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THE REFORM OF IMF QUOTAS: THE WAY TOWARDS THE 2008 RESOLUTION

by Andrea Colabella*, Enrica Di Stefano* and Claudia Maurini*

Abstract

In April 2008 the International Monetary Fund approved a resolution which modified its quotas and voting power. The goal was to realign, at least in part, the voting power of IMF member countries with their relative weight and role in the world economy, while ensuring better representation for the poorest ones. This paper guides the reader through the complicated process that led to the final outcome, exploring both the technical aspects of the reform and the underlying political motivations. In particular, we discuss the functions of IMF quotas and their evolution in an historical perspective. We talk about the inadequacy of the former distribution of voting power and, therefore, the need for the reform. We also analyze several technical aspects debated during the negotiations. Finally, we assess the effectiveness of the resolution in achieving the proposed goals. We conclude that the approved outcome represents a first step in the right direction. Nevertheless, some issues remain unresolved and will need to be addressed in the future.

JEL Classification: F53, F59.

Keywords: International Relations, International Monetary Fund, governance.

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* Bank of Italy, Economics, Research and International Relations.

LIST OF TERMS AND ABBREVIATIONS

AQS	Actual quota share
BV	Basic votes
BW	Bretton Woods
CQS	Calculated quota share
FQS	Final quota share, after IMF quota increase
GDP	Gross domestic product calculated at market exchange rates
PPP-GDP	Gross domestic product at purchasing power parity
IMF	International Monetary Fund
IMFC	International Monetary and Financial Committee
OPEN	Openness
PRGF	Poverty Reduction and Growth Facility
QS	Quota share
RES	Reserves
SDR	Special Drawing Rights
VAR	Variability
VP	Voting power
VS	Voting share
α	Share of gap (see below) filled after the overall quota increase
θ	Under-representation threshold. It is assumed to be non-negative (see under-represented country)
i	Country index
f	See compression factor
F	See rescaling factor
R	Percentage increase of total quotas
w_j	Weight of variable j
Actual quota share	Quota share prevailing <i>before</i> the <i>ad hoc</i> quota increase decided in Singapore, if not otherwise specified.
Allocation mechanisms	Rules governing the allocation of the quota increase among eligible countries.
Blended GDP	Weighted average of GDP measured at market exchange rates and at purchasing power parities (PPP-GDP).
Calculated quota share	The quota share of a member that can be computed on the basis of the quota formulas system.
Compression	Two-step procedure: first, for each member, the weighted sum of its shares in the formula's variables ($w_1X_1^i + w_2X_2^i + \dots + w_NX_N^i$) is raised to the power of f ; second, results are rescaled by F to sum up to 100.
Compression factor	The exponent f in the formula.
Eligible countries	IMF members that are entitled to a quota increase.
First round increase	A limited <i>ad hoc</i> increase in quotas for China, Korea, Mexico and Turkey, deliberated in September 2006 at Singapore.
Foregoing	Amount of a quota increase that an eligible country is willing not to subscribe.
Gap	Difference between CQS and AQS. Computed only for under-represented countries.
Gap closure	The share of the gap filled after the adjustment.

Rescaling factor	The coefficient F in the formula needed to make compressed quotas summing up to 100.
Under-represented country	A country with $CQS/AQS > 1 + \theta$.
Voting power	Number of votes assigned to each member. Currently members receive one vote for each SDR 100,000 plus 250 basic votes.
Voting share	Percentage of a country's votes relative to the IMF members total voting power.

COUNTRY GROUPS

Advanced (25)	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, United Kingdom, United States.
Dynamic (12)	This group was defined in the Canadian proposal put forward at the 2007 G20 meeting held in Istanbul. In broad terms, it refers to those emerging countries that contributed by more than 0.5 percent to global economic growth in PPP GDP terms in the 5 year-period ending in 2004. The group includes the following 12 countries: Brazil, China, Korea, India, Indonesia, Malaysia, Mexico, Philippines Poland, Thailand, Turkey, and Vietnam.
Group of Seven - G7	Canada, France, Germany, Japan, Italy, United Kingdom, United States.
Non-advanced (160)	All IMF members except advanced countries. Korea and Singapore are included in this group, as well as Cyprus, Malta and Slovenia, consistently with IMF documents at the time of writing.
PRGF (78)	Low-income countries qualified to receive financial assistance under the IMF's Poverty Reduction and Growth Facility (PRGF): Afghanistan, Albania, Angola, Armenia, Azerbaijan, Bangladesh, Benin, Bhutan, Bolivia, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Côte d'Ivoire, Democratic Republic of Congo, Djibouti, Dominica, Eritrea, Ethiopia, Georgia, Ghana, Grenada, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, India, Kenya, Kiribati, Kyrgyz Republic, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Moldova, Mongolia, Mozambique, Myanmar, Nepal, Nicaragua, Niger, Nigeria, Nepal, Pakistan, Papua New Guinea, Popular Democratic Republic of Lao, Republic of Congo, Republic of Yemen, Rwanda, Samoa, São Tomé and Príncipe, Senegal, Sierra Leone, Solomon Islands, Somalia, Sri Lanka, St. Lucia, St. Vincent and the Grenadines, Sudan, Tajikistan, Tanzania, The Gambia, Timor Leste, Togo, Tonga, Uganda, Uzbekistan, Vanuatu, Vietnam, Zambia, Zimbabwe.

INTRODUCTION

Recent developments in the global economy have cast doubt on the adequacy of the Fund's governance. Some emerging market countries have now become global players and have expressly requested to increase their political weight at the IMF. On the other hand, while low-income countries have progressively lost ground, advanced countries as a group continue to provide the bulk of the Fund's resources and therefore have the greatest say at the IMF. To maintain the relevance of the Fund as the primary forum for international cooperation on monetary and financial issues, an adjustment in the distribution of its members' political weights appears warranted at this juncture.

The political weight of a country at the IMF is measured by its *voting share*, i.e., the number of its votes relative to the number of votes of all the Fund's members. Since countries' relative votes depend heavily on their quotas in the IMF's capital¹, it is natural to think that the necessary reallocation of powers within that institution should entail a change in the Fund's quotas. Unfortunately this is easier said than done, for three main reasons. First, quota negotiations typically hinge on technical benchmarks (meant to gauge countries' relative position in the world economy), which over the years have become increasingly complex and opaque. Second, there are a number of constraints embedded in the Fund's statutes (the Articles of Agreement) that prevent a full adjustment of actual quotas to the benchmark. Third, changes in countries' quotas remain a prominently political issue, and the amount of political consensus required by these changes has always represented an essential condition for their approval. Over the years this political dimension translated into additional complexity for the technical engineering of any quota reform proposal.

The former IMF's Managing Director, Rodrigo de Rato, launched in 2005 an ambitious reform agenda (the Medium Term Strategy, MTS), which solicited a change in several key areas, including governance. At the 2006 Annual Meetings in Singapore, a resolution was approved by the Board of Governors to allocate a quota downpayment to the four most under-represented countries (China, Korea, Mexico, and Turkey). This resulted in a moderate increase in the voting shares of these countries. The Singapore Resolution called for, among other things, an update and simplification of the quota benchmark, as well as for a second *ad hoc* quota increase based on the new benchmark. Finally the Singapore Resolution urged that these reforms be completed before the 2008 Annual Meetings (see Chapter 1 for more details).

In late March 2008, the Board of Executive Directors approved a new draft resolution (the 2008 Resolution), which was eventually approved by the Board of Governors on April, 28.

This paper sets out to guide the reader through the process that led to the April 2008 Resolution (the 2008 Resolution), with particular reference to the technical aspects of the reform and the many political issues involved. It is organized as follows. In the first chapter, the actual distribution of IMF quotas is surveyed in a historical perspective, the shortcomings of the

¹ The votes of each country are the sum of two components: the so-called *basic votes* and an amount of votes proportional to the member's quota. Basic votes are automatically granted at subscription and their number (currently 250) is the same for all members. Countries are also entitled to express one additional vote every 100,000 Special Drawing Rights (SDR) of quota subscribed. Quotas are denominated in SDR, an international reserve asset created by the IMF in 1969 to supplement the existing official reserves of member countries. The SDR also serves as the unit of account of the IMF and some other international organizations. Its value is based on a basket of key international currencies (at present they are: US dollar, euro, Japanese yen, pound sterling).

resulting voting power are assessed, and the need for change arising from new global players and low income countries is noted. In the second chapter, the key elements involved in the reform package are analyzed. For simplicity's sake they will be treated separately, although it should be borne in mind that the final outcome of the reform shall be determined by the simultaneous interaction of all its parameters. Finally, Chapter 3 describes and evaluates the March 2008 Resolution, also in the light of the analytical framework developed in the previous chapters.

1. CURRENT QUOTA SYSTEM AND REVIEWS

When joining the IMF all member countries must subscribe a quota of its capital.

Quotas play four different roles in the functioning of the institution. In particular, they: (a) set the amount of financial resources that a member is obliged to provide the IMF with²; (b) determine the amount of financing that a member can expect to obtain from the IMF under normal circumstances (“normal access limits”); (c) concur, together with the number of basic votes, to the calculation of members’ voting power within the institution; and (d) define the share received by each member in general SDR allocations.³

The IMF’s Articles of Agreements (the Articles) neither specify how a member’s quota should be determined, nor clarify how quotas should be adjusted over time. They only stipulate that the IMF’s Board of Executive Directors should conduct a general review of quotas at intervals not longer than five years, and propose the appropriate adjustments to the Board of Governors for their final approval. However, quota negotiations have been traditionally linked to an assessment of countries’ relative positions in the world economy, based on factors such as national incomes and external trade and payments values (IMF, 2001). To this end, use has been made of a system of quota formulas, whose juridical status was never made clear in the Articles. This system has remained only as a theoretical benchmark and, over the years, the IMF’s actual quota shares have been adjusted to those calculated with the formulas only to a very limited extent.

1.1. Quota formulas and reviews in the IMF’s Articles of Agreements

The Articles stipulate a procedure for General Quota Reviews: quota adjustments are proposed by the Board of Governors, with a periodicity of no more than five years, based on an assessment of the current situation (Article III Section 2(a)). Finally, the possibility is left open for quota increases to individual members, the so-called *ad hoc* quota increases, if requested.

Since its foundation, the IMF has used special formulas to guide the negotiations on members’ quotas. The original formula was introduced at Bretton Woods (BW) in 1944. It considered the level of GDP at current market prices for a recent year, the level of foreign reserves, the level of current account transactions, and the variability of the latter. Four other formulas were added to the original one in 1963, to better capture changes in the world economy. These derive from the

² The subscription must be paid in full upon joining the Fund: 25 percent must be paid in SDR or widely accepted currencies, the rest is paid in the member’s own currency.

³ General allocations of SDR are periodical SDR distributions based on a long-term global need to supplement existing reserve assets. General allocations are considered every five years, although decisions to allocate SDR have been made only twice. The first allocation was for a total amount of SDR 9.3 billion, distributed in 1970-72. The second allocation was distributed in 1979-81 and brought the cumulative total of SDR allocations to SDR 21.4 billion.

original formula, make use of the same variables but are weighted differently. The current system is based upon the BW formula plus the four additional ones (see the appendix for details).

The Articles set two major constraints on quota adjustments (Article III Section 2 (c) and (d)). First, changes in IMF quotas must be approved by the Board of Governors with a qualified majority of 85 percent of all votes: this gives the United States a *de facto* veto power on all proposed quota reforms. Second, each member can veto changes in its own quota level. Changes in IMF quota *shares* have normally been implemented (a) in the context of general quota increases, through increases in the quotas of some members, larger than those received by the remaining ones; or (b) in the context of *ad hoc* quota increases, by raising the quotas of selected members only. The veto power of individual countries also explains why, under the prevailing rules of the game, the vector of actual quota shares cannot be brought fully in line with the calculated one.⁴

Since the IMF's foundation, there have been 13 General Quota Reviews, 8 of which have been followed by quota increases. The last review was completed in January 2008 and no general quota increase was decided. In the last 30 years, there have been only 6 *ad hoc* increases out of the context of a General Quota Review. As noted earlier, the last one was granted in September 2006 to China, Korea, Mexico and Turkey, for a total amount of SDR 3,847 (US \$ 6,263) million, equal to 1.8 percent of the total Fund's quotas.

1.2 A historical perspective

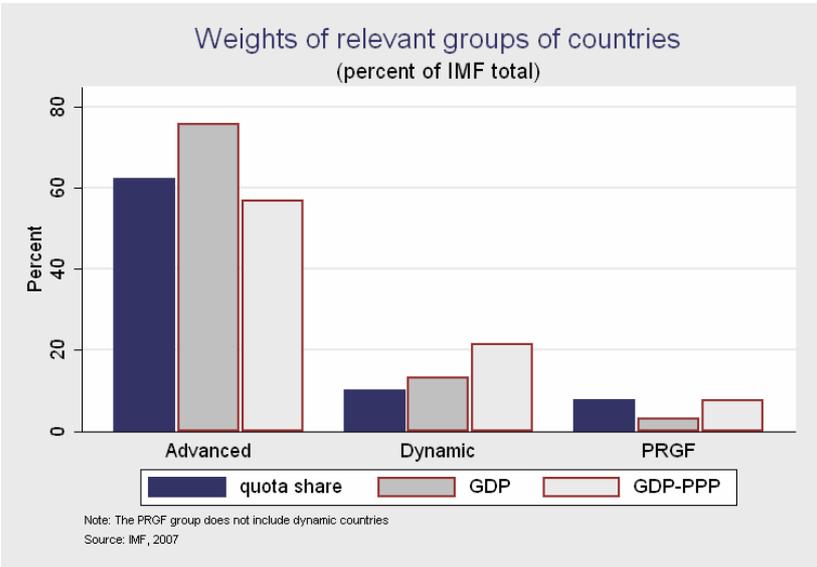
The overwhelming majority of these quota increases were determined on the basis of an assessment of the adequacy of IMF total liquidity in matching members' balance of payments financing needs (IMF, 2003). Instead, little attention has been paid to changes in members' relative positions in the world economy as described by the quota formulas. In particular, "the bulk of the quota increases resulting from the five-yearly general quota reviews has taken the form of increases expressed as a uniform percentage of the then existing quotas" (IMF, 2000). In other words, total quota increases have been distributed equiproportionally to existing quota shares, thus leaving unchanged their distribution. On average, the share of increases in quotas has been about 75 percent, and has ranged from a minimum of 40 percent to a maximum of 98 percent. In some of the past Quota Reviews (fifth, sixth and ninth), countries entitled to a certain increase in their own quota level decided to accept only a part of it, thus voluntarily reducing their own quota share. This notwithstanding, actual quota shares have adjusted only partially towards calculated ones. In fact, they have never been reduced and have been only modestly realigned to under-represented countries.

As a consequence, not only the current distribution of quota shares but also their total amount does not correspond to the calculated ones. Some figures can help to illustrate this gap. Since the IMF foundation, membership has more than quadrupled from the original 45 countries to the current 185 members. Actual quotas have increased even more, reaching the current SDR 217 billion from the original SDR 8 billion. However, actual quotas are still a small share of calculated ones, which are presently worth about SDR 1,140 billion (Skala *et al.*, 2007).

⁴ See the numerical example on pg. 17 for a more detailed explanation of the effects of such veto power.

The need for an in-depth revision of IMF quotas is basically due to the misalignment in the quota shares of some key country groups, which do not correspond to their relative importance in the world economy. This can be gauged through different measures. The most obvious benchmark is GDP measured at market exchange rates (MER-GDP); a possible alternative could be GDP measured at Purchasing Power Parities (PPP-GDP), which allows for a better comparison of economic welfare.

In Figure 1, the IMF quota shares of three country groups (advanced, dynamic and PRGF) are compared with their shares in world MER-GDP and PPP-GDP.⁵ Based on this comparison, advanced countries would appear to be under-represented in terms of MER-GDP and slightly over-represented in terms of PPP-GDP. On the other hand, PRGF countries would appear to be over-represented in terms of MER-GDP and under-represented in terms of PPP-GDP, while the third group would be under-represented according to both measures.

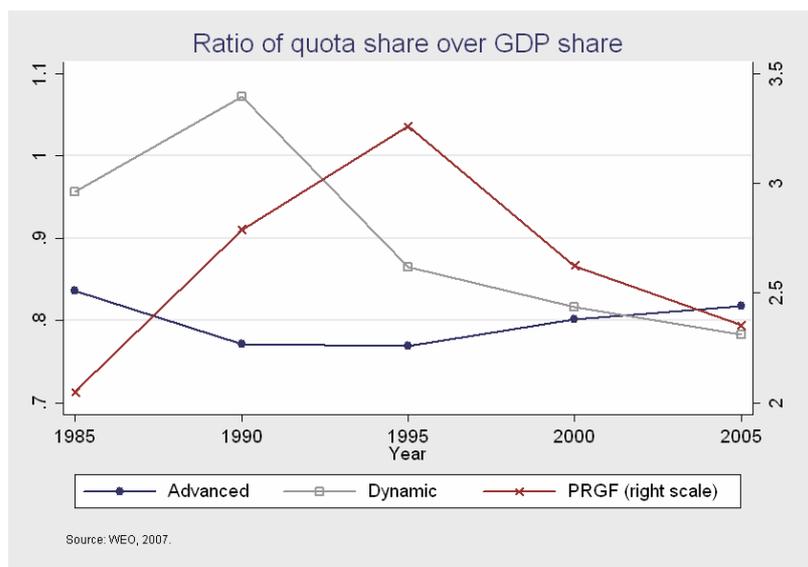


- Figure 1 -

Figures 2a and 2b show how the ratios between IMF quota shares and countries' shares in world MER-GDP and PPP-GDP have evolved in the last 20 years.⁶

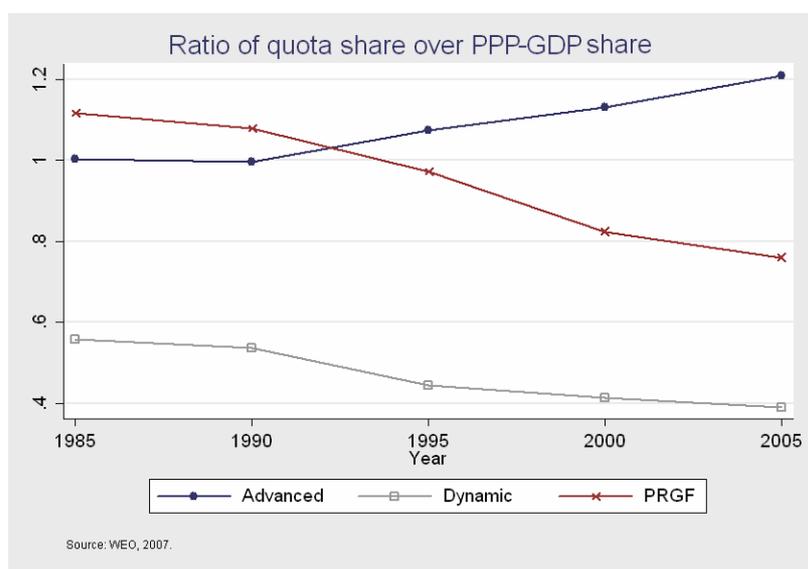
⁵ These are the data circulated by the IMF in 2007 and used in the updated quota calculations (averages 2003-2005).

⁶ These ratios compare the importance of a group in terms of IMF quota shares to its relevance in terms of other economic measures; whenever it takes values above (below) one, the group is over-represented (under-represented) according to that measure.



- Figure 2a -

For advanced countries, the ratio between IMF quota shares and MER-GDP shares has remained below one for the entire period, while the ratio between IMF quota shares and PPP-GDP shares started to grow above one since the early 1990s. The trend for dynamic emerging economies is clearer: both ratios have grown over time, signalling their increasing under-representation. Finally, PRGF countries, which were traditionally over-represented in terms of PPP-GDP, have recently become under-represented. On the other hand, their quota share is always larger than their weight in terms of GDP (figure 2a, right scale).



- Figure 2b -

1.3. The Singapore Resolution and the subsequent debate

At the 2006 Annual Meeting in Singapore, the Board of Governors approved a resolution on quotas and voice reform. The Resolution envisaged a two-step approach that rests on four pillars.

Pillar 1. A first round *ad hoc* increase in the quotas of the four most under-represented countries (China, Korea, Mexico and Turkey).⁷ This increase was meant as a down payment to the four beneficiaries and as a first step for a wider realignment of quotas.

Pillar 2. A deep revision in the current system of quota formulas, which should “provide a simpler and more transparent means of capturing a member’s relative position in the world economy”, giving a “significantly higher weight to GDP together with ensuring that other variables, in particular openness, also play an important role” (IMFC, 2007).

Pillar 3. A second round increase in quotas, based on the new formula.

Pillar 4. At least a doubling of basic votes, to preserve the voting share of low-income countries as a group.

The reform should be seen as a unique comprehensive package and be delivered not later than the 2008 Spring Meetings.

After the Singapore Resolution, consensus emerged on the use of a single formula to guarantee transparency and simplicity.⁸ It was also agreed that formula variables should be an updated version of the current ones (IMF 2007a), and that gross domestic product should have the highest weight and reserves the lowest.⁹ In October 2007, consensus was reached on additional elements, namely: (a) a commitment to acknowledge the role of PPP-GDP in determining the new IMF quotas, along with a compression factor (see Chapter 2); (b) an increase in total IMF quotas “of the order of 10 percent”; and (c) a further increase in the voting share of emerging market and developing economies as a whole (IMFC, 2007). This notwithstanding, divergences remained on several points which will be analyzed in the following chapter.

2. MEANS FOR BUILDING THE NEW DISTRIBUTION OF VOTES

Any changes in the distribution of IMF’s quota and voting shares must be based on a number of key elements, such as: (a) the economic variables used for ranking members’ relevance in the world economy; (b) the functional form of the quota formula; (c) the criteria for selecting countries entitled to quota increases (eligibility criteria); (d) the size of the overall quota increase; (e) how this increase is allocated to eligible countries; and, finally, (f) the number of basic votes assigned to each member.

The final outcome clearly depends on the interaction between all such elements. Unfortunately, its outcome cannot be easily predicted *ex ante*. In particular, as a result of linear changes in any of the parameters, the simulated distribution of votes will typically vary in a nonlinear fashion.

⁷ These countries were under-represented both on the basis of the existing quota formulas and on each of the various filters (based upon the variables used in the formulas) used to classify countries. Each of these countries reduced the gap between calculated and actual quota share of about 1/3.

⁸ Paradoxically, this decision made it more difficult to reach an agreement, since a single formula was unlikely to accommodate the conflicting requests made by the parties involved in quota negotiations. To help build up the necessary consensus, temporary additional *ad hoc* elements were proposed subsequently, at the expense of transparency (see Chapters 2 and 3).

⁹ Reserves have been given a low weight due to the potential perverse incentives associated with excess reserve accumulation. Indeed, recent accumulations in the context of deliberate policies have been in connection with insufficient flexibility of exchange rates.

More importantly, any alternative reform scenarios need to be evaluated in terms of their political feasibility. The remainder of this chapter is organized as follows: first, the key elements involved in the reform will be assessed separately together with the political issues involved. Then, some of the interactions between the parameters will be scrutinized.

2.1. The quota formula

The **first element** is represented by the variables and formula used to compute the benchmark for members' quota shares (calculated quota shares). This benchmark makes it possible to identify under-represented and over-represented countries, i.e., those whose current quota shares are, respectively, lesser or greater than the calculated ones.

The need for a “simpler and more transparent” system of quota formulas naturally leads to the use of a single formula with the following structure:

$$q^i = F \times (w_1 X_1^i + w_2 X_2^i + \dots + w_N X_N^i)^f$$

where q^i is the quota share of the i -th member (or *calculated quota share*, CQS), and the variables X are expressed as shares of IMF totals.

Variables

Quota negotiations have focused on the following five economic variables, many of which are defined in the same manner as those already in use.

Gross Domestic Product at Market Exchange Rate (MER-GDP). This is a new variable, which had not been considered in the earlier system of quota formulas. It is an average over three years, evaluated at market exchange rates. It provides a comprehensive measure of the economic size of a country and is also a relevant indicator of a member's ability to contribute to the Fund's financial resources.

Gross Domestic Product at Purchasing Power Parities (PPP-GDP). This variable is an average over three years, expressed in international dollars.¹⁰ A rationale for its use is that *PPP-GDP* may be relevant to the Fund's non-financial activities; moreover, it is regularly used in the IMF's *World Economic Outlook* to measure countries' weight in the global economy.

Openness (OPEN). It is defined as the average sum over a five-year time span of current receipts and payments for international transactions in goods, services, income and transfers. This variable (which does not include financial transactions) can be viewed as an indicator of a member's involvement and stake in the global economy. In addition, as relatively more open countries may be more vulnerable to external shocks, it can also serve as an indicator of potential demand for Fund's resources.

Variability (VAR). This is measured by the variability of current account receipts (credits) plus net capital flows, defined as “one standard deviation from the centred 5-year moving average, from a recent 13-year period”. It provides a measure of members' vulnerability to balance of payments shocks and therefore of the potential need for Fund resources.

¹⁰ International dollars are a hypothetical unit of currency with the same purchasing power that the U.S. dollar has in the United States at a given point in time.

Reserves (RES). Official reserves are defined as the annual average of the sum of foreign exchange, SDR holdings, reserve position in the Fund, and monetary gold valued at SDR 35 per fine troy ounce. They provide an indicator of a member’s financial strength and resilience towards external shocks.

Coefficients

Coefficients are positive and sum up to one. Thus, they can be interpreted as weights measuring the variables’ importance in the formula. The initial debate was heavily influenced by the relative position of various countries and country groups in terms of formula variables and their pre-Singapore voting shares (see table below).

Formula variables: shares of totals (averages 2003-2005)

Country groups	Variables (percent of IMF totals)					VS pre- Sing
	MER-	PPP-	OPEN	VAR	RES	
	GDP	GDP				
Advanced	75.3	56.5	69.2	62.8	37.4	60.67
Non-advanced	24.7	43.5	30.8	37.2	62.6	39.33
<i>Memo:</i>						
Dynamic	14.9	26.0	16.8	17.2	38.9	12.03
PRGF	3.2	7.6	3.2	4.2	6.2	8.43
EU27	31.0	24.2	43.7	31.2	11.4	32.55

Note: for each country group the largest weight is reported in **bold**.

Not surprisingly, advanced countries were the most vocal supporters of a stronger weight for GDP at market exchange rates, since they accounted for over 75 percent of the total in that variable; dynamic non-advanced countries supported a heavier weight for GDP evaluated at purchasing power parities, while EU countries instead favored a greater role for openness, given their relatively large weight on that variable. Finally, PRGF countries mostly invoked an increase in basic votes, consistently with their low shares in all variables.

By the end of 2007, consensus was reached on several elements that have been taken into account in the March 2008 Resolution. These elements will be used for the simulations in the remainder of this chapter (we refer to these as the baseline formula):

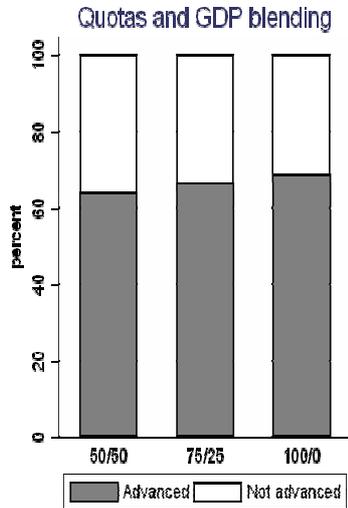
- An overall weight of 50 percent for *MER-GDP* plus *PPP-GDP*;
- A weight on *RES* of 5 percent;
- The remaining 45 percent would be distributed between *OPEN* and *VAR*. Two options were on the table at that time: either 30 percent for openness and 15 for variability, or 25 and 20 percent, respectively.

GDP Blend

The IMFC *Communiqué* of October 2007 noted that a blended measure of GDP, defined as the weighted average of *MER-GDP* and *PPP-GDP*, “should play a role”.

The introduction of a blend for the *GDP* in the formula is one possibility and the effects of this choice are shown in the figure and table below. The figure shows the aggregate *CQS* of advanced and non-advanced countries with the blend varying from a fifty-fifty scenario to an unblended

one.¹¹ The lower the weight for *PPP-GDP*, the lower the aggregate *CQS* of non-advanced countries. In addition, the table displays how the number of under-represented countries changes according to different blends. Coherently with the following figure, we observe that the number of advanced (non-advanced) under-represented countries increases (decreases) with the weight of *GDP* at market exchange rates.



	No. of members	GDP blend (MER/PPP)		
		50/50	75/25	100/0
All IMF members	185	60	54	53
<i>Advanced</i>	25	16	16	16
<i>Non-advanced</i>	160	44	38	37
Memorandum				
<i>Dynamic</i>	12	11	10	10
<i>PRGF</i>	78	13	9	9

Compression

By *compression* we mean the effect on the quota distribution of two parameters: f (the *compression factor*) and F (the *rescaling factor*). During quota negotiations, its use was proposed and strongly supported by European countries, especially the small ones, as a means to adjust for the high correlation of size-related variables, which tends to favour large economies.¹²

The compression of the quota formula entails the following two-step procedure. First, for each member, the weighted sum of its shares in the variables' totals ($w_1X_1^i + w_2X_2^i + \dots + w_NX_N^i$) is raised to the power of f (which is positive but lower than one). Second, the calculated quota shares are multiplied by the rescaling factor F to sum up to 100.¹³ A "compressed" quota share is, in general, different from the original one but it is not trivial to say which one is higher. In fact, the final effect is the result of two components that might be pushing towards opposite directions. On the one hand, f will decrease (increase) the weighted sum depending on whether the latter is higher (lower) than one.¹⁴ On the other hand, F will always increase the compressed quota share for all members, since it is greater than one.¹⁵ For a single country there may be either an increase or a decrease in the calculated quota share, depending on which effect dominates.

¹¹ The other parameters in the formula are taken from our baseline formula.

¹² Although compression was not favourable to large European countries, these latter decided to support it to the extent that this element could have broadened the consensus for the overall quota reform package.

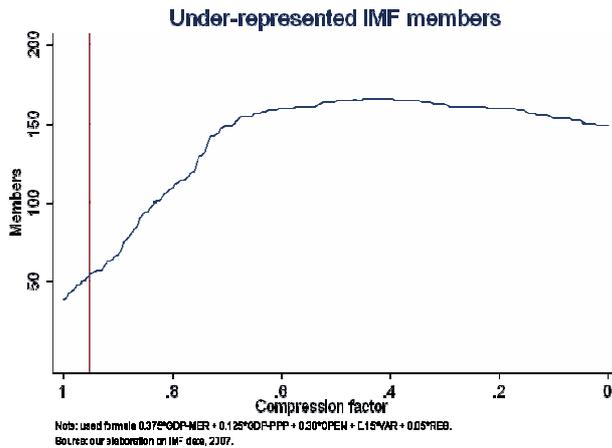
¹³ Analytically, $F = \frac{100}{\sum_{i=1}^{185} \sum_{j=1}^N (w_j X_j^i)^f}$. The rescaling factor is therefore a function of all other parameters.

¹⁴ According to the baseline formula, there are 166 countries that have a weighted sum of their shares in the variables' totals below 1: these countries will certainly take advantage from higher compression.

¹⁵ Theoretically, if compressed quotas summed up to a number higher than 100, then F would be lower than 1.

One advantage of this procedure is that it does not modify countries' ranking with respect to the non-compressed case. In the extreme case of $f = 1$ (no compression), the formula becomes a linear weighted sum. In the opposite case of $f = 0$, each country is assigned the same quota share, which is equal to $1/185$.

The effects of compression are illustrated in the figure and table below. The number of under-represented countries according to the baseline formula is shown for values of f between 1 and 0. With no compression ($f = 1$), there are 42 under-represented countries. Their number increases monotonically for most values of f and decreases slightly only if f falls below 0.4. In the baseline scenario ($f = 0.95$, vertical line) there are 53 under-represented countries. This increase is due to the high number of relatively small economies in terms of quotas. In fact, when the degree of compression increases (i.e., when f decreases) small countries are more likely to become under-represented. To gauge the quantitative effect of compression, we can look at the shift in calculated quota share of relevant country groups with respect to the no compression case. The table shows the shift in calculated quota shares from large to small members and from advanced to non-advanced countries with respect to the not compressed case for different values of f . As expected, the shift gets larger when the compression factor f decreases. Moreover, all other things being equal, the shift from big countries to small ones is larger than that from advanced to non-advanced countries. This is so because compression prominently favours small countries, irrespective of whether they are advanced or not.



Compression and shift in quota shares

f	From large to small countries	From advanced to non-advanced
0.97	1.85	1.24
0.95	3.11	2.09
0.90	6.29	4.28

Note: "Large" countries are those with a quota share above 3 percent.

Under-representation threshold

A country i will be defined under-represented if the following condition holds:

$$\frac{CQS^i}{AQS^i} > 1 + \theta, \quad \theta \geq 0$$

In other words, the ratio between its calculated and actual quota shares must be greater than a certain number. If θ equals 0, this condition says that CQS must be greater than AQS ; if it is positive, then CQS must surmount AQS by a certain percentage. The parameter θ is referred to as *under-representation threshold*. On the contrary, countries that do not match the condition above are defined over-represented. The higher (lower) the ratio, the larger the degree of under-representation (over-representation). In general, all under-represented countries will be entitled to gain quotas, whilst over-represented ones will not.

2.2. Eligibility criteria

The **second element** is represented by the criteria used to identify countries eligible to receive a quota increase.

An obvious point of departure is to treat all countries that are under-represented according to the formula as *eligible* for a quota increase. The number of eligible countries could be enlarged further either through additional criteria or “eligibility filters”. The discussion on this issue has been fruitful for the identification of countries that would deserve special treatment. In fact, even though no filters have been included in the March 2008 Resolution, it uses a selection mechanism borrowed from the filter which compares a country’s *PPP-GDP* share of the world total to its actual quota share. However, as we will see, such filters are not used for selecting eligible countries, but for allocating the total quota increase.

2.3. Total quota increase and its allocation mechanism

The **third element** is represented by the increase in total IMF quotas and how it is allocated among eligible countries. Combined with the previous elements (formula and eligibility criteria), it identifies the new vector of countries’ quota shares.

The percentage increase in total IMF quotas is calculated with respect to the quota levels prevailing before the *ad hoc* quota increase decided in Singapore¹⁶, and is adjusted for the later entry of Montenegro in the Fund’s membership.¹⁷ At that juncture, total quotas amounted to about SDR 213,756 (US\$ 347,995) million.

As noted earlier, according to the Articles of Agreements each member can veto a reduction in its quota (Art. III Section 2(d)). This poses an important constraint on the extent to which actual quota shares can converge to their calculated values. In particular, while the relative weight of a non-eligible country would decrease with respect to all eligible countries, its weight will remain unchanged relative to other non-eligible countries. In other words, the prevailing rules of the game prevent the full adjustment of actual and calculated quota shares. A numeric example may be helpful to clarify this claim. Suppose that there are only four members of the IMF: countries A, B, C, and D. The table below shows the starting point for the adjustment procedure. Initial quotas are known (in both levels and shares), together with calculated quota shares:

¹⁶ This is in the aim of the Singapore Resolution, which considers both the initial *ad hoc* increase and the second one as two parts of a unique package.

¹⁷ Montenegro joined the Fund in January 2007. Its quota was set at SDR 28 (US\$ 45) million.

Quotas			
Country	Initial		Calculated
	(units)	(%)	(%)
A	\$40	40	30
B	\$30	30	40
C	\$20	20	10
D	\$10	10	20
Tot.	\$100	100	100

In particular, we can observe the following:

- (1) Both B and D are under-represented and therefore are eligible to receive a quota increase; the overall weight of these countries should be equal to 60, while B should weigh twice as much as D;
- (2) A and C are over-represented; their total weight should be 40 percent, and C should weigh one-third of A.

How can countries' quota shares be adjusted to their calculated distribution? Because we cannot impose any reduction of quotas, the over-represented countries (A and C) must be left with their initial levels (\$40 and \$20, respectively):

Quotas				
Country	Initial		Calculated	Final
	(units)	(%)	(%)	(units)
A	\$40	40	30	40
B	\$30	30	40	
C	\$20	20	10	20
D	\$10	10	20	
Tot.	\$100	100	100	

If it were possible to increase the total amount of quotas as much as we like, this could be computed by imposing the total weight of A and C to equal 40 percent, that is:

$$\frac{\$40 + \$20}{Total} = 0.40 \Rightarrow Total = \$150$$

Thus, we have to distribute \$90 (\$150 - \$40 - 20\$) to B and D. Since B should weigh twice as much as D, we can assign a new quota level of \$60 to B and \$30 to D. Our table eventually becomes:

Country	Quotas				
	Initial		Calculated	Final	
	(units)	(%)	(%)	(units)	(%)
A	\$40	40	30	\$40	26.7
B	\$30	30	40	\$60	40
C	\$20	20	10	\$20	13.3
D	\$10	10	20	\$30	20
Tot.	\$100	100	100	\$150	100

In the final situation, the actual quota shares of under-represented countries are perfectly matched with their calculated values. On the contrary, the shares of over-represented countries are matched only in aggregate, not for individual countries: the condition that D should weigh one-third of A is not met because of the constraint imposed by the Articles of Agreements.

If total IMF quotas were to increase to a level below \$150, the adjustment would have been even more incomplete, in fact under-represented countries would have only moved towards (but would have not reached) their calculated quota shares.

To conclude: given the constraint posed by the Article of Agreements, the weight of non-eligible countries as a group can be reduced vis-à-vis that of eligible countries, but the relative distribution within non-eligible countries cannot be modified. This raises a problem of equity, because countries can be over-represented at different degrees.

Allocation mechanisms

Given a certain amount of new quotas to be distributed among eligible countries, rules governing the allocation of the increase are needed. These rules are referred to as *allocation mechanisms* and can be divided into two broad categories: *ad hoc* rules and rules of general application. *Ad hoc* rules are targeted to selectively identify specific eligible countries. For example, it could be prescribed that over-represented countries, which have qualified for a filter, receive a given increase in their voting share. Alternatively an *ad hoc* rule could bound the amount of quotas distributed to some groups and increase this amount for others. General rules apply to all under-represented countries and include:

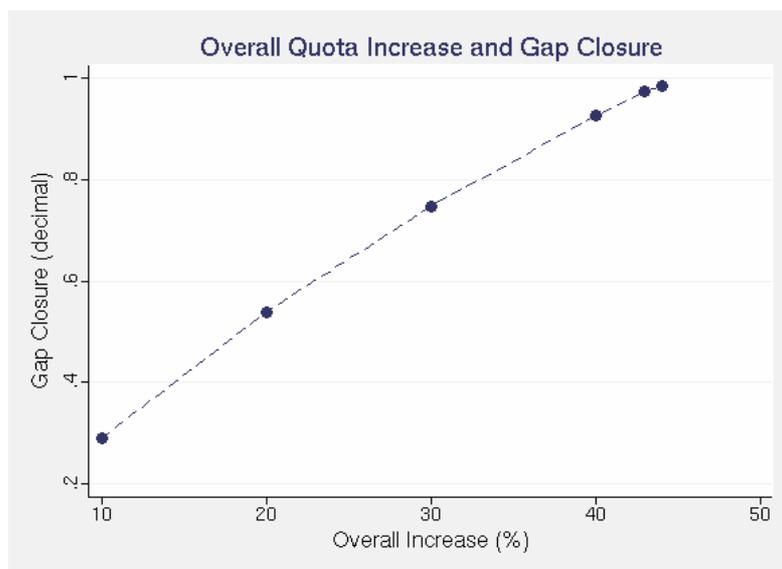
Proportional distribution. Each country is assigned a share corresponding to its relative weight in the group of under-represented countries. This criterion is intuitive but has an important drawback: large but only slightly under-represented countries would get the largest part of the total increase in quotas.

Equiproportional gap closure. The under-representation *gap* is defined as the (positive) difference between *CQS* and *AQS*; the *gap closure* (α) is the share of the gap filled after the adjustment, that is:

$$\alpha = \frac{FQS - AQS}{CQS - AQS}$$

where FQS is the final quota share after the adjustment.

According to the equiproportional gap reduction criterion, all under-represented countries would get the same gap closure. This rule is fair as it treats each member equally, but involves some technical difficulties for the computation of the equilibrium value of α , which depends on the overall quota increase (see the appendix for more details). The relation between the latter and α is depicted in Figure 3: the greater the increase in total IMF quotas R , the better the fit between new quota shares and calculated ones.



- Figure 3 -

Overall increase and gap closure	
Overall increase (%)	Gap closure (decimal)
10	0.29
20	0.54
30	0.75
40	0.93
43	0.97
44	0.98

Note: used formula:

$(0.375MERGDP + 0.125PPPGDP + 0.3OPEN + 0.15VAR + 0.05RE)^{0.95}$ A full gap closure would require a total increase of about 44 percent.

Foregoing

By *foregoing* we mean the amount of additional quota that an eligible country is willing *not* to subscribe. In particular, this possibility was explicitly contemplated by the United States, and

other G7 under-represented countries announced their availability to follow the United States' example. There are two main issues at stake here:

1. *Amount of foregoing.* In principle, eligible countries could opt to give up the whole amount of their additional quotas. If they did so, and disregarding any changes in basic votes, their voting share would surely diminish because of the increase in total IMF quotas. For this reason, the United States bounded their potential foregoing to preserve their voting share at a predetermined level (either the pre-Singapore level, 17.03 percent, or the post-Singapore level, 16.73 percent).
2. *Allocation mechanisms.* When an eligible country gives up part of its quota increase, this benefits all the remaining under-represented countries. The higher the foregoing, the greater the gap closure for the latter. In principle, the foregoing of some eligible countries could also be targeted to a specific subset of under-represented countries. In this case, as is clear, the latter countries would close their gap even further. Yet, this option was never taken into account in the quota negotiations.

All the elements discussed so far are sufficient to determine the new distribution of IMF's quota shares. The voting share of each member can be obtained by adding basic votes.

2.4. Basic votes

The **fourth and final element** is the number of basic votes, which are by definition equal for each member country. The new voting shares can now be calculated.

According to the Articles of Agreements, each Fund's member is accorded 250 *basic votes (BV)*, irrespective of its quota. In 1945 BV represented 11.3 percent of total votes, but their relative importance has steadily declined over the years (see table). Today, they represent a mere 2.1 percent. This is due to different factors. On the one hand, the absolute number of basic votes per member has remained unchanged since the IMF's foundation, and their total number has grown only occasionally, when new countries joined the Fund. On the other, total IMF quotas have been repeatedly increased over time – and so have the quota-related votes. In order to rebuild the 1945 share, each member should be assigned 1,328 BV today.

Relative importance of basic votes, 1945-2007 (IMF, 2005)

Year	Members	All votes	Basic votes	
			Total number	% of total
1945	45	99,390	11,250	11.3
1958	68	108,930	17,000	15.6
1965	101	179,928	25,250	14.0
1970	115	236,835	28,750	12.1
1976	132	319,719	33,000	10.3
1978	140	432,415	35,000	8.1
1983	145	646,415	36,250	5.6
1990	152	1,387,910	38,000	2.7
1998	183	2,166,040	45,750	2.1
2007	185	2,176,037	46,250	2.1

The decline of basic votes has been perceived by some countries (especially small developing ones) as a loss of voice within the IMF. This loss would be unavoidably exacerbated by a large *ad hoc* increase in IMF quotas aimed at increasing the weight of fast-growing emerging market countries, since low-income members are typically over-represented on the basis of the new formula, and are therefore not eligible to any quota increase. To tackle this issue, the Singapore Resolution and the last IMFC *Communiqué* envisaged a clear mandate for at least a doubling of BV and for enhancing the voice and representation of developing countries as a group. From a legal point of view, a change in the number of basic votes requires an amendment to the Articles of Agreement, which must be accepted by three-fifths of the members having 85 percent of the total voting power.

Basic votes and quotas together determine the *voting power* (VP), i.e. the number of votes of each member $i = 1, 2, \dots, 185$. In fact:

$$VP^i = BV^i + \frac{Q^i}{100000},$$

A country's *voting share* (VS^i) is defined as:

$$VS^i = 100 \times \frac{VP^i}{\sum_{i=1}^{185} VP^i}$$

Not all members gain more VS from an increase of BV. In particular, only members whose quota is below the average level will benefit from this increase¹⁸, in other words:

¹⁸ Currently, the average quota is SDR 1,176 million corresponding to a quota share of 0.54. The condition is equivalent to: $VS^i \leq \frac{1}{185}$.

$$\frac{\partial VS^i}{\partial BV^i} \geq 0 \Leftrightarrow Q^i \leq \frac{1}{185} \times \sum_{i=1}^{185} Q^i$$

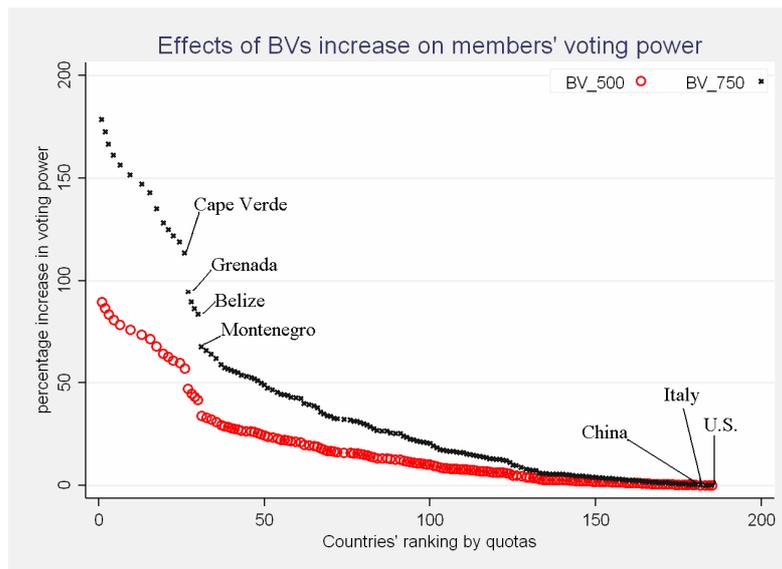
An increase in BV enhances the voice of all countries which are small in terms of quotas regardless of their relative income. Therefore, large emerging market countries, such as China, will not benefit from increases in BV, while small advanced economies (e.g. San Marino and Luxembourg) will.

Quota size and economic development

	Advanced	Non-advanced	Total
Very small	10	138	148
Others	17	20	37
Tot.	27	158	185

Note: Very small countries have a quota below the average.

A more general picture is provided in Figure 4, which shows the effect on the total voting power of a doubling or a tripling of BV.



- Figure 4 -

A doubling of BV would produce a more than 50 percent increase of VP for 26 IMF members, whose quota is less than SDR 25 million. Similarly, the 48 IMF members with quotas less than SDR 75 million will have their quota increased by more than 50 per cent in the case of BV set at 750.

Not surprisingly, all these countries are very small: in the former case, they have an average quota of SDR 10 million and a quota share of 0.005 percent; in the latter case, they have an average quota of SDR 31.5 million and a quota share of 0.014 percent.

3. THE 2008 RESOLUTION

A resolution on quotas and voice was finally approved by the Board of Governors on April 28th 2008 (hereafter Resolution).¹⁹ In this chapter we describe the Resolution in the light of the framework previously proposed and provide an assessment of the political value of its content.

In order to accommodate the different requests of the membership regarding the GDP blend, the use of a compression factor, and the weights of the variables, the Resolution uses the following formula to calculate quota shares:

$$q^i = 1.055 \times (0.3 \times GDP^i + 0.2 \times PPPGDP^i + 0.3 \times OPEN^i + 0.15 \times VAR^i + 0.05 \times RES^i)^{0.95}$$

Recognizing that the inclusion of PPP-GDP and compression has been one of the most difficult aspects of the deliberations, the Board of Governors decided to keep these elements for a limited period of time of **20 years** (sunset clauses). Later than that these elements might no longer be used for the quota realignments.

Regarding other elements of the package, the Resolution stipulates a tripling of basic votes from 250 to 750 and a total quota increase of 11.5 percent with respect to pre-Singapore.²⁰ The allocation of the increase to under-represented countries is based primarily on the equiproportional gap closure allocation criterion, which yields to a gap reduction between actual and calculated quota shares of **29.8** percent. This approach is complemented with three *ad hoc* criteria, namely: (a) foregoing of quota increases by some under-represented advanced members; (b) a minimum quota increase for China, Korea, Mexico, and Turkey (the “Singapore 4” countries); (c) a “booster” for the quotas of dynamic emerging market economies.

- *Foregoing*. The four under-represented G7 countries (US, Japan, Germany and Italy) forego part of the quota increase they are entitled to, but following different criteria. Specifically, the US foregoes any quota increase greater than that needed to preserve its post-Singapore voting share (16.73 percent). This implies a gap closure equal to **18.3** percent. The remaining under-represented G7 countries close the gap between actual and calculated quota shares in the same proportion as the US. In addition, Ireland and Luxembourg, two very under-represented advanced members, have agreed to forego part of the increases they would otherwise be eligible for (in particular, those beyond a nominal quota increase of 50 percent). This implies a gap closure of, respectively, **17.3** and **9.1** percent.²¹
- *Singapore 4 countries*. China, Korea, Mexico, and Turkey increase their quotas by at least 15 percent with respect to the post-Singapore level. Korea and Mexico benefit from this clause and close their gap by **41** and **43** percent, respectively.
- *Booster*. Under-represented members, whose share of global PPP-GDP exceeds their current quota share by more than 75 percent are guaranteed a minimum quota increase of

¹⁹ The Resolution was approved by the Board of Governors with 92.93 percent of total votes. Russia and Saudi Arabia abstained, whilst Argentina voted against the Resolution.

²⁰ It corresponds to a 9.6 percent increase with respect to post-Singapore.

²¹ Without foregoing, Ireland and Luxembourg would have received a quota increase of 73 and 128 percent, respectively.

40 percent. Only Brazil, India and Vietnam benefit from the booster, but are affected differently: for example, while Vietnam faces a gap closure of only **51** percent, India and Brazil close their gap by **980** and **105** percent respectively (with the new quota their representation status turns from under- to over-represented).

In order to enlarge the consensus, two amendments to the Articles of Agreement were contemplated: (i) the Executive Directors of large constituencies (African) will appoint one additional Alternate; (ii) the automatic adjustment of basic votes, whose aggregate weight on the total voting power will be maintained at 5.502 percent. The introduction of the latter amendment implies that the number of basic votes allocated to each member will no longer be fixed but will change endogenously and automatically according to changes in the number of Fund's members as well as in their quotas.²² Specifically:

(a) in case of changes in the quotas of members, any increase will trigger a rise in both the aggregate number of basic votes and the number of basic votes granted to each member. Symmetrically, any decrease in a member's quota will result in a decrease in the number of basic votes, at both the aggregate and individual country level.

(b) in case of changes in the number of members, both the aggregate and individual number of basic votes will change with admission or withdrawal of a member. In particular, the net effect will depend on whether the quota of the member that is being admitted or withdrawn is higher or lower than the average quota.

Finally, the Resolution commits the Executive Board to recommend further realignments of quota shares in the context of future General Quota Reviews, to ensure that quota shares continue to reflect members' relative position in the world economy.

The quota and voting shares for country groups and relevant countries, as they result from the 2008 Reform, are reported in the following table.

²² Analytically, after the 2008 Resolution the basic votes of an individual country will be a linear function of the total amount of quotas: $BV^i = \frac{0.05502}{1-0.05502} * \frac{100}{185} * \sum_{i=1}^{185} Q^i$. Also, the relation between voting and quota shares will be linear: $VS^i = 0.03 + 0.945q^i$

Quota and voting shares for country groups and relevant countries

	QUOTA SHARES (pp)				VOTING SHARES (pp)		
	Pre-Singapore	Post-Singapore	Calculated	2008 Reform	Pre-Singapore	Post-Singapore	2008 Reform
Advanced	61.5	60.4	63.7	60.4	60.5	59.5	57.8
Non-advanced	38.5	39.6	36.3	39.6	39.5	40.5	42.2
<i>Memo:</i>							
Dynamic	12.2	13.7	19.5	15.3	12.0	13.5	14.8
PRGF	7.7	7.6	4.9	7.7	8.4	8.3	9.6
EU27	32.9	32.4	32.9	31.9	32.5	32.0	30.9

ADVANCED

(a) under-represented

<i>United States</i>	17.38	17.08	18.99	17.67	17.02	16.73	16.73
<i>Japan</i>	6.23	6.12	8.03	6.56	6.11	6	6.23
<i>Germany</i>	6.09	5.98	6.23	6.11	5.97	5.87	5.8
<i>Italy</i>	3.3	3.24	3.34	3.31	3.24	3.19	3.16
<i>Spain</i>	1.43	1.4	2.3	1.69	1.41	1.38	1.62
<i>Ireland</i>	0.39	0.39	1.17	0.53	0.4	0.39	0.53
<i>Luxembourg</i>	0.13	0.13	0.62	0.18	0.14	0.14	0.2

(b) over-represented

<i>France</i>	5.02	4.94	4.02	4.51	4.93	4.84	4.29
<i>United Kingdom</i>	5.02	4.94	4.43	4.51	4.93	4.84	4.29
<i>Canada</i>	2.98	2.93	2.57	2.67	2.93	2.88	2.56
<i>Netherlands</i>	2.41	2.37	1.93	2.17	2.38	2.33	2.08
<i>Belgium</i>	2.15	2.12	1.5	1.93	2.12	2.08	1.86
<i>Sweden</i>	1.12	1.1	0.99	1.01	1.11	1.09	0.98
<i>Finland</i>	0.59	0.58	0.54	0.53	0.59	0.58	0.53

NON-ADVANCED

(a) under-represented

<i>China</i>	2.98	3.72	6.39	3.99	2.93	3.65	3.8
<i>India</i>	1.95	1.91	2	2.44	1.92	1.88	2.34
<i>Mexico</i>	1.21	1.45	1.97	1.52	1.2	1.43	1.47
<i>Brazil</i>	1.42	1.4	1.72	1.78	1.4	1.38	1.72
<i>Korea</i>	0.76	1.35	2.24	1.41	0.76	1.33	1.36
<i>Turkey</i>	0.45	0.55	0.99	0.61	0.45	0.55	0.61
<i>Vietnam</i>	0.15	0.15	0.23	0.19	0.16	0.16	0.21

(b) over-represented

<i>Saudi Arabia</i>	3.27	3.21	0.83	2.93	3.21	3.16	2.8
<i>Russia</i>	2.78	2.73	2.05	2.49	2.73	2.69	2.39
<i>Australia</i>	1.51	1.49	1.32	1.36	1.49	1.47	1.31
<i>Argentina</i>	0.99	0.97	0.58	0.89	0.98	0.96	0.87
<i>Indonesia</i>	0.97	0.96	0.9	0.87	0.96	0.95	0.85
<i>South Africa</i>	0.87	0.86	0.59	0.78	0.87	0.85	0.77
<i>Iran, I.R. of</i>	0.70	0.69	0.59	0.63	0.70	0.69	0.62

3.1. An evaluation

The 2008 Reform reflects a compromise between conflicting requests advanced by the membership during the negotiations. On the one hand, the inclusion of PPP-GDP in the formula is a concession made in favor of emerging market and developing countries; its coefficient in the formula has been chosen to include India in the group of under-represented countries. On the other hand, the use of a compression factor and the large weight attributed to the openness variable (30 percent) represent a concession made to European countries. With respect to a linear formula, compression penalizes the largest IMF members (US, Japan, Germany, France, United Kingdom, China, Italy and Saudi Arabia), Canada is indifferent, and all the remaining 175 IMF members gain.

The Resolution implies 135 countries will receive an increase in voting share. The aggregate gain for these countries amounts to **5.4** percentage points, while the shift of voting shares from advanced to non-advanced countries is **2.7** percentage points. Although not unprecedented, the voting share gain for non-advanced economies is fairly large by historical standards. A larger gain than 2.7 points was observed only twice, in 1963 and 1978. In the first instance, 20 new members (all non-advanced) joined the Fund; in the second case, there was a large quota increase for oil exporting countries.

A group of influential Washington-based academics²³ has judged the reform package as a “modest improvement in governance” of the IMF; according to them the formula is the weakest element of the package as it generates limited changes in voting shares. Overall, the reform is considered to “fall far short in addressing the challenges facing the IMF in its evolution toward a truly global institution with more balanced and inclusive representation and voting power”²⁴. This view has also been shared by G-24 countries: in their 2008 Spring Meetings *Communiqué*, the increase in voting and quota shares of developing countries was considered still insufficient to reach the goals of the reform.

To evaluate the effectiveness of the reform we tried to disentangle the relative importance of its main elements, namely: i) the quota formula, ii) the tripling of basic votes and iii) the additional *ad hoc* elements (booster, Singapore-4 and foregoing). The first two elements represent the “structural” components of the reform, which are bound to persist in the future quota negotiations while the remaining elements were meant to apply only to this round of negotiations.

We simulated three different scenarios always using the new formula (see above), the same total quota increase (11.5 percent) and the equiproportional gap closure as distribution criterion. In scenario (1) basic votes are kept constant at their traditional level (250) and no additional elements are included; in scenario (2) basic votes are tripled, all else being equal to (1); the third is the 2008 Reform scenario. In the table below, we report the shift in voting share with respect to pre-Singapore for the three simulations.

²³ The group included Nancy Birdsall, president of the Center for Global Development, Ralph Bryant, Colin Bradford, Homi Karas, Johannes Linn of the Brookings Institution, Ted Truman and John Williamson of the Peterson Institute for International Economics, and Jo Marie Griesgraber of the New Rules for Global Finance Coalition.

²⁴ “Letter to the Executive Directors of the IMF and their Governments, 26 March 2008”, available at www.cgdev.org.

Shift in voting shares (with respect to pre-Singapore)			
	(1)	(2)	(3)
Advanced	-0.2	-1.9	-2.7
<i>memo:</i>			
Dynamic	2.3	2.0	2.8
PRGF	-0.6	0.7	1.1
EU27	-0.7	-1.3	-1.6

(1): new formula, increase in total IMF quotas= 11.5%, equiproportional gap closure and BV=250
(2): new formula, increase in total IMF quotas = 11.5%, equiproportional gap closure and BV=750
(3): IMF 2008 Reform

We can observe the following:

- 1) The new formula alone is able to deliver a substantial increase in the voting share of dynamic countries, while it leaves almost unchanged advanced countries' share and penalizes PRGF countries.
- 2) If we introduce a combination of the new formula plus the tripling basic votes, it increases the shift of PRGF whilst enlarging the loss of advanced countries.
- 3) The *ad hoc* elements amplify further the loss of advanced and, consequently, the gain of dynamic and PRGF countries.

Based on this, the overall shift of 2.7 percentage points can be explained mostly (over 60%) by the basic votes increase, whilst *ad hoc* elements represent less than one third of it. Therefore, the doubts raised on the likely capacity of the new formula to respond to future claims from developing and emerging countries remain.

Prospectively, in the context of future general quota reviews, *ad hoc* elements will not hold and basic votes will be adjusted endogenously.²⁵ The formula would then be the only means to deliver further realignments in quota and voting shares. Whether it would be capable of doing so is still questionable. For example, assume that, with the voting share distribution stemming from the 2008 Reform in place, the ongoing fourteenth General Quota Review will end before data and variables will have been updated: this translates into a scenario featuring the new formula and the basic votes adjustment mechanism. In this context, we simulated a 10 percent quota increase allocated through the equiproportional distribution criterion. With respect to the "post-Reform" situation, the shift in voting share from advanced countries to non-advanced ones would then be of **0.4** percentage points, whilst dynamic countries would gain **1.8** and PRGF would lose **0.6**. These results, which do not account for the evolution of the global economy, point to the likely need for future revisions of the formula and its variables. In particular, openness and variability leave more scope for further work on their definitions.²⁶

²⁵ For example, an overall quota increase of 10 percent (20 percent) will result in 825 (900) basic votes granted to each member.

²⁶ Regarding openness, the main issues are the inclusion of financial openness, the exclusion of intra-currency union trade flows and the development of an alternative openness measure based on value added. Regarding variability, the staff has examined a range of options for amending or redefining its measure (see IMF 2007b for details).

In line with this view, the 2008 Spring Meetings IMFC *Communiqué* stipulates: “[further quota shares] realignments are expected to result in increases in the quota shares of dynamic economies, and hence in the share of emerging market and developing countries as a whole. The Committee looks forward to further work by the Executive board on elements of the new quota formula that can be improved before the formula is used again”.

CONCLUSIONS

The current voting share distribution at the IMF neither reflects the weights and roles of member countries in the world economy nor does it protect the voice of low income countries. In order to address these issues, a comprehensive quota and voice reform package was approved by the Board of Governors. The reform aims at enhancing the Fund's credibility among its members by introducing a new quota system and should strengthen the role of new global players along with the representation of low income countries.

Any change in the quota distribution is a zero sum game: an increase for some countries necessarily results in a decrease for others. Therefore, the debate on the key features of the new quota system has been characterized by the existence of competing political requests. Moreover, the construction of a politically feasible system has involved several technical difficulties. This paper has provided a historical perspective of previous quota increases along with the main shortcomings of the current system. It has also given motivations for deep changes in the existing quota and voice distribution and described the evolution of the debate. Moreover, it has explored each element together with the political issues involved and the interaction between them. Finally, the 2008 Reform package has been described and evaluated with respect to the analytical framework developed.

The Reform is a first and substantial step towards a better governance structure for the IMF. However, it represents a compromise and, as such, shows some shortcomings that need to be addressed by future negotiations.

APPENDIX

A. Key elements of the reform agenda approved in Singapore

- Initial *ad hoc* quota increases of four of the most clearly under-represented members—China, Korea, Mexico and Turkey;
- Agreement, by the time of the 2008 Spring Meetings, on a new quota formula that can provide a simpler and more transparent means of capturing members' relative positions in the world economy;
- A second round of *ad hoc* quota increases, based on the new formula, with a view to achieving a significant further alignment of members' quotas with their relative positions in the world economy;
- Agreement that general reviews of quotas conducted after the completion of these reforms also consider distributing any increases in quotas with a view to achieving a better alignment of members' quotas with their relative positions in the world economy, while ensuring that the Fund has adequate liquidity to achieve its purposes;
- An amendment to the Articles of Agreement that would provide for at least a doubling of basic votes that at a minimum protect the pre-Singapore voting share of low-income countries as a group, while also ensuring that the share of basic votes to total votes is preserved in the future;
- An increase in staffing resources available to Executive Directors representing a large number of members, whose workload is particularly heavy; and
- Consideration of the merits of an amendment to the Articles to enable Executive Directors representing a large number of members to appoint more than one Alternate Executive Director.

B. The system of formulas before the 2008 Reform

The original Bretton Woods (BW) formula was a single equation intended to provide a comprehensive measure of the relative size of a country's economy that took into account important differences in the economic structures of countries. The formula contained the following variables in levels (millions of SDR): (i) national income; (ii) reserves; (iii) merchandise imports; (iv) variability of exports. Variables under (i) and (ii) were thought of as proxies for a measure of a country's ability to contribute, whilst the remaining ones were envisaged as indicators for a member's possible need of IMF resources.

In order to bridge some of the gap between actual and calculated quotas and to increase the quotas of smaller primary commodity producing countries, at the beginning of the Sixties, the original BW formula was deeply revised and two new variables, namely, current payments and current receipts, replaced imports and exports. In addition, four derivative formulas were developed with higher weights on trade and variability, in order to cope with the issues of small open economies.

In 1983 the quota formulas were subject to a last revision, aimed at updating the definition of variables and reducing variability weight in the derived formulas. There have been no changes in the formulas since 1983, although on several occasions the Executive Board considered proposals for changes, mostly in the variables to be included.

At the current juncture, the formulas are as follows:

$$\text{Bretton Woods: } Q_1 = (0.0100\text{GDP} + 0.0250\text{RES} + 0.0500\text{P} + 0.2276 \text{VAR})(1+\text{C}/\text{GDP})$$

$$\text{Scheme III: } Q_2 = (0.0065\text{GDP} + 0.0205\text{RES} + 0.0780\text{P} + 0.4052\text{VAR})(1+\text{C}/\text{GDP})$$

$$\text{Scheme IV: } Q_3 = (0.0045\text{GDP} + 0.0390\text{RES} + 0.0700\text{P} + 0.7700\text{VAR})(1+\text{C}/\text{GDP})$$

$$\text{Scheme M4: } Q_4 = 0.0050\text{GDP} + 0.0423\text{RES} + 0.0440(\text{P}+\text{C}) + 0.8352\text{VAR}$$

$$\text{Scheme M7: } Q_5 = 0.0045\text{GDP} + 0.0528\text{RES} + 0.0390(\text{P}+\text{C}) + 1.0432\text{VAR}$$

Where all variables are expressed in levels and:

Q1, Q2, Q3, Q4 and **Q5** = calculated quotas for each formula;

GDP = gross domestic product measured at current market prices for a recent year;

RES = twelve-month average of gold, foreign exchange reserves, SDR holdings and reserve positions in the IMF, for a recent year;

P = annual average of current payments (goods, services, income, and private transfers) for a recent five-year period;

C = annual average of current receipts (goods, services, income, and private transfers) for a recent five-year period;

VAR = variability of current receipts, defined as one standard deviation from the centred five-year moving average, for a recent 13-year period.

For each of the four non-Bretton Woods formulas, quota calculations are multiplied by an adjustment factor so that the sum of the calculations across members equals that derived from the Bretton Woods formula.

C. Equilibrium α

By manipulating the definition of α given in the text, it yields to

$$FQS^i = AQS^i + \alpha(CQS^i - AQS^i), \forall i \in I. \quad (*)$$

where I is the set of all under-represented countries.

Remember that:

$$FQS^i = \frac{AQL^i + NQ^i}{(1+R) \times Q};$$

where AQL^i is the actual quota level for the i -th country, NQ^i is the quota increase for the i -th country, Q is the total actual quota level and R is the increase in the Fund's quota.

Thus, by plugging into equation (*) the above definition, one can solve for NQ^i :

$$NQ^i = Q \times (1+R) \times (AQS^i + \alpha(CQS^i - AQS^i)) - AQL^i, \forall i \in I \quad (**)$$

In addition, the quota increases distributed to eligible countries must sum up to R .

$$\sum_{i \in I} NQ^i = R \quad (***)$$

Equations (**) and (***) form a linear system of $I+1$ equations in $I+1$ unknowns that can be solved either numerically or analytically. Notice that if we solve the simple example used in the text, we will obtain $NQ^B = 30, NQ^D = 20$ and, notably, $\alpha = 1$. If, in the same example, we had set $R = 30$, we would have obtained $NQ^B = 20, NQ^D = 10$, and $\alpha = \frac{1}{3}$. Thus, final quota shares would have been $FQS^A = 30,79\%, FQS^B = 38,46\%, FQS^C = FQS^D = 15,38\%$.

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