

INTERNATIONAL MONETARY FUND

EXTERNAL REVIEW OF QUOTA FORMULAS: QUANTIFICATION

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In Consultation with Other Departments

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I. INTRODUCTION

1. **In response to concerns expressed during the Eleventh General Review of Quotas, management proposed the convening of a committee of external experts in 1999 to conduct an independent review of the formulas used to calculate quotas.** This Quota Formula Review Group (QFRG) provided the Board with a report on the adequacy of the quota formulas and a proposal for change.¹ The QFRG report, and a Staff Commentary, were discussed at an Executive Board seminar on August 31, 2000.²

2. **The QFRG report recommended a major simplification and updating of the quota formulas to take account of changes in the world economy.** The Staff Commentary included a partial quantification of the formula recommended by the QFRG based on the data ending in 1994 that were used for the Eleventh Review of Quotas and, due to a lack of data at the time, excluded the QFRG's proposed inclusion of net long-term capital flows. Consequently, the calculations provided only an illustration of quota shares resulting from the use of the proposed formula. The results of the partial quantification indicated that the calculated quota share of the major industrial countries, especially the largest economies, would be significantly higher using the QFRG formula compared to the traditional five formulas.³ At the end of the Board seminar on the QFRG report, the Acting Chairman remarked that it was clear Directors did not agree fully with the outcome of the report. In addition, he noted that quota formulas developed to reflect changes in the global economy would—as several Directors emphasized—need to have wide support.

3. **This paper follows up on the earlier work by providing a quantification of the quota formula recommended by the QFRG based on more up to date information and including data on net long-term capital flows.** The paper also provides updated calculations for the traditional five quota formulas as a basis for comparison.

II. THE DATA

4. **The QFRG suggested the use of a linear formula containing only GDP and external variability:**

$$\text{Calculated quota} = (2/3) \text{ GDP} + (1/3) \text{ Variability,}$$

¹ “External Review of the Quota Formulas,” EBAP/00/52, 5/1/00, “External Review of the Quota Formulas—Annex”, EBAP/00/52, Supplement 1, 5/1/00, “External Review of the Quota Formulas—Statistical Appendix (Part A),” EBAP/00/52, Supplement 2, 5/1/00, and “External Review of the Quota Formulas—Statistical Appendix (Part B),” EBAP/00/52, Supplement 3, 5/2/00. These papers are available on the Fund’s web site.

² “Staff Commentary on the External Review of Quota Formulas,” EBAP/00/66, 6/7/00. This paper is also available on the Fund’s web site.

³ Table 2, Staff Commentary (EBAP/00/66).

where calculated quota, GDP and variability are expressed as members' shares in the global total. The QFRG recommended that GDP be averaged over three years and that the measure of variability of current receipts contained in the traditional five quota formulas (described in Appendix II) be expanded to include net long-term capital inflows.

5. Both the QFRG formula and the traditional quota formulas are quantified in this paper using available data from the *International Financial Statistics (IFS)* database for the period up to 1999. The *IFS* database has been used because the information is from official sources and the Statistics Department has been able to compile it into series that are consistent across time and countries (*IFS* data also formed the core of the database for the Eleventh Review quota calculations). The staff explored the feasibility of using the World Economic Outlook (WEO) database, but concluded that it contained data from mixed (official and other) sources that are not as comparable across countries as *IFS* data, and that definitions of variables were not always the same as specified in the quota formulas. Appendix I discusses in greater detail the procedures and concepts used to develop the required data.

6. The QFRG suggested, as an operational definition of net long-term capital inflows, the sum of direct investment, portfolio investment, and long-term trade credits and loans, all on a net basis. Each of these components can be derived from the *IFS* by summing a number of detailed series. As variability in the traditional formulas has been computed on the basis of 13 years of data, in principle data are needed for each of these detailed series for the period 1987-99.

7. Staff has carefully examined the capital flow data in *IFS* that would be required for the computation of the QFRG formula, using the above definition, with the aim of assembling a data set for as many members as possible. Data availability in *IFS* for the period 1987-99 is more complete for the series used to derive direct investment and portfolio investment than long-term trade credits and loans. However, even for direct investment, less than half of members have reported data to *IFS* for the period 1987-99 (Appendix I, paragraph 29).

8. Due to the limitations on the availability of capital flow data, staff judges that sufficient *IFS* capital flow data for the quantification of the QFRG quota formula are available for a subset of the membership consisting of 74 countries (Appendix I, paragraph 30). Members are generally included when they do not have missing data in the following four aggregate series: inward direct investment, direct investment abroad, net portfolio investment, and net other long-term investment. The aggregate series are derived by summing the respective detailed component series.⁴ To enlarge the sample of members, in a few cases estimates have been made for gaps in the aggregate series on the basis of levels or trends in comparable (though not identical) WEO series.

⁴ In the aggregation, zeros were assumed in place of (...), which indicates either missing or zero in the *IFS*.

III. RESULTS OF QUANTIFICATION

9. **The overall results of the quota calculations for the sample of 74 members are likely to be representative for the membership as a whole because of the high share in total quotas of the 74 members.** The 74 countries account for 83 percent of current quotas and 88 percent of Eleventh Review calculated quotas. Most of the advanced economies are included, as are over half (by quota share) of developing countries.

10. **Quota shares are calculated for the 74 members on the basis of the traditional formulas, the (baseline) QFRG formula, and an alternative QFRG formula with the weights of GDP and variability reversed** (Table 1).

- The traditional formulas generate a single calculated quota (expressed in SDRs) for each member. The resulting quota share of each of the 74 members is adjusted proportionally so that the shares sum to their Eleventh Review calculated quota share.
- The QFRG formula generates quota shares that are also adjusted proportionally so that they sum to the Eleventh Review calculated quota shares of the 74 members.

The results demonstrate the broad effects of the QFRG formula on the quota distribution, for two different sets of variable weights.

11. **The results for the baseline QFRG formula are similar to those presented in the Staff Commentary on the QFRG report.** Using the QFRG formula and data up to 1999 for the 74 members, calculated quota shares differ substantially from those derived from the traditional formulas for individual members and major country groupings. The quota share of the major industrial countries, in particular the United States, is sharply higher using the QFRG formula compared to using the traditional formulas. In contrast, the quota share of the smaller advanced economies is much lower. Among the developing countries, the quota share of Asian countries is smaller under the QFRG formula than under the traditional formulas while the quota share of countries in the Western Hemisphere is greater.

12. **The differences between the results of the baseline QFRG formula and the traditional formulas are due to the following factors** (Table 2).

- **Fewer variables in the QFRG formula**, specifically, trade flows are not separately included in the QFRG formula. Their contribution to calculated quotas using the traditional formulas is around 50 percent. The exclusion of reserves from the QFRG formula, on the other hand, has a small influence on the results as the contribution of reserves to calculated quotas under the traditional formulas is relatively minor.

Table 1. Illustrative Quota Calculations for 74 Fund Members by Major Country Group
By WEO Classification

(In percent)

	Current Quota Shares	Calculated 11th Review Quota Shares	Calculated Quota Shares, Latest Data		
			Traditional five formulas	QFRG formula	
				GDP: 2/3 Variability: 1/3	GDP: 1/3 Variability: 2/3
(1)	(2)	(3)	(4)	(5)	
Advanced economies	60.4	72.2	72.0	72.8	70.6
Major industrial countries	46.0	54.0	52.4	59.2	54.6
Other advanced economies	14.4	18.1	19.6	13.6	16.0
Developing countries	17.1	12.1	12.3	11.7	12.4
Africa	1.4	0.7	0.7	0.6	0.6
Asia	5.6	4.2	5.0	3.3	3.5
Middle East and Europe	5.0	3.0	2.7	2.3	3.2
Western Hemisphere	5.1	4.2	3.9	5.4	5.3
Transition economies	5.4	3.7	3.7	3.5	4.9
Total (74 members)	83.0	88.0	88.0	88.0	88.0
Memorandum items:					
Other (109 members)	17.0	12.0	...	...	...
Advanced economies	2.3	2.7	...	...	...
Major industrial countries	0.0	0.0	...	...	...
Other advanced economies	2.3	2.7	...	...	...
Developing countries	12.6	7.8	...	...	...
Transition economies	2.1	1.5	...	...	...

Source: Appendix Table 1.

Table 2. Average Contribution of Variables to Calculated Quotas
By WEO Classification

(In percent)

	GDP	Reserves	Current Payments	Current Receipts	Variability 1/	Total
Traditional five formulas 2/						
Advanced economies	30.2	4.1	45.8	5.5	14.4	100.0
Major industrial countries	35.4	2.8	45.2	3.6	13.0	100.0
Other advanced economies	16.2	7.6	47.3	10.7	18.2	100.0
Developing countries	26.1	8.8	45.3	4.1	15.7	100.0
Africa	28.6	5.5	50.1	5.2	10.5	100.0
Asia	21.0	9.9	49.6	5.4	14.1	100.0
Middle East & Europe	12.6	7.1	43.1	5.5	31.6	100.0
Western Hemisphere	41.7	9.2	40.5	1.2	7.4	100.0
Transition economies	7.9	6.0	37.9	12.4	35.8	100.0
Total (74 members)	28.7	4.9	45.4	5.6	15.5	100.0
QFRG formula						
Baseline	66.7	...	...	...	33.3	100.0
Alternative	33.3	...	...	...	66.7	100.0

Source: Staff calculations.

1/ Variability of current receipts, in the case of the traditional five formulas, and of current receipts and net long-term capital inflows, in the case of the QFRG formula.

2/ The average contribution of a variable is the sum, over the members in the group, of the variable multiplied by its coefficient in the applicable formula, divided by the group's total calculated quotas. The variable's coefficient includes the multiplicative factor in the case of the nonlinear formulas.

- **The weight of GDP is greater in the QFRG formula** than in the traditional formulas. Economies that are large and relatively closed—thus benefiting little from the inclusion of trade flows in the traditional formulas—gain from the QFRG formula.
- **Differences in variability:**
 - The weight of variability is greater in the QFRG formula than in the traditional formulas, which benefits countries with balance of payments receipts that are especially variable.
 - The magnitude of variability for the 74 Fund members is on average almost twice as high when net long-term capital flows are included.⁵ Under the traditional formulas, such an increase would have led to a larger contribution of variability to calculated quotas. However, since under the QFRG formula variables are expressed as shares in the global total, the contribution of variability is fixed and it is the distribution of variability over the membership rather than its absolute value that affects calculated quota shares.

13. **Using the QFRG formula with the weights of the two variables reversed—a possibility suggested by the QFRG—mitigates but does not eliminate the difference in results between the QFRG formula and the traditional formulas** (Table 1, column 5). The developing and the transition economies benefit under this alternative, compared to the baseline QFRG formula, as greater weight is given to their relatively high variability of balance of payments receipts. Furthermore, under this alternative, the quota share of the largest economies is still higher than under the traditional formulas, but not by as much as under the baseline QFRG formula due to the reduced weight for GDP. Similarly, the share of other advanced economies is lower than under the traditional formulas, but not by as much as under the baseline QFRG formula.

IV. CONCLUSIONS

14. **The quota calculations based on the QFRG formula in this paper confirm the preliminary conclusions of the Staff Commentary on the QFRG report.** The calculated quota share of the major industrial countries is significantly higher under the QFRG formula than under the traditional five formulas, while the calculated share of the other advanced economies is sharply lower. Developing countries also lose calculated quota share under the QFRG formula, compared to the traditional formulas.

⁵ For the 74 Fund members, average variability of current receipts is SDR 2,693 million and of current receipts and net long-term capital flows SDR 4,671 million. For comparison, average GDP in 1999 was SDR 273,405 million.

15. Using a greater weight for variability and a lower weight for GDP modifies but does not eliminate the shift in quota shares toward the large advanced economies.

However, the calculated quota shares of developing and transition economies are higher under the QFRG formula than the traditional formulas when the weight of variability in the QFRG formula is doubled.

16. The results of the quantification of the QFRG formula validate the concerns raised by Directors during the seminar in August 2000 on the basis of the preliminary conclusions reached in the Staff Commentary. Directors had focused on the ramifications of the proposed formula and several had emphasized the need for quota formulas to have wide support. The calculations in this paper demonstrate that the preliminary results in the Staff Commentary accurately reflected the broad shifts in quota shares that would result from the application of the QFRG formula.

17. The quantification of the QFRG formula was possible only for a subset of the membership due to limitations on the availability of data on their capital flows. Less than half of Fund members report complete data to *IFS* on direct investment in their economies and abroad, and data availability is worse for other capital flows. The lack of data on capital flows for most Fund members makes the derivation of alternative quota formulas a very challenging task.

18. As agreed by the Executive Board in the work program, the next step is the exploration by staff of alternative quota formulas. Staff will explore formulas, taking into account data availability, that better represent the role of quotas in the Fund and developments in the global economy, and examine the appropriateness of other data sources. Staff will also, of course, continue to work on *IFS* and other data, in conjunction with area departments, to improve the capital flow series. A Board seminar is expected to be held on the basis of the paper(s) staff will be preparing in the coming months.

SELECTION OF DATABASE AND DERIVATION OF QUOTA VARIABLES

19. **This appendix discusses the selection of the data base that was used for the quota calculations and explains the derivation of the data series.**

20. **Quantification of the existing five formulas and the QFRG formula on the basis of the most recent available data requires the following data** (converted into SDRs as the common denominator):⁶

- Existing five formulas:
 - GDP at current market prices for 1999;
 - current receipts (goods, services and private transfers) for the period 1987-1999, to calculate the five-year average for 1995-99 and variability of current receipts for the 13-year period 1987-99;
 - current payments (goods, services, private transfers) for the five-year period 1995-1999, to calculate the five-year average for 1995-99; and
 - reserves (foreign exchange, gold—valued at SDR 35 per fine ounce, reserve position in the Fund, and SDRs) for the months of 1999, to calculate average 1999 reserves.
- QFRG formula:
 - GDP at current market prices for 1997-99, to calculate average GDP over three years;
 - current receipts for 1987-99 (as above); and
 - net long-term capital inflows for 1987-99, to calculate variability as suggested by the QFRG.

21. **The data base containing these variables would ideally have the following attributes:** it would be comprehensive, i.e., contain all required data for all members; the data would be from official sources; and the data would be comparable across time and countries. It would also be helpful if the database could be updated without major additional use of staff resources.

22. **The *IFS* database has been the main source of data in past quota reviews** because the data have been supplied by the authorities and an effort has been made by the Statistics Department to compile them into series that are consistent across time and countries. However, the *IFS* database is not as comprehensive as needed even for the calculations of the existing five formulas.⁷ In the Eleventh Review of Quotas, *IFS* data were supplemented by

⁶ The specification of the five existing quota formulas may be found in Appendix II.

⁷ The *IFS* database covers 173 of the Fund's 183 members. Not all of the 173 submit complete data, however.

other official data and staff estimates obtained from area departments and TRE staff estimates.⁸ This problem is exacerbated when including capital flow data (Box 1).

Box 1. Capital Flows: Data Problems

In accordance with the fifth edition of the *Balance of Payments Manual (BPM5)*, in the *IFS* investment is classified as long term if it has an original contractual maturity of more than one year or no stated maturity. However, questions have been raised about the validity of the maturity distinction, as the effective maturity of financial instruments is often changed through offsetting transactions, the extent of which is not known and can vary over time and across countries. Classification problems with the maturity distinction also occur. For instance, direct investment in the *IFS* is not uniformly long-term. Included in direct investment are short- and long-term inter-company transactions, which are not separately identified in the *BPM5* standard reporting to the Fund. Data on direct investment also include financial derivatives (normally classified as short-term) relating to claims on and liabilities to affiliated enterprises—these flows, however, are relatively small.

The accuracy of capital flow data in many countries, including those contained in the *IFS* database, is uneven and the statistical detail not sufficient for the quantification of the QFRG formula. Data on capital flows are generally less accurate and comprehensive than the other data used for the quota formulas. This reflects conceptual, classification, and practical difficulties encountered by countries in compiling the data. Institutional and accounting requirements for data compilation differ across countries (for example, the market valuation of direct investment differs across countries),¹ and data availability on the private nonbank sector varies. In the *IFS*, a number of countries do not separate long and short-term flows,² and in many cases only aggregates and not component series are reported.

Capital flow data, particularly on the private nonbank sector, are generally difficult and resource-intensive to compile. The switch from data collection systems based predominantly on government and balance sheet records to systems incorporating large nonbank private sector transactions has been slow. Countries are also adapting their collection and recording procedures to changes in the composition and magnitude of financial transactions, in part to take account of new financial instruments such as derivatives.

¹ See “Report on the Survey of Implementation of Methodological Standards for Direct Investment,” IMF/OECD, March 2000.

² For instance, Canada does not distinguish long- and short-term trade credits and loans, and the United Kingdom reports nearly all loans as short term. The United States classifies all loans and deposits of the banking system, whether long- or short-term, as currency and deposits, which are inherently short term.

⁸ “Eleventh General Review of Quotas—Quota Calculations Based on Data Ended in 1994,” EB/CQuota/97/4, 8/12/97, “Eleventh General Review of Quotas—Quota Calculations Based on 1994 Data,” EB/CQuota/97/7, 11/20/97, and Supplement 1, 12/15/97.

23. **A possible alternative data source, the World Economic Outlook (WEO) database, contains data that are not official and that are not as comparable across countries as *IFS* data.** Definitions of WEO data series also do not always correspond to definitions of variables in the quota formulas.⁹ WEO data were not used in the final stage of the data work for the Eleventh Review, except insofar as area departments submitted them to fill gaps in *IFS*.

24. **Due to these concerns, in this paper *IFS* data are used for the quota database.**¹⁰ Gaps in *IFS* data can, to some extent, be filled and, in any case, members without sufficient data are excluded from the quota calculations in the present paper. The alternative of attempting to adjust WEO data to conform to the requirements imposed by the quota formulas (official status, data definitions) would not be feasible. Staff considered other databases but did not identify any with the desired attributes.¹¹

25. **While data for 1999 in *IFS* are not yet as complete as for 1998, differences are not substantial enough to warrant ending the data series in 1998 instead of 1999.** Advantages of using data ending in 1999 instead of 1998 include the facts that the results of calculations will more accurately represent the most current economic situation of members and that the comparability of the results with those in future staff papers is improved.

26. The following two sections discuss the capital flow and other required data in some detail.

A. Net Long-Term Capital Flows

27. **The QFRG defined net long-term capital inflows as the sum of the following balance of payments standard functional categories on a net basis.**¹²

- direct investment;
- portfolio investment, specifically equity securities and bonds and notes; and

⁹ The WEO database contains current official transfers on a net basis, while the separate credit and debit items are required for the derivation of current receipts and payments in the traditional quota formulas.

¹⁰ The “*IFS*” database in this paper also includes the data base for the *Balance of Payments Statistics Yearbook*.

¹¹ A secondary potential source of information on long-term capital flows is the BIS, but its databases are less suitable for deriving the QFRG capital flow variable. The BIS international securities database provides information on long-term capital flows in the form of debt securities. However, the BIS database on international banking statistics, containing data on capital flows associated with deposits with and borrowing from banks abroad, does not provide a maturity breakdown.

¹² Net inflows are inflows minus outflows. The QFRG’s definition of net long-term capital inflows is provided in “External Review of the Quota Formulas—Annex,” EBAP/00/52, Supplement 1, 5/1/00, Note 8.

- other long-term investment, specifically long-term trade credits and long-term loans.
28. **The QFRG suggested extending “the existing measure of variability of current receipts [...] to take account of the increasing importance of long-term capital flows in countries’ external financing, by adding to current receipts net inflows of long-term capital.”** Variability has been defined in the present quota formulas as the standard deviation of current receipts from a five-year (moving) average over a 13-year period. For consistency, net long-term capital inflows are thus needed for a recent period of 13 years (i.e., 1987-1999).
29. **Because of a paucity of data in *IFS* for many members, the QFRG formula can currently only be computed for a subset of members.** Data availability is relatively better for direct investment and portfolio investment than for the other required series (long-term trade credits and loans).
- Approximately half of the members report data to *IFS* on **direct investment** in their economies over the entire required 13-year period, while another one eighth have at least six years of data.¹³ About 40 percent of members have data on direct investment abroad. About a third of members have one to six years of data on direct investment in their economies and abroad for 1987-99.
 - About one in four members report data to *IFS* on **equity securities and bonds and notes** for 1987-99, while less than 20 percent of members report at least six years of data. About 40 percent report data for a period between one to six years, and about 10 percent report no data.¹⁴
 - A small fraction of members report complete data to *IFS* on **long-term trade credits** for 13 years, and a large number report no such data. About 15 percent of members report data to *IFS* on **long-term loans** for 1987-99.¹⁵ More than half of members report no data to *IFS* for long-term loans on the asset side of the balance sheet, while on the liabilities side no country reports complete data for 1987-99. However, most members report data for periods between six and 13 years.
30. **Taking into account the above, staff judges that sufficient *IFS* capital flow data for the quantification of the QFRG’s quota formula are available for 74 members.** The

¹³ With at least six years of data it may become possible to estimate the missing data with some accuracy.

¹⁴ A few countries, such as India and Greece, do not report bond liabilities to the *IFS* even though BIS data indicate that they issue international bonds.

¹⁵ Excluding the category “monetary authorities,” where coverage of long-term loans is particularly sparse. This may reflect the fact that assets of monetary authorities are normally included in reserves.

following procedure to derive the QFRG's net long-term capital inflows and the subset of the membership for which it is available was followed:

- Four series were derived for all countries that report data to the *IFS*: inward and outward direct investment, portfolio investment, and other long-term investment (on the basis of the QFRG's definition). Each of these four series is the aggregate of its respective component series. Where dots (...) appear in the component series, which signify that data are either not available, zero, or insignificant, zeros were substituted.¹⁶
- Those members that had non-zero data in overall net long-term capital inflow after summing the four constituent series were included in the sample. This resulted in a sample of 74 countries that broadly represents the membership.¹⁷ For these members, data are available in most of the component series, and in some cases the absence of data makes economic sense (for example, several developing countries reported zeros for outward direct investment and portfolio investment).
- In addition, for the few countries where zeros appear in any of the four constituent series that could not be justified, estimates were made based on available WEO data. The estimation technique, or gap filling, extrapolates from nearby non zero data based on growth rates in comparable (but not necessarily identical) WEO series.¹⁸ Relatively few data gaps were filled in this manner.¹⁹

B. Other Data

31. Other *IFS* data for the 74 selected countries that are required for the quantification of the existing five formulas and the QFRG formula are mostly complete. There are some missing data for GDP and the current account for recent years and, as in the

¹⁶ For Canada and the United Kingdom, total loans instead of long-term loans were used to derive other long-term investment (see Box 1, footnote 2).

¹⁷ China was not included because of a lack of data on capital flows between the mainland and Hong Kong SAR, which would have to be netted out of the mainland's and Hong Kong's capital flows to be able to derive China's external capital flows. Belgium and Luxembourg were not included because the lack of data on capital flows between them prevents the derivation of their individual external capital flows from the combined series reported to *IFS*.

¹⁸ This method has been used to fill gaps in series for the purpose of publishing world and regional summary tables in the *Balance of Payments Statistics Yearbook (BOPSY)*, Part 2, and the *IFS*.

¹⁹ Zero values for capital flows in transition countries through the early 1990s were not changed.

past, current receipts data for early years in the case of transition countries are not available in *IFS*.²⁰ Required data on reserves were complete for the 74 countries.²¹

Box 2. Revisions in *IFS* Methodology

The *System of National Accounts 1993 (1993 SNA)* extended the scope of GDP slightly, resulting in an increase in reported GDP levels of up to five percent. By the beginning of 2001, about 50 countries had adopted the *1993 SNA* for reporting GDP data to the *IFS*. Some of them have revised historical data. The size of data inconsistencies across countries due to the revisions related to *1993 SNA* is likely to be smaller than other differences related to known measurement problems with GDP.

The Operational Guidelines for the *Data Template on International Reserves and Foreign Currency Liquidity* issued in 1999 clarify existing concepts on international reserves and provide guidelines for reporting the data on a consistent basis across countries. The quantitative effect of improved reporting practices is not known but likely to be small for 1999 reserves data.

The fifth edition of the *Balance of Payments Manual* also introduced new statistical definitions, particularly on derivatives. Countries are at different stages of implementing the various revisions in methodology.

32. As in the case of capital flow data, gaps were filled by estimating the data on the basis of (trends in) the corresponding WEO series, and two other adjustments were made.

- Gaps in current receipts through the early 1990s in transition countries without comparable WEO data for that period were filled by using their current receipts data from the Eleventh Review.
- GDP data for Slovenia and Spain were adjusted to reflect recent data made available by the authorities through area departments.

33. Reexports (“entrepôt trade”) have been excluded from current receipts and payments, for those countries among the 74 that were so adjusted in the Eleventh

²⁰ For GDP, *IFS* lacked data for 1999 for nine countries and for 1997-99 for another four countries. For current receipts and payments, *IFS* lacked data for two countries for 1999 and for another two countries for 1998-99. In addition, four transition countries lacked *IFS* data on current receipts and payments through the early 1990s.

²¹ Several changes have been made in recent years to *IFS* methodology that may have resulted in slight breaks in series (Box 2). The new methodologies have only been partially adopted by the membership, and it is not feasible to adjust the data so that they are defined consistently across countries.

Review.²² However, no adjustment for international banking interest has been made at this time due to the general lack of readily available data.

34. **Appendix Table 2 includes the data that were used in the QFRG formula calculations, and Appendix Table 3 the traditional data.** The tables are based on 1987-99 data that were available in January 2001.

²² Bahrain, El Salvador, Israel, Malta, Mexico, Panama, Singapore, and Switzerland. See “Eleventh General Review of Quotas—Preliminary Quota Calculations,” EB/CQuota/95/1, 8/10/95, and references in footnote 9.

Table I. Illustrative Quota Calculations for 74 Fund Members

(In percent)

	Calculated Quota Shares, Latest Data 1/				
	Current Quota Shares 3/	Calculated 11th Review Quota Shares 4/	Traditional five formulas 5/	QFRG formula 2/	
				GDP: 2/3 Variability: 1/3	GDP: 1/3 Variability: 2/3
(1)	(2)	(3)	(4)	(5)	
Albania	0.023	0.016	0.018	0.017	0.024
Argentina	0.991	0.634	0.626	0.974	1.002
Australia	1.514	1.192	1.165	1.206	1.153
Austria	0.876	1.268	1.182	0.704	0.732
Bahamas, The	0.061	0.035	0.029	0.016	0.020
Bahrain	0.063	0.107	0.185	0.323	0.626
Bangladesh	0.250	0.088	0.095	0.092	0.070
Barbados	0.032	0.022	0.017	0.009	0.010
Bolivia	0.080	0.028	0.027	0.027	0.027
Brazil	1.421	1.360	1.177	2.139	1.980
Bulgaria	0.300	0.190	0.123	0.120	0.202
Burundi	0.036	0.006	0.003	0.003	0.004
Canada	2.980	3.242	2.908	1.975	1.913
Chile	0.401	0.254	0.311	0.286	0.339
Colombia	0.362	0.241	0.233	0.334	0.352
Czech Republic	0.383	0.316	0.455	0.262	0.350
Denmark	0.769	0.991	1.184	1.223	1.887
Egypt	0.442	0.374	0.299	0.342	0.405
El Salvador	0.080	0.035	0.044	0.037	0.035
Fiji	0.033	0.020	0.018	0.008	0.011
Finland	0.591	0.630	0.630	0.432	0.452
France	5.025	5.534	4.917	4.760	4.944
Germany	6.087	8.934	7.989	7.443	7.991
Greece	0.385	0.380	0.360	0.318	0.239
Guatemala	0.098	0.047	0.052	0.050	0.041
Hungary	0.486	0.299	0.364	0.206	0.258
Iceland	0.055	0.036	0.033	0.027	0.029
India	1.946	0.756	0.908	1.129	0.903
Indonesia	0.973	0.785	0.793	0.542	0.602
Ireland	0.392	0.604	1.179	0.607	0.931

Table I. Illustrative Quota Calculations for 74 Fund Members

(In percent)

	Calculated Quota Shares, Latest Data 1/				
	Current Quota Shares 3/	Calculated 11th Review Quota Shares 4/	Traditional five formulas 5/	QFRG formula 2/	
				GDP: 2/3 Variability: 1/3	GDP: 1/3 Variability: 2/3
(1)	(2)	(3)	(4)	(5)	
Israel	0.434	0.382	0.439	0.279	0.230
Italy	3.301	4.147	3.776	4.569	5.324
Japan	6.229	10.121	8.857	11.826	10.281
Jordan	0.080	0.079	0.073	0.027	0.031
Kazakistan	0.171	0.188	0.312	0.298	0.534
Kenya	0.127	0.050	0.042	0.036	0.036
Korea	0.764	1.646	1.990	1.330	1.364
Kuwait	0.646	0.515	0.409	0.266	0.440
Latvia	0.059	0.046	0.046	0.028	0.037
Malaysia	0.696	1.020	1.358	0.416	0.560
Maldives	0.004	0.004	0.006	0.002	0.003
Malta	0.048	0.057	0.053	0.035	0.058
Mauritius	0.048	0.036	0.034	0.016	0.019
Mexico	1.210	1.318	1.180	1.164	0.922
Morocco	0.275	0.167	0.153	0.113	0.114
Nepal	0.033	0.018	0.019	0.015	0.015
Netherlands	2.416	2.808	3.035	1.388	1.547
New Zealand	0.419	0.260	0.240	0.197	0.210
Norway	0.782	0.947	0.841	0.436	0.382
Pakistan	0.484	0.206	0.174	0.174	0.146
Panama	0.097	0.068	0.052	0.086	0.143
Papua New Guinea	0.062	0.042	0.038	0.022	0.031
Peru	0.299	0.156	0.160	0.281	0.381
Philippines	0.412	0.337	0.606	0.355	0.468
Poland	0.641	0.483	0.621	0.644	0.791
Portugal	0.406	0.554	0.529	0.376	0.405
Romania	0.482	0.226	0.189	0.151	0.181
Russia	2.782	1.828	1.360	1.702	2.442
Rwanda	0.037	0.006	0.005	0.007	0.007
Samoa	0.005	0.002	0.002	0.001	0.001

Table I. Illustrative Quota Calculations for 74 Fund Members

(In percent)

	Current Quota Shares 3/	Calculated 11th Review Quota Shares 4/	Calculated Quota Shares, Latest Data 1/		
			Traditional five formulas 5/	QFRG formula 2/	
				GDP: 2/3 Variability: 1/3	GDP: 1/3 Variability: 2/3
(1)	(2)	(3)	(4)	(5)	
Saudi Arabia	3.269	1.302	0.994	0.633	0.818
Seychelles	0.004	0.004	0.005	0.003	0.004
Singapore	0.404	1.517	1.783	0.482	0.681
Slovenia	0.108	0.141	0.165	0.093	0.123
Solomon Islands	0.005	0.004	0.003	0.002	0.003
South Africa	0.874	0.442	0.414	0.411	0.378
Spain	1.427	2.063	2.020	2.395	2.901
Sri Lanka	0.193	0.078	0.076	0.053	0.055
Sweden	1.121	1.252	1.445	1.133	1.494
Switzerland	1.618	1.582	1.520	1.110	1.379
Thailand	0.506	0.855	0.922	0.513	0.610
Turkey	0.451	0.528	0.712	0.709	0.783
United Kingdom	5.025	4.951	6.331	5.117	5.723
United States	17.383	17.111	17.657	23.464	18.388
Total	82.970	87.971	87.971	87.971	87.971

Source: Staff calculations.

1/ Shares have been adjusted proportionally so that they sum to the total in column (2).

2/ In column (4), calculated quota share = 2/3 GDP + 1/3 variability. Weights reversed in column (5).

3/ The total used for the derivation of shares includes, for the members that have not yet consented to their 11th Review quota increase, their 11th Review proposed quota.

4/ The total used for the derivation of shares includes the 11th review calculated quota for members that have not yet consented to their quota increase, and China's calculated quota as calculated by staff for its recent ad hoc increase.

5/ See Appendix II.

Table 2. Data Used for the Quota Calculations with Traditional Formulas

(In millions of SDRs)

	GDP (1999)	Reserves (1999)	Current Receipts (1995-99)	Current Payments (1995-99)	Variability of Current Receipts (1987-99)
Albania	2,688.6	263.0	582.3	737.1	112.8
Argentina	206,982.6	17,433.4	24,482.0	31,773.3	1,116.4
Australia	288,149.1	11,582.5	59,397.0	71,881.1	3,256.4
Austria	152,249.5	11,572.5	72,796.6	75,508.1	2,760.2
Bahamas, The	2,921.3	315.0	1,455.7	1,851.2	85.1
Bahrain	4,841.8	960.3	6,373.9	6,487.5	977.3
Bangladesh	26,702.0	1,170.4	5,147.9	5,792.2	132.1
Barbados	1,779.1	240.3	980.7	995.8	40.0
Bolivia	6,115.8	630.6	1,071.5	1,569.6	82.1
Brazil	387,237.7	28,162.8	44,567.6	63,226.0	2,064.0
Bulgaria	9,070.8	1,936.9	4,700.7	4,793.5	648.3
Burundi	586.0	45.5	68.7	131.1	14.9
Canada	471,537.2	18,678.9	190,656.3	194,432.9	5,230.7
Chile	49,482.3	10,866.2	14,798.3	16,857.6	762.3
Colombia	63,367.5	6,189.7	10,571.0	13,535.3	393.2
Czech Republic	38,779.6	8,926.7	23,486.6	25,148.9	1,316.1
Denmark	127,461.1	15,650.6	60,650.6	58,764.5	4,293.1
Egypt	67,691.7	12,147.7	13,735.5	15,179.1	840.1
El Salvador	9,112.6	1,420.5	2,381.1	2,545.3	86.3
Fiji	1,238.0	297.1	859.4	884.3	62.0
Finland	94,834.0	5,929.9	37,587.0	32,476.5	2,046.5
France	1,008,337.4	30,894.9	309,727.4	283,330.0	14,028.2
Germany	1,544,592.7	48,385.9	495,544.7	487,247.4	19,323.5
Greece	91,279.7	15,020.8	14,166.0	20,747.6	413.2
Guatemala	13,227.5	884.3	2,743.6	3,276.5	72.5
Hungary	35,406.3	7,070.1	17,773.1	19,119.9	1,122.2
Iceland	6,315.2	326.9	2,031.0	2,220.2	55.9
India	317,784.5	22,924.1	40,394.4	44,066.4	1,359.4
Indonesia	100,099.2	18,807.4	42,015.9	43,461.5	2,018.5
Ireland	68,317.0	3,884.9	61,714.2	60,744.8	4,386.6
Israel	73,749.8	16,149.1	22,805.3	27,886.2	323.6
Italy	856,397.2	18,916.5	251,662.9	230,324.2	9,110.7
Japan	3,180,648.1	182,273.8	482,154.5	409,147.0	13,025.1
Jordan	5,459.9	1,704.9	3,838.2	4,106.5	129.0
Kazakhstan	11,044.2	943.4	4,944.6	5,449.1	2,984.4

Table 2. Data Used for the Quota Calculations with Traditional Formulas

(In millions of SDRs)

	GDP (1999)	Reserves (1999)	Current Receipts (1995-99)	Current Payments (1995-99)	Variability of Current Receipts (1987-99)
Kenya	7,788.5	514.4	2,433.3	2,679.1	91.4
Korea	297,620.0	45,998.3	119,096.8	114,798.2	3,819.5
Kuwait	21,701.9	3,197.2	14,976.8	11,050.3	2,698.4
Latvia	4,577.3	600.8	2,079.2	2,397.2	175.9
Malaysia	57,583.6	21,732.5	65,677.2	65,052.4	2,462.2
Maldives	317.3	96.7	284.8	321.5	8.8
Malta	2,652.4	1,241.4	2,189.6	2,558.3	176.7
Mauritius	3,092.5	467.8	1,979.0	2,002.2	86.3
Mexico	353,638.3	23,248.2	58,856.5	64,906.7	2,195.2
Morocco	25,595.8	3,682.5	8,710.4	8,952.3	301.8
Nepal	3,639.3	582.4	979.8	1,242.8	27.3
Netherlands	290,322.6	8,681.8	201,049.4	181,894.0	7,572.6
New Zealand	39,390.8	2,936.6	13,002.3	15,761.7	547.1
Norway	111,856.2	13,466.8	47,071.2	42,581.3	2,691.9
Pakistan	43,567.4	1,273.7	9,536.3	11,215.4	351.6
Panama	6,989.3	707.6	2,893.2	3,489.8	99.0
Papua New Guinea	3,031.1	93.7	1,893.6	1,821.1	155.3
Peru	38,014.0	6,763.5	6,441.4	8,705.2	360.6
Philippines	56,062.5	9,095.6	30,767.2	30,844.8	2,008.0
Poland	113,755.1	18,608.7	30,709.6	34,882.7	1,495.9
Portugal	82,833.5	6,953.8	29,473.1	34,627.1	1,181.3
Romania	24,886.3	1,862.1	7,436.9	8,995.7	932.3
Russia	135,028.3	5,909.6	69,876.4	63,028.1	5,906.6
Rwanda	1,392.2	113.0	102.2	286.7	19.2
Samoa	161.9	45.8	87.8	96.8	5.3
Saudi Arabia	101,939.1	11,012.6	43,434.8	46,089.6	4,556.9
Seychelles	432.0	18.6	265.2	332.0	12.7
Singapore	62,126.8	54,448.6	78,855.7	66,206.3	3,580.5
Slovenia	14,635.2	2,487.1	7,983.5	8,070.5	590.3
Solomon Islands	266.5	39.1	168.3	188.1	7.5
South Africa	95,237.5	3,892.5	25,616.2	26,313.1	751.4
Spain	438,776.0	28,529.6	124,235.9	122,860.3	4,350.6
Sri Lanka	11,537.8	1,275.7	4,534.3	4,924.5	136.4
Sweden	174,562.0	10,788.4	84,916.9	79,143.4	4,385.0
Switzerland	189,382.7	29,131.6	103,631.7	84,773.8	2,979.3

Table 2. Data Used for the Quota Calculations with Traditional Formulas

(In millions of SDRs)

	GDP (1999)	Reserves (1999)	Current Receipts (1995-99)	Current Payments (1995-99)	Variability of Current Receipts (1987-99)
Thailand	90,678.6	22,542.7	53,120.6	53,475.4	1,644.4
Turkey	145,296.7	16,439.2	37,953.0	39,233.0	1,982.4
United Kingdom	1,055,029.4	23,110.6	385,571.7	388,565.5	16,511.2
United States	6,801,062.9	55,025.8	816,670.4	936,677.9	27,745.9

Sources: International Financial Statistics; and staff estimates.

Table 3. Data Used for QFRG Formula Calculations

	Average GDP (1997-99)		Variability of Current Receipts and Net Long-Term Capital Inflows (1987-99)	
	Millions of SDRs	Percent share 1/	Millions of SDRs	Percent share 1/
Albania	2,201.0	0.011	124.8	0.036
Argentina	213,272.9	1.075	4,048.7	1.171
Australia	284,211.2	1.432	4,318.4	1.249
Austria	152,644.1	0.769	2,983.0	0.863
Bahamas, The	2,711.8	0.014	94.9	0.027
Bahrain	4,671.6	0.024	3,647.6	1.055
Bangladesh	25,652.8	0.129	190.7	0.055
Barbados	1,697.5	0.009	43.3	0.013
Bolivia	6,054.7	0.031	105.9	0.031
Brazil	518,236.0	2.612	7,154.9	2.070
Bulgaria	8,499.1	0.043	1,117.7	0.323
Burundi	644.8	0.003	16.2	0.005
Canada	459,467.2	2.315	7,275.2	2.105
Chile	52,686.7	0.265	1,537.9	0.445
Colombia	71,311.6	0.359	1,455.2	0.421
Czech Republic	39,369.4	0.198	1,722.5	0.498
Denmark	125,953.6	0.635	10,023.2	2.900
Egypt	62,864.6	0.317	1,839.9	0.532
El Salvador	8,677.5	0.044	128.8	0.037
Fiji	1,320.9	0.007	50.5	0.015
Finland	93,049.7	0.469	1,851.1	0.536
France	1,032,125.8	5.201	20,148.6	5.829
Germany	1,555,553.1	7.839	33,551.5	9.706
Greece	89,623.8	0.452	630.0	0.182
Guatemala	13,372.4	0.067	126.9	0.037
Hungary	34,440.3	0.174	1,222.9	0.354
Iceland	5,897.3	0.030	118.5	0.034
India	305,777.3	1.541	2,657.0	0.769
Indonesia	108,768.4	0.548	2,598.8	0.752
Ireland	64,046.6	0.323	4,928.0	1.426

Table 3. Data Used for QFRG Formula Calculations

	Average GDP (1997-99)		Variability of Current Receipts and Net Long-Term Capital Inflows (1987-99)	
	Millions of SDRs	Percent share 1/	Millions of SDRs	Percent share 1/
Israel	73,919.8	0.372	713.7	0.206
Italy	860,304.6	4.335	23,887.8	6.911
Japan	3,016,417.3	15.200	34,324.3	9.930
Jordan	5,305.2	0.027	137.1	0.040
Kazakhstan	14,014.9	0.071	3,022.6	0.874
Kenya	7,984.7	0.040	145.0	0.042
Korea	292,552.3	1.474	5,488.6	1.588
Kuwait	20,730.0	0.104	2,412.4	0.698
Latvia	4,387.1	0.022	181.2	0.052
Malaysia	61,281.6	0.309	2,769.9	0.801
Maldives	291.2	0.001	12.2	0.004
Malta	2,554.5	0.013	317.7	0.092
Mauritius	3,027.2	0.015	88.3	0.026
Mexico	317,106.6	1.598	2,669.9	0.772
Morocco	25,391.1	0.128	453.2	0.131
Nepal	3,619.1	0.018	54.7	0.016
Netherlands	277,074.7	1.396	6,704.3	1.940
New Zealand	41,660.0	0.210	875.0	0.253
Norway	110,288.2	0.556	1,291.6	0.374
Pakistan	45,652.8	0.230	463.5	0.134
Panama	6,723.4	0.034	784.7	0.227
Papua New Guinea	3,132.2	0.016	154.7	0.045
Peru	40,963.5	0.206	1,886.1	0.546
Philippines	54,729.2	0.276	2,282.9	0.660
Poland	111,952.9	0.564	3,687.9	1.067
Portugal	78,547.3	0.396	1,701.4	0.492
Romania	27,039.4	0.136	832.1	0.241
Russia	217,076.6	1.094	12,504.1	3.617
Rwanda	1,412.7	0.007	27.7	0.008
Samoa	162.7	0.001	5.9	0.002

Table 3. Data Used for QFRG Formula Calculations

	Average GDP (1997-99)		Variability of Current Receipts and Net Long-Term Capital Inflows (1987-99)	
	Millions of SDRs	Percent share 1/	Millions of SDRs	Percent share 1/
Saudi Arabia	101,014.7	0.509	3,939.4	1.140
Seychelles	424.0	0.002	17.1	0.005
Singapore	63,966.5	0.322	3,457.9	1.000
Slovenia	14,101.6	0.071	603.5	0.175
Solomon Islands	282.6	0.001	14.6	0.004
South Africa	100,366.6	0.506	1,353.1	0.391
Spain	426,030.7	2.147	13,388.2	3.873
Sri Lanka	11,374.5	0.057	225.6	0.065
Sweden	174,144.1	0.878	7,287.9	2.108
Switzerland	189,683.5	0.956	6,478.4	1.874
Thailand	94,123.3	0.474	2,773.5	0.802
Turkey	143,087.6	0.721	3,367.1	0.974
United Kingdom	1,017,683.7	5.128	24,865.7	7.193
United States	6,437,958.8	32.442	52,306.5	15.132
Total	19,844,348.8	100.000	345,672.2	100.000

Sources: International Financial Statistics; and staff estimates.

1/ Note that these shares sum to 100 percent while QFRG calculated quota shares presented in Appendix Table 1 sum to less than 100 percent (see footnote 1 of that table.)

TRADITIONAL QUOTA FORMULAS

The traditional five quota formulas, with the Bretton Woods formula listed first, are:

$$(0.01Y + 0.025R + 0.05P + 0.2276VC)(1 + C/Y)$$

$$(0.0065Y + 0.0205125R + 0.078P + 0.4052VC)(1 + C/Y)$$

Adjustment factor:²³ 0.831228

$$(0.0045Y + 0.03896768R + 0.07P + 0.76976VC)(1 + C/Y)$$

Adjustment factor:²³ 0.808677

$$0.005Y + 0.042280464R + 0.044(P + C) + 0.8352VC$$

Adjustment factor:²³ 0.911391

$$0.0045Y + 0.05281008R + 0.039(P + C) + 1.0432VC$$

Adjustment factor:²³ 0.920001

Where: Y = GDP at current market prices for 1999

R = Twelve-month average of gold and foreign exchange reserves, including SDR holdings and reserve positions in the Fund for 1999

P = Annual average of current payments (goods, services, income, and private transfers) for the period 1995-1999

C = Annual average of current receipts (goods, services, income, and private transfers) for the period 1995-1999

VC = Variability of current receipts, defined as one standard deviation from the five-year moving average centered on the third year, for the period 1987-1999²⁴

The calculated quota is the higher of the Bretton Woods calculation and the average of the lowest two of the remaining four calculations (after adjustment).

²³ The result of the calculation is multiplied by the adjustment factor so that the sum of the calculation for the 74 members equals the sum of the Bretton Woods calculation for the 74 members.

²⁴ Variability in the QFRG formula is defined in the same way, except that net long-term capital inflows are added to current receipts.