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Reform of Quota and Voting Shares in the International Monetary Fund: "Nothing" Is Temporarily Preferable to an Inadequate "Something"

Ralph C. Bryant

Brookings Institution

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Introduction and Summary

A prosperous, stable world economy is in the self interest of every nation—large or small, rich or poor. The International Monetary Fund (IMF) is a worldwide intergovernmental institution that can facilitate that prosperity and stability. Because every nation has a stake, each should participate in the IMF's governance and operations. The value to each nation of an effective IMF increases as the world economy and financial system become more integrated.

Effective international institutions typically cannot operate with *one-nation-one-vote* governance (as is used, for example, in the General Assembly of the United Nations). It is a strength of the IMF that its existing governance structure accords *weighted votes* to individual nations. A large nation has, other things equal, a larger stake and greater responsibilities in the IMF than a small nation. Hence the large nation has, appropriately, a larger vote share.

As the world economy and financial system evolve, however, the weighted votes must adapt to reflect changes in the relative importance of nations. At the September 2006 annual meetings of the IMF and World Bank, governments took a small "first-round" step in tackling this thorny question. Quotas, and hence voting shares, were adjusted upwards by small, ad hoc amounts for four countries (China, Korea, Mexico, and Turkey). Governments also promised, much more ambitiously, that—no later than the annual meetings in September 2008—they would agree on a simpler and more transparent formula for rebalancing the quotas and voting rights for all

member nations. That formula was to be a foundation for a comprehensive "second round" of adjustments in quotas and vote shares.

Progress toward a satisfactory agreement has been meager. At the October 2007 annual meetings, negotiations about a rebalancing formula appeared close to stalling out.

As the year 2007 came to an end, many participants nonetheless seemed to believe that a compromise of some sort on a second-round of quota and vote adjustments could, and should, be reached by the time of the April 2008 spring meetings. The envisaged compromise would include an expansion in aggregate IMF quotas of only 10 to 12-1/2 percent and only a modest increase in the basic votes of member countries. A satisfactory revised formula would not be part of the compromise. Rather, the quotas and votes of individual nations would be adjusted with ad hoc devices inconsistent with a rebalancing formula that would be adequate and viable for the longer-run future of the IMF. The envisaged compromise package would also address issues about the IMF's budget (for example, paring back expenditures and enhancing revenue sources).

Section I of this paper summarizes a first-best approach for periodic reviews of IMF quotas and voting shares, emphasizing the issues at stake in the design of a rebalancing formula. I concentrate on the formula because, though aspects of the subject are technical, adopting a better formula is the single most important requirement for successful governance reform for the IMF (and World Bank). The second section of the paper assesses the status of the international negotiations as of the beginning of 2008 and criticizes the inadequate compromise currently on the table. Section III identifies a more

promising way forward for compromising on a quota formula and other aspects of governance reform closely linked to the quota-formula issues. Finally, I ask whether the world community would be better served in April 2008 by adopting the current-status compromise on governance reform or, alternatively, by accepting a short-run failure followed by re-started efforts to reach a more satisfactory compromise.

My overall conclusions are pessimistic. The largest member nations—most notably the United States, Canada, Japan, the European countries in the G-7, and the largest emerging-market countries such as China, India, Korea, Brazil, and Mexico—have the greatest self interest of any countries in supporting a viable and effective IMF. Most unfortunately, today they are *not* adopting a farsighted view of their interests. Consequently they are *not* encouraging an ambitious enough reform of governance procedures for the IMF. In effect they are treating the current international negotiations about quota and voting shares as a zero-sum game. Member nations who would experience a decline in quota and voting shares are perceiving the declines as an unambiguous loss, and vice versa for those who would receive share increases. A fundamental truth is underemphasized if not ignored completely: reforming IMF governance is a *positive-sum* game. Individual member nations badly need to rise above the perception that reform is a zero-sum game and instead emphasize features of the reform that advance the collective interest of all members.

The current-status compromise envisaged for April 2008 is inadequate, in particular the quota formula to serve as a foundation for determining quota and voting shares. In the absence of various gimmicks that have been

proposed to mask the inadequacy of the underlying formula, the variant suggestions now on the table produce an outcome that is *markedly less acceptable than the quota and voting shares in force as of today*. Minor alterations in the current-status formula cannot produce a quota-share compromise that is satisfactory for the present negotiations. Nor is such a formula plausible and sustainable for the future. Worse still, the unsatisfactory formula currently on the table cannot deliver acceptable results *even when aggregate IMF quotas and basic votes are generously increased*. More generous expansions in IMF quotas and in basic votes can and should contribute to an improved compromise. But they cannot be sufficient. The *sine qua non* of a better compromise package is a better quota formula.

The suggestions made in section III of the paper suggest a way forward that could yield a compromise outcome far preferable to the one currently envisaged. The key to an improved approach is to forge a more acceptable agreement about the variables appearing in the quota formula, how they are measured, and the weights attached to them. Such an approach should forswear gimmicks that are devised merely to override inadequacies in the formula itself. The goal should be to design a gimmick-free formula that can be transparently replicated in future quinquennial quota reviews, using the same principles and variables. An improved formula is the most plausible method of objectively capturing major changes in the relative positions of countries in the world economy.

Several changes in attitudes could catalyze genuine forward progress. The most important would be an agreement to include shares in the world's population as a variable in the quota formula, receiving a modest weight. A

second would be an agreement to give world shares in PPP-GDP (purchasing-power-parity measures of gross product) a more prominent weight in the formula. A third would be an agreement to redefine the currently-employed variables for trade "openness" and variability and to incorporate the amended ratio variables in the quota formula. These suggestions are all controversial. But together they could readily lead to a better, more viable approach. The paper provides analysis of all three suggestions. Appendix A further addresses the issues associated with using population shares. My own view is that agreement on an acceptable formula viable for the long run cannot be reached without including population.

The probability is very small of a satisfactory reform package being agreed by April 2008, particularly if it is to include an acceptable formula to serve as a foundation for rebalancing quota and voting shares. Because such a reform package probably cannot be negotiated by then, I reluctantly conclude that a temporary failure of the current negotiations followed promptly by a fresh new start is the best of the feasible outcomes. For the short run, "nothing" is a better gamble than an inadequate "something." A temporary failure is most likely to keep participants' feet held to the fire and to encourage eventual adoption of a more farsighted agreement that nurtures the collective interest of the world community as a whole.

I. Principles for Periodic Review of IMF Quotas and Voting Shares

Does the World Need a Revised Formula?

The IMF's Articles of Agreement require a quinquennial review of the aggregate size of member nations' quotas.[1] The size of an individual member's quota should, in principle, reflect the relative importance of its economy in the world economy. Votes for IMF decisions are divided into two components. A small fraction of the total is "basic" votes; each member is allocated an equal number of such votes. The remaining votes, much the largest fraction of the total, are proportional to members' quotas. The practices used to fix individual quotas and quota shares thus determine a member's voting share. A member's voting share is the primary factor determining its relative political influence in IMF decisions.

Quotas and voting shares at the outset of the IMF's history were decided on nakedly political grounds. To provide cosmetic cover, a quota formula was devised in the U.S. Treasury to produce a politically pre-determined result.[2] During the quinquennial reviews of quotas in subsequent years, minor changes were made in the original formula. The original formula and four variants of it have been used in IMF staff calculations for the last several decades. Throughout the IMF's subsequent history, however, the original formula and its variants were *not* the principal determinants of individual nations' quotas and voting shares.

Historical adjustments in IMF quotas were dominated by increases granted equiproportionately to every member according to its existing quota share. This equiproportionate component was on average some 70 percent of the total increase; in the quota review agreed to in 1978, this fraction was as large as 98 percent. Only a small component of any increase consisted of selective increases reflecting recalculated quota shares resulting from the old (inadequate) quota formulas. Virtually all the negotiations downplayed the results of formula calculations and resorted instead to political horsetrading among the governments of the largest member nations. That horsetrading was little influenced by the formulas.

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[1] The quinquennial review currently in process is the Thirteenth, slated in principle to be concluded by the end of January 2008. The IMF issued a press release on January 4, 2008 announcing that the Executive Board is recommending that the Thirteenth review be concluded without an increase of quotas.

[2] The story is well known to students of the IMF; see especially Raymond Mikesell (1994). Ariel Buira (2005) summarizes the Mikesell account; see also Murilo Portugal (2005, p. 85).

When the largest part of quota increases is allocated in proportion to existing quotas, inertia from the past of course guarantees that adjustments in the *relative* quota shares of members will be minor and that IMF members experiencing relatively rapid economic growth will have quota shares that lag far behind recent economic developments.

Unlike the practice in past decades, the current international negotiations about quotas and voting shares should be grounded in a revised formula that is objective and broadly acceptable to all IMF member nations. A satisfactory formula will gauge, broadly and presumptively, the relative importance of individual nations in the current world economy and financial system. Because subsequent changes in the circumstances and relative positions of member nations will be reflected objectively in calculations made with the formula, a satisfactory formula will prove viable and sustainable over a longer run.

No single formula can be judged as unambiguously preferable, either to capture relative positions today or to adapt gradually to future changes in the world economy. The goals of simplicity and transparency compete with the goals of accuracy and completeness. What is deemed "objective" has a normative element and hence inevitably (though usually to a minor degree) differs across analysts.

Even so, policymakers acting in good faith can identify formulas that are objective in reasonable and acceptable ways. And a generally reasonable formula is a greatly preferred starting point for intergovernmental political negotiations. Without an objective starting point, the exercise of raw political power virtually ensures that the status quo and inertia will play too large a role in negotiations. The absence of a satisfactory formula favors large and rich nations at the expense of the smaller and the poorer. Lack of an objectively defensible criterion as the foundation for discussions increases the chances of unproductive conflictual negotiations and lowers the probability that the negotiated outcome will reflect systemic values and goals.

The pros and cons of using formulas to gauge the relative positions of nations in the world will increasingly preoccupy officials and political theorists in coming decades. For the purposes of the rest of this note, I take it for granted that a revised formula is highly desirable and should figure prominently in the current international negotiations. The stakes are high, since the world will probably have to live for quite some time with whatever is or is not agreed in coming months.

How to Measure "Relative Position"?

The original concept of the IMF, agreed at Bretton Woods at the end of World War II, was to establish an intergovernmental lending intermediary. All significant nations in the world would be members (the institution would be "universal"). All members would contribute financial resources. Each member would be able to use the resources in times when it had payments imbalances that needed to be financed. Payments deficits would oscillate over time, so that each nation would at times be in surplus and at other times in deficit. The lending-intermediary operations were the IMF's primary function.

Much has changed in the decades that followed. Surveillance and crisis prevention are arguably the most important IMF functions today and for the future. All IMF members—again, large or small, rich or poor—can benefit from the IMF being an "adjustment referee" and a "cooperation catalyst." The IMF can play a critical role in collective crisis management. It can catalyze collective prudential overview of supervision and regulation of financial systems. More generally, it can facilitate oversight, monitoring, and implementation of the working norms and rules of the international financial system. Intergovernmental lending-intermediary operations that smooth the financing of balance-of-payments imbalances remain an important IMF function. But those operations are less important than in earlier decades, and are certainly no longer the dominant function.[3]

When analyzing governance reform for the IMF, one should therefore distinguish between variables that have a bearing on relative status in the world economy *broadly conceived* versus variables that pertain to nations' "contributions" and "needs" as participants in the IMF's intergovernmental lending intermediation. Governance reform should focus more on the first class of variables—measuring relative status in the world economy broadly conceived.[4]

Numerous variables are candidates for such a broad-based formula. The alternatives include a country's gross domestic product (GDP) measured at market prices and exchange rates, its gross flows of cross-border trade, and its international reserves. GDP measured at purchasing-power-parity prices (PPP-GDP) could be used in addition to or instead of GDP at

[3] These issues are identified and carefully analyzed in Bryant (2003, 2004).

[4] The Quota Formula Review Group headed by Richard Cooper (IMF, 2000) was appointed to examine the issues raised by the existing quota formulas. Their report was unsatisfactory, in part because the report took a narrow rather than broader view of why variables should appear in a revised formula. The report's proposed formula was simpler but inadequately sensitive to changes in the IMF's functions and to the rapid growth of emerging-market and other developing economies. The report was not accepted by the IMF Executive Board (though not for the reasons identified in the preceding sentences).

market prices. A member's population is a candidate variable. Several broad measures of a nation's financial system would be appropriate in principle—for example, measures of aggregate financial activity and of cross-border financial assets and liabilities.

Some candidate variables for a broad-based formula are ratios of two or more national variables. Prominent possibilities are the ratio of a nation's cross-border trade to its GDP, referred to by economists as "trade openness," and the "variability" of a nation's cross-border trade, defined for example as the ratio of the standard deviation of trade to its mean value (both numerator and denominator measured over some past period). In principle, financial openness and the variability of a nation's cross-border *financial* transactions are also relevant.[5]

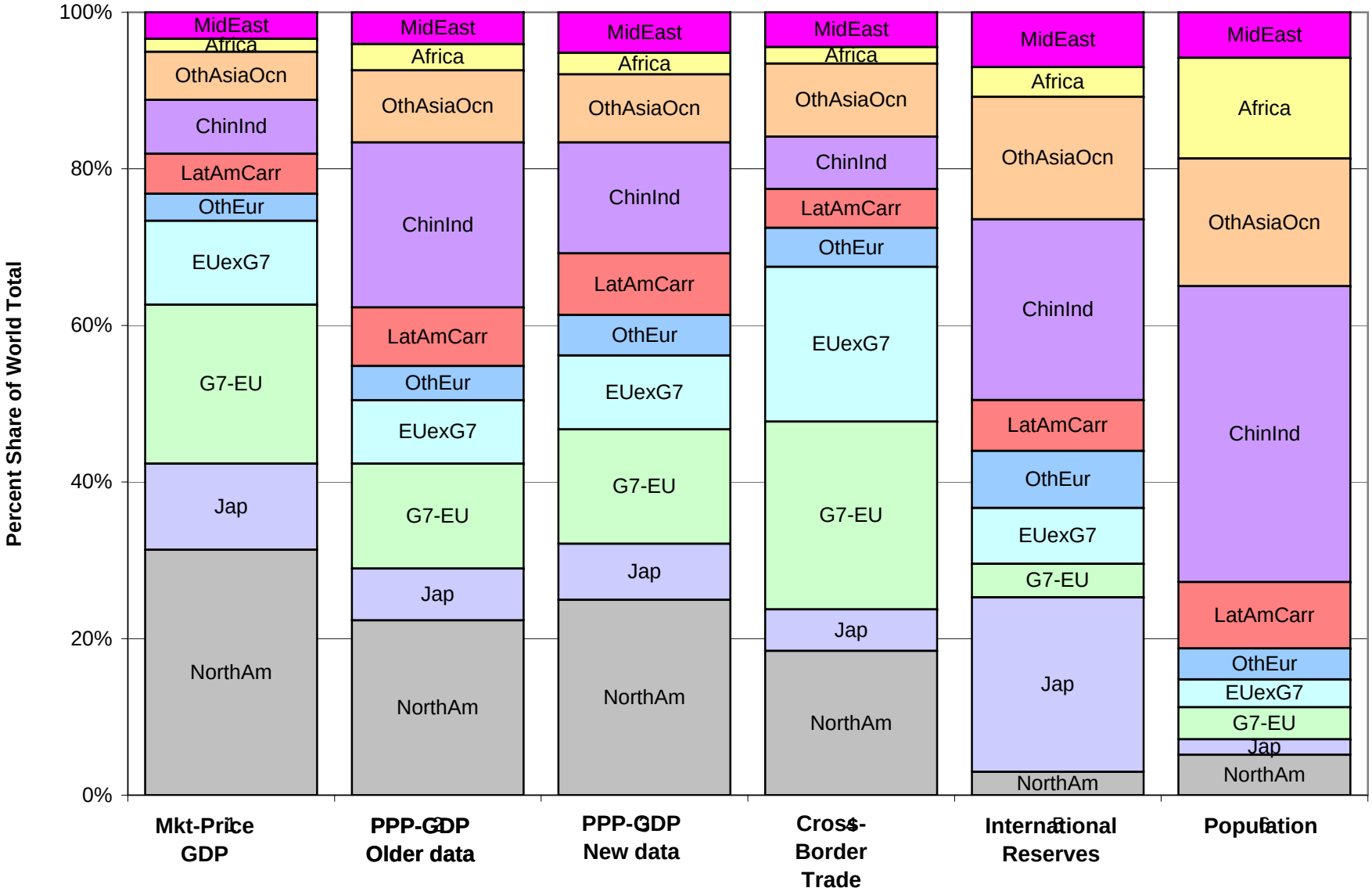
Designing a formula poses an obvious difficulty: alternative variables generate diverse conclusions about nations' relative positions. Specifically, the shares of world GDP, world trade, world reserves, world financial activity, and world population accounted for by any individual nation can differ markedly. Figure 1 illustrates this point for a division of all IMF members into ten regional groupings: North America (the United States and Canada), Japan, the 4 European-Union members of the G-7 (Germany, France, Italy, United Kingdom), the European Union other than the four G-7 countries, Other Europe (countries not in the European Union), Latin America and the Caribbean, China plus India, Other Asia plus Oceania, Africa, and the Middle East. Consider the large G-7 countries as an example: together they have 63 percent of the world's GDP at market prices and exchange rates, only some 42-46 percent of the world's PPP-GDP, 48 percent of aggregate cross-border trade, less than 30 percent of aggregate international reserves, and barely 11 percent of the world's population.[6]

Each of the share variables pictured in Figure 1 has some valid claim to be a yardstick of a nation's or a region's relative position in the world economy. Other share variables not shown, such as measures of financial activity, also have a valid claim. Plainly, therefore, a revised formula for IMF quota shares cannot reasonably be based on any single yardstick. But great complexity is also undesirable; transparency and simplicity argue for a formula based on only a small number of variables. The awkward truth, again, is that no single formula, however it combines variables, is likely to command consensus as "the correct" or "the optimal" gauge of

[5] Much of the current international discussion about a formula has used the term "openness" as a label for the gross flows of cross-border trade. From an analytical perspective, that usage is confusing and unfortunate.

[6] Figure 1 shows two bars for PPP-GDP data, one based on older data for a 2003-2005 average of countries' shares and a second based on new data for the year 2005 alone, just released in December 2007, from the World Bank's ICP project. See below for further discussion of the recent revisions in PPP-GDP data.

Figure 1
Major Regional Groupings: Alternative Measures of Relative World Position



relative importance in the world economy. This conclusion would be even more compelling if formulas gauging relative status were to be extended still further to, for example, indicators of financial activity or of political power or military power.

To conclude that no single formula is correct or optimal, however, should certainly not lead one to conclude that the existing formulas and the existing quota shares are acceptable. No matter which broad variables are considered, the current distribution of quota and voting shares in the IMF is unbalanced and inappropriately reflective of nations' relative economic status.

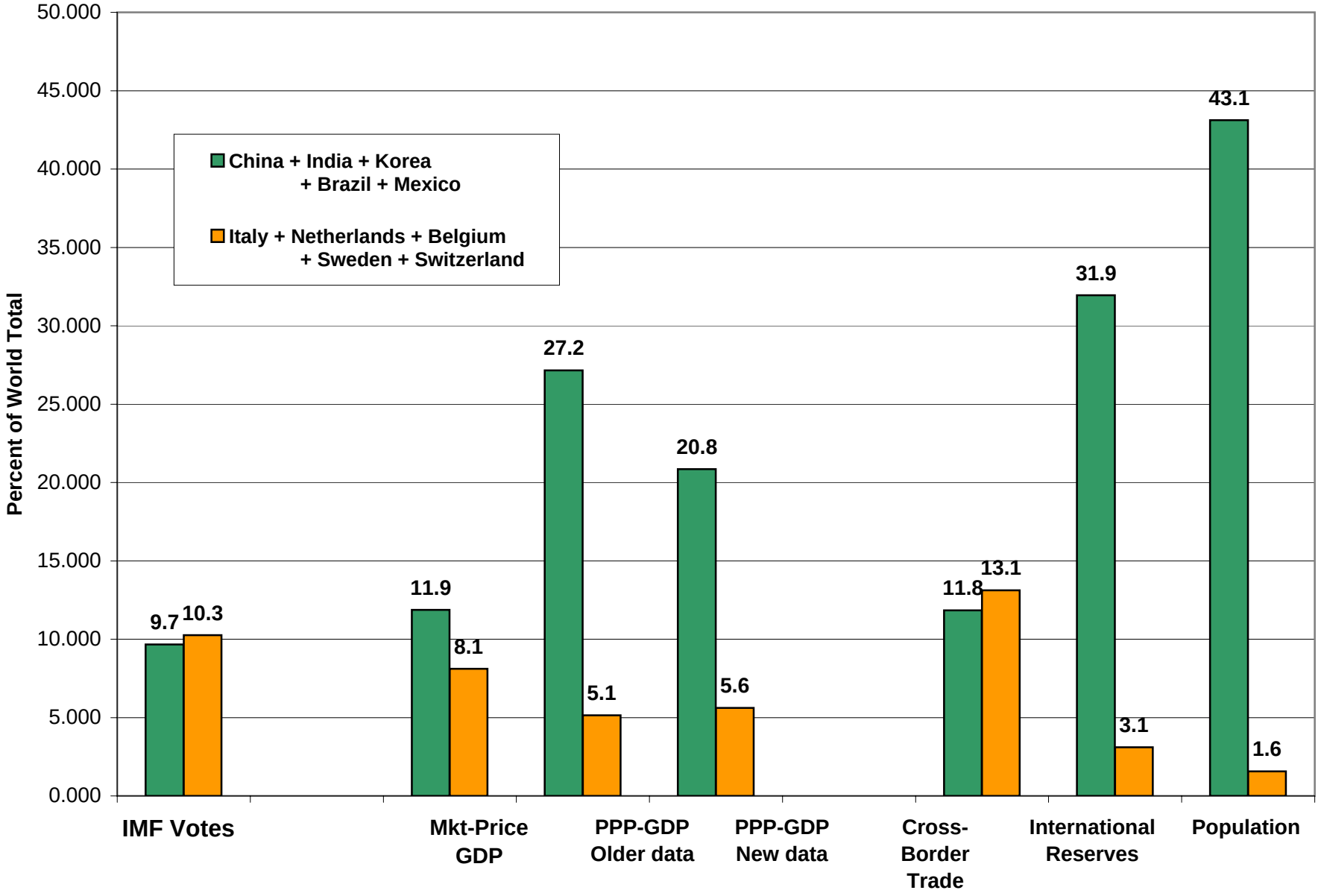
The nature of the unbalanced voting shares of members can be grasped by examining a single comparison. Consider five European countries: Italy, the Netherlands, Belgium, Sweden, and Switzerland (the first four of which are members of the European Union). Contrast those European countries with five large emerging-market member nations (LEMs) taken together: China, India, Korea, Brazil, and Mexico.

Each of the two groups has roughly one tenth of the total IMF voting power. But the five European members have the larger vote share, 10.3 percent versus only 9.7 percent for the five emerging-market nations. For a graphic comparison, see the left-most columns in the bar chart of Figure 2.[7] The European economies have a significantly *smaller* share of world GDP—only 8.1 percent versus 11.9 percent—if GDP is measured at market prices and exchange rates. And if one compares shares of GDP measured at purchasing-power-parity prices instead of market prices, the European countries have only some 5.1 to 5.6 percent of the world total, less than the 21 to 27 percent world share of the five LEMs.[8] One indicator of relative status, world shares in the gross value of cross-border trade, shows the European nations with a slightly greater share than the emerging-market economies—13.1 percent for the Europeans versus 11.8 percent for the LEMs. That measure of cross-border trade, however, includes all intra-trade within common currency zones, most notably intra-trade within the Euro zone of the European Union countries. If one were to make an adjustment to exclude intra-trade within common currency zones, the five European countries' share of world trade would be significantly less than the share of the five LEMs. Shares in the world total of reported foreign-exchange reserves held by central banks and governments are very different: the five Europeans' share is one-tenth that of the five LEMs (3.1

[7] The aggregated voting share for the five emerging-market countries is AFTER the September 2006 "first-stage" upward adjustment in quota and vote shares for China, Korea, and Mexico. (India and Brazil, who opposed the September 2006 changes, did not get a selective upward adjustment in their quota and vote shares.)

[8] The first of each set of numbers refers to the new World Bank ICP data for PPP-GDP, the second to the older data. See below for further discussion.

Figure 2
Five Emerging-Market Economies versus Five European Economies,
Shares in World Total of Key Variables



percent versus 31.9 percent). The contrast between the groups is especially dramatic for population: the five European countries have 1.6 percent of the world's population whereas the five LEMs account for more than 43 percent!

The comparison in Figure 2 is dramatic but not misleading. Numerous other examples could be given. Actual voting shares for many IMF members cannot be justified in terms of the member nations' relative positions in the world economy, measured in virtually any plausible way.[9] Determination of quota shares and voting shares also, of course, dominantly influences the existing number of Executive Directors and the composition of their constituencies.

The world community should be deeply concerned that voting shares and Executive Board constituencies in the IMF are unbalanced. Member nations that are greatly "under-represented" will be tempted to disengage from the IMF, using other channels for communication and resolution of common problems. Nor is the existing unbalanced situation in the enlightened self interest of "over-represented" countries. If over-represented members use the IMF in the short run to pursue narrowly-conceived goals when such goals are not widely shared in the world community, the IMF in the longer run will atrophy as a universalist institution. The IMF would then be less likely to serve effectively as a catalyst and referee for common financial and economic problems. More generally, confidence would decline further that the IMF is an international institution capable of collectively and successfully serving the interests of the world community as a whole.[10]

Desirable Characteristics of a Revised Formula

Variables in a revised formula should be of two classes, *core-share* variables and *share-adjustment* variables. The detailed specification of the formula should reflect this distinction. The observations that follow summarize key points about the desirable characteristics of a formula. Appendix B provides details.[11]

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[9] The underlying share data are taken from IMF staff data currently used in the international discussions; see IMF (2007b). The data for votes pertain to vote shares as of 2007. The shares of market-price GDP, cross-border trade and the older data for PPP-GDP pertain to an average of the years 2003-2005. The share estimates for the newer PPP-GDP data published by the World Bank ICP are based only on the year 2005 (because only that single year is so far available) and are preliminary calculations on my part, not those of the IMF staff team.

[10] Similar concerns exist about the World Bank group institutions, since voting shares and Executive Board constituencies for them follow closely the arrangements in the IMF Articles of Agreement.

[11] Appendix B summarizes the treatment of core-share and share-adjustment variables in the quota formula and indicates how the latter modify results that would emerge from core-share calculations alone. The proposed method

A core-share variable contains values for individual members expressed as a member's *fractional share in a global total* for that variable. A share-adjustment variable contains a value for each individual member that is based on a *ratio* of two or more variables. Members' fractional shares in global totals for GDP, trade, reserves, and population are examples of core-share variables. Examples of a share-adjustment variable are a measure of trade openness, such as the ratio of trade to GDP, or the ratio of a member's GDP to its population (per capita GDP). Both core-share variables and share-adjustment variables are intended to capture some significant aspect of individual countries' relative positions in the world economy and financial system.

High correlations typically exist among candidate variables. Such correlations are most problematic for core-share variables. If several highly correlated core-share variables are included in a formula, the core-share part of the formula may, in effect, "over-count" for the sizes of member nations. Larger member countries may receive bigger calculated core shares relative to smaller countries than seems justified on the grounds of size alone. An advantage of including share-adjustment variables in a formula is that over-representation for economic size is less likely. Share-adjustment variables expressed as ratios may better identify the characteristics of members' economies that are qualitatively distinct rather than dominantly determined by economic size.

Analysts typically encounter difficulties providing specific definitions for any variable in a formula. And the availability and reliability of statistical data differ markedly across countries. Inaccuracies in underlying data carry though to inaccuracies in estimated world shares and estimated relativities among ratio variables. Data-availability and definition issues are particularly difficult for measures of financial activity or cross-border assets and liabilities; that fact largely explains the absence so far of these variables from calculations for quotas and voting shares.

Data issues associated with PPP-GDP have been especially prominent in the last year. Many analysts believe that PPP-GDP is, in principle, a preferable measure for international comparisons of aggregate economic activity across nations.[12] Hence they argue that world

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for incorporating share-adjustment variables would be a significant improvement over currently followed procedures.

[12] It is a well established empirical generalization that the prices of non-traded goods and services relative to the prices of traded goods and services are lower in low-income countries than in high-income countries. Therefore if

shares in GDP in a revised quota formula should be calculated in terms of PPP-GDP rather than, or at least as a complement to, GDP at market prices and exchange rates. Because the data for PPP-GDP are less available and reliable than the data for market-price GDP, however, analysts have had to swim upstream in making that case. In December 2007, the first installment of a major revision of PPP-GDP data was released by the World Bank's International Comparison Program (ICP). That release further complicates the use of PPP-GDP data in a revised formula. The 2005 estimates for China and India, in particular, were revised sharply downward. As can be clearly seen in the two bars for PPP-GDP in Figures 1 and 2 above, calculations of world shares based on the new preliminary ICP data differ markedly from calculations with the older data. The data issues with PPP-GDP are further discussed below.

Another important data issue complicates discussion of candidate variables for cross-border trade. Much confusion—some inadvertent, some deliberately created for self-interested purposes—has existed about variables labeled as "openness." Throughout 2006 and 2007, many individuals and officials—abetted by IMF staff background papers—attached an "openness" label to variables that were merely some measure of the gross flows of cross-border trade. Economically sensible definitions of openness are variables expressed as ratios of external transactions to total transactions (domestic and external combined). In a revised quota formula, openness and other indicators of external vulnerability should be treated as share-adjustment, not core-share, variables. Because measurements of GDP and of cross-border trade are highly correlated and indicators of the absolute size of economies, to include both as core-share variables is especially likely to cause an over-counting of economic size in formula calculations.[13]

A related but conceptually separate issue is how to measure cross-border trade itself. The IMF staff in its analyses of quota shares, probably yielding to pressures from European Union members, has continued to sanction a definition that includes rather than excludes intra-currency zone trade (notably, intra-Eurozone trade). The underlying issues here are complex, but for the purposes of judging relative positions in the world economy it is implausible to treat intra-EMU

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world-market prices and market exchange rates are used to convert national income and product accounts into a common currency unit, a comparison across countries of living standards understates the living standards of low-income developing countries relative to those of high-income countries. Basic references include Kravis, Heston, and Summers (1982), Kravis (1984), Heston (1994), and Heston and Summers (1996).

[13] Ted Truman and Richard Cooper have emphasized problems in using measures of gross cross-border trade as a sensible measure of "openness"; see Cooper and Truman (2007).

cross-border trade between two Eurozone countries as conceptually equivalent to cross-border trade between a Eurozone country and a country outside the Eurozone.

Basic Votes and Quota-Proportional Votes

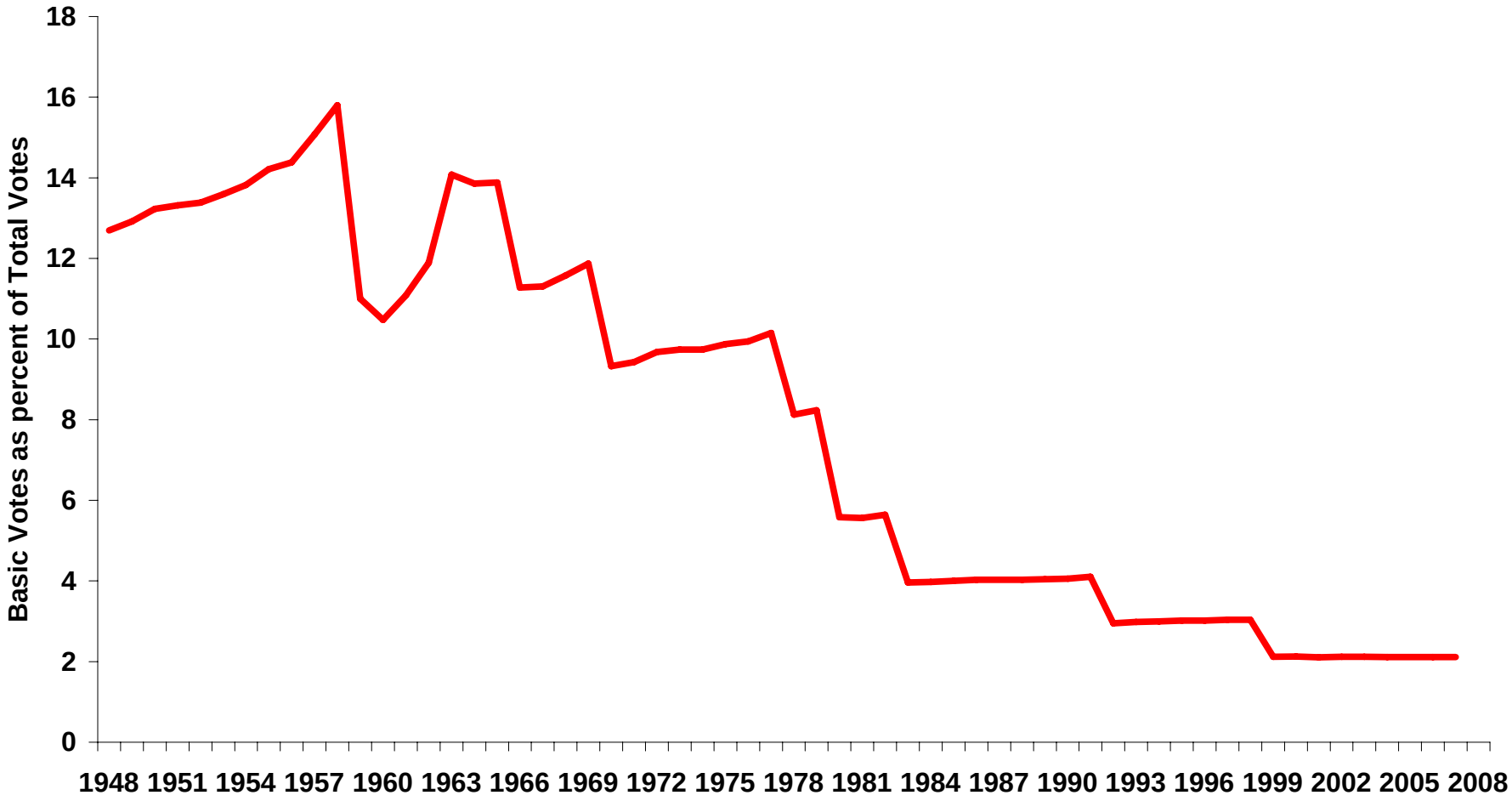
When the IMF was established in 1944, it had only 44 member nations and basic votes were significant in the voting power of members. Basic votes as a fraction of the total votes were at the level of 11.3 percent 1944. With many new members joining and with total quotas increasing only moderately, the proportion of basic votes actually rose, to as high as 15.6 percent in 1958. The fraction of basic votes was still high at roughly 14 percent in 1963-65. Because the number of basic votes per member has never been changed and aggregate quotas were periodically increased, however, the basic-votes proportion thereafter declined sharply over time. It fell to 5-1/2 percent by 1980-82 and declined further all the way to only 2.1 percent in the last decade. Figure 3 plots the historical evolution of the proportion.

The waning significance of basic votes has reduced the voting power of smaller IMF members and hence their ability to influence IMF decisionmaking. By the time of the Annual Meeting of the IMF in Singapore in September 2006, a consensus had emerged for a modest, but only a modest, increase in basic votes. Changing basic votes requires an amendment of the IMF Articles of Agreement, which can occur only if three-fifths of the members holding 85 percent of the total votes agree to the change.

A first-best reform of IMF governance would amend the Articles of Agreement, setting the aggregate of basic votes at a constant agreed fraction of the total voting power (not, as at present, an absolute number of votes) and including an indexation provision that maintains basic votes at that percent of total voting power in future quinquennial reviews of quotas. The idea of an indexation provision is not a radical suggestion. The charter of the Asian Development Bank already includes such a provision.

The current political negotiations, as discussed further below, are focused on a doubling of basic votes (from 250 to 500), or at most a tripling (to 750). A mere doubling or even a tripling of basic votes would not begin to restore basic votes to the higher fraction they reached in the early decades of the IMF's operations. If the fraction of 10 percent or more was deemed

Figure 3
Share of Basic Votes as a Percentage of Total Votes
All IMF Member Nations, 1948-2007



appropriate in 1944-1958, it is difficult to understand why that fraction should be much lower in the 21st century.[14]

Because quota-proportional votes are by far the largest fraction of total votes, the basic-vote component of voting power must be determined simultaneously and in an integrated way with a revised formula for determining quota shares. Appendix B summarizes the procedure for making the integrated calculations.

Appropriate Procedures for Using a Revised Formula

An objectively designed and satisfactory formula is only a necessary, not a sufficient, condition for satisfactory periodic reviews of quotas and voting shares. Equally important, a revised quota formula needs to be used wisely.

The unsatisfactory historical experience with past reviews of IMF quotas is a sobering reminder that such formulas as exist, whatever their merits, may have little bearing on actual negotiations. Even a good revised formula could exert little influence on decisions if the formula is ignored or systematically overridden. In the absence of a satisfactory formula, inertia from the past is likely to be the dominating factor. Such modest adjustments as may emerge from a political free-for-all negotiation are likely to be much less desirable, not least because they deemphasize the important changes in relative world positions that would be captured in a satisfactory formula.

The appropriate way to view an objectively designed formula is as the starting point and the foundation for informed political negotiations. Politically astute officials neither could nor should mechanically accept calculations from a formula as the sole basis for compromise decisions in negotiations about actual quota shares. An element of horsetrading embodying political judgments is inevitable, even desirable. The final outcome of negotiations should be an artful blend of formula calculations and constructive political horsetrading.

The essential first step in a sound procedure is to make calculations with a satisfactory formula and to agree that the calculations should be a binding presumptive norm for subsequent discussions. In effect, the calculated quota shares should be treated as presumptive targets toward which the existing actual shares will adjust. For a few individual countries, special and

[14] There has as yet been no explicit agreement on an indexation provision that would keep the fraction of basic votes constant over time at a new higher level. The resolution agreed in Singapore in September 2006, however, foreshadows such a provision as part of an amendment to the basic-votes aspects of the Articles.

probably temporary circumstances may exist that can be agreed to justify a significant deviation of negotiated from formula-calculated shares. But negotiators should be chary of deviating far from the presumptive norm of the calculated shares. In particular, inertia from the past by itself should not be allowed a decisive weight in the political negotiations. Inertia can easily masquerade under the argument that the formula calculations yield an "imperfect" sense of "my country's true relative world position." To repeat, no formula can yield "perfect" results. But an imperfect formula, applicable equally to all IMF members, is a much better presumptive norm than alternatives ignoring a formula.

The IMF Executive Board could provide a helpful constraint on negotiations by adopting a new by-law, as one component of a general package of governance reforms. The by-law would state that a member's actual negotiated quota share at times of quinquennial quota reviews cannot differ from its formula-calculated share by more than X percent, where X is a small number. Such a provision would ensure that incremental quota adjustments over time would at least roughly reflect a revised formula's calculations.

II. Assessment of the Likely Compromise Envisaged for April 2008

During 2007, discussions about quota and voting shares among government officials and within the IMF were disappointing. The most encouraging thing that can be said about the negotiations occurring prior to the October 2007 Annual Meetings is that agreement was NOT reached on the inadequate compromise packages on the table at that time. As of the beginning of 2008, the status of negotiations remains unsatisfactory.

As best an outsider can judge, the variants of a proposed compromise package of IMF reforms on the table for possible adoption at the April 2008 spring meetings are little different from the inadequate packages proposed last October. Notably, the envisaged compromise would not include a satisfactory rebalancing formula for quota and voting shares, would include an expansion of aggregate quotas of only 10 to 12-1/2 percent, and would provide for only a modest increase in basic votes (not more than a trebling, and possibly only a doubling).

A compromise envisaged for April 2008 will probably also include some reforms not directly related to quota and voting shares. For example, a proposed package would probably contain guidelines for cutting back IMF staff expenditures and guidelines for enhancing IMF

income sources other than earnings related to IMF lending. I focus here on quota and voting shares, and will not discuss those additional reform issues.[15]

The Inadequate Quota Formula Currently on the Table

The variants of a rebalancing quota formula most under discussion in October 2007 were, judged on their own, unacceptable. They remain unacceptable early in 2008. Most important, they constitute an inadequate foundation for reviews of quota and voting shares for the medium- and longer-run future.

The inadequacy of those formula variants is transparent: the proposed compromise overrides the underlying formula with a variety of gimmicks. The essential purpose of the gimmicks—a so-called "compression factor," one or another "supplementary filter," and suggestions that the largest countries voluntarily "forego" some part of the share increases that would otherwise accrue to them because of the underlying formula calculations—is to offset and mask the unpalatable results emerging from the underlying inadequate formula. The goal of designing a revised formula that could be sustained as an appropriate foundation for periodic reviews over the longer run has been effectively demoted, if not abandoned altogether. The proposals for the largest IMF members "foregoing" some of the share increases otherwise mandated by the formula is especially unfortunate because of their damaging consequences for long-run sustainability.

In the absence of the foregoing, the supplementary-filter, and the compression-factor gimmicks, variants of the underlying formula now on the table produce an outcome that is *markedly less acceptable* than the quota and voting shares actually in force as of today. European countries are the strongest supporters of the proposed current-status compromise. Japan appears to be going along. Canada, and more recently Australia, played a lead role in designing supplementary filters to make the underlying formula results less unpalatable. China is said to be hanging back with a low profile, letting other emerging-market countries play stronger roles in trying to shape the negotiations. The United States position about the specifics of a revised formula is unclear to me, although the United States is similar to the Europeans in resisting a major reduction in its voting share below the share that existed prior to the 2006

[15] A committee of appointed experts, chaired by Andrew Crockett, submitted a report in January 2007 on issues associated with enhancing IMF revenues. A package proposed for adoption in April 2008 will likely draw on this report's well-argued recommendations – see IMF (2007a).

Annual Meeting in Singapore. The United States has taken the lead in voluntarily foregoing some part of the share increase to which it would otherwise be entitled by the (inadequate) underlying formula. The following paragraphs summarize this disappointing current status.

The formula variants now under discussion use only four variables, defined as individual members' shares in the world total. The variables are a blend of market-price GDP and PPP-GDP, cross-border trade, international reserves, and a measure of the variability of cross-border transactions that includes capital flows. The weight assigned to the GDP blend is 50 percent (one half of the total weight); cross-border trade receives a weight of 30 percent; international reserves and variability receive, respectively, weights of 5 percent and 15 percent. Within the GDP blend, market-price GDP is assumed to have three fifths of the weight of 50 percent; thus the effective weights of the two GDP measures in the entire formula are 30 percent for market-price GDP and 20 percent (40% of 50%) for PPP-GDP.[16] The cross-border trade variable is misleadingly labeled as "openness" and inappropriately includes intra-currency-union trade as comparable to other cross-border trade. Neither the "openness" nor the "variability" variable is measured as a ratio, as each preferably should be, with trade or volatility scaled by some measure of the size of the economy.

Absent any masking gimmicks, a formula constructed with these four variables alone—regardless of the weights attached to them—cannot produce a quota-share compromise that is satisfactory for the present negotiations. Nor is such a formula plausible and sustainable for the future.

Table 1 illustrates with an example set of calculations. The first column in the table reports the actual voting shares for major groupings of IMF member nations (as of 2007). The G7 countries have 44.4 percent of the total voting power, while all advanced and other higher-income nations (36 members in total) account for 65.8 percent. Other member nations, 149 in all, have 34.2 percent of the voting power. Lowest-income members, 58 in number, account for 7.3 percent.[17] The second column in the table shows the incremental changes in voting shares

[16] The relative weights of market-price GDP and PPP-GDP within the GDP blend appear to be one of the still-open questions under discussion in January 2008. In an earlier draft of this paper, I used the assumption that market-price GDP would have three-quarters of the weight and PPP-GDP only one quarter of the weight in the GDP blend (which would itself have 50 percent of the weight in the overall formula); that was the assumption most often discussed in the late fall of 2007. I have continued to change my assumptions about the "current-status" compromise in response to the (limited) information available to me about where the ongoing conversations may be headed.

[17] The 58 lowest-income countries are, as defined by the World Bank, countries with less than $825 gross national income per capita. Because I use the World Bank classification scheme, Korea, Singapore, Saudi Arabia, and 5

Table 1
Actual IMF Vote Shares and
Share Increments Resulting from Current-Status Compromise Formula (Calculation A),
Major Country Groupings

	Actual Vote Share as of 2007	Calculated Vote Share for Current-Status Compromise Formula (Calculation A) less Actual Vote Share
	% of world total	(difference in percentage points)
World Total (All IMF Members) (185)	100.000	0.00
Advanced & Other Higher-Income (36 members)	**65.825**	**2.82**
G7 -- "Major Advanced" (7)	44.354	4.19
United States	16.732	3.41
Japan	6.003	2.15
Canada	2.878	-0.40
Germany + France + Italy + UK (4)	18.742	-0.97
Germany	5.866	0.37
France	4.844	-0.91
Italy	3.187	0.05
United Kingdom	4.844	-0.47
Other EMU/Euro Area (excl UK) (12)	8.792	0.96
Australia + New Zealand (2)	1.882	-0.40
Other Industrial & High Income (7)	4.684	-0.58
Korea + Singapore (2)	1.728	1.39
Saudi Arabia + 5 Other High-Income Oil Producing (6)	4.385	-2.73
Other Emerging-Market/Developing/Transition : (185 - 36 = 149)	**34.175**	**-2.82**
China	3.652	2.79
India	1.883	0.05
Brazil	1.378	0.26
Mexico	1.430	0.44
Russian Federation	2.687	-0.71
All Other "Non-Advanced" (144)	23.145	-5.65
Memo: Lowest-Income Countries (< $825 GNI per capita) (58)	**7.316**	**-2.23**
Memo: European Union, total (27	**31.991**	**-0.24**

Source: IMF; author's calculations. See text for explanation.

that would occur—calculated share minus actual share—if the underlying formula is the compromise currently on the table (with the weights just described, and without any masking gimmicks). This "calculation A" assumes that aggregate quotas would be increased by only 10 percent and that the basic-vote proportion of total votes would be increased to only 3-3/4 percent (equivalent to a doubling of the votes themselves).[18]

The outcome in calculation A would *increase* the voting share of the 36 advanced, higher-income members by the large amount of 2.82 percentage points. The United States and Japan would receive especially large increases. The four G7 members in the European Union would together experience a decline in share of only 0.97 points (Germany's share would increase moderately and Italy's share slightly, whereas France's share would fall sharply and the U.K.'s share would also fall). The non-G7 members of the EMU would collectively have a share increase of 0.96 points. Among the emerging-market and developing members, China would experience a substantial increase of 2.79 points; Brazil and Mexico would have modest increases; India's share would be little changed; the Russian Federation would experience a sizable decline. The 144 emerging-market and developing members other than China, India, Brazil, Mexico, and Russia would have to accept a *decrease* in share of 5.65 percentage points. The lowest-income members would experience a share decline of 2.23 points, a reduction of some 30 percent from their existing share. (The table highlights share increases with a russet background and shows share declines in green.)

A minimum requirement for an acceptable compromise for the second round of quota and voting adjustments is that the voting shares of emerging-market and developing economies as a whole should *increase*. A further criterion is that the shares of lowest-income countries should, if not increase, then at least not diminish.[19] Such increases in shares for emerging-market and developing economies obviously require diminutions in quota and voting shares for many

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other higher-income oil producers are included in the 36 "advanced and other higher income" grouping. The IMF staff in their analyses of quota and voting shares include Korea and Singapore among the emerging-market and developing grouping.

[18] One recent observation passed on to me suggested that the current-status compromise might include a trebling rather than just a doubling of basic votes. The assumption of a doubling of basic votes was the most frequently used assumption in IMF staff calculations made during the fall of 2007.

[19] Both these objectives have been emphasized in IMF documents, most recently in the October 20, 2007 communique of the International Monetary and Financial Committee and in the December 14, 2007 statement by the new IMF Managing Director on the Interim Work Program of the Executive Board.

advanced economies. As Table 1 indicates clearly, the compromise formula currently on the table cannot begin to deliver such results.

When preparing Table 1, I have used the new single-year GDP-PPP shares data released by the World Bank ICP program in December 2007.[20] When used in the current-status formula, the older PPP-GDP data produce a slightly less pessimistic outcome from the perspective of the emerging-market and developing countries. But even when the older PPP-GDP data are used, the current-status formula is not capable of delivering a satisfactory result.[21] Remember, moreover, that the compromise formula gives only a 20 percent overall weight to PPP-GDP (only two fifths of the weight in the GDP blend). Without a still larger weight for PPP-GDP in the GDP blend variable, the PPP-GDP data cannot influence the current-status calculations by a decisive amount. For the calculations in subsequent tables, I continue to use estimates of the newer rather than older PPP-GDP data.

Apply a "Compression Factor" in the Formula?

As one measure to back away from the unsatisfactory results delivered by the underlying formula they wish to promote, numerous participants in the international negotiations have supported the idea of altering the formula with a compression factor. European nations, especially the smaller ones, are said to be deeply committed to this gimmick. Even many members of the G-24 group of developing nations appear to have assented to its use. Few appear to have criticized it, including even the United States and Japan.

A compression factor is a purely mathematical device that reduces the calculated shares of the very largest IMF members. Compression does not by itself alter the rankings of calculated shares; it mechanically reduces the dispersion across members' shares. The formula-share reductions experienced by the largest countries are, in essence, reallocated to *all* other IMF members. What is not well understood is that a sizable fraction of those increases gets assigned

[20] Share statistics for the new World Bank ICP data for some of the smallest countries (representing roughly 1-1/2 percent of world PPP-GDP) have not yet been published. I have made preliminary rough estimates for those countries, scaling the shares appropriately so that shares for all 185 IMF member countries add to exactly 100 percent.

[21] When the older rather than the newer PPP-GDP data are used but all other assumptions are identical, the 36 Advanced and Other Higher Income members collectively experience a 1.72 percentage point increase (rather than +2.82 points). The share increases for China and India, respectively, are 3.85 and 0.36 points (rather than 2.79 and 0.05 points). All 144 Other Emerging-Market/Developing/Transition members experience a share change of -5.70 points (-5.65 points) and the shares of the 58 Lowest Income Countries together change by -1.87 points (-2.23 points).

by the mathematics to advanced and higher-income countries. The algebra behind the compression-factor idea is summarized in Appendix B.

An illustration of the compression-factor adjustments is shown in Calculation B, the final column in Table 2. Calculations B and A make identical assumptions about the underlying formula, the expansion in aggregate quotas, and the basic-vote proportion of total votes. The only difference between the two is that Calculation B applies a compression factor of 0.95. When examining Table 2, concentrate your attention on the differences between the final column and the middle column (the two left-hand columns repeat the figures in Table 1).

The compression-factor adjustment does significantly reduce the share increases allocated to the United States, Japan, Germany, and China. It somewhat enlarges the share declines of France and the United Kingdom. And it slightly increases (or reduces the declines in) the shares of India, Brazil, Mexico, Korea, and Singapore. Those changes probably do work in the appropriate direction, thereby mitigating some unwanted consequences of applying the underlying inadequate formula. Instead of raising the share of all advanced and other higher income countries by 2.82 percentage points, as in Calculation A, the undesirable increase in that aggregate share is cut to 1.10 points (with the corresponding change in the aggregate share for the 149 other emerging-market/developing countries falling by only 1.10 points).

But notice that the compression-factor adjustment itself has unwanted effects for countries of middle size. The shares of other EMU/Euro area countries are further *increased*. The share reductions assigned to mid-size industrial and higher-income countries and to higher-income oil producers are *diminished*. The compression-factor adjustment, though working in the right direction from the perspective of the 58 lowest-income countries, still leaves those countries with a sizable fall in voting shares (1.80 percentage points compared with 2.23 points). The apparent assent of many developing-country members to use of a compression factor seems not to recognize that a major part of the reductions in largest-member shares go, not to the bulk of small and lower-income developing countries, but rather to advanced and higher-income countries.

Although the compression-factor device mechanically reduces shares of the largest IMF members, the rationale for it is inherently weak. Why should one wish to penalize the voting shares of the largest countries in the world merely because they have large relative positions in the world economy and financial system? A balanced formula should incorporate agreed

Table 2
Illustration Applying a "Compression Factor" of 0.95 to Current-Status Inadequate Compromise Formula

		Actual Vote Share as of 2007	Calculated Vote Share less Actual Vote Share: Calculation A -- "Current-Status"	Calculated Vote Share less Actual Vote Share: Calculation B -- "Current-Status" with Compression Factor of 0.95
		% of world total	(difference in percentage points)	(difference in percentage points)
World Total (All IMF Members)	(185)	100.000	0.00	0.00
Advanced & Other Higher-Income	**(36 members)**	**65.825**	**2.82**	**1.10**
G7 -- "Major Advanced"	(7)	44.354	4.19	1.45
United States		16.732	3.41	1.51
Japan		6.003	2.15	1.72
Canada		2.878	-0.40	-0.39
Germany + France + Italy + UK	(4)	18.742	-0.97	-1.40
Germany		5.866	0.37	0.12
France		4.844	-0.91	-0.97
Italy		3.187	0.05	0.02
United Kingdom		4.844	-0.47	-0.57
Other EMU/Euro Area (excl UK)	(12)	8.792	0.96	1.40
Australia + New Zealand	(2)	1.882	-0.40	-0.32
Other Industrial & High Income	(7)	4.684	-0.58	-0.32
Korea + Singapore	(2)	1.728	1.39	1.47
Saudi Arabia + 5 Other High-Income Oil Producing	(6)	4.385	-2.73	-2.57
Other Emerging-Market/Developing/Transition : (185 - 36 = 149)		**34.175**	**-2.82**	**-1.10**
China		3.652	2.79	2.53
India		1.883	0.05	0.09
Brazil		1.378	0.26	0.30
Mexico		1.430	0.44	0.48
Russian Federation		2.687	-0.71	-0.68
All Other "Non-Advanced"	(144)	23.145	-5.65	-3.82
Memo: Lowest-Income Countries (< $825 GNI per capita)	**(58)**	**7.316**	**-2.23**	**-1.80**
Memo: European Union, total	**(27)**	**31.991**	**-0.24**	**0.12**

Source: IMF; author's calculations. See text and Appendix B for specification of "compression factor."

objective indicators of relative positions. Negotiations based on such formula calculations should then broadly implement the formula results without further arbitrary doctoring. A satisfactory underlying formula removes the rationale for applying a compression factor. Alternatively stated, arguments for using a compression factor are an implicit admission that the underlying formula is inappropriate. The most worrisome aspect of the compression-factor gimmick is that it undermines efforts to design a balanced formula that will be viable for future periodic reviews of quota and voting shares.

Use a "Supplementary Filter"?

A "supplementary filter" is a second method of mitigating the unpalatable results delivered by a bad formula. The suggestions made so far have been motivated by advanced-country (in particular European) reluctance to permit PPP-GDP to play a direct and prominent role in a revised formula. The filter proponents have thus, in effect, proposed that PPP-GDP be brought into the negotiations by the back instead of the front door. The specific manner of entering by the back door, however, is intended to tilt share adjustments influenced by PPP-GDP toward the larger or faster-growing emerging-market and developing countries rather than allocating them comparably to all the IMF membership. Such tilting can be perceived as in the narrowly defined interests of the nations favored by the filter, such as Brazil, China, India, Indonesia, Korea, and Mexico. But the interests of most smaller developing nations would not be well served.

Canadian officials suggested one form of a supplementary filter in July 2007. Australian officials suggested another variant several months later which was incorporated into a "Troika Working Group" report submitted to the G-20 Deputies. As of the beginning of 2008, it is unclear to me whether the supplementary-filter proposals have fallen by the wayside or are still being seriously considered as part of a compromise to be agreed in April 2008. It appears that willingness has recently increased to include PPP-GDP directly in a formula, albeit probably with only a modest weight.[22] The greater the weight given directly to PPP-GDP, the weaker is the rationale for jumping through the hoop of a filter gimmick.

[22] Those indications explain my use of the PPP-GDP data in the illustrative calculations for the current-status compromise in this section of the paper. As noted above and discussed further below, the arguments for using PPP-GDP shares in a quota formula have been complicated by the World Bank ICP program's publication of substantially revised data for PPP-GDP.

A supplementary filter modifies the results of a basic underlying formula that gives all or almost all of the weight assigned to GDP to market-price GDP. The essence of the approach is to grant "extra" share increases to particular IMF members who are NOT calculated as under-represented in terms of the (inadequate) basic formula but who would appear to be substantially under-represented if relative world positions were calculated solely on the basis of PPP-GDP. (The first, Canadian filter focused on countries' contributions to the global growth of PPP-GDP. The Australian proposal focused on the levels of countries' PPP-GDPs.)

The filter suggestions are open to the strong criticism that they prejudice future periodic reviews—certainly unless the filters can be agreed to continue in use for a considerable period into the future. Some proponents of exclusive use of market-price GDP in a formula have argued that, for a majority of countries, the gap between PPP-GDP and market-price GPD will eventually disappear. That argument is convincing only for countries that will experience successful growth and development. In the possibly long interval between today and the time when all countries will have undergone sustained development, a supplementary filter could not be phased out but rather would have to be kept in operation.

A more straightforward approach is to permit both market-price GPD and PPP-GDP to play significant roles in a basic formula. Such a formula can be viable for the present and also over the longer run. For those IMF members for whom the measures of market-price GDP and PPP-GDP differ substantially today but will gradually converge over the future, the formula will continue to give acceptable results as the two measures do converge. Why take a circuitous route when a direct route is simpler and more transparent?

The newest variant of a supplementary filter approach is a "booster" device. Like the other variants of a supplementary filter, the intent is to override the results of a formula that is itself unsatisfactory. Rather than taking the calculated share adjustments that emerge from a quota formula at face value, participants in the negotiations would be invited to doctor the formula by "boosting " the positive share increments of a lower-income group of members and "deflating" the share increments of some or all of a group of advanced, higher-income members. The lower-income members, for example, might receive share increases equal to 105 percent of their formula-calculated increases while higher-income members receive only 95 percent of their calculated increases.

The demerits of this device are the same faults that afflict other supplementary filters and a compression factor. A booster/deflator would apply an arbitrary mathematical gimmick to mask an inadequate formula and to mitigate, partially, its undesirable effects. A preferable, more transparent approach would try to improve the quota formula itself so that the formula does not deliver unsatisfactory results.

Override the Formula with "Foregoing" Adjustments?

"Foregoing" proposals are the third manner of trying to live with the unacceptable results of an inadequate underlying formula. Those favoring this approach believe that major advanced countries would voluntarily forego part of the share increases to which the unsatisfactory formula would otherwise entitle them. As noted already, the United States has signaled a willingness to take such a step as part of an agreed compromise package. At least one other IMF member is also on the record as supporting this approach. The IMF staff for illustrative purposes has performed calculations assuming that several of the G-7 countries would participate in a foregoing exercise.

The idea of foregoing is most often associated with so-called "pre-Singapore" voting shares, that is the voting shares of larger members that existed prior to the first-round quota increases for China, Korea, Mexico, and Turkey that were agreed at the Singapore Annual Meeting in September 2006. A member participating in the foregoing exercise would agree, in effect, to give back that portion of the formula-calculated share increase due to it that would otherwise raise its voting share above its pre-Singapore level. The IMF staff has even explored the idea of a larger amount of foregoing, namely that foregoing members would agree not to accept any formula-based increase that would raise their voting share above "post-Singapore" levels.[23] For the foregoing members, in other words, the voting shares emerging from the second round of quota adjustments would, despite the formula, be "capped" either to where they are today or to where they were prior to September 2006.

Neither the pre-Singapore or post-Singapore voting shares are a sensible benchmark for setting shares for today and the future. There is no economically sound rationale for the foregoing suggestion. Nor do the proponents of it pretend otherwise. The motivation is nakedly

[23] To modify the results of the bad formula sufficiently to achieve a palatable compromise result, calculations with the formula would presumably first be made using the compression-factor and supplementary-factor gimmicks and would then subsequently be modified further in accordance with the foregoing agreements.

political. The mere existence of the foregoing proposal is an admission that international negotiations have been unable to achieve the goal of reaching "agreement on a new quota formula to guide the assessment of the adequacy of members' quotas" with the formula providing "a simpler and more transparent means of capturing members' relative positions in the world economy."[24] In fact, the most powerful IMF member nations have NOT been willing to agree on an objective formula for relative positions because such a formula suggests significant reductions in their quota and voting shares.

Periodic reviews of quota and voting shares, as stressed earlier, *should* be political. But political judgments should not be subject to wrong-headed benchmarks from the past or to unreasonable "red lines" that it is said cannot be crossed. Here are several examples of such red lines: "the voting shares of France and the United Kingdom cannot possibly be allowed to fall below China's share"; "Japan must always have a larger voting share than China"; "the voting shares of France and the United Kingdom must be equal, to honor the tradition that ruled in the past"; "under no circumstances can the share of the United States be permitted to fall near the figure of 15 percent, since that would call into question the absolute veto enjoyed by the United States over the set of IMF decisions requiring an 85 percent majority vote." Such constraints, though politically understandable, are far removed from objective assessments of today's relative positions in the world economy and are inconsistent with genuine reform of governance procedures for the IMF.

Expanding Basic Votes and Aggregate Quotas Would Not By Themselves Be Sufficient

A compelling case exists for sharply raising the basic-vote proportion of total votes back towards the higher fraction prevailing in the early years of the IMF's history (Figure 3 above and the related discussion). A strong case can also be made for an expansion in aggregate quotas that is substantially larger than the 10 percent currently envisaged.[25] The IMF's lendable resources in relation to the world economy have shrunk in recent decades. Increasing those resources in advance of contingent needs would be sensible. If conservative creditor nations are fearful that a large expansion in aggregate quotas would encourage debtor members to seek excessive

[24] The quotations are from the September 18, 2005 Press Release of the IMF Board of Governors announcing the Singapore resolution.

[25] If one counts the selective quota increases awarded to China, Korea, Mexico, and Turkey in the "first-round" increase in September 2006, the total envisaged expansion in aggregate quotas would be some 12-1/2 percent rather than just 10 percent.

borrowing, IMF policies could be adopted that would gradually rather than abruptly permit access to the increased quotas. A larger expansion in aggregate quotas, moreover, would lubricate the process of getting agreement from all countries on a reallocation of quota shares. With a large enough aggregate expansion in quotas, members who need to allow their quota *share* to be reduced would not thereby also have to accept a reduction in the *absolute size* of their quotas.[26]

A large expansion in aggregate quotas and a sizable upward adjustment in the basic-vote proportion of total votes, however, would not by themselves be enough to yield an acceptable compromise. The inadequate quota formula currently on the table cannot deliver acceptable results *even when aggregate quotas and basic votes are generously increased.*

Consider another illustration, "Calculation C." Instead of merely a 10 percent expansion of aggregate quotas as in Calculation A, Calculation C supposes that agreement is reached on a 25 percent expansion. And instead of doubling the basic votes allocated to each IMF member so that basic votes as a proportion of the total rise to just 3.725 percent of total votes, Calculation C assumes that basic votes are increased to 7.5 percent of the total votes (a rise in votes by a factor of 4.77 with quotas expanded by 25 percent). An assumption of 7.5 percent for the basic-vote proportion certainly cannot be labeled as extreme in the light of history (again see Figure 3). Except for the quota-expansion and basic-vote changes, Calculation C makes assumptions identical to those in A. In particular, both the A and C calculations assume that the formula places a 50 percent weight on a GDP blend (with market-price GDP having three fifths of that weight and PPP-GDP two fifths), a 30 percent weight on gross cross-border trade, a 5 percent weight on international reserves, and a 15 percent weight on a non-scaled measure of the variability of external transactions. Neither calculation uses a compression factor, a supplementary filter, or any foregoing assumption. The voting-share implications of Calculations A and C (relative to existing voting shares) are compared in Table 3.

More generous expansions in aggregate quotas and basic votes are obviously beneficial for emerging-market/developing countries taken together. But though the effects are in the "right" direction, they cannot go far enough. The voting shares of all emerging-market/developing members taken together still *fall* by nearly a full percentage point in

[26] The arguments for (and against) a large expansion in aggregate IMF quotas merit much more careful exposition than is feasible in this paper. For further discussion, see Truman (2006a, 2006b) and Cooper and Truman (2007).

Table 3
Effects of Expanding Aggregate IMF Quotas and Increasing the Basic-Vote Proportion but Otherwise Retaining the Current-Status Compromise Formula

		Actual Vote Share as of 2007	Calculated Vote Share less Actual Vote Share: Calculation A -- "Current-Status" Formula with only 10% Expansion in Aggregate Quotas and only a Doubling of the Basic-Vote Proportion	Calculated Vote Share less Actual Vote Share: Calculation C -- "Current-Status" Formula with 25% Expansion in Aggregate Quotas and Increase in Basic-Vote Proportion to 7-1/2%
		% of world total	(difference in percentage points)	(difference in percentage points)
World Total (All IMF Members)	(185)	100.000	0.00	0.00
Advanced & Other Higher-Income	**(36 members)**	**65.825**	**2.82**	**0.89**
G7 -- "Major Advanced"	(7)	44.354	4.19	2.43
United States		16.732	3.41	2.64
Japan		6.003	2.15	1.85
Canada		2.878	-0.40	-0.48
Germany + France + Italy + UK	(4)	18.742	-0.97	-1.58
Germany		5.866	0.37	0.14
France		4.844	-0.91	-1.04
Italy		3.187	0.05	-0.06
United Kingdom		4.844	-0.47	-0.62
Other EMU/Euro Area (excl UK)	(12)	8.792	0.96	0.84
Australia + New Zealand	(2)	1.882	-0.40	-0.42
Other Industrial & High Income	(7)	4.684	-0.58	-0.59
Korea + Singapore	(2)	1.728	1.39	1.31
Saudi Arabia + 5 Other High-Income Oil Producing	(6)	4.385	-2.73	-2.67
		0.000		
Other Emerging-Market/Developing/Transition : (185 - 36 = 149)		**34.175**	**-2.82**	**-0.89**
China			2.79	2.56
India		1.883	0.05	0.00
Brazil		1.378	0.26	0.21
Mexico		1.430	0.44	0.39
Russian Federation		2.687	-0.71	-0.77
All Other "Non-Advanced"	(144)	23.145	-5.65	-3.28
		0.000		
Memo: Lowest-Income Countries (< $825 GNI per capita)	**(58)**	**7.316**	**-2.23**	**-1.20**
Memo: European Union, total	**(27)**	**31.991**	**-0.24**	**-0.91**

Source: IMF; author's calculations. See text for explanation.

calculation C (though less than the 2.8 points fall in A). The lowest-income members experience a share *decline* of 1.2 points, less than the 2.23 point decline in A but still a significant loss in voting share even with the large expansion in basic votes. The United States, Japan, and the non-G7 members of the EMU still have significantly *increased* shares in calculation C, albeit less of an increase than in A. The aggregate share decline for the four G7 EU members is augmented somewhat (Germany has only a small increase, and France and the United Kingdom experience significantly larger declines). Notice, moreover, that a larger expansion in basic votes does not move voting shares in the "right" direction for the very largest emerging-market nations. The shares of China, India, Korea, Singapore, Brazil, and Mexico increase by slightly less (for example, for Mexico 0.39 points in C instead of 0.44).

Aggregate-quota and basic-vote expansions, even if much larger than those currently contemplated, are thus incapable of rescuing the current unsatisfactory status of the governance-reform negotiations. More generous expansions can and should contribute to an improved compromise. But they will not be sufficient. The *sine qua non* of a better compromise package is a better quota formula.

III. The Way Forward

The compromise package most likely to be agreed at the April 2008 meetings, if any agreement at all can be reached, will probably include some variant combination of the disappointing features identified in section II. Yet sometime in the future, an improved approach—not least an improved quota formula—will have to be adopted if the decline in the IMF's credibility and legitimacy is to be arrested. It is not too early to be looking ahead to that time. Rethinking the way forward will be especially important if no agreement can be reached by April 2008.

The key to an improved approach is to focus negotiating energy on the quota formula itself. That means forging a more acceptable agreement about the variables appearing in the formula, how they are measured, and the weights attached to them. An improved approach should forswear gimmicks that are devised to override the formula itself. In particular, the use of compression factors and supplementary filters should be abandoned. Above all, a sound

approach should reject "foregoing" proposals. If a revised formula is broadly acceptable in itself, overrides of the formula will be unnecessary.

Any quota formula that includes as variables only the four that have been emphasized in the current-status negotiations—world shares in market-price GDP, cross-border trade, international reserves, and “variability” of external transactions unscaled by an economy’s size—cannot yield reduced quota and voting shares for advanced countries together (in the absence of gimmicks that override the formulas). On the basis of the formulas considered up to now, therefore, it is impossible to obtain calculated quotas that significantly increase the aggregate share of all emerging-market/developing nations. That conclusion is evident even from the examples in section II. All the IMF staff work in the past year supports that conclusion.

Two types of alterations to the current status could catalyze genuine forward progress. The first would be an agreement to include world shares in PPP-GDP as an explicit variable in the formula and to assign that variable a more prominent weight than has been contemplated in the current-status negotiations. The second would be an agreement to include shares in the world's population as a variable in the formula, receiving a modest weight. Both these changes are contentious. But together they are the key to achieving a better, more viable formula.

A broad consensus exists, appropriately, for identifying GDP *somehow measured* as the most important variable in a revised formula. The notion of a "GDP blend" acknowledges the salience of both market-price and PPP measures; controversy then turns on the relative importance of the two in the blend. Whether the formula uses a GDP-blend variable or whether the two measures appear separately in the formula is of no consequence. The key issue is the relative weights attached to the two.

The case for more prominent emphasis on PPP-GDP has been greatly complicated by the new World Bank ICP data (discussed above). The large differences between the new and older data, most particularly for China and India, reinforce concerns about the data's reliability. For those who have advocated more emphasis in the formula on PPP-GDP, the new data relative to the old tend to reduce sought-for share increases for emerging-market/developing countries. Other aspects of the formula being held constant, share increases for the aggregate of emerging-market/developing countries now require the formula to put a larger weight on PPP-GDP relative to market-price GDP than with the older data. Seen from the perspective of developing countries, the new data force them to argue for a still more prominent role for PPP-GDP. On the

other hand, the new data diminish a bit the opposition to using PPP-GDP simply because the share increases for emerging-market/developing members resulting from any given weight on PPP-GDP, most notably for China and India, are now smaller than they would have been with the older data.

The arguments, both conceptual and pragmatic, for giving PPP-GDP a prominent role in a quota formula are sound. Cross-border transactions (as measured in balance-of-payments accounts) occur predominantly on the basis of market prices and exchange rates. Contributions of resources to the IMF's lending-intermediary activities and many aspects of systemic IMF surveillance are best analyzed in terms of market prices and exchange rates. Hence market-price measures of nations' economic activity certainly should not be excluded from a quota formula. But PPP-GDP belongs in the formula too. Some of the most important considerations were already identified above. Further calculations giving a substantial weight to PPP-GDP are illustrated below.

The case for including population in the formula is equally sound. Yet the international negotiations have so far given this suggestion essentially no serious discussion. The case has merely been dismissed out of hand without a thoughtful weighing of the pros and cons.

Those who have wanted to kill the suggestion with no discussion of its merits have tried to frighten people by citing the calculated shares that would result if population were the *sole* variable in the formula. China and India together have 38 percent of the world's population, it is remarked; would you be willing for China and India to have 38 percent of the voting share in the IMF? This tactic is ludicrous. No one argues that population should be the sole variable in the formula. It would be inappropriate—and of course politically infeasible—even to make population the dominant variable.

To agree that population should not be the dominant variable in a revised formula, however, is not to agree that a population variable should be excluded altogether. The arguments advanced for completely excluding population are feeble. In particular, numerous participants in the negotiations have off-handedly observed that population is "not an economic variable" and hence is "not relevant for a financial institution." A paper by staff economists at the European Central Bank, which at least is one of the few documents mentioning population in the context of

formula reform, asserts that use of population as a variable is "not straightforward to square with the notion of a financial institution."[27] That line of argument is very weak.

Numerous participants in the negotiations have also asserted it is not necessary to consider population in the formula because PPP-GDP and population are so highly correlated that the former is essentially a substitute for the latter. That assertion, however, is demonstrably false. Of course population and PPP-GDP have a substantial correlation. But *all* candidate core-share variables have a substantial correlation: large (small) countries have larger (smaller) values because every variable reflects some aspect of relative world positions. The correlation between population shares and PPP-GDP shares is only 0.54 and is not nearly high enough to allow the two variables to be treated as a rough substitute for one another.

To maintain the flow of the analysis in this section, I will not here further discuss the merits of adding population to the quota formula. Nor will I include here more evidence showing that population and PPP-GDP are insufficiently highly correlated to justify excluding population from the formula. Appendix A addresses both topics. Anyone doubting the case for including population as a variable while giving it a modest weight is invited to test their predilections by reading Appendix A. My own view is that agreement on an acceptable formula viable for the long run cannot be reached without including population.

To provide a more specific sense of the way forward to an improved formula, Table 4 shows a further illustrative calculation. This illustration, labeled "W," implements the preceding suggestions about PPP-GDP and population but does not yet alter the definitions of any of the core-share variables. Similarly to Calculation C in Table 3, W assumes a 25 percent expansion in aggregate quotas and raises the basic-vote proportion of total votes up to 7.5 percent. The W calculation gives a total weight of 50 percent to GDP variables in the formula; but of that total, shares in market-price GDP receive only one third (16-2/3 percent of the total) while PPP-GDP shares receive two thirds (33 percent). Shares in cross-border trade receive only 15 percent of the total weight, shares in international reserves 5 percent, and shares in the unscaled gross measure of the variability of external transactions only 15 percent. The biggest change in calculation W relative to calculations A and C is that shares in world population receive a modest

[27] European Central Bank (2007, p. 49, 17).

Table 4

A More Ambitious Illustrative Calculation: Effects of Including Population as a Variable with a Modest Weight, Increasing the Emphasis on PPP-GDP Relative to Market-Price GDP, and Readjusting the Weights on Other Existing Variables

		Actual Vote Share as of 2007	Calculated Vote Share less Actual Vote Share	
			Calculation A -- "Current-Status"	Calculation W (see text for detailed description)
		% of world total	(difference in percentage points)	(difference in percentage points)
World Total (All IMF Members)	(185)	100.000	0.00	0.00
Advanced & Other Higher-Income	**(36 members)**	**65.825**	**2.82**	**-9.75**
G7 -- "Major Advanced"	(7)	44.354	4.19	-4.69
United States		16.732	3.41	0.41
Japan		6.003	2.15	0.90
Canada		2.878	-0.40	-0.93
Germany + France + Italy + UK	(4)	18.742	-0.97	-5.07
Germany		5.866	0.37	-1.12
France		4.844	-0.91	-1.75
Italy		3.187	0.05	-0.63
United Kingdom		4.844	-0.47	-1.57
Other EMU/Euro Area (excl UK)	(12)	8.792	0.96	-1.15
Australia + New Zealand	(2)	1.882	-0.40	-0.61
Other Industrial & High Income	(7)	4.684	-0.58	-1.44
Korea + Singapore	(2)	1.728	1.39	0.95
Saudi Arabia + 5 Other High-Income Oil Producing	(6)	4.385	-2.73	-2.82
Other Emerging-Market/Developing/Transition : (185 - 36 = 149)		**34.175**	**-2.82**	**9.75**
China		3.652	2.79	5.19
India		1.883	0.05	2.55
Brazil		1.378	0.26	0.65
Mexico		1.430	0.44	0.40
Russian Federation		2.687	-0.71	-0.47
All Other "Non-Advanced"	(144)	23.145	-5.65	1.42
Memo: Lowest-Income Countries (< $825 GNI per capita)	**(58)**	**7.316**	**-2.23**	**4.13**
Memo: European Union, total	**(27**	**31.991**	**-0.24**	**-6.82**

Source: IMF; author's calculations. See text for explanation.

15 percent of the total weight. To facilitate comparison, Table 4 again reports the current-status compromise of Calculation A alongside the new Calculation W.[28]

The changes in W assumptions radically change the outcomes for quota and voting shares. Instead of the voting share for all emerging-market/developing countries *falling* by 2.82 percentage points, the new assumptions produce an *increase* of 9.75 points. The lowest-income countries' voting shares *rise* by 4.13 points instead of falling by 2.23 points. China and India of course receive big boosts in shares. Brazil receives a bigger increase. Mexico, and also Korea and Singapore (shown in the table with higher-income members), have somewhat smaller but still sizable increases. The bulk of all 144 individual "non-advanced" members other than China, India, Brazil, Mexico, and Russia experience a *rise* instead of a decline in their individual shares.[29]

The declines in shares corresponding to the increases for emerging-market/developing members of course occur overwhelmingly among the industrial economies. The shares of the four European members of the G-7 in the aggregate decline by 5.07 percentage points (each of the four individually experiencing a substantial decline). Other EMU/Euro area shares fall by 1.15 points. The collective share of all 27 members of the European Union goes down by 6.8 percentage points. Most smaller industrial and higher-income countries experience declines. The shares of Saudi Arabia and higher-income oil producers such as Kuwait likewise fall sharply. The W assumptions are consistent with moderate *increases* in the voting shares of Japan (0.90 points) and the United States (0.41 points).[30]

The cross-border trade variable used in the IMF staff work on quota formulas (and hence in all the preceding illustrative calculations) suffers from two deficiencies. The first, identified in section I, is that the definition of cross-border trade includes rather than excludes intra-currency zone trade. The major instance of this definition problem occurs with trade flows among the members of the European Monetary Union.[31] Unfortunately, I have no easy means of

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[28] Calculation W, like C, is uncontaminated by a compression factor and there is no resort to a supplementary filter, a booster/deflator, or to foregoing overrides.

[29] Oil-producing countries such as Venezuela and Nigeria and a few middle-sized South American members such as Argentina and Chile are among the exceptions to this generalization.

[30] Other higher-income countries that experience increases rather than decreases in their voting shares include Spain, Ireland, Poland, and the Czech Republic.

[31] To repeat section I, it is implausible for the purposes of judging relative positions in the world economy to treat intra-EMU cross-border trade between two Eurozone countries as conceptually equivalent to cross-border trade between a Eurozone country and a country outside the Eurozone.

amending my illustrations to adjust for this problem. An adjustment to exclude intra-currency zone trade, however, would alter the calculations significantly.[32]

The other deficiency is that trade defined as gross flows of cross-border trade, and world shares in the total of that trade, is an inappropriate measure of the trade "openness" of economies. In the language of section I, "openness" should not be a core-share variable but rather a share-adjustment variable expressed as a ratio (e.g., the ratio of cross-border trade to GDP at market prices and exchange rates). An individual nation's share in the world aggregate of cross-border trade is dominantly influenced by the relative size of its economy (and hence is highly correlated with its GDP). The ratio of a nation's trade to its GDP measures its trade openness in a qualitatively distinct manner not as dependent on the absolute size of its economy. Two IMF members might have the same share in world aggregate trade, for example, while one's economy relies twice as heavily on cross-border trade as the other's.

A comparable problem exists with the definition of the "variability" of cross-border transactions (regardless of whether the transactions are goods trade, goods and services trade, or both current-account and capital-account transactions). In principle, variability should also be treated as a share-adjustment variable. Unlike in the present treatment by the IMF staff, measures of the absolute standard deviation of external transactions for an economy should be scaled by some measure of the size of the economy. The unscaled measures are very highly correlated with the level of the external transactions themselves and do not capture the idea of a "variability" not dominated by the absolute size of the economy.

Consider as a single example the relative positions of India and Costa Rica. India is of course much the larger in absolute size regardless of which indicators are examined. India's world shares in market-price GDP and PPP-GDP are, respectively, some 1.67 percent and 4.26 percent; the comparable figures for Costa Rica's world shares in the GDP measures are only 0.05 percent and 0.07 percent. India's share of world gross cross-border trade is 1.09 percent, 13 times larger than Costa Rica's 0.08 percent. India's world share in the unscaled measure of variability now in use by the IMF staff is 0.86 percent, more than 9 times the comparable unscaled measure for Costa Rica of 0.09 percent. But now consider the associated *ratios* for

[32] Note 9 in the Annex to the Report of the Quota Formula Review Group chaired by Richard Cooper (IMF, 2000) examines intra-European trade data. That note, written by the IMF Staff, showed that the calculated quota shares of EU members would be substantially reduced if intra-trade flows within the Eurozone were excluded from their cross-border trade.

openness (trade to market-price GDP) and variability (standard deviation of external transactions scaled by market-price GDP). For both ratios Costa Rica has much higher values than India. India's cross-border trade is less than two-fifths of its GDP (the openness ratio is only 0.38). Costa Rica's trade is slightly greater than its GDP; it has a trade openness ratio of 1.01, a multiple of India's by a factor of 2-1/2. The scaled ratio of Costa Rica's variability of external transactions (with capital flows included) is 3.8 times larger than India's scaled ratio.

If the definition deficiencies are remedied for the trade and variability variables currently in use and if the amended variables (ratios) are used in a quota formula, the range of possible outcomes is substantially enlarged. This important point is highlighted by a final illustrative "Y" calculation. Y, like W, assumes a 25 percent expansion in aggregate quotas and raises the basic-vote proportion of total votes to 7.5 percent. The redefinition of variables now permits a major adjustment in the weights attached to them. The Y calculation gives a larger total weight of 67 percent to the two GDP variables (W uses only 50 percent). Furthermore, market-price GDP and PPP-GDP have the same weights (33 percent for each, whereas W gives twice as much of the combined GDP weight to PPP-GDP). The weight assigned to shares in world population is *reduced* in Y relative to W; population receives only one third of the weight remaining after the two thirds weight given to combined GDP; thus the weight assigned to population is only 11.1 percent of the total (versus the 15 percent in W). Shares in world reserves are assigned a weight of 7.2 percent. The remaining weight is given to the two ratio variables, 10 percent to shares in trade openness and 5 percent to shares in scaled variability. Calculation Y is compared to W, and to the current-status A, in Table 5.[33]

Under the Y assumptions for the formula, the voting share for emerging-market/developing countries in the aggregate rises by 14.35 percentage points (9.75 points for W). The voting shares of lowest-income members rises by 6.70 points (4.13 points for W). The increments to shares for the largest emerging-market/developing countries such as China, India, Brazil, Mexico, and Korea are still large, but less large than for W. The United States experiences a small decline in voting share (instead of the moderate increase for W). The voting-share increase for Japan is even larger for Y than for W. Not surprisingly, the primary beneficiaries of redefinition of the trade-openness and variability variables (in the sense of

[33] As with Calculations W and C, Calculation Y does not apply a compression factor, a supplementary filter, or foregoing overrides.

Table 5

Further Illustrative Calculation: Major Changes in the Formula Currently on the Table, Redefining the "Openness" and "Variability" Variables as Ratios, Assigning a Modest Weight to Population

	Actual Vote Share as of 2007	Calculated Vote Share less Actual Vote Share		
		Calculation A -- "Current-Status"	Calculation W (see text for detailed description)	Calculation Y (see text for detailed description)
	% of world total	(difference in percentage points)	(difference in percentage points)	(difference in percentage points)
World Total (All IMF Members) (185)	100.000	0.00	0.00	0.00
Advanced & Other Higher-Income (36 members)	**65.825**	**2.82**	**-9.75**	**-14.35**
G7 -- "Major Advanced" (7)	44.354	4.19	-4.69	-7.22
United States	16.732	3.41	0.41	-0.21
Japan	6.003	2.15	0.90	1.31
Canada	2.878	-0.40	-0.93	-1.29
Germany + France + Italy + UK (4)	18.742	-0.97	-5.07	-7.04
Germany	5.866	0.37	-1.12	-2.13
France	4.844	-0.91	-1.75	-2.16
Italy	3.187	0.05	-0.63	-0.79
United Kingdom	4.844	-0.47	-1.57	-1.97
Other EMU/Euro Area (excl UK) (12)	8.792	0.96	-1.15	-2.51
Australia + New Zealand (2)	1.882	-0.40	-0.61	-0.63
Other Industrial & High Income (7)	4.684	-0.58	-1.44	-1.87
Korea + Singapore (2)	1.728	1.39	0.95	0.54
Saudi Arabia + 5 Other High-Income Oil Producing (6)	4.385	-2.73	-2.82	-2.64
Other Emerging-Market/Developing/Transition : (185 - 36 = 149)	**34.175**	**-2.82**	**9.75**	**14.35**
China	3.652	2.79	5.19	4.44
India	1.883	0.05	2.55	2.01
Brazil	1.378	0.26	0.65	0.46
Mexico	1.430	0.44	0.40	0.13
Russian Federation	2.687	-0.71	-0.47	-0.71
All Other "Non-Advanced" (144)	23.145	-5.65	1.42	8.01
Memo: Lowest-Income Countries (< $825 GNI per capita) (58)	**7.316**	**-2.23**	**4.13**	**6.70**
Memo: European Union, total (27)	**31.991**	**-0.24**	**-6.82**	**-10.34**

Source: IMF; author's calculations. See text for explanation.

receiving larger increases in voting shares under the Y relative to the W assumptions) are middle- and smaller-sized economies.

Self-evidently, the voting shares resulting from the Y assumptions transgress several of those political "red lines" identified earlier that, according to some officials, must not be crossed. For example, China's share exceeds that of Japan and substantially exceeds the shares of France and the United Kingdom. Such outcomes are the virtually inevitable result of a more objective measurement of relative positions in today's world economy.

The Y and W illustrations point the way toward conceivable outcomes for the ongoing negotiations that would be far preferable to the inadequate current-status compromise. Such an approach to a gimmick-free quota formula could be transparently replicated in future quinquennial quota reviews, using the same principles and variables. It represents a plausible way of objectively capturing major changes in the relative positions of countries in the world economy.

The organization of IMF member countries into constituencies, the selection of Executive Directors for the constituencies, and the size of the Executive Board itself—the so-called chairs issues of governance reform—are integrally related to how quota and voting shares are determined. The chair issues are just as complex, and at least as politically delicate. Without an agreement on a better quota formula and voting shares, there is no hope of satisfactorily resolving the chair issues. The inadequate compromise package being considered for the April 2008 meetings appears to envisage no changes in the composition of the Executive Board and member constituencies.

For a moment give free rein to your imagination. Suppose that agreement might be reached on a revised quota formula and voting shares embodying assumptions something like those underpinning the Y calculation. One might then, in the same spirit, imagine amendments to IMF governance that would substantially alter the Executive Board and the grouping of members into constituencies.

A first change would eliminate the existing provision in the IMF Articles of Agreement that the five members with the largest quotas are treated as single-member constituencies and can each appoint their own Executive Director (ED) and Alternate ED. Instead, a revised provision would specify that any individual member with more than [**X**] percent of the total voting power shall be able, if it chooses, to act as a single-member constituency and *appoint* its own ED and

Alternate ED (without consulting other members). All other members would be grouped into multi-member constituencies; each multi-member constituency would *elect* its ED and Alternate ED. The number **X** might be specified as 7 percent. The revised provision would also state that a member with a share larger than [**X**] percent of the total voting power shall not be *required* to appoint its own ED and Alternate ED, but may instead, if it chooses, form a constituency that includes other member nations and may consult with them on the designation of the ED and the Alternate.

A second change would agree to reduce the number of constituencies and EDs to only [20]. This change would not in fact require a change in the Articles of Agreement since Article XII already specifies the normal size of the Executive Board as twenty chairs. The current Executive Board has 24 constituencies and EDs. This enlargement was possible because Article XII, section 3 provides for a special vote every two years on whether the number should differ from 20. Significantly, agreement every second year on the size of the Board differing from the number 20 requires approval of an eighty-five percent majority of total votes. Any single member or any grouping of constituencies with more than 15 percent of the total votes thus has the capacity to force the size of the Executive Board back to 20 chairs.[34]

Formal votes are seldom taken in the Executive Board. Rule C-10 of the IMF's rules and regulations, which dates back to the early years of the institution, prescribes that "the Chairman shall ordinarily ascertain the sense of the meeting, in lieu of a formal vote." The tradition of decision by consensus is often praised as fostering a spirit of cooperation among member nations. Significantly, however, if a formal vote is taken in the Executive Board, an ED is required to vote the same way on an issue for all members in his or her constituency (Article XII, section 3 (i) (iv) of the Articles of Agreement).

A further possible change in procedures would eliminate this provision blocking "vote splitting" within a constituency. Proponents of the existing provision believe that it fosters consensus decisions and that consensus decisions in the Executive Board are valuable enough to justify the prohibition against vote splitting. Those like myself who favor reconsideration of the provision blocking split votes are unsure of the degree to which the provision actually facilitates consensus decisions. The combination of the consensus tradition and the provision against vote

[34] So far in the IMF's recent history, neither the United States nor any other member grouping has been willing to exercise this drastic measure.

splitting, it can be argued, gives smaller members *less* of a voice and influence than they might otherwise have if procedures continue to emphasize consensus decisions but are conditioned by an awareness that voting rules on a member-by-member basis can be applied when attempts at consensus fail. My sympathy for permitting vote splitting is also influenced by a conjecture that it might facilitate reorganization of the number and composition of constituencies.

Regardless of the views one takes about the preceding suggestions, a thoroughgoing genuine reform of quota and voting shares will surely require a redrawing of constituency groupings and the resulting designation of Executive Directors.

Some officials may want to lubricate the adjustments in voting shares by *increasing* the size of the Executive Board, enlarging it to a number even greater than 24. An increase could reduce the number of members within several constituencies. Depending on the details of how the increase were implemented, it could slightly or moderately raise the number of constituencies headed by an emerging-market/developing nation or composed exclusively of such nations; that in turn could provide more opportunities for such nations to exercise "voice." It might persuade some higher-income (in particular European) members to be less unwilling to accept genuine reform if, as their voting shares decline as part of a negotiated agreement, they can nonetheless continue to lead a constituency with a national citizen serving as Executive Director.

Nonetheless, the potential benefits from increasing still further the size of the Executive Board should be weighed against the potential costs. Costs from enlarging the Executive Board include the budgetary expenses and a possible loss in efficiency and effectiveness of decisionmaking. Even though a reduction rather than increase in the number of Executive Directors raises severe political difficulties, a strong case can be made for trying to move in that direction.

The overriding political obstacle stems from the existing position of European member nations in the Executive Board. At least eight of the current twenty-four IMF constituencies are regularly headed by a western European nation—Germany, the United Kingdom, France, Italy, Belgium, the Netherlands, Switzerland, and a Scandinavian country. In some years when Spain heads the constituency it shares with (among others) Mexico and Venezuela, nine of the twenty-four constituencies have Executive Directors from western Europe. European nations, notwithstanding the evolution of European Union political institutions, are extremely reluctant to change this situation.

This section has tried to discern a better way forward in the current international negotiations. In keeping with the spirit of giving your imagination free rein to think outside the box, Table 6 takes another step by imagining how constituency boundaries might be redrawn in conjunction with voting-share adjustments grounded in an improved quota formula. The existing twenty-four IMF constituencies are shown on the left-hand side of the table. On the right-hand side, twenty illustrative new constituencies are identified. The new constituencies are based on the voting shares emerging from the "Y" calculation shown in Table 5. The most significant suggested changes are the reduction to 20 from 24 constituencies, the establishment of a single constituency for the fifteen members of the European Monetary Union,[35] the creation of a second EU constituency for EU members currently outside the EMU, the loss of single-member constituencies by Saudi Arabia and the Russian Federation, and the creation of three (rather than the existing two) constituencies for African members.

If your thinking can go so far as to imagine the Executive Board changes shown in Table 6, why not be logical and go still further? Consider as part of a package of thoroughgoing governance reform a further amendment to the IMF Articles of Agreement that would alter decisions requiring a high special majority of the total voting power. Suppose that required special majority were reduced from 85 percent to 80 percent. With that modification, no single member—not the United States—and no other single constituency—not the EMU Fifteen—would have an unambiguous veto for the most critical IMF decisions.

IV. Options for April 2008

The way forward suggested in section III is a radical, beneficial departure from the inadequate compromise currently on the table in the international negotiations. But that way forward will seem quixotic. It requires the larger transatlantic IMF members to act on a farsighted evaluation of their self interests and to exert much more genuine leadership. It also requires more farsightedness and leadership from larger emerging-market countries—not least China, India, Korea, Brazil, and Mexico. The probability of such leadership manifesting itself

[35] On January 1, 2008 Cyprus and Malta joined the thirteen EU members previously constituting the European Monetary Union.

Table 6

Existing Constituencies and Illustrative New Constituencies

24 Existing

		Number of Members	Vote Share (Percent
1	**United States**	1	16.73
2	**Japan**	1	6.00
3	**China, People's Republic**	1	3.65
4	**Germany**	1	5.87
5	**France**	1	4.84
6	**United Kingdom**	1	4.84
7	**Elected I (Belgium etc.)** Austria Belarus Belgium Czech Republic Hungary Kazakhstan Luxembourg Slovak Republic Slovenia Turkey	10	5.13
8	**Elected II (Netherlands etc.)** Armenia Bosnia & Herzegovina Bulgaria Croatia Cyprus Georgia Israel Macedonia, fmr. Yug. Rep. Moldova Netherlands Romania Ukraine	12	4.74
9	**Elected III (Sweden, Denmark etc.)** Denmark Estonia Finland Iceland Latvia Lithuania Norway Sweden	8	3.43
10	**Elected IV (Italy etc.)** Albania Greece Italy Malta Portugal San Marino Timor-Leste	7	4.09
11	**Elected V (Switzerland etc.)** Azerbaijan Kyrgyz Republic Poland Republic of Serbia Switzerland Tajikistan Turkmenistan Uzbekistan	8	2.78
12	**Russian Federation**	1	2.69
13	**Elected VI (Canada etc.)** Antigua & Barbuda Bahamas Barbados Belize Canada Dominica Grenada Ireland Jamaica St. Kitts & Nevis St. Lucia St. Vincent & the Grenadines	12	3.63
14	**Elected VII (India etc.)** Bangladesh Bhutan	4	2.35

20 Illustrative New

		Number of Members	Vote Share (Percent of Total)
1	**United States**	1	16.53
2	**Japan**	1	7.31
3	**China**	1	8.09
4	**EMU Fifteen (2008)** Germany France Italy Netherlands Belgium Luxembourg Austria Greece Finland Ireland Portugal Spain Slovenia Malta Cyprus	15	15.10
5	**European Union Other (27 - 15)** United Kingdom Sweden Denmark Poland Hungary Czech Republic Slovakia Lithuania Latvia Estonia Romania Bulgaria	12	6.55
6	**Switz., Turkey, Candidate EU, Etc.** Switzerland Turkey Israel San Marino Albania Armenia Bosnia & Herzegovina Croatia Republic of Serbia Macedonia,fmr.Yug.Rep. Moldova Azerbaijan Montenegro	13	3.32
7	**Russia, Central Asia** Russian Federation Belarus Kazakhstan Georgia Ukraine Kyrgyz Republic Tajikistan Turkmenistan Uzbekistan	9	3.53
8	**Canada + Nordic + Caribbean** Canada Norway Iceland Antigua and Barbuda Bahamas Barbados Dominica Grenada Jamaica St. Kitts and Nevis St. Lucia St. Vincent & Grenadines	12	3.32
9	**South Asia** India Sri Lanka Seychelles Maldives Bhutan	5	4.50
10	**East Asia excl. China & Japan**	4	2.61

India
Sri Lanka

15	**Elected VIII (Indonesia etc.)** Brunei Darussalam Cambodia Fiji Indonesia Lao P.D.R. Malaysia Myanmar Nepal Singapore Thailand Tonga Vietnam	**12**	**3.11**
16	**Elected IX (Australia, Korea etc.)** Australia Kiribati Korea Marshall Islands Micronesia, Fed. States Mongolia New Zealand Palau Papua New Guinea Philippines Samoa Seychelles Solomon Islands Vanuatu	**14**	**3.84**
17	**Elected X (Mexico, Spain etc.)** Costa Rica El Salvador Guatemala Honduras Mexico Nicaragua Spain Venezuela	**8**	**4.44**
18	**Elected XI (Brazil etc.)** Brazil Colombia Dominican Republic Ecuador Guyana Haiti Panama Suriname Trinidad & Tobago	**9**	**2.41**
19	**Elected XII (Argentina etc.)** Argentina Bolivia Chile Paraguay Peru Uruguay	**6**	**1.95**
20	**Saudi Arabia**	**1**	**3.16**
21	**Elected XIII (Egypt, Kuwait etc.)** Bahrain Egypt Iraq Jordan Kuwait Lebanon Libya Maldives Oman Qatar Syrian Arab Republic United Arab Emirates Yemen, Republic of	**13**	**3.19**
22	**Elected XIV (Iran etc.)** Afghanistan Algeria Ghana Iran, Islamic Republic Morocco Pakistan Tunisia	**7**	**2.42**
23	**Elected XV (Africa 1)** Angola Botswana Burundi Eritrea Ethiopia Gambia Kenya Lesotho	**19**	**3.00**

Korea
Vietnam
Mongolia
Bangladesh

11	**Other Asia and SE Asia** Indonesia Malaysia Thailand Singapore Brunei Darussalam Cambodia Lao P.D.R. Myanmar Nepal	**9**	**3.83**
12	**Pacific** Australia New Zealand Philippines Timor-Leste Kiribati Marshall Islands Micronesia, Fed. States Palau Papua New Guinea Samoa Solomon Islands Vanuatu Fiji Tonga	**14**	**3.49**
13	**Mexico, Other Lat Am, Central Am** Mexico Venezuela Costa Rica El Salvador Guatemala Honduras Nicaragua Belize Panama	**9**	**2.96**
14	**Brazil, South America I** Brazil Dominican Republic Guyana Haiti Suriname Trinidad & Tobago	**6**	**2.64**
15	**Argentina, South America II** Argentina Colombia Bolivia Chile Ecuador Paraguay Peru Uruguay	**8**	**2.19**
16	**Saudi Arabia, Middle East** Saudi Arabia Egypt Bahrain Kuwait Iraq Jordan Lebanon Oman Qatar Syrian Arab Republic United Arab Emirates Yemen, Republic of	**12**	**3.42**
17	**Other Muslim, N. Africa** Algeria Morocco Tunisia Libya Iran, Islamic Republic Pakistan Afghanistan	**7**	**2.71**
18	**Africa I (esp. Southern)** South Africa Angola Botswana Lesotho Malawi Mozambique	**14**	**2.48**

	Malawi Mozambique Namibia Nigeria Sierra Leone South Africa Sudan Swaziland Tanzania Uganda Zambia		
24	**Elected XVI (Africa 2)** Benin Burkina Fasc Cameroon Cape Verde Central African Republic Chad Comoros Congo, Democratic Republic of Congo, Republic of Cote d'Ivoire Djibouti Equatorial Guinea Gabon Guinea Guinea-Bissau Madagascar Mali Mauritania Mauritius Niger Rwanda Sao Tome & Principe Senegal Togo	**24**	**1.38**
	Not now voting in a constituency: Somalia Liberia Zimbabwe Montenegro	**4**	**0.31**
		185	**100.00**

	Namibia Swaziland Tanzania Zambia Comoros Madagascar Mauritius Zimbabwe		
19	**Africa II (esp. Western)** Nigeria Gambia Sierra Leone Ghana Benin Cape Verde Central African Republic Congo, Democrat Republic of Congo, Republic of Cote d'Ivoire Equatorial Guinea Gabon Guinea Guinea-Bissau Sao Tome & Principe Senegal Togo Liberia Cameroon	**19**	**3.31**
20	**Africa III** Eritrea Ethiopia Sudan Kenya Uganda Burundi Rwanda Somalia Djibouti Chad Niger Burkina Faso Mali Mauritania	**14**	**2.11**
		185	**100.00**

before the April 2008 meetings of the IMF lies between zero and slim—and Slim is likely to be out of town.

Thus the range of outcomes that can be envisaged today is restricted to an option A and option B. In option A, a substantial majority of IMF members would agree to accept a minimal, inadequate package little different from the current-status compromise analyzed in section II above. In option B, a group of members with more than 15 percent of the current total voting power would refuse to go along with an inadequate compromise, thereby preventing an agreement being reached by the April 2008 meetings. Option A and option B may each be divided into suboptions, depending on what is expected to happen after April 2008:[36]

- **A1** Minimal compromise reached by April 2008. No further reform assumed in the succeeding 3-4 years for quota and voting shares, for constituencies and Executive Board chairs, and for other aspects of governance reform. The reform issues would not be effectively re-opened until 2012 as part of the final months of the Fourteenth quinquennial General Review of quotas mandated to conclude in January 2013.

- **A2** Minimal compromise reached by April 2008. But then a further discussion of governance reform issues would be continued in 2008-2010 with a goal of reaching further agreed adjustments in quota and voting shares and in Executive Board chairs by sometime in 2009 or 2010.

- **B1** No agreed compromise reached by April 2008. And no agreed re-opening of governance-reform discussions for the next several years.

- **B2** No agreed compromise reached by April 2008. But continuation of the official discussions thereafter with a goal of reaching agreed adjustments in quota and voting shares and in Executive Board chairs by sometime in 2009 or 2010.

Each individual IMF member will no doubt concentrate on which one of these options promises to best promote its own narrowly defined interests. But, preferably, the world community should carefully weigh how the legitimacy and effectiveness of the IMF would be influenced.

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[36] As noted earlier in the paper, a compromise package envisaged for April 2008 will likely include proposed reforms not directly related to quota and voting shares and the size of Executive Board constituencies, such as guidelines for cutting back IMF staff expenditures and guidelines for enhancing IMF income sources other than earnings related to IMF lending. If no agreement on a package is possible by April 2008, these other reform issues will also continue to command attention.

To favor the no-compromise B2 outcome is to assert that nothing would be better for the time being than a pallid something. If member nations believe the IMF needs to be credibly and viably effective and that the current-status compromise falls far short of the governance reforms needed to assure that result, those members should keep the pressure on for reaching an improved compromise. Rather than accepting only, say, 5 percent of a loaf, they should hold out for at least half a loaf, and better still something much closer to a full loaf.

The risk associated with advocacy of a *temporary* failure of the negotiations in April is that the "temporary" failure could turn out to be long lasting (the outcome de facto proving to be B1 rather than B2). From the perspective of the IMF, the worst outcome would be a *persisting* failure to agree on governance reforms (B1). IMF credibility and effectiveness could decline sharply further, and many nations might decide to bypass the IMF. The persisting failure of option B1 would also not serve well the interests of western Europe and North America. Those countries, it is true, would retain a dominant role in IMF decisionmaking. But the rest of the world would be reinforced in their impression that the IMF is a transatlantic institution inadequately serving their interests. And the IMF could atrophy. Its decisions, overly dominated by the transatlantic nations, might have less and less relative importance over time.

The IMF would be marginally less worse off with an A1 than with a B1 outcome. A little bit of something followed by nothing at all over the medium run, it can be plausibly argued, is slightly better than nothing in the short run followed by nothing in the medium-run. Some officials that are predisposed to an inadequate compromise in April appear to feel that, if nothing is agreed by April, "the window might close" on *any* sort of agreement because momentum for political agreement is bound to dissipate. This view, however, assumes that there is no realistic possibility of a temporary failure leading to a subsequent, more adequate agreement. And if a temporary failure could not generate enough pressure for continuation of negotiations (B2), how could one be optimistic that an inadequate compromise would be complemented by further agreed adjustments in quota and voting shares and in Executive Board chairs (A2)? Just as there is a risk that a temporary failure to agree in April could turn into a persisting failure, so is there a risk that agreeing on an inadequate compromise in April in the expectation that more will follow will merely ease the pressures for subsequent substantial reform.

Thus difficult questions of judgment and political expectations are at stake when IMF members decide whether to gamble on a temporary failure of the negotiations or on promises

that a pallid something in April will lead to further subsequent reforms. Those members who favor a small step in April followed later on by something more substantial will try to persuade those who advocate the temporary-failure strategy that they would in practice be stuck with a persisting failure. Conversely, those inclined to gamble on a temporary failure because of the pressures it would generate for an improved compromise will be suspicious of any assurances that a little bit now will, by and by before long, lead to further substantial progress.

The world community faces a close call as to which of the two risks is greater and which entails the larger threat to the viability of the IMF. The choice of near-term strategy is especially difficult for IMF members whose countries do not border the Atlantic Ocean. My own judgment is that the strategy of accepting a temporary failure in April and pushing for continuing intensive negotiations is a wiser course. If European and North American members (and Japan) were to promise, after agreement on an "inadequate something" in April, that they could in subsequent months agree to much more than the maximum they say is possible for April, why should those assurances be regarded as credible? If transatlantic members cannot find the farsightedness to cross red lines now, it is more implausible to imagine that they will do so a few months from now after it can be argued that "at least something" was done in April 2008.

A new government will exist in the United States by early 2009. There seems a reasonable hope that that new government will be somewhat more sympathetic than its predecessor to the potentially fruitful role of international institutions in general, and of the IMF in particular. If no agreement is reached in April 2008, the current U.S. administration would presumably be unwilling to submit to the U.S. Congress an international agreement of any sort reached as late as September 2008 (because of the pending election in November 2008).

For the U.S. political reasons just given and because of inevitable slowness in adjustments of European political views, a temporary failure of negotiations in April 2008 is very likely to postpone the implementation of any agreement at all until at least 2009. Such a delay would be unfortunate. But if the world community has to wait until 2009 or 2010 for a "much better something" than the unacceptable compromise currently in the pipeline, the wait may well be justified.

Appendix A

Population as a Variable in a Revised Quota Formula

Official participants in the ongoing negotiations about IMF governance reform have so far rejected, out of hand, the use of shares in world population as one of the variables in a revised quota formula. In section III of the text I argue that this rejection of a population variable is a serious mistake and recommend inclusion of population shares, with only a modest weight, as a critical ingredient of a more viable formula. This appendix backs up that text discussion with further analysis.

How High a Correlation between PPP-GDP and Population?

The first argument to consider, used frequently in the last year by some of those rejecting population as a variable, is that member nations' shares in PPP-GDP and members' shares in population are so highly correlated that PPP-GDP is essentially a substitute for population. As emphasized in the text, that assertion is flatly wrong. Population shares and PPP-GDP shares do of course have a substantial correlation. But *every pair* of candidate core-share variables exhibits a substantial correlation. Large countries tend to have large values and small countries tend to have smaller values because each core-share variable reflects some aspect of relative world positions. The correlation between population and PPP-GDP, however, is *not* high enough to justify treating the two variables as a substitute for one another. For all 185 IMF members, the correlation coefficient between the two is only 0.534.[37] (For comparison, the correlation coefficients are much higher between cross-border trade and market-price GDP (0.916) and between PPP-GDP and market-price GDP (0.963).) Thus the verdict on this question is unambiguous: a quota formula *cannot* get similar results merely be excluding population shares as a variable, including PPP-GDP shares, and assigning PPP-GDP shares a higher weight than might otherwise be considered.

The easiest way to grasp this point is to examine the following scatter diagrams. These diagrams plot member nations' shares in world PPP-GDP on the vertical axis and their shares in

[37] This statistic uses the newer World Bank ICP data for PPP-GDP (including my own rough estimates for some of the smallest member nations—see earlier discussion). If a correlation coefficient between population shares and PPP-GDP shares is calculated with the older PPP-GDP data, the number is slightly higher, 0.687.

world population on the horizontal axis (both axes scaled to the same range). If the two shares for a member nation are identical, the point for that nation falls exactly on the 45-degree diagonal line. The points for members whose population share is larger (smaller) than their PPP-GDP share fall below and to the right (above and to the left) of the 45-degree line. Figure A-1 shows the scatter for the largest member nations, defined as those with more than 1 percent of total IMF voting power. To make it easier to identify the positions of most countries, Figure A-2 shows the points for the same group except that the points for the United States, China, and India are excluded. Middle-sized members, those with shares in IMF voting rights less than 1 percent but more than 0.2 percent of the total, are shown in Figure A-3. Figures A-4 and A-5 plot the points for all the remaining members, each with a share in total voting rights of less than 0.2 percent.[38]

The great majority of points in the diagrams do not fall close to the 45-degree line. Moreover, the differences across the five panels are substantial. Most of the IMF members in Figures A-1 and A-2 have PPP-GDP shares markedly larger than their population shares; the notable exceptions are China and India. The points in Figure A-3 are widely dispersed, some to the left of the line but with many others well to the right; countries such as Indonesia, Pakistan, Bangladesh, Nigeria, and the Philippines have much higher population shares than PPP-GDP shares. The bulk of the smaller member nations in Figures A-4 and A-5 have population shares substantially larger than their PPP-GDP shares so that their points in the scatter are also well to the right of the 45-degree line. The differences between the values of the two variables across the entire range of individual members are so significant that one can see merely from visual inspection that neither one of the two variables could appropriately substitute for the other in formula calculations.

Is Population an Economic Variable?

As section III observes, no one has argued that population shares should be the sole variable in a quota formula. Everyone agrees that it would be inappropriate, and politically infeasible, even to make population shares the dominant variable.

[38] As for the correlation coefficient mentioned in the text, the scatter diagrams in Figures A-1 to A-5 us the newer World Bank ICP data (including my rough estimates for some of the smallest member nations).

Figure A-1
Correlation between PPP-GDP Shares and Population Shares,
Members with More than 1% of IMF Voting Rights

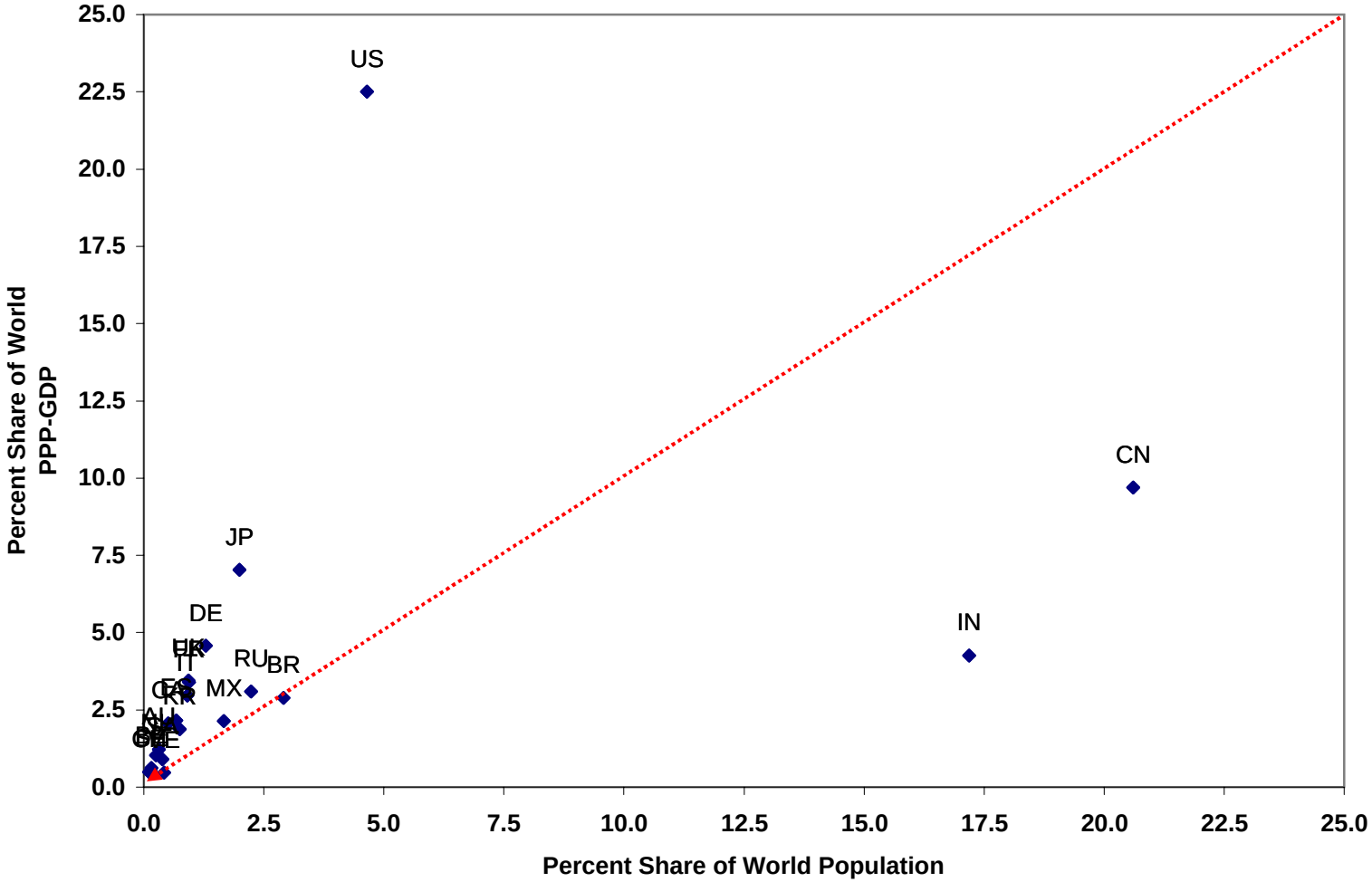


Figure A-2
Correlation between PPP-GDP Shares and Population Shares,
Members with More than 1% of IMF Voting Rights Excluding US, China, India

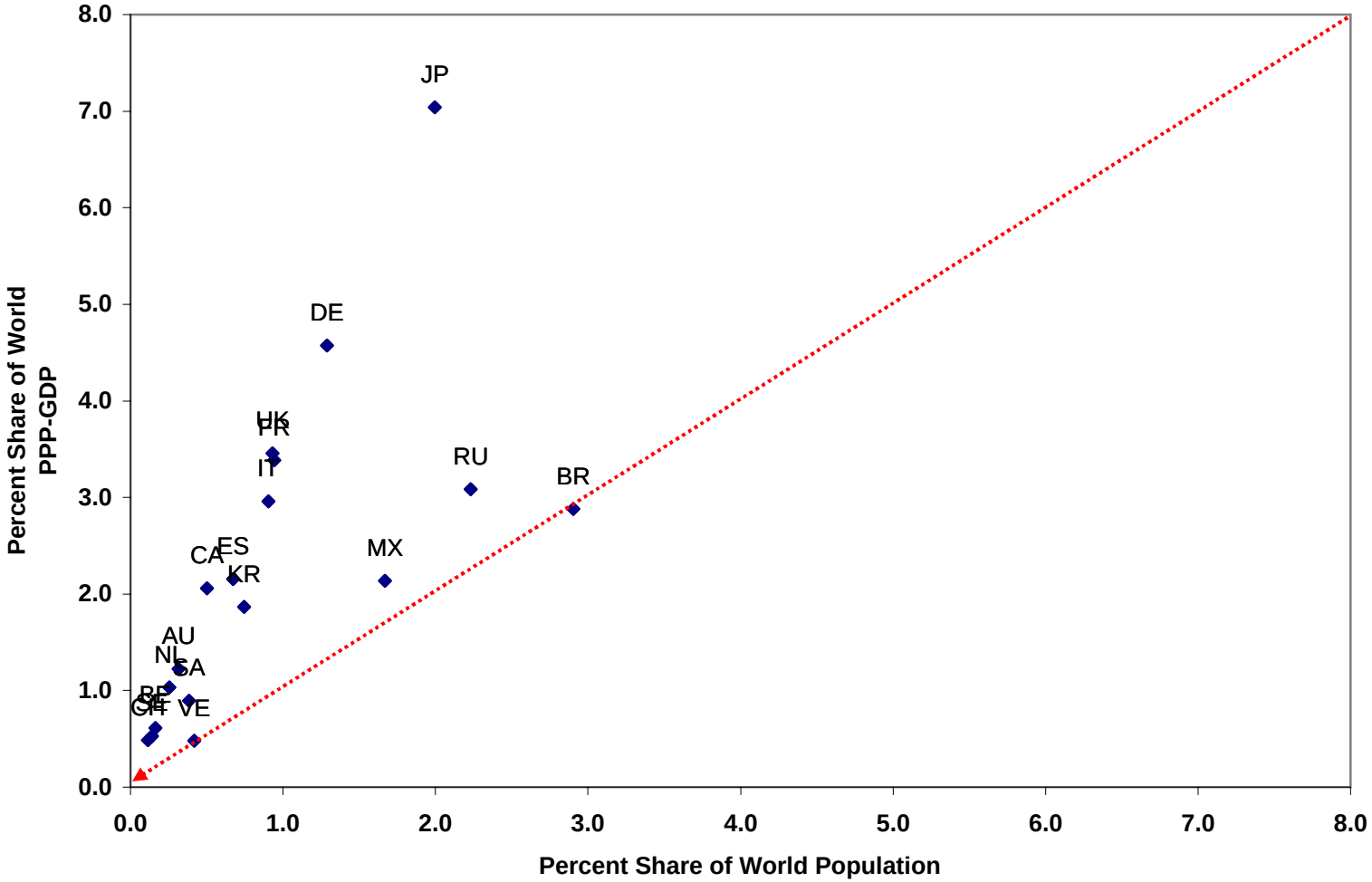


Figure A-3
Correlation between PPP-GDP Shares and Population Shares,
Members with Less than 1% and More than 0.2% of IMF Voting Rights

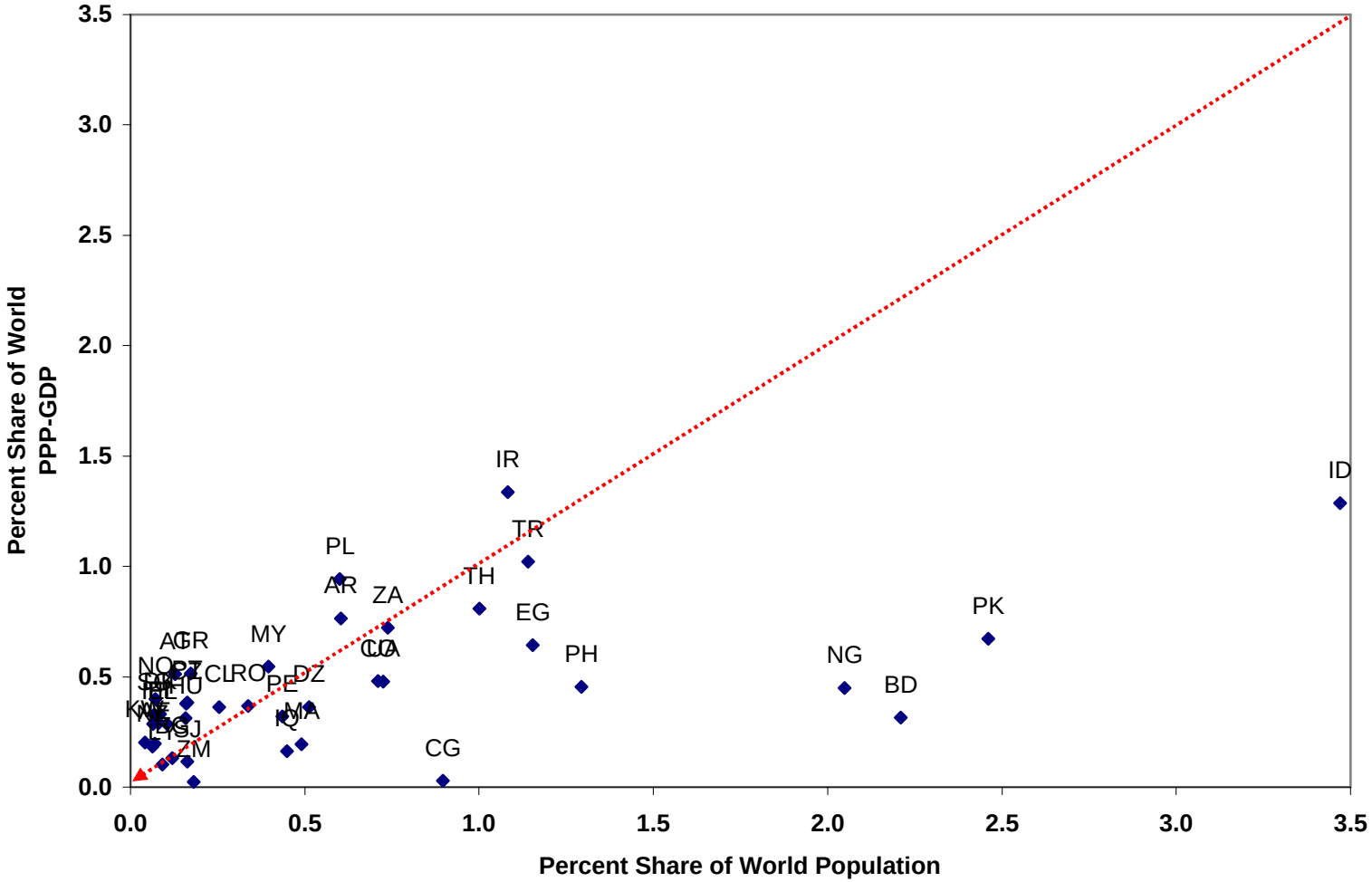


Figure A-4
Correlation between PPP-GDP Shares and Population Shares,
Members with Less than 0.2% and More than 0.069% of IMF Voting Rights

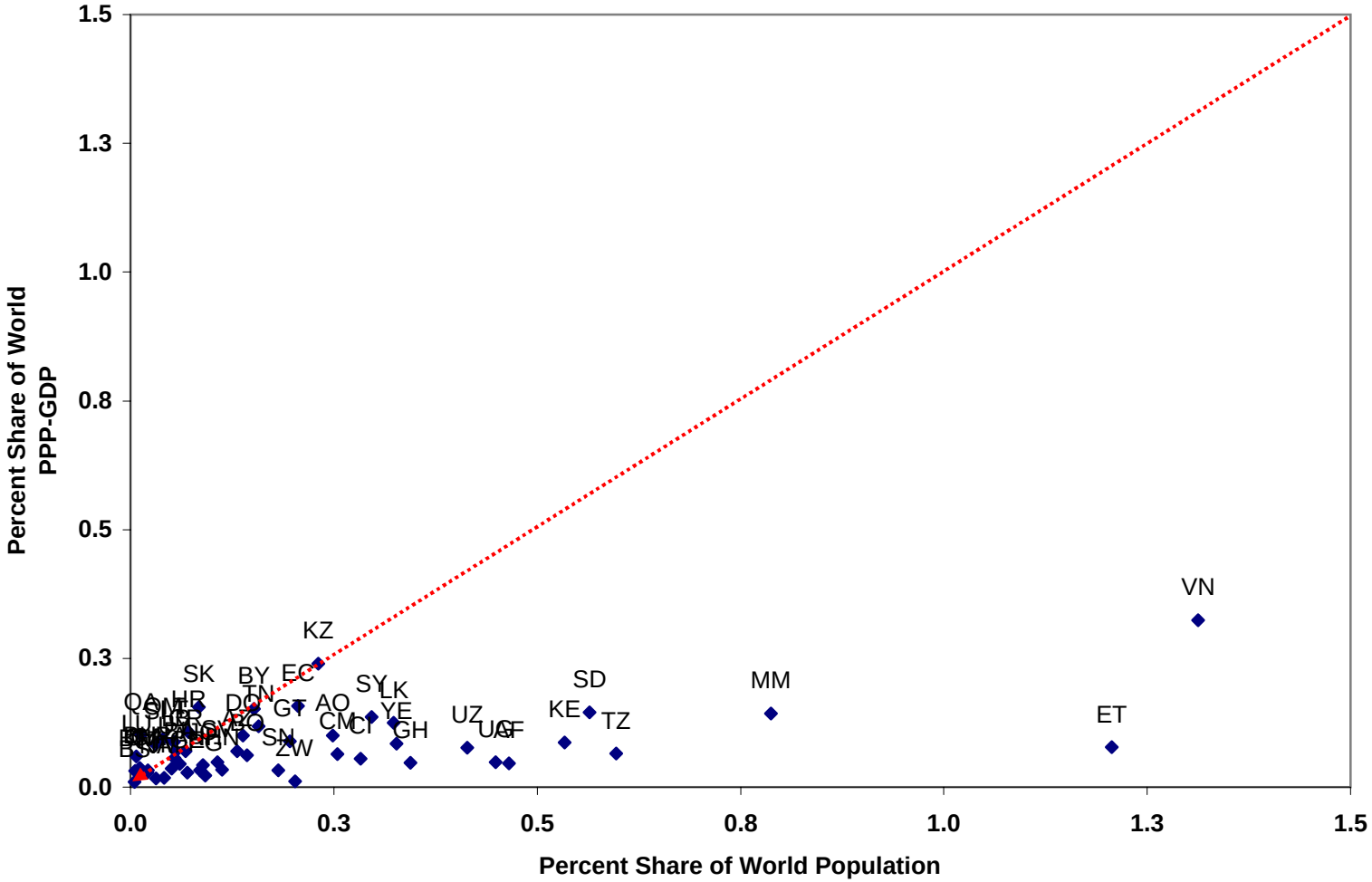
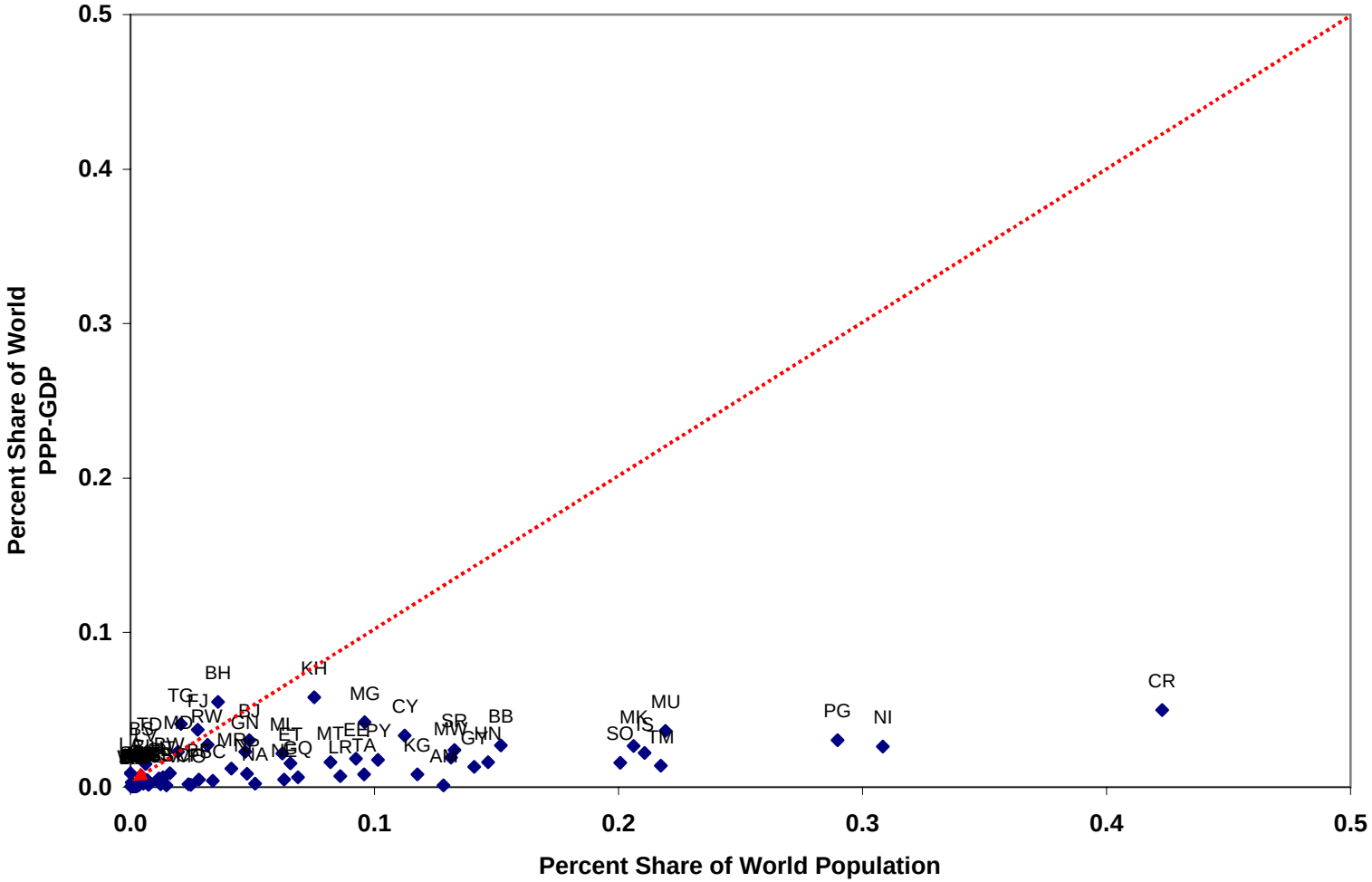


Figure A-5
Correlation between PPP-GDP Shares and Population Shares,
Members with 0.070% or Less of IMF Voting Rights



In arguing for the complete exclusion of population shares, some have asserted that population is "not an economic variable" and hence is "not relevant for a financial institution." Consider the initial part of the assertion first. Beyond doubt, population is a variable that bears directly on nations' evolutions in the world economy and financial system. Labor supply and employment are critical components of economic performance. Demographic trends, such as fertility declines and population aging, are widely acknowledged as key determinants of health-care supplies and economic performance more broadly. The assertion that population is not an economic variable is either a silly remark or relies on a definition of "economic" far outside common usage.

The motivations are murky that underlie the remark that population is not relevant for a financial institution such as the IMF. Suppose the remark is interpreted as charitably as possible. Then proponents of this view may be hypothesized as believing that the IMF's lending and borrowing operations are the IMF's primary if not exclusive function. That belief in turn could lead to an exclusive emphasis on member nations' potential ability to contribute financial resources to the Fund's lending operations and members' potential needs to borrow those funds, which in turn could lead to an assertion that only those two criteria should be considered in selecting variables to appear in a quota formula.[39]

Section I of this paper argues that variable selection for a quota formula should *not* focus narrowly on member nations' "contributions" and "needs" in the IMF's intergovernmental lending-intermediary operations. Rather the formula should emphasize variables that bear on relative status in the world economy broadly conceived, in keeping with the shifts in the IMF's primary functions away from lending operations toward such newly important activities as multilateral surveillance and monitoring. If this view of the IMF's mission is accepted, population has just as much claim in principle to be considered an economic variable included in the formula as such variables as GDP, cross-border trade, and international reserves. A sufficiently broad view of the IMF's functions today and in the future certainly cuts the ground out from under offhand remarks that use of population as a variable is "not straightforward to square with the notion of a financial institution."[40]

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[39] The Quota Formula Review Group working in the years 1999-2000 (IMF, 2000) adopted, in essence, a sophisticated variant of this view.

[40] European Central Bank (2007, p. 49, 17).

Population is of course not merely an economic variable. To consider population for inclusion in a quota formula opens the door explicitly to a still wider range of political considerations. But debate about all candidate variables for a quota formula is in any event highly political. Discussion about using population as a variable needs to surmount the hurdle of being treated as a serious question and get on with objective analysis of the pros and cons.

Relative Productivities

Some analytic preliminaries can help. Consider the relationship between a nation's population and the gross output it produces. Gross output as typically measured depends *both* on the number of people in the nation (strictly, the number engaged in measured economic activity) *and* on the "productivity" of those people. A nation's productivity can be roughly measured as the ratio of its gross output to its population, in other words output per capita.[41]

The following algebraic identities summarize these definitions for an individual nation and for the world, where Y_i is the individual nation's output (GDP), N_i its population, $prody_i$ its per capita output; Y_W and N_W are aggregated output and population for the world as a whole; and $YShare_i$ and $NShare_i$ are the respective shares for nation i :

$$prody_i \equiv \frac{Y_i}{N_i};\ \ Y_i \equiv N_i(prody_i);\ \ Y_W \equiv \sum_i Y_i\ ;\ \ N_W \equiv \sum_i N_i;\ \ YShare_i \equiv \frac{Y_i}{Y_W};\ \ NShare_i \equiv \frac{N_i}{N_W}\ .$$

Given these definitions, the identity for a nation's share in world output can also be written as:

$$YShare_i \equiv \frac{N_i(prody_i)}{Y_W} \equiv (\frac{N_i}{N_W})(\frac{prody_i}{Y_W})N_W \equiv NShare_i\left[\frac{prody_i}{\frac{Y_W}{N_W}}\right]\ .$$

In words, the share of a nation in world GDP is the product of its share in world population and the ratio of the nation's productivity (measured by national GDP per capita) to *average* world productivity (world GDP per capita).

[41] For more precise analysis of productivity trends, measures of productivity should be expressed as another ratio, for example, the output produced by resident workers divided by the number of hours worked.

A highly productive, rich nation will have higher-than-world-average productivity; its ratio $\left[\frac{prody_i}{\frac{Y_W}{N_W}}\right]$ will be substantially greater than unity. Conversely, that ratio will be low, significantly less than unity, for a relatively unproductive, poor country. If every nation in the world had productivity equal to world average productivity, the ratio $\left[\frac{prody_i}{\frac{Y_W}{N_W}}\right]$ for every nation would be unity; then the only difference between nations' share in world GDP would be attributable to different size populations. In that hypothetical world, it could make no difference whether member nations are weighted relative to each other by their GDP shares or by their population shares. In practice, of course, relative productivities across nations differ enormously. Therefore it makes a great difference when relative positions have to be judged—for example, in an IMF quota formula—whether one weights by GDP shares, by population shares, or some mixture between the two.

To weight voting shares in the IMF exclusively by population shares would completely ignore national differences in productivity and the resulting cross-national differences in output and wealth. Yet those differences determine the capacities of member nations to contribute resources to the IMF and, still more important, determine their capacities and willingness to support the activities of the IMF more generally.

But now consider the other extreme choice, choosing voting shares only on the basis of GDP shares, giving a zero weight to population shares. That choice would be tantamount to saying that output and wealth are alone the relevant criterion. Yes, a sole use of GDP shares as weights would implicitly accord a limited role to population. Everything else being the same, a member nation with a larger rather than a smaller population would receive a higher voting share. But, in effect, the implicit principle would be to count each individual in the world, not as an entire person, but rather weighting each person by the relative productivity of the nation in which they reside (alternatively stated, by how much output per capita is produced in their nation relative to the average output produced by all individuals in all nations). Nations with lower than average productivity (GDP per capita) would have their residents discounted, treated as a

fraction— $\left[prody_i /(Y_W / N_W) \right] < 1$ —of a person with average world productivity. Nations with higher than average productivity would have their individuals enhanced, counted as a multiple— $\left[prody_i /(Y_W / N_W) \right] > 1$—perhaps a large multiple, of a single person.

Governance within Nations versus Governance for the IMF: Which Relativities?

For purposes of governance, should political jurisdictions be weighted by how much output and wealth they produce, or by how many individuals are resident within the jurisdictions? Significantly, *within* democratic nations the second method is unambiguously preferred for government institutions. There is no serious advocacy for counting each individual person not as an entire individual but rather weighting persons in a jurisdiction by how much average output the jurisdiction produces relative to the average output produced by all individuals in all jurisdictions.

Consider two states within the United States, New Jersey and West Virginia. The population of New Jersey is a bit less than 5 times that of West Virginia. Representation in the U.S. House of Representatives is based on population. New Jersey thus has 15 Congressman and West Virginia has 3. If one examines measures of state product, however, New Jersey's is more than 8 times that of West Virginia's. One does not encounter the argument that New Jersey should have 24 Congressmen—8 times as many as West Virginia's 3. Nor is there discussion of giving partial weight to state products and partial weight to populations, for example allocating New Jersey 7 or 6 times as many Congressmen as West Virginia instead of just 5 times.

By invoking this example, I am not suggesting that the relative influence of political jurisdictions within the United States is, even today, without controversy. And determination of today's relativities, after all, was the outcome of a difficult, chequered history. A key feature of the 1789 constitution in the United States was the so-called sectional compromise among slavery and anti-slavery states that each slave would be counted as *three-fifths* of a person for the computation of populations governing the allocation among states of seats in the House of Representatives! The United States fought a bloody civil war before slavery was eradicated. It had to endure decades of political struggle over gender equality and civil rights before one-adult-person-one-vote became a reality instead of a legal promise!

Determining relativities among political jurisdictions even within nations is thus not at all straightforward. Not for the United States. Not within individual European countries. Not in

Canada. Not in Japan. Probably not within *any* nation giving prominence to some procedural form of democratic decisionmaking. Nevertheless, within those nations as of today, there exists widespread acceptance of the principle that domestic jurisdictions' relative voting power in national political institutions should depend on the numbers of people resident in the jurisdictions.[42]

To state the obvious: determining the voting shares and other relative influences of member nations within the IMF is a very different matter from determining relativities among political jurisdictions within a nation. The presumptions should be and are different. It *is* relevant that the IMF is an international institution with specialized economic and financial functions.

But just *how different* should IMF governance be? Should IMF voting shares be determined in a process that assigns world shares in population a weight of *exactly zero* after world shares in output and wealth are taken into account?

Consider again an example comparing two political jurisdictions. But now let the jurisdictions be IMF member nations, the United States and Brazil. The United States has a population 1.6 times that of Brazil (world population shares are, respectively, 4.65 percent and 2.90 percent). U.S. productivity measured by market-price GDP per capita is 6-1/2 times greater than the world average. Brazil's productivity measured comparably is only 1/2 the world average. Given those facts about relative populations and relative productivity, U.S. output at market prices is some 21 times the output of Brazil. The U.S. share of total voting power in the IMF as of 2007 is 16.73 percent, about 12 times the Brazilian share of 1.40 percent.

The comparison between the United States and Brazil is between two nation states in a heterogeneous and imperfectly integrated world economy. When judging the current relativities between the two, one inevitably asks whether it seems appropriate that the United States should have a voting share in the IMF 12 times greater than Brazil's when the United States has output 21 times greater and output per capita 13 times greater but population only 1-1/2 times greater. Even given that one wishes to make substantial allowance for the greater output and wealth of the United States as a proxy for its greater ability and (it is hoped) greater willingness to support

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[42] And for intermediate "federal" entities, the issues are still more complex. Think of that most difficult case of the political relativities of the now 27 nations within the European Union as a whole. Voting shares and decisionmaking procedures for the European Union are still, at best, a work in progress—and "progress" sometimes seems too extravagant a word for what is actually happening.

the activities of the IMF, how large a difference in vote shares and population shares is appropriate? Yes, the shares should be different. But just how different?

If one tries to reason from first principles about the general issue highlighted by this example, I doubt that any conclusion can be reached that would command a full consensus. But it is surely an extreme position, most unlikely to command thoughtful agreement in the world community as a whole, that voting shares and other aspects of IMF governance should be determined by according population shares a weight of exactly zero once shares in world output are taken into account.

Broader Justifications for Inclusion of Population as a Variable

The reasoning in this appendix so far is rooted in economics as much as politics. It supports the inclusion of population shares in a quota formula, but only as one of several variables and only if the population-shares variable has a modest weight relative to other variables. But it is also useful to stand back from today's political perspectives and take a longer view.

The history of suffrage expansion within domestic political organizations and other aspects of the world's democratic nations suggests some salutary lessons for thinking about the future. The notion that democratic societies should adopt governance procedures emphasizing one-adult-person-one-vote was never written in tablets of stone. Very much the contrary. Those societies that now emphasize such procedures evolved, painfully and slowly, to their current position.

Before the nineteenth century in Britain and Continental Europe, the original idea about voting in governance institutions was that only those owning a minimum amount of property should have the vote. The arguments—made notably by property owners—included the contentions that property owners had a much bigger stake in how the society functioned, that property owners contributed more to the functioning and the stability of the political institutions, and that only property owners would prudently exercise the responsibility of voting.

Decades elapsed before the original idea was modified. But eventually voting rights were extended to men regardless of the property they owned.

In nations describing themselves as democratic, originally women were not allowed to vote either. It was for long argued by many—notably the men—that men had a larger stake in

how the society functioned, that men contributed more to the functioning and stability of the political institutions, and that only men would prudently exercise the responsibility of voting.

After decades of heated discussion and controversy, such arguments also failed to be sustained. Eventually voting rights were extended to adult individuals regardless of gender.

If we look ahead fifty or one hundred years, should we presume that voting rights in international institutions—including specifically international *financial* institutions such as the IMF—will still depend primarily on the relative wealths of nations', giving no or little weight to the numbers of people living in the nations independently of national wealths? To put the question more provocatively, which seems justified if one holds the view that democratic ideas should actually be implemented in societies that claim allegiance to them, can we imagine the persistence for 50 or 100 years of a world in which rich nations always enjoy large vote shares proportional to their wealths, regardless of their populations, while poor nations, again regardless of their populations, experience small vote shares simply because they are poorer, have fewer resources, and have not yet unlocked the secret of successful development?

The longer view just sketched, in my opinion, also points toward permitting population shares to be used as a core-share variable in a revised formula for IMF quota and voting shares. Economic reasoning, detailed examination of the alternatives for a quota formula, and a longer view of political history all point toward letting the camel's nose a little bit into the tent today.

According a modest weight to population shares in the formula would marginally help in the short run, as shown in section III of the text, to increase voting shares for many individual developing nations and for developing nations in the aggregate. Over a much longer run, the modest weight on population shares in a quota formula could gradually increase further. Pressures to adjust the governance of international institutions to reflect more fully the widely professed democratic principle of one person, one vote will eventually push the IMF and its shareholder governments in that direction. The world in the first decades of the twenty-first century is certainly not ready for governance of international institutions giving prominence to that principle. But if the experiences of democracies around the world are a guide—in western Europe, North America, Japan, India and elsewhere in Asia, in South America, in Africa—then global decisionmaking over the long run will need to accord gradually increasing weight to individual persons regardless of their geographical jurisdiction and regardless of their incomes and wealths.

Appendix B

The Structure of Formulas for IMF Quota and Voting Shares

This appendix discusses the technical specification of a revised formula for quota shares and its use in the calculation of voting shares. The proposed method of defining share-adjustment variables and incorporating them in a formula is an innovation from current practice.

Two Classes of Variable

Variables in a revised quota formula can be divided into two broad classes, *core-share* variables and *share-adjustment* variables.

A core-share variable contains values for individual member nations expressed as a member's *fractional share in a global total* for that variable. Definition of core-share variables in terms of members' shares in global totals is simpler and more transparent than specifying such variables in terms of levels of nominal or inflation-adjusted amounts.[43] A share-adjustment variable contains a value for each individual member that is based on a *ratio* of two or more variables for that member.

Examples of core-share variables are members' fractional shares in global totals for:

- GDP at market prices and exchange rates.
- GDP at purchasing power parity prices (PPP-GDP).
- exports of goods and services.
- imports of goods and services.
- cross-border financial assets.
- cross-border financial liabilities.
- international reserves.
- population.

A core-share variable may indicate something about the ability of a member nation to contribute financial resources to the lending-intermediary operations of the IMF. A core-share variable may indicate something about the size of a member's potential need to use (borrow) the IMF's financial resources. But because lending and borrowing of Fund resources to finance payments

[43] The five variants of the original Bretton Woods formula predominantly use variables in nominal-levels form. In recent discussions and IMF staff papers, variables have appropriately been specified in terms of shares in global totals. If consensus has emerged for using shares rather than levels, that evolution is genuine progress.

imbalances are no longer the primary function of the IMF and because functions such as surveillance, crisis prevention, and monitoring of the norms and rules of the world financial system are more important functions, it follows that core-share variables capturing still other dimensions of members' positions may be equally if not more relevant.

Core-share variables could be combined in several ways. For example, rather than using GDP-PPP and GDP at market prices and exchange rates as separate variables, one could use a "blend" of the two (e.g., 50 % of each or 33% GDP at market rates and 67% PPP-GDP). Exports and imports could be combined into a cross-border trade variable that is the average of exports and imports, or the sum of the two. Whether two variables are combined into a blend variable or whether they appear separately in the formula is solely an expositional matter so long as the effective weights on the two variables are the same for both methods.

Examples of ratios that are the underlying basis for share-adjustment variables include:

- a measure of the "trade openness" of an economy (e.g., the ratio of a member's cross-border trade to its market-price GDP).
- a measure of the "financial openness" of an economy (e.g., the ratio of a member's cross-border financial assets or cross-border liabilities to a measure of the total assets of its national financial system).
- a scaled measure of the "variability" of the member's cross-border transactions (e.g., some measure of the standard deviation of its cross-border transactions scaled by the mean of those transactions—such as one standard deviation from a centered five-year average calculated over a recent 13-year period scaled by the mean of those transactions or scaled by some other variable, all averaged over the same period).
- other scaled measures of the "vulnerability" of the member's cross-border transactions to exogenous shocks.
- the ratio of a member's GDP to its population (per capita GDP).

A core-share variable should capture some significant dimension of individual nations' relative positions in the world economy and financial system. Preferably, a particular core-share variable should capture characteristics identifiably different from other core-share variables. Because core-share variables are intended to capture dimensions of *relative* position, they are all a function of the size somehow measured of member's economies or polities. Each pair of such variables, seen from a statistical perspective, has a fairly high correlation coefficient.

Share-adjustment variables, like core-share variables, should capture something significant about individual members' relative positions in the world economy and financial system. Yet there is a subtle difference. Share-adjustment variables focus on relativities among

nations that are best expressed and interpreted in terms of ratios. The value of the ratio for an individual member is calibrated, in effect, against the corresponding world-average value of the ratio. Because the numerator and denominator of a ratio variable are both typically a function of members' economic sizes, the ratio variable can depict relativities that are not dominated by economic size alone.

The text provides an illustration by contrasting the relative positions of Costa Rica and India. Because India is a much larger country, India's share of world cross-border trade is more than 13 times larger than Costa Rica's (1.09 versus 0.08 percent). But the trade-openness *ratio*—cross-border trade divided by GDP—is 2-1/2 times higher for Costa Rica than for India (1.01 versus 0.38). An unscaled measure of the variability of cross-border trade and capital-flow transactions is 9 times higher for India than for Costa Rica, but the *ratio* of unscaled variability to GDP is 3.8 times larger in Costa Rica than the corresponding ratio value for India. This example and countless others reflect the general point that share-adjustment variables expressed as ratios often can better identify the characteristics of members' economies and polities that are qualitatively distinct rather than dominantly determined by economic size.

Problems Arising from the Correlation among Formula Variables

Significant correlations may exist among share-adjustment as well as core-share variables. For example, the broader concept of member nations' "vulnerability" to shocks originating outside their borders can depend both on ratios of trade and financial openness and on ratios of the variability of cross-border transactions, with all those ratios exhibiting a sizable correlation with each other.

But when considering candidate variables for inclusion in a formula, correlations are most problematic for core-share variables.[44] If a variety of core-share variables, all highly correlated, are included in a formula, the core-share part of the formula can result in an excessive emphasis on the sizes of member nations. Larger members may receive bigger calculated core shares relative to smaller members than seems objectively reasonable on the grounds of size alone. In effect, large members can be "over-counted." An important advantage of including

[44] As an important example, the correlation coefficient between member nations' shares in world cross-border trade and shares in world market-price GDP is the high value 0.916.

share-adjustment variables in a formula—instead of, or in addition to, particular core-share variables—is that over-representation for economic size is less likely.

The confusion in the current negotiations that has existed about "openness" and "variability" variables is discussed in sections II and III of the paper. Economically sensible definitions of openness should be expressed as ratios of cross-border transactions to total transactions (domestic and cross-border combined).[45] Indicators of variability in cross-border transactions should be defined as a ratio, for example a standard-deviation measure scaled by the mean size of transactions. In a revised formula, openness and vulnerability variables should be treated as share-adjustment variables. Comparison of the illustrative calculations labeled "W" and "Y" in section III highlights the fact that use of share-adjustment variables as substitutes for related core-share variables can markedly offset the tendency of multiple core-share variables to over-weight the economic sizes of member nations.[46]

Formula Structure

Suppose that, say, three different variables have been agreed for use as core-share variables, *AShare*, *BShare*, and *CShare*. For a particular member *i*, the *Ashare* variable is defined as its value of the nominal or inflation-adjusted magnitude of *A* as a fraction of the corresponding global total for *A*. The global total is the sum across all members of *A* values:

$$AShare_i \equiv \frac{A_i}{A_{WORLD}} \quad \text{and} \quad A_{WORLD} \equiv \sum_i A_i \quad .$$

Analogous identities define the *Bshare* and *Cshare* variables. By construction, the sum of each share variable across members is unity (or 100 if the shares are expressed in percent):

$$\sum_i AShare_i \equiv \sum_i BShare_i \equiv \sum_i CShare_i \equiv 1.000$$

[45] Note again that this confusion is in addition to the controversial practice in IMF staff analyses that continues to define cross-border trade measures for the ongoing negotiations to include intra-currency zone trade (notably, intra-Euro-zone trade).

[46] Correlations among share-adjustment variables could conceivably lead to over-representation in the opposite direction, giving some smaller countries *larger* shares than might seem reasonable on objective grounds (giving *too little* emphasis to economic size). As an example suppose the formula were to include multiple share-adjustment variables, representing several dimensions of both the "openness" and the "variability" of members' economies. Might the formula then give smaller-sized economies, which tend to have both greater openness and greater variability, excessively large upward adjustments in quota and voting shares? This possibility merits more analysis in further examinations of alternative formulas.

For an individual member, the core-share part of the overall formula is then given by:

$$\alpha\left(AShare_i\right)+\beta\left(BShare_i\right)+\gamma\left(CShare_i\right),$$

where α, β, and γ are positive parameter values assigned as the weights associated with the variables. Each parameter has a value bounded by zero and unity.[47] These features of the structure of a formula are now familiar and widely accepted. If the formula is to include a different number of core-share variables than three, the number and values of the parameter weights obviously have to be changed accordingly.

Suppose two share-adjustment variables are also to be included in the formula. For a particular member *i*, suppose the ratios are

$$DRatio_i \equiv \frac{D_i}{J_i} \quad \text{and} \quad ERatio_i \equiv \frac{E_i}{K_i} \ ,$$

where D_i and E_i are the identifying numerator variables for the ratios and J_i and K_i are the associated scalar (denominator) variables.[48] To obtain *relative* ratios for member nations, define the world sums of members' ratios as

$$DRatioSum_{WORLD} \equiv \sum_i \frac{D_i}{J_i} \quad \text{and} \quad ERatioSum_{WORLD} \equiv \sum_i \frac{E_i}{K_i}$$

and then define the share-adjustment relatives themselves as

$$DShrAdj_i \equiv \frac{DRatio_i}{DRatioSum_{WORLD}} \quad \text{and} \quad EShrAdj_i \equiv \frac{ERatio_i}{ERatioSum_{WORLD}} \ .$$

Again by construction it will be true that

$$\sum_i DShrAdj_i \equiv \sum_i EShrAdj_i \equiv 1.000 \ .$$

For an individual member, the part of the overall formula comprising share-adjustment variables is then given by:

$$\lambda\left(DShrAdj_i\right)+\mu\left(EShrAdj_i\right),$$

where as before λ and μ are positive parameter weights with values bounded by zero and unity. (Use of just one share-adjustment variable, or more than two, require the obvious adjustments in the algebra.)

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[47] To exclude a variable altogether from a particular calculation with the formula, its parameter weight can be set exactly equal to zero.

[48] J_i and K_i could be the same variable, for example an indicator of total economic activity such as GDP.

When both types of variables are entered into the formula together, the entire formula determining the quota share for each member is

$$QShr_i = \alpha\left(AShare_i\right) + \beta\left(BShare_i\right) + \gamma\left(CShare_i\right) + \lambda(DShrAdj_i) + \mu(EShrAdj_i) \ .$$

The parameter weights on each of the included variables, uniform across all member nations, determine the relative importance of the variables in the formula. For consistency, the parameter weights together must sum to unity:

$$\alpha + \beta + \gamma + \lambda + \mu \quad = \quad 1.000 \quad .$$

Similarly, since the sum of each variable across members is unity, it is also true that

$$\sum_i QShr_i \equiv 1.000 \quad .$$

A Compression Factor?

Use of a "compression factor" for a formula is, as emphasized in section III above, unnecessary if the formula itself is adequate. If used, the compression factor is motivated by a desire to mitigate unpalatable implications of an inadequate formula.

The algebra underlying the idea is straightforward. Suppose that, as in the proposals on the table at the time of this writing, a formula uses four core-share variables, labeled for simplicity here as *AShare*, *BShare*, *CShare*, and *FShare*. The underlying formula, yielding quota shares for individual nations, is then:

$$QShr_i = \alpha\left(AShare_i\right) + \beta\left(BShare_i\right) + \gamma\left(CShare_i\right) + \varphi(FShare_i) \ .$$

When the four weights on the variables sum to unity $(\alpha + \beta + \gamma + \varphi \equiv 1.00)$, then also $\sum_i QShr_i \equiv 1.000$. The imposition of a compression factor changes the formula to:

$$QShr_i = \left[\alpha\left(AShare_i\right) + \beta\left(BShare_i\right) + \gamma\left(CShare_i\right) + \varphi(FShare_i)\right]^{\theta}$$

where θ is an exponent with a value less than one. When the compression-altered formula is used for all members, the resulting $QShr_i$ do not, as required, sum to unity. A further scaling-up adjustment must then be applied to each $QShr_i$ to produce shares that do sum for all members to unity.

Simultaneous Calculation of Quota Shares and Voting Shares

A quota formula and the procedure for determining voting shares should be determined together in an integral fashion. That in turn means that "basic votes" must be determined simultaneously with votes proportional to quota shares. As stated in section I, an amendment of the IMF Articles of Agreement should set the aggregate of basic votes at a constant agreed fraction of the total voting power (not, as at present, an absolute number of votes) and include an indexation provision that maintains basic votes at that percent of total voting power in future quinquennial reviews of quotas.[49]

Such an indexation provision would be straightforward to implement. Given an aggregate value for total quotas, which must be agreed at each quinquennial review, an individual member's quota is given by

$$Quota_i = QShr_i\left(AggregateQuotas\right).$$

The Articles of Agreement provide that each member, in addition to its basic votes, will have one additional vote for each part of its quota equivalent to 100,000 special drawing rights. Thus its quota-related number of votes is determined by

$$QuotaDrivenVote_i = \frac{Quota_i}{100,000}.$$

For the IMF as a whole,

$$AggregateTotalVotes = BasicVotes + QuotaDrivenVotes$$

and, similarly, for the individual member country,

$$TotalVotes_i = BasicVote_i + QuotaDrivenVotes_i .$$

The aggregate number of basic votes, if calculated as a fraction of total votes and if an indexation provision is adopted, would be

$$BasicVotes = \Phi\left(AggregateTotalVotes\right), \qquad 0 < \Phi < 1$$

where Φ is the fraction of total votes reserved for basic votes.

For the individual member country:

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[49] The IMF Articles of Agreement still specify only that each country will have 250 basic votes. No provision yet exists in the Articles for increasing the number of basic votes as total quotas are expanded. It is an implication of the resolution agreed in Singapore in September 2006 that such an indexation provision will be included as part of an amendment to the basic-votes aspects of the Articles.

$$BasicVotes_i = \frac{1}{n}\left(BasicVotes\right),$$

where *n* is the number of IMF member nations. As of January 2008, the number *n* is 185. Therefore for the individual member,

$$TotalVotes_i = \frac{1}{n}\left(BasicVotes\right) + \frac{Quota_i}{100,000}$$
$$= \frac{\Phi}{n}\left(AggregateTotalVotes\right) + \frac{1}{100,000}\left(QShr_i\left(AggregateQuotas\right)\right) \quad .$$

Thus the share in voting power of an individual member, with an indexation provision keeping Φ unchanged over time, will be

$$VoteShr_i = \frac{TotalVotes_i}{AggregateTotalVotes} = \frac{\Phi}{n} + \left(\frac{QShr_i}{100,000}\right)\left(\frac{AggregateQuotas}{AggregateTotalVotes}\right) \quad .$$

This last relationship makes it transparent that the values of $QShr_i$, of Φ, and of *Aggregate Quotas* must be simultaneously chosen at the time of a review of quotas and voting shares.

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