INTERNATIONAL MONETARY FUND

IMF POLICY PAPER

REVIEW OF THE ADEQUACY OF THE FUND'S PRECAUTIONARY BALANCES

February 2018

IMF staff regularly produces papers proposing new IMF policies, exploring options for reform, or reviewing existing IMF policies and operations. The following documents have been released and are included in this package:

- A **Press Release** summarizing the views of the Executive Board as expressed during its January 29, 2018 consideration of the staff report.
- The **Staff Report**, prepared by IMF staff and completed on December 26, 2017 for the Executive Board's consideration on January 29, 2018.

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IMF Executive Board Discusses the Adequacy of the Fund's Precautionary Balances

On January 29, 2018, the Executive Board of the International Monetary Fund (IMF) reviewed the adequacy of the Fund's precautionary balances.[1]

Precautionary balances, comprising the Fund's general and special reserves[2] and the Special Contingent Account (SCA-1), are one element of the IMF's multi-layered framework for managing financial risks. These balances are ultimately available to absorb possible financial losses, thereby helping protect the value of reserve assets represented by member countries' positions in the Fund and underpin the exchange of assets through which the Fund provides financial assistance to countries with balance of payments needs.

This review of the adequacy of the Fund's precautionary balances took place on the standard two-year cycle. In conducting the review, the Executive Board applied the framework agreed in 2010. This framework includes an indicative range for precautionary balances, linked to developments in IMF total credit outstanding, that is used to guide decisions on adjusting the target for precautionary balances over time.

Executive Board Assessment[3]

Executive Directors welcomed the opportunity to review the adequacy of the Fund's precautionary balances on the standard two-year cycle. They emphasized the importance of maintaining an adequate level of precautionary balances to mitigate financial risks, safeguard the strength of the Fund's balance sheet, and protect the value of members' reserve positions in the Fund. Directors considered that an adequate level of precautionary balances is an integral part of the Fund's risk management framework, which includes the strength of the Fund's lending policies and its preferred creditor status.

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[1] This press release summarizes the views of the Executive Board as expressed during the January 29, 2018 Executive Board discussion based on the paper entitled "Review of the Adequacy of the Fund's Precautionary Balances."
[2] Except the portion of the Special Reserve attributed to gold sales profits.
[3] An explanation of any qualifiers used in summings up can be found here: http://www.imf.org/external/np/sec/misc/qualifiers.htm.

Directors agreed that the current rules-based framework adopted in 2010 for assessing the adequacy of precautionary balances remains broadly appropriate. They emphasized the continued importance of judgment and Board discretion in light of a broad assessment of financial risks facing the Fund. At the same time, Directors saw a continued need to keep the framework under review and refine it as warranted by further experience in its application. Many Directors called for a more holistic approach to the Board's deliberations covering precautionary balances, the Fund's income position, the Fund's investment account and access limits and surcharge policies, and requested that staff adopt an approach that would better join these issues together in future Board discussions.

Directors supported retaining the medium-term indicative target for precautionary balances of SDR 20 billion. They observed that, while credit outstanding has continued to fall since the last review, and the indicative range for precautionary balances remains below the target, the financial risks facing the Fund remain elevated. In particular, the Fund's lending portfolio remains highly concentrated and includes large exposures to members facing deep-rooted and difficult structural adjustment challenges. Also, despite an improved global economic outlook, continued downside risks and vulnerabilities may give rise to a further uptick in demand for Fund credit. Directors further noted that the Fund's commitments under current precautionary arrangements remain elevated and the Fund's lending capacity is broadly unchanged. Furthermore, the limited capacity of the burden sharing mechanism increases the potential reliance on precautionary balances in the event of large new arrears.

Directors supported maintaining the minimum floor for precautionary balances of SDR 15 billion, which remains broadly consistent with the risk of a rise in credit during the next lending cycle as well as maintaining a sustainable income position in the medium term. They noted that the floor, which was raised to its current level at the last review in 2016, is driven by longer-term considerations and is not expected to be changed often under the framework.

Directors welcomed the increase in the projected pace of reserve accumulation since the last review. Although precautionary balances are projected to remain just short of the SDR 20 billion target over the medium term, they did not see a compelling case at this time for taking additional steps to reach that target, recognizing that a significant build-up of reserves is projected in the next few years. Directors saw a continued need to monitor the pace of accumulation carefully, particularly as the projected path of precautionary balances is sensitive to developments in Fund credit and commitments, as well as other factors affecting Fund income.

December 26, 2017

REVIEW OF THE ADEQUACY OF THE FUND'S PRECAUTIONARY BALANCES

EXECUTIVE SUMMARY

This paper reviews the adequacy of the Fund's precautionary balances, using the framework approved by the Board in 2010. The review takes place on the standard two-year cycle and assesses developments since the last review in 2016.

The framework provides an indicative range for the target for precautionary balances linked to credit outstanding, and allows for judgment in setting this target. The range is based on a reserve coverage ratio of 20-30 percent of a forward-looking credit measure, drawing on approaches in other IFIs that have been adapted to the circumstances of the Fund. At the same time, Directors have emphasized the continued importance of judgment and Board discretion and that the target may be set outside the indicative range if warranted by a broader assessment of financial risks facing the Fund.

Staff proposes keeping the medium-term target of SDR 20 billion. At the last review in 2016, the indicative range was below the target set by the Board, which supported retaining the target in light of the elevated risks facing the Fund. Staff considers that the broad considerations underpinning the decision at that time remain relevant. In particular, the Fund's credit portfolio remains heavily concentrated and includes large exposures to members facing deep-rooted and difficult structural adjustment challenges. Despite an improved global economic outlook, continued downside risks and vulnerabilities may give rise to a further uptick in demand for Fund credit. Commitments under current precautionary arrangements remain elevated, as does the Fund's credit capacity. Furthermore, the limited capacity of the burden sharing mechanism increases the potential reliance on precautionary balances in the event of large new arrears.

Staff proposes keeping the minimum floor at SDR 15 billion. The floor, which was raised to its current level at the last review in 2016, is driven by longer-term considerations and is expected to be changed only occasionally under the framework. Staff does not see compelling reasons to revisit the level of the floor in this review, as it remains broadly consistent with the risk of a rise in credit during the next lending cycle as well as a sustainable medium-term income position of the Fund.

Staff does not believe that additional steps to achieve the SDR 20 billion target are needed at this time. While higher than anticipated at the last review, the current level of precautionary balances of SDR 16.7 billion remains well short of the target. Prospects for reaching the agreed target have improved since the last review, although under staff's baseline projection, precautionary balances remain below the target in the medium term. The projection is sensitive to developments in Fund credit and commitments, as well as other factors affecting Fund income, suggesting that the pace of accumulation should continue to be monitored closely.

Approved By
Andrew Tweedie (FIN)

Prepared by the Finance Department.

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ANNEXES

INTRODUCTION[1/]

1. This paper reviews the adequacy of the Fund's precautionary balances. It uses the transparent and rules-based framework that has been employed since 2010 to guide the assessment of reserve adequacy.

2. This review takes place on the standard two-year cycle.[2] It will serve as background for the review of the Fund's income in April 2018, including the decision on the margin for the basic rate of charge that will apply over FY 2019–20.[3] The pace of accumulation of precautionary balances may also be affected by discussions concerning the payout policy for the Endowment Account (EA), which will be considered by the Board in early 2018.[4]

3. The paper is organized as follows. The first section reviews the role of precautionary balances in the Fund's multi-layered framework for mitigating financial risks and the framework used to guide the assessment of reserve adequacy. The subsequent section takes stock of developments since the last review in 2016. The following section assesses the adequacy of the current indicative target of SDR 20 billion, the projected pace of accumulation of precautionary balances and the minimum floor. The final section concludes and suggests issues for discussion.

PRECAUTIONARY BALANCES AND THE FRAMEWORK FOR ASSESSING RESERVE ADEQUACY

A. The Role of Precautionary Balances

4. The Fund faces a range of financial risks in fulfilling its mandate (Table 1):

- *Credit risks* typically dominate, reflecting the Fund's core role of providing balance of payments support to members when other financing sources may not be readily available.[5] Credit risks can

[1] Prepared by a team led by Janne Hukka comprising Maria Albino-War, Alex Attie, Sonja Davidovic (RMU), Joseph Hanna, Niels Jakob Hansen, Heikki Hatanpaa, Joao Jatene, Diviesh Nana, Amadou Ndiaye, Breno Oliveira, Jean Guillaume Poulain (EUR), Sergio Rodriguez-Apolinar, Yan Sun-Wang, Wellian Wiranto and Vera Zolotarskaya under the guidance of David Andrews and Donal McGettigan (all FIN, except where otherwise noted).

[2] Reviews of the adequacy of precautionary balances have been on a two-year cycle since 2002 but can be brought forward by the Executive Board if needed.

[3] The interactions of the review of the precautionary balances with other reviews affecting the Fund's finances decisions are presented to the Executive Board periodically. The latest update to the roadmap chart was circulated for a Committee on the Budget Meeting on September 2017.

[4] The issue was also discussed in the context of an informal Executive Board session on November 13, 2017.

[5] Credit risks refer to the risk of a member falling into arrears with regard to its obligations to the Fund arising from Fund financing. This can be related to, but is distinct from, risks to program performance under Fund arrangements that give rise to review delays and unmet program conditionality.

fluctuate widely since the Fund does not target a particular level of lending or lending growth, and Fund lending can also be highly concentrated and subject to correlated risks.[6]

- The Fund also faces *income risks*—the risk of shortfalls in annual income relative to expenses. These risks have been significant in the past, including when lending fell to very low levels prior to the global crisis. The implementation of the Fund's new income model which broadens the sources of sustainable non-lending income will, over time, help mitigate these risks. Precautionary balances—which generate investment income for the Fund as well as being a critical part of the risk mitigation framework—are an important element of this model.

- The Fund faces *market risks* on assets held in the investment account. These risks have increased somewhat as the phased investment of the endowment (EA) subaccount has been nearly completed, but remain moderate given its relatively conservative investment strategy and the short duration of fixed income investments in the fixed-income (FI) subaccount.[7] The Fund does not face market risks on its lending or holdings of members' currencies since the same floating rate determines the rate of charge and remuneration and the Fund's balance sheet is denominated in SDRs.

- The Fund faces *liquidity risk*—the risk that the Fund's resources will be insufficient to meet members' needs and for the Fund to repay its obligations as they fall due, including under Fund borrowing agreements.[8] Quota reviews are the key medium-term mitigating factor, along with long-standing borrowing facilities, and the Fund can also borrow further amounts temporarily to supplement its quota resources, as it has done in response to the global crisis. In addition, the Fund retains a prudential balance of quota resources to help manage liquidity risks and provide a buffer to support the encashability of members' reserve tranche positions.[9]

- The Fund self-insures for certain risks (for example, to cover losses of a capital nature) and has strong internal controls to address *operational risks*.

[6] Precautionary balances address credit risks arising from the Fund's non-concessional lending operations, which are managed through the General Resources Account (GRA). The Fund's concessional lending operations are trust-based so this removes associated credit and liquidity risks of these operations from the balance sheet of the Fund.

[7] Amounts in the Fixed Income subaccount currently correspond to the Fund's reserves that are treated as precautionary balances. Article XII, section 6(f)(ii) provides that the amounts of currency transfers from the GRA to the Investment Account shall not at the time of the decision to transfer exceed the total amount of the general and special reserve. GRA currencies for SDR 1.4 billion, equivalent to the increase in reserves in FY 2017, were transferred from the GRA to the IA in the first half of FY 2018. See *Review of the Fund's Income Position for FY 2017 and FY 2018* (4/4/17).

[8] Following termination of the latest NAB activation period in February 2016 after the implementation of the 14th Review of Quotas, the Fund currently relies solely on quota resources to meet new commitments under the GRA.

[9] The prudential balance is currently set at 20 percent of the quotas of members participating in the financing of IMF transactions (Financial Transaction Plan members).

Table 1. Financial Risk Management in the Fund

Financial Risk	Risk Management Measures
Credit risk: The risk that a borrower could fail to meet its financial obligations to the Fund	Lending policies (e.g., conditionality, access limits, charges and maturities, exceptional access framework) De facto preferred creditor status Safeguards assessments Arrears strategy Burden-sharing mechanism Co-financing of arrangements by other official lenders *Precautionary balances*
Income risk: The risk that the Fund's annual income may not be sufficient to cover its annual expenditures.	Margin on the basic rate of charge Surcharges Burden sharing mechanism Investment Account and investment mandate *Precautionary balances*
Interest rate risk: The risk that future cash flows will fluctuate because of changes in market interest rates	The Fund does not incur interest rate risk on credit as it uses a floating market interest rate (SDR interest rate) to determine the rates of charge and remuneration. Interest rate risk in the Fixed Income subaccount is managed with a low average duration (of up to 2½ years). The EA is exposed to higher interest rate risk given the higher duration (7½-8 years) of currently invested strategic asset allocation (SAA), approved by the Board in early 2013.
Exchange rate risk: The exposure to the effects of fluctuations in foreign currency exchange rates on the Fund's financial position and cash flows	The Fund has no exposure on its holding of member currencies, including those representing Fund credit, or borrowings which are all denominated in SDRs, the Fund's unit of account. (Regarding Fund holding of members' currencies, the de facto SDR denomination results from the fact that members are required to maintain the SDR value of the Fund's holdings of their currencies.) Exchange rate risk on investments in the IA-FI is managed by investing in financial instruments denominated in SDRs or in constituent currencies with a view to matching currency weights in the SDR basket. In the EA, limited exchange rate risk exists vis-à-vis the SDR, which is the unit of account of the Fund. For performance management purposes, the US dollar is the base currency; fixed-income instruments in developed country currencies are hedged into the US dollar.
Liquidity risk: The risk that available resources will not be sufficient to meet financing needs of members and the Fund's obligations under borrowing agreements	Monitoring of Forward Commitment Capacity (continuous) Financial Transactions Plans (semi-annual) Liquidity reviews (semi-annually) General quota reviews (every five years) Bilateral borrowing and note purchase agreements; NAB *Precautionary balances play a small role in managing this risk, given their small size relative to the FCC.*
Operational risk in financial matters: The risk of loss attributable to errors or omissions, process failures, inadequate controls, human factors, and/or failures in underlying support systems	Internal control procedures and processes Executive Board approved new Rules and Regulations for the IA while the IOC (by delegation from the Managing Director) is charged with defining key risk parameters and investment guidelines for external asset managers and for related operations. Audit arrangements: independent external audit, oversight of controls and financial processes by an independent external audit committee, and an internal audit function *Precautionary balances*

5. The Fund employs a multi-layered framework for managing credit risks. The primary tools are Fund policies on access, program design, and conditionality, which are critical for ensuring that Fund financial support helps members resolve their balance of payments difficulties in a timely manner. These policies include assessments of members' capacity to implement adjustment policies and repay the Fund, and the exceptional access policies. The framework also includes the structure of charges and maturities (which provide incentives for timely repurchases), safeguards assessments and requirements for adequate financing assurances, including co-financing. In the event that arrears arise, the Fund has an agreed strategy for addressing them and benefits from a de-facto preferred creditor status. The burden sharing mechanism is designed to protect the Fund's income in the event of arrears. The Fund's cooperative nature is also of crucial importance should credit risks materialize.

6. Maintaining an adequate level of precautionary balances is a key element of the Fund's overall strategy for managing financial risks and ensuring balance sheet strength. Fund lending is based on an exchange of reserve assets. Precautionary balances are available to protect the balance sheet in the event that the Fund were to suffer a loss as a result of credit or other financial risks.[10] In this way, they play an important role in seeking to protect the value of reserve assets that members place with the Fund and underpin the exchange of international reserve assets through which the Fund provides assistance to members with financing needs.[11]

7. Reserves generated as retained earnings comprise the bulk of the Fund's precautionary balances. These reserves are accumulated when annual operational income and surcharge income less administrative expenses (which correspond to the Fund's budgetary expenses) and other accounting-related adjustments is positive. Precautionary balances at end-FY 2017, which also include the balance in the Special Contingent Account (see Text Table and Box 1) amounted to SDR 16.7 billion. Inclusion of estimated net income to date would increase them to SDR 16.8 billion as of end-October.

Accumulation of Precautionary Balances

(In billions of SDRs)

		FY 2017 (Year)	FY 2018 1/ (6 months)
I	Precautionary balances - beginning of period 2/	15.2	16.7
II	Operational income	1.0	0.3
	Lending income	0.8	0.2
	Non-lending income	0.2	0.1
III	Administrative expenses	-0.8	-0.4
IV	Net operational income/(loss) (II-III)	0.2	-0.1
V	Surcharges	0.6	0.2
VI	IAS 19 adjustment	0.7	- *
VII	Precautionary balances - end of period (I+IV+V+VI)	16.7	16.8

Source: IMF Finance Department.

* represents an amount less than SDR 50 million.

1/ To end-October 2017.

2/ Includes SCA-1 of SDR 1.2 billion.

[10] For instance, the Fund drew on its precautionary balances during FY 2007-08 to cover income losses.

[11] Although the Fund's gold holdings are an important factor of strength in the Fund's balance sheet, they are not included in the Fund's precautionary balances given the limitations on their use. In particular, outside of a liquidation of the Fund, the use of gold by the Fund is restricted by the Fund's Articles and any authorized use requires a decision by an 85 percent of the total voting power.

Box 1. The Composition of the Fund's Precautionary Balances

Precautionary balances comprise retained earnings, held in the Fund's general and special reserves, and the Special Contingent Account (SCA-1).[1/ 2/]

- **Special reserve.** This reserve–established in 1957–was initially funded by the proceeds from a gold investment program set up to address the deficits accumulated from annual losses the Fund suffered from its inception to April 1956. Income from the investment program was placed in the special reserve when the program was terminated in 1972. The Board also agreed in 1957 when the reserve was established that any administrative losses would first be written off against the special reserve. In symmetric fashion, from 1972 through 2015, the Fund's annual net operational income was placed in the special reserve. In FY 2016-17, GRA net income (including surcharges and excluding income from the gold endowment) was placed equally in the special and general reserves. Under the Fund's Articles, no distributions (dividends) can be made from the special reserve.

General Department—Balance Sheet

(In billions of SDRs, as of April 30, 2017)

Assets 1/		Liabilities		
Credit outstanding	48.3	Reserve tranche position	48.6	
Usable currencies	359.4	Subscription payments	426.8	
Other currencies	67.4	*Total quotas*	475.4	
Total currencies	*475.1*			
o/w to be transferred to Fixed Income account	1.4	Borrowing	29.1	
SDR holdings	28.3	Reserves and retained earnings		
Investments	19.1	Retained earnings of Endowment	0.6	
Endowment	5.1	Reserves of the GRA	19.9	
Fixed Income	14.1	Special reserves - Gold profits	4.4	
		Special reserves - Excl. gold profits	5.2	
		General reserves	10.3	PB
		SCA-1 balance	1.2	
Gold holdings	3.2			
Other	1.4	Other	0.8	
Total Assets	**527.1**	**Liabilities and Total Resources**	**527.1**	

Amounts may not add due to rounding.

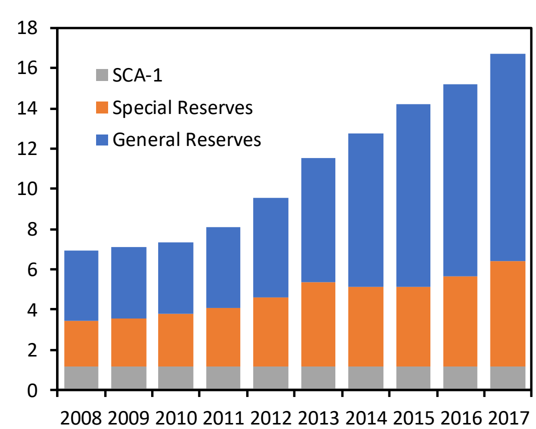
Source: IMF Finance Department.

1/ The SCA-1 balance of SDR 1.2 billion forms part of the Fund's SDR and currency holdings.

General reserve. In 1958, it was decided that the reserve contemplated in Article XII, Section 6(a) of the Articles, prior to the Second Amendment, would be referred to as the general reserve to distinguish it from the special reserve. Net operational income was placed in this reserve while the gold investment program was active, i.e., during FY 1958–72, as the Fund had returned to profitability from its operations. The purpose of the general reserve is to absorb capital losses and to meet administrative losses. Further placements of resources were made to the general reserve over FY 1998 to FY 2006 as follows: net operational income generated under the Supplemental Reserve Facility (SRF), after meeting the cost of administering the PRGF Trust (FY 1998–2001); and surcharges on purchases under the SRF, credit tranches and EFF (FY 2002-2006). During FY 2007–08, the Fund experienced net income shortfalls and subsequently the Board agreed to resume the practice of placing surcharge income in the General Reserve in FY 2011. As noted earlier, during FY 2016-17, half of GRA net income (excluding income from the gold endowment) was placed in the general reserve. Reserves accumulated in the general reserve may be distributed to members, in proportion to their quota, if the Board approves such decision by a 70 percent majority of the total voting power.

PB Composition, 2008-2017

(In billions of SDRs, end of financial year)



Source: IMF Finance Department.

Box 1. The Composition of the Fund's Precautionary Balances (concluded)

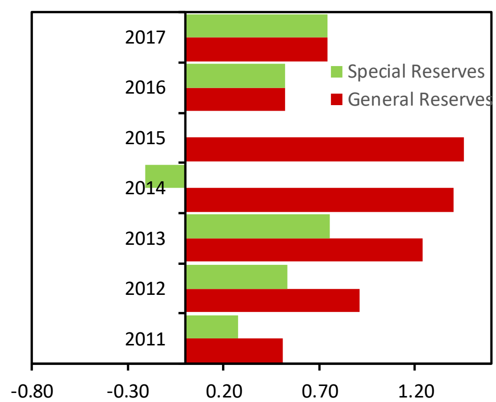
- **Special Contingent Account (SCA-1).** This account was set up in 1987 with the specific purpose of protecting the Fund against the risk of a loss resulting from the ultimate failure of a member to repay its overdue charges and repurchases in the GRA. The SCA-1 has been funded under the burden sharing mechanism through equal contributions from borrowing and creditor member countries through adjustments to the rates of charge and remuneration, respectively.[3] SCA-1 accumulations were suspended effective November 1, 2006. Under the Executive Board's current SCA-1 decision, the Fund is required to distribute the balances in SCA-1 to contributing members when there are no outstanding overdue charges or repurchases. Any earlier distribution of the SCA-1 requires a Board decision by a 70 percent majority of the total voting power.

Net income equivalent to surcharge income has been the main source of precautionary balances accumulation over FY 2011-2017:

- The accumulation of the general reserve was SDR 6.8 billion, relative to SDR 2.6 billion accumulated in the special reserve (see text chart). The fall in the special reserve in FY 2014 reflects the Fund's implementation of the amended international accounting standard for employee benefits (IAS 19). Since FY 2016, net income has been allocated equally to the special and general reserves.

- The balance of the SCA-1 has remained unchanged at SDR 1.2 billion since 2008. After Liberia cleared its protracted arrears to the Fund, SDR 0.5 billion of the SCA-1 was distributed to contributing members, to facilitate contributions for debt relief for Liberia.

Reserves Accumulation, 2011-17[1/]
(In billions of SDRs, end of financial year)



Source: IMF Finance Department.
1/ In FY 2014, the special reserve reflects an allocation of net income of SDR 1.2 billion and a charge of SDR 1.4 billion associated with the amended IAS 19 retroactive adjustment.

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[1] In setting up the endowment, the Board recognized that its sole purpose would be to generate income. Hence, precautionary balances do not include the portion of special reserves attributed to the gold profits and invested in the endowment.
[2] On the asset side, the Fund's reserves treated as precautionary balances are either invested in the fixed-income subaccount (SDR 14.1 billion) or held in SDRs and currencies (SCA-1 balance of SDR 1.2 billion and GRA net income of SDR 1.4 billion for FY 2017 that was transferred to the fixed-income subaccount after the end of the financial year in August 2017).
[3] In FY 1987, the SCA-1 was initially funded from GRA income in excess of the target for the financial year.

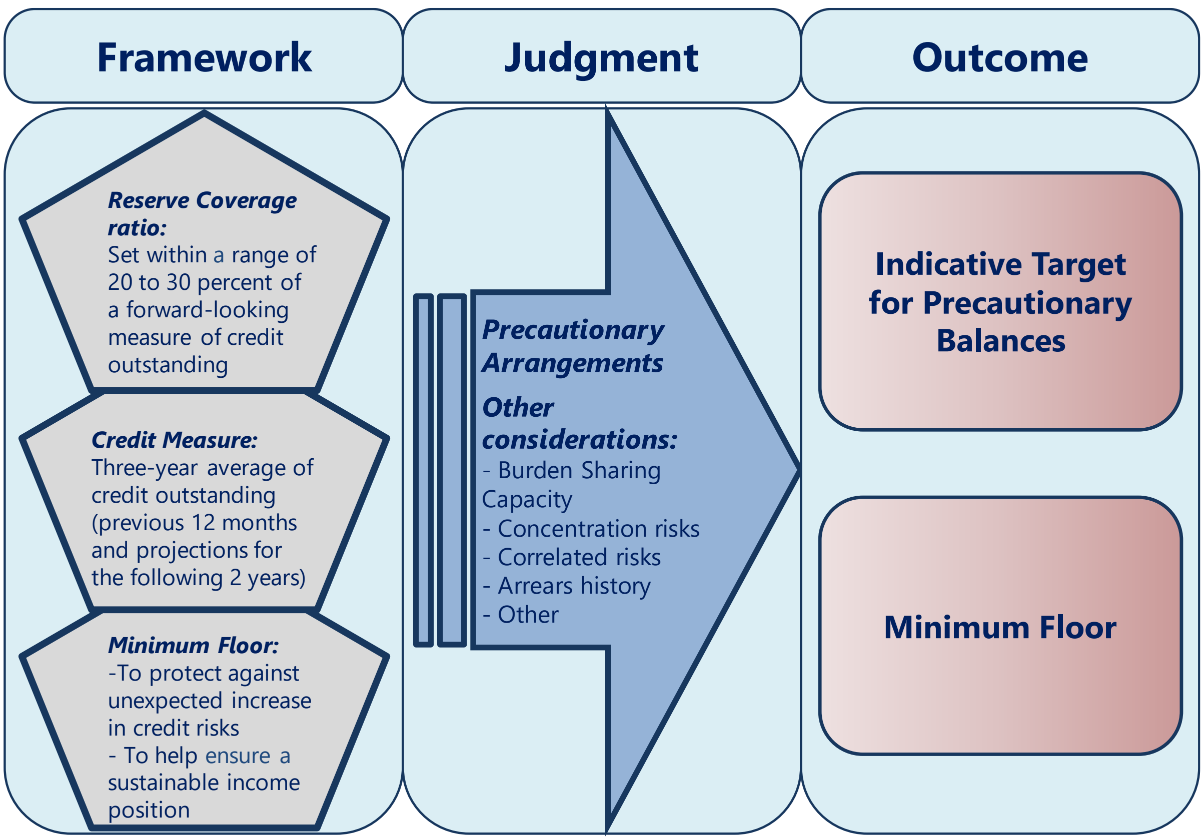
B. Framework for Assessing Precautionary Balances

8. **The Fund conducts biennial reviews of the adequacy of precautionary balances.** The Board adopted an SDR 10 billion target for precautionary balances in 2002 in light of the increasing

risks arising from large financial arrangements with several middle-income countries. The SDR 10 billion target was subsequently reaffirmed on three occasions in 2004, 2006, and 2008.

At the 2010 Review, the Board endorsed a new rules-based framework for assessing precautionary balances.[12] The framework provides an indicative range linked to developments in credit outstanding that serves as a guide to decisions on adjusting the target over time, and the Board retains flexibility to determine where the target should be set based on a comprehensive assessment of the risks facing the Fund. It is generally envisaged that the target will be maintained within the range, but there could be circumstances where the Board would decide to set or maintain the target outside the range, as was the case at the last review in 2016, if this is warranted by a broader assessment of financial risks. In this context, the Board has repeatedly stressed the importance of judgment, and that the framework should not be applied in a mechanistic way.

Figure 1. Framework to Determine the Indicative Target and the Minimum Floor for Precautionary Balances



Source: IMF Finance Department.

[12] See *Public Information Notice: IMF Board discusses the Adequacy of the Fund's Precautionary Balances* (9/22/10), *Press release: IMF Board Discusses the Adequacy of the Fund's Precautionary Balances* (4/6/16).

9. The framework consists of four main elements (Figure 1): (i) a *reserve coverage ratio*, set to 20 to 30 percent of a forward-looking measure of credit outstanding. This element draws on approaches in other IFIs (Annex I), adapted to the specific circumstances of the Fund (in particular the highly concentrated needs-driven nature of its lending portfolio),[13] (ii) a *forward-looking credit measure* to anchor the range—specifically, a three-year average of credit outstanding covering the past twelve months and projections for the next two years—which helps smooth year-to-year volatility of credit movements,[14] (iii) commitments under *precautionary arrangements*, which are excluded from the credit measure used to derive the indicative range, but are considered by the Board in setting the target, and (iv) a *minimum floor* to protect against an unexpected increase in credit risks, particularly after periods of low credit, and ensure a sustainable income position.[15]

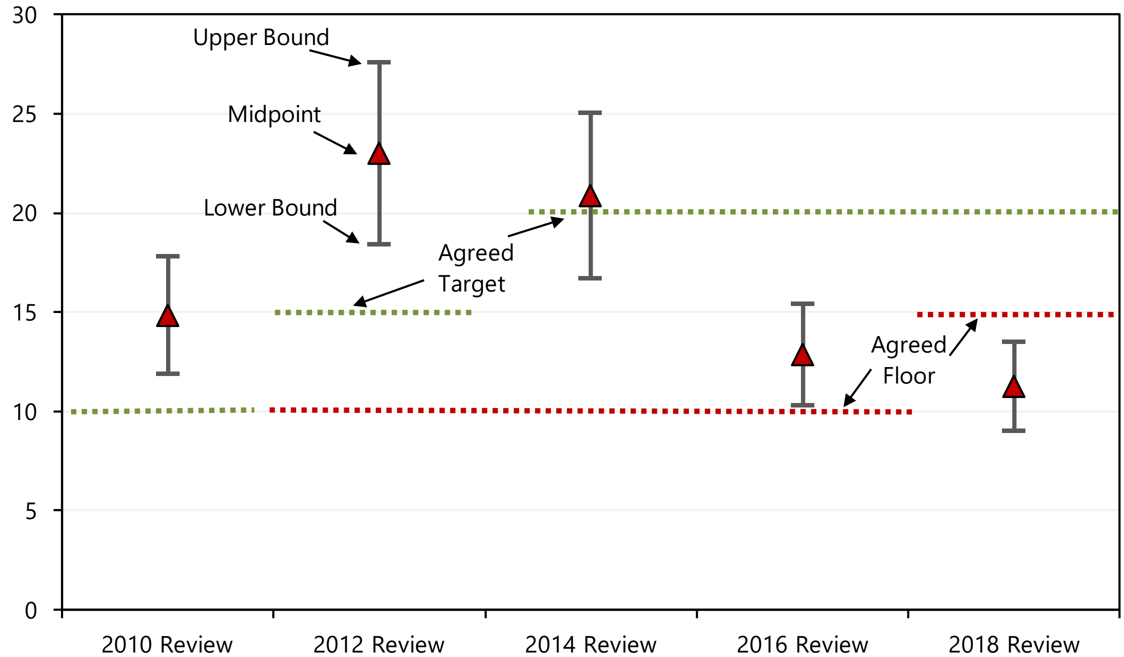
10. Based on this framework, the Board has increased the target for precautionary balances twice and the minimum floor once (Figure 2). The Board agreed in 2010 to raise the indicative medium-term target to SDR 15 billion in light of the sharp increases in commitments and actual and projected lending, the projected increases in individual exposures, and the limited capacity of the burden sharing mechanism. The target was further increased to SDR 20 billion in 2012, and reaffirmed in 2014 and 2016. A minimum floor of SDR 10 billion for precautionary balances was also agreed in 2010 and reaffirmed in the 2012 and 2014 reviews. The floor was increased to SDR 15 billion in 2016 as this was seen as more consistent with the maintenance of a sustainable income position in the medium term and would also provide a larger buffer to protect against risks associated with any unexpected rise in credit. The floor is expected to be changed only occasionally under the framework and staff does not propose to revisit its level under this review.

[13] The framework also has elements in common with the methodologies used by rating agencies in assessing capital adequacy in supranational lending institutions (see Annex II in *Review of the Adequacy of the Fund's Precautionary Balances* (1/22/16).

[14] The two-year projection is based on scheduled net disbursements under non-precautionary arrangements. While the methodology makes no provision for possible future arrangements (which could bias the projections downwards) it also assumes the timely completion of all reviews and related purchases under existing arrangements, with no provision for early repurchases (which could bias the projections upwards). See also *Review of the Adequacy of the Fund's Precautionary Balances* (8/24/10).

[15] While Fund credit is highly volatile and can increase sharply, it takes a considerable time to rebuild precautionary balances. Thus, the floor provides a buffer in the face of an unexpected increase in credit risks. The floor is kept under review in light of changing conditions and longer-term trends in Fund lending. Being based on longer-term considerations beyond the current lending cycle, the floor is expected to be changed only occasionally.

Figure 2. The Indicative Ranges, the Agreed Target and the Agreed Floor at the Time of Each Review 2010 – 2018
(In billions of SDRs)



Source: IMF Finance Department.

DEVELOPMENTS SINCE THE LAST REVIEW

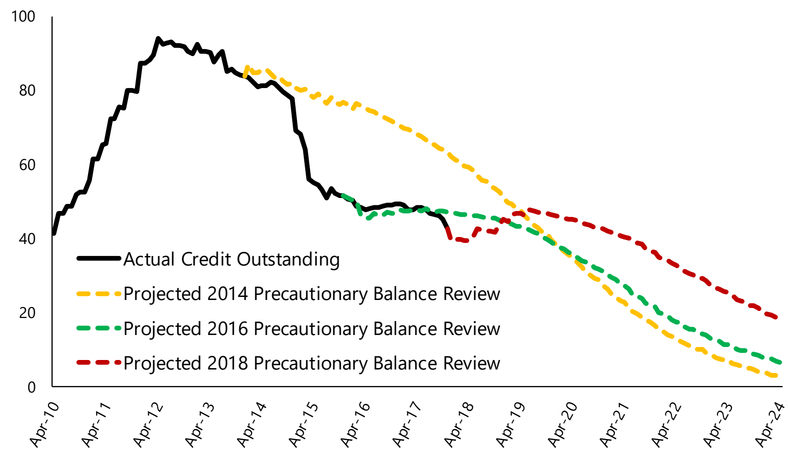
Credit outstanding is just below the projected level at the time of the last review, while total commitments remain high. The lending portfolio remains concentrated (if a bit less so than before) and, as before, subject to substantial risks. Near-term income risks remain low, while market risks have risen modestly.

A. Credit Risks

11. Credit outstanding is just below the projected level at the time of the last review (Figure 3). Outstanding credit fell steeply in mid-2015 largely on account of sizeable advance repurchases, but has remained broadly stable since then. At end-November 2017, credit outstanding stood at about SDR 43 billion. The moderate decline since the last review reflects mainly large advance repurchases of SDR 11.2 billion, mostly by Portugal. These have more than offset purchases of SDR 5.9 billion under 12 new drawing arrangements and an outright purchase agreed since the last review. Looking ahead, notwithstanding further advance repurchases that took place in December (about SDR 4.6 billion by Ireland and Portugal) and that are expected in the rest of the projection period (about SDR 0.7 billion), credit outstanding is expected to rebound slightly in the near term due to projected purchases under the current arrangements, peaking in FY 2020. Compared to the last review, the projected credit path has increased by an average of SDR 5.6 billion over the five-year period FY 2018-22. From a longer-term historical perspective, the current level of credit outstanding remains above pre-crisis levels, although it is well below its post-global financial crisis (GFC) peak (Figure 4, Panel A and Figure 5, Panel B).

Figure 3. Projected Credit Outstanding at Precautionary Balance Reviews in 2014, 2016 and 2018[1/]

(In SDR billions)



Source: IMF Finance Department.

1/ This figure shows actual credit outstanding through November, 2017 and projected credit outstanding at each respective precautionary balance review date.

12. Total outstanding commitments also remain high. Total commitments stood at about SDR 137 billion at end-November 2017. This includes undrawn balances under existing arrangements as well as commitments under precautionary arrangements, including the FCL arrangements for Colombia and Mexico, the PLL arrangement for Morocco and four precautionary SBAs. In total, 19 new arrangements amounting to about SDR 162 billion were approved since the last review.[16]

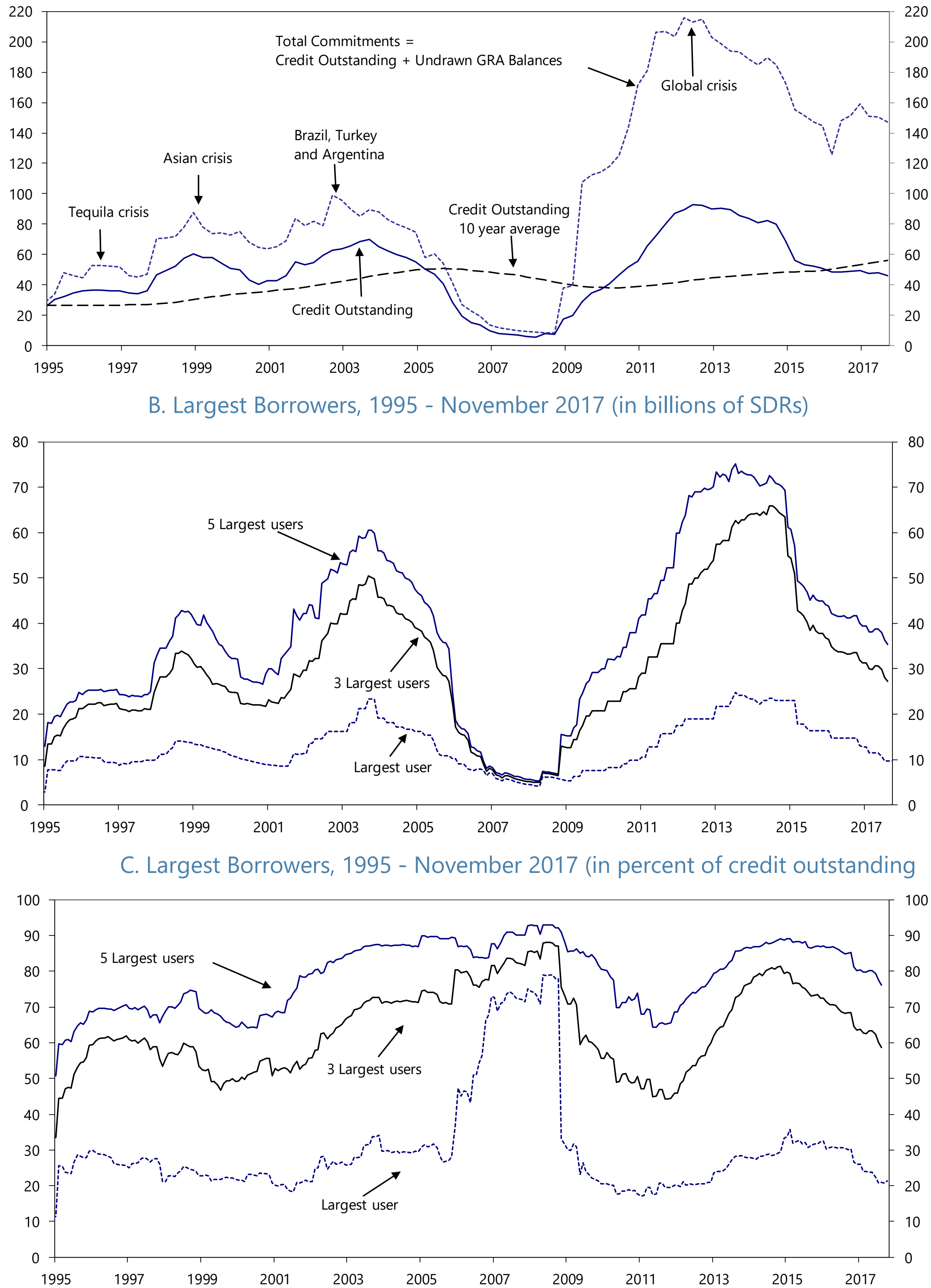
13. The concentration in the Fund's portfolio has fallen, but continues to be elevated. While sizeable advance repurchases (Portugal), as well as review delays (Ukraine), have led to a faster-than-projected reduction in the share of the Fund's largest exposures, the five largest borrowers continue to account for more than 75 percent of credit outstanding, and the largest three account for 55 percent (Figure 4, Panels B and C). Lending exposure to euro area countries fell further to about SDR 19 billion at end-November 2017, compared with about SDR 35 billion at the time of the last review, though it still accounts for nearly half of total exposures (Figure 5). In addition to the high loan concentration, the risks associated with two of the Fund's largest individual exposures—Greece and Ukraine—have been recognized as high.[17]

[16] New non-FCL/PLL arrangements approved from November 2015 through end-November 2017 provided total access of about SDR 20 billion. Poland recently cancelled its FCL arrangement effective November 3, 2017.

[17] See Greece—Request for Stand-By Arrangement (7/7/17) and Ukraine—Assessment of the Risks to the Fund and the Fund's Liquidity Position (3/6/15).

Figure 4. Total Commitments, Credit Outstanding and Credit Concentration: 1995–2017

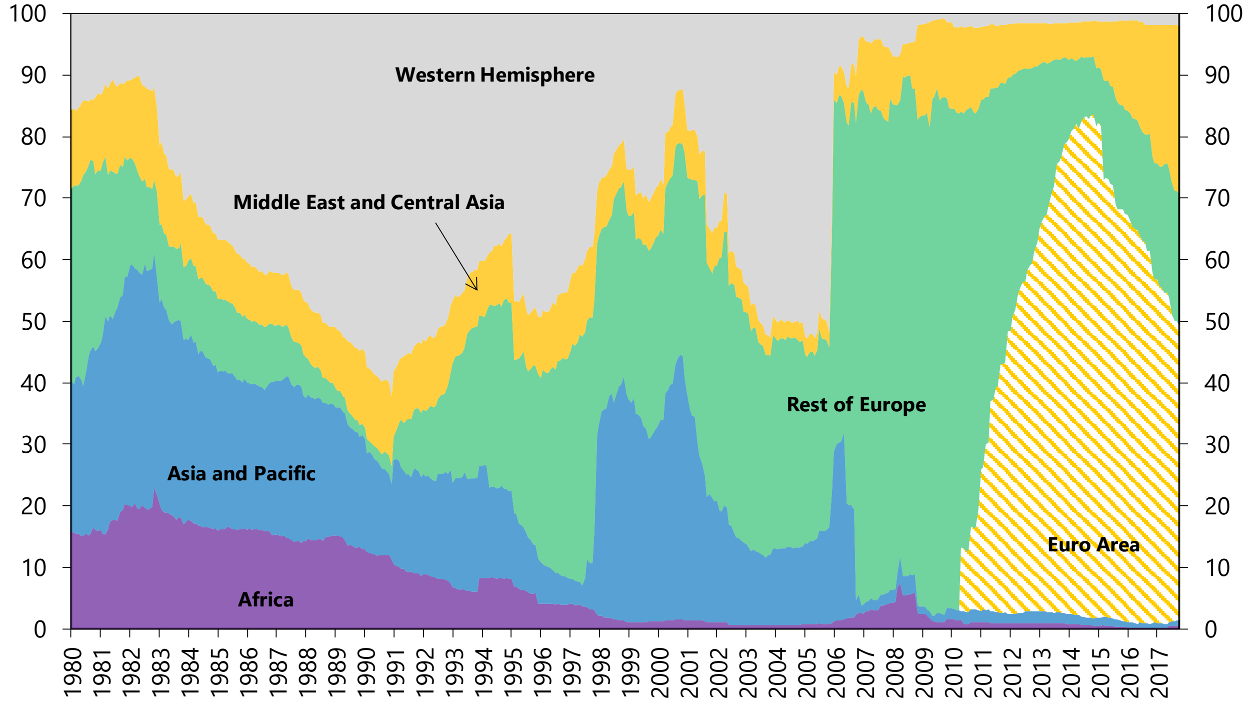
A. GRA Total Commitments and Credit Outstanding, 1995 – November 2017 (in billions of SDR)



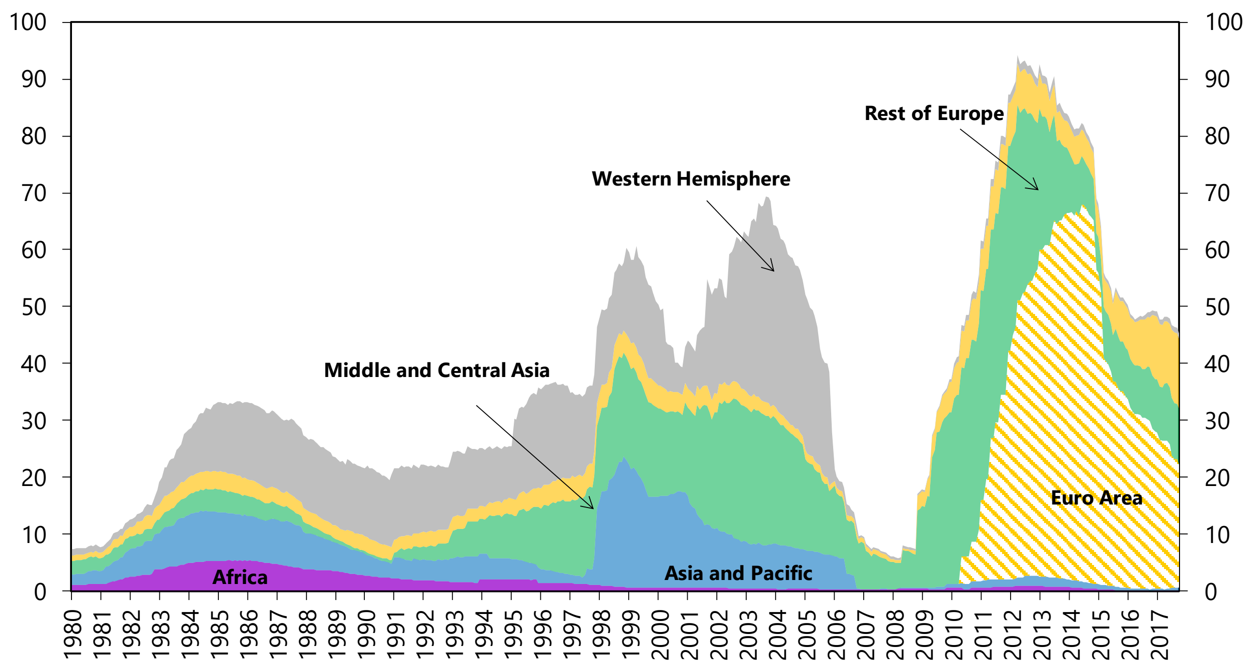
Source: IMF Finance Department.

Figure 5. Credit Concentration by Region: 1980 – October 2017

A. In Percent of Total Fund Credit



B. In Billions of SDRs



Source: IMF Finance Department.

14. Arrears to the Fund remain low. As of end-November 2017, protracted arrears to the GRA by Somalia and Sudan amounted to about SDR 1.1 billion and are covered by the Fund's burden sharing mechanism and SCA-1 balances. There have been no further arrears since Greece fell temporarily into arrears to the Fund shortly before the last precautionary balance review. While the arrears were cleared promptly at that time, the experience underlines the potential risks associated with the Fund's large scale support for members facing deep and protracted balance of payments problems.[18]

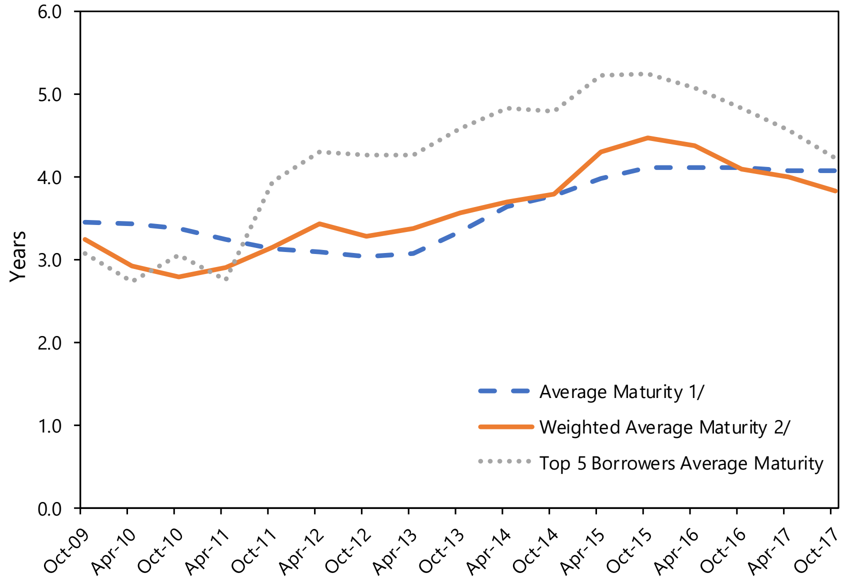
15. The average maturity of Fund credit remains high (Figure 6). This reflects the continued prominence of Extended Fund Facilities in recently approved arrangements. Weighted by credit outstanding, the average maturity has declined slightly since the last 2016 Review, mostly on account of the advance repurchases by Portugal.

16. The schedule of projected repurchases continues to be heavy over the medium term (Figure 7). Notwithstanding large actual and expected advance repurchases, scheduled repurchases are expected to remain heavy over the medium term, heightening the risks that a member could have difficulty meeting its Fund obligations if its adjustment and reform program is not successful in addressing underlying weaknesses.

[18] In June and July 2015, Greece failed to make SDR 1.6 billion in repurchases falling due, representing the first case of significant new arrears to the Fund since 2001. At the time, Greece was the Fund's largest single exposure at nearly SDR 16.9 billion, exceeding the Fund's precautionary balances of SDR 14.2 billion at the time. The arrears were cleared in mid-July with financing from Greece's European partners.

Figure 6. Average Maturity of Outstanding GRA Credit: 2009-2017

(In calendar years)



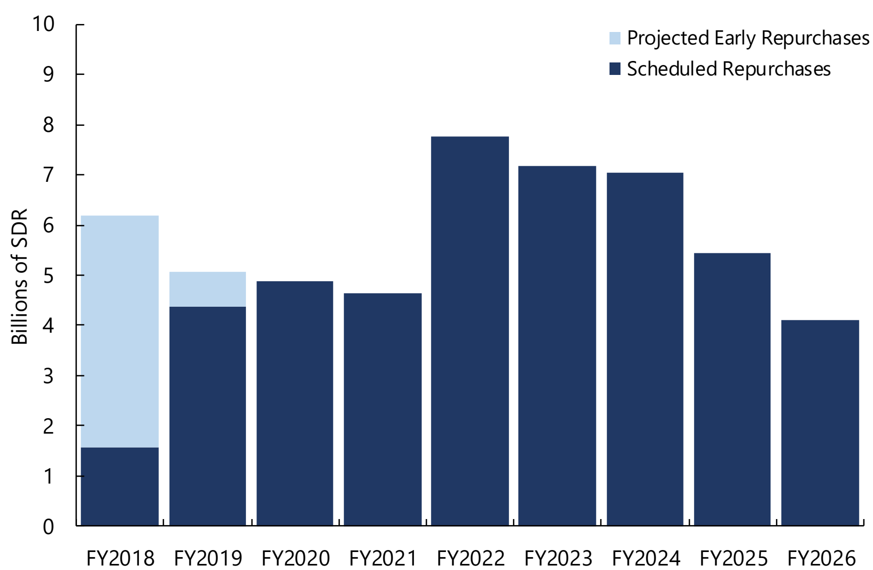
Source: IMF Finance Department.

1/ Average of the remaining maturities of each purchased credit tranche outstanding, as determined by the scheduled repurchase date.

2/ Average of the remaining maturities of each purchased credit tranche outstanding, as determined by the scheduled repurchase date, weighted by its share in total credit oustanding.

Figure 7. Scheduled Repurchases: FY 2018-26[1/ 2/]

(As of November 30, 2017, in SDR billion)



Source: IMF Finance Department.

1/ FY 2018 reflects scheduled repurchases and expected advance repurchases for the remainder of the fiscal year.

2/ Accounts for projected advance repurchases in the amount of SDR 5.3 billion in FY 2018-19.

17. The Fund's credit capacity has been sustained close to the level reached in 2013. Total credit capacity, which includes quotas, the New Arrangements to Borrow (NAB), and the 2016 bilateral borrowing agreements, stands at about SDR 700 billion (Table 2).[19] This reflects Board approval, in August 2016, of a new framework for bilateral borrowing (the 2016 Borrowing Agreements), with 40 members or their institutions, including 5 new creditors, subsequently committing a total of about SDR 318 billion in bilateral agreements with a common maximum term through end-2020.[20] In November 2016, the Board also approved the renewal of the NAB, with total credit arrangements of SDR 182 billion, for a further five years through November 16, 2022.

Table 2. Current versus Past Reviews: 2008-2017

	Oct-08 1/	Jul-10 1/	Feb-12 1/	Nov-13 1/	Nov-15 1/	Nov-17
	(In billions of SDRs)					
Precautionary balances	6.9	7.3	9.2	12.3	14.5 3/	16.8 3/
Arrears 2/	1.1	1.1	1.1	1.1	1.1	1.1
Largest individual exposure						
Actual	5.7	9.0	17.5	22.2	16.4	9.6
Projected	11.0	26.4	28.1	27.6	16.4	12.9
Credit outstanding						
Actual	17.2	48.6	88.5	84.1	51.5	42.7
Projected peak	30.0	78.2	100.6	87.1	51.5	47.9
Total commitments 4/	36.5	144.0	201.6	189.9	146.0	137.2
Credit capacity	165.9	310.1	451.4	668.7	665.2	693.4
Precautionary balances	(In percent of)					
Credit outstanding	40.5	15.1	10.4	14.6	28.1	39.4
Total commitments	19.0	5.1	4.6	6.5	9.9	12.3
Credit capacity	4.2	2.4	2.0	1.8	2.2	2.4

Source: IMF Finance Department.
1/ Review of the Adequacy of the Fund's Precautionary Balances; (12/08/2008), (8/25/2010), (1/15/2014), and (1/16/2016).
2/ Includes charges and principal.
3/ As of end-October 2015 and end-October 2017.
4/ Total commitments equal GRA credit outstanding plus undrawn balances.

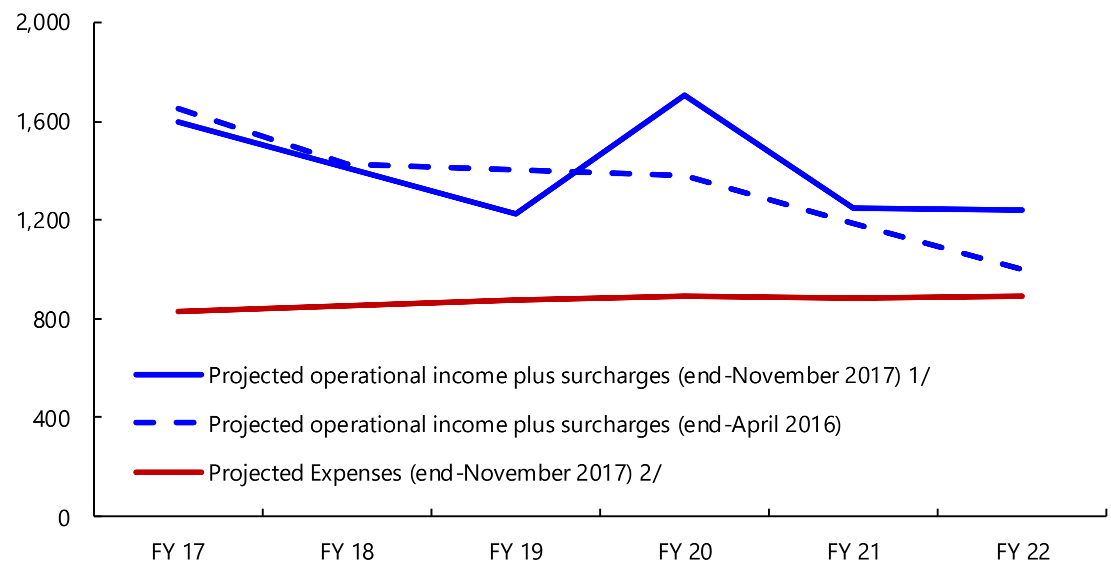
[19] The Fund's credit capacity consists of the Fund's total usable resources, before any lending, less relevant prudential balances.

[20] Under the framework, the 2016 Borrowing Agreements have an initial term to end-2019, extendable for a further year through end-2020 with creditors' consents. The committed total SDR amount is as of end-November, 2017.

B. Income Risks

18. Near-term income risks remain low and broadly unchanged since the last review.[21] The latest projections suggest that total operational income and surcharge income would exceed total expenditures by an annual average of about SDR 490 million in the five-year period through FY 2022 (Figure 8). New GRA arrangements approved since the 2016 review have increased projected lending income by an amount that more than offsets the impact of advance repurchases and review delays on margin and surcharge income. On the other hand, non-lending income is projected to increase at a somewhat lower pace than at the last review. This reflects more conservative assumptions on the investment returns of the Fixed-Income Subaccount and future payouts from the Endowment Subaccount, to be discussed by the Board in the context of the review of the Investment Account in early 2018.[22] Projected medium-term expenditure reflects a flat net administrative budget in real terms.

Figure 8. Medium-Term Projected Income and Expenses: 2017-2022
(In millions of SDRs, end of financial year)



Source: IMF Finance Department.
1/ Pending future Board discussions in the context of the upcoming review of the Investment Account, the projected operational income assumes only a modest payout from the Endowment Account (EA) during the projection period corresponding initially to one percent of the EA net asset value in FY 2018 and adjusted by inflation in subsequent financial years.
2/ End-November 2017 projected expenses are broadly unchanged from end-April 2016 projections.

[21] The current projection is compared to the baseline in the *Review of the Fund's Income Position for FY 2016 and FY 2017-18* (4/8/16). Relative to the range of projections presented in the 2016 *Review of the Adequacy of the Fund's Precautionary Balances* (1/26/16), the end-April 2016 projection incorporated the outcome of the review of level and time-based surcharge thresholds and commitment fee thresholds following the effectiveness of the 14th Review quota increases and an updated projected interest rate path.

[22] The projections for FI returns assume a lower premium over the SDR interest rate over the medium term, reflecting possible capital losses in a rising interest rate environment.

19. The projections are sensitive to a number of assumptions. These include the path of outstanding credit and Fund commitments, the path of SDR interest rates and the U.S. dollar/SDR exchange rate, returns on the Fund's investment accounts (see discussion on market risks below), as well as the margin on the basic rate of charge, which will be considered by the Board in the context of the annual review of the Fund's income position in April. Additionally, changed reporting requirements under International Financial Reporting Standards (IFRS) accounting standards followed by the Fund contribute to uncertainty around the baseline projection:

- **Adjustments under IAS19:** Since the adoption of the amended IAS 19 in FY 2014 and the elimination of the option to defer recognition of gains and losses on the Fund's employee benefits plan over time, the Fund's annual income has been subject to significant volatility (Figure 9).[23] The gains (losses) arise from the periodic re-measurement of the defined benefit obligation (DBO), as well as changes in the fair value of the Plan assets. The re-measurement of the DBO is highly sensitive, especially in the current low interest rate environment, to small variations in the discount rate used to calculate the present value of future benefit payments, which is derived from high-grade corporate bonds.[24] The valuation of the plan's assets depends on the uncertain nature of future market performance. While the IAS 19 gains since the last review (cumulatively about SDR 0.8 billion in FY 2016-17) have contributed positively to income, they are highly unpredictable and can have a substantial impact on the projected path of precautionary balances (see staff analysis on uncertainty around the projected path further below).

- **Impairment recognition under the IFRS9:** The Fund will begin implementing the IFRS9 accounting standard for impairment in FY 2019. Under the standard, it is no longer necessary for a credit event to have occurred before credit losses are recognized, but entities are instead required to estimate an "expected loss" considering a broader range of relevant considerations, including forward-looking information. In circumstances where the risk of a member entering into protracted arrears has increased significantly and the value of the principal exceeds available SCA-1 balances, the new standard could require an earlier recognition of impairment than under the current standard, possibly reducing the Fund's net income at an earlier point

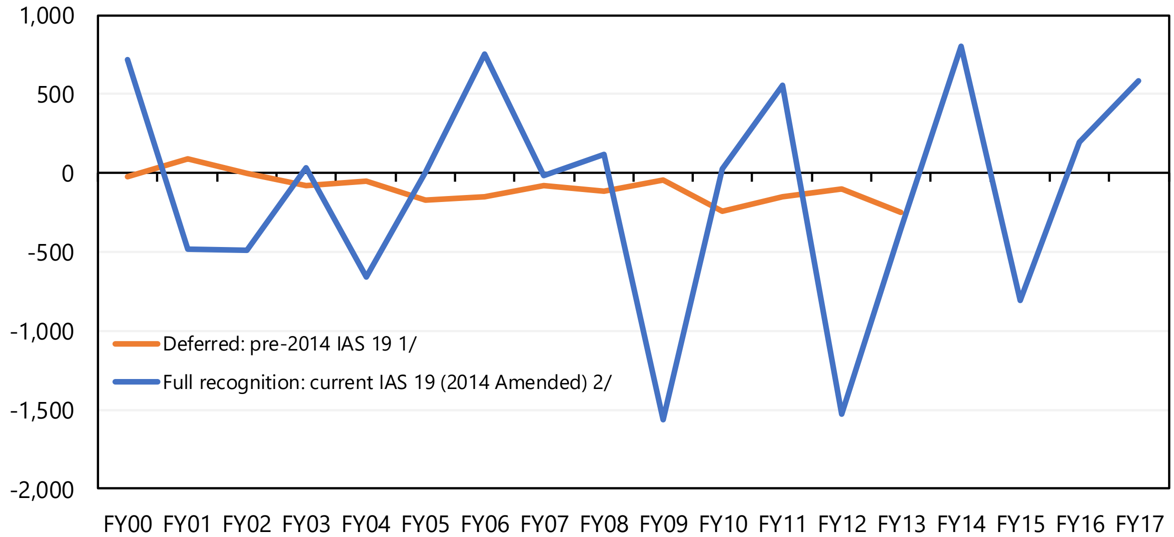
[23] IAS 19 is the International Financial Reporting Standard that deals with accounting for pension and other employee benefits. Up until FY 2013, the Fund deferred the recognition of a portion of such gains and losses, as permitted under the previous IAS 19 standard, and recognized this in income over time (i.e., the corridor method). Effective FY 2014, such deferrals were disallowed under the amended IAS 19 where the annual IAS 19 expense reflects the full impact of gains and losses incurred during the financial year. For further discussion, see *Review of the Fund's Income position for FY 2017 and FY 2018* (4/4/17).

[24] A rule-of-thumb rule applied by the Fund's Actuary is that a one percent increase (decrease) in the discount rate yields a decrease (increase) in the range of about 17 to 19 percent in the DBO. Changes to other financial and demographic assumptions also impact the DBO but generally occur less frequently than the effect of changes to the discount rate. See page 24 of *Audited Financial Statements for the Financial Years ended April 30, 2017, and 2016* (6/30/17) for the sensitivity of the present value of the DBO to changes in actuarial assumptions at April 30, 2017.

even if the protracted arrears are yet to materialize.[25] Accordingly, the implementation of IFRS9 may heighten uncertainty around the volatility of income.

Figure 9. Effect of IAS 19 on Income: Deferred (Pre-2014) and Full Recognition of Gains and Losses: FY 2000-17

(In millions of SDRs, in financial year)



Source: IMF Finance Department.

1/ Previously, the Fund had deferred the recognition of a portion of the gains and losses related to IAS 19 under the so-called "corridor" method. This practice ceased after FY 2013 with the adoption of the amended IAS 19.

2/ Starting in FY 2014, the full impact of gains and losses during the financial year is reflected in the annual IAS 19 expense under the amended IAS 19.

C. Market Risks

20. Since the last review, market risks on the Fund's investments have increased slightly, mainly due to the phased investment of the Fund's endowment subaccount (see Annex II for more detailed discussion).[26]

- **Fixed income subaccount (FI).** The Rules and Regulations governing the FI were amended in August 2015 to allow wider investment powers, while maintaining the original investment objective of exceeding the 3-month SDR interest rate. The FI investment strategy nevertheless remains relatively conservative and seeks to preserve nominal capital and limit the risk of

[25] The SCA-1, which serves as the first line of defense should the Fund ultimately recognize an actual credit loss, allows the Fund to uphold an equivalent amount of impaired credit at full value. Should the principal exceed available SCA-1 balances, the (expected) loss under the IFRS is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows and is charged against the Fund's net income. If the amount of estimated impairment loss decreases as a result of events (e.g., settlement) occurring after the impairment was recognized, the previously recognized loss is reversed.

[26] The Fund does not face market risks on its lending or holdings of members' currencies since the same floating rate determines the rate of charge and remuneration and the Fund's balance sheet is denominated in SDRs.

permanent losses. This is ensured by the current short duration of the FI and the high quality of assets in which it is invested. Currency risk is minimized by ensuring the portfolio is aligned with the SDR currency basket. That said, normalization of yields remains the main risk faced by the FI as coupon income remains near historical lows and provides little cushion against marked-to-market losses if rates increase.

- **Endowment account (EA).** Relative to the FI, assets invested in the EA's long-term diversified strategy are exposed to greater market risks, particularly over short horizons. Since the last review, risks in the EA have increased because 98 percent of its balance is now fully invested. With yields near their historical lows and risks related to rising asset valuations in some markets, future EA returns are likely to be compressed going forward. This cautious market outlook serves as background for the upcoming review of the EA investment strategy.

ASSESSMENT OF THE ADEQUACY OF PRECAUTIONARY BALANCES

This section assesses the adequacy of precautionary balances in light of the above developments and concludes that, on balance, and given the similarities to conditions at the time of the 2016 review, the target should be kept at SDR 20 billion. The section also concludes that the minimum floor should be kept at SDR 15 billion.

A. Indicative Precautionary Balance Target

21. Under the agreed framework, the starting point for assessing precautionary balances is the forward-looking measure of credit outstanding, which has declined slightly since the last review. As of end-November 2017, it stood at about SDR 45 billion, compared with about SDR 51½ billion in end-November 2015 (Table 3, column 2). This fall reflects primarily both actual and expected advance repurchases (mainly by Portugal and Ireland). As in the past, the projected path of average credit outstanding assumes full and timely disbursements under all non-precautionary arrangements approved to date, but makes no allowance for possible new arrangements or for drawings under existing precautionary arrangements. It also assumes that all repurchases are made as scheduled except the expected advance repurchases communicated to the Fund by Portugal and Ireland. Under these assumptions, the forward-looking measure is projected to remain broadly at its current level through FY 2019.

22. The calculated range has also fallen modestly. The calculated range now stands at about SDR 9 to 13½ billion, with the midpoint down from about SDR 13 to about SDR 11 billion, remaining below the agreed minimum floor of SDR 15 billion as in the 2016 Review (Table 3, columns 5 and 6).

Table 3. Calculated Range for Precautionary Balances: 2009–2020[1/]
(In billions of SDRs, end of financial year)

	Average Credit Outstanding [2/]	Measure for Credit Outstanding [3/]	Coverage for Credit Outstanding [4/]		Mid-point of bounds	Higher of Mid-point of bounds and Floor	Precautionary Balances [5/]
			Lower Bound 20%	Upper Bound 30%			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FY2009	13.1	34.4	6.9	10.3	8.6	10.0	7.1
Jul. 2010	***48.6***	***59.5***	***11.9***	***17.8***	***14.9***	***14.9***	***7.3***
FY2010	35.2	57.3	11.5	17.2	14.3	14.3	7.3
FY2011	54.8	76.1	15.2	22.8	19.0	19.0	8.1
Feb. 2012	***77.5***	***91.8***	***18.4***	***27.6***	***23.0***	***23.0***	***9.2***
FY2012	81.9	86.9	17.4	26.1	21.7	21.7	9.5
FY2013	91.7	86.0	17.2	25.8	21.5	21.5	11.5
Nov. 2013	***88.4***	***83.6***	***16.7***	***25.1***	***20.9***	***20.9***	***12.3***
FY2014	85.0	69.8	14.0	20.9	17.4	17.4	12.7
FY2015	72.9	57.7	11.5	17.3	14.4	14.4	14.2
Nov. 2015	***56.7***	***51.4***	***10.3***	***15.4***	***12.9***	***12.9***	***14.5***
FY2016	51.5	48.0	9.6	14.4	12.0	15.0	15.2
FY2017	48.6	45.3	9.1	13.6	11.3	15.0	16.7
Nov. 2017	***47.2***	***44.9***	***9.0***	***13.5***	***11.2***	***15.0***	***16.8***
FY2018	43.9	44.5	8.9	13.4	11.1	15.0	17.3
FY2019	43.3	44.8	9.0	13.5	11.2	15.0	17.6
FY2020	46.4	-	-	-	-	-	-

Source: IMF Finance Department.
1/ Italicized figures reflect calculations at the time of the respective 2010, 2012, 2014, 2016 reviews (8/25/2010; 3/23/2012; 1/15/2014; and 1/26/16). Figures shown between FY 2009 and November 2017 are actual outturns, not projections, and hence may differ from the figures in the equivalent tables from previous review papers. Figures for FY 2018-20 are based on projections.
2/ For July 2010, February 2012, November 2013, November 2015 and November 2017, the figure shown reflects the average credit during the previous twelve months, respectively.
3/ Three-year average based on one-year of backward looking data and projections two years forward.
4/ The lower and upper bound correspond to 20 percent and 30 percent coverage for the credit measure, respectively.
5/ The italicized figures correspond the calculated level of precautionary balances as of end-April 2010, end-January 2012, end-October 2013, end-October 2015, and end-October 2017, respectively.

23. Under the agreed framework, the calculated range serves as a guide and the Board retains flexibility to set the target for precautionary balances outside of the range. For example, at the time of the last review, the Board decided to keep the target at SDR 20 billion, despite being above the calculated framework range. This reflected the assessment of risks in the Fund's lending portfolio (as evidenced by the emergence of significant, albeit short-lived arrears and high credit concentration), the very limited capacity of the burden sharing mechanism to mitigate these risks, the risk of a potential further increase in Fund lending, as well as its sizeable precautionary commitments and high credit capacity. These considerations remain relevant.

24. The Fund's lending portfolio remains heavily concentrated with large exposures to members facing deep-rooted and difficult structural adjustment challenges. The five largest Fund exposures still account for about three-quarters of total outstanding credit. As of end-November, the largest two—Greece (SDR 9.6 billion) and Ukraine (SDR 8.6 billion)—amount each to more than half of the current level of precautionary balances and continue to face challenges in securing the support needed to address deep-rooted structural problems. In July 2017, the Board approved a new precautionary SBA for Greece in principle, but the preconditions for the arrangement to come into effect are yet to be met. Under the current EFF for Ukraine, approved in March 2015, only three reviews have so far been completed. Both members also face substantial repurchases to the Fund of about SDR 15 billion cumulatively in the coming years (see text table).

Greece and Ukraine Projected Exposures and Repurchases[1/]

(in billions of SDRs, end of financial year)

	Combined Credit Outstanding	Combined Scheduled Repurchases
FY 2018	17.2	1.1
FY 2019	20.4	2.9
FY 2020	17.5	2.9
FY 2021	15.0	2.6
FY 2022	12.3	2.7
FY 2023	9.6	2.6

Source: Fund staff calculations.

1/ FY 2018 includes only projected repurchases as of end-November 2017.

25. Looking ahead, demand for Fund financing could increase particularly if downside risks to the global outlook materialize. As noted in the October 2017 flagship surveillance reports, although the global economic recovery has strengthened, it is not yet complete. Growth remains weak in many economies and commodity exporters continue to face a protracted adjustment to lower revenues. Prospects for medium-term growth face structural headwinds as negative output gap shrinks and demographic factors and weak productivity weigh on potential growth. Moreover, while short-term risks are broadly balanced, policy missteps in an environment of high uncertainty and geopolitical tensions could take a toll on market confidence, resulting in tighter financial conditions and weaker asset prices. Medium-term risks also remain skewed to the downside. These include a host of financial tensions such as rapid and sizeable tightening of global financial conditions amid rising asset valuations and higher leverage, persistently low inflation in advanced economies limiting central banks' capacity to respond to a downturn, possible shifts towards more inward-looking policies and non-economic factors such as geopolitical tensions. All these risks are interrelated and can be mutually reinforcing.

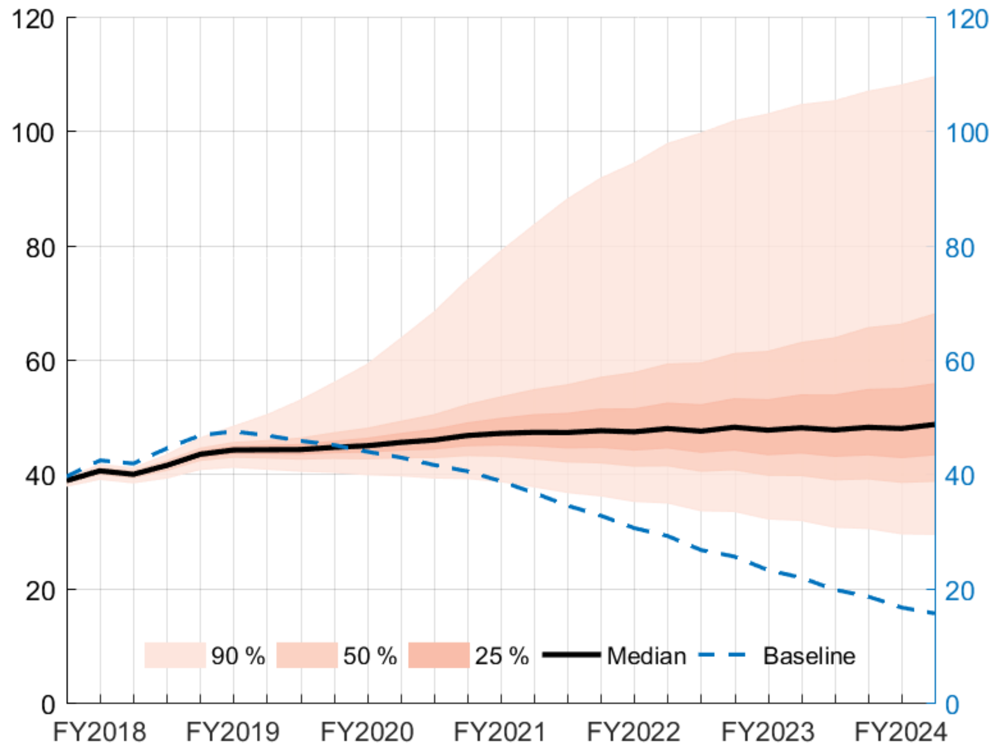
26. It should also be noted that staff's baseline projection for credit outstanding is subject to considerable uncertainty. The projection assumes that no new arrangements are approved in the projection period and that all purchases are made as scheduled. To gauge the degree of uncertainty from these factors to the credit path going forward, staff has developed probabilistic scenario simulations that draw on the history of Fund arrangements since 2000 (see Annex IV for methodology). Specifically, for upside risk, an econometric model based on past approved arrangement requests is used to estimate potential new credit demand under a conservative non-shock scenario, where the model inputs are based on current WEO assumptions and a moderate level of volatility.[27] For downside risk, distributions of ratios of drawn to approved amounts under past approved arrangements are used to quantify the possibility of lower than scheduled purchases, e.g., due to arrangement cancellations. The analysis suggests that, even in absence of major shocks, credit outstanding is likely to remain higher in the medium term than projected under the baseline (see median simulated path in Figure 10). In 50 percent of the simulations, outstanding credit in FY 2024 would be in the range of about SDR 40 to 70 billion and could in some simulated outcomes reach a much higher figure.[28]

[27] The scenario inputs used in this paper are *not* based on an assumed global shock, but rather reflect current economic conditions under normalized market volatility.

[28] The upside risks to the baseline credit path tend to dominate since the current level of undrawn balances under non-precautionary Fund arrangements in effect (about SDR 19 billion as of end-November 2017) provides less scope for downside risks relative to amounts that could be approved under potential new arrangements over the projection period. Advance repurchases of outstanding credit could be a source of a further downside risk in the projection period, but with the exception of the recent advance repurchases under the large euro area arrangements, the amounts of advance repurchases have been modest in the past.

Figure 10. Baseline Projection and Probabilistic Simulations for Credit Outstanding: FY 2018-24[1/2/]

(in billions of SDRs)



Source: IMF Finance Department.

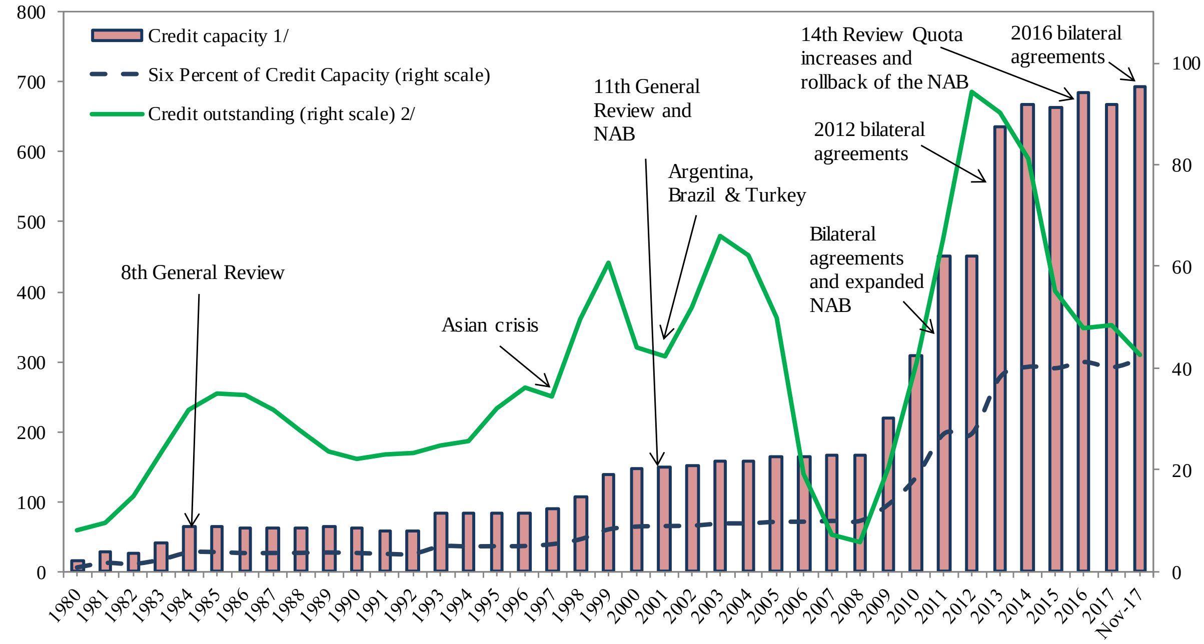
1/ The baseline projection is as of end-November, 2017. The shaded uncertainty bands represent the path of the credit outstanding with 25, 50 and 90 percent probability simulated using Monte Carlo simulations with 10,000 replications.
2/ Methodology is described in Annex IV.

27. The Fund's overall credit capacity could meet a large increase in financing demands should downside risks to the current global outlook materialize. The commitments under the 2016 Borrowing Agreements and the recent renewal of the NAB would preserve the Fund's current total credit capacity at least through end-2019 and through end-2020 should the terms of the former be extended. While not formally part of the framework for setting the indicative target, Directors have agreed to include credit capacity among the indicators for assessing where to set the target for precautionary balances. The Executive Board has in the past discussed a precautionary balances target to credit capacity ratio of 6 percent.[29] Applying this ratio to the Fund's current credit capacity would yield an indicative target of more than SDR 40 billion, more than double the current target (Figure 11).

[29] See *Review of the Adequacy of the Fund's Precautionary Balances* (1/15/14).

Figure 11. Credit Outstanding and Credit Capacity: 1980-2017

(In billions of SDRs, end of financial year)



Source: IMF Finance Department.

1/ Credit capacity is approximated as the sum of the quotas of FTP members, resources under the NAB, and resources under the effective 2012 and 2016 loan and note purchase agreements, and excluding prudential balances.

2/ As of November 30, 2017.

28. Fund commitments under precautionary arrangements remain large. Notwithstanding the recent cancellation of the FCL arrangement by Poland (SDR 6.5 billion), the end-November stock of precautionary commitments stands at SDR 76 billion, compared with SDR 71 billion at the 2016 review.[30] Under the framework, these commitments are not included in the calculation of the forward-looking credit measure, but are taken into account judgmentally when setting the precautionary balances target. Given the low historical incidence of drawings and no new developments since the last review, staff continues to consider this approach as appropriate, while keeping the issue under review.[31] That said, a drawing of a large precautionary arrangement could quickly and significantly affect the projected path of outstanding credit and the indicative range.

29. A further important consideration in assessing the target for precautionary balances is the continued very low capacity of the burden sharing mechanism. This mechanism plays a key

[30] The stock of precautionary arrangements includes arrangements under the FCL, PLL and SBA treated as precautionary by the authorities.

[31] There have been no drawings to date under FCL arrangements, which account for the bulk of the Fund's precautionary commitments. Moreover, applying the low historical drawing rate under the Fund's precautionary arrangements to current commitments would have only a modest impact on the calculated indicative range and past stress scenario analyses by staff suggest that members with precautionary arrangements are only likely to draw in the most extreme stress conditions. See Annex V in *Review of the Adequacy of the Fund's Precautionary Balances* (1/26/16).

role in protecting the Fund's income position in the face of unpaid charges by members in arrears and supports the Fund's ability to avoid recognition of an impairment loss under IFRS (Annex III). Since the last review, the capacity of the mechanism has improved on the back of a rise in the SDR interest rate and remunerated reserve tranche positions following the 14th General Review quota increases. However, the current residual capacity of about SDR 86 million, taking account of existing arrears by Somalia and Sudan, remains low relative to projected charges coming due as well as its historical levels (see Figures in Annex III). The emergence of new unpaid charges could thus have a sizeable impact on Fund income, and possibly the precautionary balances, which could be amplified if the Fund were also required to record an impairment loss due to overdue repurchases.

30. On balance, staff believes that the SDR 20 billion indicative target remains appropriate. The forward-looking credit measure has seen a modest decline and, as at the 2016 Review, the indicative range remains below the target. At the time, the Board decided to keep the indicative target unchanged based on broader consideration of financial risks faced by the Fund. In staff's view, these considerations remain relevant today. The Fund's credit portfolio remains highly concentrated with large individual exposures, uncertainties over the global outlook continue to give potential for significant new demand for Fund resources that could be met with the Fund's broadly unchanged credit capacity, the Fund's precautionary commitments remain sizeable and the capacity of the Fund's burden sharing mechanism remains low.

B. The Pace of Accumulation

31. Precautionary balances have increased faster than projected at the last review, but remain below the indicative medium-term target. At end-FY 2017, precautionary balances increased to SDR 16.7 billion, compared with a projected level of SDR 16.1 billion at the time of the 2016 review of the Fund's income position.[32] The faster-than-expected accumulation largely reflects the positive IAS 19 adjustment, which may continue to display volatility around staff's baseline projections going forward (see below).

32. The coverage of precautionary balances has continued to improve relative to key metrics (Table 4). With the decline in credit outstanding, the coverage of precautionary balances at end-FY 2017 has increased to about 35 percent of *credit outstanding*, the highest since FY 2009, and 11 percent of *total commitments*. Relative to the Fund's total *credit capacity*, precautionary balances stood at 2.5 percent, having increased from 2.1 percent at the time of the last review. Despite the increase, these coverage ratios remain well below those prevailing prior to the start of the latest credit cycle (Figure 12).

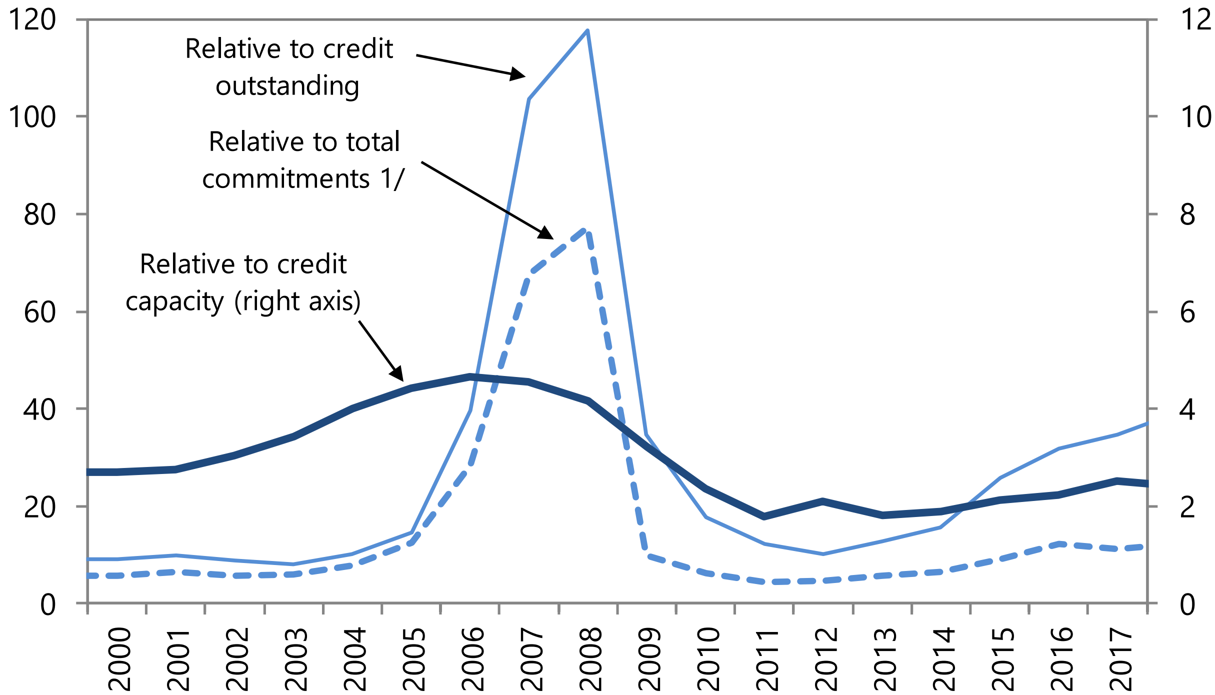
[32] The 2016 review of the Adequacy of the Fund's Precautionary Balances presented a range of projections pending the outcome of the discussions on the new surcharge and commitment fee thresholds that would apply following the effectiveness of the 14th Review quota increases. The new policy thresholds were incorporated in the subsequent updated projections for the 2016 review of the Fund's income position. See *Review of the Fund's Income Position for FY 2016 and FY 2017-2018* (4/ 8/16).

Table 4. Precautionary Balances: 2007–2017
(End of financial year)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
					(In billions of SDRs)						
Precautionary balances 1/	7.6	6.9	7.1	7.3	8.1	9.5	11.5	12.7	14.2	15.2	16.7
Memorandum items:											
Credit capacity 2/	166.3	166.7	219.5	309.2	451.2	451.6	635.2	671.5	667.1	684.5	667.5
Total commitments 3/	11.2	9.0	72.2	117.5	181.5	201.6	198.2	194.6	154.3	125.4	150.6
Credit outstanding	7.3	5.9	20.4	41.2	65.5	94.2	90.2	81.2	55.2	47.8	48.3
Arrears 4/	1.6	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
					(In percent)						
Precautionary balances to											
Credit capacity	4.6	4.2	3.2	2.4	1.8	2.1	1.8	1.9	2.1	2.2	2.5
Total commitments	67.5	77.2	9.8	6.2	4.5	4.7	5.8	6.5	9.2	12.1	11.1
Credit outstanding	103.5	117.7	34.7	17.8	12.4	10.1	12.8	15.6	25.7	31.9	34.6

Source: IMF Finance Department.
1/ Precautionary balances exclude that part of the Special Reserve that is attributed to gold sale profits from the 2009-10 gold sales (SDR 4.4 billion) (see *Review of the Fund's Income Position for FY 2010 and FY 2011*).
2/ The Fund's credit capacity is approximated by the quotas of members in the FTP plus resources made available under effective bilateral loan and note purchase agreements plus resources that could be made available by activating the NAB, excluding a prudential balance based on these combined resources. Amounts available in SDRs under the bilateral loan and note purchase agreements are subject to variations due to exchange rate movements.
3/ Total commitments equal credit outstanding plus undrawn balances under GRA arrangements.
4/ Obligations to the GRA that are overdue for six months or more, excludes arrears for Structural Adjustment Facility loans.

Figure 12. Precautionary Balance Ratios: 2000-2017
(In percent, end of financial year)



Source: IMF Finance Department.

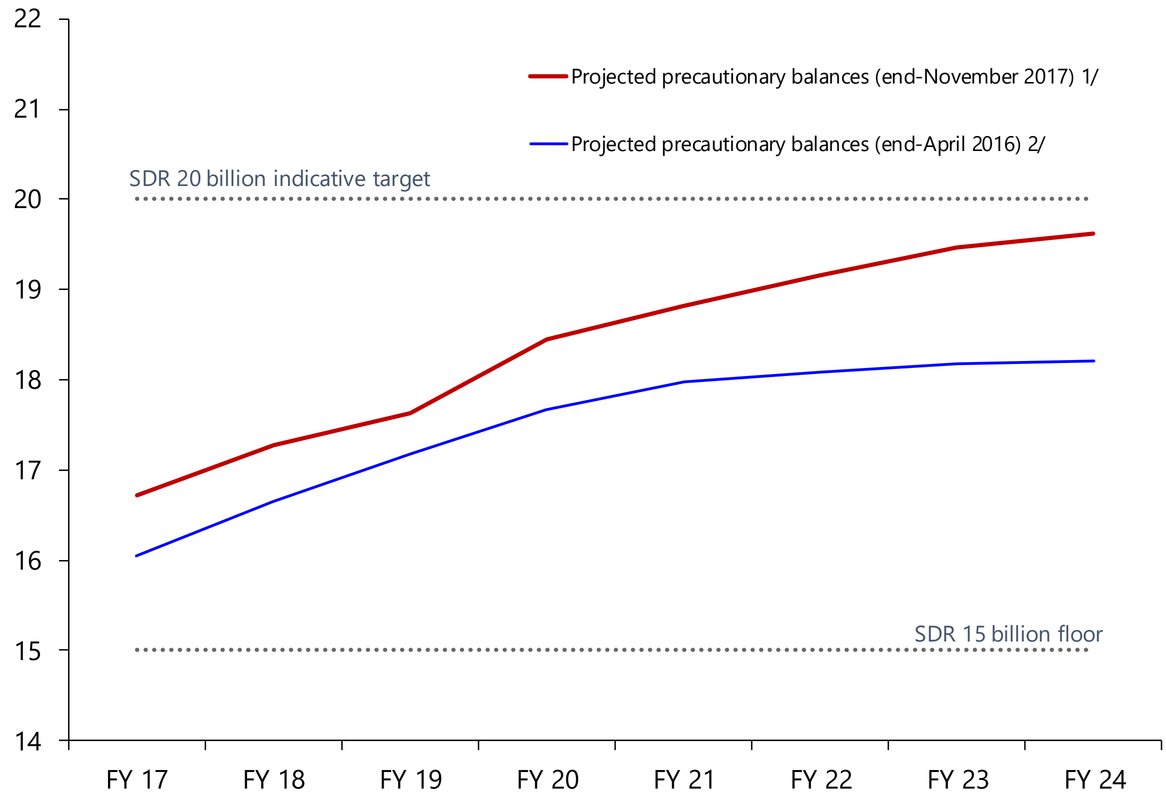
1/ Total commitments equal credit outstanding plus undrawn balances under GRA arrangements.

33. **Despite these developments, the accumulation of precautionary balances may not be sufficient to reach the current target over the projection period.** Staff's updated baseline projections (red line in Figure 13), incorporating both new arrangements and the large advance repurchases since the last review, a modest upward revision in the interest rate path over the medium term and lower projected non-lending income, show a pickup in the pace of accumulation of precautionary balances relative to the baseline projections in April 2016 (blue line).[33] Under this baseline projection, precautionary balances would remain just short of the indicative target in the projection period and reach SDR 19.6 billion by end-FY 2024. The projection assumes that the margin of the basic rate of charge remains at 100 basis points.

[33] See *Review of the Fund's Income Position for FY 2016 and FY 2017-2018* (4/8/2016).

Figure 13. Projected Precautionary Balances: 2017-2024

(In billions of SDRs, end of financial year)



Source: IMF Finance Department.

1/ Pending future Board discussions in the context of the upcoming review of the Investment Account, these projections assume only a modest payout from the Endowment Account (EA) during the projection period corresponding initially to 1 percent of the EA net asset value in FY 2018 and adjusted by inflation in subsequent financial years.
2/ As in the *Review of the Fund's Income Position for FY 2016 and FY 2017-18* (4/ 8/16). Relative to the range of projections presented in the 2016 *Review of the Adequacy of the Fund's Precautionary Balances* (1/26/16), the end-April, 2016 projection incorporated the outcome of the review of level and time-based surcharge thresholds and commitment fee thresholds following the effectiveness of the 14th Review quota increases and an updated projected interest rate path.

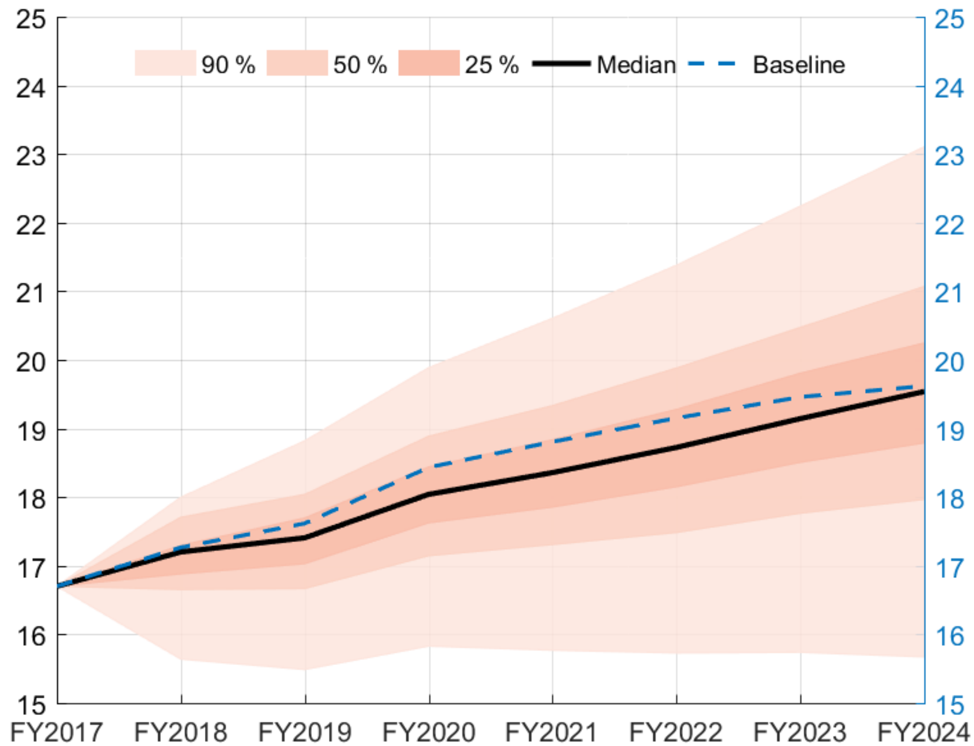
34. The projected path of precautionary balances is also subject to substantial uncertainty.[34] To demonstrate the degree of such uncertainty, staff has conducted new probabilistic simulations introducing variability around the projected baseline path for (i) credit outstanding, (ii) the SDR interest rate and (iii) the total return on the two investment subaccounts (see Annex IV for details on the methodology). Additionally, the simulations also allow for variation in the IAS 19 gains and losses, which is assumed as zero under the baseline projection. At the end of the projection period, the median of the simulated outcomes would be broadly in line with staff's baseline projection (Figure 14). However, as illustrated by the simulated uncertainty bands around the median, the accumulation path could both significantly overshoot or undershoot this range. A large

[34] At the time of the 2016 review precautionary balances were also not expected to reach the target within the projection period, while in 2014 the target was expected to be reached by mid-FY 2018.

degree of the simulated uncertainty arises from the volatility in the IAS19 gains and losses, while the uncertainties about the projected credit path provides some upside risk relative to staff's baseline projection (see Figure 10). The SDR interest rate and the investment returns have more modest impact on the simulated variance.

Figure 14. Baseline Projection and Probabilistic Simulations for Precautionary Balances: 2017-2024[1/ 2/]

(In billions of SDRs, end of financial year)



Source: IMF Finance Department.

1/ The baseline projection is as of end-November, 2017. The shaded uncertainty bands represent the path of the precautionary balances with 25, 50 and 90 percent probability simulated using Monte Carlo simulations with 10,000 replications.
2/ Methodology is described in Annex IV.

35. **Despite the modest projected shortfall relative to the current medium-term target, staff does not believe that additional steps to achieve the SDR 20 billion target are needed.** While the baseline projection suggests precautionary balances would remain below the target over the medium term, further significant reserve build up is projected in the forthcoming review period and, as illustrated by staff's simulations, uncertainty around this baseline remains large. Should further demand for Fund financing materialize over the medium term, the pace of precautionary balance accumulation should itself pick up with the associated increase in lending income.

C. Minimum Floor

36. The minimum floor was increased at the 2016 review from SDR 10 billion to SDR 15 billion based on both income and credit risk considerations.[35] Precautionary balances represent an important source of Fund income, and a certain minimum level of precautionary balances is consistent with a sustainable income position under the new income model. Also, Fund credit can be highly volatile and increase sharply with little notice, while it can take time to build precautionary balances. Thus, the Fund needs to maintain an adequate reserves buffer to protect against an unexpected rise in credit risks.

37. Staff proposes that the floor, which is based on longer-term considerations, be kept at SDR 15 billion. The floor was expected to be changed only occasionally under the framework. Staff does not see strong reasons to revisit the floor in this review, as it remains broadly consistent with sustainable medium-term income and provides an appropriate buffer to protect against risks associated with any unexpected rise in credit during the next lending cycle. The floor will continue to be kept under review.

CONCLUSIONS AND ISSUES FOR DISCUSSION

38. This paper has reviewed the adequacy of precautionary balances and proposes that the medium-term target should be kept unchanged at SDR 20 billion. The review follows the rules-based framework adopted in 2010, and takes account of developments since the last review in 2016. Notwithstanding a modest decline in the indicative range under the framework, the paper concludes that financial risks facing the Fund remain significant and that the considerations underpinning the Board's decision to retain the target at the 2016 Review remain relevant today. Accordingly, staff does not see a compelling case for changing the agreed target. The Fund's lending portfolio remains heavily concentrated, including large individual exposures to members facing structural adjustment challenges. As during the last review, a further uptick in Fund credit cannot be ruled out given remaining global economic and financial risks, while the level of commitments under current precautionary arrangements remains elevated, as does the Fund's credit capacity. Furthermore, the limited capacity of the burden sharing mechanism increases the potential reliance on precautionary balances in the event of large new arrears.

39. The paper also proposes maintaining the minimum floor for precautionary balances at SDR 15 billion. Under the framework, the floor is not expected to change often, and the increase in 2016 was the first change under the new approach. The agreed floor remains consistent with a sustainable income position over the medium term and provides a buffer to protect against an unexpected rise in credit risks.

40. The projected pace of reserve accumulation has increased modestly and staff does not see a need for taking additional steps at this point to reach the SDR 20 billion target. While

[35] See *Review of the Adequacy of the Fund's Precautionary Balances* (1/26/16).

the precautionary balances would remain short of the agreed target under the updated baseline projections, prospects for reaching the target have improved since the last review. Nonetheless, uncertainties around the baseline projection remain high and the pace of accumulation will need to be kept under close review.

41. Directors may wish to comment on the following issues:

- Do Directors agree that the indicative medium-term target for precautionary balances should be kept unchanged at SDR 20 billion?
- Do Directors agree that it would not appear necessary at this point to take additional steps to accelerate the pace of precautionary balance accumulation?
- Do Directors agree that the minimum floor for precautionary balances should be kept unchanged at SDR 15 billion?

Annex I. Overview of Other IFIs' Capital Adequacy Frameworks

This annex updates the summary of capital adequacy frameworks in selected International Financial Institutions (IFIs) presented during the 2010-16 reviews.[1,2] *Most other IFIs, unlike the Fund, borrow from capital markets, and therefore in determining their approaches seek to maintain a high foreign currency long-term credit rating (AAA) by preserving a strong financial footing.*

Table 1. Summary of Capital Adequacy Frameworks in Selected International Financial Institutions (IFIs) Presented During the 2010-16 Reviews

Credit risk. The IBRD, and the ADB employ, or employed until recently, an explicit target for equity to loan types of measures. Since the global crisis, these IFIs have gradually moved towards a more comprehensive approach to assess capital adequacy though credit risks still account for the major component of required capital. In the same direction, the EBRD, AfDB, IDB, and the BIS have similar frameworks built on risk-based capital measures, where the economic capital available to support risk taking is based on an assessment of the institution's loss absorbing capacity. Available capital typically comprises paid-in capital and reserves and usually excludes callable capital. While definitions vary according to the institutions, in general, economic capital consumption is calculated by taking into account unexpected financial losses that the institution may incur subject to a targeted solvency level:	The **IBRD** set a target for the equity-to-loans ratio in the range of 23-27 percent in 2008. The minimum equity-to-loans ratio was reduced to 20 percent from 23 percent in FY 2014, in light of improvements in portfolio credit risk; the ratio at end-June 2017 stood at 22.8 percent. The minimum 20 percent equity-to-loans ratio is based on an internal income-based stress test sufficient to ensure that income remains positive following a large nonaccrual shock. The **IDB** had until 2009 employed a formal target for its equity-to-loans ratio of 32-38 percent. In 2010, it introduced the capital utilization ratio (CUR) as the main indicator of capital adequacy and in 2015 concluded a comprehensive review of its capital adequacy policy framework. The policy uses Capital Coverage Ratio (CCR) as the main indicator of capital adequacy. The IDB continues to publish the equity-to-loans ratio (32 percent at end-2016) in its information statements to investors. The CCR is the ratio of adjusted equity to base capital requirements, which covers financial risks, including credit, market, defined benefit pension plan, and operational risks. The CCR targets the top of a buffer zone placed on top of the minimum capital.

[1] The International Bank for Reconstruction and Development (IBRD), the Inter-American Development Bank (IDB), the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), and the Bank for International Settlements (BIS). Based on the latest publicly available information and Fund staff estimates.

[2] The 2010 precautionary balances paper reviewed the capital adequacy practices of the IBRD, the IDB, and the ADB. The 2014 and 2016 papers summarized the overall risk management approach (capital adequacy as well as market and operational risks).

Summary of Capital Adequacy Frameworks in Selected International Financial Institutions (IFIs) Presented During the 2010-16 Reviews (continued)

	The **ADB** uses a minimum equity-to-loans ratio target of 34 percent for long term financial planning, following the transfer of the Asian Development Fund concessional lending operation to the ADB. The ADB holds capital for credit risks and other risk exposures. Point-in-time capital adequacy is tested using a Capital Utilization Ratio (CUR) which is defined as total economic capital to total available capital. The **EBRD**'s capital adequacy framework aims at maintaining the ratio of required capital (aimed at covering potential capital losses based on credit, market and operational risks) to available capital below 90 percent. Required capital varies by product and counterparty rating in the banking book. Overall internal capital requirements are calibrated relative to external benchmarks: the Basel capital framework and rating agency frameworks. The **AfDB's** economic capital framework aims at maintaining the ratio of required capital (for covering potential losses based on credit, market and operational risks) to available capital below 100 percent. Economic capital for credit and market risk are determined using a value-at-risk model. Its risk capital utilization rate (RCUR) was about 80 percent at end-June 2017, of which the bulk was reserved for credit risks. The AfDB's risk appetite statement aims at maintaining the RCUR below 100 percent with a trigger level of 90% for recapitalization discussions. The **BIS**'s economic capital framework which covers credit risk, market risk and operational risks, is geared to a higher solvency level than the minimum Pillar 1 capital level required. Economic capital for credit risk is determined on the basis of a portfolio value-at risk model. The ratio of economic capital allocated for credit risks to overall equity was almost 50 percent at end-March 2017. In addition, the BIS maintains an

Summary of Capital Adequacy Frameworks in Selected International Financial Institutions (IFIs) Presented During the 2010-16 Reviews (continued)

	"economic capital cushion" (based on stress tests) with a view to sustaining a potential material loss without the need to reduce other capital allocations or liquidate assets. At end-March 2017, the economic capital cushion was about 12 percent of equity.
Market risks. Treatment of market risks in the IFIs' capital adequacy frameworks varies. Several IFIs have integrated market risks in their capital frameworks, although the specific risks covered and the amount of allocated capital vary considerably.	The **IBRD** minimum equity-to-loans ratio of 20 percent includes a buffer for market risks. The **ADB**'s capital metrics mentioned above include the capital required for equity investment risk, interest rate risk, currency risk, and pension-related market risk. The **IDB** manages overall interest rate risk through setting a target for equity duration. In addition, it sets a risk appetite for its investment portfolio as measured in the form of value-at-risk. The CCR quantifies capital requirements for interest rate risk on the whole bank balance sheet (including its pension plans) and for foreign exchange risk. Capital requirements for market risk are aggregated with those of other financial risks through the use of a correlation matrix. The **AfDB** sets the maximum economic capital for all non-core risks (market and operational) at 10 percent of total available capital. At end-June 2017, about 9 percent of the AfDB's economic capital was reserved for non-core risks including interest rate, currency, liquidity and counterparty credit risks as well as residual risk exposure to its staff retirement plan. The **EBRD** operates within Board-approved limits for market risk on treasury and banking debt assets based on value-at risk approach. Minimum capital requirements for treasury activities (credit and market risk) are set at five percent of the investment portfolio.

Summary of Capital Adequacy Frameworks in Selected International Financial Institutions (IFIs) Presented During the 2010-16 Reviews (concluded)

	The **BIS** determines the economic capital for market risk on the basis of a value-at risk modelling based on stressed market data. The ratio of economic capital allocated for market risks to equity was near 21 percent at end-March 2017.
Operational risks. All IFIs give priority to the management of operational risk through strong internal controls. With regard to capital adequacy, the treatment of operational risks varies across IFIs.	For the **IBRD,** the minimum equity-to-loans ratio of 20 percent includes a buffer for operational risks. The **ADB**'s capital requirement for operational risk is set at 1 percent of total assets in the balance sheet. Off balance sheet commitments and undisbursed loans and guarantees are considered in the calculation of total assets. The **IDB** allocates capital of one percent of total assets to operational risks. Capital requirements for operational risk are aggregated with those of other financial risks through the use of a correlation matrix. The **AfDB's** capital adequacy framework provides for an operational risk capital charge based on Basel II of 15 percent of the average operating income for the preceding three years. This methodology is under review. At end-June 2017, about 0.8 percent of the AfDB's economic capital was reserved for operational risks. The **EBRD's** required capital takes operational risks into account consistent with Basel II, using a capital charge of 15 percent of the average operating income for the preceding three years. The **BIS** allocates some economic capital to operational risks on the basis of a value-at risk approach that is consistent with the methodology set out in the Basel II advanced measurement approach. The ratio of economic capital allocated for operational risks to equity was about 6 percent at end-March 2017.

Annex II. Market Risk and the Investment Mandate[1]

This annex discusses developments in, and management of, the market risks to the Fund's investments with a high level breakdown of each main risk category. It notes that the risk has risen slightly since the last review, mainly since the EA is now nearly fully invested.

1. The Executive Board established the Investment Account (IA) in April 2006 to diversify the Fund's sources of income. When the IA's new Rules and Regulations (the Rules) were adopted in 2013, following the entry into force in 2011 of the expanded investment authority of the Fund, two distinct subaccounts – Fixed-Income Subaccount (FI) and Endowment Subaccount (EA) – were created, each with a different financial objective and investment strategy.[2] The FI consists of IA assets not attributed to gold sales profits and are equivalent to the bulk of the Fund's precautionary balances. Its investment mandate, which was expanded in August 2015, remains a relatively conservative strategy with high average credit quality and low duration with a view to preserve its nominal capital and limit the risk of permanent losses. The EA assets consist of profits from the 2009-10 sales of the Fund's post Second Amendment gold and any retained income attributed to these assets. Its sole objective is to generate income, with a diversified asset allocation across global bonds and equities aiming to achieve a long-run real return target of 3 percent in US dollar terms. As of end-October 2017, resources held in the FI and EA subaccounts stood at SDR 15.6 billion and SDR 5.1 billion respectively.

2. Estimated potential losses for the IA portfolio have increased slightly since the last review with the phasing-in of the FI and EA investment strategies. The three-year gradual implementation of the EA ended in FY 2017 (except for 2.5 percent of the portfolio still held in deposits pending the funding of a second external manager in the EA active component). FI assets in the short-duration Tranche 1 were fully transitioned in FY 2017 while those in the slightly longer duration Tranche 2 are being phased-in over 5 years from March 2017. As government bonds in the markets of the SDR basket are close to their historical lows, the probability of losses should rates begin to normalize remains elevated. The scale of any losses in the FI should be limited given the relatively short duration of this portfolio. In the EA, historically low yields combined with risks associated with rising equity valuations in some markets are likely to compress EA returns over the medium term. This cautious market outlook serves as background for the upcoming review of the EA strategy by the Board in early 2018.

3. The main categories of market risks for the FI and EA, based on the strategy in place as of end-October 2017, may be broken down as follows:

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[1] Market risk refers to the risk that the future value of invested resources fluctuates because of changes in the value of underlying securities.

[2] For further background on the IA, including on the different financial objectives and investment strategies of the FI and EA subaccounts, see *Review of the Adequacy of the Fund's Precautionary Balances* (1/26/16).

- **Interest rate risk:** In the FI, rising interest rates comprise the predominant source of risk but this risk is low and mitigated by the low duration of the portfolio. Based on the phase of the transition of Tranche 2 assets, as of end-October 2017, the weighted-average duration of the aggregate FI was 0.7 years, implying a loss of about SDR 106 million for a 1 percentage point instantaneous rise in rates.[3] Ultimately, the FI will have a duration of close to 2 years, which implies that an instantaneous one percentage point increase in yields would result in a loss of nearly 2 percent, or SDR 312 million assuming end-October net asset value (versus about SDR 298 million under the old 1–3 year strategy). Interest rate risk in the EA is considerably higher (duration of about 6-7 years), but the fixed-income allocation is expected to benefit from diversification across over 50 countries in which the portfolio is invested and diversification benefits from its equity allocation.

- **Exchange rate risk:** The FI exposure to exchange rate risk is negligible, even under its broader mandate. The 2015 Rules require aligning the currency composition of the FI with the SDR basket and hedging back non-SDR holdings to one of the currencies of the basket. With respect to the EA, exchange rate risk is to a significant extent hedged back to the US dollar (the EA's unit of account). However, some residual risk remains in about 25 percent of the EA's portfolio consisting of equities and REITs, where currency volatility is a smaller portion of the overall market volatility, and emerging market assets where hedging is costly (overall about 25 percent of the portfolio).[4]

- **Credit risk:** Under its new strategy, the FI is marginally exposed to default risk and credit spread widening, but credit risk is tightly monitored through stringent rating requirements and concentration limits. The 2015 Rules set out a minimum rating threshold of single-A, using Standard and Poor's long-term rating scale.[5] In the EA, credit risk is controlled by the EA's rating threshold of BBB- on corporate bonds and BBB+ on sovereign bonds, along with diversification requirements and a divestment rule in the event of a downgrade.

- **Liquidity risk:** Liquidity risk is negligible in the FI, as it is invested in highly-rated marketable securities. Liquidity risk in the EA is also limited: although the EA includes instruments that are less liquid, such as emerging market bonds and developed market corporate bonds, the bulk of the portfolio consists of developed market sovereign bonds (40 percent) and publicly-traded equities (35 percent). In addition, actual liquidity requirements on FI or EA resources are low, so both subaccounts can sustain periods of reduced market liquidity.

- **Other market-related risks:** The EA's main source of risk remains equity risk, a risk to which the FI is not exposed. Equity risk is mitigated by the diversified and long-term strategy of the EA, as

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[3] As of end-October 2017, 14 percent of assets earmarked for Tranche 2 (currently half of the FI) are invested under the new strategy.

[4] Since the base currency of the EA is the US dollar, it is also exposed to fluctuations in the USD/SDR exchange rate when recorded on the Fund's balance sheet in SDRs.

[5] By delegation from the Managing Director, the Investment Oversight Committee (IOC) established higher thresholds in some asset classes and additional risk mitigating measures.

shown for example through the risk decomposition of the EA (Figure II.1). Finally, both the FI and the EA are exposed to residual counterparty risk arising mainly from asset managers' positions in derivatives. As in the case of credit risk, the IOC sought to limit counterparty risk by establishing strict concentration, credit quality requirements, and netting requirements.

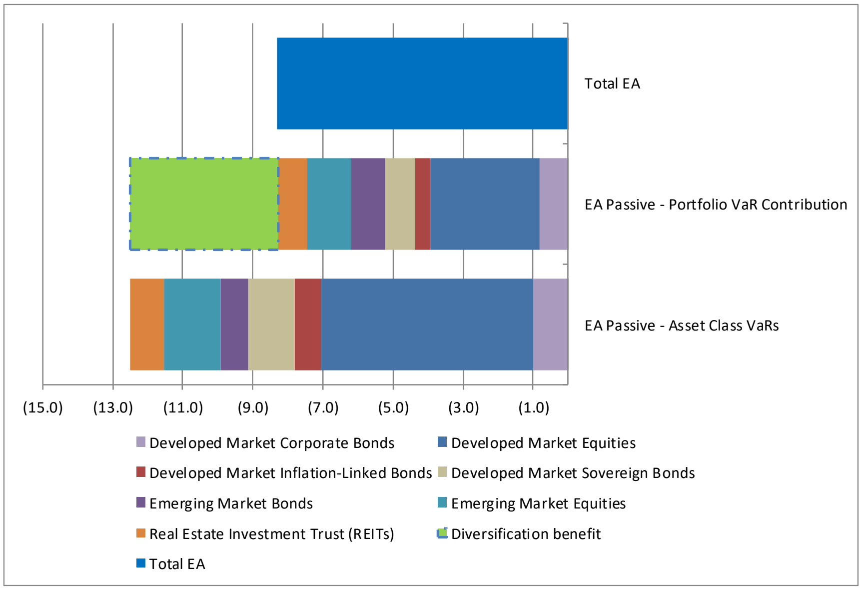
4. While risks on the IA are monitored using a variety of indicators, Value-at-Risk provides a standardized measure, with key highlights listed below.

- For the invested portion of the EA, the one-year "worst-case loss" as measured by the 95 percent Value-at-Risk (VaR) is estimated at -8.3 percent, as of end-October 2017. Developed market equities remain the key contributor to overall risk, followed by emerging market equities, REITs, and bonds (Figure II.1, Panel a). Diversification benefits substantially reduce the EA's VaR.

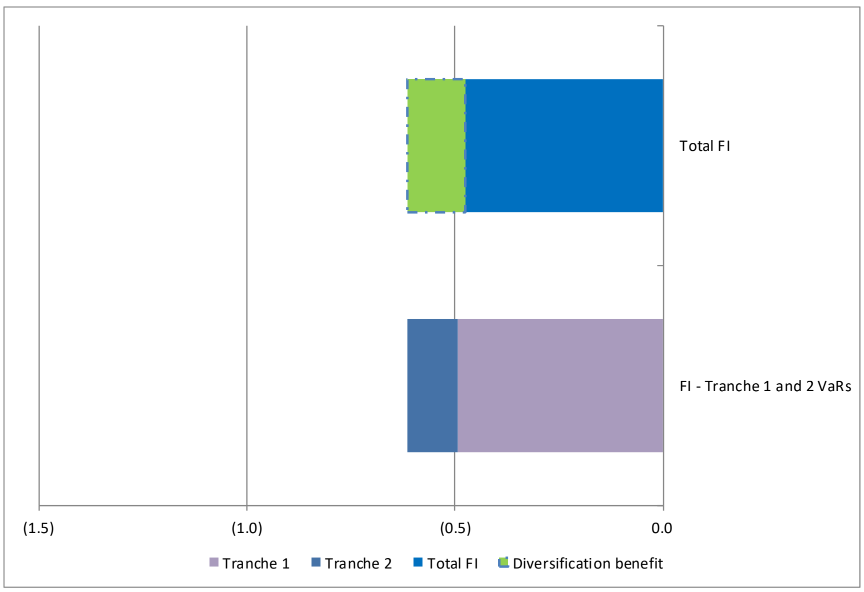
- By comparison, the overall VaR of the FI was much lower at -0.48 percent, reflecting the more conservative profile of its strategy (Figure II.1, Panel b). In Tranche 1, VaR stood at -0.99 percent and was limited to -0.24 percent in Tranche 2. The higher VaR of Tranche 1 is largely due to the allocation of active managers to credit securities, which increases risks as measured by VaR but should ultimately strengthen portfolio resilience and return over time.

Figure 1. Estimated Historical VaR as of end-October 2017[1/]

Panel a. EA (Invested US dollar terms)



Panel b. FI (SDR terms)



Source: State Street data.

1/ The one-year 95 percent VAR is estimated based on a historical simulation method using three-year data.

Annex III. Burden Sharing Capacity

This annex discusses the role of the Fund's burden sharing mechanism as well as the factors that determine its capacity. It observes that, despite an improvement since the last review in 2016, the current burden sharing capacity remains low from a historical perspective and provides only a limited buffer relative to scheduled charges falling due under the Fund's largest exposures.

Role of the Burden Sharing Mechanism

1. **The burden sharing mechanism was established in 1986 to compensate the Fund for any unpaid charges by members in arrears ("deferred charges"), and in so doing, to offset the impact of unpaid charges on Fund income.** Under burden sharing, the Fund's creditor and debtor members contribute temporary financing in equal amounts to cover the amount of unpaid charges. This is achieved through increases in the rate of charge paid by debtor members and reductions in the rate of remuneration to creditor members.[1]

2. **The burden sharing mechanism has proven important in protecting the Fund's income position and in enabling the Fund to recognize no impairment for its credit outstanding under International Financial Reporting Standards (IFRS).** Specifically, even though a member may not be meeting its obligation to pay charges, the "collection" of an equivalent amount from other members through the burden sharing mechanism enables the Fund to demonstrate that, on a net present value basis, there is no impairment of outstanding credit under the IFRS.

3. **Should the loss of income from deferred charges exceed the capacity of the mechanism, the carrying value of the asset in arrears on the Fund's balance sheet may need to be reduced.** The deferred charges in excess of the burden sharing capacity would reduce the Fund's annual net income and reduce the pace of accumulation of precautionary balances. Moreover, future cash flows due from members in arrears would not be expected to be collected in full, which could undermine the Fund's ability to demonstrate that the carrying value of credit outstanding has not been impaired, giving rise to the possibility of an impairment loss.[2] Recognition of an impairment loss arising from deferred charges would need to consider a variety of factors, including the unique nature of the Fund's financing mechanism, but could have a further negative impact on the Fund's net income and precautionary balances.[3]

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[1] These adjustments are currently set to match charges in arrears but could also include the possible accumulation of balances in the SCA-1, which are part of precautionary balances. Accumulations to the SCA-1 were suspended effective of November 1, 2006, due to high projected adjustments to the rates of charge and remuneration in a low and concentrated credit environment.

[2] Under IFRS, the amount of the loss is measured as the difference between an asset's carrying amount and the present value of estimated future cash flows.

[3] Recognition of an impairment loss is not equivalent to writing off the outstanding claims against the member in arrears, since it does not relieve the member of its obligations to the Fund. The impairment loss may be reversed in future years as the arrears are cleared.

Capacity of the Burden Sharing Mechanism

4. The total capacity of the burden sharing mechanism to cover unpaid charges is the sum of the maximum feasible reduction in remuneration expenses and the maximum feasible increase in income from charges:

- Article V, Section 9 (a) of the Fund's Articles of Agreement states that the rate of remuneration shall be no less than four-fifths (80 percent) of the SDR interest rate, limiting the maximum reduction in remuneration expenses to: *0.2 * SDR Interest Rate * Remunerated Reserve Tranche Positions.* The Board has set the current floor for remuneration at 85 percent of the SDR interest rate, which may be changed with a 70 percent majority of the total voting power.[4]

- The maximum capacity of a symmetrical burden sharing mechanism is simply twice the above amount, because debtors and creditors contribute equally.[5] However, the contributing debtor base declines in the event of arrears, which may in practice limit the maximum feasible adjustment to the rate of charge without overburdening these members.

5. The burden sharing capacity depends on the following factors:[6]

- **Quotas payments:** quota increases typically result in higher reserve tranche positions, as members acquire additional liquid claims on the IMF as part of their quota payments.[7] As reserve tranche positions increase, the remunerated portion also increases, thus allowing for a larger maximum reduction in remunerated expenses and higher burden sharing capacity. Remunerated reserve tranche positions have increased from SDR 21 at the end of 2015 billion to SDR 41 billion in November 2017, partially reflecting the doubling of quotas under the 14th review.

- **Outstanding credit and borrowing by the Fund:** Reserve tranche positions also move in tandem with changes in outstanding credit financed from quota resources. However, no burden sharing adjustment is made to the interest paid to creditors on borrowed resources (New Arrangements to Borrow and bilateral loan or note purchase agreements). Therefore, outstanding credit financed by borrowed resources would not affect the Fund's burden sharing

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[4] See Decision No. 12189-(00/45), April 28, 2000, as amended.

[5] Under the terms of the burden sharing Decision No. 11945-(99/49), adopted April 30, 1999, the operation of the mechanism would need to be reviewed if the adjustment in the rate of remuneration falls below the agreed floor of 85 percent of the SDR interest rate. Absent any Executive Board decisions at such a review, debtor members would be required to cover any remaining amounts of unpaid charges through further (uncapped) adjustments to the rate of charge, and burden sharing would become asymmetric.

[6] Burden sharing capacity can also be affected by other Fund operations and transactions involving changes in the GRA currency holdings, such as transfer of currencies to the Investment Account and sales of SDRs to members in exchange for currencies.

[7] Quota increases paid in currencies do not affect members' aggregate RTP positions.

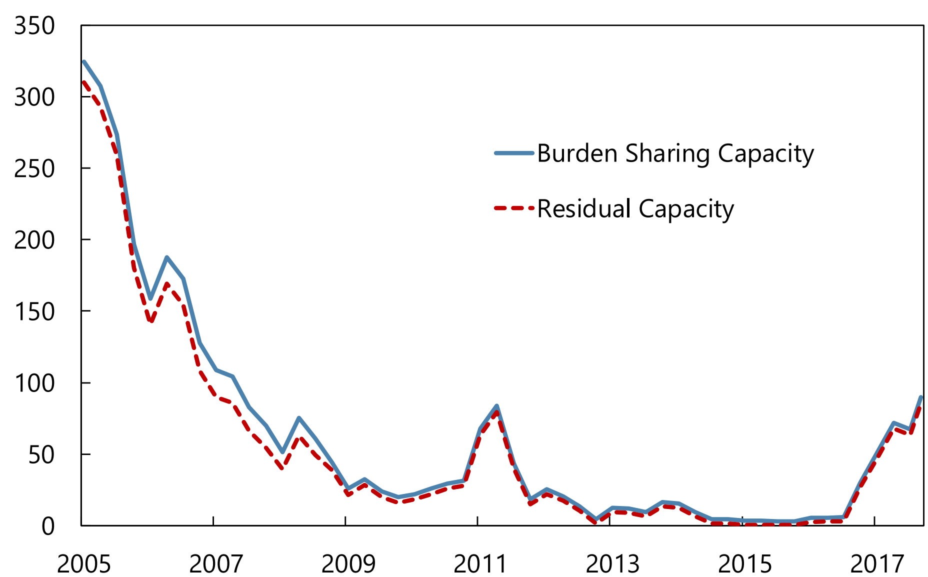
capacity. As of end-November 2017, the share of Fund credit financed by borrowed resources is around 60 percent compared to 70 percent in end-November 2015.

- **SDR interest rate:** as the burden sharing adjustment to the rates of remuneration is set as a proportion of the SDR interest rate, a higher SDR interest rate increases the total burden sharing capacity. As of end-November 2017, the SDR interest rate was 0.73 percent, compared to the 0.05 percent SDR interest rate floor as of end-November 2015.

6. **Burden sharing capacity has increased since the 2016 precautionary balance review due to the increase in the SDR interest rate and in remunerated reserve tranche positions.** As of end-November 2017, the annual burden sharing capacity (based on the current floor for remuneration at 85 percent of the SDR interest rate) is around SDR 91 million, compared to just over SDR 3 million as of end-November 2015. After accounting for deferred charges by Sudan and Somalia, the residual burden sharing capacity is at around SDR 86 million, compared to under SDR 0.3 million as of end-November 2015.

Figure 1. Burden Sharing Capacity 2005-2017[1/]

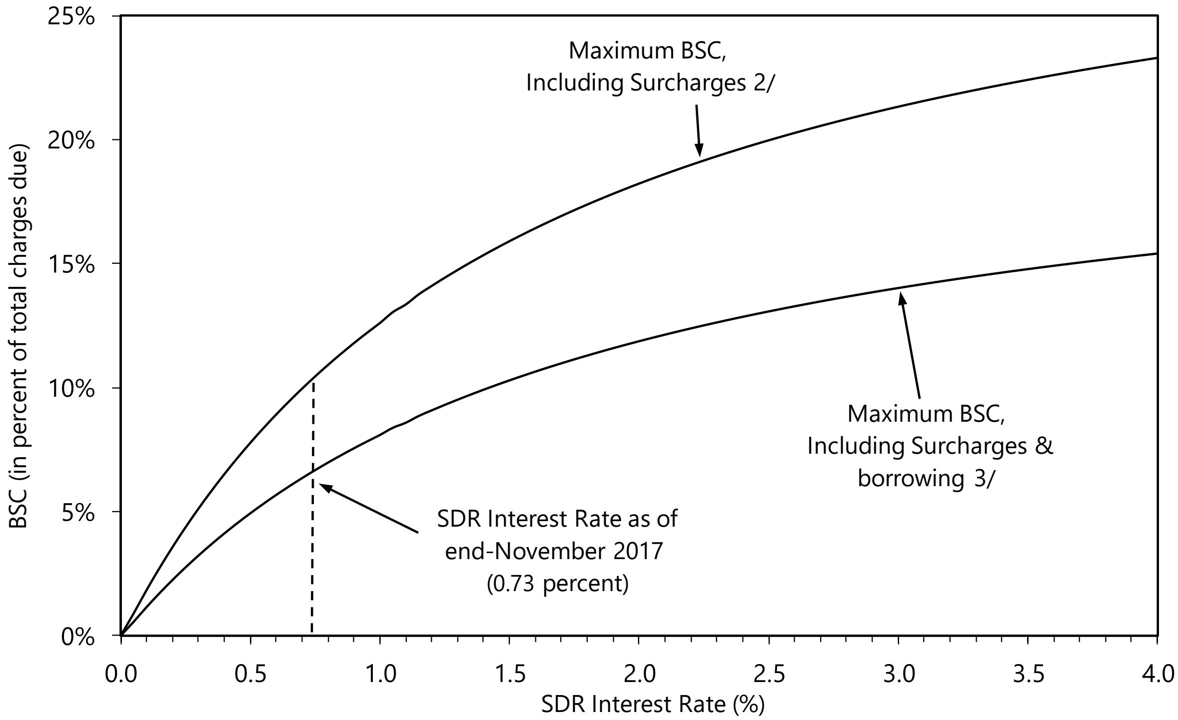
(In millions of SDRs)



Source: Finance Department.

1/ Under a floor for remuneration of 85 percent of the SDR interest rate.

Figure 2. Burden Sharing Capacity at Different Levels of the SDR Interest Rate[1/]
(In percent of total charges)



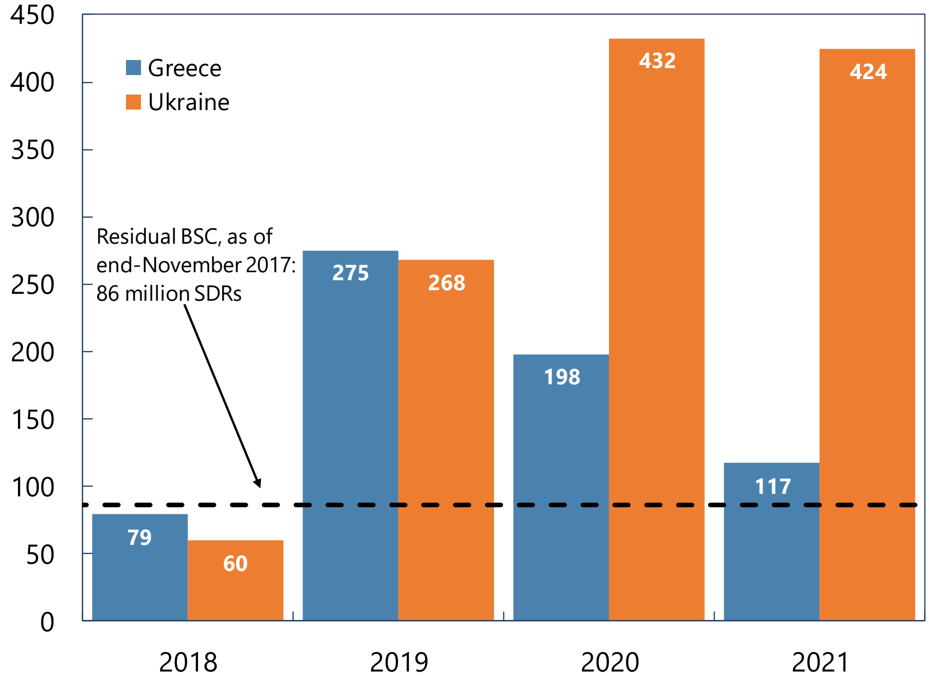
Source: Finance Department.

1/ The figure assumes a floor for remuneration of 80 percent of the SDR interest rate.
2/ A basic margin of 100 basis points plus average surcharges of about 95 basis points for the credit outstanding (based on FY 2017-19 projected average). Assuming that remunerated reserve tranche positions (RRTP) equals credit outstanding, i.e. no borrowing by the Fund.
3/ As footnote 2 but assuming borrowing share at 60 percent of total credit.

7. **However, the current burden sharing capacity remains significantly below its historical levels, underlining the importance of maintaining an adequate level of precautionary balances.** Despite the recent increases that have brought the burden sharing capacity on par with the level last seen in 2011, it is still significantly below the historical levels (Figure III.1). Moreover, the current capacity remains limited relative scheduled charges coming due. Taking into account the current share of credit outstanding financed by borrowed resources, the theoretical maximum capacity could currently cover just over 6 percent of total charges coming due (Figure III.2). Moreover, the burden sharing capacity is lower than the charges coming due in the next few years from Ukraine and Greece, two of the Fund's largest current exposures (Figure III.3).

Figure 3. Residual Burden Sharing Capacity Relative to Charges FY 2018-21[1/2/3/]

(Arrangements for Greece and Ukraine, in millions of SDRs, end of financial year)



Source: Finance Department.

1/ Current residual burden sharing capacity under a floor for remuneration of 85 percent of the SDR interest rate.
2/ Projected charges as of end-November 2017. Ukraine includes charges on projected purchases as of end-November 2017.
3/ FY 2018 reflects projected charges for the remainder of the fiscal year, December 1, 2017 – April 30, 2018.

Annex IV. Calculation of Probabilistic Scenarios for Credit Outstanding and Accumulation of Precautionary Balances

This annex explains the methodology used to compute the probabilistic scenarios for the path of credit outstanding and accumulation of precautionary balances over the medium-term period through FY 2024.

Path of Credit Outstanding

1. **Staff's baseline projection for the path of outstanding credit is based on the Fund's current lending portfolio and assumes all purchases are made as scheduled.**[1] The baseline projection does not factor in potential new approved arrangements in the projection period (see Figure 2 of the main paper). At the same time, the baseline projection also does not factor in the possibility of reviews being delayed or unanticipated advance repurchases. The realization of these uncertainties are difficult to predict ex ante and staff therefore continues to consider the current approach for determining the baseline projection appropriate.

2. **The potential degree of uncertainty around the path for credit outstanding may nonetheless be gauged on basis of the historical experience.** Specifically, staff has produced a probabilistic scenario using Monte Carlo simulations to quantify the uncertainty stemming from (i) potential new arrangements approved within the projection period under conservative scenario assumptions, and (ii) less than full purchases of the undrawn balances under arrangements in effect.

- **New Arrangements:** The country probabilities of new arrangements are derived using a number of country-specific and global explanatory variables to estimate the probabilities of new approved arrangement requests.[2] The scenario draws on the latest October 2017 WEO projections and assumes a VIX level of 16, which is the yearly average during 2000-17 when excluding the crisis years 2001-02 and 2008-10. New arrangements are assumed to be approved from FY 2019 onward. If a new arrangement is realized, access is assumed to amount to 4 percent of the member's projected 2018 GDP. For simplicity, purchases are assumed to be evenly phased over a three-year period, and no repurchases under the new approved arrangements are modelled.

- **Undrawn Balances under Approved Arrangements:** Historical data on Fund arrangements since 2000 are used to determine the expected distribution for the ratio of purchased to approved amounts. In this sample, 65 percent of all arrangements were less than fully

[1] The baseline projection accounts for advance repurchases to the extent the borrowing member has communicated specific intentions to the Fund.

[2] Countries with probabilities less than 1 percent and countries with active programs are excluded. This delivers an annualized range of 0-20 new programs per year. This is broadly consistent with the range of new arrangements per year observed in the period 1990-2017, excluding crisis years 2001-02 and 2008-10 (comparable to the calculated long-term average for the VIX).

purchased, with an average ratio of purchased to approved amounts of 73 percent due to delays in review completions and/or cancellations. Existing and new arrangements are assumed to follow the same distribution.[3] For simplicity, rephasing of purchases under the arrangements or of the possibility of follow-up arrangements are not modelled.

3. **The impact of these uncertainties is quantified through Monte Carlo simulations.** The path of credit outstanding is simulated 10,000 times. For each simulation a path of outstanding credit is determined as function of independent realizations of new arrangements and undrawn balances, in line with the probabilities described above. The realized 10,000 credit paths then allow for computation of the intervals containing 25, 50, and 90 percent of all credit paths, as shown by the three bands in Figure 10 of the main paper.

Path of Precautionary Balances

4. **The projected accumulation of the Fund's precautionary balances is determined by the projected path for net income.** The baseline projection is based on staff's medium-term income and expenditure projections as of end-November, 2017. These draw on the baseline credit path, the projection of total commitments, the SDR interest rates, the USD/SDR exchange rate, investment returns from the Fixed Income account (FI) and the Endowment Account (EA) as well as key expenditure items. The baseline projection also assumes an unchanged margin for the basic rate of charge of 100 basis points and does not allow for possible future IAS 19 gains or losses. For the accumulation of precautionary balances, it is assumed that that all net income, excluding retained earnings in the EA, is annually allocated to the Fund's reserves.

5. **To gauge the degree of uncertainty surrounding the future path of precautionary balances, a probabilistic scenario is used to introduce variance to key income items.** The medium-term expenditure projections are assumed as under the baseline.

- **Lending income:** Uncertainty in the path for outstanding credit is introduced as discussed above, which in turn affects the Fund's net lending income. For simplicity, the variance in lending income is assumed to derive only from the margin on the basic rate of charge. Surcharges, commitment fees and service charges are assumed to remain as under the baseline projections.

- **Investment income:** Under the baseline, the projected return on the FI corresponds to the SDR interest rate plus an excess return above this rate that is assumed to gradually increase towards a target of 50 basis points. Uncertainty around the assumption is introduced through variance in the projected SDR interest rate path and the excess return. The former is allowed to vary by +/- 50 percent around a projection based on forwards, while the latter is allowed to vary by +/- 25 basis points around the baseline path. The baseline income projection from EA is based on the assumption for the annual inflation-adjusted payout to the GRA starting from end-FY 2018,

[3] The methodology involves a technical simplification of letting a disbursement probability of less than 100 percent imply that only a part of each tranche associated with a review completion is purchased. In practice, unpurchased undrawn balances result from either arrangement cancellations or Board approved augmentation of access. However, in aggregate this is similar to assuming that a certain number of tranches are not disbursed.

corresponding initially to one percent of the EA's net asset value. Uncertainty around the baseline is introduced by allowing the EA total return to vary +/- 200 basis points around its baseline. Returns above the baseline payouts are assumed to add to EA accumulation, while returns below reduce the payout amount.

- **Other income:** The IAS 19 adjustment introduces a substantial degree of uncertainty into the Fund's income statement (see Figure 9 of the main paper). This uncertainty is modelled by allowing the realization of future IAS19 adjustments to follow the historical distribution during FY 2000-17. In addition, the Fund earns an implicit SDR interest rate on its interest free resources, where the assumed variance of the SDR interest rate described above introduces a degree of uncertainty.

6. The impact of these uncertainties on the accumulation of precautionary balances is quantified through Monte Carlo simulations. The path for precautionary balances is simulated 10,000 times. Each path is a function of the realization of the above income items, and these realizations are determined by the probabilities described above. The realized 10,000 paths then used to compute the intervals that contain 25, 50, and 90 percent of the realizations (see Figure 14 in the main paper).

7. Although the range of uncertainties around the baseline projection is wide, actual uncertainties may be larger than illustrated by the simulations. First, as explained, the computations above are subject to a number of simplifying assumptions. Second, not all sources of uncertainties are captured, including lending income from other charges and fees than the margin, the possibility of advance repurchases, and volatility in the SDR/USD exchange rate.