982.

which the norm for remuneration for the member exceeds the average daily balance of its currency held in the General Resources Account (after allowing for excluded balances). Before the Second Amendment, the norm for all members was 75 percent of quota, which meant that remunerated creditor positions emanated only from the use of members' currencies in Fund operations and transactions, and that the portion of the reserve tranche resulting from quota payments made in reserve assets, normally 25 percent of quotas, was not remunerated. Beginning April 1978, however, the norm has been defined by the Articles of Agreement as the sum of 75 percent of quotas prior to that date plus all subsequent increases in the member's quota. 1/ As a consequence, the norm for remuneration varies from member to member, depending on the size of a member's quota increases since 1978; the average norm for all members has risen from 75 percent of quotas in 1977 to 91.7 percent of quotas at end-April 1988. The aggregate remunerated portion of reserve tranche positions has, therefore, increased on average from 44.7 percent in FY 1979 to 73.2 percent in FY 1988.

The rate of remuneration paid on reserve tranche positions and the frequencies of its setting and payment have increased over time. Before the First Amendment of the Articles in July 1969, the Fund was not required to pay remuneration on creditor positions. A distribution of income was made if the Fund's financial position at the end of the year permitted such a distribution. 2/ A fixed rate of remuneration of 1.5 percent per annum was in effect from July 1969 until the introduction of the basket valuation of the SDR in July 1974, when the rate of remuneration was based on the combined market interest rate. This latter rate is a weighted average of the interest rates on five short-term representative instruments quoted in the markets of the five members with the largest shares in exports of goods and services and in reserve liabilities to other members. The rate of remuneration has been progressively adjusted closer to the combined market rate, moving from 35 percent of that rate in July 1974 to 60 percent in July 1976, 72 percent in January 1979, and 85 percent in May 1981 when the SDR interest rate was raised to 100 percent of the combined market rate. The rate of remuneration was further increased gradually thereafter, reaching 93 percent of the SDR interest rate in August 1985, and was

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1/ The norm for a new member that joined the Fund after the Second Amendment is equivalent to the weighted average of the norms for all members at the time of membership, plus the amount of all subsequent quota increases for that member (Article V, Section 9).

2/ The "Rate of Remuneration and the Fund's Income Position," EBS/83/237 (11/2/83), p. 19.

set equal to the SDR interest rate in February 1987. 1/ The rate of remuneration, however, may not at any time be greater than the SDR interest rate. 2/ The rate of remuneration has been adjusted weekly since August 1983 rather than quarterly, as was the case between July 1976 and July 1983, and semiannually before then. Remuneration is also being paid quarterly instead of annually, as was done prior to that date.

While considerable improvements in the characteristics of the reserve tranche position have taken place since the First Amendment of the Articles, it would still appear to be the case that other Fund-related reserve assets, i.e., SDRs and loan claims on the Fund, provide more flexibility to holders in the management of their reserve portfolios, and also earn higher rates of return. A member can, for example, acquire additional SDR holdings through bilateral transactions with other holders, and if there is a willing seller, also add Fund loan claims to its reserves. But, a member cannot, at its own initiative, increase its reserve tranche position which, as indicated above, varies in response to variations in the scale of Fund transactions and operations. 3/ On the other hand, while all Fund-related assets have the common feature that they can be mobilized on demand by a holding member in the event of a balance of payments need, 4/ SDRs and loan claims, unlike reserve tranche positions, can also be transferred or sold to other holders by agreement, with such transfers taking place either freely or under certain conditions agreed in

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1/ Beginning August 1986, however, the rate of remuneration actually paid was adjusted downward (but could not fall below 85 percent of the SDR interest rate) to offset half of the impact on the Fund's income position of charges that became deferred during any quarter and to generate half of the increase in reserves beyond five percent. The other half is obtained by increasing the rate of charges on the use of Fund resources. These arrangements are temporary, and upon settlement of the deferred charges the proceeds of the settlement are to be returned to the members that paid the related additional charges and to those that received reduced remuneration (see Fund's Annual Report, 1987, pp. 69-70).

2/ Article V, Section 9(a).

3/ A creditor member can, however, enlarge its reserve tranche position by opting to receive remuneration from the Fund in its own currency. Such transactions however have a marginal impact on the aggregate size of reserve tranche positions.

4/ Members' use of SDRs by designation and their requests for the early repayment of loan claims are subject to the requirement of need. In the latter case, the Fund gives the overwhelming benefit of any doubt to the member's representation.

advance by the Fund; <sup>1/</sup> in case of need, reserve tranche positions can only be encashed. With regard to rates of return, the reserve tranche position was until February 1987 the only claim on the Fund with a yield below a market-related rate of interest. While this situation has been partly addressed by raising the rate of remuneration to the level of the SDR interest rate in February 1987, remuneration is paid by the Fund only on creditor, rather than on all, reserve tranche positions. Hence, no rate of return is paid by the Fund on about 25 percent of reserve tranche positions, equivalent to the portions of these positions which are above the norm for remuneration.

### III. Holdings and Use of Reserve Tranche Positions

#### 1. Level of reserve tranche positions in the period 1979-87

Table 1 traces the evolution of members' reserve tranche positions since 1978, i.e., following the implementation of the Second Amendment of the Articles, when the reserve asset characteristics of these positions were enhanced and some flexibility was introduced with regard to the use of reserve tranche positions by members. The table also shows the size of these positions relative to Fund quotas and the proportion of international reserves held in this form.

It is evident from the table that aggregate reserve tranche positions (Section I of the table) declined from SDR 8.5 billion in 1978 to SDR 7.9 billion in 1979, reflecting mainly large repurchases of drawings made earlier under the oil facilities and the credit tranche policy, particularly by the United Kingdom and Italy, so that the Fund's holdings of usable currencies increased and the reserve tranche positions of those members whose currencies were used correspondingly declined. Reserve tranche positions rose sharply by SDR 4.7 billion to SDR 12.6 billion in the following year, resulting in part from payments in SDRs for quota increases under the Seventh Review. They continued to rise to SDR 28.8 billion in 1984 as a consequence of the very large expansion of Fund credit combined with payments in SDRs in December 1983 for 25 percent of quota increases under the Eighth General Review. Reserve tranche positions tended to decline thereafter, reflecting the discharge of obligations to the Fund by indebted members.

In relation to total Fund quotas (Section III of Table 1), reserve tranche positions declined from 21.7 percent in 1978 to 20.2 percent in 1979, reflecting mainly large repayments of earlier purchases, but rose

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<sup>1/</sup> For example, loan claims under the Supplementary Financing Facility totaling SDR 172 million were transferred by the Deutsche Bundesbank to the Saudi Arabian Monetary Agency in November 1980 without the prior consent of the Fund (Annual Report, 1982, pp. 85-86).

Table 1. Members' Reserve Tranche Positions Outstanding (RTP), 1978-87

	End of December									
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
I. <u>RTP (in billions of SDRs)</u>										
<u>All members</u>	8.45	7.87	12.63	15.06	17.69	27.32	28.82	26.97	24.84	23.13
Industrial countries	6.76	5.86	8.77	10.58	13.25	21.49	23.38	21.92	20.69	19.11
Major oil exporters	0.84	0.98	1.79	2.49	2.77	3.53	3.69	3.42	2.59	2.50
Non-oil developing countries	0.85	1.03	2.07	1.99	1.67	2.30	1.75	1.63	1.56	1.52
II. <u>Shares of country groups</u> (in percent of overall RTP)										
Industrial countries	80.0	74.5	69.4	70.3	74.9	78.7	81.8	81.3	83.3	82.6
Major oil exporters	9.9	12.4	14.2	16.5	15.7	12.9	12.8	12.7	10.4	10.8
Non-oil developing countries	10.1	13.1	16.4	13.2	9.4	8.4	6.1	6.1	6.3	6.6
Members with largest quotas <sup>1/</sup>	72.4	68.9	67.6	70.5	78.9	81.2	83.4	83.4	82.4	81.1
Of which: five largest <sup>2/</sup>	53.6	47.4	44.7	50.5	59.0	61.3	63.2	63.0	64.5	62.6
III. <u>RTP in percent of quotas</u>										
<u>All members</u>	21.7	20.2	21.2	24.8	29.0	30.9	32.3	30.2	27.6	25.7
Industrial countries	27.1	23.5	23.5	28.3	35.4	38.3	41.7	39.1	36.9	34.1
Major oil exporters	22.3	26.0	32.0	37.3	41.5	38.1	37.8	35.0	26.6	25.6
Non-oil developing countries	8.7	10.6	12.5	12.0	9.8	9.9	7.4	7.0	6.5	6.3
Members with largest quotas <sup>1/</sup>	26.3	23.3	23.2	28.0	36.8	39.5	42.8	40.0	36.4	33.4
Of which: five largest <sup>2/</sup>	26.6	21.9	22.1	29.7	40.8	43.8	47.6	44.4	41.9	37.9
IV. <u>RTP in percent of reserves <sup>3/</sup></u>										
<u>All members</u>	3.6	3.0	4.1	4.7	5.6	7.9	7.4	6.9	6.2	4.8
Industrial countries	5.2	4.2	5.1	6.1	7.8	11.3	11.2	10.4	9.0	6.4
Major oil exporters	1.9	1.8	2.6	3.7	4.2	5.4	5.4	5.0	5.1	5.2
Non-oil developing countries	1.5	1.6	3.1	2.8	2.4	2.9	1.8	1.8	1.9	1.8

<sup>1/</sup> These are the 12 members with quotas in excess of SDR 2.0 billion at the end of 1987. They comprise nine industrial countries (the United States, the United Kingdom, Germany, France, Japan, Canada, Italy, the Netherlands, and Belgium), one major oil exporter (Saudi Arabia), and two non-oil developing countries (People's Republic of China, and India).

<sup>2/</sup> These are the first five industrial countries reported in the above footnote.

<sup>3/</sup> Non-gold reserves.

thereafter to reach a peak of 32.3 percent in 1984 before falling to 25.7 percent by end-1987. It may be noted that members held on average slightly more than one-quarter of their quotas in reserve tranche positions during the nine-year period ended in 1987.

The movement in reserve tranche positions broadly reflected changes in the positions of the industrial countries and those of major oil exporters whose currencies account for the bulk of the currencies used by the Fund in its operations and transactions; the currencies of the industrial countries in particular constituted over 75 percent of all members' currencies used in purchases, irrespective of type, and in excess of 85 percent of members' currencies used in repurchases during the period 1979-87. Consistent with the general trend of total reserve tranche positions, those of the industrial and major oil exporting countries rose to reach a peak in 1984 before falling thereafter. In the case of the non-oil developing countries, however, there were occasional increases in reserve tranche positions, mainly in 1980 and 1983 as a result of quota increases, which were drawn down in subsequent periods.

About two-thirds of the developing countries with reserve tranche positions at the beginning of a stand-by or an extended arrangement (25 of 38 members) took advantage, as of December 1987, of the Fund's decision of May 1981 to maintain these positions despite relatively large use of Fund credit by them; about half of these members in fact increased their reserve tranche positions. 1/ On the other hand, two countries made partial use and nine members used their positions in full. The remaining two countries maintained their reserve tranche positions during some programs and used them fully during other programs. Twenty-five of the thirty-eight members had reserve tranche positions outstanding at the end of December 1987. The bulk of members that made repurchases beginning in January 1979 of their previously drawn reserve tranche positions also opted to maintain the newly created positions. This type of expansion aggregated SDR 1.2 billion up to the end of 1983 when repurchases of reserve tranche positions were completed. About half of this expansion was accounted for by three industrial countries and the remainder by several non-oil developing countries.

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1/ Increases in reserve tranche positions by these countries resulted from payments for quota increases, repurchases of earlier reserve tranche drawings, repurchases of currency holdings in excess of 75 percent of a member's quota under the transitional provisions of Schedule B of the Articles of Agreement, e.g., repurchases of quota subscriptions made in national currencies in lieu of reserve assets, and of charges paid in the payers' currencies. For one country, the increase in reserve tranche position resulted, inter alia, from disbursements by the Fund of administrative expenditure.

At the end of December 1987 there were 90 members that held reserve tranche positions; they included 20 industrial countries, 11 major oil exporters, and 59 non-oil developing countries. As indicated above, the bulk of total reserve tranches was accounted for by the industrial countries followed by the major oil exporters (see Table 1, Section II). Reserve tranche positions are also highly concentrated in a few members with large quotas (see Table 1, Sections II and III), reflecting in part the generally strong balance of payments and reserve positions of these members. The combined positions of 12 countries, including nine members from the group of the industrial countries, with present Fund quotas in excess of SDR 2.0 billion each, accounted for about 70-80 percent of total reserve tranche positions in 1979-87, of which five industrial countries accounted for 50-60 percent.

The importance of reserve tranche positions in global international reserves may be gauged from the proportion of non-gold reserves held in this form. As can be seen from Section IV of Table 1, this proportion increased sharply for all country groups except the non-oil developing countries since the quota increase under the Seventh Review in December 1980 and up to 1984. This increase was commensurate with the large expansion in the use of the currencies of the industrial and major oil-exporting countries by the Fund. The share of reserves held in the form of reserve tranche positions declined in 1985-87 as a result of repurchases by members of the earlier use of Fund resources. At end-December 1987, the share of reserve tranches in total reserves stood at 6.4 percent for the industrial countries, 5.2 percent for major oil exporters, 1.8 percent for the non-oil developing countries, and 4.8 percent for all members combined.

## 2. Extent of use

The use of reserve tranche positions by Fund members is measured by reserve tranche purchases. Such use since the Second Amendment, i.e., during the period 1979-87, is presented in Table 2 below.

The use of reserve tranches by the industrial countries and major oil exporters over the last nine years has been limited despite the unfavorable current account balances of a number of industrial countries during this period and also of oil exporters in general in 1983 and 1986. The bulk of such drawings were made by the non-oil developing countries and totaled SDR 3,620 million in 1979-87, of which SDR 294 million represented statutory drawings associated with the use of Fund resources under Fund arrangements. 1/

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1/ Reserve tranche drawings were deemed to have been associated with the use of ordinary resources under the credit tranche policy and the Extended Fund Facility when they were made during periods covered by stand-by and extended arrangements or one to two months preceding a purchase in the first credit tranche. Almost all these reserve tranche drawings took place no later than two months prior to associated credit tranche and extended facility purchases; in many cases, both types of drawings were made in the same period.

Table 2. Reserve Tranche Purchases by Fund Members, 1979-87

(In millions of SDRs)

Calendar Year	Industrial countries	Major oil exporters	Non-oil developing countries 1/			All countries
			Mandatory	Other	Total	
1979	49 (0.7)	--	78	20	98 (11.5)	147 (1.7)
1980	--	--	48	311	359 (38.1)	359 (4.4)
1981	--	--	168	142	310 (15.0)	310 (2.5)
1982	288 (2.7)	309 (12.4)	--	739	739 (37.1)	1,336 (8.9)
1983	87 (0.7)	408 (14.8)	--	1,019	1,019 (60.9)	1,514 (8.6)
1984	28 (0.1)	67 ( 1.9)	--	718	718 (31.3)	813 (3.0)
1985	--	--	--	185	185 (10.6)	185 (0.7)
1986	195 (0.9)	--	--	187	187 (11.4)	382 (1.4)
1987	<u>132</u> (0.6)	<u>--</u>	<u>--</u>	<u>4</u>	<u>4</u> ( 0.3)	<u>136</u> (0.5)
	779	784	294	3,326	3,620	5,183

Note: Figures in parentheses are reserve tranche purchases in percent of reserve tranche positions outstanding at the end of each preceding year.

1/ Up to April 1981, the use of reserve tranches comprised drawings made at the initiative of a member and mandatory or statutory drawings, i.e., the prior use of any reserve tranche position that a member may have had at time of requesting a purchase under a stand-by or an extended arrangement financed with ordinary resources. Subsequent to that date, all reserve tranche drawings were made at the initiative of the holder.

Compared with reserve tranche positions outstanding at the end of each preceding year, total drawings by all members beginning in 1979 averaged 3.5 percent. Use of reserve tranche positions by the non-oil developing countries as a group was significantly higher, averaging 24.0 percent in 1979-87. Such use by this country group was also the highest in relation to quotas and total cumulative use of reserves. However, the use of this reserve asset by all major country groups was invariably smaller than their use of the SDR (see Table 3).

Table 3. Cumulative Use of Reserve Tranche Positions and SDRs During 1979-87 as a Percent of Fund Quotas and Declines in Non-gold Reserves

	Reserve tranche drawings <u>1/</u> in percent of:		SDR use <u>2/</u> in percent of:	
	Quotas <u>3/</u>	Reserve declines <u>3/</u>	Quotas <u>3/</u>	Reserve declines <u>3/</u>
All countries	5.4	1.1	18.3	3.8
Industrial countries	1.4	0.4	13.2	4.1
Major oil exporters	8.0	0.9	17.0	1.8
Non-oil developing countries	13.8	2.1	30.7	4.7

1/ Data relate to purchases made at the initiative of members. They thus exclude mandatory use of reserve tranche positions associated with drawings made before May 1981 under certain facilities.

2/ Data exclude infrequent use for the payment of the reserve asset portion of the quota increases.

3/ Quotas outstanding at end-December 1987 and total cumulative declines in non-gold reserves in 1979-87.

Reserve tranche positions were drawn down completely by 40 percent of Fund members (60 non-oil developing countries and one oil exporter) at the end of December 1987. 1/ In absolute terms, however, this had little impact on aggregate reserve tranche positions to the extent that purchases of such positions were made in other members' currencies, as reductions in the positions of drawing members were offset by corresponding increases in the positions of those members whose currencies were drawn.

In relation to the cumulative use by members of non-gold reserves since 1978, reserve tranche drawings were less than one percent for both the industrial countries and the major oil exporters, and amounted to 2.1 percent for non-oil developing countries (see Table 3 above). These uses were substantially smaller than the average proportion of reserve tranche positions in total non-gold reserves of the industrial and major oil-exporting countries (see Table 4), which may signify the

1/ For the majority of these countries, the full use of reserve tranche positions took place in one or two quarters. For this reason, the ratios in Table 3 above are expressed as cumulative use of reserve tranches over the years 1979-87 as a percent of cumulative reserve use and Fund quotas, rather than as an average of annual ratios.

Table 4. Shares of Reserve Tranche Positions (RTP) and SDR Holdings in Total Non-Gold Reserves, 1979-87

(Average of annual end-year ratios in percent)

	<u>Share in reserves of</u>	
	<u>RTP</u>	<u>SDR</u>
All countries	5.6	4.4
Industrial countries	7.9	6.1
Major oil exporters	4.3	2.7
Non-oil developing countries	2.2	2.3

preference of these countries to draw down reserve assets other than reserve tranche positions when they need to use reserves. Relative reserve tranche use for the non-oil developing countries was not different from the proportion of their reserves held in this form (see Tables 3 and 4). These countries made greater recourse to their reserve tranche positions mainly because of the low levels of their holdings of international reserves and their limited access to international capital markets which could have provided alternative balance of payments financing.

Use of reserve tranches has also been considerably smaller than the use of SDRs by all major country groups (see Table 3). This reflects mainly the wider scope for using SDRs. SDR use includes the payment of charges and the discharge of repurchase obligations to the Fund by the non-oil developing countries and associated bilateral sales of SDRs by agreement to these members by the industrial and major oil exporting countries. The larger use of SDRs relative to reserve tranche positions by the industrial and major oil exporting countries occurred despite the fact that they held on average a higher share of their reserves in reserve tranche positions than in SDRs (see Table 4). The non-oil developing countries, however, held about the same, though much lower, portions of their reserves in SDRs and in reserve tranche positions.

While as a group non-oil developing countries made relatively large use of reserve tranche positions compared with other major country groups, there were 23 members among the former group which did not use any part of their reserve tranche positions during the nine-

year period covered by this study. 1/ Only a few of these latter members had debt problems (13 percent) compared with those exhausting their reserve tranche positions (73 percent). Also, less than 10 percent of those not making use of their reserve tranche positions had reserve levels lower than one month of imports compared with 37 percent for reserve tranche users. In addition, a smaller number of the former countries had current account deficits in excess of 25 percent of export earnings (39 percent) or used Fund credit (48 percent), compared with the latter countries (51 percent and 76 percent, respectively). 2/ These differences in economic conditions with other non-oil developing countries were sufficiently pronounced for some of the non-users that they were included in the currency budget and the SDR designation plan.

The foregoing analysis indicates that reserve tranche use--in absolute terms, in relation to outstanding tranche positions, in percent of quotas, and relative to the use of other reserve assets--has been marginal by the industrial countries and major oil exporters but significantly larger on the part of most non-oil developing countries.

In the nine-year period ended in 1987, reserve tranche drawings were made by 104 members, comprising six industrial countries, three major oil exporters, and 95 non-oil developing countries. While the abrogation in May 1981 of the requirement that members use their reserve tranches before making purchases influenced many members with such arrangements to retain their tranche positions, there was a perceptible increase in the number of members drawing down their reserve tranche positions fully or in part since May 1981. There were 60 members which used their reserve tranche positions in the three-year period ended April 1984, excluding those whose only use was in connection with quota payments under the Eighth General Review, compared with 39 members which made such use in the preceding three years. 3/

While most of the reserve tranche drawings were made to finance balance of payments deficits, they were also used by some members to meet specific policy objectives. The Netherlands used its drawings of SDR 80 million in 1983 and SDR 104 million in 1986 in connection with

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1/ The combined reserve tranche positions of these 23 countries accounted for 4.8 percent of the total reserve tranche positions of Fund members outstanding at the end of December 1987. Five countries (India, Malaysia, Trinidad and Tobago, Greece, and Singapore) accounted for most (77 percent) of the reserve tranche positions of these 23 members.

2/ The level of reserves, magnitude of current account deficit, and the extent of use of Fund credit relate to 1985.

3/ Reserve tranche purchases by these 39 countries include statutory drawings associated with the use of some types of Fund credit prior to May 1981.

intra-EEC settlements. Most of Denmark's reserve tranche purchases of SDR 91 million in 1986 and SDR 132 million in 1987 were for the same purpose. Some members used their reserve tranche positions to discharge repurchase obligations and to pay charges to the Fund; such use, however, was small, amounting to about SDR 100 million in the past five years. Finally, under a special arrangement members with inadequate international reserves borrowed SDRs from other members to pay the reserve asset portion of their quota increases under the Eighth General Review, and drew simultaneously their newly created reserve tranche positions to repay these borrowings. Thus, reserve tranche positions were actually used by these countries to pay the reserve asset part of their increased quota subscriptions. The amounts involved totaled SDR 540 million.

3. Influence of economic factors on use or retention of reserve tranche positions

This section examines the extent to which the use of reserve tranche positions by members can be attributed to certain economic factors reflecting balance of payment financing need, such as the size of members' current account deficits in 1985, the magnitude of foreign exchange reserves held at the end of 1985, and the extent of indebtedness to the Fund in the same year. <sup>1/</sup> It would be expected that the frequency of reserve tranche use and the amounts involved correlate positively with the severity of members' balance of payments problems. An examination has also been made of the extent to which reserve tranche use has been influenced by yield differentials between the rate of remuneration on reserve tranches and rates of return on other reserve assets.

In this context, it should be noted that most countries making use of reserve tranches over the last nine years (78 percent) purchased the entire amount of their reserve tranche positions in one or two quarters with a large number of countries exhausting them in one period. In light of this characteristic of the use of reserve tranches, the analytical approach followed here focuses on reserve tranche use in terms of the total amount used over the entire period 1979-87 rather than use on a periodic (quarterly) basis. The frequency of such use was also examined; it was measured by the number of occasions (quarters) of actual use relative to potential use, i.e., number of quarters in which reserve tranche positions were available. In both cases, the use of reserve tranches at the initiative of holders in 1979-87, after excluding statutory use prior to May 1981, has been classified by major country groups, and for the non-oil developing countries, according to analytic subgroups as well.

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<sup>1/</sup> Data for 1982 were used in an earlier draft of the paper. The results of the study were little changed as a consequence of using 1985 data in the present version of the paper.

a. Frequency of reserve tranche use

The frequency of reserve tranche use was measured by relating the number of quarters in which such drawings took place to the number of quarters in which reserve tranche positions were available for use, including those in which drawings were actually made. <sup>1/</sup> The number of occasions on which the reserve tranche was drawn as a condition for using Fund resources was excluded from the calculation. Data on potential, actual, and frequency of reserve tranche use by major country groups and subgroups in 1979-87 are presented in Tables 5 and 6.

Looking first at Table 5, it can be seen that Fund members in general used their reserve tranche positions in 6.4 percent of the occasions (quarters) on which these positions were available. Among country groups, the non-oil developing countries were more frequent users (8.7 percent) than the industrial countries (1.7 percent) or the major oil exporters (1.2 percent). The frequency of reserve tranche use for Fund members in the aggregate was responsive to the three economic indicators employed: magnitude of current account deficit, size of foreign exchange reserves, and use of Fund credit (see the last column of Table 5). In other words, Fund members in general made more frequent use of their reserve tranche positions the larger their current account deficits, the lower their stock of foreign exchange reserves, and the greater their use of Fund credit. This positive association was not, however, evident for each major country grouping separately. While the frequency of reserve tranche use was positively correlated with the use of Fund credit across country groups, such a correlation with current account deficits and foreign exchange reserves existed for only some of the groups. In the case of the industrial countries and major oil exporters, the frequency of reserve tranche use increased as external imbalances intensified but did not appear to be influenced by a lower level of foreign exchange reserves, probably because few of the countries in these two groups were subject to such a constraint. The reverse was true, however, for the non-oil developing countries as a group.

As can be seen from Table 6, the frequency of reserve tranche drawings was higher for selected subgroups of the non-oil developing countries, i.e., those with debt service difficulties, low-income countries, and Sub-Saharan African countries, with such use being almost twice as large for the first subgroup (at 15 percent) as the

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<sup>1/</sup> Periods of potential use included the quarters during which reserve tranche drawings took place, even though reserve tranche positions may have been completely utilized, so as not to overstate the ratios reflecting the frequency of such use.

Table 5. Frequency of Use of Reserve Tranche Positions (RTP), 1/ 1979 (I)-1987 (IV)

(Expressed in number of quarters unless otherwise specified)

Economic factors 2/	Industrial countries			Major oil exporters			Non-oil developing countries			All countries		
	Potential use	Actual use	Ratio of use (in percent)	Potential use	Actual use	Ratio of use (in percent)	Potential use	Actual use	Ratio of use (in percent)	Potential use	Actual use	Ratio of use (in percent)
<u>Overall frequency of use</u>	<u>693</u>	<u>12</u>	<u>1.7</u>	<u>401</u>	<u>5</u>	<u>1.2</u>	<u>2,237</u>	<u>195</u>	<u>8.7</u>	<u>3,331</u>	<u>212</u>	<u>6.4</u>
Use according to:												
I. <u>Size of current account deficit</u>												
Less than 25 percent of export earnings	627	11	0.2	383	3	0.8	1,157	101	9.0	2,167	115	5.3
25 percent or more of export earnings	66	1	1.5	18	2	11.1	1,080	94	8.7	1,164	97	8.3
II. <u>Size of foreign exchange reserves 3/</u>												
One month or more of imports	517	11	2.1	383	3	0.8	1,495	109	7.3	2,395	123	5.1
Less than one month of imports	140	--	--	--	--	--	596	69	11.6	736	69	9.4
III. <u>Extent of use of Fund credit</u>												
No use of Fund credit	660	11	1.7	366	4	1.1	708	29	4.1	1,734	44	2.5
Use of Fund credit	33	1	3.0	35	1	2.9	1,529	166	10.9	1,597	168	10.5

1/ Excluding statutory use of RTP associated with drawings made before May 1981 under certain Fund facilities and policies.

2/ Flow data for 1985 in the case of current account deficits, export earnings and imports, and end-1985 data for foreign exchange reserves, the use of Fund credit and Fund quotas.

3/ Data do not include a small number of countries for which data on reserves were not available.

Table 6. Frequency of Use of Reserve Tranche Positions (RTP) <sup>1/</sup> for Selected Subgroups of Non-Oil Developing Countries, 1979 (I)-1987 (IV)

(Expressed in number of quarters unless otherwise specified)

Economic factors <sup>2/</sup>	<u>All non-oil developing countries</u>			<u>Members with debt service difficulties</u>			<u>Low-income countries</u>			<u>Sub-Saharan African countries</u>		
	Potential use	Actual use	Ratio of use (in percent)	Potential use	Actual use	Ratio of use (in percent)	Potential use	Actual use	Ratio of use (in percent)	Potential use	Actual use	Ratio of use (in percent)
<u>Overall frequency of use</u>	<u>2,237</u>	<u>195</u>	<u>8.7</u>	<u>886</u>	<u>136</u>	<u>15.3</u>	<u>788</u>	<u>75</u>	<u>9.5</u>	<u>912</u>	<u>85</u>	<u>9.3</u>
Use according to:												
I. <u>Size of current account deficit</u>												
Less than 25 percent of export earnings	1,157	101	9.0	468	79	16.9	179	25	14.0	345	40	11.6
25 percent or more of export earnings	1,080	94	8.7	418	57	13.6	609	50	8.2	567	45	7.9
II. <u>Size of foreign exchange reserves <sup>3/</sup></u>												
One month and more of imports	1,495	109	7.3	462	69	14.9	485	39	8.0	507	35	6.9
Less than one month of imports	596	69	11.6	384	55	14.3	216	28	13.0	302	39	12.9
III. <u>Extent of use of Fund credit</u>												
No use of Fund credit	708	29	4.1	91	11	12.1	142	8	5.6	219	9	4.1
Use of Fund credit	1,529	166	10.9	795	125	15.7	646	67	10.4	693	76	11.0

<sup>1/</sup> Excluding statutory use of RTP associated with drawings made before May 1981 under certain Fund facilities and policies.

<sup>2/</sup> Flow data for 1985 in the case of current account deficits, export earnings and imports, and end-1985 data for foreign exchange reserves, the use of Fund credit and Fund quotas.

<sup>3/</sup> Data do not include a small number of countries for which data on reserves were not available.

aggregate for the non-oil developing countries combined. <sup>1/</sup> But, the factors affecting the frequency of use by each subgroup were not different from those influencing the non-oil developing countries in general, viz., the level of foreign exchange reserves and the extent of use of Fund credit.

b. Size of amounts used

The distribution of the cumulative use of reserve tranche positions during 1979-87 in proportion to present Fund quotas according to the size of members' current account deficits, magnitude of their foreign exchange reserves, and extent of their use of Fund credit suggests that these factors had little influence on the amounts of reserve tranche drawings compared with their effect on the frequency of use (see Table 7). This apparent lack of visible positive correlation between the amount of reserve tranche use and the extent of financing needs is probably because the existence of a balance of payments financing requirement at the time of use was more relevant than the quantitative magnitude of that financing. In addition, the fact that reserve tranche positions cannot be reconstituted once they are drawn and that they were often completely used up within one or two quarters meant that reserve tranche positions were not available for future use in the event of further balance of payments financing needs.

c. Interest differentials

Most of the reserve tranche drawings made at the discretion of members in the nine-year period covered by this study (140 out of 196 purchases) were from unremunerated positions. Nonetheless, it is difficult to judge whether the nonpayment of a rate of return on the portion of reserve tranches falling above the norm for remuneration was a factor inducing holders to draw them down because there were unremunerated positions for a large majority of members at one time or another during this period which they did not always choose to use.

The rate of remuneration payable on reserve tranche positions remained below market rates of interest until February 1987 when it was increased to 100 percent of the combined market rate, whereas the interest rate on the SDR had been equal to the combined market rate since May 1981. The rate of remuneration for most of the period

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<sup>1/</sup> The definitions of these subgroups are those used for the World Economic Outlook (see SM/88/51, 3/4/88). Members with debt service difficulties are countries which incurred external payments arrears in 1985 or rescheduled their debts during 1983-86. Low income countries are those with per capita GDP which did not exceed the equivalent of \$410 in 1980. Sub-Saharan Africa comprise all African countries other than Algeria, Morocco, Nigeria, South Africa, and Tunisia.

Table 7. Cumulative Amounts of Reserve Tranche Drawings (RTD) from 1979 (I) to 1987 (IV)  
in Percent of Fund Quotas Classified According to Selected Economic Factors

(In percent)

Economic factors <u>1/</u>	All countries	Industrial countries	Major oil exporters	Non-oil developing countries			
				Total	Members with debt service difficulties	Low-income countries	Sub-Saharan African countries
<u>Overall use of RTD</u>	<u>5.4</u>	<u>1.4</u>	<u>8.0</u>	<u>13.8</u>	<u>17.5</u>	<u>10.9</u>	<u>11.6</u>
Use according to:							
I. <u>Size of current account deficit</u>							
Less than 25 percent of export earnings	5.6	1.4	6.5	15.5	18.3	12.7	12.0
25 percent and more of export earnings	5.0	1.3	35.6 <u>3/</u>	11.1	13.7	9.6	11.2
II. <u>Size of foreign exchange reserves</u> <u>2/</u>							
One month and more of imports	7.2	2.9	7.0	13.7	19.6	10.8	10.1
Less than one month of imports	2.4	--	--	14.3	15.0	9.4	13.0
III. <u>Extent of use of Fund credit</u>							
No use	2.9	1.4	6.5	19.4	21.2	19.4	13.9
Use	13.3	15.2 <u>3/</u>	21.6 <u>3/</u>	12.9	17.3	10.4	11.5

Note: Data relate to reserve tranche drawings, made at the initiative of the users, in proportion to Fund quotas. Data are for six industrial countries, three major oil exporters and 95 non-oil developing countries.

1/ Flow data for 1985 in the case of current account deficits, export earnings and imports, and end-1985 data for foreign exchange reserves, the use of Fund credit and Fund quotas.

2/ Data do not include a small number of countries for which data on foreign exchange were not available.

3/ Data relate to one country and therefore are not representative of the country grouping.

1979-87 was also sharply lower than the interest paid by the Fund on its borrowings from lending members under the Supplementary Financing Facility and the Enlarged Access Policy. The rate of remuneration was also lower than the rate of interest payable by the Fund on the amounts that it could borrow under the present General Arrangements to Borrow (GAB) and associated arrangement with SAMA, which was equivalent to the combined market rate used to determine the SDR interest rate, up to February 1987. 1/ Indicative yields on investments in U.S. dollar-denominated assets, which account for the predominant part of members' reserves, were also higher than the rate of remuneration for most of the period 1979-87. This can be seen from Table 8, which gives the uncovered interest differentials between the rate of remuneration, adjusted, ex post, for the variation in the U.S. dollar/SDR exchange rate, and the yields on three-month U.S. Treasury bills and three-month eurodollar deposit rates in London for the quarterly period 1979-87. 2/ The question thus arises as to whether interest differentials favoring reserve assets other than reserve tranche positions have had an effect on the use of this latter asset.

Members' voluntary use of reserve tranches in the nine-year period ended December 1987 appeared to have been significantly smaller than their use of SDR holdings, excluding infrequent use for quota payments. In proportion to total use of non-gold reserves in this period, SDR use at 4.1 percent was ten times as large as that of reserve tranche use for the industrial countries, twice as large as that of reserve tranche use for major oil exporters (1.8 percent versus 0.9 percent) and similarly large for non-oil developing countries (4.7 percent versus 2.1 percent); for all members, SDR use accounted for 3.8 percent of non-gold reserve use, compared with the reserve tranche use of 1.1 percent (see Table 3 above). This preference for the use of SDRs rather than reserve tranche positions does not reflect interest rate

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1/ Interest on borrowings under early GAB, however, was linked to the rate of charge on drawings from the Fund's ordinary resources, subject to a minimum of 4 percent, and as such was lower than the rate of remuneration.

2/ The adjustment is made quarterly and follows the same method used in DM/81/18, "An Analysis of Factors Influencing the Level of SDR Holdings in Non-Oil Developing Countries," by Robert Murphy and George M. von Furstenberg, March 9, 1981, p. 5, footnote 3. Example, U.S. dollar equivalent of the rate of remuneration for 1987 (IV) is

$$(1.0591 \times \frac{1.41866}{1.27964}) - 1 \times 100 = 17.42 \text{ percent.}$$

Table 8. Yield on Reserve Tranche Positions Compared with  
Indicative Yields on Foreign Exchange Holdings 1/

(Annual averages of quarterly data in percent per annum)

	Rate of remuneration (1)	Equivalent U.S. dollar rate <u>2/</u> (2)		Indicative yields on foreign exchange		Uncovered yield differentials <u>3/</u> (2)-(3) (2)-(4)			
				U.S. Treasury bill yield (3)	Euro-dollar rate (4)				
1979	6.08	6.38	(7.88)	9.44	11.44	-3.06	(-1.56)	-5.06	(-3.56)
1980	8.16	7.39	(8.13)	11.53	14.55	-4.14	(-3.40)	-7.16	(-6.42)
1981	11.08	8.64	(7.95)	14.35	17.15	-5.71	(-6.40)	-8.51	(-9.20)
1982	9.50	8.05	(11.35)	11.68	14.19	-3.63	(-0.33)	-6.14	(-2.84)
1983	7.31	5.92	(10.39)	8.96	9.74	-3.04	(+1.43)	-3.82	(+0.65)
1984	7.77	6.03	(6.76)	9.89	10.81	-3.86	(-3.13)	-4.78	(-4.05)
1985	7.15	10.26	(5.13)	7.73	8.35	+2.53	(-2.60)	+1.91	(-3.22)
1986	6.09	8.99	(10.00)	6.14	6.77	+2.85	(+3.86)	+2.22	(+3.23)
1987	5.85	9.95	(6.70)	5.98	7.08	+3.97	(+0.72)	+2.87	(-0.38)

1/ Until July 1983 the rate of remuneration for each quarter was determined at the end of the preceding quarter and since August 1983 it has been set weekly. Hence, in comparisons with yields on three-month U.S. Treasury bills and three-month euro-dollar rates in London (mid-point between offer and bid rates), the data on the rate of remuneration and yields on U.S. Treasury bills and euro-dollar deposits up to mid 1983 relate to the end of the previous quarter, whereas subsequent rates and yields relate to the average of weekly observations in each quarter.

2/ Calculated by adjusting the rate of remuneration for the variation in U.S. dollar/SDR exchange rate over each quarter (see footnote 1 on page 30 for method of calculations). Figures in parentheses are calculations based on the assumption that the change in the value of the U.S. dollar in terms of the SDR over the entire year would be equal to that which had occurred in the last quarter of the previous year.

3/ Negative differentials favor yields on foreign exchange reserves.

factors because the yield on the SDR has been higher than the rate of remuneration during most of the period considered. 1/

In regard to the effect on reserve tranche use of yield differentials between the rate of remuneration and indicative rates of return on foreign exchange reserves, it is noteworthy that use of reserve tranche positions declined sharply in 1985-87 (see Table 2) when the U.S. dollar equivalent of the rate of remuneration, determined by adjusting the latter rate, ex post, for changes in the U.S. dollar exchange rate, was higher than indicative yields on U.S. dollar-denominated assets, reflecting the weakness of the U.S. dollar against the SDR (see Table 8). In earlier years when use of reserve tranche positions was relatively large, uncovered yield differentials favored investment in U.S. dollar-denominated assets because of the dollar's appreciation on foreign exchange markets. This would appear to suggest some association between reserve tranche use and interest rate considerations.

The above method of calculating yield differentials, however, assumes that monetary authorities were in a position to predict correctly, ex ante, the future movements of the U.S. dollar. An alternative, and possibly more realistic, approach is to calculate the opportunity cost of holding reserve tranche positions on the assumption that the expected change in the value of the U.S. dollar against the SDR in any year would be equal to that which had occurred in the last quarter of the preceding year. This embodies the notion that the "best" forecast of exchange rate changes in the future is equal to the most recent change in the past. 2/ The U.S. dollar equivalent of the rate of remuneration and yield differentials computed according to this method are shown in parentheses in Table 8. Yield differentials were narrower and generally in the same direction as those computed on the basis of the first method, but there were important timing differences; according to the alternative method, yield differentials favored the rate of remuneration in 1983 whereas the largest volume of reserve tranche drawings during the last nine years occurred in that year (see

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1/ The rate of remuneration was equivalent to 90 percent of the SDR interest rate from January 1979 through April 1981, during which period the SDR interest rate was set at 80 percent of the combined market rate. When the SDR interest rate was raised to 100 percent of the combined market rate in May 1981, the rate of remuneration was set at 85 percent of the SDR interest rate. The rate of remuneration was subsequently raised in relation to the SDR interest rate until it reached 100 percent of that rate in February 1987.

2/ Another variation to the above approach is to calculate the change in the value of the U.S. dollar on a quarterly basis, with the expected change in each quarter being equivalent to the actual change in the previous one, and then to average the expected quarterly changes within a year.

Table 2). The above two methods of calculating yield differentials are based on the nominal rate of remuneration. However, the effective rate actually paid by the Fund is much lower because only creditor, rather than all, reserve tranche positions are remunerated. When this factor is taken into account, yield differentials favorable in recent years to reserve tranche positions narrow considerably or become unfavorable. The above computations, therefore, do not provide conclusive indications of an association between use of reserve tranche positions and interest rate factors.

There are also other indications that yield differentials did not have a major bearing on reserve tranche use. For example, the increase in the remuneration coefficient from 72 percent of the combined market rate, applicable to most of the period from April 1978 through April 1981, to 85 percent from May 1981 to April 1984 did not discourage the use of these positions; in fact, more members (60 countries not including those whose only purchases were associated with the payment for the last quota increase) drew down their reserve tranche positions in the three-year period ended April 1984 than in the preceding three years (39 countries). Moreover, the total amount of reserve tranches drawn in 1982-1984 of SDR 3.7 billion (see Table 2) was significantly higher than the SDR 0.8 billion used in the previous three years, despite the fact that latter purchases included mandatory drawings of SDR 0.3 billion which were associated with the use of certain types of Fund credit.

The foregoing discussion points out that the separate indicators of financing needs as well as yield differentials used in this study provide only limited and partial explanation of the extent to which members have used their reserve tranche positions over the last nine years.

The relevance and significance of these indicators of financing needs for reserve tranche use were also examined by means of regression analysis (see Appendix). The results of this statistical analysis indicated that there was some significant statistical relationship between these indicators and the use by members of their reserve tranche positions. However, the above indicators explained only a small portion of the total variation across members of their reserve tranche use. These empirical results, as well as the analysis contained in this section of the paper, suggest that there were other factors affecting the decision by members to hold or to use their reserve tranche positions in the Fund.

#### 4. Reserve tranche use and Fund liquidity

It was shown above that industrial and major oil exporting countries have made relatively little use of their reserve tranche positions, and that the majority of these countries, together with some non-oil developing countries, preferred to use reserve assets other

than the reserve tranche position in the Fund to finance balance of payment deficits. This may have reflected in part a perception among some of these countries that use of Fund-related assets could be interpreted as a symptom of serious weakness in their balance of payments and reserve positions. Such a perception could have led them to believe that use of their reserve tranche positions could have triggered an adverse reaction in the foreign exchange markets, leading to capital outflows and increased borrowing costs for them in international capital markets. By maintaining their reserve tranche positions they may, therefore, have gained a benefit over and above the rate of return earned on these positions.

The preference to use other reserve assets may also have reflected possible concern on the part of a few members with the largest quotas 1/ that encashment of their reserve tranche positions could create difficulties for the liquidity position of the Fund. While such concern may exist, it should be pointed out that the Fund takes steps to ensure that the reserve tranche positions of all members are fully liquid reserve assets. Reviews of the Fund's liquidity are conducted regularly and frequently by its Executive Board to examine (a) potential demands on the Fund in the foreseeable future to provide balance of payments financing to its members in the form of Fund credit as well as the use of creditor positions, consisting of reserve tranche positions and loan claims, and (b) sources of financing, including ordinary resources, comprising use of the Fund's holdings of SDRs and of the currencies of members in sufficiently strong balance of payments and reserve positions, and available balances in borrowing arrangements supplementing these resources. Such assessments of the Fund's liquidity position also include, inter alia, the monitoring of the relationship between the Fund's immediately usable resources and its reserve tranche liabilities.

Uses of reserve tranche positions result in the enlargement of the reserve tranches of members with strong external positions whose currencies are sold by the Fund for this purpose. This reduces the potential for further reserve tranche encashment on the part of those members drawing on their reserve tranche positions, but it leads to the concentration of reserve tranche positions in members with the largest quotas in the Fund which could experience an unexpected need to draw down their tranche positions.

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1/ Twelve members with present quotas in excess of SDR 2 billion each--comprising nine industrial countries, one major oil exporter, and two non-oil developing countries--had a combined share of 81 percent of total reserve tranche positions in the Fund at the end of 1987 (see Table 1).

In the management of the Fund's liquidity, the effect on its ordinary resources of unexpected reserve tranche encashment is mitigated in a number of ways. Firstly, a member is not exempted from having its currency selected for use by the Fund, for instance for sale to other members making purchases, by its recourse to Fund resources. This is because a member would tend to draw down its reserve tranche position on the basis of an unfavorable balance of payments or reserve position or developments in its reserves, with any one factor being sufficient grounds for making the purchase; however, the combined position of a member's balance of payments and reserves, which is the criterion for the selection of currencies used in Fund transactions, might still be strong, with weakness in one aspect compensated for by strength in the other. This was the case, for example, of members which used their reserve tranche positions for intra-EEC settlements. Of course, a member using the Fund's resources whose combined external position is also weak is excluded from the list of members judged sufficiently strong to be included in the currency budget.

Secondly, the stock of the Fund's usable resources is customarily adjusted downward by an estimate of the probability that the external positions of some members which currently are strong might weaken in the immediate future, and therefore their currencies would not be used by the Fund. To the extent that this contingency does not materialize fully, a cushion would be available to meet, at least in part, large and unexpected encashments of reserve tranche positions. Thirdly, the Fund's ordinary resources are supported by lines of credit provided by the major industrial countries under the General Arrangements to Borrow (GAB) of SDR 17 billion and by Saudi Arabia under an associated arrangement amounting to SDR 1.5 billion. Calls may be made on GAB resources and those of the associated arrangement when needed to forestall or cope with an impairment of the international monetary system to supplement the Fund's ordinary resources in financing, inter alia, reserve tranche drawings by participants in these arrangements, which include ten of the twelve countries with Fund quotas in excess of SDR 2 billion each. <sup>1/</sup> Indeed, about one third of the reserve tranche drawings made by the United States in November 1978 of SDR 2.3 billion were financed by Fund borrowings under the GAB.

In sum, the aims of the Fund's management of its total resources include enabling creditor members to use their reserve tranches and loan claims on the Fund. This safeguards the liquidity of these claims and ensures that they are fully usable at all times by members. Thus, while some members may have concerns about the effect of the use of their reserve tranche positions on the Fund's liquidity, such

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<sup>1/</sup> The Fund may also call on GAB and associated arrangement resources to finance drawings by members that are not participants, provided that these transactions are made under policies of the Fund requiring adjustment programs.

apprehension should be alleviated by the precautions taken by the Fund to protect its liquidity position.

#### IV. Summary and Conclusions

Reserve tranche positions are liquid claims of members on the Fund which arise in part from the reserve asset payments for quota subscriptions, but mostly from the sale by the Fund of the currencies of members in strong external positions to meet the demands on its resources on the part of other members for balance of payment support. There was a substantial increase in reserve tranche positions in the early 1980s which reflected the growth in the use of Fund credit. The industrial countries received most of this increase as their currencies were drawn on to finance the expansion of Fund credit, and in the process they held a significantly larger share of their total reserves in the form of reserve tranche positions, compared with other members. There were also significant increases in the reserve tranche positions of major oil exporters, while those of the non-oil developing countries as a group were little changed. As a result, the bulk of these claims on the Fund has become concentrated in a few members, mainly among those industrial countries which have the largest quotas in the Fund. By contrast, reserve tranche use has been substantially higher for the non-oil developing countries as a group, although some of these countries have not made any use of their reserve tranche positions. Compared with non-oil developing countries that used reserve tranche positions extensively, non-users generally had less severe debt problems, higher reserve levels and smaller current account deficits. The use of reserve tranches by the industrial and the major oil exporting countries has been significantly below the proportion of their total reserves held in this form, implying that they preferred to use other reserve assets to finance balance of payment deficits. In fact, use of SDRs and of foreign exchange reserves was larger than reserve tranche use for all major country groups.

Unlike other reserve assets created by the Fund, the reserve tranche position provides less flexibility to holders in the management of their reserve portfolios and receives lower remuneration. A member cannot increase or transfer its position to another member, but it can encash it from the Fund at any time. A member's ability to manage its reserve tranche position is limited by the fact that use by the Fund of that member's currency, with its concurrence, in Fund transactions and operations results in increases and decreases in the member's position over which the member has no control. This particular characteristic of a reserve tranche position is not shared by other Fund-related reserve assets, such as SDRs. With regard to the rate of return, the below-market rate of remuneration on the reserve tranche position has been raised to the level of the SDR interest rate in February 1987. Nonetheless, because remuneration is not paid by the Fund on that portion of the reserve tranche position which lies above the norm for

remuneration, such positions are not fully remunerated. Hence, the effective rate of return on a member's entire reserve tranche position is still somewhat below yields paid on alternative reserve assets.

The frequency of reserve tranche use, i.e., the number of occasions in which drawings were made relative to the number of quarters in which reserve tranche positions were available, has in general been very low. However, non-oil developing countries used their reserve tranches much more frequently than the industrial countries or the major oil exporters. The timing of reserve tranche use in general correlated positively, as would be expected, with economic factors bearing on the need for balance of payment financing, such as the size of external imbalances, the level of foreign exchange reserves, and the extent of indebtedness to the Fund. There were, however, variations among major country groups, with some factors being more relevant to one group or subgroup than the other. On the other hand, the size of the amounts used in relation to quotas did not appear to be influenced to any significant extent by the magnitude of these economic factors, as the existence of a financing need at the time of use was apparently more relevant than the intensity of need during any given period. Yield differentials did not appear to have influenced holders to draw down their tranche positions as members, particularly the industrial countries, tended to use other reserve assets, including SDR holdings, with a higher rate of return when use of international reserves was necessary.

There would appear to be other factors that may account for the fact that there was not a close quantitative link between reserve tranche use and indicators of balance of payments need covered in this study. These apparently include the perception among some holders that use of Fund-related assets could be interpreted as a symptom of weakness in their balance of payments and reserve positions. In addition, there seems to be a preference to use other reserve assets possibly because of concern by some of the members with the largest quotas that encashment of their reserve tranche positions could create difficulties for the Fund's liquidity position. Such apprehension should, however, be alleviated by the precautions taken by the Fund to protect its liquidity position. The Fund manages its resources with the aim, inter alia, of enabling creditor members to use their reserve tranche claims on the Fund when needed. This assurance of the liquidity of these claims is important in encouraging creditor countries to accept increases in their reserve tranche positions to finance the expansion of Fund credit in support of the adjustment efforts of other members.

Statistical Analysis of the Use of  
Reserve Tranche Positions

This appendix provides a statistical analysis of the extent to which the use of reserve tranche positions was influenced by a relatively small set of economic factors which describe a member's balance of payments need, viz., its current account position, its holdings of international reserves, and the extent of its indebtedness to the Fund. The examination covers separately the impact of these factors on the extent of reserve tranche use, as well as whether these factors led to the use or nonuse by a member of its reserve tranche position. The specific equation estimated was as follows:

$$RT_i = a_0 + a_1 CAB_i + a_2 RES_i + a_3 UFC_i \quad (A1)$$

where  $RT_i$  = the ratio of country  $i$ 's reserve tranche use to its quota 1/

$CAB_i$  = the ratio of country  $i$ 's current account balance to its exports earnings (positive denotes a deficit),

$RES_i$  = the ratio of country  $i$ 's nongold reserves to its imports, and

$UFC_i$  = the ratio of country  $i$ 's outstanding use of Fund credit to its quota.

Equation A1 was estimated as a cross-country regression for all Fund members for each year separately from 1979 to 1986. 2/ The sample included the countries that had not used their reserve tranche positions as well as those that had not completely exhausted these positions. Once a country had used up its reserve tranche position, it was excluded from the sample for the next and subsequent years.

The expected direction of the independent variables can be deduced straightforwardly from the effects of these variables on a country's balance of payments financing needs. It is expected that the coefficient of CAB would be positive. As the current account position (CAB) deteriorates relative to a country's ability to earn foreign exchange via exports earnings, it would be anticipated that the use of reserve tranche would increase. The coefficient of reserves (RES) should be negative; as reserves rise relative to imports, financing constraints become less binding and a country would need to rely less on its reserve tranche position. The use of Fund credit variable (UFC)

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1/ When the left-hand-side variable reflects the use or nonuse of these positions,  $RT_i = 1$  if country  $i$  used its position, and  $RT_i = 0$  if country  $i$  did not use that position.

2/ No estimate was made for 1987 because balance of payments data were not available for many countries.

reflects cumulative past balance of payments conditions. The larger the use of Fund credit, the larger have been past balance of payments problems and hence the higher the probability of using the reserve tranche, other things being equal. Thus, the coefficient of UFC should be positive.

The estimation results for the equation explaining the magnitude of the use of reserve tranche positions for each of the eight years examined are presented in Table 1. The technique used was ordinary least squares (OLS). While the  $R^2$ s may be considered low, they are not unreasonable for cross-section data and indicate a statistically significant estimated relationships for some of the variables at the 5-6 percent levels of significance. The reserves variable consistently provides the most explanatory power. While the size of its impact varies over time, its estimated coefficient has the expected sign for each year except 1986 and is statistically significant at the 5 percent level in each year except 1979 and 1981. (For 1981 it is significant at the 6 percent level.) 1/ Turning to the remaining explanatory variables, the coefficient of UFC has the expected sign but is statistically significant in only three of the eight years. The ratio of the current account balance to exports never adds to the explanatory power of the equation and frequently its coefficient does not have the expected sign. 2/

The analysis thus far has treated the use by a member of its reserve tranche position as if it were a continuous variable, that is, can be increased or decreased at the complete discretion of a member. While use of the reserve tranche is a continuous process, a reserve tranche cannot generally be replenished unilaterally by a country for further use. Consequently, changes in the right-hand-side variables in equation A1 can only motivate use up to a point beyond which no further use can be made. Furthermore, an examination of the data revealed that the majority of members which used reserve tranches exhausted them completely within one or two quarters. For both of these reasons, an alternative way to characterize reserve tranche use was adopted, namely, as a dichotomous choice variable, i.e., to use or not to use it, with the amount used being effectively constrained by the amount

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1/ The relatively small coefficients should not be interpreted as necessarily indicating that differences in the size of reserves across countries have little impact on reserve tranche use. This is because all right-hand-side variables are expressed in percent.

2/ In general, the right-hand-side variables in equation A1 are three different ways to measure balance of payments conditions. Consequently, it may be extremely difficult to estimate accurately the marginal impact of any one variable given the inclusion of the other two.

available for use. To implement this type of analysis, RT in equation A1 was converted into a dichotomous variable equal to one if a country used part or all of its reserve tranche, and equal to zero if it did not make any use of its reserve tranche in a given year. Ordinary least squares estimation of this transformed equation would yield errors with non-classical properties. <sup>1/</sup> Given the nature of the dependent variable, a logit technique is the appropriate estimation method. The logit technique transforms the left-hand-side variable into the natural log of the odds that the reserve tranche will be used by a particular country. The coefficients of the right-hand-side variables are estimated by an iterative maximum likelihood process so that the errors of the estimating equations have classical properties asymptotically.

The logit estimation results are presented in Table 2. These portray a somewhat different picture from those in Table 1. In particular, no one variable dominates in terms of explanatory power, although RES remains important. In contrast to the results in Table 1, the coefficient of CAB has the expected sign in each year and is statistically significant at the 10 percent level in four of the eight years while the coefficient of the RES is statistically significant in only three of the eight years. It would thus appear that the evolution of a current account deficit may be important in triggering the use of the reserve tranche, while a country's reserve position may be more significant in determining how much of the reserve tranche position is used. Generally speaking, the logit results appear to be quite reasonable. All coefficients (except RES in 1979) have the anticipated sign and the  $R^2$ s are uniformly higher than those in Table 1. The generally lower T-statistics accompanied by higher  $R^2$ s may indicate that multicollinearity among the right-hand-side variables is more of a problem in the logit estimation than in the initial estimation.

Since the left-hand-side variable in the logit model is the log of the odds of using the reserve tranche, the quantitative interpretation of the coefficients is not straightforward and requires some

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<sup>1/</sup> In this case, OLS estimation yields heteroskedastic, nonnormal errors, whereas errors in the classical linear model are typically normally distributed, homoskedastic, not correlated, and have a zero mean.

transformation of the variables. <sup>1/</sup> Since both the sample means for the probabilities and the estimated coefficients differ across the years included in the sample, only representative measures of the impact of changes in the right-hand-side variables on the probability of using the reserve tranche have been calculated. For example, the estimated coefficients using data for 1983 indicate that the probability that a country with a current account deficit that is 25 percent of its export earnings would use its reserve tranche is 12 percentage points higher than for a country with a balanced current account, all other things being equal. Similarly, using the estimated coefficients for 1985 indicates that the probability that a country with foreign reserves equivalent to 50 percent of its imports would use its reserve tranche is 11 percentage points lower than for a country whose foreign reserves are 25 percent of its imports, all other things being

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<sup>1/</sup> The bivariate version of a logit model is:

$$\ln (P_i/(1-P_i)) = a + bx_i \quad (A1')$$

where  $P_i$  = the probability of using the reserve tranche and  
 $x_i$  = an explanatory variable.

From A1',  $d \ln (P_i/(1-P_i))/dx_i = b$

That is,  $b$  measures the marginal impact of a change in  $x$  on the log of the odds ratio. To interpret the impact of change in  $x_i$  on  $P_i$ , the following transformation must be made:

$$\begin{aligned} d \ln (P_i/(1-P_i)) &= b dx_i \\ d \ln P_i - d \ln (1-P_i) &= b dx_i \\ (dP_i/P_i) - (d(1-P_i)/(1-P_i)) &= b dx_i \\ ((1/P_i) - 1/(1-P_i)) dP_i &= b dx_i \\ (1/P_i(1-P_i)) dP_i &= b dx_i \\ dP_i &= b dx_i (P_i(1-P_i)) \end{aligned}$$

Thus, using the sample means for  $P_i$  and  $1 - P_i$ , one can calculate the impact of a change in one of the right-hand-side variables in the logit model on the probability of using the reserve tranche.

equal. <sup>1/</sup> The above probabilities, however, are not constant over time, as they vary considerably across the years in the sample.

The above results would appear to indicate that some significant statistical relationship exists between indicators of financing need and use by members of their reserve tranche positions, in that all three independent factors carried the expected signs (in Table 2) even though the relative importance of the variables varied over time. The low explanatory power of the equations, however, indicates that there were other reasons that influenced members to hold or use their reserve tranche positions in the Fund.

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<sup>1/</sup> The values chosen for these exemplary calculations are well within the range of actual observations.

Table 1. Impact of Indicators of Need on Extent  
of Use of Reserve Tranche Positions

Year	Estimated Coefficients 1/				R <sup>2</sup>
	Constant	CAB	RES	UFC	
1979	21.554 (5.19)	-0.101 (1.14)	-0.083 (1.23)	0.137 (2.15)	0.10
1980	16.498 (5.96)	0.019 (0.30)	-0.104 (2.08)	0.119 (2.16)	0.14
1981	19.077 (5.83)	0.032 (0.54)	-0.137 (1.92)	0.059 (1.34)	0.09
1982	27.332 (7.51)	-0.075 (1.37)	-0.274 (3.23)	0.020 (0.87)	0.14
1983	17.735 (6.56)	-0.011 (0.21)	-0.141 (2.47)	0.031 (2.28)	0.15
1984	21.648 (7.27)	-0.004 (0.07)	-0.158 (2.47)	0.024 (1.60)	0.11
1985	23.433 (8.74)	-0.087 (1.65)	-0.228 (4.07)	0.009 (0.63)	0.21
1986	20.432 (7.51)	-0.048 (1.06)	0.174 (3.28)	0.011 (0.76)	0.18

1/ Abbreviations are: CAB = current account balance in percent of export earnings; RES = nongold reserves in percent of imports; and UFC = use of Fund credit in percent of quota. Figures in parentheses are absolute values of T-statistics.

Table 2. Impact of Indicators of Need on Use  
or Nonuse of Reserve Tranche  
Positions (Logit Equation)

Year	Estimated Coefficients 1/				R <sup>2</sup>
	Constant	CAB	RES	UFC	
1979	0.031 (0.06)	0.009 (0.79)	0.008 (1.00)	0.059 (2.14)	0.14
1980	0.412 (0.83)	0.021 (1.74)	-0.002 (0.23)	0.141 (1.54)	0.18
1981	0.581 (1.17)	0.022 (1.91)	-0.010 (1.02)	0.281 (1.26)	0.21
1982	1.576 (3.08)	0.017 (1.57)	-0.024 (2.10)	-- 2/	0.14
1983	1.002 (1.92)	0.032 (2.00)	-0.018 (1.54)	0.018 (1.59)	0.27
1984	1.374 (2.63)	0.032 (1.87)	-0.018 (1.62)	0.013 (1.84)	0.21
1985	1.871 (3.20)	0.014 (0.94)	-0.028 (2.43)	0.007 (1.26)	0.24
1986	1.679 (2.46)	0.021 (1.27)	-0.031 (2.06)	0.015 (1.53)	0.28

1/ Abbreviations are: CAB = current account balance in percent of export earnings; RES = nongold reserves in percent of imports; and UFC = use of Fund credit in percent of quota. Figures in parentheses are absolute values of T-statistics.

2/ The estimation would not converge when UFC was included. Hence, it was omitted for 1982 only.

