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June 7, 2013

To: Members of the Executive Board

From: The Secretary

Subject: **Quota Formula—Data Update and Further Considerations—Annexes**

The attached paper provides background information to the paper on quota formula—data update and further considerations (SM/13/138, 6/6/13) for the **informal session to engage** Executive Directors that is tentatively scheduled for **Wednesday, June 26, 2013**.

The staff proposes publication of this paper on the Fund's external website after the informal session.

Questions may be referred to Mr. Kumar (ext. 37771) and Ms. Bassett (ext. 34621) in FIN.

This document will shortly be posted on the extranet, a secure website for Executive Directors and member country authorities.

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QUOTA FORMULA—DATA UPDATE AND FURTHER CONSIDERATIONS—ANNEXES

June 6, 2013

Approved By
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Prepared by the Finance Department

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Annex I. Implications of Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6)¹

This annex discusses the impact of the introduction of BPM6 on openness and variability. An important change arising from conversion to BPM6 relates to goods for processing (GFP).² Under BPM6, only the processing fees are recorded under services, whereas under BPM5, the full value of the goods were included (on a gross basis) in goods imports and exports. Although the impact of this change is important for a number of individual countries, it is relatively small at an aggregate level.

A. Main Changes due to BPM6

1. **In August 2012, the IFS began publishing Balance of Payments and IIP data under BPM6.** The implementation of BPM6 entails a number of methodological changes, and since full implementation is expected to take many years, there will be a mixture of BPM5 and BPM6 data reported to STA for some time. In cases where BPM5 data are reported, STA converts these data to a BPM6 basis, so that all quota data approximate a BPM6 basis.

2. **As of January 31, 2013, there were 20 countries reporting data on a BPM6 basis (Table AI.1).** For these 20 countries, to ensure comparability over time, STA developed bridging tables that allowed the rearrangement of data from a BPM5 to a BPM6 basis going back to 2005; these data were approved by country authorities for publication. For the remainder of the 13-year period covered by variability, STA used the same bridging tables, and verified the converted data internally. In addition, for those countries which report under BPM5 and report GFP (58 countries), an adjustment is made to their current receipts and payments consistent with BPM6 (i.e., the value of exports and imports are reduced by the value of the goods for processing, and only the estimated fee for processing is included under services).^{3, 4} For the remainder of the membership (110

¹ Prepared by FIN and STA.

² These are goods processed under contract for an explicit fee by a non-resident processing entity, where the goods being processed do not change ownership.

³ Currently there are 70 countries that report GFP (credits, debits or both), including 12 members which currently report under BPM6.

⁴ In computing China's openness, the practice has been to exclude trade among the territories (Mainland, Hong Kong SAR and Macao SAR) from China's total trade using Direction of Trade Statistics (DoT), which are only available on a BPM5 basis. With the move to BPM6, such an approach would imply an over-adjustment for intra-China trade to the extent that GFP (which are already excluded from BPM6 data) account for part of the intra-China trade flows. After consultation with STA, a two-step procedure was followed: first, current receipts and payments for the Mainland, Hong Kong SAR and Macao SAR were estimated under BPM5 (for 1999-2011), thereby allowing the overall GFP adjustment introduced by BPM6 to be estimated; second, this adjustment was subtracted from the overall DoT intra-China trade used to obtain China's openness excluding intra-territory trade. This approach implicitly assumes that all of the GFP adjustment is associated with intra-territory trade, and could therefore understate the adjustment to the extent that significant GFP relate to trade with other members.

countries) that report under BPM5 and which do not report GFP data, no adjustments for GFP are made.⁵

3. **The change in the treatment of GFP impacts both openness and variability.** Under BPM6 the value of GFP is no longer recorded under (gross) goods exports and imports. Only the *fees* from processing are recorded, and are included under services. In this sense, BPM6 helps reduce, at least partially, the double counting in gross trade flows (see Box AI.1 for simple numerical examples). Variability is also impacted to the extent that there are breaks in the data, since the change in methodology to BPM6 does not cover the full period for variability, 13 years, in most cases. As noted, where possible, STA applies bridging tables back to 1999. The extent to which breaks in the data affect variability would also depend on the importance of GFP in the member's trade.⁶

4. **Additional changes arising from BPM6 may also affect openness and variability, but usually to a lesser extent.** For example, the change in the treatment of merchanting transactions has no net effect.⁷ Changes in the calculation of capital account credits and debits appear to have a small impact on quota variables. In particular, countries reporting under BPM6 have eliminated migrants' transfers from their capital accounts (according to BPM6, a change of ownership is no longer imputed).⁸

B. Goods for Processing and BPM6

5. **To estimate the impact of the introduction of BPM6 on quota variables, data for current receipts and current payments under BPM5 and BPM6 are compared for the 70 countries reporting data for GFP (Table AI.2).**⁹ The average reduction for these 70 countries is

⁵ In addition to adjusting BPM5 data for GFP for those countries reporting these data, there are other adjustments made by STA to convert the data to BPM6, mainly reclassification of items which have no impact on the openness measure, as well as some other adjustments as discussed below.

⁶ GFP may be a relatively recent activity or a country may discontinue this activity. Breaks in the GFP series may also reflect data reporting difficulties.

⁷ Merchanting is defined as the purchase of goods by a resident (of the compiling economy) from a nonresident combined with the subsequent resale of the same goods to another nonresident without the goods being present in the compiling economy. The countries that report under BPM6 include the acquisition of goods as negative goods exports, and the subsequent resale of the goods as positive goods exports, of the economy of the merchant, with the difference between purchases and sales recorded in goods exports as "net exports of goods under merchanting." Compared to data for countries reporting under BPM5, which included merchanting in services, the BPM6 reclassification leaves overall current receipts and current payments unchanged.

⁸ For those countries whose BOP data have been converted into BPM6, STA has not eliminated this item since it would impact net errors and omissions.

⁹ STA has provided access to an algorithm that allows a conversion of the BPM5 databank to a BPM6 basis. For those countries that still report in BPM5, but which report GFP, the algorithm automatically performs the conversion. Thus it is possible to approximate the proportion of the total change in current payments and current receipts which is due to the move from BPM5 to BPM6 and which primarily reflects the adjustment to GFP. Some gap filling had to be carried out for a few countries to insure uniform comparison for the period 2007-11. For a few BPM6 reporters,

(continued)

2.5 percent in both receipts and payments, with the reduction exceeding 5 percent for 11 members. Relatively large changes are seen for some countries in Central America (for whom maquiladora trade is significant such as Costa Rica, Honduras, and El Salvador), the Philippines, as well as a number of Central European countries. For the four G7 countries for which data are available (Germany, Italy, France, and Japan), the reduction is relatively small—below 3 percent for both receipts and payments. For BPM6 reporters providing data on GFP (12 countries), the average decline in their openness variable is below 1 percent, suggesting that the impact of the new methodology is rather small. For a few BPM6 reporters, openness is slightly higher than under BPM5; this arises both from data revisions and from the methodological changes introduced by BPM6. For the rest of the membership data on GFP are not available and hence it is not possible to estimate the impact of the move to BPM6. Within this latter group, there are countries for which these activities may be sizable but do not yet provide this detail (see Table A1.1).

6. **The effects of BPM6 on variability were also examined.** The estimates suggest that the top five countries whose openness shares are most affected by the implementation of BPM6 (Costa Rica, Honduras, Bosnia-Herzegovina, Philippines, and Macedonia, FYR) are also negatively impacted in their variability shares. Costa Rica, for example, loses 21.3 percent of its openness share due to BPM6, and loses 17.1 percent of its variability share; in the case of Honduras, the figures are 20.0 and 27.1 percent, respectively. For these countries, the effects of BPM6 on variability are very similar to those on openness.

Table AI.1. Countries Reporting on a BPM6 Basis 1/ 2/

	BPM6 data starting date
1 Armenia	2011
2 Australia	1989
3 Bangladesh	2005
4 Belarus	2005
5 Belize	2011
6 Bosnia-Herzegovina	2007
7 * Canada	1981
8 * Chile	2009
9 Fiji	2005
10 Finland	2005
11 Georgia	2005
12 * India	2009
13 * Kuwait	2008
14 Nicaragua	2005
15 Samoa	2005
16 * Saudi Arabia	2005
17 * Singapore	2005
18 * Thailand	2005
19 Ukraine	2005
20 * United States	2005

Source: IMF Statistics Department

* Countries that lack basic information to identify goods for processing

1/ China, P.R. reports under BPM5 (inc. goods for processing);

Hong Kong SAR and Macao SAR report under BPM6.

2/ Table is as of January 31, 2013.

openness is slightly higher than under BPM5; this arises both from data revisions and from the methodological change in BPM6.

**Table AI.2. Openness (2007-2011) and Variability (1999-2011) Under BPM5 and BPM6:
Impact of Goods For Processing 1/
(SDR millions)**

		Current Receipts (2007-2011)	Current Payments (2007-2011)	Openness			Variability		
		Percent Change BPM6 vs. BPM5 2/	Percent Change BPM6 vs. BPM5 2/	BPM5 3/	BPM6 4/	Percent Change BPM6 vs. BPM5 2/	BPM5 3/	BPM6 4/	Percent Change BPM6 vs. BPM5 2/
1	Afghanistan, Islamic State of	0.0	0.0	7575	7575	0.0	802	802	0.0
2	Albania	-9.3	-7.5	8500	7796	-8.3	236	234	-0.9
3	Algeria	0.0	0.0	82158	82158	0.0	4858	4858	0.0
4	* Armenia	-0.2	0.0	5707	5701	-0.1	113	112	-0.6
5	* Australia	-0.2	0.5	390754	391415	0.2	11263	11305	0.4
6	Austria	-1.3	-1.4	332128	327674	-1.3	7034	6874	-2.3
7	Azerbaijan	-0.7	-1.2	30909	30634	-0.9	874	861	-1.4
8	* Bangladesh	-0.4	-0.1	38281	38187	-0.2	337	328	-2.7
9	* Belarus	-2.3	-2.0	48251	47213	-2.1	1774	1763	-0.6
10	Belgium	-2.1	-2.1	626478	613387	-2.1	13693	12959	-5.4
11	* Belize	-0.2	-0.4	1298	1294	-0.3	34	35	1.1
12	Bolivia	-0.1	-0.1	9998	9993	-0.1	358	358	0.0
13	* Bosnia-Herzegovina	-14.8	-13.1	13982	12036	-13.9	472	374	-20.7
14	Brazil	0.0	0.0	328826	328826	0.0	11794	11845	0.4
15	Burkina Faso	-0.1	-0.1	3037	3035	-0.1	107	107	0.3
16	Cameroon	-0.8	-0.8	9691	9612	-0.8	288	292	1.6
17	Cape Verde	-0.6	-0.5	1582	1574	-0.5	39	39	-0.2
18	China	0.0	0.0	2456314	2456333	0.0	46403	46403	0.0
19	Colombia	-0.5	-0.4	71567	71233	-0.5	1830	1835	0.3
20	Costa Rica	-22.5	-20.2	20104	15821	-21.3	535	443	-17.1
21	Cote d'Ivoire	0.0	-0.1	16003	15995	0.0	348	349	0.5
22	Czech Republic	-4.1	-4.0	196234	188340	-4.0	4378	4192	-4.3
23	Dominican Republic	0.0	0.0	23227	23227	0.0	638	718	12.4
24	El Salvador	-7.4	-6.8	12910	11993	-7.1	400	373	-6.8
25	Estonia	-7.0	-6.9	25425	23650	-7.0	955	908	-4.9
26	* Fiji	-0.2	-1.8	2851	2820	-1.1	48	50	4.6
27	* Finland	1.1	-0.6	163583	164028	0.3	5686	5732	0.8
28	France	-1.3	-1.3	1317909	1300562	-1.3	17296	17090	-1.2
29	* Georgia	-0.5	0.2	8295	8286	-0.1	212	213	0.9
30	Germany	-2.3	-2.6	2346805	2288849	-2.5	43417	42685	-1.7
31	Greece	0.0	0.0	131864	131821	0.0	4529	4528	0.0
32	Guatemala	0.0	0.0	20832	20832	0.0	435	435	0.0
33	Guinea	-0.1	0.0	2398	2397	0.0	115	114	-1.2
34	Honduras	-20.8	-19.2	14052	11247	-20.0	475	347	-27.1
35	Hungary	-2.9	-2.8	176654	171633	-2.8	4927	4836	-1.9

**Table AI.2. Openness (2007-2011) and Variability (1999-2011) Under BPM5 and BPM6:
Impact of Goods For Processing 1/ (concluded)
(SDR millions)**

		Current Receipts (2007-2011)	Current Payments (2007-2011)	Openness			Variability		
		Percent Change BPM6 vs. BPM5 2/	Percent Change BPM6 vs. BPM5 2/	BPM5 3/	BPM6 4/	Percent Change BPM6 vs. BPM5 2/	BPM5 3/	BPM6 4/	Percent Change BPM6 vs. BPM5 2/
36	Indonesia	-4.3	-4.4	219140	209592	-4.4	6545	6360	-2.8
37	Italy	-2.6	-2.4	950989	926842	-2.5	22404	22261	-0.6
38	Japan	-0.5	-0.6	1244858	1238529	-0.5	40097	40037	-0.2
39	Kosovo	-0.6	-0.5	3949	3929	-0.5	98	96	-1.7
40	Lao, People's Dem. Republic	0.0	0.0	2602	2602	0.0	63	65	3.7
41	Latvia	-1.7	-1.6	22867	22487	-1.7	904	896	-0.8
42	Lebanon	-1.9	-1.6	43264	42515	-1.7	2401	2417	0.7
43	Libya	0.0	0.0	46732	46721	0.0	2823	2823	0.0
44	Lithuania	-1.5	-1.5	39372	38783	-1.5	1867	1902	1.8
45	Luxembourg	-0.1	-0.1	324385	324112	-0.1	9589	9595	0.1
46	Macedonia, FYR	-10.1	-9.2	8730	7890	-9.6	271	242	-10.6
47	Madagascar	0.0	0.0	3569	3569	0.0	168	179	6.4
48	Malaysia	0.0	0.0	284878	284823	0.0	7387	7390	0.0
49	Moldova	-7.1	-6.1	6392	5975	-6.5	315	305	-3.0
50	Mongolia	0.0	0.0	5417	5416	0.0	289	289	0.1
51	Morocco	-8.0	-7.1	53504	49471	-7.5	1080	1004	-7.0
52	Myanmar	-4.2	-4.6	9471	9054	-4.4	171	132	-22.3
53	Netherlands	-1.4	-1.5	900483	887675	-1.4	23673	22995	-2.9
54	* Nicaragua	-4.5	-3.8	6833	6551	-4.1	214	202	-5.7
55	Niger	0.0	0.0	2699	2699	0.0	75	75	0.1
56	Panama	-0.1	-0.1	27938	27913	-0.1	614	614	0.0
57	Paraguay	-0.5	-0.5	12916	12850	-0.5	373	374	0.2
58	Peru	-1.0	-0.9	55165	54652	-0.9	2254	2232	-0.9
59	Philippines	-12.6	-13.9	100445	87170	-13.2	4005	3058	-23.6
60	Portugal	-0.8	-0.6	149562	148516	-0.7	4136	4129	-0.2
61	Romania	-7.7	-6.5	101288	94124	-7.1	4643	4764	2.6
62	Russia	-0.9	-1.0	611797	606160	-0.9	22369	22259	-0.5
63	Rwanda	-1.0	-0.9	1999	1980	-1.0	45	44	-2.5
64	* Samoa	1.8	0.5	494	500	1.2	16	13	-15.3
65	Slovenia	-0.4	-0.4	47790	47596	-0.4	1524	1516	-0.6
66	Spain	-0.8	-0.7	707876	702375	-0.8	16656	16526	-0.8
67	Swaziland	-1.5	-1.4	3856	3801	-1.4	129	124	-3.9
68	Syrian Arab Republic	0.0	0.0	26021	26021	0.0	795	799	0.5
69	Trinidad and Tobago	-0.1	-0.2	15922	15902	-0.1	787	786	-0.1
70	* Ukraine	-4.1	-3.5	108833	104689	-3.8	7227	7055	-2.4
Averages		-2.6	-2.4	215689	212581	-2.5	5324	367959	-2.4
Range of Changes		-22.5 -- 1.8	-20.2 -- 0.5			-21.3 -- 1.2			-27.4 -- 12.4

Source: Finance Department & Statistics Department.

* Reporting under BPM6 as of January 31, 2013.

1/ Note that this is only an approximation for the differences between BPM5 and BPM6 where the comparison was done using the conversion algorithm provided by STA. For a few BPM6 reporters, openness is slightly higher under BPM6 than under BPM5; this arises both from data revisions and from the methodological change in BPM6.

2/ Percent difference between the measure computed under BPM6 vs under BPM5 (i.e. $(\text{BPM6/BPM5} - 1) \times 100$)

3/ Computed using a databank recorded under BPM5 for 2007-11 (reported data as of January 31, 2013). For those countries that still report in BPM5, this is simply the data reported by authorities before applying STA's conversion algorithm. Data under BPM5 for several countries were gapfilled using BPM6 data due to their unavailability for several years. A few cases of note are Afghanistan (2007 and 2011), Australia (2011), Swaziland (2011), China (missing Macao data for 2011), Burkina Faso and Niger (2010 and 2011).

4/ Computed using the 2013 STA data submission for 2007-2011, which is reported under BPM6.

Box AI.1: Numerical Example for the Impact of GFP under BPM6

Country A sends abroad goods valued at \$75 to be processed in country B. The goods for processing remain in the ownership of Country A. The goods are later returned to the owner after processing, with Country B charging \$25 for its processing.

Two key changes take place affecting the goods and services flows: 1) under BPM5, a change in ownership was imputed for the goods sent abroad for processing and the flows were recorded as imports and exports of goods – this is no longer done in BPM6 (the change in ownership principle is observed), and 2) only the value of processing is now recorded under services rather than the full value of the goods for processing entering and leaving the processing economy.

The example below illustrates how the flows are recorded under the two standards:

	Country A				Country B			
	Current Receipts (credits)		Current Payments (debits)		Current Receipts (credits)		Current Payments (debits)	
	Goods	Services	Goods	Services	Goods	Services	Goods	Services
BPM5:	\$75		\$100		\$100		\$75	
BPM6:				\$25		\$25		

Thus, under BPM5, current receipts related to this activity for Country A equaled \$75 and current payments were \$100. For country B, the corresponding values were \$100 and \$75. However, under BPM6, the current receipts for A are zero, while current payments are \$25; the analogous values for Country B are \$25 and zero.

Annex II. OECD-WTO Data on Value Added Trade: A Preliminary Analysis

This annex provides a preliminary analysis of the OECD-WTO data on trade on a value added basis (TiVA). These data, first released in January 2013 and supplemented with additional data in May 2013, provide estimates of value added exports and imports for 54 member countries. They are based on national input-output tables and rely on a number of assumptions. Staff is in contact with the OECD to seek additional information on the data used, methodology and estimation procedures.

1. **In March 2012, the OECD and the WTO announced a joint initiative to regularly produce estimates of trade on a value-added basis to complement the official statistics on gross trade.**¹ The first estimates of trade in value added were released in mid-January 2013 for 40 countries, followed by a release in late May 2013 for an additional 14 members.² According to the OECD-WTO:³

“The database aims to inform trade policy in a number of areas: (i) the significantly higher contribution made by services in global value chains, (ii) the role of imports of intermediate goods and services in export performance, (iii) the true nature of economic dependencies, (iv) the role of emerging economies in global value chains and (v) how supply and demand shocks might impact on downstream and upstream production.”

2. **The OECD-WTO Trade in Value Added database currently provides estimates for value added trade for 54 members—less than one third of IMF membership.** Data are provided for three benchmark years—2005, 2008, and 2009, and coverage includes all the OECD countries (34 members), plus 20 EMDCs including Brazil, China, India, Indonesia, Russia, Saudi Arabia, Singapore, and South Africa. The coverage is fairly comprehensive for advanced economies (21 countries in total, all G7 included) but much less so for EMDCs. In particular, there are very limited data available for countries in Africa (1 country) and the Middle East (3 countries). Thus, while over 80 percent of the AEs are covered, only one fifth of the EMDCs are included (Table AII.1). A broader coverage of EMDCs is constrained in part by the lack of availability of input-output tables (and if available, they may be out-dated). These tables, together with bilateral trade data, are the main inputs for estimating a country’s exports (and imports) on a value added basis. The country-specific input-output tables are made consistent—that is the aggregate of exports and imports within the OECD-WTO sample is equalized.⁴

¹ For extensive background information on measuring trade on a value-added basis, see Annex II in SM/12/236 (Supp. 1). See also Box 1 for a discussion of the challenges in measuring trade on a value-added basis.

² See www.oecd.org/trade/valueadded. The OECD-WTO sample includes 56 economies (54 IMF members, Hong Kong SAR, and Taiwan, Province of China) as well as a measure for the “Rest of the World”.

³ See www.oecd.org/sti/ind/TIVA_stats%20flyer_ENG.pdf.

⁴ This is to ensure global consistency across this group of countries.

3. **For goods exports, the OECD-WTO value added data are similar to those provided in previous academic studies (Table AII.2).**⁵ The value added ratios computed using OECD data vary substantially across countries, and are similar to those provided earlier by Johnson and Noguera (2012)⁶ for 91 countries (for 2004).⁷ For the 54 countries in the OECD sample, the value added to exports ratio (VAX ratio) for 2008-09 ranges from 0.41 percent in the case of Luxembourg to 0.97 for Saudi Arabia. More than one third of the countries in the sample have VAX ratios between 0.65 and 0.80, resulting in a cross-country average of 0.71. The average of these VAX ratios is very close to the corresponding sample in the Johnson and Noguera study.⁸ The standard deviation for the time-series for the OECD data (for 2008-2009), and the Johnson and Noguera series (for 2004) are also about the same, and the correlation between the series is very high (over 0.90). These results suggest that over relatively short periods of time, the VAX ratios appear to be relatively stable.

4. **Unlike previous academic estimates of trade in value added, the OECD-WTO dataset also provides estimates of imports in value-added terms.** The OECD-WTO estimates a variable which measures foreign value added in gross imports. This variable—value added in imports—(VAM) is calculated at the country level using the VAX ratios across each country's trading partners. As table AII.2 shows, VAM ratios are much more homogenous than VAX ratios across the sample. This may be due to several factors: in general, a country's imports tend to be more diversified than its exports and, across countries, import baskets tend to be more similar than exports. In the OECD-WTO data, since a country's VAM ratio is essentially an average of its trade partners' VAX ratios, the averaging effect may also tend to lower dispersion. Moreover, the limited sample size implies that most countries have significant trade with the "rest of the world" grouping (which includes most commodity exporters) thus reducing heterogeneity even further.

5. **The OECD-WTO's value-added ratios are estimates based on quite stringent assumptions, similar to those used by most academic studies.** The OECD-WTO employs, as do most studies on this subject, the "proportionality assumption" whereby bilateral trade data are divided into final and intermediate consumption goods using overall shares of intermediate to final

⁵ See Annex V of SM/12/272 (November 8, 2012): "Value Added Trade Data." In addition to the study noted above, estimates for 30 countries have been provided by Stehrer et al.(2012)⁵ for 1995, 2000, 2007, and 2009 and Koopman et al. (2012)⁵ for 17 countries for 2007.

⁶ Johnson, Robert C. and Guillermo Noguera (2012a)—Accounting for Intermediates: Production Sharing and Trade in Value-added," *Journal of International Economics* 86, pp. 224-236. Johnson and Noguera (2012b), "Fragmentation and trade in value added over four decades," NBER Working Paper 18186, report values for 42 countries in the period 1970-2009.

⁷ The value added to export ratio (VAX) are computed using the OECD data for value added and for total exports; the corresponding value added to import ratio (VAM) is computed analogously. Staff noted some discrepancies between the quota data (based on IFS) and the total export and import data from OECD-WTO. These may in part reflect re-exports and the consistency step mentioned in paragraph 2 above, and the staff are working with the OECD to clarify the reasons for the discrepancies

⁸ Johnson and Noguera study has 50 countries that overlap with the OECD sample.

consumption goods at the sectoral level for each country, based on the country's input-output tables.⁹ This is likely to generate a downward bias in the estimates of the use of foreign inputs in some sectors, as well as underestimating the effects of offshoring.¹⁰ Moreover, these estimates also use the "production assumption" that all firms in each industry employ the same production technology. In addition, as noted above, assumptions are made to harmonize the aggregate of exports and imports within the sample.

6. **In addition to the stringent assumptions and the limited sample, the value added estimates only cover trade flows.** Thus, there remains an important issue of the components of the current account not covered by the VAX ratios (including investment income), which are significant—close to 25 percent on average and as high as 70 percent. For some countries, there are also significant differences between the trade data used in the OECD-WTO estimates and those reported to IFS (and used in quota calculations).¹¹

Table AII.1. Number of Countries with OECD-WTO VAX Ratios

	Membership	OECD-WTO
Advanced economies	26	21
Major advanced economies	7	7
Other advanced economies	19	14
Emerging Market and Developing Countries 1/	162	33
Africa	52	1
Asia	32	12
Middle East, Malta and Turkey	16	3
Western Hemisphere	32	5
Transition economies	30	12
Total	188	54

Source: IMF Finance Department.

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

⁹ The proportionality assumption rules out economies of scale, the existence of a variable fixed cost per unit of production, etc. Methods to relax the proportionality assumption are feasible but their non-linear approximations are far too complicated to estimate.

¹⁰ See Puzzello, Laura (2012) "A Proportionality Assumption and Measurement Biases in the Factor Content of Trade," *Journal of International Economics*, Elsevier, vol. 87(1), pages 105-111; and Winkler, Deborah and William Milberg (2009), "Errors from the 'proportionality assumption' in the measurement of Offshoring: Application to German Labor Demand." SCEPA Working Paper 2009-12, The New School.

¹¹ As noted in the main paper, there are a number of adjustments applied to the bilateral merchandise data used in the estimation. For instance, OECD notes that the published trade statistics are adjusted for re-exports among other flows. See *Trade in Value-Added: Concepts, Methodologies and Challenges (Joint OECD-WTO Note)*; <http://www.oecd.org/sti/ind/49894138.pdf>.

Table AII.2. Value Added Ratios, OECD-WTO and Johnson and Noguera Data

		Value Added Ratio for Exports					Value Added Ratio for Imports 2008-2009
		OECD-WTO		Johnson and Noguera 2004	(2) - (1)	(2) - (3)	
		2005 (1)	2008-2009 (2)	(3)			
1	Luxembourg	0.43	0.41	0.40	-0.02	0.01	0.80
2	Singapore	0.48	0.48	0.37	0.01	0.11	0.75
3	Hungary	0.51	0.58	0.54	0.07	0.04	0.71
4	Slovak Republic	0.52	0.54	0.55	0.02	-0.01	0.71
5	Estonia	0.52	0.64	0.53	0.12	0.11	0.74
6	Ireland	0.53	0.56	0.66	0.03	-0.10	0.83
7	Philippines	0.54	0.60	0.58	0.06	0.02	0.73
8	Belgium	0.58	0.62	0.48	0.04	0.14	0.74
9	Malaysia	0.58	0.62	0.59	0.04	0.03	0.70
10	Slovenia	0.59	0.63	0.64	0.04	-0.01	0.71
11	Malta	0.59	0.61	0.63	0.02	-0.02	0.76
12	Czech Republic	0.59	0.60	0.59	0.01	0.01	0.71
13	Iceland	0.61	0.64	n.a.	0.03	n.a.	0.77
14	Lithuania	0.61	0.61	0.63	0.00	-0.02	0.79
15	Thailand	0.62	0.64	0.60	0.02	0.04	0.79
16	Israel	0.62	0.67	n.a.	0.05	n.a.	0.73
17	Cambodia	0.62	0.65	0.62	0.03	0.03	0.74
18	Korea	0.62	0.58	0.63	-0.04	-0.05	0.79
19	China 1/	0.64	0.67	0.70	0.03	-0.03	0.74
20	Vietnam	0.65	0.62	0.58	-0.03	0.04	0.67
21	Netherlands	0.66	0.64	0.69	-0.02	-0.05	0.76
22	Finland	0.66	0.65	0.72	-0.01	-0.07	0.76
23	Sweden	0.67	0.66	0.72	-0.01	-0.06	0.73
24	Austria	0.68	0.67	0.67	-0.01	0.00	0.73
25	Denmark	0.68	0.67	0.73	-0.01	-0.06	0.75
26	Bulgaria	0.68	0.64	0.63	-0.04	0.01	0.75
27	Mexico	0.69	0.70	0.67	0.00	0.03	0.75
28	Poland	0.69	0.71	0.70	0.01	0.01	0.72
29	Switzerland	0.71	0.71	0.67	0.00	0.04	0.71
30	Latvia	0.71	0.73	0.64	0.02	0.09	0.74
31	Romania	0.72	0.74	0.70	0.03	0.04	0.73
32	Spain	0.72	0.77	0.75	0.05	0.02	0.75
33	Italy	0.73	0.79	0.77	0.06	0.02	0.75
34	Portugal	0.74	0.66	0.68	-0.08	-0.02	0.74
35	Germany	0.74	0.73	0.74	-0.02	-0.01	0.73
36	Canada	0.74	0.80	0.70	0.05	0.10	0.79
37	France	0.75	0.74	0.73	-0.01	0.01	0.74
38	Greece	0.76	0.76	0.77	0.00	-0.01	0.76
39	Turkey	0.79	0.76	0.76	-0.03	0.00	0.75
40	United Kingdom	0.80	0.82	0.79	0.02	0.03	0.75
41	New Zealand	0.80	0.80	0.82	0.00	-0.02	0.76
42	India	0.80	0.77	0.81	-0.03	-0.04	0.80
43	Indonesia	0.82	0.84	0.79	0.02	0.05	0.71
44	Chile	0.82	0.80	0.80	-0.02	0.00	0.78
45	South Africa	0.83	0.81	0.80	-0.02	0.01	0.75
46	Norway	0.86	0.85	0.87	-0.01	-0.02	0.74
47	Japan	0.86	0.83	0.85	-0.03	-0.02	0.79
48	Brazil	0.87	0.90	0.86	0.03	0.04	0.77
49	Australia	0.87	0.87	0.86	0.00	0.01	0.73
50	Argentina	0.87	0.87	0.84	0.00	0.03	0.77
51	United States	0.88	0.87	0.77	-0.01	0.10	0.74
52	Russian Federation	0.92	0.93	0.87	0.01	0.06	0.75
53	Brunei Darussalam	0.93	0.90	n.a.	-0.03	n.a.	0.70
54	Saudi Arabia	0.97	0.97	n.a.	0.00	n.a.	0.81
Mean		0.70	0.71	0.69	0.01	0.01	0.75
Median		0.69	0.68	0.70	0.00	0.01	0.75
Rest of the World		0.78	0.81				0.75

n.a. : not available

Source: IMF Finance Department, OECD-WTO, and Johnson and Noguera (2012a).

1/ Including China, P.R. (Mainland) and Hong Kong SAR.

Box AII.1. Measurement Challenges of Trade on a Value-Added Basis¹

Despite the recent OECD-WTO initiative, there is no internationally agreed methodological framework for measuring trade on a value-added basis, unlike the international guidelines on measuring trade which focus on gross values of goods and services.² Further, it is not possible to measure trade on a value-added basis directly using official trade statistics. Official macroeconomic statistics compiled by national agencies are predicated on the concept of residence, and these statistics cover the activities of resident units (the national economy) with other resident units and/or between resident units and units in the rest of the world. For measuring trade on a value-added basis, the official statistics may provide some information on the domestic or import content of its exports, but it is not possible to directly measure imported goods on a value-added basis, or to measure the domestic content of imports, even with data from trading partners or third economies.

Much of the work on developing measures of trade on a value-added basis has therefore focused on the use of international input-output tables, which have been constructed by combining the national input-output tables available from national statistical agencies. For example, the WIOD, covering 40 countries for the period 1995–2009, became available in May 2012. The Asian International Input-Output Tables, covering 10 countries for 1985, 1990, 1995, and 2000, are also available. The OECD Input-Output Database, covering 33 OECD member countries and 15 non-OECD member economies for years around 1995, 2000, and 2005, is often used together with the OECD Bilateral Trade Database to construct an international input-output table with a so-called proportionality assumption.³

There are various challenges to the use of national input-output tables as part of a global framework. First, the national input-output tables vary widely in terms of the level of detail and scope, and are therefore not consistent. Second, the availability of national input-output tables for a broad cross-section of economies, particularly developing and emerging market economies, is limited. The development of input-output tables is a resource intensive exercise, a difficult undertaking on a regular or timely basis.

¹ Prepared by Thomas F. Alexander (STA).

² A number of conferences and workshops have addressed measurement challenges: an OECD-World Bank workshop on “new metrics for global value chains” was organized in September 2010; WTO hosted a Global Forum on Trade Statistics in February 2011, in collaboration with Eurostat, United Nations Statistics Division, and UNCTAD; and a World Bank workshop on “the fragmentation of global production and trade in value added—developing new measures of cross border trade” was organized in June 2011.

³ An assumption that final and intermediate goods trade patterns are proportional to gross trade patterns is required.

Annex III. Alternative Measures for Adjusting Openness

This annex explores different approaches that have been considered to address Directors' concerns regarding the openness measure in the formula. The impact on openness shares of the two capping approaches—in absolute terms, and in shares—is broadly similar: members with relatively open economies continue to benefit from openness, but the extent of the gain is constrained for those with very high ratios. Compression generates smaller losses for countries with very high ratios but relatively large and dispersed gains.

1. **As part of the review of the quota formula, staff explored several approaches to address issues with openness in the formula.**¹ These included: (i) the use of a cap on the ratio of openness (measured in nominal terms) relative to market GDP (“absolute cap”); (ii) a cap on the ratio of the openness share to the GDP blend share in the formula (“shares cap”); and (iii) the use of compression on the absolute measure of openness relative to market GDP. Under all three approaches, members with relatively open economies would still benefit from the inclusion of openness in the formula, but the extent of the gain would be constrained for those members with very high ratios. In addition to those approaches, the main text also explores the effects of lowering the weight of openness in the quota formula.

Capping in absolute and share terms

2. **The first two approaches employ a threshold to limit the extent to which a member may benefit from openness.** Under the first approach, an absolute cap, limits the maximum size of a member's openness relative to its market GDP in nominal terms. In previous discussions, the cap was based on a given percentile² (the use of percentiles allows for the likelihood that openness ratios will rise over time for most members). The results obtained from the cap are then converted into shares for use in the formula. Under the second approach, a shares cap, the maximum boost in CQS that a member could receive from its openness share relative to its GDP blend share is limited. This approach operates directly on variables in the formula which are expressed in shares.

3. **In principle these two approaches could yield equivalent results.** This is because the ratio in absolute terms can be converted to a ratio in shares by multiplying by a constant, which is the ratio of global GDP to global openness in absolute terms (see Box AIII.1).³ Since global GDP

¹ See SM/12/236, Annex IV.

² For instance, 95th or 85th percentile, which would correspond to thresholds of 2.28 and 1.57 for the ratios in absolute terms and affecting 10 and 29 members, respectively.

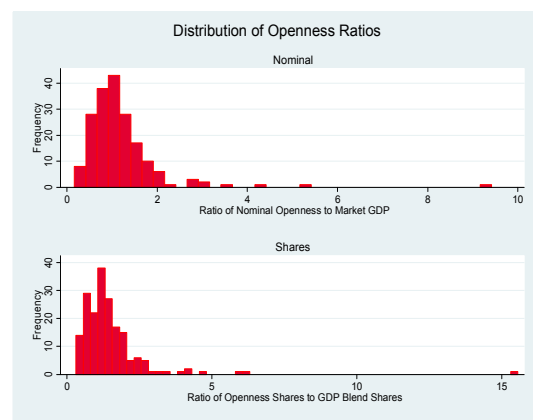
³ In order to compare the absolute cap with the shares cap, it is informative to first examine the case where the cap on shares is defined as the ratio between openness shares and market GDP shares. In this case, the rankings of the ratios on shares versus the ratios on nominal openness are the same and differ only by a multiplicative factor – the ratio of global GDP to global openness (1.4 in the current data set). Thus if the shares cap were

(continued)

is greater than global openness the equivalent threshold for capping in absolute terms will be lower than the threshold for capping in shares to yield the same results.⁴ The equivalence between the two approaches only holds if the numerator and denominator use the same underlying variables.

4. **In practice, however, there are differences in the two approaches.** First, the GDP variable used in the denominator differs—the first approach uses market GDP, while the second uses the GDP blend (the measure of GDP in the formula) which consists of both market GDP and PPP GDP. Thus, for a country whose PPP GDP is lower than its market GDP, the use of the blend variable, *ceteris paribus*, will result in a higher openness to GDP ratio than if market GDP were used.⁵ Secondly, computational differences arise due to the units of measurement. Under the first approach, openness in absolute terms is adjusted for those countries affected by the cap, and then new shares are computed based on the adjusted value of global openness. In the second approach, an adjustment is needed to ensure that the final ratio of openness shares to GDP blend shares of all members remains under the cap, after rebasing the shares to add up to 100, requiring an iterative procedure.⁶

5. **In both approaches, the choice of threshold is important.** The thresholds determine gainers and losers, and also how these changes are distributed.⁷ Under the shares cap, countries which have ratios of openness shares to GDP blend shares above the threshold of the cap will unambiguously lose openness shares. However, under the absolute cap, some countries whose ratio of nominal openness to market GDP is only slightly above the threshold may actually gain openness shares. In previous



defined over market GDP, for any ratio used in the shares cap, there would be a corresponding percentile of the nominal cap which would produce the same capped openness shares for all members (See Box A.III.1).

⁴ This explains why in previous papers an absolute cap on openness relative to GDP set at the 85th percentile, which corresponds to an absolute ratio of 1.6 negatively affects 26 countries, while a 1.5 cap on shares results in losses for 65 countries; thus, the results for an absolute cap at the 85th percentile are closer to a cap in share terms of 2.0.

⁵ The use of PPP GDP, therefore, changes the rankings and a direct mapping is not possible. See Box A.III.1 for an analytical mapping.

⁶ For those gaining countries whose original openness shares to GDP blend shares ratios are slightly below the threshold, their ratios may exceed the threshold after rebasing the shares to 100. Then, an iterative procedure is needed to make sure all members' final ratios are below the cap.

⁷ For example, under the absolute cap with a cut off at 95th, the Netherlands *gains* share (from 3.08 to 3.15); but loses both under the 85th percentile cap and the 75th percentile; Sweden is a similar case under the shares cap. On the other hand, even though the nominal cap is binding for Thailand, it ends up having minor gains because the reduction in global openness due to capping (in proportionate terms) is greater than the reduction in Thailand's openness.

discussions, staff have considered thresholds of the 85th and 95th percentile for the absolute cap and 2.0 and 1.5 for the ratio cap.⁸

6. **As noted in the main text, further information about the thresholds can be gained from the distribution of openness ratios illustrated in the text figure.** The basic approach is to first adjust the distributions so that they are less asymmetric. This is done by removing the outliers from the sample in order to generate a more symmetric distribution. Second, a simple standard deviation measure is used to determine the placement of the threshold. For example, for the absolute cap, dropping from the sample all ratios higher than 2.0 (13 countries) yields a more symmetric distribution around a mean of 1.0, with a standard deviation of 0.4.⁹ A threshold of one standard deviation from the mean would be equivalent to a 76th percentile cut-off and contain all countries with openness ratios higher than 1.4. A similar approach can be applied to the ratio of shares in openness relative to the GDP blend. In this case, if observations above a ratio of 2.5 (16 countries) are removed, this would yield a distribution around a mean of 1.22, with a standard deviation of 0.50. Applying to this a one standard deviation from the mean would imply a cutoff of 1.72. The cutoffs implied by this approach closely correspond to a simple method of setting the cap at the top quartile of the distributions of both openness ratios and shares—a 75th percentile cap for the nominal ratios and a 1.7 cap on shares. The implications of these thresholds are discussed in the main text.

Compression

7. **Staff also explored the use of a compression factor on the openness variable, similar to that used for the formula as a whole.** Compression maintains the original ranking of the series and narrows its dispersion. This approach uses the ratio of openness to market GDP in nominal terms (same as the first cap above) and reduces the wide dispersion of the series by increasing the nominal openness for those countries whose ratios are below 1 and decreasing openness of those with ratios above 1.¹⁰ Two compression factors were explored in previous work, 0.95 (used in the formula) and 0.70. The latter factor reduces the mean of the modified openness to GDP ratio from 1.2 to 1.1, which is roughly equal to the average of the original series excluding the five members with the largest openness to GDP ratios. While the former factor had only a modest impact, the latter has more pronounced effects for the top ranking members (see below and Table AIII.1).

⁸ See Annex IV, SM/12/236, Sup.1.

⁹ Eliminating from the distribution all countries with absolute openness ratios higher than 2.0 leads to a decline in both the skewness (from 5.11 to 0.33) and kurtosis (from 39.63 to -0.49). A similar effect occurs for the distribution of shares ratio whose skewness and kurtosis decline markedly (from 6.65 to 0.37 and 63.17 to -0.53, respectively) after the removal of all observations above 2.5.

¹⁰ This implication in general does not hold for openness shares; whether a country gains or loses shares depends on its change in nominal openness relative the change in global openness.

Comparing the Effect of Caps

8. **Capping is more targeted at those members which have very high ratios of openness to GDP.** The absolute cap negatively affects about as many countries as the corresponding percentile (10 for the 95th percentile, 26 for the 85th percentile, and 40 for the 75th percentile);¹¹ by way of comparison, the cap on shares results in losses in openness for 29, 45, and 65 countries with the 2.0, 1.7, and 1.5 caps, respectively. The largest effects are on those countries with the highest ratios (Table AIII.2).

9. **Most countries gain the same proportional amount under capping.** For the absolute caps at the 75th, 85th, and 95th percentile, 141, 159, and 178 countries gain 6.2, 4.2, and 2.2 percent, respectively. In the 1.5, 1.7, and 2.0 share caps, 99, 127, and 151 countries gain 17.8, 11.3 and 7.4 percent, respectively. There are however, some countries which gain less than these amounts. In the case of the absolute cap, 7 countries gain less than 6.2 percent when an 75th percentile cap is applied, and 3 countries gain less than 4.2 percent under the 85th percentile cap. The absolute openness to GDP ratios of these countries are slightly above the threshold. Although their openness to GDP ratios are capped at the threshold, the reduction in the global openness due to capping is greater than the reduction in their openness to GDP ratios. As a result, these countries actually gain from capping openness, although to a smaller degree than most other gaining countries. Under the 1.5, 1.7, and 2.0 share caps, there are 24, 16, and 8 countries, respectively, which gain less than the percentages above. These are countries whose shares ratios are originally close to the threshold, and thus their gains are capped in order to ensure that the threshold holds for all members.¹²

10. **For the specific thresholds considered here, caps on shares imply an aggregate shift in openness shares from AEs to EMDCs, while the absolute caps generate the opposite shift** (Table AIII.3). The two capping methods also have somewhat different impact on advanced economies, with major advanced economies tending to gain more and other advanced economies tending to lose more under the caps on shares. With respect to the absolute caps, all the losses of EMDCs are explained by Asia, where Singapore loses significant openness shares under these caps.

11. **Both capping methods imply a shift in openness shares from richer to lower-income members** (Table AIII.4). While the top quartile of countries by GDP per capita has losses in openness shares up to 3.91 pps, the bottom three quartiles all gain under both approaches. The number of countries in the top quartile by GDP per capita which lose openness shares is also significantly higher than in each of the bottom three quartiles. The cap also implies a shift in

¹¹ As noted above, some countries slightly above the cap end up gaining openness shares.

¹² One example of this is Korea which has a shares ratio of 1.41 and thus can only gain 6.1 percent of openness shares in order to ensure that its new ratio will not be above 1.50.

openness shares towards larger members, but the overall magnitudes are smaller than in the case of GDP per capita.

12. **In contrast to the caps, compression negatively affects the vast majority of members.** 125 countries lose openness shares with a compression factor of 0.95, and 127 lose with a factor of 0.70. Compared to capping, the distributions of percent changes in openness shares under compression are much more dispersed (Figure AIII.1). Compression methods generate a gain in openness shares for advanced economies because of the significant gains for those countries which are relatively closed, combined with relatively smaller losses for other advanced economies.

Figure AIII.1. Distribution of Changes in Openness Shares under Compressions

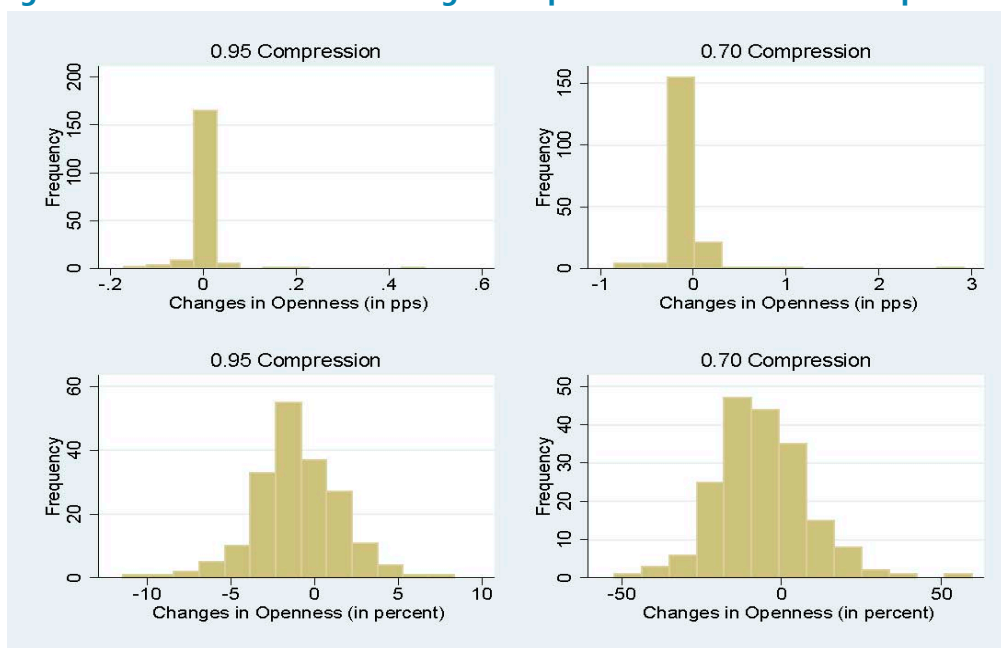


Table AIII.1. Top Losers and Gainers using Compression (In percent)

<i>Top Losers</i>					<i>Top gainers</i>				
	Openness Share	0.95	0.70			Openness Share	0.95	0.70	
1	Luxembourg	1.126	-11.4	-52.4	Syrian Arab Republic	0.090	8.2	58.2	
2	San Marino	0.017	-8.8	-43.4	Brazil	1.142	6.2	41.7	
3	Singapore	2.149	-7.9	-39.9	Myanmar	0.031	4.6	29.5	
4	Liberia	0.011	-7.0	-36.3	Japan	4.303	4.3	27.3	
5	Maldives	0.010	-6.3	-33.2	Central African Republic	0.002	3.9	24.0	
6	Ireland	1.426	-6.2	-32.6	Colombia	0.247	3.8	23.5	
7	Tuvalu	0.000	-6.1	-32.5	Sudan	0.065	3.8	23.0	
8	Malta	0.054	-6.0	-31.8	United States	12.989	3.7	22.5	
9	Seychelles	0.005	-5.7	-30.8	Venezuela	0.331	3.3	20.2	
10	Lesotho	0.011	-5.2	-28.3	Argentina	0.371	3.2	18.9	
11	Marshall Islands	0.001	-4.6	-25.8	Pakistan	0.193	3.0	17.6	
12	Bahrain	0.105	-4.5	-25.3	Indonesia	0.728	2.9	16.9	
13	Hungary	0.596	-4.4	-24.8	Burundi	0.002	2.7	16.1	
14	Belgium	2.131	-4.2	-24.0	Iran	0.450	2.7	15.4	
15	Palau, Republic of	0.001	-4.2	-23.7	Australia	1.360	2.6	15.1	
16	Equatorial Guinea	0.054	-4.2	-23.6	India	1.793	2.5	14.1	
17	Congo, Republic of	0.046	-4.0	-22.9	Burkina Faso	0.011	2.3	12.9	
18	Estonia	0.082	-3.9	-22.4	Rwanda	0.007	2.1	12.1	
19	Malaysia	0.990	-3.8	-22.0	Turkey	0.851	2.1	12.0	
20	Lebanon	0.148	-3.8	-21.7	Egypt	0.278	2.0	11.2	

Table AIII.2. . Top Losers under Capped Openness Shares and Capped Absolute Openness (In percent)

Capped Openness (Shares)					Capped Openness (Absolute)				
	Openness Share	2.0	1.70	1.5		95th	85th	75th	
1	Luxembourg	1.13	-87.1	-89.0	-90.3	Luxembourg	-74.9	-82.4	-84.6
2	San Marino	0.02	-67.7	-72.6	-75.8	San Marino	-55.4	-68.8	-72.7
3	Singapore	2.15	-65.8	-71.0	-74.4	Singapore	-45.4	-61.8	-66.6
4	Ireland	1.43	-57.3	-63.7	-68.0	Liberia	-33.8	-53.6	-59.5
5	Liberia	0.01	-53.2	-60.2	-64.9	Maldives	-22.3	-45.6	-52.5
6	Tuvalu	0.00	-52.2	-59.4	-64.1	Ireland	-20.2	-44.1	-51.2
7	Malta	0.05	-49.1	-56.7	-61.8	Tuvalu	-19.6	-43.7	-50.9
8	Maldives	0.01	-42.7	-51.3	-57.0	Malta	-16.8	-41.7	-49.1
9	Belgium	2.13	-36.6	-46.1	-52.5	Seychelles	-12.6	-38.8	-46.6
10	Lesotho	0.01	-31.1	-41.5	-48.3	Lesotho	-1.6	-31.1	-39.9
11	Bahrain	0.11	-28.7	-39.4	-46.5	Marshall Islands		-22.8	-32.6
12	Netherlands	3.08	-26.8	-37.8	-45.1	Bahrain		-21.2	-31.3
13	Switzerland	1.97	-26.3	-37.4	-44.7	Hungary		-19.4	-29.7
14	Seychelles	0.01	-24.5	-35.8	-43.4	Belgium		-16.3	-27.0
15	Hungary	0.60	-24.1	-35.5	-43.1	Palau, Republic of		-15.3	-26.1
16	Estonia	0.08	-20.4	-32.3	-40.3	Equatorial Guinea		-14.9	-25.7
17	Iceland	0.05	-17.4	-29.8	-38.0	Congo, Republic of		-12.4	-23.5
18	Palau, Republic of	0.00	-16.3	-28.9	-37.2	Estonia		-10.4	-21.8
19	United Arab Emirates	1.00	-16.1	-28.7	-37.1	Malaysia		-9.1	-20.6
20	Slovak Republic	0.35	-15.2	-28.0	-36.4	Lebanon		-7.6	-19.3
Maximum Gains		7.4	11.3	17.8		2.2	4.2	6.2	
Number of Gainers		159	143	123		178	162	148	

Table AIII.3. Changes in Openness Shares due to Capping and Compression Methods
(absolute changes in pps)

	Openness Shares	Capped Openness (Shares)			Capped Openness (Absolute)			Compression	
		2.0	1.70	1.5	95th	85th	75th	0.95	0.7
Advanced economies	60.71	-0.49	-0.82	-1.42	0.16	0.19	0.22	0.07	0.43
Major advanced economies	40.68	3.02	3.91	4.12	0.91	1.72	2.51	0.58	3.32
United States	12.99	0.96	1.46	2.32	0.29	0.55	0.80	0.48	2.92
Japan	4.30	0.32	0.48	0.77	0.10	0.18	0.27	0.19	1.18
Germany	7.95	0.59	0.23	-0.73	0.18	0.34	0.49	-0.09	-0.65
France	4.52	0.34	0.51	0.81	0.10	0.19	0.28	0.02	0.04
United Kingdom	5.12	0.38	0.58	-0.07	0.11	0.22	0.32	-0.05	-0.36
Italy	3.22	0.24	0.36	0.57	0.07	0.14	0.20	0.03	0.15
Canada	2.57	0.19	0.29	0.46	0.06	0.11	0.16	0.01	0.04
Other advanced economies	20.03	-3.51	-4.73	-5.54	-0.75	-1.53	-2.29	-0.52	-2.89
Spain	2.44	0.18	0.27	0.44	0.05	0.10	0.15	0.01	0.03
Netherlands	3.08	-0.83	-1.17	-1.39	0.07	-0.13	-0.51	-0.11	-0.64
Australia	1.36	0.10	0.15	0.24	0.03	0.06	0.08	0.04	0.21
Belgium	2.13	-0.78	-0.98	-1.12	0.05	-0.35	-0.57	-0.09	-0.51
Switzerland	1.97	-0.52	-0.74	-0.88	0.04	0.08	-0.13	-0.06	-0.36
Sweden	1.27	0.01	-0.18	-0.31	0.03	0.05	0.08	-0.02	-0.15
Austria	1.14	-0.03	-0.20	-0.31	0.03	0.05	0.07	-0.03	-0.16
Norway	0.87	0.06	0.05	-0.06	0.02	0.04	0.05	0.00	-0.04
Ireland	1.43	-0.82	-0.91	-0.97	-0.29	-0.63	-0.73	-0.09	-0.47
Denmark	0.88	-0.06	-0.18	-0.26	0.02	0.04	0.05	-0.02	-0.11
Luxembourg	1.13	-0.98	-1.00	-1.02	-0.84	-0.93	-0.95	-0.13	-0.59
Emerging Market and Developing Countries 1/	39.29	0.49	0.82	1.42	-0.16	-0.19	-0.22	-0.07	-0.43
Africa	2.67	0.16	0.21	0.28	0.05	0.08	0.10	-0.01	-0.08
South Africa	0.50	0.04	0.06	0.09	0.01	0.02	0.03	0.01	0.03
Nigeria	0.41	0.03	0.05	0.07	0.01	0.02	0.03	0.00	-0.02
Asia	18.93	-0.31	-0.03	0.29	-0.60	-0.75	-0.78	-0.07	-0.40
China 2/	8.53	0.63	0.96	1.52	0.19	0.36	0.53	0.13	0.71
India	1.79	0.13	0.20	0.32	0.04	0.08	0.11	0.04	0.25
Korea	2.44	0.18	0.27	0.15	0.05	0.10	0.15	-0.04	-0.24
Indonesia	0.73	0.05	0.08	0.13	0.02	0.03	0.04	0.02	0.12
Singapore	2.15	-1.41	-1.52	-1.60	-0.98	-1.33	-1.43	-0.17	-0.86
Malaysia	0.99	-0.06	-0.20	-0.29	0.02	-0.09	-0.20	-0.04	-0.22
Thailand	0.98	0.07	0.04	-0.08	0.02	0.04	0.00	-0.03	-0.16
Middle East, Malta and Turkey	5.42	0.07	0.00	-0.15	0.11	0.16	0.14	-0.03	-0.18
Saudi Arabia	1.14	0.08	0.13	0.04	0.03	0.05	0.07	-0.02	-0.11
Turkey	0.85	0.06	0.10	0.15	0.02	0.04	0.05	0.02	0.10
Iran, Islamic Republic of	0.45	0.03	0.05	0.08	0.01	0.02	0.03	0.01	0.07
Western Hemisphere	5.02	0.37	0.54	0.83	0.11	0.21	0.29	0.12	0.72
Brazil	1.14	0.08	0.13	0.20	0.03	0.05	0.07	0.07	0.48
Mexico	1.53	0.11	0.17	0.27	0.03	0.06	0.09	0.02	0.08
Venezuela, República Bolivariana de	0.33	0.02	0.04	0.06	0.01	0.01	0.02	0.01	0.07
Argentina	0.37	0.03	0.04	0.07	0.01	0.02	0.02	0.01	0.07
Transition economies	7.25	0.19	0.10	0.18	0.16	0.11	0.02	-0.07	-0.49
Russian Federation	2.11	0.16	0.24	0.38	0.05	0.09	0.13	0.03	0.17
Poland	1.05	0.08	0.12	0.19	0.02	0.04	0.06	-0.01	-0.07
Total	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Memorandum items:									
EU27	39.58	-1.75	-2.91	-4.81	-0.31	-0.91	-1.25	-0.67	-4.03
LICs 3/	2.21	0.14	0.19	0.21	0.04	0.07	0.03	-0.02	-0.12

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 AIII.4. Absolute Change in Openness Shares 1/
(absolute changes in pps)

<i>Absolute Change in Openness Shares by Quartile of GDP per Capita (in pps)</i>								
	Cap				Percentile Cap		Compression	
	2	1.7	1.5	0.95	0.85	0.75	0.95	0.7
Top Quartile	-1.98	-2.68	-3.91	-0.65	-1.05	-1.27	-0.27	-1.46
3rd	1.47	1.97	2.92	0.50	0.77	0.94	0.23	1.23
2nd	0.38	0.53	0.79	0.12	0.21	0.30	0.06	0.30
Bottom Quartile	0.13	0.18	0.20	0.04	0.07	0.03	-0.01	-0.07
<i>Number of Losers by Quartile of GDP per Capita</i>								
Top Quartile	18	23	30	5	11	16	38	38
3rd	5	8	12	1	6	8	31	31
2nd	4	10	16	2	6	10	33	35
Bottom Quartile	2	4	7	2	3	6	23	23
<i>Absolute Change in Openness Shares by Quartile of Market GDP (in pps)</i>								
	Cap				Percentile Cap		Compression	
	2	1.7	1.5	0.95	0.85	0.75	0.95	0.7
Top Quartile	0.80	0.95	1.11	0.67	0.86	1.06	0.26	1.42
3rd	-0.78	-0.88	-1.01	-0.68	-0.82	-0.97	-0.22	-1.20
2nd	-0.01	-0.05	-0.07	0.02	-0.02	-0.06	-0.03	-0.18
Bottom Quartile	-0.01	-0.02	-0.03	-0.01	-0.02	-0.03	-0.01	-0.04
<i>Number of Losers by Quartile of Market GDP</i>								
Top Quartile	9	12	16	2	5	8	23	23
3rd	6	10	16	1	4	8	27	29
2nd	6	11	14	1	6	10	36	36
Bottom Quartile	8	12	19	6	11	14	39	39

1/ There are 47 countries in each quartile.

Box AIII.1: Relationship between Cap on Shares and Nominal Cap

In order to compare the cap on shares with the cap on absolute ratios, it is informative to first examine the case where the cap on shares is defined on the ratio between openness shares and market GDP shares. In this case, the rankings of the ratios on shares versus the ratios on nominal openness are the same and differ only by a multiplicative factor – the ratio of global GDP to global openness:

$$SR = NR \times F, \text{ where}$$

SR = ratio of openness shares to market GDP

NR = ratio of nominal openness to nominal market GDP

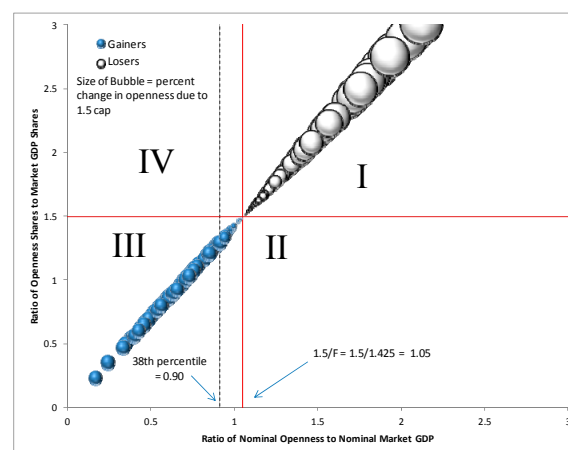
F = Global GDP/ Global Openness = 1.425

An example:

- Ratio of openness shares to market GDP shares for Denmark = 1.747
- Ratio of openness to market GDP in nominal terms = 1.226 = $SR/F = 1.747 / 1.425$

Thus if the shares cap were defined over market GDP, for any ratio used in the shares cap, there would be a corresponding percentile of the nominal cap which would produce the same capped openness shares for all members (the red lines in Figure).¹

However, due to the multiple iterations of the shares cap which assures that after rebasing, the openness shares of all countries (i) add up to 100 and (ii) no country's ratio of openness share to GDP blend share exceeds the cap value, for each cap on shares (e.g. 1.50) the corresponding ratio of nominal openness is not the shares cap value divided by F; it is lower. The nominal cap must be low enough such that the impact of the subsequent rounds using the shares cap will be taken into account by the one-off nominal cap



(the dashed vertical line in the Figure). Moreover, as the figure shows, the countries affected by the iterative step are those which will have smaller percentage gains than most (those countries between the dashed and the red lines).

- In order to generate the same results as the 2.0 SR cap using the nominal cap, one needs an NR threshold which is lower than $(2.0/F) = 1.40$; the exact number is about 1.31 which is equivalent to a 72nd percentile.

¹ One way to see this is the fact that, for any vertical line, there exists a horizontal line which will affect the same exact countries, e.g., quadrants II and IV are empty.

Box AIII.1: Relationship between Cap on Shares and Nominal Cap (concluded)

However, the cap on shares is defined over the ratio of openness shares over GDP blends shares. This implies that, for countries whose PPP GDP is lower than its market GDP, the use of the blend variable instead of the market GDP, *ceteris paribus*, will increase the likelihood that the country will be affected by the openness share cap vis-à-vis the nominal cap (vice-versa for the countries whose PPP GDP is higher than market GDP).

Furthermore, the inclusion of PPP GDP in the shares ratio implies that the rankings of the countries' openness ratios will differ across the two caps and thus, under the current definition, no direct mapping between the two caps is possible. Graphically, this is equivalent to the fact that no vertical line can cut off the same exact countries as a horizontal line (e.g., there are countries in quadrants II and IV).

Annex IV. Variability and Balance of Payments Difficulties

This Annex responds to a request by a few Directors to examine if there is a link between variability and balance of payments difficulties. Previous analysis had explored the relationship between variability with the need for Fund resources and found essentially no correlation. In this note, balance of payments difficulties are proxied by two sets of measures, based on exchange market pressure and external sector vulnerability indicators. The findings suggest that the correlation between variability and measures of exchange market pressure or external sector vulnerability is close to zero.

1. **Background.** At the completion of the Quota Formula Review, a few Directors requested further work on variability, including on “the link between variability and balance of payments difficulties, irrespective of whether these difficulties lead to the use of Fund resources”. For the purposes of this analysis, balance of payments difficulties are approximated with a measure of exchange market pressure which has been often used in the economic literature to identify currency crises (see below). In addition, staff has looked into the relationship between variability and several external sector vulnerability indicators since in some cases there may be underlying vulnerabilities that do not immediately lead to balance of payments difficulties or may not be captured by the specific measure being used.
2. **Balance of payments difficulties.** Countries with weak fundamentals are generally more vulnerable to external shocks such as deterioration in the terms of trade or sudden stops in capital inflows. Such shocks usually put pressure on the exchange rate and in the worst case can result in a full-blown crisis characterized by a sharp depreciation of the currency and/or large decline in international reserves.¹ Although currency crises have been studied extensively, there does not seem to be a universally accepted method for identifying them or classifying their intensity. Most of the studies are based on some version of exchange market pressure index and crisis episodes are defined depending on whether the value of the index exceeds a pre-specified threshold in a given period.
3. **Exchange market pressure (EMP).** A single variable to proxy both exchange rate movements and official intervention was first used by Girton and Roper (1977) who constructed an EMP measure as the sum of the changes in the exchange rate and international reserves scaled by domestic base money.² Eichengreen, Rose, and Wyplosz (1995)³ used an alternative definition whereby the EMP index is calculated as a weighted average of the changes in the

¹ Kaminsky, G., Lizondo, S., Reinhart, C., “Leading Indicators of Currency Crises”, IMF Staff Papers, 45 (1), 1998, pp. 1-48.

² Girton, L., Roper, D., “A Monetary Model of Exchange Market Pressure Applied to the Postwar Canadian Experience”, American Economic Review 67 (4), 1977, pp. 537-548.

³ Eichengreen, B., Rose, A., Wyplosz, Ch., “Contagious Currency Crises. First Tests”, Scandinavian Journal of Economics, 98 (4), 1995, pp. 463-484.

exchange rate, reserves and interest rates with weights equal to the inverse standard deviations of the respective series. The rationale for this choice of weights is the need to equalize volatilities of the three components, so as to prevent any one of them from dominating the results. Crises are defined as the extreme values of the index which in this study is equivalent to values higher than 1.5 standard deviations above the mean. Sachs, Tornell, and Velasco (1996)⁴ and Kaminsky, Lizondo, and Reinhart (1998) did not include interest rates (due to data constraints). In the latter paper, periods in which the EMP index is more than 3 standard deviations above the mean are labeled as crises.

4. **Data and assumptions.** In the analysis below the EMP index is calculated as the weighted average of the changes in exchange rates (national currency per US dollar) and the negative of the changes in international reserves using quarterly data from IMF's International Financial Statistics database for the period 1995–2011. Following the recent literature, the weights are set equal to the inverse of the standard deviations of the individual country time series. As discussed above, this choice of weights would ensure that the index is not driven by only one of its components. The continuous EMP index is then transformed into a binary variable taking the value of one if an observation is above a certain threshold value and zero otherwise. Three different threshold values are used based on 1, 1.5 and 2 standard deviations from the mean. These thresholds are motivated by the focus on balance of payments difficulties rather than currency crises per se which are typically perceived as more severe events. Since variability data are available on an annual basis, the quarterly binary variables are aggregated. The aggregation is done by assigning the annual data point the value of one if at least one of the quarterly observations equals one and zero otherwise.

5. **EMP episodes and results.** The text table provides summary information for the three versions of the EMP variable depending on the threshold. When the mean plus 1 standard deviation is used to classify a given year as a year of balance of payments difficulties, about 34 percent of the observations fall into this category. This share drops to about 9 percent if the threshold of 2 standard deviations is applied.⁵ To examine whether countries where balance of payments

Table. Summary of the EMP measures using different threshold values

	1 SD	1.5 SD	2 SD
Total number of observations 1/	2845	2845	2845
Episodes of BOP difficulties	979	482	267
"Tranquil" periods	1866	2363	2578
	(in percent of total observations)		
Episodes of BOP difficulties	34.4	16.9	9.4
"Tranquil" periods	65.6	83.1	90.6

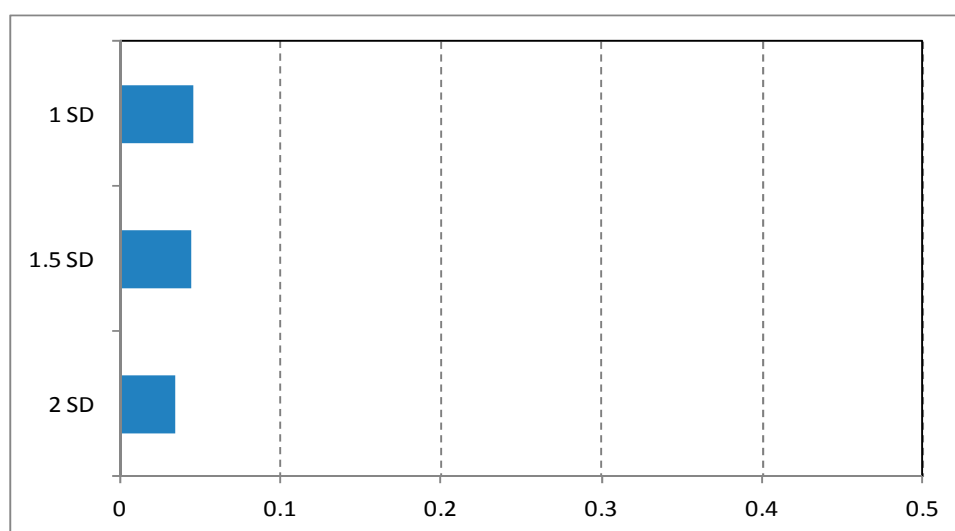
1/ An observation refers to a specific data point, i.e. the value of the binary variable for a given country in a given year.

⁴ Sachs, J., Tornell, A., Velasco, A., "Financial Crises in Emerging Markets: The Lessons from 1995", *Brookings Papers on Economic Activity*, 1, 1996, pp. 147-215.

⁵ This is broadly consistent with the number of IMF arrangements approved in the considered period representing about 11 percent of the total number of observations.

difficulties occur more frequently tend to have also higher shares in variability, staff calculated the correlation of variability with the EMP binary variables.⁶ As in previous work, the original variability variable for each country has been adjusted by subtracting the country's share in GDP in order to remove the effect of economic size ("adjusted" variability). Figure AIV.1 suggests that the relationship between variability and balance of payments difficulties measured by the various EMP measures is very weak with correlations ranging between 0.035 and 0.046. Furthermore, the result does not appear very sensitive to the choice of the threshold, with the correlation coefficient decreasing only marginally when increasing the threshold value from one to two standard deviations.⁷

Figure AIV.1. Point Biserial Correlation between EMP and Adjusted Variability



Source: Finance Department.

6. **Variability and external sector vulnerability indicators.** Variability was included in the quota formula to capture vulnerability to balance of payments shocks and potential need for Fund financing. Since vulnerabilities are not equivalent to crises (or more generally, to balance of payments difficulties), the scope of the analysis was expanded to include cases where external

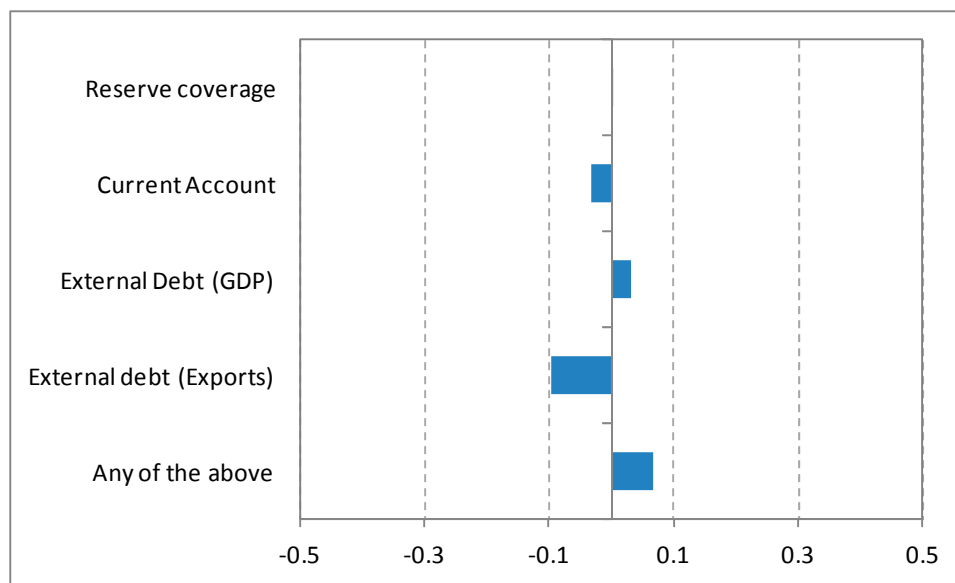
⁶ Since one of the variables is binary and the other one is continuous, the appropriate measure of association is the point biserial correlation coefficient (see Anderson, J. "Point biserial correlation," STATA Technical Bulletin STB-17, January 1994).

⁷ This robustness indicates that alternative methods of identifying extreme observations which take into account the possible non-normality of the underlying continuous EMP index distribution are unlikely to produce qualitatively different outcomes, at least as far as the correlation with variability is concerned. Staff also calculated the correlation coefficient between adjusted variability and the original (continuous) EMP index using two methods for aggregation of the quarterly data to annual – based on the average and on the maximum of the quarterly indices. (The definition based on the maximum would capture instances of large positive and negative quarterly values that would offset each other when averaging.) In both cases the correlation coefficients were in the order of 0.05 – practically the same as for the binary variables.

vulnerabilities are present but they do not necessarily manifest in heightened exchange market pressure. Staff calculated the correlations between “adjusted” variability and four external sector indicators used in the vulnerability exercise for emerging markets: (i) reserves in percent of short-term debt at remaining maturity plus current account deficit; (ii) current account (in percent of GDP); (iii) external debt (in percent of GDP) and (iv) external debt (in percent of exports). The ratios were converted into binary variables using the thresholds specified in SM/07/328 (Table 8). Overall, the correlations of the individual vulnerability indicators with the variability measure in the quota formula are either not significantly different from zero, or negative (Figure AIV.2). An indicator variable which takes the value of 1 if the threshold is breached for at least one of the four vulnerability indicators does not appear to be correlated with variability either. To test the sensitivity of the results to the choice of threshold levels, calculations were repeated using thresholds that differed by 20 percent in both directions. The correlation coefficients did not change significantly.

7. **Conclusion.** Overall, based on the correlation analysis there is no evidence to support a conclusion that the current measure of variability in the quota formula is a good proxy of members’ balance of payments difficulties or underlying vulnerabilities.

Figure AIV.2. Point Biserial Correlation between Adjusted Variability and Indicators of External Sector Vulnerability



Source: Finance Department.

Annex V. Financial Contributions to the Fund

This annex presents updated data on voluntary financial contributions to the Fund—both in absolute terms and relative to 14th Review quota shares.

As part of the quota formula review, it was agreed to consider whether and how to take into account very significant voluntary financial contributions through ad hoc adjustments as part of the 15th Review.¹ In line with the data update on quota variables, this annex brings the financial contributions data series one year forward.² The data include NAB commitments, new pledges, PRGT loans and subsidies, and contributions to financing IMF technical assistance. Tables AV.1 and AV.2 show members' contributions in levels and shares for the largest 35 members while Table AV.3 shows share of members' contributions relative to their 14th Review quota shares (detailed by member information is provided in Appendix Tables A16-A18).

NAB

The data cover the commitments by members under NAB credit arrangements and reflect the rollback agreed by the Executive Board.³ Commitments by those members that have not yet adhered to the NAB decision are not included. For those members that have bilateral borrowing arrangements with the Fund that have been folded into the NAB, only the NAB commitment is included. Bilateral loan commitments from members that are not participants in the NAB (Czech Republic, Malta, Slovak Republic, and Slovenia) have been included.

New Pledges

These data reflect the bilateral pledges secured under the current fund raising exercise, including the announcements initially made at the G-20 Leaders' Summit in Los Cabos.⁴

PRGT Loans

This reflects all loan commitments to the PRGT Trust as of December 31, 2012.⁵

¹ See *Outcome of the Quota Formula Review—Report of the Executive Board to the Board of Governors* (SM/13/13, 1/31/13, Rev. 2).

² For the previous dataset, see *Quota Formula Review—Initial Considerations* (SM/12/29, 02/10/12), *Quota Formula Review—Data Update and Further Considerations* (SM/12/163, 6/28/12) and *Quota Formula Review—Additional Considerations—Annexes* (SM/12/236, Supplement 1, 9/5/12).

³ See *The Rollback of Credit Arrangements in the New Arrangements to Borrow (NAB)*, (SM/11/331, 12/15/331).

⁴ See *IMF Managing Director Christine Lagarde Welcomes Additional Pledges to Increase IMF Resources* (IMF Press Release No. 12/231, 6/19/ 2012).

⁵ See *Update on the Financing of the Fund's Concessional Assistance and Debt Relief to Low-Income Member Countries* (SM/12/86, 4/4/13).

PRGT Subsidies

This includes total bilateral resources provided since 1987 for subsidizing concessional lending, HIPC and MDRI debt relief as of December 31, 2012 plus all pledges made under current fundraising as of December 31, 2012.⁶

Technical Assistance

This includes contributions from donor countries for the period 1990-2013 to finance technical assistance and training provided through both the Framework Administered Account for Technical Assistance Activities (FAA) and The Framework Administered Account for Selected Fund Activities (SFA).

⁶ See *Update on the Financing of the Fund's Concessional Assistance and Debt Relief to Low-Income Member Countries* (SM/12/86, 4/4/13).

Table AV.1. Financial Contributions to the Fund: Selected Indicators
(In SDR millions unless specified otherwise)

	14th Review Quota	NAB and New Pledges		PRGT		Technical Assistance 5/
		NAB with Rollback 1/	New Pledges 2/	Loans 3/	Subsidies 4/	
Advanced Economies	274,955	135,188	207,156	23,906	4,495	583
Major advanced economies	206,853	104,332	133,758	19,291	3,320	444
United States	82,994	28,202	-	-	491	3
Japan	30,821	33,509	39,710	6,935	880	311
Germany	26,634	12,890	36,203	2,750	307	14
France	20,155	9,479	27,400	4,898	448	10
United Kingdom	20,155	9,479	9,928	1,328	577	51
Italy	15,070	6,899	20,517	2,180	297	6
Canada	11,024	3,874	-	1,200	320	49
Other advanced economies	68,101	30,857	73,398	4,615	1,175	139
Spain	9,536	3,405	12,972	1,113	54	5
Netherlands	8,737	4,595	11,913	950	183	22
Australia	6,572	2,220	4,633	-	59	27
Belgium	6,411	3,994	8,736	700	141	10
Switzerland	5,771	5,541	6,618	1,102	151	40
Sweden	4,430	2,256	6,618	-	197	6
Austria	3,932	1,818	5,361	-	79	-
Norway	3,755	1,967	6,155	450	86	14
Ireland	3,450	-	-	-	14	-
Denmark	3,439	1,630	4,633	300	86	6
Emerging Market and Developing Countries 6/	202,069	46,298	97,754	2,248	773	27
Developing countries	167,608	39,081	82,134	2,248	688	26
Africa	21,173	340	4,633	-	77	-
South Africa	3,051	340	1,324	-	32	-
Nigeria	2,455	-	-	-	14	-
Asia	76,552	24,975	49,837	1,593	297	2
China	30,483	15,860	28,459	1,000	51	0
India	13,114	4,441	6,618	-	35	0
Korea	8,583	3,345	9,928	593	85	1
Indonesia	4,648	-	-	-	14	-
Malaysia	3,634	340	662	-	43	0
Singapore	3,892	649	2,647	-	34	0
Thailand	3,212	340	662	-	16	-
Middle East, Malta, and Turkey	32,153	6,096	13,435	656	172	21
Saudi Arabia	9,993	5,653	9,928	500	119	1
Turkey	4,659	-	3,309	-	12	-
Iran	-	-	-	-	-	-
Western Hemisphere	37,730	7,670	14,230	-	142	3
Brazil	11,042	4,441	6,618	-	15	-
Mexico	8,913	2,538	6,618	-	55	3
Venezuela	-	-	-	-	-	-
Argentina	3,187	-	-	-	51	-
Transition economies	34,461	7,218	15,619	-	85	0
Russia	12,904	4,441	6,618	-	45	0
Poland	4,095	1,285	5,493	-	12	-
Total	477,024	181,486	304,910	26,154	5,268	609
Memorandum Items:						
EU27	144,170	62,075	158,577	14,219	2,542	132
LICs 7/	19,068	-	-	-	18	-

Source: Finance Department.

1/ NAB credit arrangements reflecting the rollback agreed by the Executive Board (SM/11/331, 12/15/11). Includes bilateral credit lines for Czech Republic, Malta, Slovak Republic and Slovenia.

2/ Based on the USD/SDR exchange rate as of May 3, 2013. Does not include Indonesia.

3/ Loan commitments to the PRGF-ESF Trust as of December 31, 2012 (SM/13/84, April 4, 2013).

4/ Total bilateral resources received since 1987 for subsidizing concessional lending, HIPC and MDRI debt relief as of December 31, 2012 (SM/13/84, April 4, 2013).

5/ Contributions from donor countries for the period 1990-2013 to finance technical assistance and training provided through both the Framework Administered Account for Technical Assistance Activities (FAA) and The Framework Administered Account for Selected Fund Activities (SFA).

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

7/ PRGT-eligible countries.

Table AV.2. Financial Contributions to the Fund: Selected Indicators
(In percent unless specified otherwise)

	14th Review Quota Share	NAB and New Pledges		PRGT		Technical Assistance 5/
		NAB with Rollback 1/	New Pledges 2/	Loans 3/	Subsidies 4/	
Advanced Economies	57.6	74.5	67.9	91.4	85.3	95.6
Major advanced economies	43.4	57.5	43.9	73.8	63.0	72.9
United States	17.4	15.5	0.0	0.0	9.3	0.5
Japan	6.5	18.5	13.0	26.5	16.7	51.0
Germany	5.6	7.1	11.9	10.5	5.8	2.3
France	4.2	5.2	9.0	18.7	8.5	1.6
United Kingdom	4.2	5.2	3.3	5.1	11.0	8.3
Italy	3.2	3.8	6.7	8.3	5.6	0.9
Canada	2.3	2.1	0.0	4.6	6.1	8.1
Other advanced economies	14.3	17.0	24.1	17.6	22.3	22.8
Spain	2.0	1.9	4.3	4.3	1.0	0.8
Netherlands	1.8	2.5	3.9	3.6	3.5	3.5
Australia	1.4	1.2	1.5	0.0	1.1	4.4
Belgium	1.3	2.2	2.9	2.7	2.7	1.6
Switzerland	1.2	3.1	2.2	4.2	2.9	6.6
Sweden	0.9	1.2	2.2	0.0	3.7	1.0
Austria	0.8	1.0	1.8	0.0	1.5	0.0
Norway	0.8	1.1	2.0	1.7	1.6	2.3
Ireland	0.7	0.0	0.0	0.0	0.3	0.0
Denmark	0.7	0.9	1.5	1.1	1.6	0.9
Emerging Market and Developing Countries 6/	42.4	25.5	32.1	8.6	14.7	4.4
Developing countries	35.1	21.5	26.9	8.6	13.1	4.3
Africa	4.4	0.2	1.5	0.0	1.5	0.0
South Africa	0.6	0.2	0.4	0.0	0.6	0.0
Nigeria	0.5	0.0	0.0	0.0	0.3	0.0
Asia	16.0	13.8	16.3	6.1	5.6	0.3
China	6.4	8.7	9.3	3.8	1.0	0.0
India	2.7	2.4	2.2	0.0	0.7	0.0
Korea	1.8	1.8	3.3	2.3	1.6	0.2
Indonesia	1.0	0.0	0.0	0.0	0.3	0.0
Malaysia	0.8	0.2	0.2	0.0	0.8	0.0
Singapore	0.8	0.4	0.9	0.0	0.6	0.0
Thailand	0.7	0.2	0.2	0.0	0.3	0.0
Middle East, Malta, and Turkey	6.7	3.4	4.4	2.5	3.3	3.4
Saudi Arabia	2.1	3.1	3.3	1.9	2.3	0.2
Turkey	1.0	0.0	1.1	0.0	0.2	0.0
Iran	0.0	0.0	0.0	0.0	0.0	0.0
Western Hemisphere	7.9	4.2	4.7	0.0	2.7	0.6
Brazil	2.3	2.4	2.2	0.0	0.3	0.0
Mexico	1.9	1.4	2.2	0.0	1.0	0.6
Venezuela	0.0	0.0	0.0	0.0	0.0	0.0
Argentina	0.7	0.0	0.0	0.0	1.0	0.0
Transition economies	7.2	4.0	5.1	0.0	1.6	0.1
Russia	2.7	2.4	2.2	0.0	0.8	0.1
Poland	0.9	0.7	1.8	0.0	0.2	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Memorandum Items:						
Total contributions (in millions of SDRs)	477,024	181,486	304,910	26,154	5,268	609
EU27	30.2	34.2	52.0	54.4	48.3	21.7
LICs 7/	4.0	0.0	0.0	0.0	0.3	0.0

Source: Finance Department.

1/ NAB credit arrangements reflecting the rollback agreed by the Executive Board (SM/11/331, 12/15/11). Includes bilateral credit lines for Czech Republic, Malta, Slovak Republic and Slovenia.

2/ Underlying calculations based on the USD/SDR exchange rate as of May 3, 2013. Does not include Indonesia.

3/ Loan commitments to the PRGF-ESF Trust as of December 31, 2012 (SM/13/84, April 4, 2013).

4/ Total bilateral resources received since 1987 for subsidizing concessional lending, HIPC and MDRI debt relief as of December 31, 2012 (SM/13/84, April 4, 2013).

5/ Contributions from donor countries for the period 1990-2013 to finance technical assistance and training provided through both the Framework Administered Account for Technical Assistance Activities (FAA) and The Framework Administered Account for Selected Fund Activities (SFA).

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

7/ PRGT-eligible countries.

Table AV.3. Financial Contributions to the Fund: Selected Indicators
(Contribution Share Relative to 14th Review Quota Share)

	NAB and New Pledges		PRGT		Technical Assistance 5/
	NAB with Rollback 1/	New Pledges 2/	Loans 3/	Subsidies 4/	
Advanced Economies	1.3	1.2	1.6	1.5	1.7
Major advanced economies	1.3	1.0	1.7	1.5	1.7
United States	0.9	0.0	0.0	0.5	0.0
Japan	2.9	2.0	4.1	2.6	7.9
Germany	1.3	2.1	1.9	1.0	0.4
France	1.2	2.1	4.4	2.0	0.4
United Kingdom	1.2	0.8	1.2	2.6	2.0
Italy	1.2	2.1	2.6	1.8	0.3
Canada	0.9	0.0	2.0	2.6	3.5
Other advanced economies	1.2	1.7	1.2	1.6	1.6
Spain	0.9	2.1	2.1	0.5	0.4
Netherlands	1.4	2.1	2.0	1.9	1.9
Australia	0.9	1.1	0.0	0.8	3.2
Belgium	1.6	2.1	2.0	2.0	1.2
Switzerland	2.5	1.8	3.5	2.4	5.5
Sweden	1.3	2.3	0.0	4.0	1.1
Austria	1.2	2.1	0.0	1.8	0.0
Norway	1.4	2.6	2.2	2.1	2.9
Ireland	0.0	0.0	0.0	0.4	0.0
Denmark	1.2	2.1	1.6	2.3	1.3
Emerging Market and Developing Countries 6/	0.6	0.8	0.2	0.3	0.1
Developing countries	0.6	0.8	0.2	0.4	0.1
Africa	0.0	0.3	0.0	0.3	0.0
South Africa	0.3	0.7	0.0	0.9	0.0
Nigeria	0.0	0.0	0.0	0.5	0.0
Asia	0.9	1.0	0.4	0.4	0.0
China	1.4	1.5	0.6	0.2	0.0
India	0.9	0.8	0.0	0.2	0.0
Korea	1.0	1.8	1.3	0.9	0.1
Indonesia	0.0	0.0	0.0	0.3	0.0
Malaysia	0.2	0.3	0.0	1.1	0.0
Singapore	0.4	1.1	0.0	0.8	0.0
Thailand	0.3	0.3	0.0	0.5	0.0
Middle East, Malta, and Turkey	0.5	0.7	0.4	0.5	0.5
Saudi Arabia	1.5	1.6	0.9	1.1	0.1
Turkey	0.0	1.1	0.0	0.2	0.0
Iran	0.0	0.0	0.0	0.0	0.0
Western Hemisphere	0.5	0.6	0.0	0.3	0.1
Brazil	1.1	0.9	0.0	0.1	0.0
Mexico	0.7	1.2	0.0	0.6	0.3
Venezuela	0.0	0.0	0.0	0.0	0.0
Argentina	0.0	0.0	0.0	1.5	0.0
Transition economies	0.6	0.7	0.0	0.2	0.0
Russia	0.9	0.8	0.0	0.3	0.0
Poland	0.8	2.1	0.0	0.3	0.0
Memorandum Items:					
EU27	1.1	1.7	1.8	1.6	0.7
LICs 7/	0.0	0.0	0.0	0.1	0.0

Source: Finance Department.

1/ NAB credit arrangements reflecting the rollback agreed by the Executive Board (SM/11/331, 12/15/11). Includes bilateral credit lines for Czech Republic, Malta, Slovak Republic and Slovenia.

2/ Underlying calculations based on the USD/SDR exchange rate as of May 3, 2013. Does not include Indonesia.

3/ Loan commitments to the PRGF-ESF Trust as of December 31, 2012 (SM/13/84, April 4, 2013).

4/ Total bilateral resources received since 1987 for subsidizing concessional lending, HIPC and MDRI debt relief as of December 31, 2012 (SM/13/84, April 4, 2013).

5/ Contributions from donor countries for the period 1990-2013 to finance technical assistance and training provided through both the Framework Administered Account for Technical Assistance Activities (FAA) and The Framework Administered Account for Selected Fund Activities (SFA).

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

7/ PRGT-eligible countries.