

INTERNATIONAL MONETARY FUND

**Quota Formula Review—Data Update and Further Considerations**

Prepared by the Finance Department  
(In consultation with the Statistics and other departments)

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## I. INTRODUCTION<sup>1</sup>

1. **In March 2012, the Executive Board held its first formal discussion on the comprehensive review of the quota formula.**<sup>2</sup> This review, to be completed by January 2013, is an important part of the quota and governance reforms agreed in 2010. Directors stressed the importance of agreeing on a quota formula that better reflects members' relative positions in the global economy for future discussions on the 15<sup>th</sup> General Review of Quotas. This view was reiterated in April by the IMFC, which looked forward to an agreement by January 2013: "...on a simple and transparent quota formula that better reflects members' relative positions in the world economy." The IMFC also reaffirmed its commitment to complete the 15<sup>th</sup> quota review by January 2014. It noted that any realignment is expected to result in increases in the quota shares of dynamic economies in line with their relative positions in the world economy, and hence likely in the share of EMDCs as a whole; and that steps shall be taken to protect the voice and representation of the poorest members. The Board held an informal follow-up meeting on June 13, 2012.

2. **The importance of the quota formula review was also highlighted at the recent summit of G-20 Leaders in Los Cabos.** Leaders reiterated their commitment to "completing the comprehensive review of the quota formula, to address deficiencies and weaknesses in the current quota formula, by January 2013." G-20 Leaders agreed that "the formula should be simple and transparent, consistent with the multiple roles of quotas, result in calculated shares that are broadly acceptable to the membership, and be feasible to implement based on timely, high quality and widely available data." They also reaffirmed "...that the distribution of quotas based on the formula should better reflect the relative weights of IMF members in the world economy, which have changed substantially in view of strong GDP growth in dynamic emerging markets and developing countries" and "the importance of protecting the voice and representation of the poorest members."<sup>3</sup>

3. **A wide range of views were expressed at the March discussion.** Directors generally concurred that GDP is the most comprehensive measure of economic size and should continue to have the largest weight in the quota formula. Beyond that, however, views differed significantly both on measurement of GDP (the relative importance of market versus PPP GDP in the GDP blend variable) and on the role of other variables in the formula.

4. **This paper provides background for the next Board discussion.** It covers three broad areas. First, it presents results of updating the quota data base through end-2010 (Section II). Second, the paper reports on further staff work on three issues—financial openness, variability, and financial contributions—responding to requests made at the March

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<sup>2</sup> See *Quota Formula Review—Initial Considerations* (2/10/12) and the *IMF Executive Board Begins Review of Quota Formula* (Public Information Notice (PIN) No. 12/35 (4/13/12)).

<sup>3</sup> G20 Leaders Declaration, Los Cabos, Mexico, paragraph 33 (06/19/12).

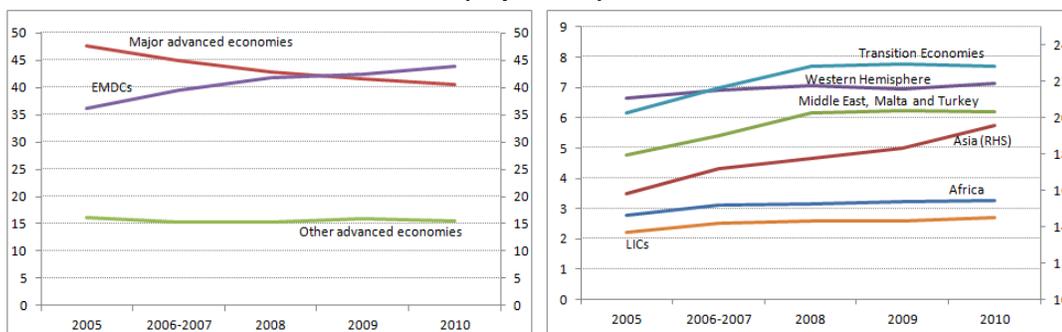
meeting (Section III). Third, the paper presents several simulations aimed at illustrating the potential impact on calculated quota shares of increasing the weight of financial openness, of changing the weights of GDP measured at market exchange rates and at PPP in the GDP blend variable, and of capturing financial contributions, as well as possible options for simplifying the formula (Section IV). No proposals are made at this stage. Section V concludes, while the Annexes and Statistical Appendix (circulated separately) provide additional technical material and individual country details for the simulations.

## II. UPDATED QUOTA CALCULATIONS

5. **Staff has updated the quota database through 2010.** This advances by one year the data presented last August,<sup>4</sup> using the same sources and methodology as in past updates (see Box 1 and the Statistical Appendix). The results of these updates are shown in Tables 1 and A1.<sup>5</sup> One further data update is expected in mid-2013 before the deadline for completing the 15<sup>th</sup> General Review of Quotas.

6. **The data update continued the broad trends observed in previous updates.** The calculated quota share (CQS) of emerging market and developing countries (EMDCs) as a whole increased by 1.4 pp to 43.9 percent—compared to an increase of 0.7 pp in the previous update (Table 1). Compared with the data used for the 2008 Reform (which went through 2005), the aggregate CQS of EMDCs has now risen by 7.7 pp. Within this group, the largest gain was recorded by countries in Asia, with smaller gains for Western Hemisphere and Africa, while the Middle East and the Transition Economies recorded small losses (Figure 1). Among the advanced economies, two thirds of the decline was recorded by the major advanced economies—all except Canada recorded a decline. The share of other advanced economies as a group fell by 0.5 pp.

**Figure 1. Evolution of CQS 2005-2010 1/**  
(In percent)



1/ For data ending in 2005, 2007, 2008, 2009, and 2010.

Source: Finance Department

<sup>4</sup> *Quota Formula Review—Data Update and Issues* (8/17/11).

<sup>5</sup> Compared to aggregate tables presented in earlier papers, Table 1 contains individual country detail for the thirty-five largest members. Tables for all individual members are provided in the Statistical Appendix.

### Box 1. Data Sources and Methodology

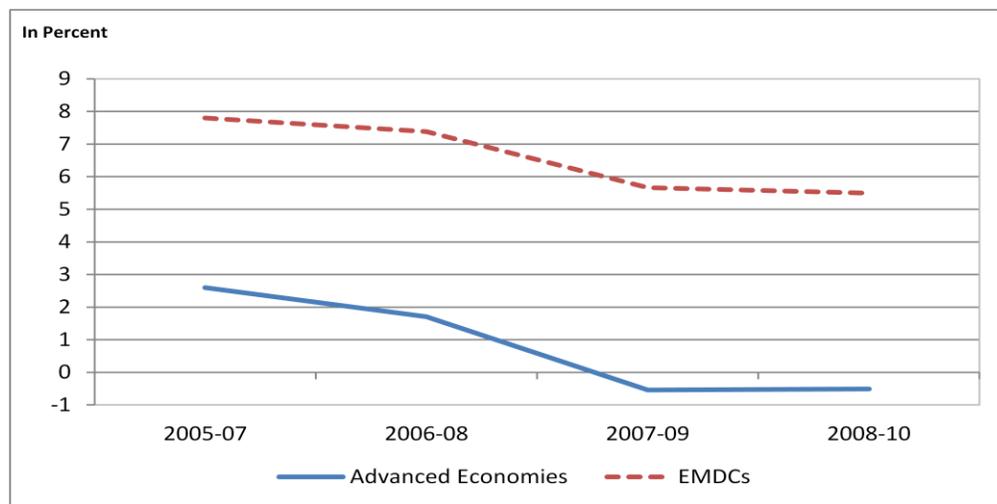
**The data sources and methodology remain in line with past practice (see the Statistical Appendix for further details):**

The primary data source is the Fund's *International Financial Statistics* (IFS). Missing data were supplemented in the first instance by the *World Economic Outlook* (WEO) database. Remaining missing data were computed based on staff reports and, in very few instances, country desk data. As is customary, a cutoff date of January 31, 2012 for incorporating new data in the quota database was employed for IFS; consistent with this cutoff, the Fall 2011 publication was used for WEO data.

PPP GDP data were taken from the WEO database and were calculated by dividing a country's nominal GDP in its own currency by the PPP price level index.

7. **The changes in CQS reflect a combination of factors.** First, real economic growth rates have continued to diverge, with EMDCs as a group recording strong growth while most advanced economies have stagnated (Figure 2). This is reflected in a 2.0 pp. increase in the aggregate share of EMDCs in the GDP blend variable (Table 2). EMDCs also generally gained share of the openness variable, reflecting a stronger rebound in external flows for EMDCs than for advanced economies. For variability, the impact of the data update differs more across countries, with some significant gainers and losers, underscoring the measurement issues highlighted in the previous paper (see Section III). Overall, the share of EMDCs in variability increased—in part reversing the significant increase in the variability share of advanced economies in the previous data update. For reserves, the changes in shares reflect strong reserve accumulation by a number of individual countries.

**Figure 2. Average GDP Growth Rates**



Source: Finance Department

**Table 1. Distribution of Quotas and Calculated Quotas  
(In percent)**

	Quota Shares		Calculated Quota Shares 1/			
	Post Second Round 2/	14th General Review 3/	Current 4/	Previous 5/	14th General Review 6/	2008 Reform 7/
Advanced economies	60.4	57.6	56.1	57.5	58.2	63.8
Major advanced economies	45.3	43.4	40.6	41.6	42.9	47.6
United States	17.7	17.4	15.8	16.1	17.0	19.0
Japan	6.6	6.5	6.2	6.3	6.5	8.0
Germany	6.1	5.6	5.7	5.8	5.7	6.2
France	4.5	4.2	3.6	3.8	3.8	4.0
United Kingdom	4.5	4.2	4.1	4.3	4.7	4.4
Italy	3.3	3.2	3.0	3.2	3.0	3.3
Canada	2.7	2.3	2.3	2.2	2.3	2.6
Other advanced economies	15.1	14.3	15.4	15.9	15.3	16.2
Spain	1.7	2.0	2.2	2.3	2.2	2.3
Netherlands	2.2	1.8	2.0	2.1	1.9	1.9
Australia	1.4	1.4	1.4	1.4	1.4	1.3
Belgium	1.9	1.3	1.3	1.4	1.3	1.5
Switzerland	1.5	1.2	1.2	1.1	1.2	1.2
Sweden	1.0	0.9	1.0	1.1	0.9	1.0
Austria	0.9	0.8	0.8	0.8	0.8	0.9
Norway	0.8	0.8	0.8	0.8	0.8	0.8
Ireland	0.5	0.7	0.9	1.0	1.1	1.2
Denmark	0.8	0.7	0.7	0.7	0.7	0.9
Emerging Market and Developing Countries 8/	39.6	42.4	43.9	42.5	41.8	36.2
Africa	5.0	4.4	3.3	3.2	3.1	2.8
South Africa	0.8	0.6	0.6	0.6	0.6	0.6
Nigeria	0.7	0.5	0.5	0.5	0.5	0.3
Asia	12.6	16.0	19.6	18.3	17.7	15.8
China 9/	4.0	6.4	9.4	8.6	7.9	6.4
India	2.4	2.7	2.6	2.4	2.4	2.0
Korea	1.4	1.8	2.0	2.0	2.1	2.2
Indonesia	0.9	1.0	1.0	0.9	0.9	0.9
Singapore	0.6	0.8	1.3	1.2	1.2	1.0
Malaysia	0.7	0.8	0.8	0.7	0.8	0.9
Thailand	0.6	0.7	0.9	0.8	0.8	0.8
Middle East, Malta & Turkey	7.2	6.7	6.2	6.2	6.2	4.8
Saudi Arabia	2.9	2.1	1.4	1.5	1.3	0.8
Turkey	0.6	1.0	1.1	1.1	1.1	1.0
Iran, Islamic Republic of	0.6	0.7	0.7	0.7	0.7	0.6
Western Hemisphere	7.7	7.9	7.1	6.9	7.0	6.6
Brazil	1.8	2.3	2.2	2.1	2.2	1.7
Mexico	1.5	1.9	1.7	1.7	1.8	2.0
Venezuela, República Bolivariana de	1.1	0.8	0.5	0.5	0.5	0.4
Argentina	0.9	0.7	0.6	0.6	0.6	0.6
Transition economies	7.1	7.2	7.7	7.8	7.7	6.2
Russian Federation	2.5	2.7	2.6	2.7	2.9	2.1
Poland	0.7	0.9	1.0	1.0	0.9	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum Items:						
EU 27	31.9	30.2	30.9	32.2	31.3	32.9
LICs 10/	4.3	4.0	2.7	2.6	2.6	2.2

Source: Finance Department.

1/ Based on the following formula:  $CQS = (0.50 \cdot GDP + 0.30 \cdot Openness + 0.15 \cdot Variability + 0.05 \cdot Reserves) \cdot K$ . GDP blended using 60 percent market and 40 percent PPP exchange rates. K is a compression factor of 0.95.

2/ The "post second round" reflects the ad hoc quota increases for 54 members under the 2008 reform, which became effective in March 2011. Includes South Sudan which became a member on April 18, 2012. For the two countries that have not yet consented to and paid for their quota increases, 11th Review proposed quotas are used.

3/ Includes South Sudan which became a member on April 18, 2012; reflects the proposed doubling of its quota after the 14th Review becomes effective.

4/ Based on IFS data through 2010.

5/ Based on IFS data through 2009.

6/ Based on IFS data through 2008.

7/ Based on IFS data through 2005. Reflects the impact of adjustments to current receipts and payments for re-exports, international banking interest, and non-monetary gold.

8/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic, and Slovenia.

9/ Including China, P.R., Hong Kong SAR, and Macao SAR.

10/ PRGT-eligible countries.

**Table 2. Distribution of Quotas and Updated Quota Variables  
(In percent)**

	14th General Review Quota Shares 1/	GDP Blend 2/		Openness		Variability 5/		Reserves	
		Current 3/	Previous 4/	Current 3/	Previous 4/	Current 3/	Previous 4/	Current 3/	Previous 4/
Advanced economies	57.6	58.2	60.2	62.2	63.8	57.9	58.6	23.9	23.6
Major advanced economies	43.4	47.4	49.1	41.8	43.0	38.7	37.6	17.3	18.4
United States	17.4	22.2	23.0	13.1	13.3	15.5	14.1	1.6	1.4
Japan	6.5	7.5	7.4	4.3	4.4	5.2	5.5	12.3	13.7
Germany	5.6	5.0	5.2	8.2	8.4	6.1	5.8	0.8	0.8
France	4.2	3.8	4.0	4.6	4.7	2.3	2.8	0.6	0.5
United Kingdom	4.2	3.6	3.9	5.6	6.0	4.5	4.2	0.7	0.7
Italy	3.2	3.1	3.3	3.4	3.5	3.0	3.5	0.6	0.6
Canada	2.3	2.2	2.2	2.6	2.7	2.1	1.7	0.7	0.7
Other advanced economies	14.3	10.8	11.1	20.4	20.8	19.2	20.9	6.7	5.3
Spain	2.0	2.2	2.4	2.5	2.6	2.1	2.3	0.2	0.2
Netherlands	1.8	1.2	1.2	3.2	3.3	2.9	2.9	0.2	0.2
Australia	1.4	1.6	1.5	1.3	1.2	1.5	1.6	0.4	0.5
Belgium	1.3	0.7	0.7	2.2	2.3	1.8	2.1	0.2	0.2
Switzerland	1.2	0.7	0.7	1.9	1.9	0.9	1.0	2.2	1.0
Sweden	0.9	0.6	0.7	1.3	1.3	1.5	1.8	0.5	0.5
Austria	0.8	0.6	0.6	1.2	1.2	0.9	0.8	0.1	0.1
Norway	0.8	0.6	0.6	0.9	0.9	1.3	1.0	0.6	0.7
Ireland	0.7	0.3	0.4	1.5	1.5	1.5	2.0	0.0	0.0
Denmark	0.7	0.4	0.5	0.9	0.9	0.7	1.0	0.9	0.8
Emerging Market and Developing Countries 6/	42.4	41.8	39.8	37.8	36.2	42.1	41.4	76.1	76.4
Africa	4.4	2.6	2.5	2.6	2.5	3.6	3.8	4.0	4.5
South Africa	0.6	0.6	0.6	0.5	0.5	0.3	0.3	0.4	0.4
Nigeria	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.6
Asia	16.0	20.0	18.7	17.9	16.9	14.9	12.6	44.5	43.4
China 7/	6.4	10.7	9.7	7.9	7.3	5.6	4.5	30.5	29.3
India	2.7	3.5	3.2	1.6	1.5	1.6	1.3	3.1	3.5
Korea	1.8	1.7	1.8	2.4	2.3	1.3	1.4	3.3	3.2
Indonesia	1.0	1.1	1.0	0.7	0.7	0.8	0.6	0.9	0.8
Singapore	0.8	0.3	0.3	2.1	2.0	2.2	1.8	2.4	2.4
Malaysia	0.8	0.4	0.4	1.0	1.0	0.9	0.8	1.1	1.2
Thailand	0.7	0.6	0.6	0.9	0.9	1.2	1.0	1.8	1.7
Middle East, Malta & Turkey	6.7	5.0	4.8	5.2	5.0	7.5	8.6	10.9	11.8
Saudi Arabia	2.1	0.8	0.8	1.1	1.1	2.8	3.0	5.0	5.5
Turkey	1.0	1.2	1.2	0.8	0.8	1.3	1.1	0.9	0.9
Iran, Islamic Republic of	0.7	0.8	0.8	0.4	0.4	0.3	0.2	0.9	1.1
Western Hemisphere	7.9	7.9	7.6	4.9	4.8	6.5	6.4	6.8	6.7
Brazil	2.3	3.0	2.7	1.1	1.0	1.6	1.9	3.1	2.8
Mexico	1.9	1.9	1.9	1.5	1.6	1.6	1.2	1.3	1.2
Venezuela, República Bolivariana de	0.8	0.5	0.5	0.3	0.3	0.6	0.7	0.2	0.3
Argentina	0.7	0.7	0.6	0.4	0.3	0.5	0.5	0.6	0.6
Transition economies	7.2	6.2	6.3	7.1	7.0	9.6	10.0	9.8	9.9
Russian Federation	2.7	2.7	2.7	2.0	2.0	2.9	3.0	5.2	5.3
Poland	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.0	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum Items:									
EU 27	30.2	25.3	26.6	41.1	42.2	34.7	37.1	8.1	7.7
LICs 8/	4.0	2.2	2.1	2.1	2.0	2.6	2.8	2.1	2.3

Source: Finance Department.

1/ Includes South Sudan which became a member on April 18, 2012; reflects the proposed doubling of its quota after the 14th Review becomes effective.

2/ GDP blended using 60 percent market and 40 percent PPP exchange rates.

3/ Based on IFS data through 2010.

4/ Based on IFS data through 2009.

5/ Variability of current receipts plus net capital flows.

6/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic, and Slovenia.

7/ Including China, P.R., Hong Kong SAR, and Macao SAR.

8/ PRGT-eligible countries.

8. **There were significant changes for some individual countries.** By far the largest gain in CQS was recorded by China, with sizable increases also recorded by several other EMDCs, including India and Brazil (Table 3). China recorded gains in share of all four quota variables. All but two of the top-10 gainers were EMDCs. The exceptions were Switzerland, which benefitted from an increase in its share of reserves, and Norway, which gained from variability. All but one of the 10 largest declines in CQS were recorded by advanced economies. The largest losses in absolute shares were recorded by the United Kingdom and the United States. These declines were mainly driven by losses on GDP and openness, while the picture for variability and reserves was more mixed.

**Table 3. Top 10 Positive and Negative Changes in Calculated Quota Shares  
(In percentage points)**

		Difference between Current and Previous Shares 1/ 2/	Contribution of Variables to Change in CQS 3/			
	<i>Top 10: Positive Change</i>	Calculated Quota Shares	GDP Blend 4/	Openness	Variability	Reserves
1	China 5/	0.785	0.471	0.183	0.171	0.057
2	India	0.172	0.116	0.046	0.037	-0.018
3	Brazil	0.101	0.116	0.021	-0.043	0.012
4	Indonesia	0.086	0.044	0.008	0.026	0.007
5	Singapore	0.084	0.006	0.016	0.062	0.002
6	Thailand	0.062	0.007	0.011	0.038	0.006
7	Switzerland	0.059	0.005	0.009	-0.016	0.062
8	Norway	0.037	-0.005	-0.005	0.050	-0.003
9	Iran, Islamic Republic of	0.035	0.022	0.007	0.015	-0.009
10	Malaysia	0.032	0.006	0.003	0.028	-0.005
<i>Top 10: Negative Change</i>						
1	United States	-0.229	-0.405	-0.083	0.216	0.008
2	United Kingdom	-0.226	-0.171	-0.121	0.045	0.004
3	Italy	-0.186	-0.075	-0.035	-0.087	-0.001
4	France	-0.184	-0.093	-0.038	-0.072	0.005
5	Japan	-0.106	0.023	-0.023	-0.043	-0.073
6	Germany	-0.106	-0.111	-0.042	0.036	0.001
7	Ireland	-0.104	-0.017	-0.007	-0.080	0.000
8	Spain	-0.099	-0.055	-0.021	-0.028	0.001
9	United Arab Emirates	-0.080	0.048	0.013	-0.138	-0.002
10	Belgium	-0.078	-0.010	-0.029	-0.042	0.001

Source: Finance Department.

1/ Current calculations are based on data through 2010 using the existing formula.

2/ Previous calculations are based on data through 2009 using the existing formula.

3/ The difference between the current dataset through 2010 and the previous dataset through 2009, multiplied by the variable weight in the quota formula. The change in CQS also reflects the effect of compression.

4/ GDP blended using 60 percent market and 40 percent PPP exchange rates.

5/ Including China, P.R., Hong Kong SAR, and Macao SAR.

9. **Out-of-lineness based on the current formula has increased compared to the last update.** At the aggregate level, advanced economies are over-represented and EMDCs are under-represented by 1.6 pp (Table 4). This contrasts with the situation at the previous update, where the calculated quota shares for aggregate groups were broadly in line with 14<sup>th</sup> Review quota shares. Total over- and under-representation of countries measured in terms of quota share has increased marginally since the last update, though fewer countries are under-represented—66 members compared with 69 in the previous update.

**Table 4. Under- and Overrepresented Countries by Major Country Groups 1/ (In percentage points)**

	14th General Review Quota Share 2/ (In percent)	Difference 3/		Post Second Round Quota Share 6/ (In percent)	Difference 7/
		Current 4/	Previous 5/		
<b>Advanced economies</b>	<b>57.6</b>	<b>-1.6</b>	<b>-0.2</b>	<b>60.4</b>	<b>-2.9</b>
Underrepresented	-	1.3	2.0	--	2.1
Overrepresented	-	-2.9	-2.2	--	-5.1
<b>Emerging Market and Developing Countries</b>	<b>42.4</b>	<b>1.6</b>	<b>0.2</b>	<b>39.6</b>	<b>3.0</b>
Underrepresented	-	5.4	4.5	--	8.3
Overrepresented	-	-3.8	-4.3	--	-5.3
<b>Total Underrepresented Countries</b>	<b>35.2</b>	<b>6.7</b>	<b>6.5</b>	<b>29.9</b>	<b>10.4</b>
<b>Total Overrepresented Countries</b>	<b>64.8</b>	<b>-6.7</b>	<b>-6.5</b>	<b>70.1</b>	<b>-10.4</b>
Memorandum Items:					
EU 27	30.2	0.7	1.9	31.9	0.3
Underrepresented	-	1.6	2.4	--	3.1
Overrepresented	-	-0.9	-0.4	--	-2.7
LICs 8/	4.0	-1.4	-1.4	4.3	-1.7
Underrepresented	-	0.1	0.1	--	0.1
Overrepresented	-	-1.5	-1.5	--	-1.8

Source: Finance Department.

1/ Under- and over-represented countries for the two datasets, respectively.

2/ Includes South Sudan which became a member on April 18, 2012; reflects the proposed doubling of its quota after the 14th Review becomes effective.

3/ Difference between calculated quota shares and 14th General Review quota shares.

4/ Based on IFS data through 2010.

5/ Based on IFS data through 2009.

6/ The "post second round" reflects the ad hoc quota increases for 54 members under the 2008 reform, which became effective in March 2011.

Includes South Sudan which became a member on April 18, 2012. For the two countries that have not yet consented to and paid for their quota increases, 11th Review proposed quotas are used.

7/ Difference between calculated quota shares based on IFS data through 2009 and post second round quota shares.

8/ PRGT-eligible countries.

### III. QUOTA FORMULA VARIABLES

10. **At the March discussion, requests were made for additional technical work on three topics.** These were: how to better capture financial openness; the scope for improving on the current measure of variability to better reflect members' underlying vulnerability and potential demand for Fund resources; and the scope for including a measure of members' financial contributions to the Fund in the quota formula. These issues are discussed in turn below.

#### Financial Openness

11. **Views on openness have diverged in the discussions to date.** Many Directors consider that openness is a measure of members' integration into the world economy and

should remain an important variable in the quota formula; and many of these Directors have favored further exploring options for better capturing financial openness. In contrast, other Directors have preferred either to reduce the weight on openness or drop it from the formula altogether, arguing that the existing openness variable overstates members' integration into the global economy, is highly correlated with the GDP variable, and is affected by data availability constraints and measurement difficulties. These Directors have been unconvinced of the benefits of continuing work on financial openness.

12. **In previous work, the International Investment Position (IIP) has been identified as the most promising option if a financial openness variable were to be introduced in the quota formula.**<sup>6</sup> The IIP provides a quantitative measure of a member's foreign financial asset and liability position, and thus in principle captures the extent of investment in a country by non-residents and of investment abroad by residents of the same country. There have been significant improvements in measurement of IIP in recent years, which have led to the inclusion of a broader range of assets and liabilities (recent changes in the composition of IIP were discussed in *Quota Formula Review—Initial Considerations*). Nonetheless, a number of issues remain with the use of IIP in the quota formula. Beyond the conceptual differences of view over the relevance of this measure noted above, country coverage of available IIP has been an issue, and there is also the question of how to address international financial centers, which have relative large shares of the global data on IIP.

13. **Country coverage of IIP continues to improve, but remains partial.** As of the cut-off date for the latest data update, IIP data were available for 109 members (compared with 102 countries at the time of the cut-off for the 2009 database). Given this, staff sees two main options for including a measure of financial openness in the formula in the near term:<sup>7</sup>

- One option illustrated previously (see *Quota Formula Review—Initial Considerations*) is to use data on cross border investment income flows as a proxy for financial openness. Investment income is already included in the current openness variable and therefore is not constrained by data availability.<sup>8</sup> However, as discussed

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<sup>6</sup> See, for example, *A New Quota Formula—Additional Considerations* (3/14/07, pp 6-10).

<sup>7</sup> Building on earlier technical work, staff also tried to construct a quantitative index of financial interconnectedness based on bilateral cross-border portfolio assets (equity and debt) (see Annex 1 for details). The ranking of countries according to this indicator is similar to the ranking obtained from IIP shares. However, the indicator relies on complex methodology; data requirements to compute all variables (debt, equity as well as banking flows) are significant; and the indicator cannot be readily translated into shares of global totals which can be incorporated into the formula. Moreover, this indicator does not avoid the issue of how to treat international financial centers. Given these considerations, staff does not consider that such indicators provide a viable proxy for financial openness at this stage.

<sup>8</sup> The correlation between IIP and a corresponding flow measure such as international investment income is high (the correlation between IIP shares (2010) and investment income shares (2006-2010) for the 109 members for which IIP data are available is 0.99). Both measures reflect a member's accumulated asset and liability positions and therefore tend to respond slowly to changes in international capital flows.

in previous papers, investment income flows are an imperfect substitute for underlying IIP stocks, given that rates of return on similar investments can vary substantially across countries for a variety of reasons (e.g., exchange controls, domestic legislation), under-recording of investment income receipts,<sup>9</sup> and also the recording of credit and debit components on a net rather than on a gross basis.<sup>10</sup>

- The second option is to use the investment income series to gap-fill the IIP series.<sup>11</sup> This approach requires some additional steps, but continues to rely on published data and is relatively transparent and easy to replicate.<sup>12</sup> Also, those countries that report IIP data account for about 98.5 percent of the global IIP total derived in this manner, suggesting that the distortions resulting from gap-filling may not be very large at the aggregate level. Over time, as more countries report their IIP, the number of countries for which gap-filling is needed would be expected to decline so this approach may have an advantage over the first option in terms of continuity if a decision was taken to include a measure of financial openness in the formula. Table 5 compares the two approaches. The overall distribution is broadly similar in both cases, though there are significant differences for a few individual countries.

**14. Both approaches leave unresolved the issue of how to treat international financial centers.** To the extent that the shares in financial openness of countries with international financial centers largely reflect the activities of non-residents, where the member is acting as a conduit, it is unclear that they should be included in the data used for quota calculations. In the past, staff attempted to correct for such “entrepot-like” activities by making adjustments to the underlying data used in the openness measure but this practice

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<sup>9</sup> This issue appears to be receding over time: recorded payments exceeded recorded receipts by US\$125 billion per year in 1994-2000 (*Annual Report of the IMF Committee on Balance of Payments Statistics*, 2001) but the differential fell to US\$62 billion in 2006-10.

<sup>10</sup> For instance, reinvested earnings reflect net profits or net losses for direct investment abroad on the credit side, and similarly for foreign direct investment in the reporting country on the debit side. The recording on a net basis in the formula is due to lack of more disaggregated information (profits and losses separately) reported by members.

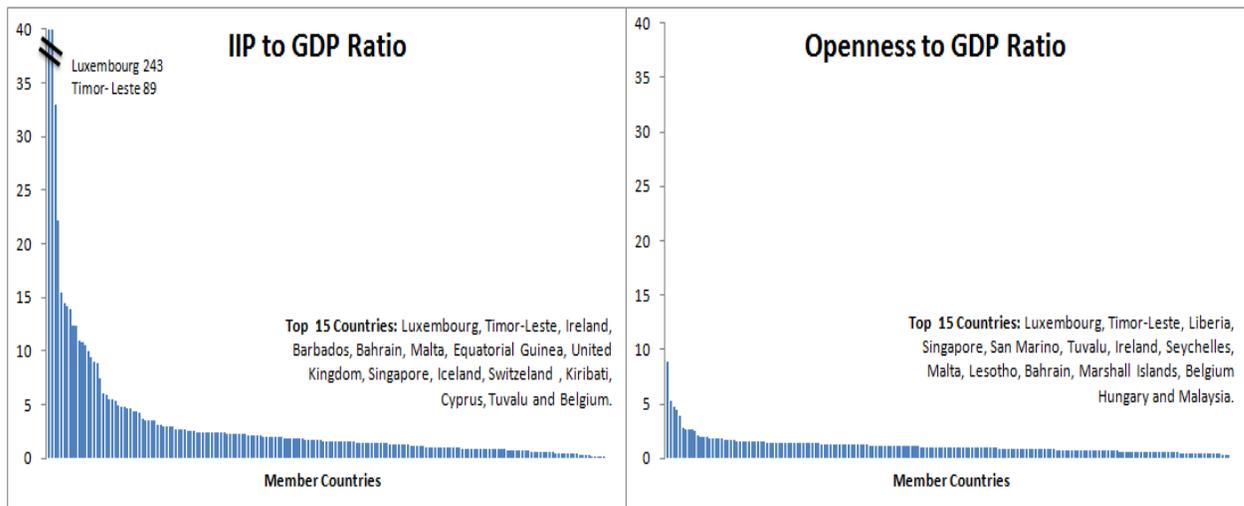
<sup>11</sup> The February paper also examined the scope for using the Lane and Milesi-Ferretti database for gap filling, but did not consider it appropriate for quota purposes since it relies partly on estimation and assumptions.

<sup>12</sup> The following steps are required: (i) investment income series (for 2006-2010) is first divided into two groups of countries: those with and without IIP data; (ii) the ratio of the aggregate of investment income of countries with IIP data to countries without IIP data is then computed, and that ratio is applied to the original IIP series to obtain an estimate of the aggregate IIP for all countries; and (iii) based on this total, an estimate of aggregate IIP for countries with no IIP data is obtained, and this aggregate is then allocated across those countries using the same relative shares as the original investment income series.

was discontinued in 2008 because it was seen as arbitrary and lacking a strong conceptual basis.<sup>13</sup>

15. **Staff has explored two means of dampening the impact of large financial centers.** Both take as a starting point the observation that international financial centers tend to have very high ratios of IIP to GDP, reflecting their role as a conduit for financial flows among non-residents. For instance, the ratio of IIP to GDP for Luxembourg, Ireland, and Barbados is 243, 33, and 22, respectively, compared with a ratio of less than 3 for the majority of countries (149 members). Thus, the distribution of the ratio of IIP to GDP is much more skewed than for other quota variables, including the current measure of openness (Figure 3). The two options considered to dampen the impact of high ratios for a few countries are somewhat arbitrary, but they would avoid a need to revert to the previous practice of making adjustments to the underlying data.

**Figure 3. Openness**



Source: Finance Department

<sup>13</sup> Through 2007, adjustments for international banking interest (IBI) were made for the G-10 plus Luxembourg and China, P.R., and Hong Kong SAR. The adjustments were carried out by subtracting the smaller of interest paid and interest received from both current receipts and current payments, leaving IBI in the data on a net basis only. For a summary of the history of data adjustments, see Appendix III of *Quotas—Updated Calculations* (8/4/06).

**Table 5. Measures of Financial Openness  
(As percent of total)**

	2010		2006-10
	IIP 1/	IIP - Gap-Filled 2/	Investment Income
Advanced economies	84.59	83.32	80.52
Major advanced economies	57.53	56.66	52.87
United States	20.09	19.78	19.79
Japan	5.01	4.93	3.58
Germany	7.31	7.20	6.99
France	6.42	6.33	6.04
United Kingdom	14.71	14.49	11.66
Italy	2.52	2.48	2.73
Canada	1.46	1.44	2.08
Other advanced economies	27.07	26.66	27.65
Spain	2.27	2.23	2.52
Netherlands	3.23	3.19	3.62
Australia	1.52	1.50	1.50
Belgium	2.06	2.03	2.28
Switzerland	2.72	2.68	2.84
Sweden	1.18	1.16	1.62
Austria	0.99	0.97	1.10
Norway	0.90	0.89	0.99
Ireland	3.20	3.15	3.41
Denmark	0.71	0.70	0.82
Luxembourg	6.09	6.00	4.76
Emerging Market and Developing Countries 3/	15.41	16.68	19.48
Africa	0.58	1.01	1.23
South Africa	0.32	0.31	0.25
Nigeria	0.08	0.08	0.24
Asia	8.83	8.87	9.77
China 4/	5.37	5.29	5.88
India	0.49	0.48	0.45
Korea	0.71	0.70	0.48
Indonesia	0.26	0.25	0.31
Singapore	1.29	1.27	1.58
Malaysia	0.27	0.27	0.38
Thailand	0.26	0.26	0.30
Middle East, Malta & Turkey	0.85	1.58	1.72
Saudi Arabia	n.a.	0.39	0.39
Turkey	0.33	0.33	0.28
Iran, Islamic Republic of	n.a.	0.05	0.05
Western Hemisphere	2.48	2.48	2.80
Brazil	0.99	0.97	0.79
Mexico	0.45	0.44	0.43
Venezuela, República Bolivariana de	0.17	0.16	0.21
Argentina	0.20	0.20	0.26
Transition economies	2.66	2.74	3.95
Russian Federation	1.09	1.07	1.65
Poland	0.31	0.31	0.39
Total	100.00	100.00	100.00
Memorandum Items:			
EU 27	53.62	52.81	50.93
LICs 5/	0.20	0.57	0.74

Source: Finance Department.

n.a. -- not available

1/ Includes 109 countries.

2/ IIP has been gap-filled using investment income (which is available for 185 countries).

3/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic, and Slovenia.

4/ Including China, P.R., Hong Kong SAR, and Macao SAR.

5/ PRGT- eligible countries.

16. **One possibility is to apply a method akin to compression to the ratio of IIP to GDP.** Such an approach would maintain the original ranking of the series and would not require additional data since the relevant data are already included in the quota database.<sup>14</sup> The main difficulty is in choosing an appropriate compression factor. Staff explored two different factors. Using the same factor currently used for the quota formula as a whole (0.95) had only a modest impact on the dispersion of the series.<sup>15</sup> A second compression factor of 0.70 was also applied, which reduces the mean of the modified IIP to GDP ratio from the original 3.4 to 2.2, roughly equal to the average of the original series excluding the ten members with the largest IIP to GDP ratio.<sup>16</sup> With the 0.70 compression factor, there is a more pronounced effect for the top ranking members, though they still have significantly higher ratios than for the membership as a whole (Table 6).

17. **A second possibility is to cap the IIP to GDP ratio at some predetermined level.** This approach would affect the countries with the highest ratios without modifying the ratios of the rest of the membership. The rationale would be that countries with large financial centers should not benefit beyond some point, linked to the statistical distribution of ratios of IIP to GDP for the membership as a whole, from their unusually high ratios. However, a judgment would be required on the appropriate level of the cap. For illustrative purposes, staff has explored caps at the 95<sup>th</sup> and 90<sup>th</sup> percentiles: the first affects 10 members, while the second affects 19 members. Depending on where the cap is set, this approach generally has a larger impact on those members that are most affected by the cap than the compression approach, and some countries with very high ratios actually have a lower share than under the current openness variable, which already captures financial openness to a limited extent (Table 7).

18. **Both these approaches require somewhat arbitrary assumptions and neither is totally satisfactory.** In terms of their impact, the compression approach still tends to leave members with international financial centers with relatively high shares of the financial openness measures, albeit significantly less than their unadjusted shares. In contrast, the cap approach brings these members' shares of financial openness closer to those applying to other members with relatively high but not extreme ratios, and could potentially reduce their overall share in trade and financial openness combined. Staff could pursue these options further in light of Directors' views.

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<sup>14</sup> The methodology is to first compress the original series of IIP to GDP ratio using a pre-established compression factor; the compressed series is then used to obtain the modified IIPs and the corresponding shares.

<sup>15</sup> This is because, for the quota formula as a whole, the dispersion of the series being compressed goes from 0 to 1, whereas for the ratio of IIP to GDP, the dispersion is much wider, going from 0 to 243.

<sup>16</sup> With a compression factor of 0.7, the average ratio of the top 20 countries after compression is also close to the 90<sup>th</sup> percentile for the IIP to GDP series, although there are pronounced differences across countries.

Table 6. Ratio of IIP to GDP 1/

	IIP - Gap Filled	IIP - Compression Factor = 0.95	IIP - Compression Factor = 0.70	Capping IIP/GDP at 95th Percentile	Capping IIP/GDP at 90th Percentile
Advanced economies	4.60	4.18	2.70	4.08	3.51
Major advanced economies	3.86	3.57	2.47	3.74	3.30
United States	2.94	2.79	2.13	2.94	2.94
Japan	1.95	1.89	1.60	1.95	1.95
Germany	4.75	4.39	2.98	4.75	4.75
France	5.34	4.91	3.23	5.34	5.34
United Kingdom	13.91	12.19	6.31	12.29	5.98
Italy	2.61	2.48	1.95	2.61	2.61
Canada	1.98	1.91	1.61	1.98	1.98
Other advanced economies	7.78	6.77	3.68	5.54	4.43
Spain	3.46	3.25	2.39	3.46	3.46
Netherlands	8.82	7.91	4.59	8.82	5.98
Australia	2.63	2.50	1.97	2.63	2.63
Belgium	9.33	8.35	4.78	9.33	5.98
Switzerland	10.94	9.71	5.34	10.94	5.98
Sweden	5.45	5.01	3.28	5.45	5.45
Austria	5.55	5.09	3.32	5.55	5.55
Norway	4.61	4.27	2.91	4.61	4.61
Ireland	32.92	27.64	11.54	12.29	5.98
Denmark	4.83	4.47	3.01	4.83	4.83
Luxembourg	242.78	184.48	46.74	12.29	5.98
Emerging Market and Developing Countries 2/	1.51	1.46	1.28	1.50	1.43
Africa	1.51	1.47	1.28	1.50	1.45
South Africa	1.85	1.79	1.54	1.85	1.85
Nigeria	0.91	0.92	0.94	0.91	0.91
Asia	1.73	1.67	1.41	1.73	1.60
China 3/	1.86	1.81	1.55	1.86	1.86
India	0.63	0.64	0.72	0.63	0.63
Korea	1.49	1.46	1.32	1.49	1.49
Indonesia	0.78	0.79	0.84	0.78	0.78
Singapore	12.29	10.84	5.79	12.29	5.98
Malaysia	2.42	2.31	1.85	2.42	2.42
Thailand	1.76	1.71	1.48	1.76	1.76
Middle East, Malta & Turkey	1.12	1.09	0.99	1.09	1.03
Saudi Arabia	1.90	1.84	1.57	1.90	1.90
Turkey	0.97	0.97	0.98	0.97	0.97
Iran, Islamic Republic of	0.26	0.28	0.39	0.26	0.26
Western Hemisphere	1.08	1.07	1.04	1.07	1.06
Brazil	0.98	0.98	0.99	0.98	0.98
Mexico	0.93	0.93	0.95	0.93	0.93
Venezuela, República Bolivariana de	0.90	0.91	0.93	0.90	0.90
Argentina	1.15	1.14	1.10	1.15	1.15
Transition economies	1.77	1.72	1.47	1.77	1.77
Russian Federation	1.56	1.53	1.37	1.56	1.56
Poland	1.41	1.38	1.27	1.41	1.41
Total	3.43	3.15	2.16	3.11	2.72
Memorandum Items:					
EU 27	7.03	6.24	3.59	5.79	4.57
LICs 4/	1.11	1.09	1.03	1.10	1.10
Top 20 Countries with Highest IIP/GDP Ratio	15.18	13.01	6.28	10.97	5.99

Source: Finance Department.

Group and Total figures refer to weighted averages.

1/ IIP has been gap-filled using investment income.

2/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic, and Slovenia.

3/ Including China, P.R., Hong Kong SAR, and Macao SAR.

4/ PRGT-eligible countries.

**Table 7. Measures of Financial Openness—International Investment Position  
(As percent of total) 1/**

	14th General Review Quota Shares 2/	IIP - Gap Filled 3/	IIP - Compression Factor = 0.95	IIP - Compression Factor = 0.70	Capping IIP / GDP at 95th Percentile	Capping IIP / GDP at 90th Percentile
Advanced economies	57.64	83.32	82.39	77.60	81.66	80.08
Major advanced economies	43.36	56.66	57.12	57.61	60.70	60.97
United States	17.40	19.78	20.41	22.71	21.84	24.91
Japan	6.46	4.93	5.20	6.41	5.45	6.21
Germany	5.58	7.20	7.26	7.16	7.95	9.07
France	4.23	6.33	6.34	6.07	6.99	7.97
United Kingdom	4.23	14.49	13.83	10.43	14.14	7.85
Italy	3.16	2.48	2.58	2.96	2.74	3.13
Canada	2.31	1.44	1.52	1.87	1.59	1.82
Other advanced economies	14.28	26.66	25.27	19.99	20.96	19.11
Spain	2.00	2.23	2.29	2.44	2.47	2.81
Netherlands	1.83	3.19	3.11	2.63	3.52	2.72
Australia	1.38	1.50	1.56	1.78	1.66	1.89
Belgium	1.34	2.03	1.98	1.65	2.24	1.64
Switzerland	1.21	2.68	2.58	2.07	2.95	1.84
Sweden	0.93	1.16	1.16	1.10	1.28	1.46
Austria	0.82	0.97	0.97	0.92	1.08	1.23
Norway	0.79	0.89	0.90	0.89	0.98	1.12
Ireland	0.72	3.15	2.88	1.75	1.30	0.72
Denmark	0.72	0.70	0.70	0.69	0.77	0.88
Luxembourg	0.28	6.00	4.96	1.83	0.34	0.19
Emerging Market and Developing Countries 4/	42.36	16.68	17.61	22.40	18.34	19.92
Africa	4.44	1.01	1.07	1.35	1.11	1.22
South Africa	0.64	0.31	0.33	0.41	0.34	0.39
Nigeria	0.51	0.08	0.09	0.14	0.09	0.10
Asia	16.05	8.87	9.30	11.42	9.79	10.34
China 5/	6.39	5.29	5.59	6.97	5.84	6.67
India	2.75	0.48	0.53	0.87	0.53	0.60
Korea	1.80	0.70	0.75	0.99	0.77	0.88
Indonesia	0.97	0.25	0.28	0.44	0.28	0.32
Singapore	0.82	1.27	1.22	0.95	1.40	0.78
Malaysia	0.76	0.27	0.28	0.32	0.29	0.34
Thailand	0.67	0.26	0.27	0.35	0.29	0.33
Middle East, Malta & Turkey	6.74	1.58	1.67	2.21	1.70	1.82
Saudi Arabia	2.09	0.39	0.42	0.52	0.44	0.50
Turkey	0.98	0.33	0.36	0.53	0.36	0.41
Iran, Islamic Republic of	0.75	0.05	0.06	0.11	0.05	0.06
Western Hemisphere	7.91	2.48	2.68	3.80	2.72	3.09
Brazil	2.31	0.97	1.06	1.55	1.07	1.23
Mexico	1.87	0.44	0.49	0.72	0.49	0.56
Venezuela, República Bolivariana de	0.78	0.16	0.18	0.27	0.18	0.21
Argentina	0.67	0.20	0.21	0.30	0.22	0.25
Transition economies	7.22	2.74	2.89	3.62	3.02	3.44
Russian Federation	2.71	1.07	1.14	1.49	1.18	1.35
Poland	0.86	0.31	0.33	0.44	0.34	0.39
Total	100.00	100.00	100.00	100.00	100.00	100.00
Memorandum Item:						
EU27	30.22	52.81	50.99	42.79	47.97	43.19
LICs 6/	4.05	0.57	0.61	0.84	0.63	0.71

Source: Finance Department.

Shading denotes capped values.

1/ The IIP shares are calculated as a percent of global IIP. As described in the main text, the capping or the compression are done on the original IIP/GDP ratios. The modified IIP shares are then expressed as percent of their corresponding global totals.

2/ Includes South Sudan which became a member on April 18, 2012; reflects the proposed doubling of its quota after the 14th Review becomes effective.

3/ IIP has been gap-filled using investment income.

4/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic, and Slovenia.

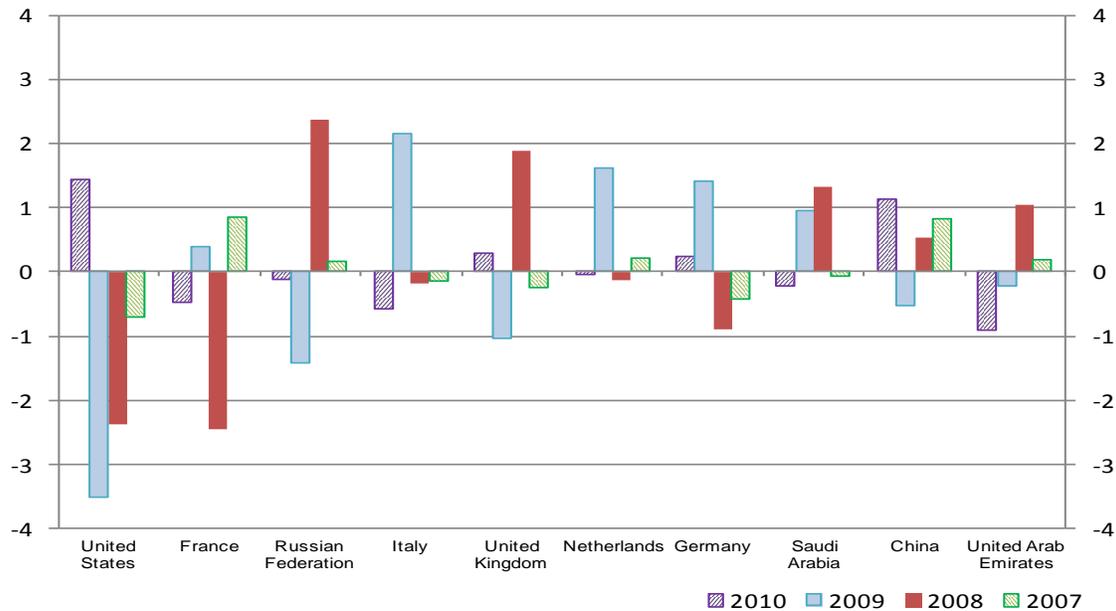
5/ Including China, P.R., Hong Kong SAR, and Macao SAR.

6/ PRGT-eligible countries.

## Variability

19. **Variability is intended to reflect members' potential need for Fund resources.** In *Quota Formula Review—Initial Considerations*, staff examined how well the current measure of variability captures external vulnerabilities and the likelihood of an IMF supported program. Staff analysis suggested that there is virtually no correlation between the existing variability measure, adjusted for economic size (calculated as the difference between a country's share in variability and its share in GDP), and potential use of Fund resources. Similar results were obtained for some alternative variability indicators considered in the past (such as five-year trend variability, downside variability, extreme variability, variability of current receipts plus variability of net capital flows, and volatility of GDP growth). Staff also noted that variability adds significant instability to the calculated quota shares for a wide range of members (see Figure 4).

**Figure 4. Changes in Variability Shares  
(In percent)**



Source: Finance Department

20. **In light of this work, many Directors saw a case for dropping variability.** A few were of the view that its weight should be significantly reduced in favor of openness, while others continued to see an important role for variability in the formula, and asked staff to further explore measures that might better capture members' underlying vulnerability.

21. **In response, staff has extended its previous work in two respects.** The first addresses the issue of instability in the existing indicator by assessing different measures of dispersion, preserving current receipts and net capital flows as the relevant variables reflecting members' external vulnerabilities. The goal was to assess whether the current measure can be improved to better capture the structural, and hence presumably less

unstable, aspects of vulnerabilities arising from external flows. Second, staff examined whether it is possible to identify a variable that may have a stronger link to potential use of Fund resources by analyzing a measure based on a set of macroeconomic indicators, given that potential need can emanate from different sources of vulnerability.<sup>17</sup>

**22. To address the instability of the current measure, staff examined a range of different measures of dispersion.** The current measure of variability is a root mean squared deviation from a three-year moving average, calculated over a recent 13-year period. To reduce the impact of extreme observations on variability shares, one alternative is to use the *average absolute deviation* from a three-year moving average (13Y AAD) instead of the root squared deviation. Another approach is to use the five-year *standard deviation* (5Y SD), calculated relative to the sample mean rather than a trend, to reduce the influence of longer term trends.<sup>18</sup> An *instability index* (10Y II) calculated over a recent ten-year period is also considered. This index is based on deviations from a trend estimated by ordinary least squares, which differs from the current practice of using moving averages for trend estimation (see Annex II for more detail).

**23. None of the alternative measures consistently outperform the current measure.** Figure 5 (panel (i) A) shows the cross-sectional standard deviation of year-on-year changes in variability shares based on the last two quota data updates: the shifts in shares based on the current variability measure in the 2009 data update were very large, and all of the alternative measures showed a smaller variation, though only the 5-year standard deviation measure showed a variation that was close to that for GDP or openness. (For comparison, panel (i) B shows the volatility of shares for the other quota variables; GDP and openness shares are relatively stable, while reserves shares are more volatile). In contrast, for the latest data update (changes from 2009 to 2010), the 13-year average absolute deviation and the instability index yielded the smallest variation in shares and the 5-year standard deviation showed the largest variation in shares.<sup>19</sup> Looking at a longer time span, the 13-year absolute deviation produces the smallest variation in shares on average (Figure 5, panel (ii)), but there

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<sup>17</sup> The G-24 has also argued that the existing measure of variability does not reflect vulnerability and suggested using alternatives, such as volatility of GDP growth (un-scaled) and a scaled version of the current variable with a cap (see “A Comprehensive Review of the IMF Quota Formula: What Should It Entail?”, G-24 Secretariat, May 31, 2012). Staff previously examined these alternatives in the context of the 14<sup>th</sup> Review. It found that a simple volatility measure that is unrelated to size can lead to radical shifts in quota shares, but there is little evidence that the results have a bearing on potential need for Fund resources and small countries tend to have the largest shares. While a cap (500 percent of quota share) was suggested in the G-24 work to address the latter problem, the choice of the cap is largely arbitrary and it is likely to be binding for a significant part of membership (see *Quotas—Updated Calculations and Quota Variables*, 08/28/09, paragraph 32).

<sup>18</sup> Annex II presents a number of alternative statistical measures of dispersion based on a 5-year period alongside the standard deviation. These include average absolute deviation, median absolute deviation and maximum deviation from the mean.

<sup>19</sup> In some cases high volatility measured by the standard deviation may reflect reversals (see Annex II).

are still periods (e.g., 2004–07) where the existing variability measure yields more stable results than the alternatives.<sup>20</sup> Overall, the results are highly dependent on the period chosen and do not provide a strong basis for choosing an alternative variability measure based on stability considerations alone.

**24. Staff also examined whether the modified variability indicators improve on the current measure in terms of indicating members’ potential need for Fund resources.**

Based on the data since 1990, the correlation between the modified variability measures (adjusted for economic size) and a binary variable indicating the approval of a Fund program is close to zero and statistically insignificant (Figure 6). Thus, none of these measures displays improved predictive power.

**25. As an alternative approach, staff has explored whether it would be possible to develop a new variable based on a set of macroeconomic indicators that would better capture members’ vulnerabilities.** In Appendix II of *Quota Formula Review—Initial Considerations*, the probability of approval of a Fund arrangement was modeled as a function of selected macroeconomic variables. Staff has extended this analysis by examining more closely how countries with IMF programs differ in terms of economic fundamentals from countries without such programs. Annex II provides an account of these differences using a set of variables that have been frequently identified as determinants of use of Fund resources. These variables include the current account to GDP ratio, reserve cover ratio, per capita GDP, fiscal deficit and external debt and debt service ratios. In nearly all cases, the analysis suggests that the data for the two groups of countries come from different distributions, e.g., countries with arrangements have higher current account deficits, higher fiscal deficits and debt ratios than countries without programs. These findings were used to construct a composite variability measure by combining variables that exhibit different patterns for program and non-program cases.

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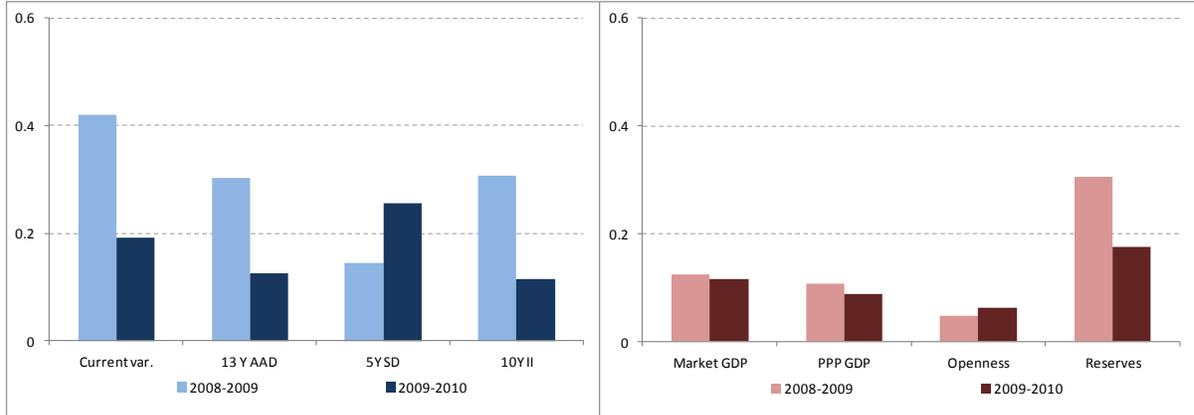
<sup>20</sup> The analysis covers the period 1990-2010 and is based on the latest quota data update for current receipts and net capital flows since 1998, and previous quota data and WEO estimates for earlier years. The series also takes into account past data revisions, whereas the chart in panel (i) is based on the original quota data for each of the three years.

**Figure 5. Cross-Sectional Standard Deviation of Changes in Variables Shares 1/**

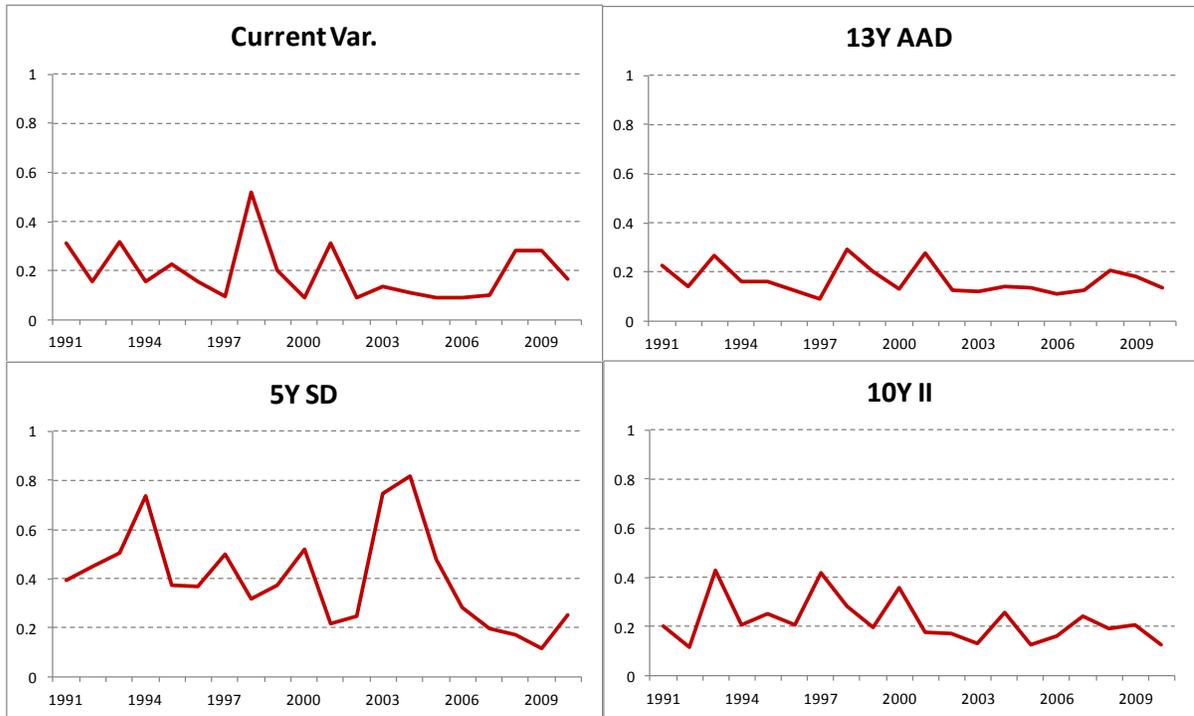
**(i) Changes in shares for 2008-09 and 2009-10 2/**

**A. Variability measures**

**B. Other quota variables**



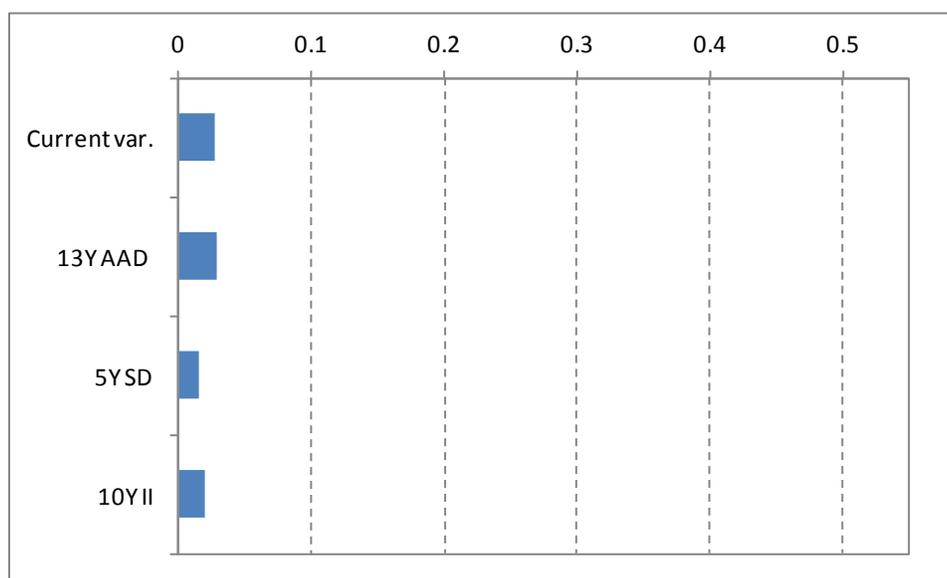
**(ii) Changes over the past twenty years based on series incorporating past data revisions**



1/ Standard deviation of the difference  $s_{i,t} - s_{i,t-1}$ , where  $s_{i,t}$  denotes the share of country  $i$  in year  $t$ , calculated over  $i$  for  $t=2009, 2010$ .

2/ Based on quota data ending 2008, 2009, and 2010.

Source: Finance Department

**Figure 6. Correlations between Variability Indicators and Potential Need**

Source: Finance Department

26. **The main potential advantage of a composite indicator is that it can capture different kinds of vulnerabilities.** Therefore, a measure of variability which combines several relevant variables is likely to have higher explanatory power for the potential use of Fund resources than a measure based on a single variable. This is broadly confirmed by the data—the correlation of a composite indicator derived as a combination of the current account to GDP ratio, reserve cover ratio, per capita GDP and real GDP growth with a variable reflecting the likelihood of a Fund program is 0.19 and is statistically significant (see Annex II). It is higher than the correlation with any of the individual components but still does not represent a very strong association with potential need. Adding more components could further increase the correlation but would also add to data requirements and complexity. In addition, these indicators may not capture well the characteristics of different types of economies, notably reserve currency issuers with low levels of reserves.

27. **Incorporating such a composite vulnerability indicator into the quota formula poses considerable challenges.** Unlike the other quota formula variables, the composite index lacks the economic size dimension. In addition, it can take both positive and negative values, which makes it difficult to incorporate directly into the formula. While it is possible to transform the measure to avoid negative values and to introduce the notion of size, such adjustments are largely arbitrary and, depending on the method, can result in very different outcomes, both for individual members and at a group level. In addition, such (non-linear) transformations could reduce considerably the correlation between the resulting variability measure and the potential use of Fund resources compared to the unadjusted indicator. For example, transforming the above composite vulnerability index into a size-related variable that could be used in the formula would reduce the correlation coefficient from 0.19 to 0.09,

although it would still be statistically significant.<sup>21</sup> The improvement in explanatory power over the existing measure is reflected to some extent in Figure 7 which plots the transformed composite variability shares against GDP shares for members with and without GRA arrangements since September 2008. For 28 of 32 countries with programs since 2008 (81 percent), the composite variability share is greater than their GDP share, compared with 70 out of 143 non-program countries (49 percent).<sup>22</sup> This suggests that the measure provides some additional information.<sup>23</sup> The composite measure also results in more stable shares throughout most of the sample, although in certain periods some of the alternative statistical definitions based on current receipts and net capital flows perform better.

28. **Overall, based on the work in this paper, it does not appear that such an approach provides sufficiently robust results to support its inclusion as an alternative indicator of potential need in the quota formula.** A composite variability indicator along the lines discussed above appears difficult to reconcile with the principle of simplicity and transparency, as a measure that performs reasonably well in predicting potential need would most likely be complex and require a substantial amount of data and assumptions. In many cases, the outcomes will depend critically on the choices of underlying variables and data transformations and there is no theory to guide these choices. They may also not be applicable to all countries, particularly reserve currency issuers, which can distort the overall results. On balance, staff continues to see a case for dropping variability from the formula, as the above analysis suggests that it is difficult to design a measure which fits all members, performs well under a wide range of circumstances and is simple and transparent.

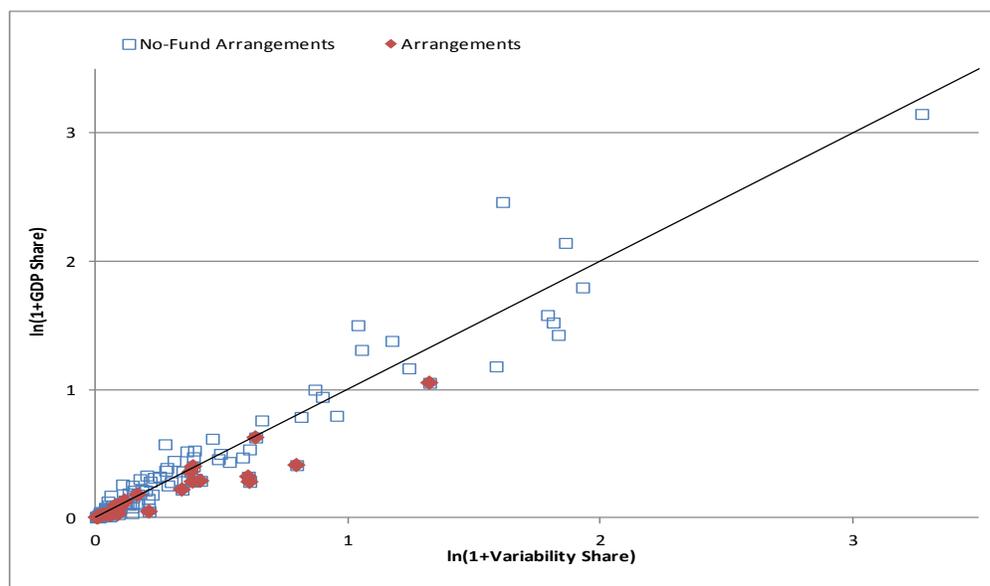
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<sup>21</sup> See Annex II for an illustration of the transformation.

<sup>22</sup> The composite variability indicator is calculated for 175 members, of which 32 have had GRA programs since 2008; 13 countries, 2 of which with programs are not covered due to data constraints.

<sup>23</sup> A similar exercise was done in *Quota Formula Review—Initial Considerations* (2/10/12) for the current measure which showed that while the majority of program countries (27 out of 34, or 79 percent) had larger variability shares than their shares in GDP, this proportion was broadly the same as for the group of countries that had not had IMF arrangements (116 out of 153 members, or 76 percent).

**Figure 7. Composite Variability and GDP Shares: Comparison of Countries with and without Recent GRA Programs 1/**



Source: Finance Department

1/ The chart compares the shares in blend GDP and composite variability (shown on a logarithmic scale) of two groups of members – members who have had a GRA program since September 2008 and those who have not.

## Financial Contributions

29. **In March, many Directors indicated that they could support further work on the scope for capturing members' financial contributions to the Fund in the quota formula.** In this regard, a few noted that the current resource mobilization efforts again highlighted the importance of members' financial contributions. Other Directors viewed the inclusion of voluntary financial contributions in the quota formula as inconsistent with the Fund's role as a quota-based institution, with a few considering that such contributions should be taken into account, if at all, outside of the quota formula, as has been done on several occasions in the past (Boxes 2 and 3 provide additional background, including on the approach followed for the most recent World Bank capital increase).

30. **As discussed in *Quota Formula Review—Initial Considerations*, members' financial contributions to the Fund come in a variety of forms, reflecting the cooperative nature of Fund membership.** These include (i) voluntary contributions including bilateral and multilateral support for Fund liquidity in the GRA, loan and subsidy contributions to the PRGT, voluntary SDR trading arrangements, and technical assistance and training (TA); and (ii) contributions mandated by Fund policies such as the Financial Transactions Plan (FTP) which captures the key role of the strongest members who are

included for transfers in the FTP, the charges and fees associated with borrowing from the Fund, and also burden-shared contributions.<sup>24</sup> Not all of these contributions lend themselves to ready comparisons across members (for example, members' voluntary SDR trading arrangements are not published and may be amended at any time). Table 8 summarizes several key channels of financial contributions that were identified in the March paper—NAB and bilateral lending, including the bilateral pledges made under the current fundraising exercise, PRGT loans, PRGT subsidies, and contributions to training and technical assistance activities. Members' FTP participation, measured both in terms of duration and size, for the past 20 years (80 quarters) is also shown, as well as a measure of contributions in the form of borrowed resources prior to the NAB (Annex III describes these data in more detail).<sup>25</sup>

**31. As previous papers have highlighted, obtaining an aggregate measure based on these diverse financial contributions raises a number of issues.** These include the need to determine the relevant time frame for considering contributions, how to combine contributions that differ substantially both in magnitude and in form, and how to aggregate diverse contributions over time. Regarding the different forms, some contributions involve budget outlays while others involve the temporary provision of loans—typically at the SDR interest rate. Although in principle computing the opportunity cost of different contributions would be one way to address issues of comparability, in practice this would be complicated, requiring an estimate of when resources are actually used and the relevant discount factors. For example, both the NAB and bilateral loan resources are commitments and the timing and magnitude of actual drawings is uncertain.<sup>26</sup> Thus, the only practical way to include such contributions would be on a commitment basis, which also reflects the amounts that members stand ready to provide to the Fund, regardless of how much is actually drawn.

**32. One way to address aggregation issues is to use members' shares of contributions for each form of contribution.** Shares could then be summed up to arrive at an aggregate measure. This methodology would allow financial contributions to be placed on a comparable basis with the other quota formula variables, although a drawback is that it abstracts from the size of individual contributions across different contribution categories. Also, the appropriate forms of contribution to be included in such a variable could vary over time and would need to be periodically reassessed.

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<sup>24</sup>A more comprehensive account of members' voluntary financial contributions was provided in *Fourteenth General Review of Quotas—Realigning Quota Shares—Initial Considerations—Supplement* (Supplement 1, 3/5/2010).

<sup>25</sup>The data have been updated from those shown in the February paper to include the most recent bilateral pledges made to the GRA in the context of the current fund-raising exercise.

<sup>26</sup>While the Resource Mobilization Plan provides members with a quarterly estimate of the maximum amount that could be drawn under these commitments, actual drawings typically differ significantly.

33. **For illustrative purposes, a number of aggregate measures are constructed** (Table 9). This helps to highlight the types of decisions that need to be made, including which contributions to include (in full or in part) and how to weight them in the aggregate measure. For this exercise, staff has focused on contributions that mainly cover the past two decades. Additional work could be done to refine these measures if there is sufficient support from Directors to explore this approach further. Drawing on the data in Table 8, five illustrative measures are calculated: the first two are simple averages while the third seeks to address the different scale of contributions by attaching differing weights; the fourth and fifth measures seek to capture only contributions that are large relative to a proxy for ability to contribute. Specifically:

- FCS I is the simple average of members' contribution shares to the four voluntary financial contributions—NAB and bilateral pledges,<sup>27</sup> PRGT loans, PRGT subsidies, and TA activities.
- FCI II is the same as FCS I, but also includes the share of members' quarterly participation in the FTP as measured by the relative quota shares of the participants in each quarter during 1992—2011. This acknowledges the contributions of externally strong members to the Fund's resources. FTP participation can also be viewed as a broader measure of ability to contribute compared to reserves, which are only one factor considered in making decisions on FTP participation.
- FCS III is defined as a weighted average of members' contribution shares to the NAB/bilateral resources (0.3), FTP participation (0.3), PRGT loans and subsidies combined (0.2) and TA activities (0.2). The higher weight on NAB/bilateral resources and the FTP would reflect to some extent the large magnitude of resources provided compared to contributions to concessional financing and TA activities.
- FCS IV uses the higher of 14th Review quota share or FCS I share rebased to ensure that total shares add up to 100 percent. This metric recognizes members that have provided financial contributions in excess of their respective quota shares.<sup>28</sup> One implication of this approach, however, is that members that have contributed but less than their 14<sup>th</sup> review quota shares are treated the same as other members that have not contributed.

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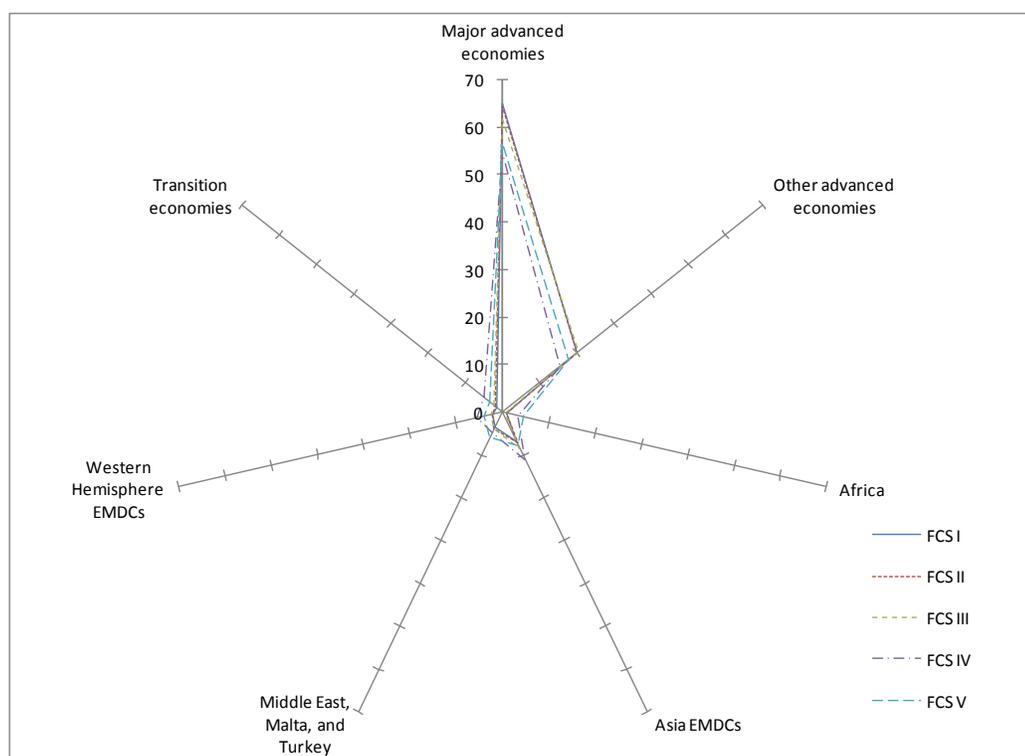
<sup>27</sup> Includes the 2009 bilateral credit lines for non-NAB bilateral lenders and the 2012 bilateral pledges.

<sup>28</sup> Quota shares have been viewed as a relevant indicator of members' relative ability to contribute in the past. The use of 14<sup>th</sup> review shares here is an approximation, as the contributions included in the various measures cover a longer historical time period.

- FCS V distinguishes between FTP participants and non-FTP participants as one means of focusing on those members that may be in a stronger position to make financial contributions.<sup>29</sup> For non-FTP participants, FCS V is set equal to the 14<sup>th</sup> Review quota share. For FTP participants, the aggregate of their 14<sup>th</sup> Review quota share is distributed across participants according to their relative shares in FCS I. This approach gives a higher share to those FTP participants that have made the largest voluntary contributions, whereas non-FTP participants are not penalized for not making contributions.

34. **In general, these measures tend to heavily favor advanced economies.** This reflects the fact that advanced economies have been by far the largest contributors in 3 of the 4 categories examined (PRGT loans and subsidies, and funding for technical assistance). The share of advanced economies in the NAB and bilateral pledges combined is somewhat lower, but still over 70 percent. For the first three measures, the share of advanced economies in the variable is 80-85 percent. The fourth and fifth measures, which mix simple indicators of ability to contribute with actual contributions, lead to a somewhat lower share of advanced economies but it still remains close to or above 70 percent.

**Figure 8. Financial Contributions: Distribution of Aggregate Measures**



Source: Finance Department

<sup>29</sup> To ensure a focus on the strongest members, only countries that have been in the FTP since 1992 for at least half of the relevant plan periods were considered to qualify as FTP participants for this purpose.

**Box 2. Ad Hoc Quota Increases—Liquidity and Financial Contributions**

Liquidity has played a role in several earlier reviews. Several countries with strong external positions received ad hoc quota increases to improve the liquidity of the Fund. In this context, financial contributions to the Fund that went beyond the provision of quota resources have played a role (e.g., GAB, NAB participation). Liquidity considerations and the provision of financial resources have generally been a supplementary criterion in determining the recipients of ad hoc increases. In general, the quotas of these recipients were considered to not adequately reflect their economic positions.

1958/1959 Review: Special increases in addition to the overall 50 percent increase were given to Canada, Germany, and Japan to reflect both economic factors (their position in world trade) and their ability to contribute to the Fund's liquidity.

4<sup>th</sup> Quinquennial Review (1965)/Ad hoc for Italy (1964): Special increases for 16 members (including Germany, Canada, Japan, and Sweden, which were among the 10 GAB participants at the time) in addition to the overall 25 percent increase in quotas resulting in a total increase of 30.7 percent. Just prior to the conclusion of the 4<sup>th</sup> Quinquennial Review, the quota of Italy—another GAB participant—had been almost doubled—to improve Fund liquidity and for comparability with quotas of other members.

Ad hoc increase for Saudi Arabia (1981): The ad hoc increase for Saudi Arabia which resulted in almost doubling of its quota was partly based on the need to improve Fund liquidity and the conclusion of the borrowing arrangement with the Saudi Arabia Monetary Authority (SAMA).

9<sup>th</sup> General Review (1990): Japan received an ad hoc increase on top of the overall 50 percent general increase in light of the large deviation between its actual and calculated quota share as well as its large potential to strengthen the Fund's liquidity.

11<sup>th</sup> General Review (1997): One percent of the overall increase was distributed to five members (Korea, Luxembourg, Singapore, Malaysia, and Thailand—all NAB participants) whose quotas were significantly out of line with their relative economic positions and which were expected to contribute to the Fund's liquidity over the medium term.

### **Box 3. Alternative Approaches to Capturing Financial Contributions**

#### World Bank and IDA Contributions

During its recent reform to enhance voice and participation of developing and transition countries, the World Bank explicitly took into account members' IDA contributions.<sup>1</sup> The approach taken realigned shareholding (and thus voting) across members with respect to three measures—economic weight (the GDP-blend variable from the IMF's quota formula), financial contributions (IDA contributions) and development contributions (client contributions to the WBG mission). Twenty percent of the realignment was done depending on financial contributions—75 percent relied on economic weight, the rest (5 percent) on development contributions. Both current, past, and future contributions to IDA were taken into account via separate mechanisms. The bulk of this portion of the realignment was based on IDA contributions in the last three IDA rounds (IDA13-15) and benefitted members who made above-average contributions. A smaller adjustment was made for a one-time recognition of all past IDA contributions. Lastly, to encourage future contributions, members with substantially increased pledges for the coming IDA round as well as new contributors had their voting shares protected.

#### Proposed Protection Mechanism Considered in the 14<sup>th</sup> Review

During the discussions on the 14<sup>th</sup> Review, an Executive Director suggested a possible approach for taking into account voluntary financial contributions. The proposal defined a protection mechanism for over-represented members that made significant contributions—their losses in quota share were to be limited based on the size of their contributions relative to quota shares. This protection mechanism would have benefitted nine countries—Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, and Switzerland. This proposal aggregated across several different voluntary financial contributions made by members (PRGT loans, PRGT subsidies, technical assistance, and the NAB).<sup>2</sup> In terms of a mechanism for quota allocations, this approach would be best described as a protection mechanism for a certain group of countries (like the ones employed in the final allocations mechanism for the 14<sup>th</sup> General Review) that would limit quota losses.

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<sup>1</sup> *World Bank Group Voice Reform: Enhancing Voice and Participation of Developing and Transition Countries in 2010 and Beyond* (DC2010-0006/1, 4/25/10).

<sup>2</sup> *Fourteenth General Review of Quotas—Realigning Quota Shares—Further Considerations—Simulation Requests* (8/30/10).

**Table 8. Financial Contributions to the Fund: Selected Indicators  
(As a percent of the total)**

	14th Review Quota Shares	Calculated Quota Shares	Reserves Shares	FTP Participation 1/		Share in Financial Contributions to					
				Based on Duration	Based on Resources	Pre-NAB Commitments 2/	NAB 3/	NAB + New Pledges 4/	PRGT Loans 5/	PRGT Subsidies 6/	Technical Assistance 7/
Advanced Economies	57.6	56.1	23.9	55.3	81.7	60.0	74.5	71.0	91.1	85.3	92.4
Major advanced economies	43.4	40.6	17.3	17.3	62.0	49.2	57.5	49.3	74.6	63.0	72.3
United States	17.4	15.8	1.6	2.5	24.1	11.0	15.5	5.9	0.0	9.3	0.5
Japan	6.5	6.2	12.3	2.5	8.3	18.4	18.5	15.2	26.8	16.7	52.0
Germany	5.6	5.7	0.8	2.5	8.2	7.8	7.1	10.1	10.6	5.8	1.9
France	4.2	3.6	0.6	2.5	6.8	3.3	5.2	7.6	18.9	8.5	1.5
United Kingdom	4.2	4.1	0.7	2.5	6.9	3.6	5.2	4.0	5.1	11.0	7.4
Italy	3.2	3.0	0.6	2.0	3.8	2.6	3.8	5.7	8.4	5.6	1.0
Canada	2.3	2.3	0.7	2.5	4.0	2.6	2.1	0.8	4.6	6.1	7.9
Other advanced economies	14.3	15.4	6.7	38.0	19.7	10.8	17.0	21.6	16.5	22.3	20.1
Spain	2.0	2.2	0.2	2.5	1.9	0.0	1.9	3.4	4.3	1.0	0.7
Netherlands	1.8	2.0	0.2	2.5	3.3	2.5	2.5	3.4	3.7	3.5	2.8
Australia	1.4	1.4	0.4	1.8	1.6	0.1	1.2	1.4	0.0	1.1	4.3
Belgium	1.3	1.3	0.2	2.5	2.9	2.1	2.2	2.6	1.4	2.7	1.6
Switzerland	1.2	1.2	2.2	2.4	2.2	4.6	3.1	2.5	4.3	2.9	5.8
Sweden	0.9	1.0	0.5	2.0	1.3	0.8	1.2	1.8	0.0	3.7	1.0
Austria	0.8	0.8	0.1	2.5	1.2	0.3	1.0	1.5	0.0	1.5	0.0
Norway	0.8	0.8	0.6	2.5	1.1	0.2	1.1	1.7	1.7	1.6	1.9
Ireland	0.7	0.9	0.0	2.3	0.5	0.0	0.0	0.0	0.0	0.3	0.0
Denmark	0.7	0.7	0.9	2.5	1.0	0.0	0.9	1.3	1.2	1.6	1.0
Emerging Market and Developing Countries 8/	42.4	43.9	76.1	44.7	18.3	40.0	25.5	29.0	8.9	14.7	7.6
Africa	4.4	3.3	4.0	4.5	0.2	1.1	0.2	0.3	0.0	1.5	1.7
South Africa	0.6	0.6	0.4	0.0	0.0	0.1	0.2	0.3	0.0	0.6	0.0
Nigeria	0.5	0.5	0.5	0.0	0.0	1.0	0.0	0.0	0.0	0.3	0.0
Asia	16.0	19.6	44.5	14.2	8.4	0.0	13.8	15.4	6.2	5.6	0.2
China 9/	6.4	9.4	30.5	2.4	4.0	0.0	8.7	9.2	3.9	1.0	0.0
India	2.7	2.6	3.1	1.2	1.4	0.0	2.4	2.3	0.0	0.7	0.0
Korea	1.8	2.0	3.3	1.9	1.0	0.0	1.8	2.7	2.3	1.6	0.1
Indonesia	1.0	1.0	0.9	0.6	0.2	0.0	0.0	0.0	0.0	0.3	0.0
Singapore	0.8	1.3	2.4	2.5	0.5	0.0	0.4	0.7	0.0	0.6	0.0
Malaysia	0.8	0.8	1.1	1.9	0.7	0.0	0.2	0.2	0.0	0.8	0.0
Thailand	0.7	0.9	1.8	1.7	0.4	0.0	0.2	0.2	0.0	0.3	0.0
Middle East, Malta, and Turkey	6.7	6.2	10.9	11.1	4.4	36.7	3.4	4.0	2.7	3.3	4.7
Saudi Arabia	2.1	1.4	5.0	1.5	3.0	32.1	3.1	3.2	2.1	2.3	0.2
Turkey	1.0	1.1	0.9	0.0	0.0	0.0	0.0	0.7	0.0	0.2	0.0
Iran, Islamic Republic of	0.7	0.7	0.9	0.0	0.0	1.9	0.0	0.0	0.0	0.1	0.0
Western Hemisphere	7.9	7.1	6.8	6.9	2.3	2.3	4.2	4.5	0.0	2.7	0.8
Brazil	2.3	2.2	3.1	0.3	0.3	0.0	2.4	2.3	0.0	0.3	0.2
Mexico	1.9	1.7	1.3	1.2	1.0	0.0	1.4	1.9	0.0	1.0	0.5
Venezuela, Republica Bolivariana de	0.8	0.5	0.2	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0
Argentina	0.7	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Transition economies	7.2	7.7	9.8	8.1	3.0	0.0	4.0	4.7	0.0	1.6	0.1
Russian Federation	2.7	2.6	5.2	0.9	1.4	0.0	2.4	2.3	0.0	0.8	0.1
Poland	0.9	1.0	1.0	1.6	0.6	0.0	0.7	1.4	0.0	0.2	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum Item:											
Total contributions (in millions of SDRs)						51,900	181,486	476,598	25,854	5,267	550
EU27	30.2	30.9	8.1	44.7	41.1	23.1	34.2	45.6	53.6	48.3	19.3
LICs 10/	4.0	2.6	2.1	0.0	0.0	1.0	0.0	0.0	0.0	0.3	1.3

Source: Finance Department.

1/ Duration metric is based on the number of quarters a member participated in the FTP/Operational Budget for the period 1992 - December 2011 (maximum 80 quarters per member) as a share of total participant quarters. The maximum share any member can have is 2.5 (see appendix 3 for details). Resource-based metric is based on relative quota shares in each quarter of participants. The latter measure is used in the simulations.

2/ Pre-NAB commitments consist of loan commitments relating to the GAB, the Supplemental Financing Facility (SFF), the Enlarged Access Facility (EAF), the Oil Facility, and bilateral loans.

3/ NAB credit arrangements reflecting the rollback agreed by the Executive Board excluding members that have not yet adhered to the NAB decision (SM/11/331, 12/15/11) and bilateral credit agreements for Czech Republic, Malta, Slovak Republic, and Slovenia.

4/ Includes NAB commitments as described in 3/ plus new bilateral pledges including those announced at the G-20 Summit in Los Cabos.

5/ Loan commitments to the PRGF-ESF Trust as of December 31, 2011 (SM/12/86, 4/18/12).

6/ Total bilateral resources received since 1987 for subsidizing concessional lending, HIPC and MDRI debt relief as of June 30, 2011 including all pledges made under current fundraising as of December 31, 2011 (SM/12/86, 4/18/12) and recent pledges communicated to the Fund.

7/ Cash contributions to the IMF for technical assistance and training (excluding in-kind contributions) FY1999-FY2012 using SDR/USD exchange rate as of June 22, 2012.

8/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic, and Slovenia.

9/ Including China, P.R., Hong Kong SAR, and Macao SAR.

10/ PRGT-eligible countries.

**Table 9. Financial Contributions—Aggregate Measures  
(In percent)**

	14th Review Quota Shares	Calculated Quota Shares	Reserves Shares	Various aggregate measures				
				FCS I 1/	FCS II 2/	FCS III 3/	FCS IV 4/	FCS V 5/
Advanced Economies	57.6	56.1	23.9	85.0	84.3	81.9	70.1	66.3
Major advanced economies	43.4	40.6	17.3	64.8	64.3	61.6	54.7	50.6
United States	17.4	15.8	1.6	3.9	7.9	10.0	12.2	3.1
Japan	6.5	6.2	12.3	27.7	23.8	21.8	19.3	21.6
Germany	5.6	5.7	0.8	7.1	7.3	7.5	5.0	5.6
France	4.2	3.6	0.6	9.2	8.7	7.4	6.4	7.1
United Kingdom	4.2	4.1	0.7	6.9	6.9	6.4	4.8	5.4
Italy	3.2	3.0	0.6	5.2	4.9	4.4	3.6	4.0
Canada	2.3	2.3	0.7	4.9	4.7	4.1	3.4	3.8
Other advanced economies	14.3	15.4	6.7	20.1	20.0	20.3	15.4	15.8
Spain	2.0	2.2	0.2	2.4	2.3	2.3	1.6	1.8
Netherlands	1.8	2.0	0.2	3.3	3.3	3.3	2.3	2.6
Australia	1.4	1.4	0.4	1.7	1.7	1.9	1.2	1.3
Belgium	1.3	1.3	0.2	2.1	2.2	2.4	1.4	1.6
Switzerland	1.2	1.2	2.2	3.9	3.5	3.3	2.7	3.0
Sweden	0.9	1.0	0.5	1.6	1.6	1.5	1.1	1.3
Austria	0.8	0.8	0.1	0.7	0.8	0.9	0.6	0.6
Norway	0.8	0.8	0.6	1.7	1.6	1.5	1.2	1.3
Ireland	0.7	0.9	0.0	0.1	0.1	0.2	0.5	0.1
Denmark	0.7	0.7	0.9	1.3	1.2	1.2	0.9	1.0
Emerging Market and Developing Countries 6/	42.4	43.9	76.1	15.0	15.7	18.1	29.9	33.7
Africa	4.4	3.3	4.0	0.9	0.7	0.7	3.2	4.5
South Africa	0.6	0.6	0.4	0.2	0.2	0.2	0.4	0.6
Nigeria	0.5	0.5	0.5	0.1	0.1	0.0	0.4	0.5
Asia	16.0	19.6	44.5	6.9	7.2	8.4	11.2	10.2
China 7/	6.4	9.4	30.5	3.5	3.6	4.4	4.5	2.7
India	2.7	2.6	3.1	0.7	0.9	1.2	1.9	2.7
Korea	1.8	2.0	3.3	1.7	1.6	1.5	1.3	1.3
Indonesia	1.0	1.0	0.9	0.1	0.1	0.1	0.7	1.0
Singapore	0.8	1.3	2.4	0.3	0.4	0.4	0.6	0.3
Malaysia	0.8	0.8	1.1	0.3	0.3	0.3	0.5	0.2
Thailand	0.7	0.9	1.8	0.1	0.2	0.2	0.5	0.1
Middle East, Malta, and Turkey	6.7	6.2	10.9	3.7	3.8	4.1	4.9	5.6
Saudi Arabia	2.1	1.4	5.0	1.9	2.1	2.3	1.5	1.5
Turkey	1.0	1.1	0.9	0.2	0.2	0.2	0.7	1.0
Iran, Islamic Republic of	0.7	0.7	0.9	0.0	0.0	0.0	0.5	0.7
Western Hemisphere	7.9	7.1	6.8	2.0	2.1	2.5	5.5	7.1
Brazil	2.3	2.2	3.1	0.7	0.6	0.9	1.6	2.3
Mexico	1.9	1.7	1.3	0.9	0.9	1.1	1.3	1.9
Venezuela, Republica Bolivariana de	0.8	0.5	0.2	0.0	0.0	0.0	0.5	0.8
Argentina	0.7	0.6	0.6	0.2	0.2	0.1	0.5	0.7
Transition economies	7.2	7.7	9.8	1.6	1.9	2.5	5.0	6.3
Russian Federation	2.7	2.6	5.2	0.8	0.9	1.2	1.9	2.7
Poland	0.9	1.0	1.0	0.4	0.4	0.6	0.6	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum Items:								
EU27	30.2	30.9	8.1	41.7	41.6	40.1	31.6	33.8
LICs 8/	4.0	2.6	2.1	0.4	0.3	0.3	2.9	4.0

Source: Finance Department.

1/ Average of contribution shares in NAB with new pledges, PRGT-loans, PRGT-subsidies, and TA activities.

2/ Average of contribution shares in NAB with new pledges, PRGT-loans, PRGT-subsidies, TA activities, and FTP participation based on resources.

3/ Weighted average of NAB with new pledges (0.3), FTP participation based on resources (0.3), PRGT combined (0.2), and TA activities (0.2).

4/ Uses the higher of 14th Review quota share or FCS I share rebased to ensure that total shares add up to 100 percent.

5/ Non-FTP participants retain 14th Review quota share; quota share of FTP participants is reallocated based on FCS I.

6/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic, and Slovenia.

7/ Including China, P.R., Hong Kong SAR, and Macao SAR.

8/ PRGT-eligible countries.

#### IV. ILLUSTRATIVE CALCULATIONS

35. **This section presents illustrative calculations to highlight the impact on CQS of some possible modifications to the formula based on the new data set** (see Tables 10-13 and Appendix tables). These calculations are intended to help inform Directors' consideration of the issues discussed above and do not in any way represent staff proposals. Four sets of simulations are presented: (i) simplifying the formula by dropping one or more variables; (ii) changing the weights of GDP measured at market exchange rates and at PPP in the GDP blend to illustrate the sensitivity of CQS to changes in these weights; (iii) including financial openness explicitly in the formula, using IIP (gap filled) as a proxy, and adjusting for financial centers by using a cap; and (iv) incorporating a measure of financial contributions in the formula.

36. **The first set of calculations shows the possible implications of simplifying the formula by dropping one or more variables** (Table 10). Two options for redistributing weights from the excluded variables are shown: (i) preserving the relative weights of the remaining variables; and (ii) redistributing the weight of the dropped variable(s) to GDP. These calculations are purely illustrative and other options for redistributing the weights could clearly be considered. The main results are as follows:

- *Dropping variability*: The aggregate CQS of advanced economies and EMDCs remains unchanged, but there are significant shifts within these groups. Within the advanced economies, there is a general shift from other advanced to the major advanced economies. Within the group of EMDCs, Asia and the Western Hemisphere tend to gain.
- *Dropping variability and reserves*: Leads to an overall shift towards advanced economies as a whole and major advanced economies in particular. This shift is most pronounced when the weights of the dropped variables are redistributed to GDP. Among EMDCs, all regions lose share except for the Western Hemisphere.
- *Dropping openness and variability*: Leads to an overall shift towards EMDCs, reflecting strong gains in Asia and the Western Hemisphere. Major advanced economies gain, while other advanced economies record sizable losses.
- *A GDP only formula*: Overall shares between advanced economies and EMDCs are broadly unaffected but there are large changes within these two groups. Major advanced economies gain at the expense of other advanced economies. Among EMDCs, several large economies (Brazil, China, and India) record sizable gains, while among regions, there is a shift in shares towards the Western Hemisphere and away from the Middle East, Malta, and Turkey region and the Transition economies.

37. **The second set of calculations updates earlier estimates of the implications of different weights of market and PPP GDP based on the new data set** (Table 11).

Increasing the weight of PPP GDP in the GDP blend variable from the current 40 to 50 percent would result in a 0.8 pp increase in the CQS of EMDCs with all sub-groups benefitting (except Africa, whose share remains unchanged). Among the larger EMDCs, China and India gain the most. The share of LICs also rises slightly.

38. **The third set of calculations illustrates the possible implications of increasing the weight on financial openness in the formula** (Table 12). For illustrative purposes, the openness variable is modified to give equal weight to trade and financial openness, where the latter is proxied by IIP (gap filled with investment income data and applying a cap at the 95<sup>th</sup> percentile to the ratio of IIP to GDP, as described in Section III).<sup>30</sup> The result is a shift of over 2 pp in favor of advanced economies. Two other variants are shown whereby an increase in the weight on financial openness is combined with: (i) dropping variability, and (ii) dropping both variability and reserves. The latter leads to a 4–4.8 pp shift in favor of advanced economies.

39. **A fourth set of calculations illustrates the possible implications of including a measure of financial contributions in the formula** (Table 13). For illustrative purposes, the calculations use the FCS III aggregate measure of financial contributions (see Section III), which is a weighted average of FTP participation and NAB/bilateral pledges, PRGT, and technical assistance contributions. Introducing this variable in place of reserves with the same weight leads to a shift in shares of about 2.7 pp in favor of advanced economies, with the gains widely shared within this group. Calculations are also shown where variability is dropped and financial contributions are added to the formula in addition to reserves (with the same weight), and where variability and reserves are both dropped. The former approach partially mitigates the impact of introducing financial contributions on the aggregate share of EMDCs.

40. **Overall, these calculations illustrate the implications of a wide range of possible modifications of the formula, with potentially sizable impact on CQS.** In broad terms, increasing the weight of the GDP variable at the expense of other variables tends to benefit the major advanced economies and a number of large EMDCs. A larger weight for financial openness and introducing a measure of financial contributions tends to favor many advanced economies, while EMDCs as a group would gain from increasing the weight of reserves and of PPP GDP.

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<sup>30</sup> See Column 4 of Table 12. For comparative purposes, the results of including the gap-filled IIP measure without any cap are shown in Column 3.

**Table 10. Illustrative Calculations—Simplifying the Formula  
(In percent)**

	14th General Review Quota Shares	Calculated Quota Shares	Without Variability		GDP and Openness			GDP and Reserves			GDP Only (60/40)
			Preserving Relative Weights	All to 60/40 GDP Blend	Preserving Relative Weights	All to 60/40 GDP Blend	Preserving Relative Weights	All to 60/40 GDP Blend			
Advanced economies	57.6	56.1	56.1	56.1	58.0	57.7	53.6	54.9	56.5		
Major advanced economies	43.4	40.6	41.4	41.9	42.9	43.3	42.4	43.6	44.9		
United States	17.4	15.8	16.2	16.8	17.0	17.7	18.5	19.2	20.1		
Japan	6.5	6.2	6.4	6.5	6.1	6.3	7.6	7.4	7.2		
Germany	5.6	5.7	5.7	5.6	6.0	5.7	4.5	4.7	4.9		
France	4.2	3.6	3.8	3.8	4.0	4.0	3.5	3.6	3.8		
United Kingdom	4.2	4.1	4.0	4.0	4.2	4.1	3.3	3.4	3.5		
Italy	3.2	3.0	3.1	3.1	3.2	3.2	2.9	3.0	3.1		
Canada	2.3	2.3	2.3	2.3	2.4	2.3	2.1	2.2	2.2		
Other advanced economies	14.3	15.4	14.7	14.2	15.1	14.4	11.1	11.3	11.5		
Spain	2.0	2.2	2.2	2.3	2.4	2.4	2.1	2.2	2.3		
Netherlands	1.8	2.0	1.9	1.8	2.0	1.8	1.2	1.2	1.2		
Australia	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.6	1.6		
Belgium	1.3	1.3	1.3	1.2	1.3	1.2	0.7	0.7	0.8		
Switzerland	1.2	1.2	1.3	1.2	1.2	1.1	0.9	0.8	0.7		
Sweden	0.9	1.0	0.9	0.9	0.9	0.9	0.7	0.7	0.7		
Austria	0.8	0.8	0.8	0.8	0.8	0.8	0.6	0.6	0.6		
Norway	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6		
Ireland	0.7	0.9	0.8	0.7	0.8	0.7	0.3	0.4	0.4		
Denmark	0.7	0.7	0.7	0.6	0.7	0.6	0.5	0.5	0.5		
Emerging Market and Developing Countries 1/	42.4	43.9	43.9	43.9	42.0	42.3	46.4	45.1	43.5		
Africa	4.4	3.3	3.1	3.1	3.1	3.1	3.2	3.2	3.1		
South Africa	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
Nigeria	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4		
Asia	16.0	19.6	20.4	20.3	19.1	19.2	21.8	20.9	19.8		
China 2/	6.4	9.4	10.1	10.1	9.1	9.3	11.6	10.9	10.1		
India	2.7	2.6	2.8	2.9	2.8	2.9	3.4	3.4	3.5		
Korea	1.8	2.0	2.1	2.0	2.0	1.9	1.9	1.8	1.8		
Indonesia	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.2		
Singapore	0.8	1.3	1.1	1.0	1.0	0.9	0.6	0.5	0.4		
Malaysia	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.5		
Thailand	0.7	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7		
Middle East, Malta and Turkey	6.7	6.2	5.9	5.9	5.6	5.6	6.1	5.8	5.5		
Saudi Arabia	2.1	1.4	1.2	1.1	0.9	0.9	1.2	1.0	0.8		
Turkey	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.3		
Iran, Islamic Republic of	0.7	0.7	0.8	0.8	0.7	0.8	0.9	0.9	0.9		
Western Hemisphere	7.9	7.1	7.2	7.4	7.2	7.4	8.2	8.3	8.3		
Brazil	2.3	2.2	2.3	2.4	2.3	2.4	3.0	3.0	3.0		
Mexico	1.9	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9		
Venezuela, República Bolivariana de	0.8	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6		
Argentina	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7		
Transition economies	7.2	7.7	7.3	7.2	7.1	7.0	7.1	6.9	6.8		
Russian Federation	2.7	2.6	2.6	2.6	2.5	2.5	2.9	2.8	2.7		
Poland	0.9	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9		
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		
Memorandum items:											
EU27	30.2	30.9	30.2	29.6	31.5	30.4	24.4	25.1	25.9		
LICs 3/	4.0	2.7	2.6	2.6	2.6	2.6	2.7	2.7	2.7		
Coefficients for quota variables											
Market GDP		0.300	0.353	0.390	0.375	0.420	0.545	0.570	0.600		
PPP GDP		0.200	0.235	0.260	0.250	0.280	0.364	0.380	0.400		
Openness		0.300	0.353	0.300	0.375	0.300	0.000	0.000	0.000		
IIP		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Variability		0.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Reserves		0.050	0.059	0.050	0.000	0.000	0.091	0.050	0.000		
Financial Contributions		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		

Source: Finance Department.

1/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic and Slovenia.

2/ Including China, P.R., Hong Kong SAR, and Macao SAR.

3/ PRGT-eligible countries.

**Table 11. Illustrative Calculations—Formula with Various GDP Blends  
(In percent)**

	14th General Review Quota Shares	Calculated Quota Shares	Formula with Various GDP Blends	
			50-50 blend	70-30 blend
Advanced economies	57.6	56.1	55.3	56.8
Major advanced economies	43.4	40.6	40.1	41.2
United States	17.4	15.8	15.7	16.0
Japan	6.5	6.2	6.0	6.3
Germany	5.6	5.7	5.6	5.7
France	4.2	3.6	3.5	3.7
United Kingdom	4.2	4.1	4.0	4.1
Italy	3.2	3.0	3.0	3.1
Canada	2.3	2.3	2.2	2.3
Other advanced economies	14.3	15.4	15.2	15.6
Spain	2.0	2.2	2.2	2.3
Netherlands	1.8	2.0	2.0	2.1
Australia	1.4	1.4	1.4	1.5
Belgium	1.3	1.3	1.3	1.4
Switzerland	1.2	1.2	1.2	1.2
Sweden	0.9	1.0	1.0	1.0
Austria	0.8	0.8	0.8	0.8
Norway	0.8	0.8	0.8	0.8
Ireland	0.7	0.9	0.9	0.9
Denmark	0.7	0.7	0.7	0.7
Emerging Market and Developing Countries 1/	42.4	43.9	44.7	43.2
Africa	4.4	3.3	3.3	3.2
South Africa	0.6	0.6	0.6	0.6
Nigeria	0.5	0.5	0.5	0.4
Asia	16.0	19.6	20.1	19.1
China 2/	6.4	9.4	9.6	9.2
India	2.7	2.6	2.8	2.5
Korea	1.8	2.0	2.0	1.9
Indonesia	1.0	1.0	1.0	1.0
Singapore	0.8	1.3	1.3	1.3
Malaysia	0.8	0.8	0.8	0.8
Thailand	0.7	0.9	0.9	0.9
Middle East, Malta and Turkey	6.7	6.2	6.3	6.2
Saudi Arabia	2.1	1.4	1.4	1.4
Turkey	1.0	1.1	1.1	1.1
Iran, Islamic Republic of	0.7	0.7	0.7	0.7
Western Hemisphere	7.9	7.1	7.2	7.1
Brazil	2.3	2.2	2.2	2.2
Mexico	1.9	1.7	1.8	1.7
Venezuela, República Bolivariana de	0.8	0.5	0.5	0.5
Argentina	0.7	0.6	0.6	0.6
Transition economies	7.2	7.7	7.8	7.6
Russian Federation	2.7	2.6	2.7	2.6
Poland	0.9	1.0	1.0	1.0
Total	100.0	100.0	100.0	100.0
Memorandum items:				
EU27	30.2	30.9	30.6	31.2
LICs 3/	4.0	2.7	2.8	2.6
Coefficients for quota variables				
Market GDP		0.300	0.250	0.350
PPP GDP		0.200	0.250	0.150
Openness		0.300	0.300	0.300
IIP		0.000	0.000	0.000
Variability		0.150	0.150	0.150
Reserves		0.050	0.050	0.050
Financial Contributions		0.000	0.000	0.000

Source: Finance Department.

1/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic and Slovenia.

2/ Including China, P.R., Hong Kong SAR, and Macao SAR.

3/ PRGT-eligible countries.

**Table 12. Illustrative Calculations—Formula Including Financial Openness  
(In percent)**

	14th General Review Quota Shares	Calculated Quota Shares	Calculated Quota Shares Modified Formula (Uncapped) 1/	Calculated Quota Shares Modified Formula (Capped) 2/	Modified Formula Without Variability 2/		Modified Formula With GDP and Openness 2/	
					Preserving Relative Weights	All to GDP 60/40 Blend	Preserving Relative Weights	All to GDP 60/40 Blend
Advanced economies	57.6	56.1	58.6	58.4	58.8	58.4	60.9	60.0
Major advanced economies	43.4	40.6	42.4	43.0	44.2	44.3	45.9	45.7
United States	17.4	15.8	16.6	16.9	17.4	17.8	18.3	18.7
Japan	6.5	6.2	6.3	6.3	6.6	6.7	6.3	6.5
Germany	5.6	5.7	5.6	5.7	5.7	5.6	6.0	5.8
France	4.2	3.6	3.8	3.9	4.2	4.1	4.4	4.3
United Kingdom	4.2	4.1	5.2	5.1	5.3	5.0	5.5	5.1
Italy	3.2	3.0	2.9	3.0	3.0	3.0	3.1	3.1
Canada	2.3	2.3	2.1	2.1	2.1	2.1	2.2	2.2
Other advanced economies	14.3	15.4	16.2	15.3	14.5	14.1	15.0	14.3
Spain	2.0	2.2	2.2	2.2	2.2	2.3	2.4	2.4
Netherlands	1.8	2.0	2.0	2.1	1.9	1.8	2.0	1.9
Australia	1.4	1.4	1.5	1.5	1.5	1.5	1.6	1.6
Belgium	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.2
Switzerland	1.2	1.2	1.3	1.3	1.4	1.3	1.4	1.2
Sweden	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.9
Austria	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Norway	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7
Ireland	0.7	0.9	1.1	0.8	0.7	0.6	0.7	0.6
Denmark	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6
Emerging Market and Developing Countries 3/	42.4	43.9	41.4	41.6	41.2	41.6	39.1	40.0
Africa	4.4	3.3	3.1	3.1	2.9	2.9	2.8	2.9
South Africa	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6
Nigeria	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Asia	16.0	19.6	18.6	18.7	19.4	19.4	17.9	18.3
China 4/	6.4	9.4	9.1	9.2	9.9	9.9	8.8	9.1
India	2.7	2.6	2.5	2.5	2.7	2.8	2.6	2.8
Korea	1.8	2.0	1.8	1.8	1.9	1.8	1.8	1.8
Indonesia	1.0	1.0	0.9	0.9	1.0	1.0	1.0	1.0
Singapore	0.8	1.3	1.2	1.2	1.0	0.9	0.9	0.8
Malaysia	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6
Thailand	0.7	0.9	0.8	0.8	0.7	0.7	0.7	0.7
Middle East, Malta and Turkey	6.7	6.2	5.8	5.8	5.4	5.4	5.0	5.1
Saudi Arabia	2.1	1.4	1.3	1.3	1.1	1.1	0.8	0.8
Turkey	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1
Iran, Islamic Republic of	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7
Western Hemisphere	7.9	7.1	6.8	6.9	6.9	7.1	6.9	7.2
Brazil	2.3	2.2	2.2	2.2	2.3	2.4	2.3	2.4
Mexico	1.9	1.7	1.6	1.6	1.6	1.7	1.6	1.7
Venezuela, República Bolivariana de	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Argentina	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Transition economies	7.2	7.7	7.1	7.2	6.7	6.7	6.4	6.5
Russian Federation	2.7	2.6	2.5	2.5	2.5	2.5	2.3	2.4
Poland	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum items:								
EU27	30.2	30.9	32.4	31.6	31.1	30.3	32.5	31.1
LICs 5/	4.0	2.7	2.5	2.5	2.4	2.4	2.4	2.4
Coefficients for quota variables								
Market GDP		0.300	0.300	0.300	0.353	0.390	0.375	0.420
PPP GDP		0.200	0.200	0.200	0.235	0.260	0.250	0.280
Openness		0.300	0.000	0.000	0.000	0.000	0.000	0.000
Trade Openness		0.000	0.150	0.150	0.176	0.150	0.188	0.150
IIP		0.000	0.150	0.150	0.176	0.150	0.188	0.150
Variability		0.150	0.150	0.150	0.000	0.000	0.000	0.000
Reserves		0.050	0.050	0.050	0.059	0.050	0.000	0.000
Financial Contributions		0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Finance Department.

1/ The traditional openness variable in the formula is replaced with IIP gap-filled, as a proxy for financial openness, and trade openness (openness minus investment income) weighted equally.

2/ The traditional openness variable in the formula is replaced with IIP gap-filled and capped at the 95th percentile, as a proxy for financial openness, and trade openness (openness minus investment income) weighted equally.

3/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic and Slovenia.

4/ Including China, P.R., Hong Kong SAR, and Macao SAR.

5/ PRGT-eligible countries.

**Table 13. Illustrative Calculations—Formula Including Financial Contributions  
(In percent)**

	14th General Review Quota Shares	Calculated Quota Shares	Calculated Quota Shares Modified Formula 1/	GDP, Openness, Reserves and Financial Contributions		GDP, Openness and Financial Contributions
				Allocated Evenly to GDP, Openness and Reserves	All to GDP 60/40 Blend	All to GDP 60/40 Blend
Advanced economies	57.6	56.1	58.8	57.5	57.3	58.9
Major advanced economies	43.4	40.6	42.7	42.4	42.6	44.0
United States	17.4	15.8	16.2	15.8	16.2	17.1
Japan	6.5	6.2	6.6	7.0	7.1	6.9
Germany	5.6	5.7	6.0	5.8	5.7	5.9
France	4.2	3.6	3.9	4.0	4.0	4.1
United Kingdom	4.2	4.1	4.3	4.2	4.1	4.2
Italy	3.2	3.0	3.2	3.2	3.1	3.3
Canada	2.3	2.3	2.4	2.4	2.4	2.4
Other advanced economies	14.3	15.4	16.1	15.1	14.7	14.9
Spain	2.0	2.2	2.3	2.3	2.3	2.4
Netherlands	1.8	2.0	2.2	2.0	1.9	1.9
Australia	1.4	1.4	1.5	1.5	1.5	1.5
Belgium	1.3	1.3	1.4	1.3	1.3	1.3
Switzerland	1.2	1.2	1.3	1.4	1.3	1.2
Sweden	0.9	1.0	1.1	1.0	0.9	0.9
Austria	0.8	0.8	0.9	0.8	0.8	0.8
Norway	0.8	0.8	0.9	0.8	0.8	0.8
Ireland	0.7	0.9	0.9	0.8	0.7	0.7
Denmark	0.7	0.7	0.7	0.7	0.7	0.7
Emerging Market and Developing Countries 2/	42.4	43.9	41.2	42.5	42.7	41.1
Africa	4.4	3.3	3.1	3.0	3.0	2.9
South Africa	0.6	0.6	0.5	0.6	0.6	0.6
Nigeria	0.5	0.5	0.4	0.4	0.4	0.4
Asia	16.0	19.6	18.0	19.7	19.8	18.7
China 3/	6.4	9.4	8.3	9.7	9.8	9.0
India	2.7	2.6	2.5	2.7	2.8	2.8
Korea	1.8	2.0	1.9	2.0	2.0	1.9
Indonesia	1.0	1.0	1.0	1.0	1.0	1.0
Singapore	0.8	1.3	1.2	1.1	1.0	0.9
Malaysia	0.8	0.8	0.7	0.7	0.7	0.6
Thailand	0.7	0.9	0.8	0.8	0.8	0.7
Middle East, Malta and Turkey	6.7	6.2	5.9	5.8	5.8	5.5
Saudi Arabia	2.1	1.4	1.3	1.2	1.2	1.0
Turkey	1.0	1.1	1.1	1.1	1.1	1.1
Iran, Islamic Republic of	0.7	0.7	0.6	0.7	0.7	0.7
Western Hemisphere	7.9	7.1	6.9	6.9	7.1	7.1
Brazil	2.3	2.2	2.1	2.2	2.3	2.3
Mexico	1.9	1.7	1.7	1.7	1.7	1.8
Venezuela, República Bolivariana de	0.8	0.5	0.5	0.5	0.5	0.5
Argentina	0.7	0.6	0.6	0.6	0.6	0.6
Transition economies	7.2	7.7	7.4	7.1	7.0	6.8
Russian Federation	2.7	2.6	2.5	2.5	2.6	2.4
Poland	0.9	1.0	1.0	1.0	1.0	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum items:						
EU27	30.2	30.9	32.4	31.0	30.3	31.1
LICs 4/	4.0	2.7	2.6	2.5	2.5	2.5
Coefficients for quota variables						
Market GDP		0.300	0.300	0.330	0.360	0.390
PPP GDP		0.200	0.200	0.220	0.240	0.260
Openness		0.300	0.300	0.350	0.300	0.300
IIP		0.000	0.000	0.000	0.000	0.000
Variability		0.150	0.150	0.000	0.000	0.000
Reserves		0.050	0.000	0.050	0.050	0.000
Financial Contributions		0.000	0.050	0.050	0.050	0.050

Source: Finance Department.

1/ Financial Contributions replaces reserves with a weight of 0.05.

2/ Including Czech Republic, Estonia, Korea, Malta, Singapore, Slovak Republic and Slovenia.

3/ Including China, P.R., Hong Kong SAR, and Macao SAR.

4/ PRGT-eligible countries.

## V. CONCLUDING REMARKS

41. **This paper presents the results of updating the quota data through 2010 and seeks to respond to requests for additional technical work made at the March meeting.** In this context, it illustrates some of the issues involved in increasing the weight on financial openness and in incorporating financial contributions into the quota formula, and presents further staff work on variability and capturing members' potential demand for Fund resources. The paper also presents several illustrative calculations that aim to show the impact of some possible changes discussed in the paper on the distribution of members' CQS, including options for simplifying the formula and for increasing the weight on financial openness and including a measure of members' financial contributions to the Fund.

42. **This will be the last data update before the January 2013 deadline for completing the quota formula review.** While it is premature to present proposals at this stage, it is hoped that the material presented in this paper will help to begin to narrow the range of issues for the review. Based on Directors' views, staff plans to prepare a follow up paper that could lay out possible options for moving forward, bearing in mind the principles that underpinned the 2008 reform and have been reaffirmed by most Directors in the March meeting and by G-20 Leaders, including that the formula should result in CQS that are broadly acceptable to the membership. As in the 2008 reform, agreement on a new quota formula will inevitably require a willingness to compromise on all sides.

43. **Directors may wish to comment on the following issues:**

- What are Directors' views on the possible options discussed in the paper for simplifying the quota formula? What do they see as the key variables that should be preserved?
- What are Directors' views on the weight and composition of the GDP blend variable?
- How do Directors see the merits of increasing the weight on financial openness in the quota formula? What are their views on the specific options discussed in this paper, including (i) the use of gap filled IIP data or alternatively of a larger weight for investment income as a proxy for financial openness, and (ii) the alternative approaches for addressing the particular situation of international financial centers?
- Do Directors agree that there is a case for dropping variability, given the shortcomings that have been identified with the current measure and the challenges in identifying a superior measure of members' potential demand for Fund resources?
- What are Directors' views on how best to reflect members' financial contributions in quota adjustments, including the options for including a measure of such contributions in the formula itself? How do they view the merits of the particular measures discussed in the paper? If such a measure were included, should it be additional to or instead of the existing reserves variable?