



# IMF POLICY PAPER

## APPROACHES TO MACROFINANCIAL SURVEILLANCE IN ARTICLE IV REPORTS

March 2017

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

- A **Press Release** summarizing the views of the Executive Board as expressed during its March 6, 2017 consideration of the staff report.
- The **Staff Report**, prepared by IMF staff and completed on February 2, 2017 for the Executive Board's consideration on March 6, 2017.

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**Washington, D.C.**



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### **IMF Executive Board Discusses Approaches to Macrofinancial Issues in Article IV Surveillance**

On March 6, 2017, the Executive Board of the International Monetary Fund (IMF) discussed progress in incorporating macrofinancial analysis and policy advice into Article IV surveillance, drawing on the findings of the staff paper on “*Approaches to Macrofinancial Surveillance in Article IV Reports.*”

The 2008 global financial crisis and its aftermath underscored the importance of financial sector surveillance and the need to better understand macrofinancial linkages to help avoid crises in the future. While the global financial system is now significantly stronger and more resilient than prior to the crisis, macrofinancial linkages remain critical for all IMF members.

To improve the traction and usefulness of IMF surveillance, the 2014 Triennial Surveillance Review (TSR) recommended that macrofinancial analysis become an integral part of Article IV consultations and that steps be taken to strengthen the IMF’s focus on macroprudential policies and how they complement other economic policies. The Managing Director’s subsequent Action Plan for strengthening surveillance laid out specific steps to achieve these goals.

In line with the Action Plan, the IMF has undertaken dedicated efforts to strengthen macrofinancial surveillance. Staff has developed new analytical tools and the IMF has boosted staff training. In addition, more than 60 Article IV consultations have sought to strengthen macrofinancial coverage in the corresponding staff reports. In doing so, staff have focused on developing a fuller understanding of macrofinancial linkages and using this to inform their policy advice.

To take stock of initial progress under this initiative, the staff paper examined: (i) the conceptual underpinnings of the IMF’s macrofinancial surveillance, (ii) how macrofinancial links have been integrated more systematically into staff reports’ baseline economic projections and risk assessments, (iii) how strengthening analytical foundations for this work can help staff provide advice on financial, fiscal, monetary, and other policies to promote growth and build resilience, and (iv) steps that could be taken to further strengthen

macrofinancial surveillance. The lessons learned are intended to guide staff in progressively extending this work across the IMF's membership.

### **Executive Board Assessment<sup>1</sup>**

Executive Directors welcomed the opportunity to discuss the approaches to integrating macrofinancial surveillance in Article IV reports. They commended the progress made by the staff in mainstreaming macrofinancial analysis in line with the recommendations of the 2014 Triennial Surveillance Review and the Managing Director's Action Plan. Directors agreed that financial sector issues are crucial to countries' growth and stability and a well-integrated analysis of these issues would be vital for effective Article IV Surveillance. They appreciated the wide range of macrofinancial issues covered in the Article IV consultations of the diverse group of countries chosen initially for this initiative. Directors supported the Fund's macrofinancial surveillance initiative and agreed that it is appropriate to progressively mainstream macrofinancial surveillance across the membership.

Directors supported the staff's focus on integrating macrofinancial analysis, given its significance to the Fund's core mandate, into baseline projections, risk assessments, and policy advice in Article IV staff reports. Going forward, they underscored that surveillance should include a two-way assessment of macrofinancial risks and macroeconomic stability, and that financial sector recommendations should be appropriately integrated with the Fund's advice on fiscal, monetary, and structural policies.

Directors considered that the efforts to integrate macrofinancial analysis are strengthening the traction of Fund surveillance by fostering a more effective dialogue with country authorities. Directors urged the staff to continue being flexible and pragmatic in their approach as they extend this work, taking into account country-specific circumstances. They underscored the importance of a deep understanding of a country's institutions, policy frameworks, economic structures, and policy challenges. In addition, macrofinancial analysis should ensure consistent high quality and evenhanded surveillance across the membership. Directors emphasized that staff should continue to engage with country authorities to identify those macrofinancial issues of greatest relevance to a country's economy. A number of Directors emphasized that country surveillance should take due account of the circumstances of members participating in economic or monetary unions.

While recognizing the overall progress, Directors noted that gaps remain and should be addressed, with due account to legal constraints on the provision of confidential supervisory data. These include giving greater attention to how the financial sector would condition the

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<sup>1</sup> At the conclusion of the discussion, the Managing Director, as Chairman of the Board, summarizes the views of Executive Directors, and this summary is transmitted to the country's authorities. An explanation of any qualifiers used in summings up can be found here: <http://www.imf.org/external/np/sec/misc/qualifiers.htm>.

outlook for credit and output, deepening the analysis of the macroeconomic effects of financial shocks, incorporating quantitative approaches to assess financial risks, and improving the availability of financial data. Directors also supported efforts to explore the contribution of the financial sector to long-run growth and financial inclusion. Staff should consider how to integrate macrofinancial perspectives more fully into advice on the overall policy mix and anchor advice on micro- and macroprudential policies on a solid risk assessment informed by a view about systemic risk.

Directors recognized the considerable efforts involved to develop staff's capacity and experience in undertaking macrofinancial analysis work. Taking into account the Fund's mandate and existing resource constraints, they encouraged the staff to continue to focus on efficient ways to support knowledge-sharing, with a number of Directors emphasizing that this initiative be advanced within the Fund's existing budgetary envelope. Directors called on staff to strengthen cooperation and share expertise of other multilateral institutions as appropriate. They looked forward to discussing progress at the time of the Comprehensive Surveillance Review in 2019.



## APPROACHES TO MACROFINANCIAL SURVEILLANCE IN ARTICLE IV REPORTS

February 2, 2017

### EXECUTIVE SUMMARY

**The Fund has made good progress over the past two years in integrating macrofinancial analysis into Article IV surveillance for a wide range of members.**

Building on past work to enhance financial sector analysis, Fund staff has sought to develop a consistent and forward-looking view on how the financial sector affects each member's economic outlook with the aim of strengthening staff's capacity to provide advice on macro-critical questions.

**The focus has been on developing a fuller understanding of macrofinancial linkages, and applying this analysis to inform policy advice.** Staff has sought to articulate the role of the financial sector in the macroeconomic baseline, and to integrate the financial sector into the risk assessment, taking into account both the impact of macro shocks on the financial sector as well as the effect of financial shocks on macroeconomic stability. Strengthening the analytical foundations of this work has helped staff provide advice in all policy areas, including financial sector policies.

**Staff has tailored macrofinancial analysis to the circumstances of a diverse set of economies.** Area departments have taken the lead in selecting 66 economies for enhanced macrofinancial coverage and in identifying topics, drawing on targeted support from functional departments. The choice of coverage has included legacies from the global financial crisis—such as deleveraging and stretched balance sheets in advanced economies and some emerging markets—and more recent challenges such as commodity price shocks, especially in low income countries, and the risks of housing booms. The financial sector's contribution to growth and inclusion has become an important question in countries across all income groups.

**Staff sees benefits in mainstreaming this approach across the membership, while continuing to address analytical gaps and adapting to new challenges.** The work of the past two years has underscored the criticality of macrofinancial analysis for a diverse range of members, and laid the basis for progressively mainstreaming macrofinancial surveillance across the membership. Building on this progress, staff sees scope for the Fund to deepen its understanding of the macroeconomic effects of financial shocks, to better adapt microprudential and macroprudential policy advice with an assessment of macro-critical risks including systemic risk, and to deepen the analysis of outward spillovers. Staff will also need to continue to adapt the focus of analysis and tools, and seek relevant data, as economic challenges evolve.

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## CONTEXT

**1. Well integrated analysis of financial sector issues is vital for effective Article IV surveillance.** The 2008 global financial crisis (GFC) showed that financial sector shocks can have large macroeconomic effects. An imperfect understanding of macrofinancial linkages was a key reason that many institutions, including the Fund, did not foresee the crisis.<sup>1</sup> Financial sector analysis continues to have a bearing on the major challenges that the membership has faced in recent years, such as mediocre growth or the impact of commodity prices shocks, alongside stretched balance sheets and other legacies from the GFC—against a backdrop of compressed interest rates and credit spreads.

**2. The Fund has taken a number of initiatives over many years to enhance the quality of financial sector work** (Figure 1). Amendments to the Fund’s surveillance decisions in 2007 and 2012 clarified that staff is expected to explore all financial sector issues that are relevant for countries’ stability, as well as financial sector shocks and policies that could have large outward spillovers, including via contagion.<sup>2</sup> The Fund developed a strategy to integrate Financial Sector Assessment Programs (FSAPs) findings in Article IVs, and established mandatory FSAPs for 29 economies with systematically important financial systems. A strategy for financial sector surveillance was adopted in 2012 with the aim of strengthening the analytical underpinnings of macrofinancial assessments, upgrading products and improving outreach to stakeholders (IMF 2012b).

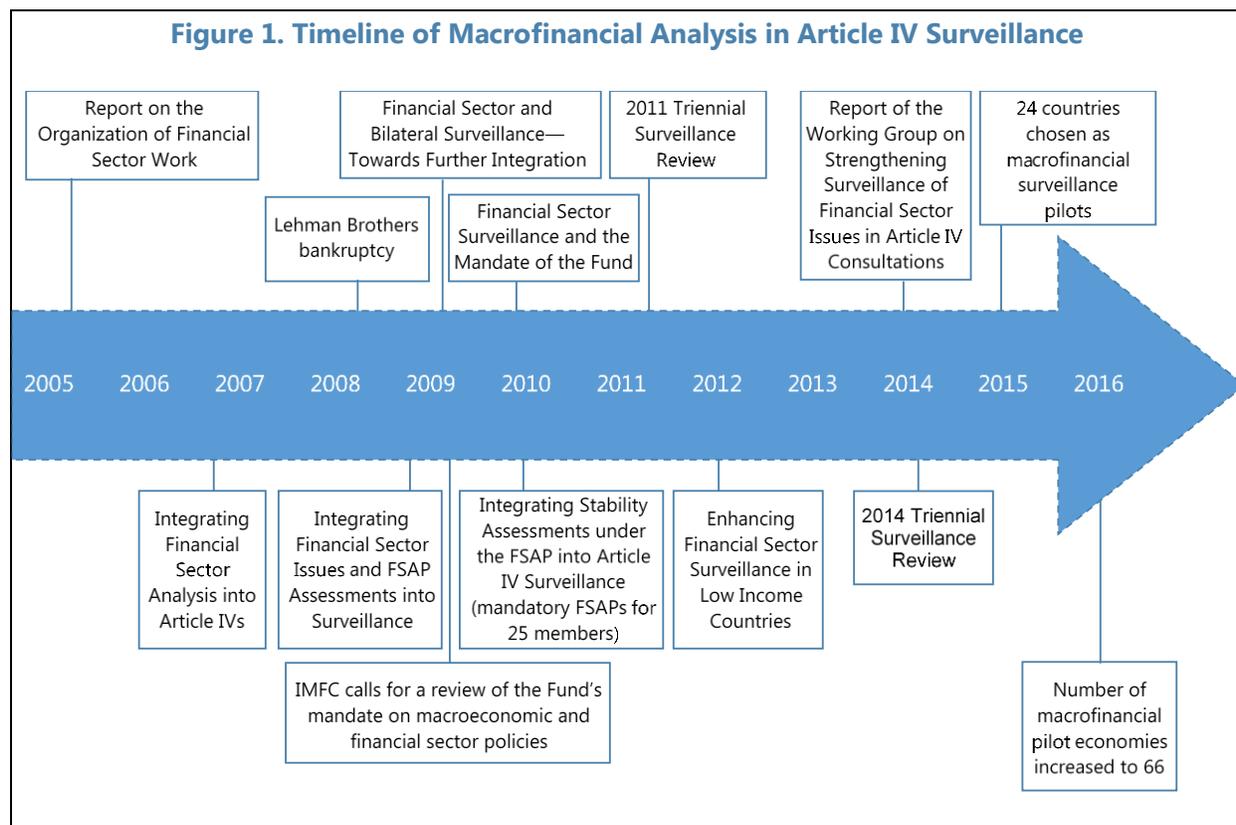
**3. These initiatives have led to improvements in the coverage of financial sector issues in Article IV surveillance, although important gaps have persisted.** Article IV consultations provide the Fund’s periodical assessment of individual members’ economies, and for most members this is an annual exercise. Article IV surveillance aims to cover all macro-critical developments and policies (including fiscal, monetary, external, and structural policies), and macrofinancial analysis and policy advice is generally just one feature. Over the last decade, the coverage of financial sector issues in Article IV surveillance has deepened considerably. This was confirmed in the 2014 Triennial Surveillance Review (TSR), which also found that coverage of financial sector issues in Article IVs has been well aligned with country priorities, and that most staff reports have presented a bottom line on financial stability risks. However, financial sector analysis has tended to be partial and backward looking, with little connection to the staff report’s discussion of the macroeconomic outlook, broader risks and policies. The TSR also found that the analytical underpinnings of financial sector advice could be strengthened.<sup>3</sup> The lack of close integration with staff’s analysis and

<sup>1</sup> As the Fund’s initial assessment of lessons from the crisis (IMF (2009)) noted: “Fund surveillance significantly underestimated the combined risks across sectors, and the importance of financial sector feedback and spillovers. For the Fund, the focus should be on better integrating financial sector issues into the WEO and Article IVs and sharpening FSAPs.”

<sup>2</sup> See IMF (2012a).

<sup>3</sup> A [survey of Article IVs for the 2014 TSR](#) found that only a third of reports explored macro-financial linkages in depth (IMF (2014a)).

recommendations on other sectors had limited the impact of this work on macro-critical issues and hampered the Fund's ability to gain traction with country authorities.



**4. To address these gaps, in late 2014, Management launched a new initiative to make the financial sector a mainstream part of all Article IVs ([Managing Director's Action Plan to Strengthen Surveillance](#)).<sup>4</sup> The pillars of the initiative were:**

- **Core concept—macrofinancial analysis.** Analysis of financial sector vulnerabilities is a necessary but not sufficient condition for staff to understand the role of the financial sector and get traction with country authorities. Staff should aim to understand the key linkages between the financial sector and other sectors of the economy to help address macro-critical questions.
- **Area departments in the lead.** Area departments have the primary responsibility for formulating financial sector analysis in Article IVs, identifying the themes and analytical approaches, drawing on support from functional departments, as they do for other core areas such as fiscal policy.
- **Leveraging expertise and disseminating knowledge.** To spread expertise across the Fund, staff from the Monetary and Capital Markets (MCM), Research (RES), Strategy, Policy and Review (SPR), and Statistics (STA) departments should develop and refine new and existing toolkits and disseminate knowledge to country teams through workshops, brainstorming, training, and the

<sup>4</sup> See IMF (2014b).

internal review process, while the Institute for Capacity Development (ICD) should support the effort with macrofinancial training.

- **Gradual coverage of the membership.** To learn lessons on the best ways of applying this work in surveillance, the initiative started in 2015 with a group of 24 economies. The group was expanded to 66 economies in 2016 (see Annex I). The initiative to strengthen macrofinancial integration in Article IVs has followed an eclectic, experimental approach, adapted to country circumstances, drawing on expert knowledge.<sup>5</sup> Ongoing self-assessment has shaped refinements to the approach.

**5. The goal of this paper is to provide an early summary of the contribution of macrofinancial analysis to Article IV surveillance, drawing on experiences from this mainstreaming effort, and to suggest the direction for future work.** The paper starts with a brief overview of the academic literature to identify the key concepts underpinning macrofinancial work at the Fund. Drawing on the analysis contained in Article IVs staff reports produced in recent years, it then lays out how country teams have integrated macrofinancial analysis more systematically into the outlook and risk assessments of Article IV staff reports to strengthen policy advice.<sup>6</sup> The last section identifies areas where country teams should make further efforts to strengthen macrofinancial surveillance and the main challenges staff will face as it moves to integrate macrofinancial analysis in bilateral surveillance across the whole membership. It is understood that this work has synergies with other initiatives at the Fund including efforts to integrate macrostructural analysis into Article IVs.<sup>7</sup>

## CONCEPTUAL UNDERPINNINGS FOR MACROFINANCIAL SURVEILLANCE

**6. Understanding the relationship between macroeconomics and finance is a long-standing analytical and empirical challenge.** For decades the two disciplines developed on separate tracks.<sup>8</sup> In the 1980s, however, several strands of research started to explore more deeply the linkages between macroeconomic and financial sector developments.

<sup>5</sup> This approach is consistent with suggestions of external observers, see for instance paragraph 22 in IMF (2014c): “On the one hand, analytical rigor, provided by economic models, is important for disciplining surveillance and policy advice, and for establishing credibility with peers. But, on the other hand, for economics to be a science, it must recognize that we are never at the frontier of knowledge. Ways have to be found to incorporate disciplined intelligence on economic and financial developments and pathologies in Fund outputs.”

<sup>6</sup> The analysis in this paper is based on the Article IV reports covered by the initiative launched in late 2014, drawing on an internal stocktaking of reports issued to the Executive Board by July 5, 2016 (43 of the 66); an earlier pilot program on enhancing financial sector surveillance in low-income countries; and some additional Article IV reports that, while not part of the initiative, provide good examples of integration of macrofinancial issues.

<sup>7</sup> See IMF (2015b).

<sup>8</sup> The separation between macro and finance became mainstream with Modigliani and Miller (1958) emphasizing the efficiency of financial markets and their low correlation with real business cycle movements. Early dissenting voices included Minsky (1957) and Kindleberger (1978), who stressed that the amount of credit provided by financial markets could be “excessive” (i.e., above optimal levels) and related this to excess demand for goods and assets.

**7. One strand of research has focused on financial development and long-term economic growth, positing that a well-functioning financial system improves economic outcomes in the long run.**

Financial development is a multifaceted concept capturing the depth, efficiency, inclusiveness, and soundness of the financial system. The empirical work initiated by King and Levine (1993) and expanded in Beck, Levine, and Loayza (2000) found evidence of causality from financial development to long-run economic growth. Demirgüç-Kunt and Levine (2008) identified five roles of well-functioning financial systems that help explain a positive, causal impact of financial development on economic growth.<sup>9</sup> Recent studies have assessed the robustness of the finance-growth nexus and have found that it seems to operate only up to a certain level of financial deepening (Arcand, Berkes, and Panizza (2012); and Aizenman, Jinjark, and Park (2015) or with significant differences across regions and income levels (Barajas, Chami, and Yousefi (2013)).

**8. Another strand has explored the relationship between financial sector developments and macroeconomic fluctuations in the short and medium run.**<sup>10</sup>

Financial accelerator models stressed the role of credit and asset prices in shaping business cycles through borrowers' balance sheets, as shown for example by Bernanke and Gertler (1989), Bernanke, Gertler, and Gilchrist (1999) and Kiyotaki and Moore (1997). Another research stream initiated by Diamond and Dybvig (1983) highlighted the links between financial institutions, liquidity and real activity in normal and "crisis" times. Some years later, Allen and Gale (1998) highlighted the role of expectations in causing "regime switches" that may have self-fulfilling effects on liquidity, asset prices and output. Second and third generation financial crisis models include these multiple equilibria; open economy models also show external balance sheet effects resulting, for instance, in "sudden stops" in capital flows.<sup>11</sup>

**9. Building on this strand of work, a growing empirical literature documents the importance of financial "frictions" for business cycle fluctuations and financial crises.**<sup>12</sup>

These papers have found that credit can be an important source of shocks. In particular, the financial (credit) cycle is found to be closely associated with banking crises (Aikman et al, (2013)), which tend to occur close to cyclical peaks and lead to severe recessions (Borio (2012)).<sup>13</sup> Strong linkages among different phases of business and financial cycles underline the importance of financial market developments for the real economy (Claessens, Kose, and Terrones (2012)). Reflecting those

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<sup>9</sup> The five roles are: (i) improving resource allocation by reducing the cost of obtaining and processing information on investment projects; (ii) helping monitor investments and exert corporate governance; (iii) facilitating risk management; (iv) mobilizing and pooling savings; and (v) helping lower transaction costs involved in the exchange of goods and services.

<sup>10</sup> Brunnermeier, Eisenbach, and Sannikov (2012) provide a comprehensive survey of the macrofinancial literature.

<sup>11</sup> See Obstfeld (1996), Krugman (1999), and Mendoza (2010).

<sup>12</sup> See, for example, Claessens, et al. (2011) and Dell'Ariccia et al. (2012).

<sup>13</sup> See Box 2 for a definition of the financial (credit) cycle.

linkages, financial variables are found to have significant predictive power on macroeconomic variables.<sup>14</sup>

**10. Interest in the relationship between financial cycles and financial crises received an impetus following the GFC.** The *financial cycle* received greater attention given its role in helping identify the build-up of financial vulnerabilities and gauge the macroeconomic consequences of sudden dislocations in financial markets. At the same time, the concept of *systemic risk* became more prominent for assessing the potential for an impaired financial system to give rise to adverse feedback effects that amplify the impact of a shock. Understanding the *interconnectedness* of financial institutions and the possible transmission of shocks across the economy highlighted the importance of conducting *balance sheet analyses* and assessing their implications.<sup>15</sup>

**11. A growing literature aims at establishing clearer and better-defined linkages between financial cycles and business cycles.** A comprehensive and widely accepted “model” or framework that encompasses macro and financial variables and yields an “equilibrium” baseline remains elusive in the literature. Although recent studies have incorporated financial factors into dynamic stochastic general equilibrium (DSGE) models (see, for example, Christiano et al. (2010), Benes et al. (2014), and Vitek (2015)),<sup>16</sup> the limitations of such approaches in modeling default of financial and non-financial sectors (or nonlinear dynamics in general) limit their usefulness for projecting macro and financial variables. A critical challenge is that of understanding how the microstructure of markets drives key features observed, including risk appetite and the structure of liabilities, which are often crucial for risk analysis but very challenging to embed within modeling frameworks.

**12. Although there remain many gaps in the conceptual and empirical understanding of macrofinancial linkages, those linkages have become too important to overlook in Article IV surveillance.** In many countries, the role of the financial sector in intermediation makes it the fastest and most powerful transmitter of both external and domestic shocks, with feedback effects magnifying the initial impact. In addition, many members, especially low-income countries (LICs), are striving to foster financial deepening and inclusion to support stronger, more sustainable growth. Understanding the linkages and interactions between finance and the rest of the economy is therefore increasingly important in formulating recommendations about the appropriate policy mix.<sup>17</sup>

**13. Mindful of knowledge and data gaps and taking into account the wide variety of countries’ evolving circumstances, the initiative to strengthen macrofinancial coverage in Article IVs has taken a practical approach.** The diversity of financial systems across countries and a wide range of transmission channels, as well as uneven data availability, require a very flexible

<sup>14</sup> Chen and Ranciere (forthcoming).

<sup>15</sup> See Allen et al. (2002) and IMF (2015a).

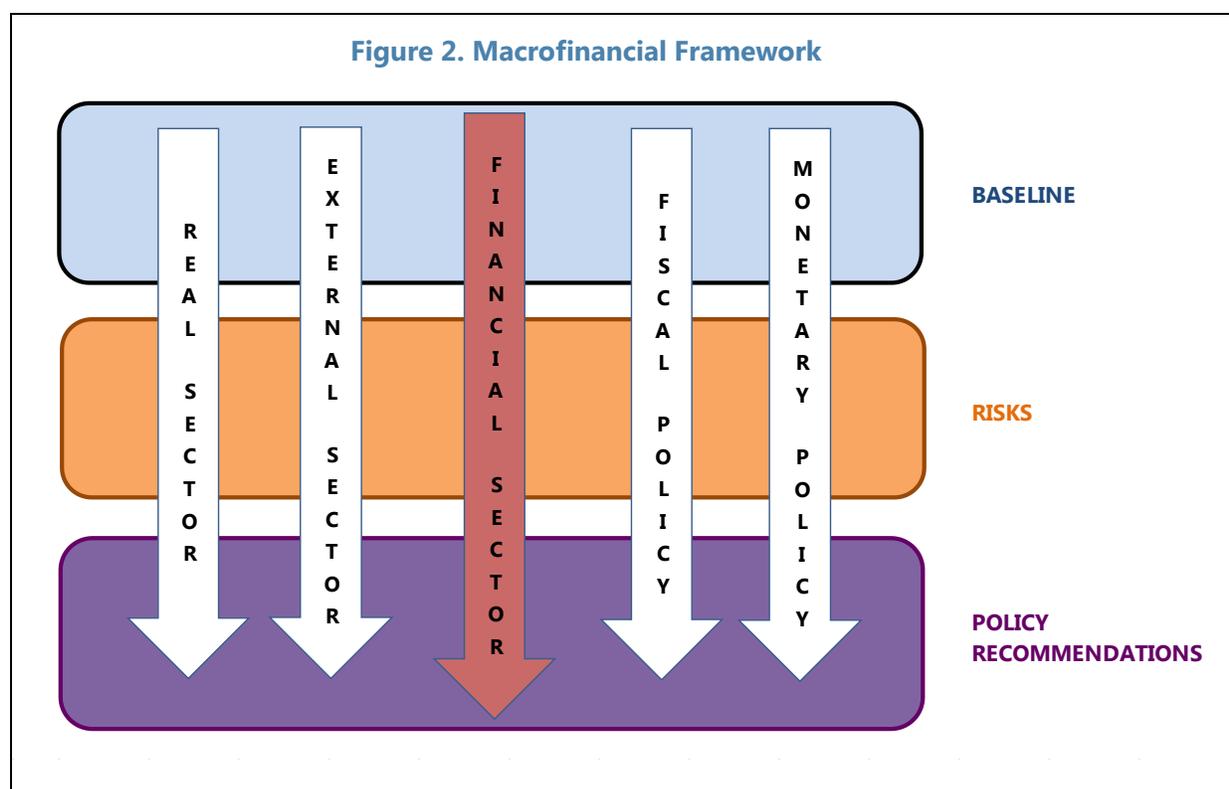
<sup>16</sup> Other examples of inclusion of the banking sector in a DSGE framework are Gerali et al. (2010) and Darracq Pariès et al. (2011) for the euro area; Hirakata, Sudo, and Ueda (2011) for the United States; Villa and Yang (2011) for the United Kingdom; Gertler and Karadi (2011) and Angeloni and Faia (2013).

<sup>17</sup> See, for example, Gaspar et al. (2016).

framework. Country circumstances differ in the degree of financial development, financial sector structure such as the relative importance of banks and capital markets, and in the openness of the financial system to the rest of the world. In addition, particularly among more advanced economies, the range of shock transmission channels (including second-round effects) has broadened considerably reflecting greater integration between financial institutions, markets, and real sectors (e.g., linkages between fiscal and financial sectors; household or corporate and financial sectors; external and financial sectors). Also, as many studies have shown, it is important to distinguish normal times, when the financial sector can mitigate financial frictions, from other times such as booms, busts, and crises, when non-linear effects have the potential of creating credit disruption with significant real effects.

## MACROFINANCIAL APPROACHES TO SURVEILLANCE

14. To strengthen macrofinancial coverage in Article IVs, Fund staff has focused on the *integration* of macrofinancial analysis into baseline macroeconomic projections, risk assessments, and policy advice—three key components of every Article IV staff report (Figure 2).

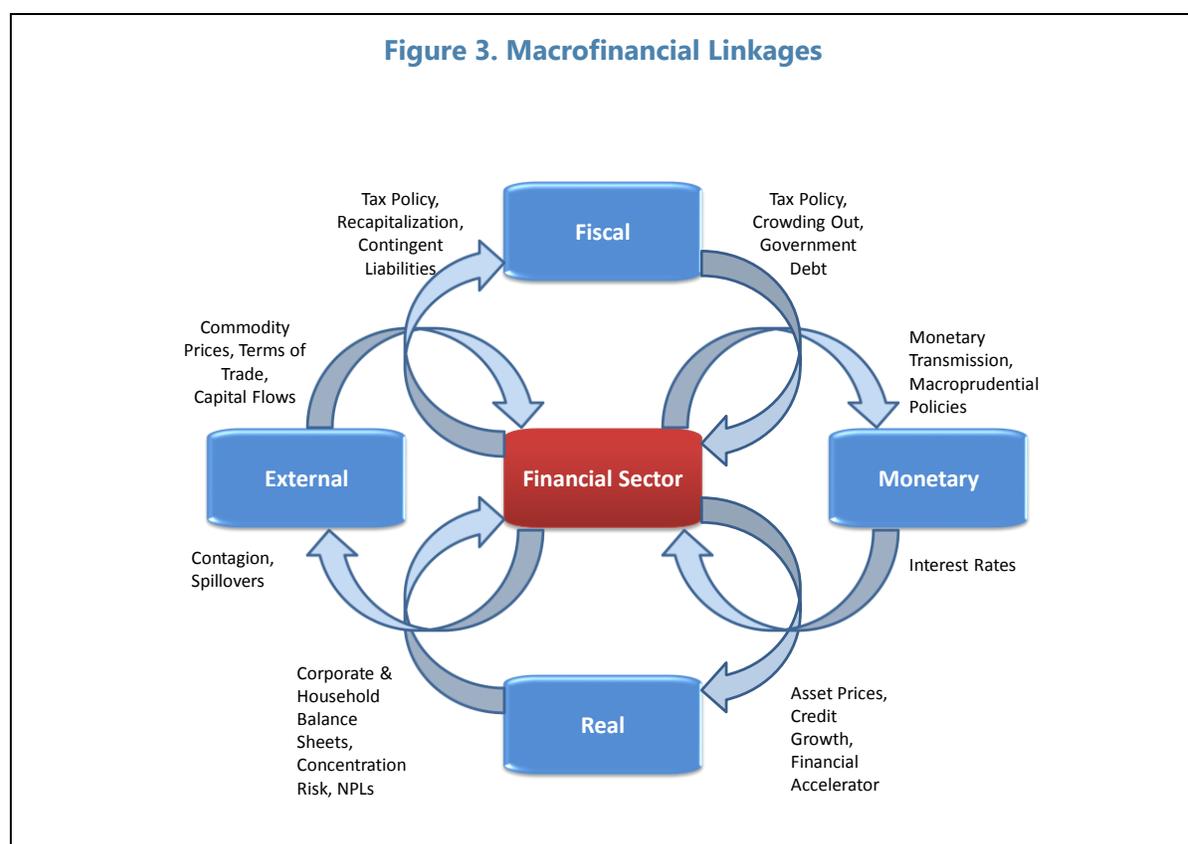


- **Baseline projections.** Country macroeconomic frameworks and baseline projections provide a foundation for Article IV surveillance, including the risk assessment and policy advice. The baseline projections may be benign or may show that current policies could lead to a build-up of vulnerabilities and risks. Integrating macrofinancial issues such as credit growth, changes in

asset prices, and financial deepening increases the value of baseline projections used in the dialogue with country authorities.

- **Risks.** Integration of macrofinancial analysis helps strengthen the understanding of the probability and source of risks and the ways in which a country's financial system amplifies, dampens, transmits or triggers shocks.
- **Policies.** In the final stage, the country team's assessments of the baseline and risks form the basis for staff's policy advice. Integrating macrofinancial linkages into the analytical basis for policy advice helps ensure an appropriate mix of fiscal, monetary, financial, and other policies to promote growth and prevent or mitigate the main risks.

**15. Such macrofinancial integration requires identifying and assessing key interlinkages and transmission channels across sectors and policies** (Figure 3). A nimble and pragmatic approach employs different models and empirical methods with particular attention to vulnerabilities and risks that are critical for macroeconomic and financial stability in the member country.



**16. The remainder of this section draws on examples from Article IV staff reports from 2013-16 to illustrate how macrofinancial surveillance has helped country teams address macro-critical issues.**<sup>18</sup> While there is considerable diversity in terms of the topics covered in Article IVs—since countries adopting a macrofinancial approach represent a cross section of the entire Fund membership—there has also been some clustering of themes, reflecting the commonality of economic challenges facing groups of countries. For instance, a number of advanced economies are still grappling with legacies from the GFC, and teams have focused on balance sheet strains and the relationship between the financial cycle and growth. In emerging markets, key issues have included the build-up of corporate debt and the impact of capital outflows. Among low income commodity producers, a key issue has been how macrofinancial linkages can magnify the initial impact of commodity price shocks. Finally, against a backdrop of low global growth, many countries have explored how the financial sector can better support growth and inclusion.

## A. Enhancing Baseline Macroeconomic Projections

**17. Integrating macrofinancial analysis into the baseline macroeconomic framework can yield important insights for Article IV surveillance.** Such integration helps improve the realism and internal consistency of the macroeconomic framework on which country teams anchor Article IV consultations, including near- and medium-term projections. It also strengthens the assessment of how vulnerabilities and risks might build up over time. The key linkages discussed below, and prominent in recent Article IVs, are those between the financial sector and the real economy, the external sector, fiscal policy, and monetary policy.

### Real-Financial Linkages

**18. Assessing real-financial linkages is important for understanding how the financial system affects near-term and trend output dynamics in a country.** A number of models and approaches have been used by country teams to identify how the financial sector affects output growth through changes in financial conditions or through the structure of financial markets.

- **Asset prices and the financial accelerator.** As noted earlier, the financial accelerator model posits that in a world with asymmetric information and enforcement costs, the role of collateral in financial intermediation will tend to amplify the impact of asset price moves on the real economy. Many Article IVs have built on this key insight and, for instance, examined the impact on growth of a sharp fall in asset prices. For example, [Canada \(2016\)](#) used a DSGE model to examine how the impact of a housing price correction could be magnified if combined with an external shock or tighter financial conditions.
- **Credit and growth.** Rapid credit growth can boost investment and growth. It can also lead to excess consumption or investment and sow the seeds for future macroeconomic problems. Examining the sources of credit growth and its allocation can improve macroeconomic

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<sup>18</sup> For ease of reference, the discussion in this section cites specific Article IVs with the name of the economy and the year it was discussed with the authorities. Staff reports cited are regarded as good examples of examining particular macrofinancial linkages; they are not the only Article IV staff reports to address that linkage effectively.

projections. For example, [Cambodia \(2016\)](#) analyzed the sources of rapid credit growth and its implications for the build-up of risks. The staff team highlighted the large credit gap (exceeding 10 percent of GDP), high loan to deposit ratios and reliance on external borrowing as vulnerabilities. [Saudi Arabia \(2016\)](#), using a panel regression, found that credit growth and economic activity had remained robust despite the drop in oil prices owing to strong balance sheets and resilient deposit growth. Vector autoregressions (VARs) have been used by country teams to understand the relationship between credit and growth.<sup>19</sup> For example, [Samoa \(2015\)](#) used VAR analysis to disentangle the relationship between credit from commercial banks and public financial institutions on growth. The country team found that credit from public institutions substituted for private bank credit in the wake of a 2012 cyclone. Moreover, causality tests indicated that credit from both banks and public institutions Granger-caused growth, while the real effective exchange rate did not.

- **Financial deepening.** As noted earlier, a vast literature points to an empirical link between financial deepening and economic growth, and also to the risk that an overly rapid pace of deepening leads to episodes of economic and financial instability by encouraging excessive risk-taking and leverage.<sup>20</sup> Based on these insights, several Article IV staff reports have sought to assess whether the pace of financial deepening in a given country is consistent with fundamentals. For example, based on a panel regression linking credit depth to the explanatory variables typically used in the literature and using data on advanced and emerging market economies, [Mexico \(2015\)](#) assessed bank credit to be 40-80 percent below the level warranted by fundamentals. The country team then employed a disequilibrium regression approach to find that the gap was driven by insufficient credit supply (because of low levels of financial inclusion), and estimated the impact on growth if bank credit were to rise to 60 percent of GDP. Such analysis could be applied to other countries, including LICs, where the focus tends to be on benchmarking financial depth and financial inclusion (see Box 1).

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<sup>19</sup> GDP growth tends to be more closely related to growth in the flow of new credit rather than to growth in the credit stock, which is more of a lagged variable and thus might create the false impression of a “credit-less” recovery. (Mayer, Biggs, and Pick (2010)). Often, however, data on the flow of new credit is unavailable, forcing the researcher to rely on credit stock data.

<sup>20</sup> Financial deepening is only one dimension of financial development. As noted by Sahay et al. (2015), financial development is a broader concept that comprises financial deepening (size and liquidity of financial markets), financial inclusion (the ability of individuals to access financial services), and financial efficiency (the ability of institutions to provide financial services at low cost and the level of activity of capital markets). This work also noted that the potential for instability and the weakening effects of financial development on growth stem from financial deepening, rather than from greater financial inclusion or higher efficiency. See Levine (2005), Demirgüç-Kunt and Levine (2009), Dabla-Norris and Srivisal (2013), and Aizenman, Jinjarak, and Park (2015), for further discussions of the empirical aspects of the finance-growth nexus.

### Box 1. Financial Deepening and Inclusion in Low Income Countries

**The effects of financial depth (size and liquidity) and financial inclusion (access to financial services) on growth are important for LICs.** In many LICs, financial markets are thin and access to credit by Small and Medium Enterprises (SMEs) and the poorer segment of the population is limited. Thus, financing is generally not channeled to where it is most needed—i.e., supporting economic diversification. Many Article IV reports argue that low financial depth has hampered growth potential and contributed to gender and geographical inequality. Expanding access to financial services by households and firms is often seen as critical to lower poverty by reducing credit constraints on the poor and facilitating the activities of small firms and entrepreneurs.

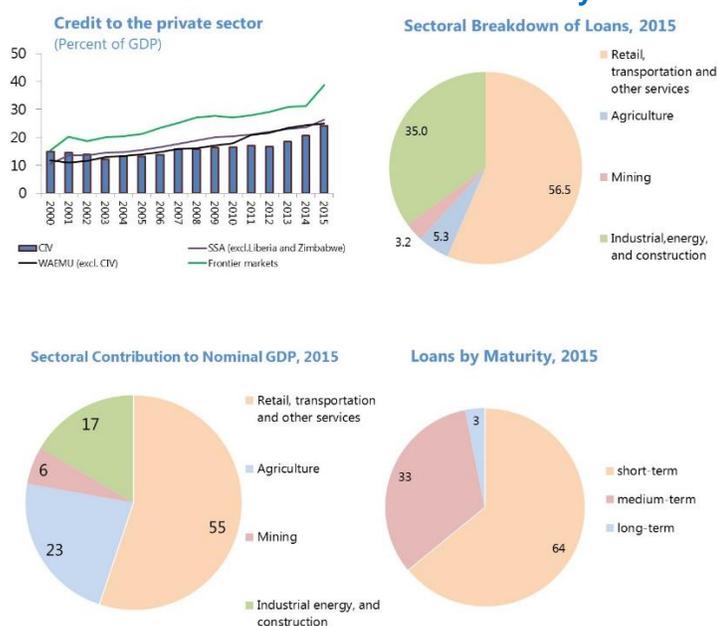
**Much of the empirical work has focused on benchmarking access to financial services as a first step in assessing the degree of financial inclusion.** The analysis is typically done using information on accounts at financial institutions and data on ATM availability. The distribution of financial accounts as a share of the population, and by income groups, gender, educational levels, and geographic regions is normally used to construct a baseline of the degree of financial inclusion ([Chad \(2016\)](#), [Côte d’Ivoire \(2016\)](#), [Liberia \(2016\)](#), [Uganda \(2015\)](#)). Data on mobile cellular subscriptions has also been used in a number of Article IV reports to assess the extent to which financial inclusion can be improved in the near term through the utilization of the mobile network platform ([Chad \(2016\)](#), [Côte d’Ivoire \(2016\)](#), [Liberia \(2016\)](#)). The general findings from this work is that access to financial services in LICs is very limited and marked by sizeable gender and rural/urban disparities, consistent with the large income and education inequalities for these groups. Factors contributing to this patchy access include the absence of information on the creditworthiness of potential borrowers, the lack of collateral registry system to support loan contracts, weak corporate transparency, and poor financial literacy.

**Some Article IV reports have examined whether the uneven sectoral allocation of credit creation is hindering economic growth.** Analyses have typically focused on matching trends in sectoral loans with sectoral contributions to GDP. In some cases, this has been complemented with results from the Financial Access Survey to ascertain whether SMEs have difficulty obtaining financing and what impact this has on their businesses. For example, using this approach,

[Côte d’Ivoire \(2016\)](#) found that lack of access to credit was a major issue for SMEs and that this explained why the agricultural sector received only about 5 percent of the credit even though it accounts for almost a

fourth of GDP and is a key contributor to employment and income in rural areas. [Uganda \(2015\)](#) reached a similar conclusion.

#### Cote d’Ivoire: Credit to the Economy



Source: IMF Country Report, No. 16/147.

**19. Identifying and assessing the links between financial sector developments and the business cycle in the baseline macro framework is particularly important in countries experiencing credit booms or deleveraging.**

Some countries have been able to maintain high rates of credit growth for many years without experiencing major economic and financial disruptions, often because of trend financial deepening. In many others, however, excessive credit growth and a large financial cycle upswing have been a precursor to a financial or economic crisis that resulted in significant deleveraging. Thus, identifying credit booms and whether they are likely to end without major disruptions is important to improve baseline projections. Conversely, a concern for a number of countries in recent years has been whether post-crisis deleveraging would have a severe adverse impact on growth. For example, [Spain \(2013\)](#) developed credit projections drawing on private-sector views of the likely pace of deleveraging and used these to inform the team's assessment of the likely path of household savings, domestic demand, and output.

**20. To this end, the financial cycle can be a useful concept to analyze links between the financial sector and the business cycle** (Box 2). The structure of a country's financial sector should guide such analysis. For example, [South Africa \(2016\)](#) estimated the financial cycle as the average of credit, and house and equity prices and used these to examine how a shock to external capital flows would affect the dynamics of the financial cycle and economic activity. [Korea \(2016\)](#) included credit from non-banks as well as banks in analyzing the credit cycle. When sectoral developments in credit diverge, it may be useful to analyze dynamics of sectoral credit instead of "just one" aggregate financial cycle. [Australia \(2015\)](#) focused on the rapid growth in credit to households, as there were growing concerns about a housing bubble but no signs of an aggregate credit boom.

**21. Country teams have used several tools to analyze the interaction between financial and business cycles.** Tools for baseline projections include those that use financial variables to improve the precision and consistency of macroeconomic forecasts, including the output gap. For example, [Kazakhstan \(2015\)](#) and [Canada \(2016\)](#) used a tool developed by RES to check the internal consistency of staff's forecasts for credit and growth.<sup>21</sup> Other teams used semi-structural models for estimating the cycles to examine linkages and to project credit and GDP, as well as other variables, in a consistent manner. For example, using this type of model, [Brazil \(2016\)](#) found that fluctuations in financial markets are important for the dynamics of economic activity and, hence, help improve macroeconomic projections (Box 3). In countries where non-bank intermediation is important, it would be advisable to measure the financial cycle using broad indicators of credit that encompass credit provided outside the banking system.

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<sup>21</sup> The tool shows distributions of the main macro variables (GDP growth and investment), conditional on certain realizations of critical financial metrics, such as credit growth and real estate prices, etc.

### Box 2. The Financial (Credit) Cycle Debate

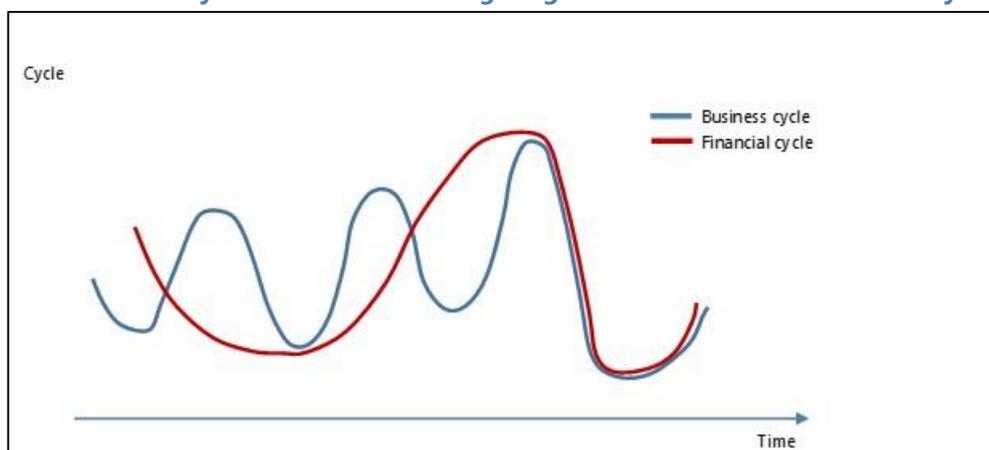
**The financial (or credit) cycle describes a build-up of financial imbalances (booms) and the ultimate unwinding of those imbalances (busts).** These cycles can be long and deep, with developments during the boom accentuating and magnifying the bust, sometimes leading to periods of serious financial distress and economic dislocation (Claessens et al, (2011)). It has been argued that the financial cycle is empirically best captured by the joint behavior of credit and asset prices, in particular property prices (Borio (2012)). Business and financial cycles are related, but fluctuations in output seem to be of shorter duration.

**A common way to identify the financial cycle is through the “credit gap”—the deviation of the credit-to-GDP ratio from its long run trend calculated using univariate filters.** An unusually rapid expansion of credit-to-GDP has been found to be one of the best predictors of subsequent financial turbulence (Drehmann, Borio and Tsatsaronis (2012)). Mainly because of its out-of-sample forecasting power in predicting banking crises in a large sample of countries, this measure has been used by regulators and standard-setting bodies in designing and calibrating countercyclical capital buffers to mitigate the negative consequences of the credit cycle on banking systems.

**More recently, financial cycles have been identified using multivariate model-based filters.** When extracting a cycle, univariate statistical methods only take into account the information from the time series being filtered. An advantage of using a model-based approach is that financial and business cycles can be jointly estimated, allowing information from all key economic relationships to be used in a consistent way (see Box 3).

**While research on the financial cycle is growing, the concept is not as well defined as the business cycle.** The evolution of financial risks varies substantially across countries and time which, together with statistical and methodological issues, poses a challenge for financial cycle research. Edge and Meisenzahl (2011) argue that the backward-looking nature of the one-sided HP filter typically used to estimate a financial trend puts too much emphasis on the end points. Another problem is that trend estimates can change significantly depending on the series’ starting point. Drehmann and Tsatsaronis (2014) show that this problem worsens as the length of the time series shrinks. Because of this, it is advisable to use the longest available time series for estimation of the credit gap, with the sample period being no less than 10 years and preferably longer than 20 years. Financial deepening in countries with low initial levels of financial depth creates further challenges to the use of this methodology. Finally, some argue that the credit gap concept—comparing a flow variable (GDP) with the stock of credit—is intrinsically flawed and that comparing GDP with the flow of credit is a superior approach to detect the relationship between credit and economic activity (Mayer, Biggs, and Pick (2010)).

#### The financial cycle is viewed as having longer duration than the business cycle



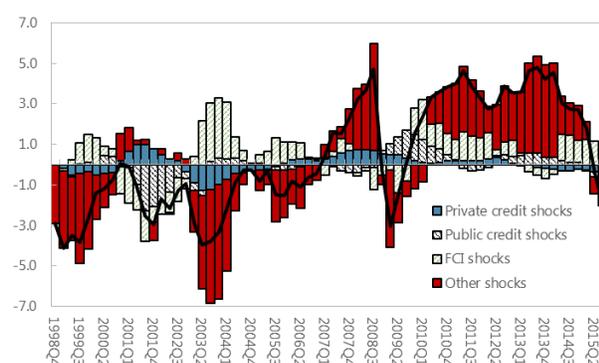
Source: IMF Staff.

### Box 3. Estimating, Modeling, and Projecting Financial and Business Cycles: The Case of Brazil

In [Brazil \(2016\)](#), staff used a semi-structural model of the Brazilian economy to jointly estimate and project financial and business cycles and model the interaction between the cycles. The model was a variant of those developed in Carabenciov and others (2008) and included equations for key macroeconomic variables. The credit cycle—the deviation of real credit from its trend—was endogenously determined and estimated. Staff also constructed a Financial Conditions Index (FCI) and assessed its relationship with real activity. Credit and business cycles were jointly estimated by specifying relationships between the cycles based on the following conceptual and empirical findings: (i) the credit cycle lags and is positively correlated with the business cycle; (ii) the FCI leads real GDP growth and financial conditions ease with expectations of stronger growth; and (iii) there are feedback loops between the financial and real sectors—autonomous shocks to credit boost demand and an autonomous tightening of financial conditions reduces demand. The model was estimated using Bayesian methods.

The results underscored the importance of macrofinancial linkages in Brazil and highlighted the potential risks of a slow economic recovery. The estimates of the model suggested that, in mid-2016, Brazil was in a downturn phase of the credit cycle which coincided with, but could last longer than, the downturn phase of the business cycle. With cross-country evidence suggesting that periods of strong credit growth are typically followed by periods of sluggish growth, this result pointed to potential vulnerabilities going forward. Impulse responses underlined the importance of demand shocks for credit and of financial conditions shocks for output. Historical decomposition of the output gap (Chart) suggested that: (i) private credit had boosted output in the lead up to the GFC and public credit boosted output following the GFC; (ii) financial conditions had played an important role both during the GFC and during the recovery period, and (iii) more recently, public and private credit and financial conditions had acted as a drag on output.

Brazil—Decomposition of Output Gap  
in percent



Source: IMF Country Report, No. 16/348.

**22. While the financial cycle is useful to assess medium-term financial sector developments, the Financial Conditions Index (FCI) helps summarize the information content of financial variables and improve short-term forecasts.** In comparison to the financial cycle, which usually focuses on credit and house price variables, researchers have used a broader set of variables to construct FCIs, including measures of risk, liquidity, leverage, and the shape of the yield curve. For strong predictive power, FCIs should be constructed to measure exogenous financial shocks.<sup>22</sup> For example, [Chile \(2016\)](#) followed this route and used a VAR to estimate the impact of tightening in financial conditions on GDP growth. [Samoa \(2015\)](#) used principal component analysis to construct an FCI, and found that it tracked real GDP closely with a six-month lead.

<sup>22</sup> Expressing the FCI in terms of financial shocks involves purging the movements in financial variables that reflect business cycle fluctuations. This has superior predictive power than FCIs that are weighted averages of unadjusted financial variables (see Hatzius et al. (2010)).

## External-Financial Sector Linkages

**23. External spillovers to the financial sector (external-financial sector linkages) can be powerful, and may unleash second round effects in the real and other sectors.** Key channels for many Fund members included external capital flows, commodity prices and trade, all of which can affect the financial system directly. Depending on the economy's structure and vulnerabilities, the financial system can mitigate or amplify the effects of external shocks on the real sector; a central question in this context is whether the financial sector facilitates the reallocation of resources across sectors.

- **Capital flows and asset prices.** Surges in capital flows affect the financial sector via increased availability of funding—and therefore lending. These forces go into reverse when capital flows slow or stop, with potentially negative second-round effects on growth. [South Africa \(2016\)](#) explored these themes, highlighting that the country's financial cycle has become increasingly correlated with that of the US, and appears to be driven by capital flows. [Poland \(2015\)](#) analyzed the transmission of global financial shocks (proxied by an increase in US 10-year bond yields) to domestic interest rates, overall financial conditions, and real GDP growth.
- **Commodity prices.** Just as asset prices affect the health of corporations, prices of commodities and a country's terms of trade influence the export sector. With the fall in commodity prices since 2014, many commodity producers have experienced a significant fall in exports and government revenues. Article IV reports have examined the impact of this terms of trade deterioration on the health of the financial sector and on the financial system's ability to channel resources to the non-commodity sectors, dampening the impact of the shock. [Chad \(2016\)](#) explored how lower revenues had resulted in public expenditure cuts and domestic payment arrears, which pushed contractors into financial distress and raised NPLs. The financial sector was thus found to have propagated and amplified the impact of the oil price decline on output rather than supporting adjustment.

## Fiscal-Financial Linkages

**24. Fiscal-financial linkages are significant in many countries, operating through balance sheet, interest rate, and revenue channels among others:**

- **Crowding out.** In most countries, government financing can have a significant impact on financial conditions, influencing both the amount of credit available to the private sector as well as the pricing of credit (e.g. crowding out). This underlines the importance of considering fiscal-financial linkages when developing baseline projections. For example, drawing on the results of a panel regression on determinants on private credit growth, [Saudi Arabia \(2016\)](#) found that banks' growing purchases of government bonds had lowered the supply of private sector credit (i.e., there had been "crowding out").
- **Sovereign-financial.** Large holdings of government debt by financial institutions expose these entities to sovereign default risk and create a clear nexus between the fiscal and financial sectors. Article IV staff reports have looked at this issue and at how government financing impacts financial market functioning. For example, [Lebanon \(2016\)](#) assessed the bank-

sovereign nexus, and the impact of central bank transactions on FX liquidity, highlighting how the government's domestic financing distorted the signaling role of T-bill rates.

- **Public expenditure arrears.** Expenditure arrears can erode the creditworthiness of key borrowers, leading to NPLs and constraining banks' capacity to lend. For example, [Sierra Leone \(2016\)](#) found that loans to construction companies working on government contracts accounted for a large share of total bank lending and that arrears to such companies had been an important driver of NPLs.
- **State owned enterprises (SOE) and directed lending.** A weak SOE sector, often combined with directed lending, can weaken the banking sector. [Belarus \(2016\)](#) highlighted that the deteriorating performance of SOEs, subject to subsidized government-directed lending, were weakening the financial sector and explained the rise in NPLs.
- **Tax and the financial cycle.** Financial developments can also affect the fiscal accounts through the tax system (e.g. levies on real estate transactions and capital gains, taxes on bank profits, VAT and import duties on credit-financed consumer goods). [South Africa \(2016\)](#), for example, projected government revenues taking into account that finance, real estate, and business services represent about a third of corporate income tax receipts. Similarly, [Luxembourg \(2016\)](#) examined links between tax policy and the financial cycle.

### Monetary-Financial Linkages

#### 25. Financial-monetary linkages are important for the operation of monetary policy and the financial system.

- **Interest rates.** The extended period of low or negative interest rates in the advanced economies has affected the operation of monetary policy and commercial banks' profitability. For example, [Japan \(2016\)](#) found that the adoption of negative interest rates had lowered and flattened the yield curve, putting pressure on net interest margins and bank profitability, especially in regional banks. In contrast, [Switzerland \(2015\)](#) found that banks had been able to pass on negative interest rates to their wholesale depositors, which cushioned the impact on bank profitability.
- **Transmission mechanism.** Countries with shallower financial markets face particular challenges in the conduct of monetary policy. For example, [Uganda \(2015\)](#) explored the challenges of coordinating fiscal and monetary policy in a shallow financial market against a backdrop of sharp changes in inflationary expectations following exchange rate shocks.

## B. Integrated Risk Assessment

**26. Integrating macrofinancial linkages into the baseline macroeconomic framework of Article IVs is a prerequisite for an integrated approach to risk analysis.** The structure and functioning of the financial sector may support or undermine macroeconomic stability. The financial sector is also a powerful transmitter or source of shocks via all the linkages mentioned in the previous section, with feedback effects often magnifying the initial impact. Understanding these relationships enables a forward-looking, integrated risk analysis that can provide an early warning and promote policy responses, aiding both in prevention and contingency planning.

**27. An integrated macrofinancial approach to bilateral surveillance would ideally encompass a two-way assessment of macrofinancial risks and macroeconomic stability, taking into account feedback loops.**

- **Macro-to-financial.** The first pillar of the approach entails an assessment of key macro and balance sheet risks in the country and the related level of systemic risks<sup>23</sup> in the financial sector in order to make a forward-looking assessment of the financial sector's resilience to macro shocks (Box 4).
- **Financial-to-macro.** The second pillar is an analysis of the role of the financial sector in magnifying or dampening shocks to the economy.

### From Macro to Financial

**28. A forward looking macrofinancial risk analysis involves assessing the resilience of the financial sector to macro shocks.** Recent Article IVs have undertaken this type of analysis focusing on two broad questions:

- *How would latent problems in other sectors of the economy affect the financial system?* Some country teams have used Balance Sheet Analysis (BSA) to assess the implications of risks and fragility of different sectors for the health of the financial system.
- *How would macroeconomic shocks affect the financial system?* Many country teams have relied on quantitative risk analysis to gauge the impact of macro shocks on the financial system. Among teams using stress tests, some have used the stress tests results from FSAPs that had been completed recently, while others have undertaken new stress tests.

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<sup>23</sup> Systemic risk is typically defined as the risk of disruption in the provision of financing caused by an impairment of the financial system that has serious adverse effects for the real economy.

#### Box 4. Assessing Systemic Risks in the Financial Sector

**An integrated approach to macrofinancial risk analysis requires forming a view about systemic risk in the financial sector, anchored on assessments of vulnerabilities in private and public sector balance sheets.** Depending on country circumstances, those assessments would cover:

**Solvency risk.** Assessments of solvency risks would include, as relevant, analysis of credit risk (quality, concentration) and market risk (e.g. currency, interest rate) in financial institutions. In many countries, partial dollarization of the assets and/or liabilities of financial institutions introduce vulnerabilities that combine currency and credit risk. Analysis of solvency risk in the financial sector would ideally be complemented by an assessment of the balance sheet health of the non-financial corporate sector and households.

**Liquidity risk.** Assessments of liquidity risks would include analyses of the short-term and medium term resilience of the financial sector to sudden, sizable withdrawals of funding. This is typically done by constructing metrics that compare the stock of liquid assets held by banks to possible outflows of deposits and wholesale funding and assessing whether banks maintain a stable funding profile in relation to the composition of their assets and off-balance sheet activities. For many members, including those with less complex financial systems, key measures of liquidity risk relate to banks' reliance on short-term deposit funding and the depth of interbank markets. Macroeconomic shocks can translate into deposit drains that quickly put strains on some banks.

**Contagion risk.** Contagion risk can be analyzed by looking at transmission channels in the financial and non-financial sectors, potential dislocations in domestic or foreign asset markets, and domestic, regional or global policies and spillovers. Factors may include capital flows across markets and countries, cross-border ownership, global liquidity conditions, a global investor base and risk management practices, and cross-border supervisory/regulatory coordination.

**29. Balance Sheet Analysis provides a useful framework to assess the resilience of the financial sector to macro shocks taking into account the interconnectedness between and within different sectors.** Recent Article IVs have focused on the following linkages:

- **Government-financial.** [Lebanon \(2015\)](#) showed how a strong banking-sovereign nexus could exacerbate the effects of lower deposit inflows on the health of the banking sector and government finances. Governments can also have major effects on systemic risk and stability through linkages between the non-banking sector (state-owned firms in particular) and the banking sector, which can amplify credit and liquidity risks (e.g. via the potential for a sovereign downgrade to increase funding costs, see [South Africa \(2016\)](#)).
- **Nonfinancial-financial.** [Mexico \(2015\)](#) used firm-level balance-sheet data to assess the impact of interest rate, exchange rate, and earnings shocks for debt repayment capacity and leverage of non-financial corporations, which could in turn affect the solvency of the banking sector. The analysis found that non-financial corporates were resilient to financial shocks, though the most highly leveraged ones would be likely to reduce investment.<sup>24</sup> Other country teams have undertaken similar exercises to assess the resilience of the household sector. For example,

<sup>24</sup> Similar analyses of non-financial/financial linkages were developed for [Chile \(2016\)](#), [Brazil \(2016\)](#), [India \(2016\)](#), and [Turkey \(2016\)](#).

[Namibia \(2016\)](#) found that households were vulnerable to income and interest rate shocks but banks appeared resilient to such shocks.

- **External-financial.** [Mauritius \(2015\)](#) used BSA, despite important data constraints, to analyze how a shock in the offshore/nonresident sector could spill over into the domestic economy. The team found that the banking sector could be the key spillover channel of shocks due to its large exposures to those other sectors.
- **Intra-financial linkages.** [Namibia \(2016\)](#) and [Luxembourg \(2016\)](#) found that shocks affecting investment funds could be transmitted to the banking sector mainly via direct exposures (either because those funds hold large claims on banks or because their deposits are an important source of banks' funding). [Namibia \(2016\)](#) concluded that even a limited redemption shock to investment funds would lead to severe liquidity shortages for banks and that such a scenario could affect credit availability and potentially undermine growth. Using scenario analysis based on a large redemption shock, [Luxembourg \(2016\)](#) pointed to the potential for investment funds to be a conduit of inward and outward spillovers (the latter due partly to investment funds' global holdings of emerging market and high yield debt securities).

**30. In several cases, Article IVs have used stress test analysis to assess quantitatively how macroeconomic shocks can affect the health of the banking sector.** The stress tests used include:

- **Macro-solvency link.** Solvency tests have been used to assess the impact of credit, market, and operational risks caused by macro shocks on the capital of the banking sector. The shocks used by country teams typically come from scenarios formulated as downside risks to the baseline, the RAM ([Brazil \(2016\)](#)) or single risk factor shocks, including a default of a large counterparty ([Chad \(2016\)](#) and [Mauritania \(2016\)](#)).<sup>25</sup> (See Box 5.)
- **Macro-liquidity link.** Several country teams ([Chad](#), [Mauritania](#), [Guatemala](#), and [Costa Rica \(all 2016\)](#)) examined the impact of an outflow of deposits on liquidity metrics set by country authorities.
- **Macro-contagion link.** Some country teams have used network tests to assess interconnectedness risk in banking sectors. For example, [Costa Rica \(2016\)](#) analyzed how macro shocks that affected the solvency and liquidity position of some banks were transmitted to other banks, further eroding their capital.
- **Macro-nonbanking sector link.** In countries with large or important non-banking sectors (e.g. insurance, pension, or investment funds) country teams have applied stress tests to non-banking financial entities.<sup>26</sup> In other cases, risks in the non-banking industry and the transmission of shocks to other sectors have been assessed qualitatively, as in the discussion in [Canada \(2013\)](#)

<sup>25</sup> Downside scenarios used for stress tests in Article IVs have generally been different from those used in FSAPs. By design, FSAP stress tests are built around severe tail-risk scenarios that are usually less relevant in the context of an Article IV consultation.

<sup>26</sup> See, for example, [Luxembourg \(2016\)](#) for quantitative analysis of macro shocks on investment funds.

and [Chile \(2016\)](#) of the impact of low interest rates on the health of life insurance companies and pension funds.

**31. While limited data availability has constrained the scope and quality of assessments of systemic risk and financial sector resilience in Article IVs, country teams have produced useful analyses.** Quantitative estimates of the effects of shocks on financial entities can be quite useful for formulating policy recommendations. However, the quality and reliability of those estimates hinge on having access to timely, comprehensive and, often, quite granular information across sectors (households, firms, etc.) and for a representative sample of financial institutions. Such data is rarely available to country teams. For stress testing, for example, few teams have had access to supervisory data for individual entities. Country teams have tried to overcome this problem by: (i) estimating macrofinancial models using publicly available data (for example, [Italy \(2016\)](#)), (ii) estimating models using cross-country evidence to assess the impact of various shocks on NPLs ([Namibia \(2015\)](#)); and (iii) using results from stress tests undertaken by the authorities ([UAE \(2015\)](#) among others). In general, it would be advisable that country teams form a view about the quality of the authorities' stress testing framework before using it to formulate recommendations.

**32. Many teams have therefore relied on qualitative analyses of the impact of macro shocks on the financial and corporate sectors.** For example, [Chile \(2015\)](#) highlighted that a sharp drop in asset prices and decompression of credit spreads could reduce the availability and increase the cost of funding for the non-financial corporate sector and banks, while [Côte d'Ivoire \(2016\)](#) noted that a downturn in the credit cycle could raise NPLs and limit banks' ability to provide credit given the banking system's low capital buffers.

#### Box 5. Solvency Stress Testing in Article IVs

Solvency stress tests in Article IVs have been based on downside scenarios to the baseline or single risk factor shocks. Stress tests have differed based on the sophistication of macrofinancial approaches used for modeling banks' key risk parameters or balance sheet and income statement items. For example, some tests have modeled the impact of shocks on all the main elements of financial statements to capture end-state impacts on capital ([Brazil \(2016\)](#)), while others have focused on credit losses only ([Kuwait \(2015\)](#) and [Guatemala \(2016\)](#)). Tests have usually been performed using balance sheet data for individual banks ([Italy \(2016\)](#)). Bank-by-bank data have been mostly used from publicly available databases such as Bank Scope, Bloomberg, SNL or Moody's KMV when granular, supervisory data were not available.

##### Scenario-based test: the case of Brazil

The team assessed the solvency risk of the six largest banks by estimating the effect of macroeconomic developments on their balance sheets and income statements. Historical quarterly data and a set of simple panel regression models were used to forecast the main components of each bank's balance sheet and income statement items. The test examined two macroeconomic scenarios: baseline and downside over a five-year forecast horizon. The downside scenario featured a deep and long recession in Brazil, significant declines in asset prices, and increases in risk premia that affect funding costs. The test assessed the level of banks' common equity Tier 1 (CET1) ratios against the regulatory threshold consistent with the Basel III transition schedule, and also accounted for the capital conservation buffer and a domestic systemically important bank (D-SIB) capital surcharge as minima. The results suggested that those six banks would be able to cope with adverse developments in the baseline scenario. However, some banks' capital would temporarily fall below the regulatory threshold in the downside scenario (Chart). Total losses in the years of

### Box 5. Solvency Stress Testing in Article IVs (concluded)

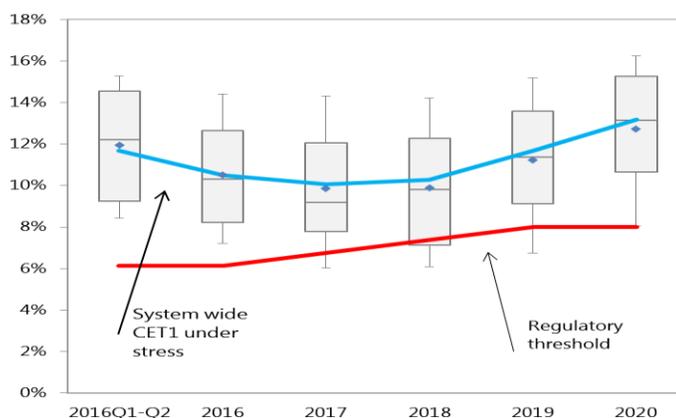
downturn would be mainly driven by lower net interest income and provisions for credit losses, which would damage the fiscal position via recapitalization costs and the realization of deferred tax credits.

Chart: The whisker boxes for each year display the distribution of CET1 ratios, projected using the team’s methodology, for the largest Brazilian banks in terms of distribution’s moments: the bottom and top of the whisker box are the first and third quartiles, the band inside the box is the second quartile (median), the diamonds represent an unweighted average CET1 ratio for 6 banks, and the lower and the upper whisker represent the minimum and the maximum CET1 ratio, respectively.

#### Single risk factor shocks (sensitivity analyses): the case of Chad

Analysis of credit and liquidity shocks for Chad were motivated by the indirect impact of the oil price shock on the real economy and focused on the risk that government payment delays and arrears posed to economic sectors such as construction, largely dependent on public contracts. As developing macrofinancial models is particularly challenging for low income countries, the sensitivity analyses for Chad focused on finding the break point levels for different assumptions about the increase in NPLs and decline in deposits. The analysis found that if NPLs rose to 20 percent of total loans, some banks would no longer meet the minimum capital adequacy ratio. Also, a further 25 percent decline in total deposits (e.g., through a 50 percent decline in government deposits plus a 20 percent decline in deposits from non-financial enterprises) would bring most banks below the regulatory liquidity ratio.

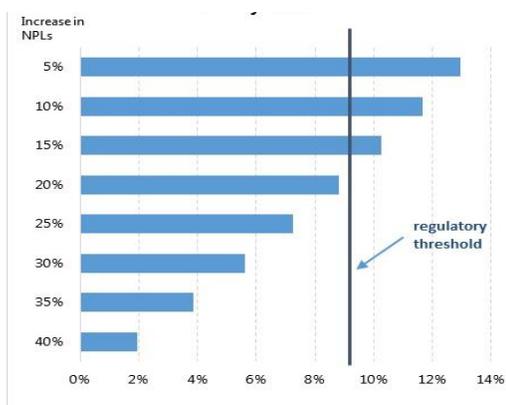
Common Equity Capital Ratio, Distribution of Ratios in Percent



Source: IMF Country Report, No. 16/349.

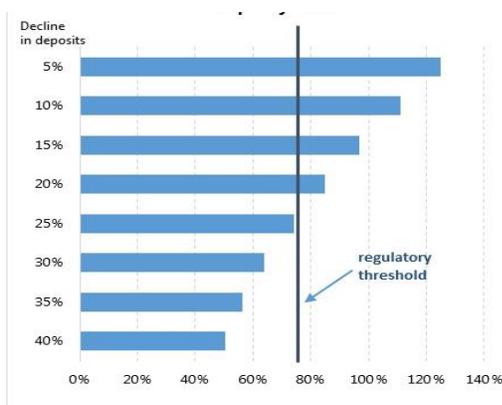
#### Impact of an increase in NPLs and Solvency Ratio

In percent



#### Impact of decline in deposits on Liquidity Ratio

In percent



Source: IMF Country Report, No. 16/275.

## From Financial to Macro

**33. As noted, assessing the effects of financial sector shocks on macroeconomic developments and stability is the second pillar of integrated risks analysis.** Financial sector shocks can have major effects on macroeconomic stability through several channels. Asset price shocks are often amplified through balance sheet effects. Complementarities among banks' strategies can lead them collectively to take on excessive risk that, in turn, can generate large swings in credit and economic activity. In addition, as shown by the bank lending channel literature, banks play a special role in the transmission of monetary policy to the real economy.<sup>27</sup>

**34. Because there are no firmly established frameworks to examine the financial to macro linkages, Article IV teams have mostly undertaken qualitative assessments, informed where possible by tools assessing the impact of financial sector risks on the rest of the economy.** Typically, teams have analyzed whether the deterioration of financial and nonfinancial sectors' balance sheets, including due to shocks to asset prices,<sup>28</sup> can become a source or amplifier of macro instability. For example, [Bangladesh \(2015\)](#) noted that weak bank balance sheets would reduce lending capacity, with adverse effects on productive investment. [Bahamas \(2016\)](#) noted that the risk of loss of corresponding banking relations could have an adverse impact on the financial sector and the economy as a whole. In some cases, the implications of shocks to financial conditions (proxied by an FCI) for GDP growth were analyzed using a VAR ([Chile \(2016\)](#), [France \(2016\)](#)) or semi-structural model ([Brazil \(2016\)](#)). [Guatemala \(2016\)](#) and [Costa Rica \(2016\)](#) found that financial shocks (changes in interest rates and risk premia) could have a significant impact on the real economy using the IMF's Flexible System of Global Models (FSGM). [Luxembourg \(2016\)](#) used a simple regression model to show that growth of investment funds' assets is a driver of economic performance. In other cases, quantitative impact estimates from other studies were used to estimate the impact of a solvency shock on lending and GDP growth ([Colombia \(2016\)](#)).

**35. Some teams have assessed international risk transmission to analyze cross-border spillovers via banking systems.** Bank contagion analysis, the main technique for making such assessments, relies on balance sheet identities that link banking systems across countries. For example, losses in one banking system could cause it to deleverage by cutting international interbank lending and by selling assets, which, in turn, would trigger losses and deleveraging in other systems with attendant effects on lending and activity. For example, [Hong Kong SAR \(2015\)](#) analyzed inward spillovers from financial linkages with Mainland China via cross-border bank lending, securities issuance in Hong Kong SAR by Mainland entities, and the internationalization of the renminbi. Also, [Guatemala \(2016\)](#) found that spillovers to Guatemala from stress in international banks were moderate, and lower than for regional peers.

<sup>27</sup> A change in the monetary policy stance would generally change banks' cost of funds and this, in turn, would affect the price and quantity of loanable funds.

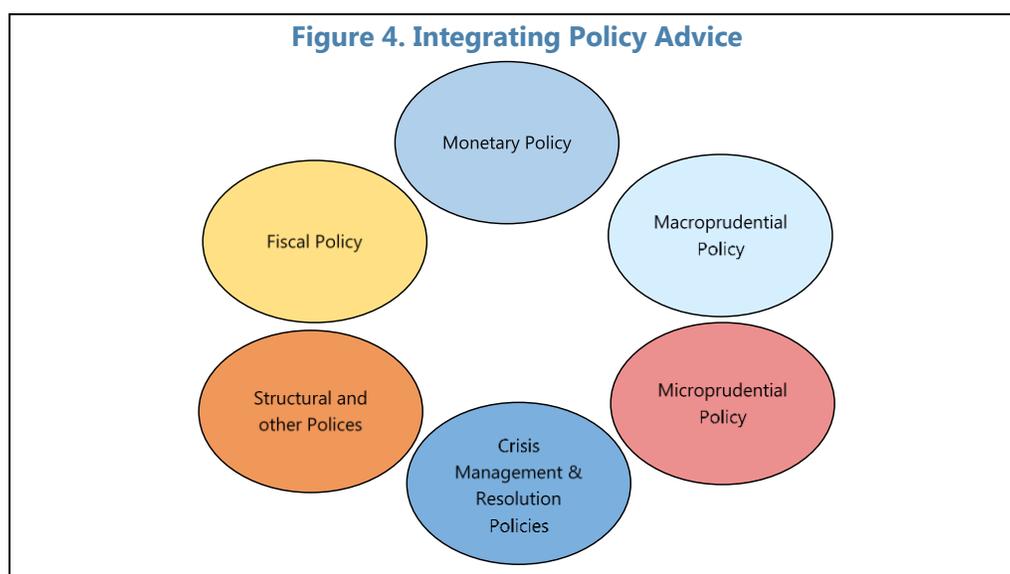
<sup>28</sup> In some cases, the Real Estate Markets module available in the RES website was used to estimate the misalignment of house prices relative to fundamentals and to evaluate the overall risk to the economy from the housing sector.

## C. Integrated Policy Advice

**36. A main goal of strengthening macrofinancial analysis in Article IVs is to improve staff's policy advice.** Integrating macrofinancial analysis in the baseline macro projections and risk assessments of Article IVs enables country teams to formulate better and more coherent policy recommendations to promote growth and prevent or mitigate risks. For example, a good understanding of systemic risk helps staff provide advice on the scope and settings of macroprudential policies, while macrofinancial analysis can underpin advice on policies that promote financial deepening and financial inclusion.

### A More Complete and Effective Policy Mix

**37. A macrofinancial approach allows country teams to incorporate financial sector policies in the formulation of the appropriate policy mix** (Figure 4). As argued by Gaspar et al (2016), policy advice comprising a combination of policies can alleviate constraints faced by policy instruments taken separately. The mutually supportive effect is particularly notable when dealing with shocks or seeking to improve the resilience of the economy and the financial sector.<sup>29</sup>



**38. Several recent Article IVs have integrated financial sector policies well with other policy recommendations.** For example, in [Sweden \(2015\)](#) the country team recommended an expansionary monetary stance to allow monetary policy to regain space to cushion future shocks, while at the same time recommending a mix of macroprudential, tax, and structural housing policies to protect household resilience and address housing market imbalances. By contrast, in the case of [Turkey \(2016\)](#), large external imbalances caused by buoyant domestic demand led staff to recommend tighter fiscal and monetary policies and the deployment of macroprudential measures to limit FX borrowing. In [Canada \(2016\)](#), the team called for a greater role for fiscal policy to

<sup>29</sup> At the same time, macroprudential policy should not be overburdened, or used inappropriately to avoid necessary policy adjustments in other areas. For instance, where financial vulnerabilities are fueled by real external or internal imbalances, macroeconomic and structural policies should be used to correct the underlying imbalances.

support the economy, given potential financial stability risks associated with low interest rates. Finally, in [Cambodia \(2016\)](#), the team recommended several micro- and macroprudential measures, as well as improving the crisis management framework, to mitigate the risks from an ongoing credit boom.

**39. Fiscal policy recommendations also have taken macrofinancial linkages into account.**

As noted earlier, fiscal-financial sector linkages are significant in many countries through multiple and complex interactions including public sector borrowing, public ownership of banks, subsidies, and tax policy. In [Netherlands \(2015\)](#), for example, the country team recommended changes in tax policy to reduce externalities related to the financial sector, in particular the debt bias in household and corporate balance sheets resulting from interest deductibility. In [Denmark \(2016\)](#), the team made fiscal recommendations aimed at correcting the procyclical impact of the property tax on the real estate market. Assessing the financial system's capacity to increase its holdings of public debt has been a common theme in countries undertaking fiscal adjustments or embarking on major investment projects. For example, in [Saudi Arabia \(2016\)](#) the country team examined the trade-offs of issuing paper domestically, borrowing externally, or modifying the pace of fiscal adjustment and recommended a financing mix that minimized the risks of crowding-out. In the case of [Colombia \(2015\)](#), the team assessed the government's plans to finance 30 percent of a large road construction program; while seeing the risk as manageable, staff advised the authorities to develop alternative financing options and instruments for risk hedging.

**40. Upgrading the monetary policy framework to improve the efficiency of the financial system is a common recommendation of recent Article IV consultations.** In emerging markets and LICs in particular, the buildup of excess liquidity, sometimes related to sudden capital inflows, often hinders the effectiveness of monetary policy. For example, [São Tomé and Príncipe \(2016\)](#) assessed that such an overhang could be mitigated by more efficient liquidity management at the central bank and a more liquid and better functioning interbank money market. [Uganda \(2015\)](#) showed that where inflation targeting is challenged by high volatility of inflation and exchange rates, the functioning of the monetary policy framework needs to improve to make transmission channels more effective and allow a rapid decline in bank spreads and lending rates; this would also have the benefit of fostering financial deepening.

**41. Structural policies can support financial sector stability.** To prevent the risk of a disruptive adjustment in lending and increase in systemic risk, structural reforms may be necessary to address corporate debt problems or governance issues in SOEs. In [China \(2016\)](#), for example, the team recommended a comprehensive approach to restructure firms, recognize losses, absorb social costs, and facilitate access to markets. From a longer-term perspective, structural reforms aimed at boosting saving and investment demand and increasing output contribute to financial deepening and development.

### **Macroprudential and Microprudential Policies**

**42. A well-grounded view of macrofinancial vulnerabilities and systemic risk enhances the quality of country teams' advice on macroprudential and microprudential policies.** Advice on microprudential policies should be aimed at closing gaps in financial supervision and oversight of

banks, non-banks, and financial market infrastructure. Recommendations related to the financial safety net and contingency planning should also be aimed at closing gaps and reducing vulnerabilities.

**43. In contrast, the advice on macroprudential policy should aim at reducing systemic risk and building resilience.** As explained in IMF (2014d), teams that provide advice in this area should: (i) recommend macroprudential measures that target well-identified systemic risks while avoiding unnecessary costs; (ii) assess and where possible address the potential for circumvention of the recommended (or existing) macroprudential measures; (iii) advise the authorities to evaluate the impact of the macroprudential measures and reconsider the selection when they do not operate as intended; and (iv) where systemic risk has already materialized or has diminished, assess the scope for relaxing the measures.

**44. Coverage of macroprudential policies in Article IVs has improved, but there is scope to strengthen links to underlying risks.** To reduce macrofinancial risks from rapid house price growth and associated rises in household borrowing, some teams recommended introducing a debt-to-income limit ([Sweden \(2015\)](#) and [\(2016\)](#)), while others recommended placing caps on loan-to-income ratios ([Canada \(2016\)](#)). To address systemic liquidity risks, [Saudi Arabia \(2015\)](#) recommended a relaxation of macroprudential settings to address liquidity shortages in the banking sector. To moderate pro-cyclical feedback between asset prices and credit [New Zealand \(2015, Box 6\)](#) and [Australia \(2015\)](#) recommended sectoral capital and asset-side tools. Many Article IVs, however, have room for improvement in establishing a clear connection between the macroprudential policy recommendations and analysis of the underlying systemic risks.

**45. Microprudential policy advice in recent Article IVs have generally targeted macrofinancial risks arising from the supervisory and regulatory framework and financial safety net.**<sup>30</sup> Features of the overall regulatory, supervisory and financial safety net frameworks have often proved to be important in attenuating or amplifying financial stability risks and macro-critical vulnerabilities. Shortcomings in microprudential policy frameworks sometimes need to be addressed as a precondition for effective macroprudential policy. In [Chad \(2016\)](#) and [Côte d'Ivoire \(2016\)](#), the country teams recommended limits on single exposures and supervision of financial conglomerates to reduce systemic financial sector risks. In [Italy \(2016\)](#), the team encouraged the authorities to accelerate the development of an effective framework for the timely and orderly resolution of NPLs, corporate debts, and weak banks to address concerns that were increasing about financial stability. Finally, in [Iceland \(2016\)](#), the lack of a financial safety net was one of the reasons for the country team's recommendation of proceeding gradually with capital account liberalization.

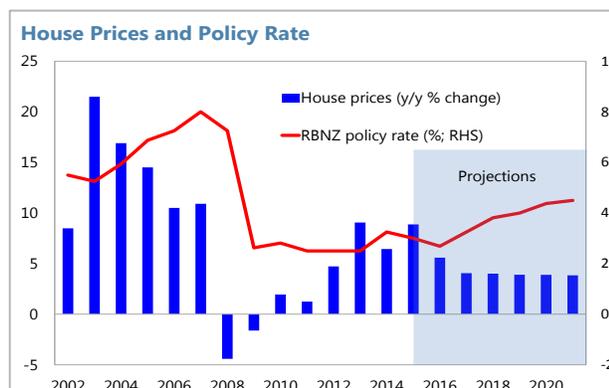
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<sup>30</sup> In many of these cases, teams based their recommendations on findings from FSAPs that had been underway or had been completed recently.

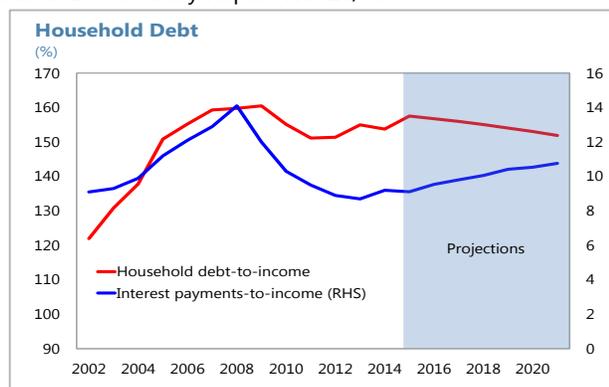
### Box 6. Macroeconomic Assessments, Macroprudential Measures, and Systemic Risks— New Zealand

**The housing sector was central in assessing New Zealand’s outlook and risks in the 2015 Article IV.** In particular, the country team focused on risks stemming from house price inflation in Auckland, the concentration of mortgage loans in banks’ asset books, and elevated levels of household debt. To address risks in the housing sector, the team recommended macroprudential measures based on findings from an integrated macrofinancial analysis.

- *House prices.* The baseline projected a soft landing supported by effective macroprudential measures and tax policies, with house price inflation expected to slow driven by medium term fundamentals (interest rates, working-age population, and per capita income).
- *Household debt.* Projected increases in house prices were expected to push up nominal household debt, but income growth was also seen to gather pace, resulting in a temporary rise in the debt-to-disposable income ratio initially, followed by a gradual decline.
- *Household interest payments.* The interest payments-to-income ratio was at historic lows. With policy interest rates rising in the medium term, the interest payment burden as a share of income was projected to rise, gradually approaching historical averages.



Source: IMF Country Report No. 16/39.



Source: IMF Country Report No. 16/39.

**Staff advice focused on a mix of policy measures to manage housing market risks.** Staff noted that the underlying cause of the housing market boom in Auckland was a supply/demand mismatch but cautioned that self-reinforcing price dynamics might emerge and eventually lead to a sudden sharp correction in house prices, with adverse effects on the financial sector. In view of this, intensifying efforts to boost housing and the supply of land and infrastructure in the city were seen as critical, but since such measures would take time, other policy steps (including macroprudential and tax measures) were needed for monetary policy to be able to focus on the business cycle.

## Financial Deepening and Inclusion

**46. Recent Article IVs have contained recommendations aimed at promoting financial deepening.** Strengthening the legal and institutional foundations for market finance and introducing legislation to support microfinance institutions and mobile financial services are frequent recommendations. Staff also have relied on macrofinancial analysis in recommending policies aimed at improving banking supervision and regulation and reducing risks in the financial sector to promote financial deepening ([Bhutan \(2016\)](#); [Senegal \(2012\)](#); [Samoa \(2015\)](#); [WAEMU \(2013\)](#)). In addition, in [Samoa \(2015\)](#), the team encouraged the authorities to not delay reforms aimed at promoting financial deepening and called for measures to improve credit and risk management and to strengthen recovery procedures, accounting practices and disclosure standards. Other Article IVs have recommended improving governance and transparency, particularly in the operations of public financial institutions, implementing reforms to develop the interbank market and deepen the market for government debt ([WAEMU \(2013\)](#)), and reducing tax distortions.

**47. Policies aimed at promoting financial inclusion are a key priority for many LICs.** In this regard, many country teams have stressed that strengthening supervision is key for promoting financial inclusion ([Liberia \(2016\)](#)). Other teams have recommended reforming collateral regulation, strengthening the credit registry, introducing deposit insurance ([Senegal \(2012\)](#); [Samoa \(2015\)](#); [Liberia \(2016\)](#)), simplifying documentation requirements, and offering low-fee accounts and locating outlets in more remote areas ([Uganda \(2015\)](#)).

## TAKING STOCK AND NEXT STEPS

**48. The Fund has made significant advances over the past two years in further integrating macrofinancial surveillance into a diverse range of Article IVs.** In seeking to make progress on a longstanding objective, staff has taken a pragmatic approach with an emphasis on learning by doing. In this phase of the effort, country teams, with extensive support from functional departments, have invested in better understanding the main macrofinancial linkages, taking “deep dives” in key areas, trying different analytical approaches and tools, and learning to overcome the challenges posed by the lack of well-established analytical frameworks or models to cover the multidimensional nature of the linkages. In many cases, they have been challenged by the paucity of data. Country teams generally have been successful in deepening and better integrating macrofinancial coverage in the Article IVs that have been part of this initiative, while there have also been improvements in other staff reports as this work has gained momentum.

**49. The integration of macrofinancial analysis in Article IVs aims to improve staff’s policy advice.** Article IV surveillance aims at covering all macro-critical issues. A focus on the role of the financial sector and the frictions that can occur in matching savings with investment in normal times and re-allocating savings in response to shocks will improve the quality of the analysis and dialogue with country authorities. In particular, integrating macrofinancial analysis in the baseline and risk assessments that are at the core of Article IV consultations will help staff tailor policy advice to country circumstances, including by taking into account financial sector policies in the appropriate policy mix. Macrofinancial mainstreaming thus seeks to improve the quality and traction of bilateral surveillance.

**50. While it is too early to precisely assess the benefits from a greater macrofinancial focus in Article IVs, staff sees the case for progressively mainstreaming it across the full membership.** The experience so far has demonstrated the relevance of macrofinancial thinking in helping country teams address macro-critical questions for a wide variety of members, and more progress can be made in the years to come. The remainder of this section summarizes the lessons drawn from the first group of Article IVs on the main gaps to be addressed and some key challenges as the Fund moves toward full mainstreaming.

## A. Lessons from the First Group of Article IVs – Main Gaps

### Baseline Integration

**51. The notion that macrofinancial analysis should inform country teams’ baseline macroeconomic outlook has been an innovation of this initiative that has benefitted the analysis and should be applied more systematically.** Country teams have used a range of tools tailored to country circumstances—VARs, FCIs, credit gap analysis—to understand relationships, and this eclectic approach remains appropriate given the state of knowledge in the literature and the large variance in quality and availability of macrofinancial data across the membership. In particular, it is helpful that country teams take into account the member’s initial position in the financial cycle when projecting output, credit, and fiscal variables. Cases where financial excess co-exists with negative output gaps present challenges. Country teams could also explore more systematically whether risk is likely to build up over time if the baseline is realized—for instance, by developing assumptions about the likely path of private-sector balance sheets and debt service (taking into account the team’s expectations for interest rates and the term premium).

### Risk Integration

**52. Quantitative risk analysis, although not feasible for all members or all types of risks, can deliver significant benefits:**

- In cases where the materialization of risks is likely to have serious negative consequences for the real economy and other sectors, country teams should undertake some type of quantitative risk analysis. Well-designed quantitative analyses that shed light on the main dimensions of macrofinancial risk need not necessarily involve stress tests.
- Recent Article IVs have used different types of stress tests to quantify solvency risks in the banking sector. Tests used by country teams have differed in terms of the data used and the granularity and scope of the exercise. In general, such tests should be built around shocks that are severe but plausible. In cases where data are available, comprehensive tests that project bank income can help improve the identification and quantification of risks and strengthen policy discussions of measures to mitigate them. In countries where authorities conduct periodic stress tests, country teams should take advantage of those exercises to establish a dialogue with the authorities, including on the main results and downside scenarios.

**53. There is scope for country teams to deepen their analysis of the macroeconomic effects of financial shocks.** This is an important task that has proven challenging thus far, in part owing to the lack of firmly established analytical frameworks to examine these transmission channels. This highlights the difficulties of embedding the financial sector into traditional modeling

frameworks. Country teams have therefore followed an eclectic approach, combining expert knowledge with ad hoc analytical tools, and there is further scope to do so. In particular, teams should try to explore the full range of relationships in shock scenarios, including feedback effects, with quantification where possible.

### Policy Advice

**54. The policy recommendations of Article IV teams should reflect the role of macrofinancial factors in correcting domestic and external imbalances.** Where imbalances exist, adjustments to the mix of fiscal and monetary policies or structural policies may in some cases be sufficient to correct them. In other cases, financial policy recommendations will be necessary, drawing on macrofinancial analysis.

**55. Staff should anchor their advice on microprudential and macroprudential policies on a solid risk assessment informed by a view about systemic risk.** Country teams should identify where macrofinancial risks are concentrated and target policy advice on those areas. In countries where a macroprudential toolkit is in use, teams should take a position on whether the settings and range of tools remain appropriate.

**56. There is greater scope for country teams to investigate the financial sector's contribution to long-term growth.** Exploiting synergies between parallel work on macrostructural policies, country teams could consider the impact of the financial sector on productivity and capital accumulation in a wide range of economies, for instance by examining whether financial institutions' business models are resilient to post-crisis circumstances. For countries undergoing significant structural changes, a key question is whether the financial system is helping to promote the reallocation of resources to more productive uses. For LICs, teams can leverage diagnostic work on deepening and inclusion to provide more detailed and specific advice on how to make advances in these areas while containing risks to financial stability.

**57. For some countries, strengthened macrofinancial analysis can also inform the Fund's advice on outward spillovers.** Under the Integrated Surveillance Decision (IMF (2012a)), staff should assess outward spillovers in Article IVs whenever a country's developments and policies have the potential to affect global economic and financial stability. Where such spillovers exist, country teams should provide recommendations on an alternative mix of policies that would reduce them. The focus of Article IV spillover analysis so far has generally been on the mix of fiscal, monetary, and structural policies and on trade channels. Macrofinancial analysis can help teams consider a wider range of shock transmission channels—including via contagion effects through financial systems—and support discussion of how spillovers could affect not only output but also systemic risk in other countries.

## B. Towards Full Macrofinancial Mainstreaming – Key Challenges

**58. The experience so far provides a strong basis to expect that it is feasible to extend macrofinancial surveillance across the full membership.** Going forward, staff plans to apply this approach in a larger set of economies. The experience gained by country teams in successfully integrating macrofinancial analysis to strengthen the quality of their Article IV consultations and

develop expertise is progressively being shared across the institution. A mid-2016 survey of mission chiefs involved in the initiative confirmed that teams see benefits from this work and feel ready to continue and intensify their efforts.

**59. Macrofinancial analysis is thus becoming a key and enduring feature of Article IV surveillance.** Macrofinancial surveillance, like other policy areas in Article IVs, will need to build on a solid understanding of country-specific issues to assess conjunctural developments that vary over time. An investment in deepening country teams' understanding of macrofinancial linkages should enable forward-looking responses as new challenges emerge. This is especially important considering that this initiative has been launched against the backdrop of a unique global environment. A reversal of the current low level of global interest rates and decompression of term premia and credit spreads is likely to affect financial institutions as well as the market's willingness to fund governments, corporates and households in many members on favorable terms. Teams will need to continue to adapt their approach in the face of such developments.

**60. Data constraints, while a serious challenge in some cases, should not preclude macrofinancial surveillance.** Data limitations vary across countries, with more gaps on balance sheets and asset prices in LICs and EMs. So far, country teams have taken an eclectic approach, applying quantitative and qualitative analysis adapted to the degree of data availability. This has worked well, but further improvements in the collection and provision of financial data would be necessary to strengthen quantitative risk assessments across the membership. More granular data would facilitate the calibration of policy advice, including on macroprudential policies. For some members, further technical assistance from STA would be important to help close or narrow macrofinancial data gaps.

**61. Mainstreaming macrofinancial surveillance will continue to require determined focus and efforts.** This work has already compelled staff, especially from area departments, to invest upfront in building capacity among country teams and to develop new ways to share information and expertise within the institution. Carrying forward this work and expanding the scope of the effort across country teams will require continued efforts from area and functional departments, especially on knowledge sharing. It will be necessary to find more efficient ways to support a learning-by-doing approach and keep pace with developments in this evolving field. Training will also remain vital as area departments seek to build up a critical mass of economists with macrofinancial expertise.

**62. Continued progress in mainstreaming macrofinancial surveillance can add value by not only fostering integrated analysis but also promoting a more effective dialogue with authorities.** The initiative has helped to integrate key macrofinancial linkages in surveillance, allowing staff to engage in a richer discussion of the main macrofinancial issues with a broader set of country authorities involved in policy implementation. Article IV consultations, by engaging periodically the full range of policymakers on the stance and mix of policies, provide a unique vehicle for this interaction. It is hoped that the membership may also find benefits in integrating a macrofinancial approach into policymaking frameworks. The results of the initiative will be evaluated in the forthcoming Comprehensive Surveillance Review.

## ISSUES FOR DISCUSSION

- Do Directors support the staff's approach to integrating macrofinancial analysis in the baseline, risk assessment, and policy advice in Article IV consultations?
- Do Directors agree that this has led to improvements in the depth and integration of macrofinancial analysis in Article IV reports and that it is appropriate to progressively mainstream macrofinancial analysis across the membership?
- Do Directors consider that the Fund will strengthen the traction of its policy advice with this new approach? What steps would further help strengthen traction?
- Do Directors agree that staff should continue to explore how financial shocks affect the macroeconomy, better align micro- and macro-prudential advice with systemic risk and macro-critical vulnerabilities, and develop a better understanding of how to promote financial deepening and inclusion?

## Annex I. Mainstreaming Macroeconomic Analysis in Article IV Consultations—Economies Covered by the Initiative 2015-16<sup>31</sup>

**Australia\***

Azerbaijan\*

Bahamas

**Bangladesh**

Belgium

**Belize****Benin\***

Brazil\*

Cambodia

**Canada\*****CEMAC****Chad**

Chile

**Colombia\***

Congo, Dem. Rep.

**Costa Rica****Côte d'Ivoire\*****Ecuador**

Equatorial Guinea

Finland

**France****Georgia**

Guatemala

Honduras

**Hong Kong SAR****Iceland\***

India

**Italy****Japan\***

Jordan

**Kazakhstan\*****Korea**

Kuwait

**Kyrgyz Republic \*****Lebanon\*****Liberia****Luxembourg****Malawi\***

Malta

**Mauritania****Mauritius\*****Mexico\*****Montenegro\***

Morocco

**Namibia\***

New Zealand

**Nigeria****Oman****Philippines\*****Poland\*****Russia****Samoa\*****São Tomé and Príncipe****Saudi Arabia\*****Sierra Leone****Singapore****South Africa****Spain\***

Sweden

Switzerland

**Tanzania****UAE\*****Uganda\*****United Kingdom**

Uruguay

Vietnam

<sup>31</sup> Area departments selected the economies to be covered by the initiative. An asterisk indicates that the economy has been part of the initiative since 2015. Economies in bold, for which at least one Article IV consultation under the initiative was completed before end-July 2016, were used for an inter-departmental discussion of progress and challenges.

## Annex II. Organizational Changes to Support the Initiative

In its first two years, the initiative to mainstream macrofinancial analysis in Article IV surveillance has followed an innovative approach based on close collaboration across many Fund departments. Mindful of knowledge gaps and resource constraints in all departments and to allow time to develop and propagate internal best practices, staff selected 24 member countries for the initiative in 2015; in 2016 the number increased to 66 economies. Going forward, staff plans to extend the scope of effort to a larger set of economies.

### Area Departments Lead Macrofinancial Work

In addition to encouraging all teams to adopt a macrofinancial perspective, area departments identified the economies in their region that would be part of the initiative. Beyond the immediate relevance of macrofinancial issues, Area Department choices reflected other considerations including differences in the level of income and financial development among their member countries and the timing of Article IV cycles.

Area departments also were responsible for identifying the macrofinancial themes to be addressed in the Article IV consultation. This leveraged country teams' knowledge of member country circumstances and promoted buy-in for the initiative. Country teams were encouraged to identify possible macrofinancial themes well in advance of the consultation cycle to allow early engagement and feedback from functional departments having expertise on the chosen subjects.

Area departments have followed different approaches to facilitate the knowledge transfer associated with the initiative across their staff. These have included setting up dedicated macro-financial teams to coordinate mainstreaming efforts and build internal expertise, leveraging existing working groups, providing specialized pilot guidance and review, promoting the uptake of financial stability tools and macrofinancial training, and organizing departmental seminars.

### Functional Departments Support

Functional departments provided enhanced support to area department teams, with the approach evolving based on needs. While some functional departments had spent considerable resources supporting financial sector work in bilateral surveillance prior to this initiative, several new elements were introduced as part of a coordinated effort to support mainstreaming work.

From the start, macrofinancial "brainstorming" sessions have been a central and novel element. In the first phase, brainstorming sessions were arranged based on major themes identified by area departments: country teams considering work on similar themes met jointly with functional departments (primarily MCM and SPR) to brainstorm on approaches, resources, and potential pitfalls. User-friendly topical notes were developed. In the second phase, starting in 2016, brainstorming sessions have been tailored to individual economies. Country teams have formulated the main questions and their work plan for macrofinancial analysis several weeks prior to their mission. Based on those questions, functional departments (MCM, SPR and others) have provided customized support, including relevant background and cross-country materials.

Functional departments also have developed user-friendly materials to support the work of country teams, drawing on existing products and methodologies. These included MCM's Toolbox (a large set of quantitative methods for key risk categories and systemic risk). SPR developed a set of good practice examples of staff approaches to analyzing comparable situations in other country cases. STA supplied balance sheet data and provided assistance with balance sheet analysis. Topical notes were developed with input from several departments. Finally, RES provided a variety of relevant data sources and new tools that were made available to staff, including a tool used by many teams to check the consistency of macrofinancial projections.

Support was also provided through focused macrofinancial reviews. MCM and SPR enhanced their review of Article IV-related documents produced by the country teams involved, giving increased attention to the integration of macrofinancial issues in the baseline, risk analysis, and policy advice. In SPR, the usual review process was augmented by a dedicated team that provided input to reviews on all economies covered by the initiative. The focused attention to macrofinancial issues in the review process for country documents (pre- and post-mission) has been critical to create momentum in the mainstreaming exercise.

### **Progress Assessments and Refining the Approach**

In line with the learning-by-doing approach, progress assessments have fed into refinements of the approach. Structured assessments have drawn on inputs including surveys of participating mission chiefs, *ex post* peer reviews of Article IV reports to identify areas for further work, and other inputs from departments collaborating on the initiative. These assessments guided the refinements in approach to date, and staff anticipates further adjustments to efficiently support a greater number of country teams involved in mainstreaming consistent with resource constraints.

### **Macrofinancial Training**

The Internal Economic Training (IET) program developed by ICD also has played an important role in supporting the initiative. The Structured Curriculum courses provide the conceptual framework to support macrofinancial work, i.e. foundation courses and the quantitative and analytical methodologies to analyze macrofinancial linkages. Demand for foundation courses, especially on macrofinancial linkages, has been high in 2015-16, exceeding space availability. ICD also offered B4/B3-level staff specialized training on macrofinancial linkages and surveillance, macroprudential policy, and macro-investing, reaching 92 participants.

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