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MYANMAR

SELECTED ISSUES

December 29, 2016

Approved By
Asia and Pacific Department

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MYANMAR'S FINANCIAL SECTOR: STRATEGY AND PRIORITIES FOR REFORM[1]

A. Introduction

1. This paper takes stock of progress in Myanmar's financial sector reform since 2012 and updates Fund advice on priorities for financial sector reform over the next two to three years. It covers three areas which have been the main focus of Fund advice and support to date for financial sector reform, including for gradual financial liberalization. It should be read in conjunction with the World Bank note "Financing the Future: Building an open, modern and inclusive financial system," which covers a broader range of issues, including financial inclusion, and the reform of state owned banks.

2. Advice from the Fund on the financial sector in the recent past, has been built around three legs of closely-interlinked reforms deemed macro-critical. These are: (i) liberalizing the foreign currency system and developing the formal foreign currency market; (ii) revamping the Central Bank of Myanmar's (CBM) monetary policy and its operations; and (iii) strengthening financial sector oversight. Why these three areas of focus?

- **Reforming the foreign currency system**. This was deemed an immediate priority to reintegrate Myanmar's economy into the global trade and financial system, and help it to meet ASEAN commitments. Pre-reform, when the authorities set the official exchange rate at overvalued levels, the exchange rate could not play a market-clearing role and the country's trade and investment activities were suppressed. There were significant controls on current account flows, including through the "export first" policy, designed to support the fixed, overvalued exchange rate, but widely avoided in practice. The ensuing foreign currency shortage, rationing, and multiple exchange rates, if left unchanged, would have continued to limit trade and investment, and led to an unsustainable balance of payments position once trade were liberalized. Making the official rate reflect market demand and supply under a unified foreign currency system and removing restrictions on current account flows were essential steps therefore to promote trade and investment, while ensuring external stability.

- **Strengthen monetary policy and support the development of domestic financial markets**. Monetary policy arrangements were largely absent and inadequate to manage price liberalization. Market-determined prices and external stability require that money aggregates be controlled through market-based tools. There was no effective nominal anchor creating a basic inconsistency in the policy stance, given the desired move to a managed floating exchange rate regime. Specifically, the first leg of the reform (i.e., foreign currency liberalization) required

[1] Prepared by Marc Dobler.

the central bank to (i) sterilize foreign currency interventions to keep reserve money at targeted levels; (ii) respond to inflation pass-through effects as a result of exchange rate movement and external shocks; and (iii) facilitate over time market-determined interest rates. A key principle guiding the reform has been that interest rate liberalization should be carefully sequenced to occur when effective monetary policy tools are in place, domestic prices are anchored by monetary discipline, and prudential oversight of the financial system is significantly strengthened. As a key component of the former, a substantial reduction in the government's reliance on central bank financing is critically needed. Interbank markets did not exist in Myanmar as either the regulatory framework did not allow them (FX markets) or prudential regulations tightly prescribed their use (money markets) and they remained moribund.

- **Strengthening the banking sector**. Under the old regime, the Central Bank of Myanmar (CBM) was part of the Ministry of Finance (MOF), and banking activities were tightly controlled and circumscribed. Four state-owned banks dominated the banking system and undertook extensive quasi-fiscal operations through subsidized lending mainly to the state and agricultural sectors. A large and increasing number of private banks have been allowed to operate, but both lending and deposit rates remain administratively controlled (as with state-owned banks) and their lending confined to one-year overdraft loans primarily to large enterprises against a narrow range of collateral (land and immovable assets), leaving the agricultural and SME sectors poorly served. Meanwhile, the legal and regulatory frameworks for banks were outdated, the arrangements for prudential regulation and supervision were inadequate, and the CBM's capacity highly limited.

B. Achievements

3. To achieve these three intertwined objectives specific policy actions were identified and agreed with the Myanmar authorities for each.

- **Reforming the foreign currency system.** The IMF helped design and implement a foreign currency auction by the CBM, as a first step to develop foreign currency price discovery and replace a heavily regulated formal market segmented from informal markets, with the ultimate objective of creating a unified market. The CBM's foreign currency auctions are currently run daily, and chronic rationing and wide market distortions have largely dissipated. In addition, a new foreign currency law was put in place, removing restrictions on current account flows while preserving capital controls. Interbank FX trading was allowed between authorized dealers and ultimately a regulatory framework governing the operation of the interbank FX market developed.[2] Steps were taken to consolidate the foreign reserves of the government at the CBM to provide it with the capacity to manage the new floating regime.

[2] Supported by JICA funded technical assistance (TA), assisted by the resident IMF TA advisor for foreign currency operations at the CBM.

- **Strengthen monetary policy and support the development of domestic financial markets.** The IMF helped the CBM design and implement a new monetary policy framework targeting reserve money, and to develop basic policy instruments and forecasting capacity. Deposit auctions have been introduced and take place regularly, as have T-bill auctions. In September 2016, the government launched a T-Bond auction. Reserve requirements have also been reformulated, and recently started to be enforced.[3] The bulk of the existing paper-based government bonds were de-materialized and transformed into standardized tranches to facilitate the development of liquid benchmark bonds, with maturities to November 2020.[4] In principle, and as demanded by its legal mandate the CBM now has a set of basic instruments[5] and procedures which it could use to conduct effective monetary policy.

- **Strengthening the banking sector.** Key achievements have included new legislation to establish an autonomous CBM[6] with clearer authority for licensing, supervision and regulation of banks, and monetary policy, in line with a new mandate for price and financial stability. With technical assistance from the World Bank and the IMF,[7] a new Financial Institutions Law (FIL) was adopted in 2016 (Box 1), and a set of core prudential regulations prepared and some issued. Significant progress has also been made in bank supervision, including the near completion of full-scope examinations of the commercial banks and one state-owned bank.

[3] The CBM recently issued instructions on the financial penalties to apply to banks which do not comply with the recalibrated reserve requirements, a key step for enforcement.

[4] A process is underway to dematerialize many of the remaining paper-based bonds held by nonfinancial investors.

[5] In addition to deposit auctions, procedures are in place to conduct credit auctions to inject liquidity to the banking system, but they have not yet been used given the liquidity in the system.

[6] The IMF has provided technical assistance on financial management and reorganization to support CBM reform.

[7] The World Bank provided TA to the CBM to strengthen the financial sector legal and regulatory framework, including with support for developing the FI Law and implementing regulations, supported by the Fund's long-term supervision expert at the CBM and various IMF technical assistance missions on banking supervision.

Box 1. Myanmar: The Financial Institutions Law (FIL)

This law brings Myanmar's legal and regulatory framework closer to international good standards. Amongst other reforms, the law:

- Installs a comprehensive legal and regulatory framework for the implementation of the Basle Core Principles;
- Introduces sufficient powers to supervise licensed institutions, impose prudential regulations, governance requirements and accounting and auditing standards on these institutions and provides an adequate framework for licensing and regulation of foreign banks;
- Removes the anomaly of granting two licenses—commercial bank and development bank licenses to the same entity—and broadens the permissible activities of the bank in line with international practices;
- Levels the playing field between private and state owned banks (except in the case of large exposure and removal of officers and directors);
- Establishes a framework for prompt corrective action and bank resolution;
- Establishes clear rules on bank insolvency, provides for voluntary and involuntary liquidation, reorders the priority of payment favoring depositors, and for cross border insolvency;
- Provides adequate provisions to deal with consumer protection, internet and mobile banking and e-money;
- Establishes a framework to oversee nonbank financial institutions and powers to ensure that they do not carry out shadow banking; and
- Enables the regulation of the payment system, electronic evidence, electronic presentment of checks and admissibility of electronic evidence, and includes provision for the recognition of netting agreements, finality of settlement and the enforceability of settlement rules for systems designated by the CBM.

C. Challenges

4. Notwithstanding these significant achievements—particularly considering the short time frame, limited absorptive capacity, and a complex political environment—progress in some areas has been slow. Moreover, macroeconomic developments have not always progressed as expected providing further challenges and increasing the urgency of reforms. In particular:

- The foreign currency market has occasionally experienced large divergences between the formal and informal market rates (e.g., between late 2014 and mid-July 2015). More recently, due to the CBM attempting to slow kyat depreciation and departing from the auction rules, the reference rate has periodically been misaligned with informal rates by more than the 0.8 percent allowed by the CBM.[8] This has led to the rates of authorized dealers being misaligned with those in the liquid informal market, legally locking the dealers out of the FX market for periods of time. Partly

[8] The CBM periodically attempts to slow exchange rate movements and depart from the own auction rules in doing so by, for example, selling foreign currency on ad hoc basis to bids at multiple, rather than the keenest, rates.

as a result, progress has been slow in achieving three key objectives, namely, the FX auction would jumpstart an interbank foreign currency market, informal trading would be absorbed into the formal market, and the CBM would no longer need to 'make the market' (e.g., any interventions by the CBM could be done in the interbank market). Although the volume of interbank trading has increased over time, a unified foreign currency market centered on an interbank system remains an aspiration.

- The CBM has struggled to build FX reserve buffers due to a rising current account deficit and pressures on the exchange rate related to exogenous shocks (e.g., the decline in the natural gas price and lower agricultural exports as a result of floods), uncertainty around the change in government at the November 2015 elections, and the undermining effect of ongoing monetary financing of fiscal deficits (including a sharp increase in FY 2015/16). In addition, state-owned banks have been unable to transfer foreign reserves of the state to the CBM after the initial efforts under the IMF Staff Monitored Program in 2013. This may be in part due to the reduced net FX resources available at the banks. Anticipated capital inflows and resource booms have not materialized and the external position has been weaker than expected.

- Treasury bills are not being issued in sufficient volume to adequately finance the government which remains heavily reliant upon monetary financing from the CBM, as the Ministry of Planning and Finance (MoPF) has seemed reluctant to pay the T-bill rates required to induce larger purchases by banks, notwithstanding the recent efforts to allocate more budgetary resources for interest expenses.

- Inflation rose significantly in part due to slow and ineffective deployment of available policy instruments (including, slow implementation of the recalibrated reserve requirements, insufficient deposit auctions to mop up excess liquidity and the absence of a monetary policy committee), pushing real interest rates into negative territory and exacerbating financial repression. This not only has severely restrained credit available to SMEs and the agricultural sector,[9] but also increased the losses of state-owned banks as they provide subsidized loans.

- There is a continued acute need to strengthen financial regulation and supervision in the face of a rapidly evolving financial sector. A large number of foreign banks have entered the country, and the balance sheets of domestic private banks have expanded rapidly. Given such growth, notwithstanding the significant progress being made, the introduction and enforcement of prudential regulations, along with strengthening supervision capacity at the CBM, have not yet caught up with developments in the market.

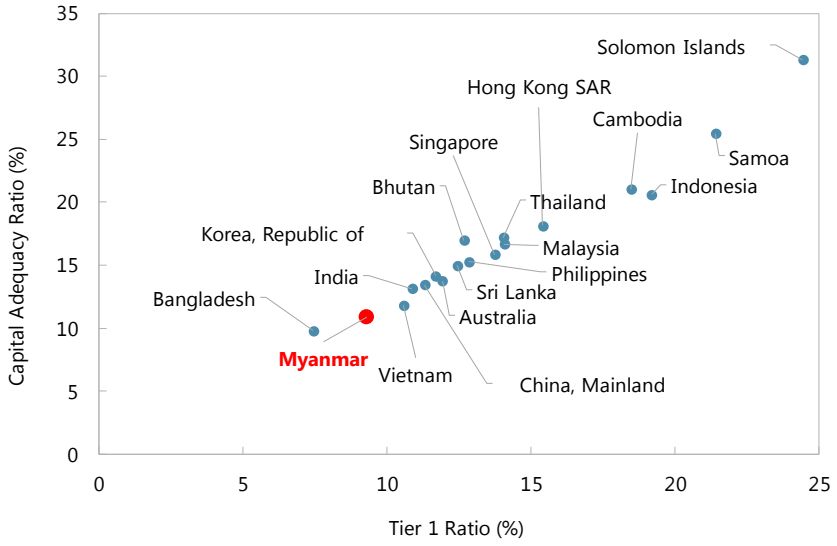
- The Myanmar banking sector is undercapitalized (Figure 1) compared to the risks it faces, including concentration and interrelated lending risks, weak accounting and auditing practices, and the need for further strengthening prudential supervision and regulation.

[9] Agricultural finance is a key issue for Myanmar, and the cause of much disruption historically (Turnell, 2009).

Moreover, the Myanmar economy is vulnerable to various shocks,[10] and the country risk is high. All these call for higher capital buffers.

Figure 1. Regulatory Total Capital and Tier 1 Ratios to Risk Weighted Assets

The Myanmar banking sector is undercapitalized…



Sources: IMF, *International Financial Statistics* (IFS); and the Myanmar authorities.

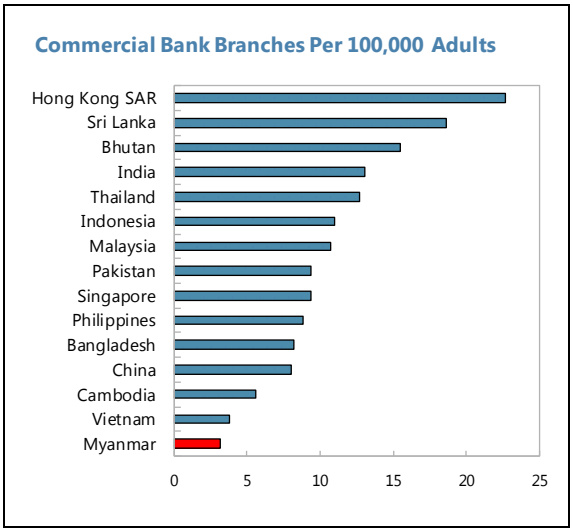
- While the state-owned banks have been losing market share to the fast-growing private banks, they still accounted for half of financial sector total assets in August 2015. Diagnostic analysis of some state-owned banks have been conducted with World Bank assistance, but reform plans are yet to be formulated to initiate the process of improving governance, addressing weak financial reporting and risk management, and reducing contingent fiscal risk and financial sector vulnerabilities.

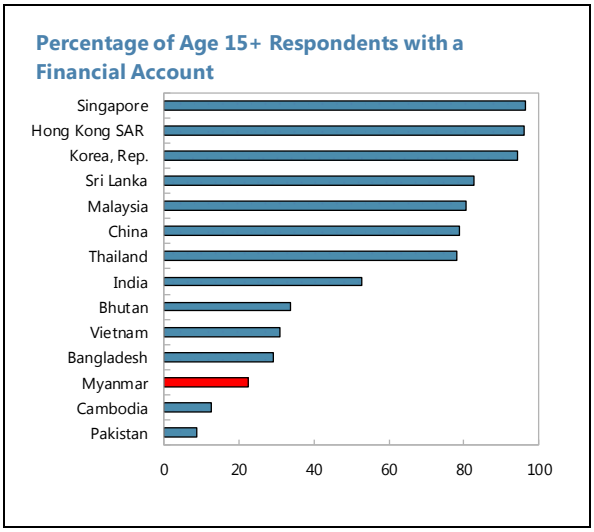
5. These developments tend to reinforce each other, aggravating the overall risks to financial and macroeconomic stability, as well as constraining financial inclusion (Box 2). For instance, continued monetary financing of fiscal deficits risks entrenching inflation expectations, which in turn would exacerbate the external current account deficit and place downward pressure on the value of the kyat. Continued high inflation would erode banks' profitability and their prudential buffers given interest rate controls, and continued kyat depreciation would amplify financial risks from currency mismatch. Containing these risks is therefore a key objective in reforming Myanmar's financial sector.

[10] Myanmar is particularly prone to weather-related natural disasters. See the companion selected issues paper "Macro-Fiscal Risks: The Challenge of Climate Related Disasters."

Box 2. Myanmar: Financial Inclusion in Myanmar

Myanmar's financial sector is still in the early stages of development compared to countries in the region. Access to basic financial services in Myanmar is extremely limited, for example, as measured by the number of commercial bank branches, and adults with an account at a financial institution. Rural areas have very limited access to financial services with only about 6 percent of commercial bank loans going to the rural sector which, along with lending from the Myanmar Agricultural Development Bank, affords only a small share of the sector's financing needs. Well sequenced and properly supervised expansion of the financial sector, along with measures to improve access for the agricultural sector and small and medium-sized enterprises (SMEs), has the potential to significantly improve livelihoods and be a key building block in delivering broad based economic growth in Myanmar (see the companion selected issues paper "Macroeconomic and Distributional Implications of Financial Reforms in Myanmar").





Source: World Bank, 2014, *World Development Indicators.*

D. Planning for the Next Steps

6. The next steps towards financial liberalization need to be taken carefully and be built upon sound monetary and fiscal financing policies and further strengthened supervision capacity and oversight of the financial system. Without these essential building blocks in place, Myanmar could risk making the mistakes other countries have made when liberalizing their financial systems (Box 3).

7. Starting from the significant progress already made and addressing where further reforms are required, the Fund staff recommends the following measures (with indicative timelines) as next steps in the reform process. If implemented, these would help accelerate the development of the interbank market for foreign exchange and allow for the interest rates on new

lending products to rise above the current cap, and for further liberalization of interest rates to occur in due course (e.g., after two years).

Box 3. Myanmar: Experience of Financial Liberalization in Other Countries

Country experiences with financial liberalization during the 1980s and 1990s has been mixed, and illustrate the risks as well as the benefits, with the former often materializing on a delayed basis and entailing significant cost. Financial crises often resulted from the rapid credit expansion that followed liberalization undertaken without adequate improvements in financial sector governance and prudential supervision. Key points to note include:

- Greater competition by foreign banks may increase the risks taken by domestic banks, as profitable domestic corporates increasingly gain access to foreign capital.
- Effective regulation and supervision, particularly with respect to bank risk management, entry, intervention and exit, are crucial as liberalization increases risky competition and new funding sources emerge.
- Poor supervision, opaque affiliate structures and weak corporate governance allow weak banks to over-extend and opt for high risk/ high return strategies using depositors' funds.
- Banks were often over-exposed to well-connected borrowers including their owners and connected parties, and under-reported non-performing loans by rolling them over ("ever-greening").
- Maturity and currency mismatches arose in countries (e.g., Korea) where bank lending increasingly became funded by short-term capital inflows from overseas.
- In cases where the macroeconomic situation was unstable and interest rates were liberalized (often with a "stroke of the pen") high real interest rates sometimes developed, leading to corporate and banking problems.
- Access to credit expanded less than expected or was imprudently directed, hindered by the lack of information on borrowers and weaknesses in legal and judicial systems for collateral and creditor rights.

Appendix I. Myanmar—Financial Sector Reforms: Recommended Actions and Timing

(i) Continued reform of the foreign currency system

• CBM to ensure close alignment between the formal and informal exchange rates by consistently enforcing the foreign currency auction rules.[1]	*Continuing*
• The authorities to effectively prohibit informal foreign currency trading through domestic transfers between accounts at banks.	*1-2 years*
• CBM to ensure that banks are well-acquainted with the foreign exchange regulatory framework and comply with its requirements. CBM to issue the foreign exchange law/regulations and main directives in English.	*Immediately*
• CBM to ease the restrictions on foreign currency deposit withdrawals.	*1-2 years*
• MoPF to audit the state owned banks, including their net FX positions, close any net FX short positions, and put in place a mechanism to transfer new government owned net reserves to the CBM.	*Immediately*
• MoPF to facilitate the process of settling the account balance transfers between state-owned banks and private and foreign banks' nostro accounts.	*Immediately*

(ii) Further strengthen monetary policy and support the development of domestic financial markets

• MoPF progressively to reduce monetary financing from the CBM to zero within two years.	*1-2 years*
• CBM to issue revised instruction governing the interbank market, allowing banks to freely set maturities, as needed for liquidity management.	*1-2 years*
• CBM to continue to enforce reserve requirements, including penalties for non-compliance.	*Immediately*

[1] The CBM are also exploring the possibility of using a different mechanism to set the reference rate, e.g., based upon market transactions.

- CBM to prepare and approve its own budget (independent of the MoPF in accordance with the CBM Law) and allocate a realistic budget for monetary operations, scale up deposit auctions and consistently allow the rates to be freely set by the market. *Immediately*

- MoPF to continue to issue liquid "benchmark"[2] bonds by auction, and ensure market determined interest rates on government treasury bill and bond issues by following auction rules (including accepting all competitive bids if treasury bill auctions are underbid). *1 year*

- MoPF to convert (a portion of) the treasury bills held by the CBM into dematerialized bonds at liquid benchmark points. *1-2 years*

- CBM to apply tiered (higher) lending rate caps on the new loan products allowed for under the new regulations (including unsecured lending, loans secured on moveable collateral, and loans of maturity longer than one year). *1-2 years*

- CBM to allow commercial banks to freely repatriate Kyat currency notes to the CBM without charges to replenish their current account balances.[3] *Immediately*

- CBM to establish a monetary policy committee to set interest rates, and an interdepartmental monetary policy working group at the CBM to support it. *1 year*

- MoPF to establish a single treasury account at the CBM, and migrate the MoPF's accounts from the Myanmar Economic Bank. *1-2 years*

(iii) Strengthening the banking sector

- CBM to reorganize along functional lines consistent with its current legal mandate (the 2013 central bank law and implementing regulations). *1-2 years*

- CBM to issue and enforce outstanding new regulations under the FIL.[4] *Immediately*

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[2] Deep liquid fixed maturities of government bonds e.g., at fixed one and two year maturities.

[3] This assists not only with monetary policy implementation, but also with the MoPF's issuance of government securities and the banks to more readily trade foreign exchange between each other.

[4] Those on capital adequacy, classification and provisioning, lending to related parties, large exposures, and liquidity in particular should be issued as full regulations.

• CBM to implement the three-year plan to enhance supervisory capacity (staffing and training) in cooperation with development partners. As part of the three-year plan, CBM to enhance the quality of on-site examinations, off-site supervision, and enforcement.	*1-3 years*
• CBM to complete full scope examinations of all banks, including state-owned banks covered by the FIL.	*1 year*
• CBM to issue no new licenses for private banks until supervisory resources are significantly strengthened. CBM to cease licensing new policy banks.	*Immediately*
• CBM to identify and audit weak banks and require capital and liquidity recovery plans to meet new regulations, and apply recovery measures (including suspending dividend payments) at banks which do not comply.	*1 year*
• CBM to develop and implement more stringent capital requirements aligned closely with enhanced international standards[5], e.g., a minimum of 6 percent tier 1 capital and 12 percent total capital.	*1-2 years*
• CBM to develop a report format for reporting a risk-based (or quality-based) CAMEL rating system, and implement.	
• CBM to develop contingency plans for resolving banks if they were to fail, and identify and implement reforms needed to enhance recovery and resolution planning and preparedness.	*1 year*
• CBM to develop and implement enhanced arrangements (including capacity to accept a wider range of capital) to provide emergency liquidity support to solvent banks on a collateralized basis, subject to adequate safeguards.	*2 years*
• The CBM to review and approve banks' credit risk management policies and procedures.	*1 year*

[5] Including capital requirements for foreign exchange exposure and for operational risk, a capital conservation buffer (of 2.5 percent of risk weighted assets in extra Tier 1 capital).

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MACROECONOMIC AND DISTRIBUTIONAL IMPLICATIONS OF FINANCIAL REFORMS IN MYANMAR[1]

A. Introduction

1. Myanmar's financial system is undergoing a rapid transformation. Recognizing the importance of the financial sector in promoting economic and social development, the Myanmar government has given priority to financial sector reform as part of its overall reform program since 2011. A financial sector development strategy (FSDS) has been developed with the assistance of World Bank and the IMF, and a financial inclusion roadmap has been launched. The FSDS envisages a phased approach to financial sector reform, with the initial focus on building institutions and policy tools before liberalization of interest rates can take place. In particular, for liberalization to take place without destabilizing the macro-economy, effective monetary policy tools need to be in place, domestic prices anchored by monetary discipline, and prudential oversight of the financial system significantly strengthened. As a key measure to strengthen monetary discipline a substantial reduction in the government's reliance on central bank financing is essential (see the companion selected issues paper "Myanmar's Financial Sector: Strategy and Priorities for Reform").

2. To prepare for the eventual liberalization of Myanmar's financial sector, it is also important to understand its impact on economic growth, poverty, and income distribution. A history of economic isolation has left Myanmar with a small and underdeveloped financial market. It has also led to concentration of credit in the public sector and large enterprises in urban areas, leaving agriculture and small and medium-sized enterprises (SMEs) poorly served. Given these salient features of financial markets in Myanmar, a key question for policy makers to ask before financial liberalization is how it will affect income distribution and poverty, as well as overall economic growth. Against this background, this selected issues paper attempts to shed some light on the macroeconomic and distributional implications of financial sector reform, with assistance of a dynamic stochastic general equilibrium (DSGE) model.

3. Some caveats are in order at the outset. The model provides a highly stylized presentation of the Myanmar economy and quantitative results presented below are therefore only illustrative. They should not be interpreted as predictions or forecasts. The results are intended to help gain a deeper understanding of the various economic forces, including those that arise from initial economic conditions, that could shape the outcome of financial sector liberalization. These results would help policy makers understand the potential pitfalls of liberalization as well as its benefits, and hence assist with informed consideration of complementary policies in designing the strategy for the financial sector reform.

[1] Prepared by Sandra Valentina Lizarazo Ruiz, Adrian Peralta-Alva, Yiqun Wu, and Vinzenz Ziesemer.

4. The paper is organized as follows. After an overview of the current state of the financial sector (section B), a brief description of the model and simulation scenarios is provided (Section C). Section D presents the simulation results and Section E concludes the paper with a summary of policy implications.

B. Financial Market Development and Financial Inclusion in Myanmar

5. Myanmar's financial sector has expanded rapidly in recent years but remains in early stages of development. Current levels of formal savings are low in Myanmar, with 62.7 percent of the population do not report any savings and 25.7 percent save at home or with someone they know. The country's historically high inflation and the restriction on the deposit rate in the range of 8 percent to 10 percent means real interest rates have often been negative, which dampens incentives to save. Given the underdeveloped financial market, bank deposits and gold holdings are the main vehicles for saving. Despite the fast growth in bank deposits and credit in recent years, Myanmar still lags behind its regional peers in terms of financial depth. Deposits were low at 35 percent of GDP in 2015/16, much lower than regional peers such as Laos and Cambodia. Domestic credit was 38 percent of GDP in 2015/16, some 15 percentage points lower than Laos. Credit to the private sector, which has been growing rapidly in recent years, was only 19 percent of GDP in 2015/16.

6. State-owned banks play an important role in Myanmar's financial sector. Despite the rapid expansion of private banks, four state-owned banks (SOBs) still accounted for around a half of banking sector assets and a majority of bank branches and customers nationwide. However, with their lending mainly targeted at the state sector and large firms, SOBs have failed to capitalize on a booming private sector, and have been quickly overtaken by private banks in both banking deposits and loans. Private banks now have a market share of 64 percent in banking deposits, and 82 percent in banking loans.

7. Access to basic financial services is very low. Partly reflecting previous regulatory limits on bank branching, bank branches in Myanmar are limited. The country has only 3.3 commercial banks branches per 100,000 inhabitants in 2015, fewer than regional comparators such as Cambodia, or other countries with similar per capita income. Over 75 percent of adults do not have a bank account in a financial institution. The majority of the population relies on unregulated lenders, often at substantially higher costs than those offered by regulated lenders, or on family and friends, to meet their need for financial services (UNCDF, 2015).

8. A large share of available credit is destined for the public sector. In 2015/16, 49 percent of domestic credit went to the government, of which 80 percent came from the CBM with the remainder largely from the SOBs, especially Myanmar Economic Bank (MEB). Rural households and SMEs have very low access to credit. While the agricultural sector represents 30 percent of GDP and employs 54 percent of the population, only about 2.5 percent of all outstanding loans are made to this sector.

9. State-owned Myanma Agricultural Development Bank (MADB) is the largest financial institution serving the agricultural sector and the rural community. Although in terms of

outreach and number of branches, MADB is the second largest state-owned institution in the banking system after MEB, it is still a relatively small financial institution accounting for only 1.3 percent of total assets in the banking system. MADB receives subsidized credit from MEB as its principal source of funding. Semi-private bank Myanmar Livestock and Fisheries Development Bank (MLFDB) also provides small-scale loans to microenterprises. From the financial inclusion perspective, funding from both banks is limited, and risk management is inadequate. The capping of the lending rate means that banks cannot price risks depending on the customer and collateral (or its availability). In fact, it is estimated that more than 3.5 million farmers are not served by MADB due to lack of land titles (World Bank, 2014). In addition, Myanmar does not have a credit bureau.

10. Rural microfinance in Myanmar is at early stages of development. Rural cooperatives and micro-financial institutions (MFIs) that are active in low-income economies could help overcome barriers to financial inclusion. However, in Myanmar, MFIs and cooperatives still have a limited reach and a very limited product offering. Until recently, MFIs were not allowed to borrow domestically from banks, and foreign borrowing could not incur interest rates of more than 8 percent. With bank lending rates capped at 13 percent, banks have little incentives to lend to MFIs given the high risks involved in microfinance. Private banks have shown little interest in direct lending to micro businesses or farmers because they often lack capacity and expertise for the undertaking and because of high operational costs.

11. Poor infrastructure also hampers access to financial services. The coverage and quality of infrastructure in Myanmar are low compared to other developing countries, including its peers in Southeast Asia. According to the Global Competitiveness Index 2015–2016, Myanmar ranks 134th out of 140 countries in terms of infrastructure quality. Electricity supply and transport networks are particularly poor, and telecommunication is also in early stages of development, although it has developed rapidly in recent years from a very base. The Myanmar authorities plan to tap into the growing telecommunication services to promote mobile banking. Recently, the Yoma Bank, in partnership with Telenor Myanmar and with assistance from the IFC, has launched a plan for mobile banking.

C. Macroeconomic and Distributional Implications of Financial Reforms—A Model–Based Approach

12. The model developed in this study is a Dynamic Stochastic General Equilibrium (DSGE) model that belongs to a family of recent models that have been applied to a number of countries to study the macro and distributional impact of economic reforms.[2] It is a small open economy model with multiple sectors and multiple types of households. Once calibrated, the model

[2] Different versions of the model have been used in the Article IV consultations with Ethiopia (2015), Malawi (2015), Honduras (2016), Guatemala (2016), Bolivia (2016), and the Republic of Congo (2016).

quantitatively reproduces key macroeconomic trends in the country modelled and replicates key distributional features of household-level data.

A Model of the Myanmar economy

13. The model calibrated to Myanmar reflects the most salient features of the Myanmar economy for the purpose of examining the macro and distributional impact of financial sector reform.[3] These features include a very significant role for agriculture, a relatively small manufacturing sector, and a basic financial market. In steady state, the model's database on private consumption, investment and government expenditures, as ratios of GDP, match the Myanmar data. The composition of the labor force in terms of occupations and sectors is also matched, as well as the composition of consumption expenditure by product. Mobility of labor across sectors and geographical areas involves a cost, and as a consequence, average incomes of different economic sectors differ.

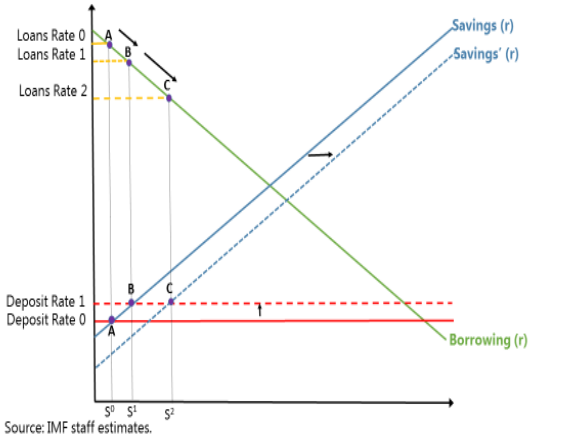
14. The model replicates key distributional features of household level data in Myanmar. Each household is subject to income shocks that are calibrated to reproduce Gini coefficients of consumption and poverty rates observed in Myanmar.[4] Moreover, the model is calibrated to match households' consumption patterns, which enable model simulations to capture the distributional implications of policy changes.

Scenarios of policy reforms

15. Four policy experiments are considered:

- *Financial liberalization:* the government pursues gradual liberalization of interest rates by allowing the deposit rate to rise by 1 percentage point and reducing the growth of money supply sufficiently to lower inflation by 2 percentage points. These measures lead to an increase in the real deposit rate and makes more financial resources available to the private sector. Figure 1 illustrates this reform where the increase in the real deposit rate from *deposit rate 0* to

Figure 1: Financial Market for the Private Sector: Financial Liberalization



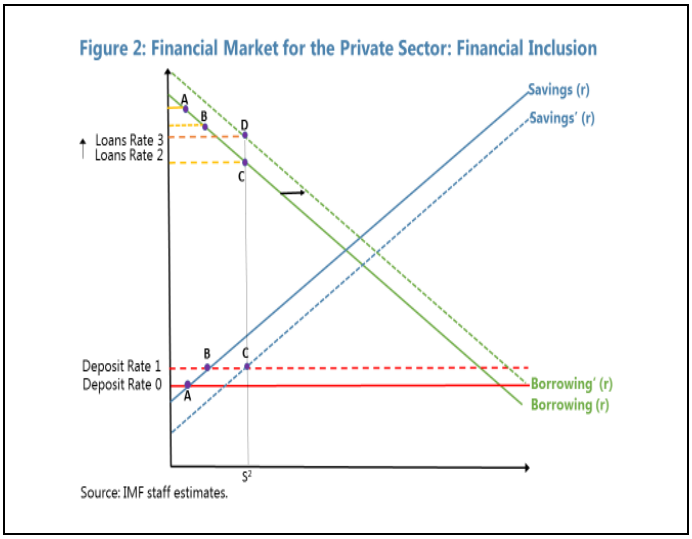
Source: IMF staff estimates.

[3] Features that are of particular relevance for the analysis include: (i) an economy with fixed nominal interest rate in savings; (ii) high level of inflation; (iii) large participation of state-owned banks in the process of financial intermediation; (iv) low levels of credit to the rural sector.

[4] Most recent information indicates that inequality as measured by the Gini index is relatively low (0.29) and about 38 percent of the population lives in poverty.

deposit rate 1 (due to the increase in the nominal rate and the reduction in inflation) moves the economy from the equilibrium described by points A to the equilibrium described by points B; measures that help promote a reduction in the share of loanable funds channeled to the public sector move the supply of financial resources from *Savings(r)* to *Savings'(r)*, and the resulting equilibrium of the economy to the one described by points C.

- *Financial inclusion:* consists of policy changes in the "financial liberalization" scenario plus easier access to private credit to a larger fraction of the agricultural sector. The latter is made possible by a general reduction (an exogenous change in the model) in impediments to credit to farmers, such as accepting a wider range of assets and income as collateral, relaxing restrictions on banking hours, and establishing a credit bureau. Figure 2 illustrates this reform where granting access to credit for rural households that did not have it before moves the demand curve for loanable funds from *Borrowing(r)* to *Borrowing' (r)*, and the equilibrium loan rate from point C to D.



- *Higher infrastructure investment:* constituted by policy changes in the "financial inclusion" scenario plus the channeling of the higher tax revenues that result from higher economic growth generated by the reforms towards infrastructure investment that improves the productivity of all economic sectors.

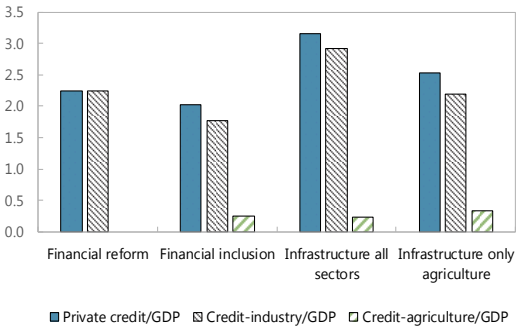
- *Higher infrastructure investment in agriculture:* constituted by policy changes in the "financial inclusion" scenario plus the channeling of the higher tax revenues that result from higher economic growth generated by the reforms towards infrastructure investment that benefits the agricultural sector.

D. Illustrative Results from Reform Scenarios

16. Financial liberalization increases savings, private credit, and growth. A higher real interest rate on savings as a result of reform motivates households to save more. More funds available for private credit lead to an upward shift of the supply of loanable funds, and a reduction in the real interest rate on private credit. As a result, investment increases and the industrial sector of the economy expands. As shown in Figure 6, the industrial sector share of GDP increases by 5.6 percentage points. The expansion in the industrial sector boosts labor demand and urban wages, promoting migration from rural areas. A larger and wealthier urban population increases the demand for consumption goods, and overall economic activity increases. This result can be seen in Figure 3 (showing the total change in the private-credit-to-GDP ratios), and Figure 4 (showing the impact of the reform on the annual rate of GDP growth). The total private credit to GDP ratio

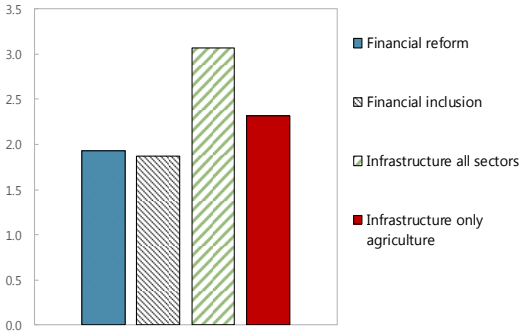
increases by 2.25 percentage points and the GDP growth rate is nearly 2 percentage points above trend. At the same time, private investment grows by 5.0 percentage points above trend, as shown in Figure 5 .

Figure 3. Average Credit to GDP Ratio
(Deviation from trend, in percentage points)



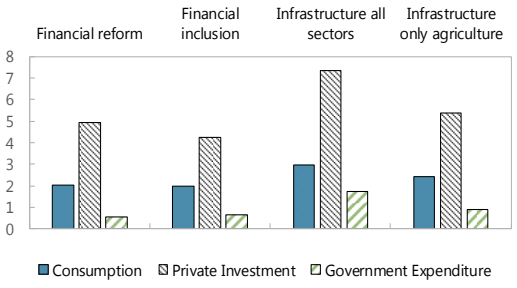
Source: IMF staff estimates.

Figure 4. Annual Average GDP Growth
(Deviation from trend, in percentage points)



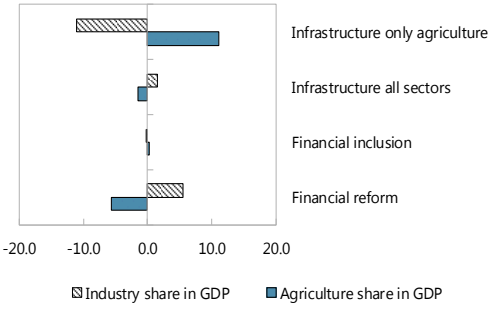
Source: IMF staff estimates.

Figure 5. Annual Average Growth in Macro Aggregates
(Deviation from trend, in percentage points)



Source: IMF staff estimates.

Figure 6. Sectoral Composition of GDP
(Total change in percentage points)

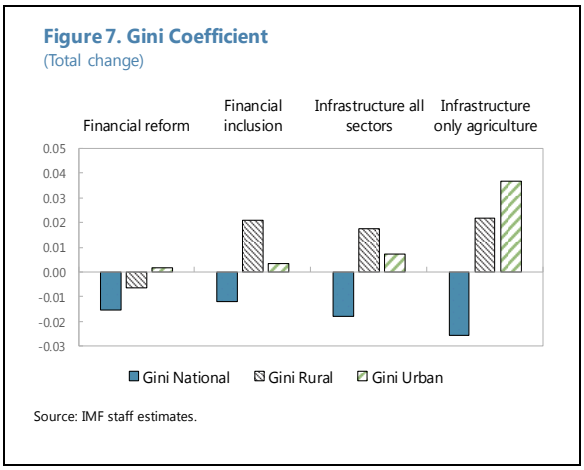


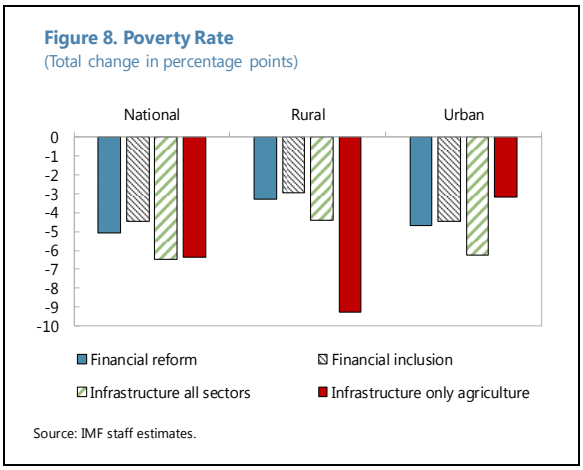
Source: IMF staff estimates.

17. Financial liberalization also reduces nationwide inequality and poverty. These results are shown in Figure 7 (showing the total change in the Gini coefficient) and Figure 8 (showing the total change in poverty rates). The Gini coefficient falls by 1.6 points, and the poverty rate falls by 5 percentage points.[5] A closer look at the results shows differential impact of the reform on inequality within the urban and rural economies: urban inequality increases slightly while rural inequality falls. This is the case because the expansion of credit to the private sector benefits disproportionally those that already have access to credit, mostly in urban areas. In the rural areas, the higher demand and prices of agricultural products lead to a higher average income for all rural households. However, this higher income has a proportionally larger impact in the level of consumption of those households that are initially more constrained in terms of their consumption levels, i.e. lower income households. Poverty falls in both rural and urban areas, but the decline is

[5] Note that inequality is measured by the Gini Coefficient of consumption rather than income.

more pronounced in urban areas because the expanding industrial sector is located in urban centers.





18. Financial inclusion reform increases access to credit for the rural population and has a positive effect on agricultural output and farm income. Other things being equal, greater access to credit by farmers leads to an increase in the lending rate. This reduces the impact of the reform on the urban sector that now has to compete for loanable funds. Figures 3 and 4 show that in the "financial inclusion" scenario both the total private credit to GDP ratio and the GDP growth rate are slightly lower than in the "financial liberalization" scenario. This is because agriculture on average has lower productivity than other productive activities, and as a result, overall demand for credit and output expansion in the economy is dampened somewhat compared with the liberalization scenario.

19. Private credit expansion to the rural sector tends to help more those households that are better positioned to take advantage of increased credit availability. These households are the ones with high levels of productivity, which are typically associated with larger land holdings with better technologies and managerial skills. Because those are usually the better-off households in the rural population, increased credit availability to the rural sector means that rural inequality may go up with this reform. Nevertheless, because this reform increases the average income in the rural sector, it reduces national inequality by reducing inter-sectoral inequality. Figure 7 shows that in fact, both rural and urban Gini coefficients go up, but the national Gini decreases by 1.2 points. Regarding poverty, Figure 8 shows that it falls by 4.4 percentage points nationwide.

20. Using revenue generated by reforms to increase investment in infrastructure can further boost growth, and further reduce poverty and nationwide inequality. Higher tax revenues that result from higher growth generated by reforms can be used to increase investment in infrastructure, amplifying the impact on growth, inequality, and poverty. Figure 4 shows that investing in infrastructure increases the GDP growth rate by at least 0.4 percentage points in comparison with the growth rate generated by the reforms where additional tax revenues are used to finance current government expenditure. Figures 4, 5 and 6 show that the impact of infrastructure investment on GDP growth, private investment growth and GDP sectoral composition depends on which economic sectors benefit from the increased investment. Investment in infrastructure directed to all economic sectors generates an annual GDP growth rate that is 3.1 percentage points above

trend, annual investment growth 7.4 percentage points above trend, and the share of the industrial sector in GDP 1.6 percentage points larger than in the baseline. In contrast, investment in infrastructure focused on agriculture generates an annual GDP growth rate that is 2.3 percentage points above trend, annual investment growth 5.4 percentage points above trend, and the share of the industrial sector in GDP 11.0 percentage points smaller than in the baseline.

21. Investment in infrastructure that benefits all economic sectors has a larger positive impact on economic activity, but investing in rural infrastructure leads to a better distributional outcome for the country as a whole. Figures 7 and 8 show that investing increased revenue in infrastructure that is directed to all economic sectors reduces the Gini coefficient (in comparison to the baseline) by 1.8 points and the poverty rate by 6.5 percentage points. In comparison, investing in infrastructure targeted to the agricultural sector reduces the Gini coefficient by 2.6 points, with a similar outcome for poverty reduction at 6.4 percentage points.

E. Policy Implications

22. Financial liberalization in Myanmar—once macro conditions are put in place—can significantly boost economic growth, reduce poverty, and improve nationwide income distribution. Allowing increases in interest rates over time and phasing out the CBM financing of fiscal deficits would ensure positive interest rates in real terms and encourage household savings. Higher savings would in turn increase credit supply to the economy and make more resources available to the private sector, allowing higher investment and hence higher growth. The poor would benefit from higher growth with reduced poverty, but they may benefit proportionally less than the better-off, especially in urban areas where a large informal sector exists.

23. Financial inclusion policies aimed at increasing general credit access for agriculture and SMEs can help further reduce poverty, but may benefit the poor less. In particular, improving credit access for agriculture and SMEs would help expand the productive capacity of these two sectors, but the ability to access finance varies among farmers and SMEs, and hence policies need to target disadvantaged groups in order to improve the distributional outcome of financial inclusion efforts. Well-targeted micro-finance schemes could play an important role in this regard.

24. Policies to improve infrastructure can amplify the positive impact on growth and poverty of financial reform. Given that Myanmar's poor infrastructure is a key impediment to financial access for the poor, increasing investment in critical infrastructure such as electricity, transport and telecom services, has a policy appeal. However, some trade-offs are inevitable in deciding sectoral priorities for infrastructure investment. Investment in rural areas may not generate the largest growth impact than investment in the more densely populated urban areas, but it would help reduce rural-urban disparity. But again, addressing intra-rural and intra-urban inequality would require policies to target the poorest groups that may not be able to take advantage of emerging opportunities from improved infrastructure.

25. Achieving inclusive growth in the process of financial sector reform will likely require trade-offs between policy objectives. Bringing down inflation by phasing out central bank

financing of fiscal deficits would help protect the income of the poor. But as financial sector reform deepens, including through the liberalization of interest rates, the authorities will need to assess possible trade-offs between growth, poverty and distribution objectives and design policies that would help achieve outcomes that are most conducive to Myanmar's long-term goal of building a prosperous and inclusive society.

Appendix I. Model Details

The model in this paper is a dynamic stochastic general equilibrium model of a small open economy with multiple sectors. There are a large number of households that are heterogeneous, both within and across sectors. Urban and rural households differ on their occupations as well as on their access to financial intermediaries. Within-sector heterogeneity is due to household-specific shocks to productivity.

Money demand in the model is introduced through a cash-in-advance constraint. As is standard in the literature, we assume that cash is required for obtaining consumption goods.

A fraction of total savings is used by the government to finance its own and SOE operations; the rest goes to financing private credit. We will assume that private investment must be financed. Also, we assume that farmers producing a surplus require an amount of intermediates (seeds, fertilizer, etc.) large enough that it must also be financed. Private investment and agricultural intermediates requirements for credit constitute the total demand for private credit in the economy.

Economic sectors

There are four types of occupations in the economy, three urban and one rural:

a. Agricultural workers (rural)

b. Entrepreneurs (urban)

c. Public sector workers (urban)

d. Private sector workers (urban)

Households are confined to their sectors and cannot easily switch occupations. Agents face a fixed cost of moving from and to urban areas. This cost is calibrated to reproduce the observed income differential between rural and urban households.

Production

Worker types: Agricultural workers use their labor and intermediate inputs to produce. The product produced can be consumed or sold on the market. Public sector workers work for the government which does not produce marketable goods. Private sector workers provide their labor to the entrepreneurs. Additionally, both private and public sector workers can choose instead to use their time to produce nonfood products, avoiding taxes—this is the informal sector.

The entrepreneurs produce a nonfood item using capital and labor[1]. This nonfood product can then either be sold to consumers or converted into capital using an intermediary. Each entrepreneurial household owns capital stock which cannot be converted back into a nonfood

[1] Hence the nonfood product is produced both within the entrepreneurs' firms and informally by workers at home.

consumption good. Capital depreciates over time so that new investments are necessary to maintain the capital stock.

Besides the domestically produced agricultural product and the nonfood product, there is also an agricultural export product. The production of this good (e.g., beans and pulses) takes place in firms owned by entrepreneurs. It uses the domestic agricultural product as input which is then refined and packaged using labor.

Production Structure			
Good	**Producer**	**Input**	**Use**
Imported food	Foreigners		Consumption
Domestic agricultural product	Agricultural workers	Labor and intermediates (seeds, fertilizer, etc.)	Consumption, production of agricultural exports
Nonfood products	Entrepreneurs	Private sector labor, capital	Consumption investment
	Private / public sector workers	Labor – informal production	
Agricultural exports	Entrepreneurs	Domestic agricultural product, private sector labor	Exports

Preferences and household decisions are as follows:

- **Households live forever and are forward looking. In every period, they decide how much of their disposable income to consume, how much to save in interest-bearing assets, and how much money to hold**. Households face uncertainty regarding their future income and are risk averse: they want to avoid large fluctuations in their consumption over time. Having access to a financial intermediary allows them to accumulate a buffer of financial wealth as insurance against future drops in income. Households facing more severe shocks can borrow to smooth consumption if they have access to finance[2].

- **Households also decide how to allocate their consumption expenditure over two food items** (domestically produced and imported) and the nonfood item.

[2] The model thereby highlights the role of financial inclusion not just as a measure of mobilizing resources for investment but also as an insurance mechanism that reduces consumption inequality.

Financial intermediation and financial sector policies

Financial intermediaries have two distinct roles in the economy:

- They finance investment for entrepreneurs, and the purchase of intermediates for agricultural producers, and
- They allow workers to save and borrow.

Fiscal policy parameters

The government in the model has access to a rich set of taxes and transfers to pay the public sector workers and to provide insurance to vulnerable households. These policies are captured by a set of exogenous policy parameters:

- A tax on entrepreneurs' capital income
- A tax on private and public sector workers' wage earnings
- Sector specific and means-tested transfers

Idiosyncratic shocks

Each non-entrepreneurial household's productivity is subject to random changes over time, but these changes in productivity are different across households. At each point in time, some households are lucky while others are unlucky. There is no aggregate uncertainty and, given the large number of households, a law of large numbers applies, so that the distribution of shocks across households within each sector remains constant. That is, the number of unlucky households is always the same.

Equilibrium and steady state

At each point in time, prices, wages, and borrowing interest rates are set to ensure that the markets for all three domestically produced goods, for credit, and for labor clear. Moreover, given these prices (both in the present and future) and government policies, all household decisions are made to maximize the present value of lifetime utility. The prices of imported food and agricultural exports are exogenously given.

The nominal savings interest rate is determined by the government through regulation and monetary policy. However, real interest rates can change with inflation. Additionally, as described before, a part of the savings that private agents accumulate goes towards the financing of government and SOE operations. The leftover part is available for private credit, and the interest rate of credit is such that the credit market clears.

The economy is in a steady state. Aggregate variables and prices are constant over time, as is the distribution of wealth, income, and consumption across households. The income, wealth, and consumption of individual households, however, changes over time with the realization of their idiosyncratic shocks.

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MACRO-FISCAL RISKS: THE CHALLENGE OF CLIMATE RELATED DISASTERS[1]

Climate-related disasters and climate change pose interrelated macro-fiscal challenges. Although the effects of climate change will be global, countries in Developing Asia (DAS) will likely be among the hardest hit.[2] Among DAS peer countries, Myanmar appears particularly at risk on account of the interplay between disaster proneness and socio-economic vulnerability. Cross-country evidence for DAS over the past four and a half decades shows that these countries suffered from frequent large-scale climate-related events. While growth generally took a permanent hit, governments refrained from countercyclical fiscal policy. They rather responded through ad-hoc fiscal rebalancing and reprioritization, reflecting policy and structural rigidities, such as overly rigid fiscal policy objectives, perceived absence of fiscal space, low capacity, and budget restrictions. Even relative to that, the policy response of the Myanmar authorities to the severe 2015 floods was more limited in many ways, making the case for structural reforms aimed at enhancing preparedness and response ability to more effectively mitigate the impact of climate-related disasters, predicted to further acerbate with climate change.

A. Myanmar's Disaster Risk: A Tango of Proneness and Vulnerability

1. Myanmar is exposed to a considerable disaster risk, putting it ahead of other disaster-afflicted peer countries in DAS and the rest of the developing world (RoDW).[3] This owes to the interaction of its proneness to physical hazards and its vulnerability of exposed material and human elements, consequently making Myanmar feature prominently in a number of global rankings: for instance, most-at-risk country in Asia and the Pacific according to the UN Risk Model (OCHA, 2012) and second-most affected country worldwide according to the Climate Risk Index (2016). The latter puts it not only at the top between Honduras and Haiti, but also ahead of other DAS peers in the top 10 (Kreft and others, 2016).[4]

Disaster Proneness

2. Worldwide, Myanmar is among the countries most prone to climate-related hazards.[5] During 1970–2015, climate-related hazards have generally been a severe and the predominant

[1] Prepared by Kerstin Gerling and Chanaporn Sereevoravitgul.

[2] Besides Myanmar, the 19 DAS countries are Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, India, Indonesia, Laos, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Timor-Leste, and Vietnam.

[3] RoDW comprises all 188 Fund members except for 35 advanced markets (AMs) as defined by the IMF WEO, 33 small developing states (SDS) as defined in IMF (2013), and 19 DAS countries (as defined in Footnote 1).

[4] There are five such DAS countries, i.e. the Philippines, Bangladesh, Vietnam, Pakistan, and Thailand.

[5] Those include climatological (e.g., heat/cold wave or drought), hydrological (e.g., flood or storm surge), meteorological (e.g., cyclone or snow storm), and biological hazards (e.g., epidemic or locust infestation).

hazard type in Myanmar and DAS countries alike,[6] entailing large material and human damages: for DAS (including Myanmar), EM-DAT reports more than 3,200 events, causing US$590 billion in material damages, affecting 6 billion people and killing more than 1 million.[7] Within DAS, Myanmar stands out because of a disaster record with average-high mortality (Table 1). To start with, DAS has—on average and by several scaled metrics—been hit more severely than the rest of the developing world (RoDW): 3 times more material damages, 1.6 times as many affected people and slightly higher frequency. Myanmar is worse off than the RoDW in terms of mortality and average material damage.

Table 1. Average Climate-Related Disaster Losses
(Annual occurrence per thousand square kilometers (tsd. sq. km), material damages in percent of GDP, human damages in percent of population, conditional on an event, 1970–2015)

	Myanmar	DAS (w/o Myanmar)	RoDW 1/
Occurrences	0.0022	0.0167	0.0165
Material damage	0.5659	1.2919	0.4481
People affected	1.0508	4.2132	2.6235
People dead	0.0091	0.0020	0.0032

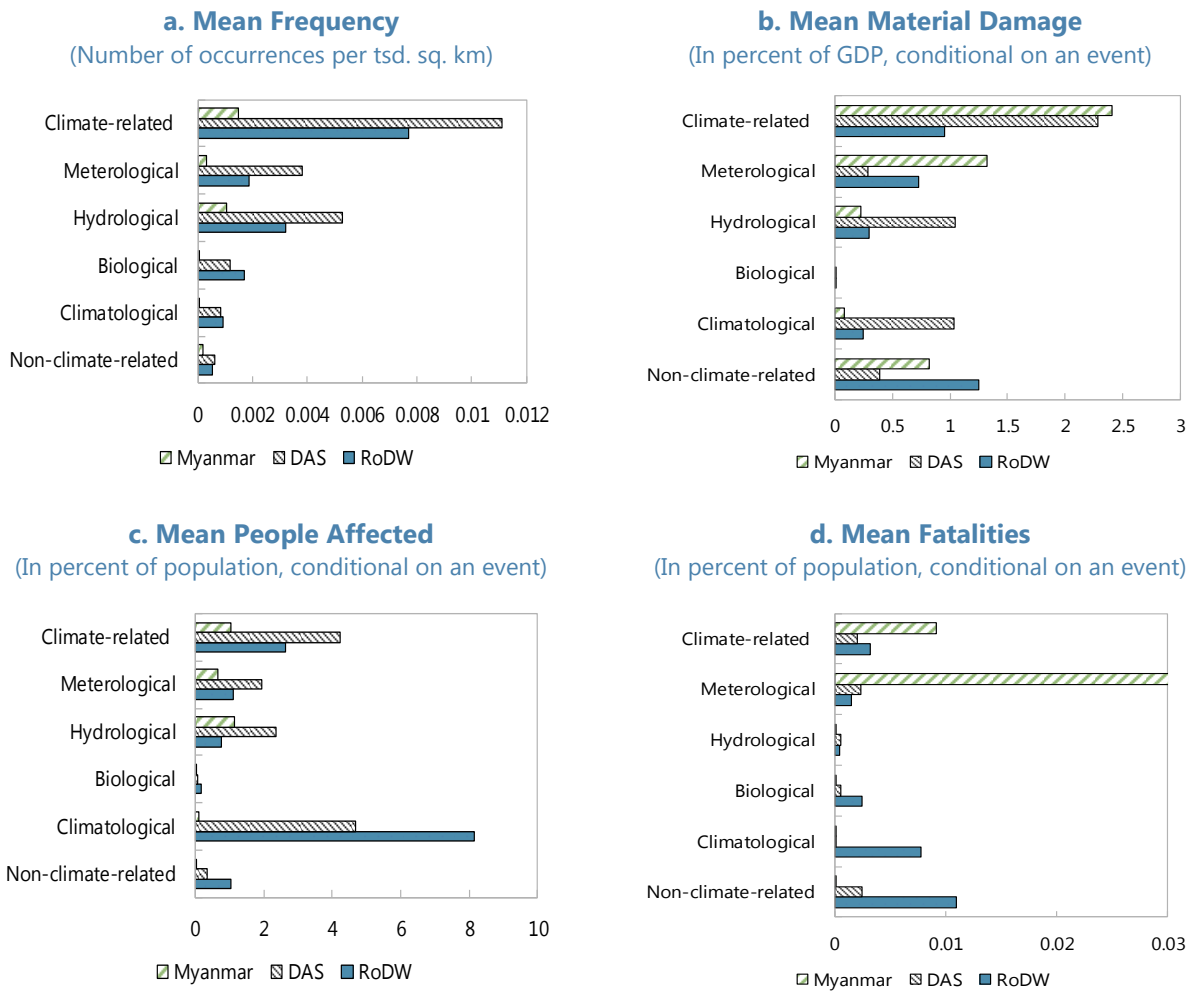
Sources: IMF Staff calculations using CRED EM-DAT; Myanmar PDNA (2015); WB WDI; and IMF WEO.

3. Climate-related disasters, particularly those from meteorological hazards, dominate the impact of natural disasters on Myanmar (Figure 1). Due to the country's geographical location and topography, earthquakes, rainfall-induced flooding, droughts, and forest fires are recurring phenomena in Myanmar. Beyond this, the mountain areas face imminent risk of landslide and the coastal line cyclones, tropical storm surges, and tsunamis (OCHA, 2016c). Relative to geophysical disasters, climate-related disasters occurred 9 times more often, caused 12 times more material damages, affected 380 and killed 750 times as many people. Among climate-related disaster types, hydrological hazards are the most frequent and affect the most people. However, while only the second-most frequent, meteorological hazards cause larger material damage and loss of life, much larger than in DAS and RoDW peers.

[6] Despite of DAS including earthquake-prone countries located on the intersection of the Indian and Eurasian plate (such as Nepal, India, or Myanmar), climate-related disasters occurred 18 times more often, caused 3 times more material damages, affected 13 times and killed almost as many people over 1970-2015 than geophysical disasters.

[7] A key caveat of available loss statistics is that damages often remain underreported, mainly due to reporting thresholds, weak capacity, and accounting difficulties (see e.g. Kousky, 2012).

Figure 1. Disaster Impact Across Hazard Types, 1970–2015 1/



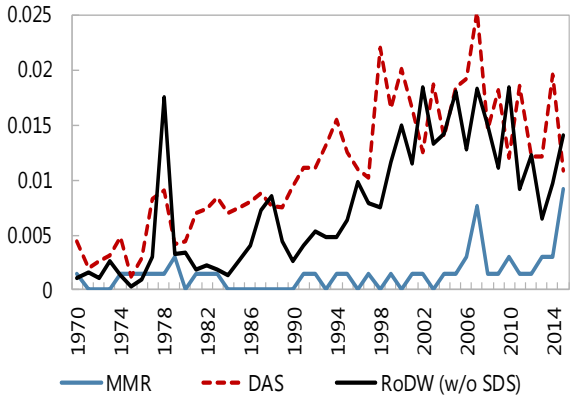
Sources: IMF Staff calculations using CRED EM-DAT; Myanmar PDNA (2015); WB WDI; and IMF WEO.
Note: 1/ Among non-weather-related disaster events, there were only geophysical events.

4. Myanmar tends to suffer from exceptionally severe rather than frequent, small disasters (Figure 2).[8] The two most devastating natural disasters in the history of the country hit within a decade: cyclone Nargis in May 2008 and the floods in 2015. They killed some 0.3 percent and 0.0003 percent of population, caused around 12 percent and 2.5 percent of GDP in material damage, and affected 5 percent and 17 percent of population, respectively. Nevertheless, there also appears to be an intensification of frequency, material damage, and human impact over time. In contrast, casualties have been on the decline since the seminal Nargis cyclone in 2008—including from cyclone Giri in 2010 and cyclone Komen in 2015. This partly owes to advances in early warning and disaster preparedness (OCHA, 2016b).

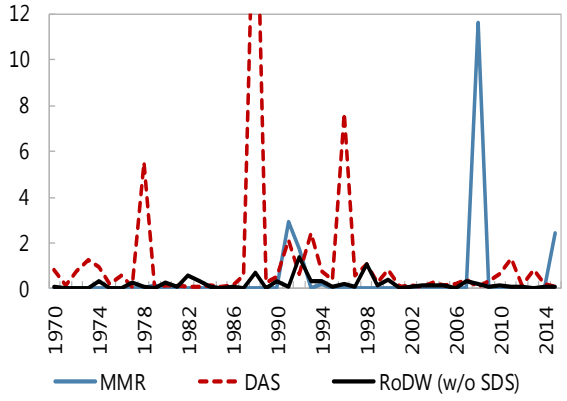
[8] For a more detailed discussion, see, e.g., Kreft and others (2016).

Figure 2. Patterns of Climate-Related Disasters, 1970–2015

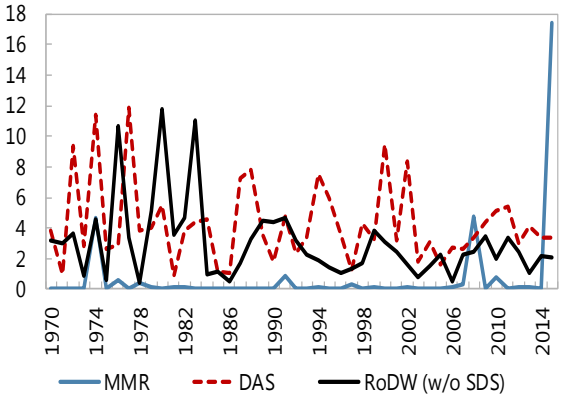
a. Mean Frequency
(Number of occurrences per tsd. sq. km)



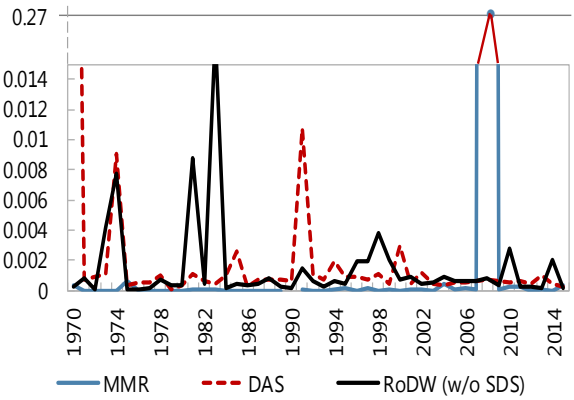
b. Mean Material Damage
(In percent of GDP, conditional on an event)



c. Mean People Affected Count
(In percent of population, conditional on an event)



d. Mean Fatality Count
(In percent of population, conditional on an event)



Sources: IMF staff calculations using CRED EM-DAT; Myanmar PDNA (2015); World Bank WDI; and IMF WEO.

Disaster Vulnerability

5. Myanmar stands out as one of the most vulnerable countries to disasters. While globally, Myanmar's susceptibility (i.e. the likelihood of suffering harm) only falls into the second highest quintile (World Risk Index, 2015), its coping capacity (i.e., capacity to reduce negative consequences) and absorptive capacity (i.e. capacity for long-term strategies for societal and spatial change) both fall into the weakest quintile (Figures 3–4). Also relative to DAS peers, Myanmar's coping capacity lags behind, reflecting weaknesses especially in the area of governance and government effectiveness; access to healthcare, public safety net, and insurance; physical connectivity and energy security. The same is true for absorptive capacity, owing mainly to a low level of socio-economic development, which typically comes with the confluence of a large share of vulnerable poor people (who tend to live in high-risk areas, rely on fragile infrastructure, and have limited savings and jobs that depend on weather conditions); shallow financial markets; low levels of education, public health, and gender equality; concentration of economic activity; and developing

governance and openness. Consequently, Myanmar ranks 11 out of 191 in the Index of Risk Management (INFORM).

Figure 3. Lack of Coping Capacity
(Related to governance, medical care and material security)

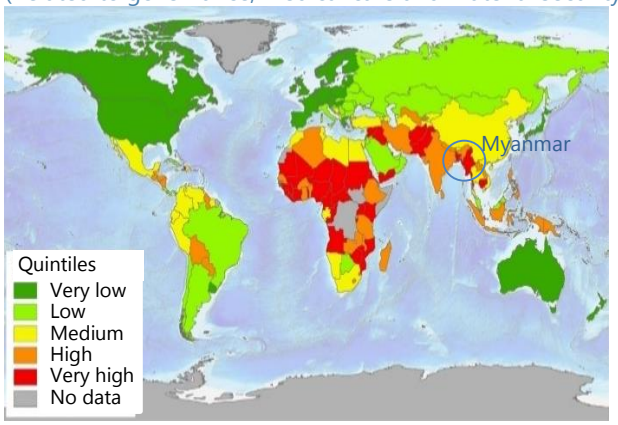
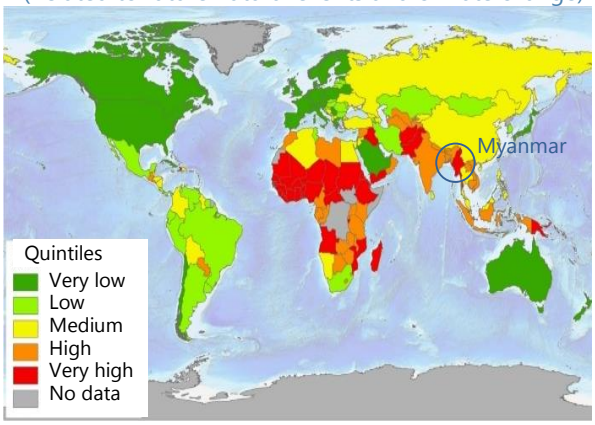


Figure 4. Lack of Absorptive Capacities
(Related to future natural events and climate change)



Source: World Risk Index (2015).

Risk Outlook

6. Although the effects of climate change will be global, DAS countries will likely be among the hardest hit (IPCC, 2014a and GFDRR, 2015). As of today, DAS countries are flashpoints for climate change, owing to a combination of being located in high-risk tropical latitudes and having the special vulnerability of both low levels of development and a rising number of people in urban areas. Projections suggest that temperature increases in DAS may be larger than the global land average (IPCC, 2014b). This would further exacerbate those countries' susceptibility to climate-related natural disasters by raising the frequency and severity of events (in particular of heat stress, extreme precipitation, inland and coastal flooding, drought and water scarcity, as well as insect infestation and diseases).

7. Thus, climate change poses a growing risk to Myanmar as a result of its proneness and vulnerability to disasters. The country already started to feel the pinch of more extreme climate-related events, such as during the unusually severe El Niño phenomenon in 2015–16: extreme temperatures, unusual rainfall patterns, dry soil, high risk of fires, and acute water shortages (OCHA 2016c). Such events put pressures on climate-sensitive activities that Myanmar is highly dependent on as they are the main source of employment and income for the overwhelming majority of the population: agriculture (especially crops, livestock, forestry, fisheries). They also increase risks to water access, food and energy security, and health, and potentially trigger new poverty traps, population displacements, and conflicts, undermining economic, social, and political stability. As a

result, growth could suffer and fiscal pressures mount in order to meet demands for critical public infrastructure and social services.[9]

B. Disaster Impact: Growth Decline and Fiscal Storm in a Teacup

8. Severe climate-related disasters are typically followed by growth declines, and yet roughly stable headline fiscal numbers. This section examines this paradox by looking at severe disasters that fall in the 90th percentile of annualized and scaled climate-related material damages (pooled across all DAS countries and years with at least one disaster occurrence). This yields a threshold of material damages amounting to 1.12 percent of GDP and 87 such cases (of which four happened in Myanmar in—as exhibited in Figure 2.b—1991, 1992, 2008, and 2015).

Macroeconomic Impact

9. A severe climate-related natural disaster poses macro-critical challenges. In the short term, immediate costs arise from the loss of lives, damage to physical assets, and immediate output contraction.[10] Large cash demands strain the fiscal and external position: lower revenues (on account of lower economic activity and disrupted tax collection infrastructure) meet higher expenditure needs (especially for emergency relief and reconstruction where households and the private sector need public support); and lower exports (because of production disruptions) meet higher imports (especially food and reconstruction materials). Over time though, the macro-fiscal effect becomes circumstantial. Scarce cross-country evidence is largely inconclusive, but points to the importance of factors such as: effectiveness of demand smoothing mechanisms (e.g., counter-cyclical fiscal policies, external assistance, remittances or insurance payouts); institutional quality (driving the speed and usefulness of response measures); differences in the degree of crowding-out (especially of productive capital expenditures by reconstruction efforts); and acceleration of a Schumpeterian creative destruction process (boosting productivity by triggering investment in upgraded capital and new technologies).[11]

[9] The overall economic impact is hard to quantify, as it depends not only on how effectively global climate policy measures can limit global mean temperature increases, but also how effectively countries can adapt to the changing climate environment. Even for the global economy as such, there are only a few, but very varying cost estimates. For instance, Tol (2014) estimates that a global warming of 3ºC might cost about 2 percent of GDP, while the World Bank (2013) estimates that 1.5°–2°C warming could lead to 6 percent to 12 percent reduction in rice yields in the Mekong River Delta, whilst other crops may experience decreases ranging from 3 percent to 26 percent by 2050.

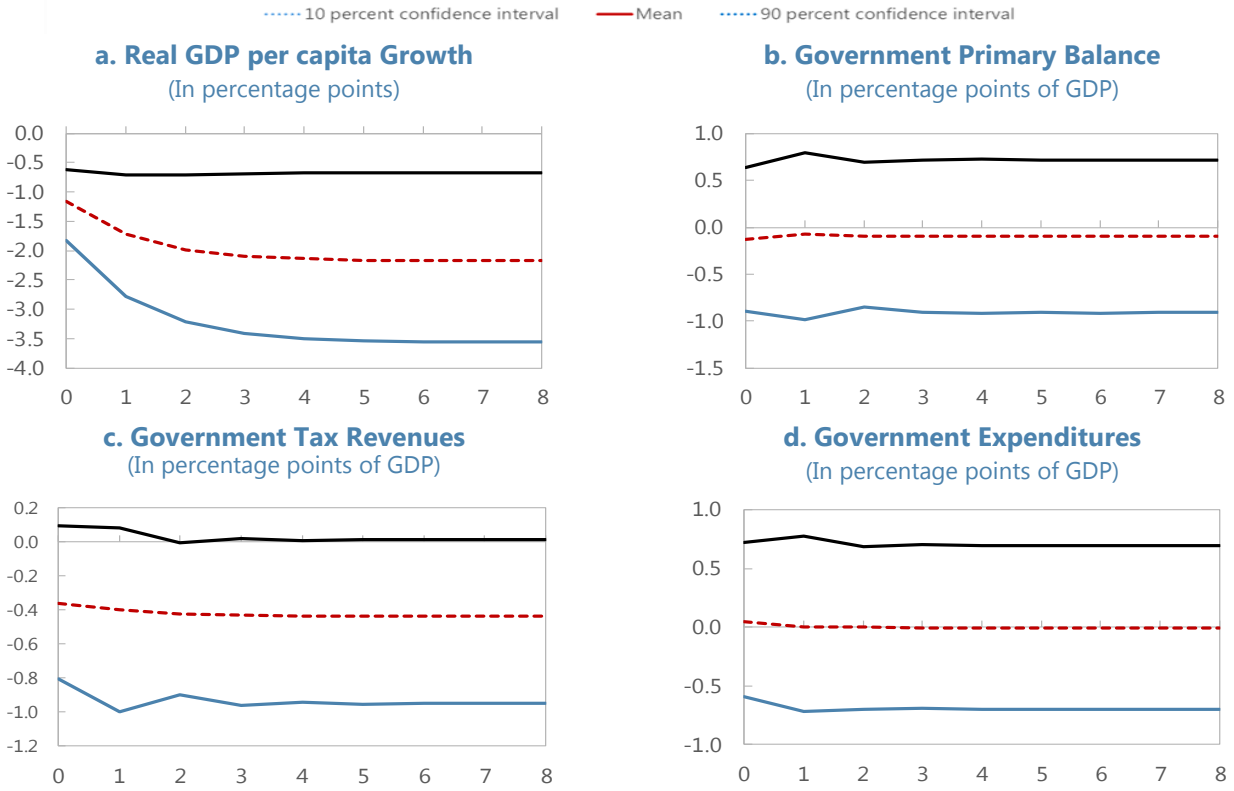
[10] See e.g., Loayza and others (2012), Noy (2009), Hochrainer (2009), or Strobl (2012).

[11] See e.g., Cavallo and others (2013), Raddatz (2009), Noy (2009), Noy and Nualsri (2007), or Melecky and Raddatz (2011). For the longer-term effects, see e.g. Cuaresma and others (2008), Benson and Clay (2004), Auffret (2003), World Bank (2003), Fomby and others (2013), Adedeji and others (2016), or von Peter and others (2012).

Cross-Country Evidence for DAS

10. Empirical evidence for DAS countries suggests that a severe climate-related disaster leads to a permanent growth loss, but triggers a limited countercyclical fiscal response (Figure 5).[12] Cumulative impulse reaction functions (IRFs) to a severe disaster in year t_0 show an immediate and significant decline of mean growth of 1.2 percentage points. It only fades out slowly over the medium term, leaving a permanent loss of 2.2 percentage points. At the same time, a dynamic fiscal response fails to appear, as evidenced by both the insignificance and small size of the mean reaction of particularly the government primary balance and expenditure-to-GDP ratio. There is, however, large heterogeneity across countries (as shown by the width of the confidence interval at the 10 percent level), likely reflecting differences such as absorptive capacity and policy response.

Figure 5. Cumulative Response to Severe Climate-Related Natural Disasters
(17 DAS countries (unbalanced), material losses as share of GDP in top 10 percentile, 300 bootstraps)



Source: IMF Staff calculations using EM-DAT; WB WDI; IMF WEO; and IMF staff reports.

Note: The impulse reaction functions (IRFs) are derived from a panel vector autoregressive model with exogenous shocks (panel-VARX) for DAS countries. Data constraints require to drop two countries (Afghanistan and Timor-Leste) and to minimize the number of lags (only allowing one, although including longer lags corroborates the robustness of the results). The model includes four endogenous variables (real GDP per capita growth, primary balance, tax revenues and expenditures) and a dummy for the exogenous climate-related natural disaster shocks that hits in t_0. Fiscal variables are expressed as a share of GDP and first-differenced to ensure stationarity and intuitive interpretability The disaster dummy takes the value of 1 for annual material losses (as a share of GDP) in the top 10 percentile of the material loss distribution for all years with at least one disaster occurrence.

[12] The results are fairly robust to the threshold (e.g. the 95 percentile or commonly used 1 percent of GDP). They are also broadly in line with evidence from Acevedo (2014) for 12 Caribbean countries and Cabezon and others (2015) for 12 small Pacific island states.

11. However, event studies suggest that underneath the surface of little affected fiscal aggregates, a range of fiscal policy responses are at play in an effort to contain a fiscal deterioration (Figure 6). Whilst corroborating the growth decline, event study results suggest that fiscal aggregates mask a fiscal policy response through a range of policy actions in DAS countries:[13]

- *Spending restraint in line with available resources*. On average, the primary balance only deteriorates very mildly, thanks to expenditure restraints in line with available resources. In the severe disaster year, total spending slightly expands with higher total revenues (driven by nontax revenues). Thereafter, they contract in parallel.

- *Expenditure reallocation*. Lower capital expenditure makes room to meet current expenditure pressures from emergency relief measures in the near disaster aftermath, before reversing to make room for reconstruction in the second year after the disaster. In parallel, anecdotal evidence points to the recourse to reprioritization of capital expenditure (especially of the capital expenditure project plan) and rationalization of current expenditure.

- *Revenue and external official support mobilization*. Efforts to support failing tax revenues with external grants on average materialize in a pickup in average grants in the second year after the disaster, likely to support the reconstruction phase through. Furthermore, the magnitude and timing of net official development assistance (NODA) and debt relief suggest that donors rather seem to respond through project grants starting in the early reconstruction phase and immediate debt relief (to reduce pressures from debt service mainly coming from the increased scarcity of cash and foreign exchange) rather than budget grants for immediate emergency relief.

- *Public debt dynamics*. The aftermath sees a worsening of debt dynamics: at first a slight one reflecting the alleviating impact of debt relief, then an accelerated one reflecting the dominance of the interplay between lower growth and slightly higher overall deficits. Beyond this, however, debt dynamics also exhibit some stock-flow-adjustment in the immediate aftermath, likely on account of exchange rate depreciation and a materialization of contingent liabilities. Concessional borrowing only slowly resumes with reconstruction, with little effect on debt dynamics thanks to typically long grace periods.

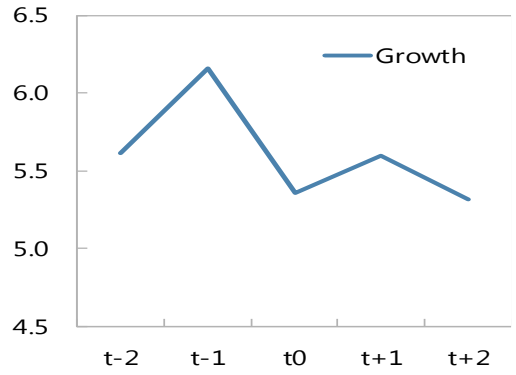
[13] While not attempting to establish causality, the event study is complementary to the panel study approach: it is less demanding as to the length of time series data and better captures relationships (including non-linear dynamics) before, in, and after an event year.

Figure 6. Event Study for Key Macro-Fiscal Aggregates

(All DAS countries (unbalanced), t_0 is a year in the top 10 percentile of costliest climate-related disaster)

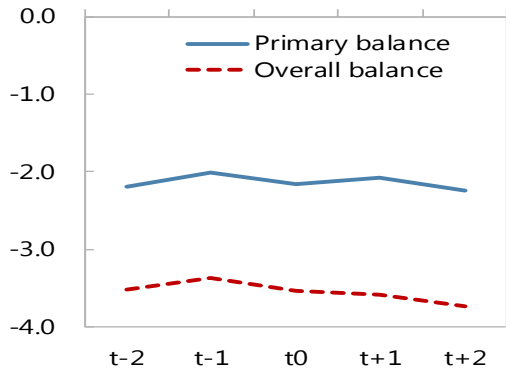
a. Real GDP per capita Growth

(In percent of GDP)



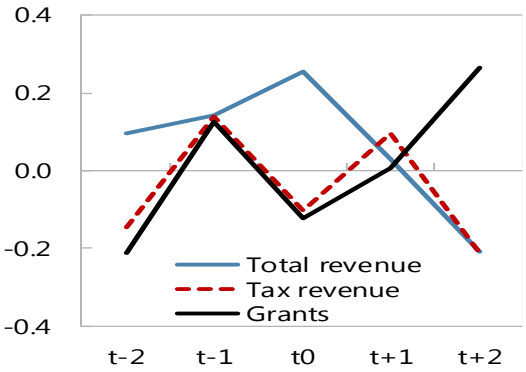
b. Fiscal Balance

(In percent of GDP)



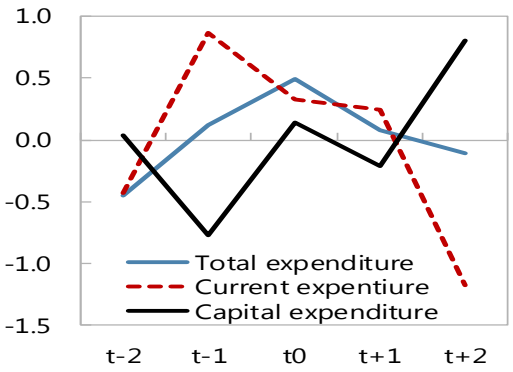
c. Public Revenue

(In percent of GDP, first differences)



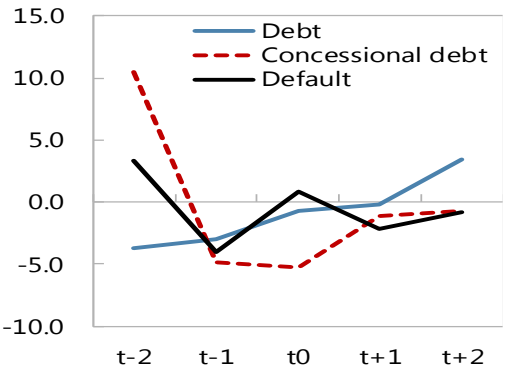
d. Public Expenditure

(In percent of GDP, first differences)



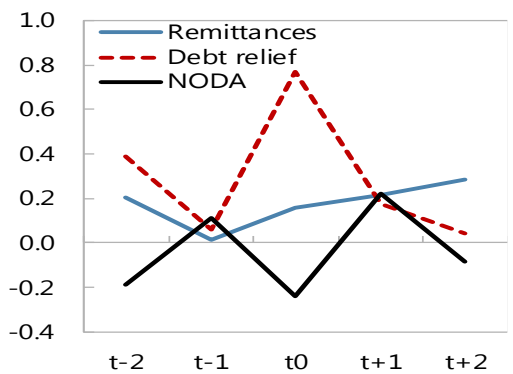
e. Public Debt

(In percent of GDP, first differences)



f. External Support

(In percent of GDP, first differences)

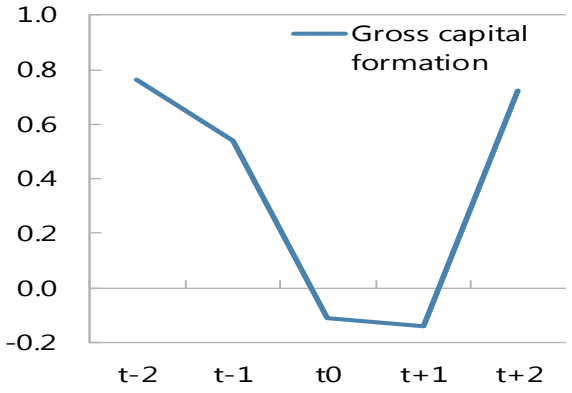


Sources: IMF Staff calculations using EM-DAT; WB WDI; IMF WEO; and IMF staff reports.

Note: To derive meaningful and comparable mean paths of variables, the study uses all variables (except for growth and the fiscal balance) in first differences of their ratio to GDP and only includes episodes where data is available for each year. The study does not allow for an overlap of event windows, resulting in dropping the second episode. Results are generally robust if instead the less severe episode gets dropped.

12. Meanwhile, the private sector's disaster response partially substitutes for a public disaster response. Comparing the evolution of the government's capital expenditure (Figure 6.d) to that of the gross capital formation of the combined public and private sector (Figure 7) suggests that the private sector plays an important role in the disaster response. It even precedes the public response. The private sector response is facilitated by the availability of fast and fresh financing. While financial and insurance markets are still in a development stage in DAS, remittances are a more important source (Figure 6.f). They increase immediately after the disaster and continue to grow, first financing emergency relief and then reconstruction.

Figure 7. Event Study for Gross Capital Formation
(In percent of GDP, first differences)



Note and sources: see Figure 6.

The 2015 Floods in Myanmar

13. Myanmar experienced massive floods in July through September 2015. After making landfall in Bangladesh, cyclone Komen brought strong winds and heavy rains to Myanmar, resulting in severe, widespread flooding and landslides across 12 of the country's 14 states and regions. According to EM-DAT and OCHA (2016a), they killed 171 people, affected more than 9 million people and temporary displaced 1.7 million people (or 17 percent and 3 percent of the population, respectively). The Myanmar PDNA (2016) reports a total economic impact of US$1.51 billion (or 2.4 percent of GDP). This puts this event in the top 10 percentile of all climate-related disasters in DAS countries over the past four and a half decades along two loss dimensions: material damages and people affected.

14. The disaster aftermath saw a significant drop in growth, but no countercyclical fiscal reaction. Relative to the pre-disaster year, growth turned out lower by 0.7 percentage points in FY 2015/16, and also led the authorities to revise downwards the growth outlook for the near-term outlook. In contrast, both a revised budget in late 2015 and the preliminary FY 2015/16 outcome did not show any substantial disaster response—neither in revenues, nor expenditures.[14]

15. Looking more closely though, the authorities responded swiftly within their means. Following improvements in their institutional and regulatory framework after cyclone Nargis in 2008,[15] the authorities were able to respond much faster and more effectively in the early stages of

[14] Since the floods hit mainly rural areas, tax collection was not very much affected.

[15] The Ministry of Social Welfare, Relief and Resettlement (SWRR) was established as the government's focal point for disaster preparedness and response. In August 2013, a Disaster Management Law was passed, also establishing a National Disaster Management Committee (NDMC) as the highest decision-making body for disaster management (with the Vice President II as a chair and the Minister of SWRR as one of the two Vice-Chairs). Explicit Disaster Management Rules were finalized in April 2015 (OCHA, 2016b).

immediate emergency relief than during past severe disasters. However, their fiscal response fell short of DAS peers', as it was characterized by:

- *Adherence to the overarching objective of preserving the fiscal stance.* Although debt levels provided some fiscal buffer for counter-cyclical policy, the government opted for not expanding spending, pointing to a lack of external budget support and their overarching philosophy of "living within your means." Unlike in dealing with cyclone Nargis in 2008, however, the authorities made a call for assistance to the international community, but external budget support remained absent—reflecting largely pre-election sensitivities of donors and the governments' inexperience in dealing with donors.[16]

- *Predominant reliance on the Reserve Fund*—an annually earmarked budgetary provision for natural disaster and emergency projects. Although sizably topped-up since FY 2012/13 to K100 billion (from previously K100 million), the fund was used up very quickly, only covering less than 1 percent of the total estimated damage.

- *Minor reliance on the National Natural Disaster Management Fund (NNDMF)*—an off-budget fund created in 2013 (with an annual budget allocation of K20 billion) for immediate relief measures and monitoring of natural disaster risk mitigation projects at the supra-ministerial level. It granted the Ministry of Social Welfare an additional K3 billion for emergency spending.

- *Some reprioritization within spending categories, reflecting severe budget rigidities.* Enacted in 1986, current financial rules and regulations only allow for re-appropriations within the same budget line, i.e., line ministry (even project) and sub-federal bodies (i.e, state and regional governments). The authorities did not request approval from cabinet and parliament to implement more substantial re-appropriations. They used the existing budget flexibility to respond to the most immediate spending pressures and submitted revised spending plans for the upcoming budget cycle.

C. Policy Implications: The Importance of Ex-Ante Resilience and Ex-Post Policy Response

16. Going forward Myanmar needs to address weaknesses in ex-ante resilience and ex-post adaptive capacity. While natural disasters cannot be prevented and their impact is unpredictable, Myanmar can reduce its macroeconomic vulnerability by addressing remaining weaknesses in the area of fiscal policy, institution and capacity.[17] Cross-country best practices and its own experience suggest that Myanmar can:

[16] Elections were held on November 8, 2015. Some donors and UN agencies slightly ramped up funding or redirected funding from other ongoing operations for their own disaster response in support of the government response (OCHA, 2016a). In the end, the government-led response was mainly supplemented by civil society efforts only (especially the Myanmar Red Cross and local NGOs).

[17] See e.g. Laframboise and Loko (2012) or Farid and others (2016) for a general discussion on fiscal policy response.

- *Improve fiscal risk management and public financing assistance:*[18]

  - *Incorporate disaster risks in fiscal management*. There is a need to explicitly identify and adequately integrate climate-related natural disaster risks into the medium-term fiscal framework and debt sustainability analysis. This will help determine how much to spend on mitigating impact and how much to self-insure by creating an adequate fiscal buffer within the budget.[19] Unused funds should contribute to bolstering a notional fiscal buffer (i.e. generating public savings in quiet times for use in disaster times).

  - *Clarify the role of the National Natural Disaster Management Fund (NNDMF)*, especially as to its mandate, governance structure, budget linkages, and relations with donors for disaster response and mitigation measures.

- *Regularize budget process flexibility*. Fiscal rules and the Disaster Management Law should be integrated to ensure that adequate flexibility remains to respond in a timely and effective way to a natural disaster. This could include an escape clause for (i) determining the extent of a fiscal response in line with a severity classification; (ii) redeploying expenditures across budget chapters; and (iii) a streamlined process for preparing and passing a revised budget.

- *Generate fiscal space to finance climate change mitigation and disaster response programs*:

  - *Enhance domestic revenue mobilization and tap into newly available international support* to secure more resources for the integration of adaption to and mitigation of climate change in development planning in the context of the formulation of the country's Sustainable Development Goals (SDGs).[20] A number of measures can help address macroeconomic vulnerability, including improving social safety nets, facilitating access to finance and insurance, and promoting disaster-resilient infrastructure (especially of physical transport and energy generation, public health capacity, risk-informed spatial planning, building standards, and payment systems).

  - *Overhaul energy subsidies and taxation*. The current global environment of low fossil fuel prices and the Paris Agreement in 2016 provide an opportune moment to gradually eliminate poorly targeted energy subsidies, adjust artificially low electricity prices, and introduce carbon taxation.[21] The redistributive implications of such measures would require

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[18] See OECD (2015) for a cross-country comparison of government disaster compensation and financial assistance arrangements, including examples of peer countries in the region such as India, Malaysia or the Philippines.

[19] International best practices mandate reserving some 1 percent to 3 percent of spending to fiscal risks as such.

[20] To this purpose, advanced countries promised developing countries during the Paris Conference on climate change at end-2015 to mobilizing US$100 billion annually by 2020 to support developing countries.

[21] At this juncture, the objective of carbon taxation would be rather to help guide a cleaner, more sustainable economic development than to raise revenues. In fact, Myanmar's share of 2012 global greenhouse emissions was 0.99 percent, but mainly on account of ongoing deforestation than old and dirty industries (Admiraal and others, 2015).

flanking measures, such as the introduction of well targeted subsidies for the most vulnerable.

- *Strengthen government effectiveness* by improving institutional capacity and quality, which also spills over to private sector disaster response. Capacity and decision making processes need to be strengthened, in particular coordination and communication (not only within the public sector, but also with the civil society, donors, and multilateral organizations), planning, information aggregation and management, policy design and implementation.

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