REPORT TO THE IMF EXECUTIVE BOARD OF THE QUOTA FORMULA REVIEW GROUP

STATISTICAL APPENDIX – PART A

May 1, 2000

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SECTION I. EXISTING AND ALTERNATIVE DATA SETS FOR USE IN QUOTA FORMULAS

A. Introduction

1. This statistical appendix presents the data used in the estimation and analysis of alternative quota formulas suggested by the QFRG. Annual data up to 1994 have been compiled for 183 countries who participated in the Eleventh Quota Review to form the statistical database used in the estimation of alternative quota formulas. The IMF *International Financial Statistics*, and *Balance of Payments* databases comprise the major sources of data, supplemented by the IMF *World Economic Outlook* and IMF staff estimates. All data have been converted, where applicable, into millions of SDRs. A general description of the data, organized by major economic concepts, is presented below. This is followed by statistical data tables showing data for individual countries, sorted by actual (proposed) Eleventh Review quotas in descending order, along with a correlation matrix of certain variables.

B. Eleventh Review of Quotas

2. The dependent variable (Q) used in all quota formula estimations is the proposed or actual quota from the Eleventh Quota Review. Please refer to *Financial Organization and Operations of the IMF*, Pamphlet Series No. 45, Fifth Edition, pages 24–27, for an overview of the methodology used in the determination of quotas. The then-existing quota (QL) would be, in most cases, the proposed or actual quota from the Ninth Review. The calculated quota (CQ) is derived as the higher of the results of: (1) the reduced Bretton Woods formula and (2) the average of the lowest two results of four other formulas containing the same variables but with larger weights for external trade and variability of exports.

C. Measures of Output and Population

3. Five different measures of GDP/GNP were considered in the estimation of quota formulas. The "standard" GDP measure used in the Eleventh Quota Review is 1994 GDP (Y) measured at market exchange rates. Alternative national output measures include:

- Five-year (1990–94) average of GDP (YAVG),
- GDP valued at purchasing power parities (PPP) in a recent year (1994),
- Five-year (1990–94) average of GDP using a centered, five-year moving average of annual exchange rates as a conversion factor (YM5X), and
- GNP converted using the World Bank Atlas Method (YATL).

4. The major source for GDP and exchange rate data is the IMF *International Financial Statistics* database. The data source for PPP-based GDP is the IMF *World Economic Outlook* database, and the World Bank's *Global Development Indicators* database is the source for 1994 GNP converted using the World Bank Atlas Method. In cases where there is a lack of reliable alternative measures of GDP, the 1994 GDP (Y) measure is usually substituted. Population (POP) is a country's 1994 population measured in millions of persons.

D. Measures of Reserves and Current Account Data

5. The standard reserves variable (R) used in the Eleventh Quota Review is a twelve-month average of gold (valued at SDR 35 per fine ounce) and foreign exchange reserves, including SDR holdings, reserve positions in the Fund, and ECUs for 1994. An alternative measure used is reserves with gold measured at market prices (RESM). This is computed as a twelve-month average of gold (valued at market prices in 1994, with monthly prices ranging from SDR 261.02 per fine ounce to SDR 273.82 per fine ounce) and foreign exchange reserves, including holdings, reserve position in the Fund and ECUs for 1994.

6. Current Receipts (C) is the 1990–94 average of the sum of goods (exports f.o.b.), services (credit), income (credit), and private current transfers (credit) divided by the average SDR value for the same years. Current Payments (P) is the 1990–94 average of the sum of goods (imports, f.o.b.), services (debit), income (debit), and private current transfers (debit); divided by the average SDR value for the same years. Trade (TRADE) is measured as the average of current receipts and current payments.

E. Variability Measures, Capital Flows, and Debt

7. Several measures of variability were considered in the estimation of alternative quota formulas. The standard variability measure in the Eleventh Review uses the variability of current receipts (VC) which is defined as one standard deviation of current receipts from its five-year moving average centered on the third year, for the period 1982–94. Another measure captures the variability of both current receipts and capital and financial account credits (VCK), also defined as one standard deviation from its five-year moving average centered on the third year, for the period 1982–94. The variability of real effective exchange rates (VREC) (Source: IMF Information Notice System) is defined in terms of the deviation of the real effective exchange rate from a normal level, represented by a five-year moving average centered on the middle year.

8. Normal net capital flow is proxied by a four-year average of net private capital flows and includes errors and omissions for the period 1991–94.

9. Total external debt (DEBT) is defined as debt owed to non-residents repayable in foreign currency, goods, and services. Short-term external debt (STDEBT) for most developing countries was obtained from the BIS-IMF-OECD-World Bank (BIOW) database.

The World Bank's *Global Development Finance* (GDF) database was used for developing countries for which data were not available from the BIOW. For the industrial countries, the Bank for International Settlements database was used.

F. Qualitative and Dummy Variables

10. A capital market accessibility (KMACC) classification was used to derive an Openness Index. This classification (KMACC) ranks each country's ability to access capital markets on a 1 to 4 scale, with a 1 given to countries with the easiest access, and a 4 given to those with the least access. The Openness Index (OPEN) has the reverse scale (computed as 1+ (5 – KMACC)).

11. Some dummy variables were not used directly as explanatory variables but were created in order to select sub-samples for estimation. NOTBW is a 0–1 dummy variable, which equals 1 if a country's calculated quota is based on a variant of the Bretton Woods Formula. Similarly, MEM20 equals 1 if the member joined the Fund in the past twenty years. Also, DDEV is a 0–1 dummy variable, which equals 1 if a country is classified as either a developing country or a transitional economy.

12. According to the WEO country classifications, advanced economies include the industrial countries of North America and Europe, Japan, and two newly industrialized Asian economies (Korea and Singapore). The countries in transition include the 15 members that were formerly part of the Soviet Union, the successor countries to the former Yugoslavia and Czechoslovakia, Albania, Hungary, Poland, Romania, and Mongolia. The rest of the members are classified as developing countries. Furthermore, San Marino, Palau, and the Marshall Islands are not currently classified by the WEO. We have classified San Marino as an industrial country, and Palau and Marshall Islands as developing countries.

13. The next section presents statistical data tables for the 183 countries that participated in the Eleventh Review of Quotas, organized along the same economic concepts presented above.