



UNITED STATES

STAFF REPORT FOR THE 2021 ARTICLE IV CONSULTATION

July 6, 2021

KEY MESSAGES

The new administration's policies have put the U.S. economy on a strong footing.

An effective vaccine rollout has put the number of new COVID-19 cases on a firmly downward path. At the same time, unprecedented fiscal support is quickly restoring the economy back to full employment and generating positive outward spillovers to the world economy. These efforts have not been costless: the path for public debt is far higher; the current account deficit has grown; and very accommodative financial conditions have led to increased corporate and nonbank leverage and rising valuations across a range of assets. The pandemic continues to weigh heavily on those at the lower end of the income distribution, exposing longstanding inequities in access to quality healthcare and education (many of which have an important gender and racial dimension).

The administration's proposed policy program seeks to address a range of challenges that have long held back the U.S. economy. The pandemic is being viewed as an opportunity to remake the economy with higher productivity, increased labor force participation, and a less polarized distribution of income and wealth. To partially fund the intended increase in federal spending, plans have been developed to close tax loopholes, raise taxes on corporates and higher income households, remake the international system for corporate taxes, and fully resource the Internal Revenue Service. Finally, a renewed effort is underway to lower carbon emissions and increase resilience to climate change.

The size and ambition of the proposed fiscal packages are admirable, but a better targeting of policies would further strengthen their impact on macroeconomic and distributional outcomes. As the appropriations process moves ahead, more could be done to (i) phase out tax credits at lower levels of household income; (ii) prioritize spending toward programs that have the biggest impact on productivity, labor force participation, reducing poverty, and facilitating a shift to a low-carbon economy; and (iii) fully eliminate step-up basis, lower the threshold for paying the estate tax, eliminate the 199A passthrough deduction, and reformulate the business tax as a cashflow tax. Reorienting the administration's tax and spending proposals in this way would likely imply a slower (but more sustained) demand impulse, create a bigger boost to aggregate supply, and, in so doing, lessen the near-term risks posed by a sustained

upswing in inflation. Even with improved targeting, additional steps will be needed over the medium term to bring down the public debt both by raising revenues (through a carbon tax, higher taxation of fuels, and a broad-based federal consumption tax) as well as lessening the impact of an aging demographic on future spending. Also, there are important uncertainties surrounding the final size and composition of these proposals, given the need to build political consensus around them.

The Federal Reserve's actions have been highly effective both in the depths of the crisis and in supporting the recovery. While there were risks to introducing the new monetary framework in the midst of COVID-related uncertainty, the low neutral rate of interest and the asymmetries posed by the effective lower bound called for a new approach to policy. The Federal Reserve's new policy framework has helped support a more rapid recovery from the pandemic and rightly commits to a near-term overshooting of the 2 percent longer-run inflation goal (in line with past IMF advice). From a conjunctural perspective, the framework helpfully defers the timing of policy normalization—increasing monetary support as the economy recovers from the COVID-19 shock—while providing clarity on how the Fed intends to achieve its statutory mandate of maximum employment and price stability. In the coming months, the ongoing rapid pace of recovery and expectations of additional fiscal support will necessitate a shift in monetary policy. Managing this transition—from providing reassurance that monetary policy will continue to deliver powerful support to the economy to preparing for an eventual scaling back of asset purchases and a withdrawal of monetary accommodation—will require deft communications, under a potentially tight timeline, to avoid market misunderstandings, volatility in market pricing, and/or an unwarranted tightening in financial conditions.

The unfolding pandemic revealed important shortcomings in the functioning-under-stress of systemically important U.S. markets and institutions. Serious consideration should be given to structural changes in the operation of the Treasury market, key money markets, and prime money market funds. Systemic financial stability risks appear close to the historical average but the very accommodative financial conditions are encouraging continued risk taking, fueling asset valuations, and facilitating rising leverage in the nonbanks and corporates that should be followed carefully.

The pandemic has resulted in a larger current account deficit and left the U.S. external position moderately weaker than the level implied by medium-term fundamentals and desirable policies. The current account deficit is likely to grow further in 2021. Trade restrictions and tariff increases should be rolled back. Doing so, would help support U.S. workers and create more and better American jobs (particularly in light of the domestic efforts that are being proposed to increase productivity, labor supply, and the competitiveness of U.S. producers). "Buy American" provisions should be tightly circumscribed and made consistent with the U.S. international obligations. Currency related trade responses should be avoided. Instead, the U.S. should work constructively with its trading partners to better address the underlying macro-structural distortions that are affecting external positions and to strengthen the rules-based multilateral trading system. Renewed engagement at the World Trade Organization—including restoring the proper functioning of the dispute settlement system—could help facilitate progress on these topics.

As the pandemic effects recede, policymakers will have to cope with simultaneous, ongoing transitions. These arise from an uncertain reshaping of the post-pandemic economy (both in the U.S. and abroad), a transition to a lower carbon economic model, an increasing role for digitalization and technology, and an underlying shift in U.S. demographics toward an older and more diverse population. The flexibility and innovativeness of the U.S. system puts it in a good place to manage these transitions. However, great care should be taken to ensure that these multi-faceted changes do not increase income polarization, further hollow out the middle class, and leave behind a material share of the population (particularly lower-skilled, lower-income workers). It would be a mistake to assume the social and economic impact of these deep-rooted transitions can simply be left to market forces and the hope that a vibrant U.S. economy will lift all boats. Instead, a multi-dimensional policy approach will need to be developed to support rising living standards for all Americans and prevent workers from becoming disenfranchised or detached from the labor force.

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Discussions were held (virtually) with non-government counterparts during May 17–June 4, 2021 and with government agencies from June 7–25, 2021. The team comprised Nigel Chalk (head), Katharina Bergant, Andrew Hodge, Li Lin, Rui Mano, Andrea Medici, Yannick Timmer, Anke Weber (WHD) and Mico Mrkaic and Elizabeth Van Heuvelen (SPR). Input to the consultation was also provided by Nicoletta Batini, Philip Barrett, Simon Black, Jean Chateau, Niels-Jakob Hansen, Shafik Hebous, Florence Jaumotte, Geoffrey Keim, Alessandro Lin, and Ian Parry. Concluding meetings were held with Chair Powell and Secretary Yellen on July 1, 2021.

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PANDEMIC AND RECOVERY

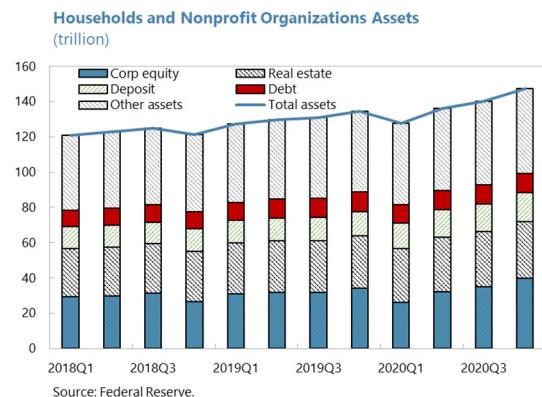
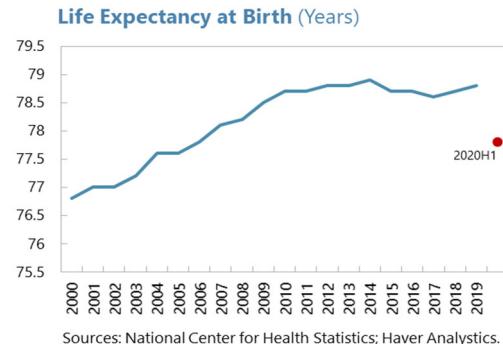
1. Tragically, the COVID-19 pandemic hit the U.S. hard. More than 600,000 Americans have died and average life expectancy has fallen. A third wave peaked in early January as new cases reached 300,000 per day, the test positivity rate hit 14 percent, and deaths exceeded 3,000 per day.

2. However, diligent work over the past year to develop vaccines and the rollout of vaccination programs over the past several months have begun to bring the pandemic under control. By mid-June, over one-half of the eligible population have been fully vaccinated and both new cases and the test positivity rate have fallen markedly. Nonetheless, the nature of the pandemic has changed globally, new variants are circulating widely, and there has been a shift in hospitalization and mortality toward younger Americans. Furthermore, while vaccines are widely available, individual decisions of whether to take the vaccine have become a more binding constraint.

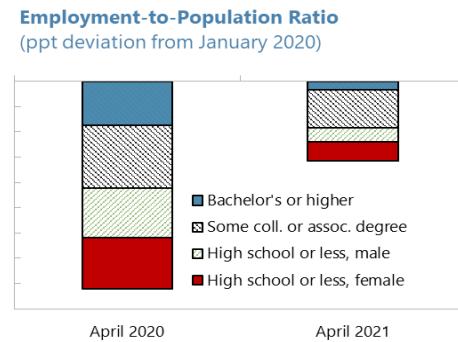
3. The receding COVID-19 case numbers should provide a substantial boost to activity. The economy grew by 6.4 percent in the first quarter, despite a 2.6 percent drag from the drawdown of inventories. Boosted by fiscal transfers, real consumption rose above its pre-pandemic peak in March. The household saving rate remains very high and rising prices of financial assets have bolstered household balance sheets. However, the share of services in consumption has fallen from 69 percent in 2019 to 66 percent in 2021Q1, led by particularly sharp declines in transportation and entertainment services. As vaccination rates rise and normal activities resume, this provides a very strong basis for growth in the coming quarters. Savings will be drawn down, demand will return for in-person services, and depleted inventories will be rebuilt. The exact pace and timing of this acceleration is unclear and behavioral stickiness is possible (as preferences for remote modalities endure or concerns about in-person interactions persist). Nonetheless, growth in 2021 is expected to be around 7 percent, the fastest pace in a generation, with modest risks to the upside.

4. The unprecedented policy response to the pandemic has mitigated hysteresis risks.

Fiscal stimulus packages approved in 2020 and 2021 have provided assistance to businesses through the Paycheck Protection Program (PPP) and other initiatives. This has helped keep the total number of corporate bankruptcies low relative to past history (with increases in Chapter 11



bankruptcies more-than-offset by lower Chapter 13 bankruptcies)¹. As temporary rent moratoria and policy support expire, there will likely be some corporate failures as the economy adapts to the lasting changes catalyzed by the pandemic. However, this is expected to be a protracted process of resource reallocation rather than a damaging surge in corporate failures. Some business models will become obsolete—particularly in retail, leisure, and entertainment—while new businesses will emerge². The prospect for labor market hysteresis for lower income workers is, as yet, unclear. Labor market conditions for college-educated workers have returned to close to those prevailing at end-2019. However, the employment-population ratio still remains around 3 percent below the pre-pandemic level, largely due to diminished participation and higher unemployment among lower-income, less-skilled workers.



Notes: Ages over 25; data is not seasonally adjusted.
Sources: BLS; IMF Staff calculations.

UNPRECEDENTED FISCAL SUPPORT

A. Discretionary Spending Packages

5. **Following on from the December fiscal stimulus package, the new administration passed the American Rescue Plan, adding 8.2 percent of 2021 GDP to spending.** With COVID-19 continuing to pose a threat, these federal resources were deployed to accelerate vaccinations and expand healthcare coverage; assist the vulnerable and the unemployed; bolster subnational government finances; and support segments of the economy that had suffered the worst effects of the pandemic (e.g. schools, colleges, healthcare providers, mass transit, etc.).
6. **Subsequently, the administration proposed a significant increase in spending through the American Families and Jobs Plans.** The principal goals of these programs are to redistribute resources toward vulnerable households, invest in infrastructure, incentivize human capital accumulation, boost labor force participation, and improve productivity. On June 24, a bipartisan agreement was reached on a US\$579 billion in a separate infrastructure bill but the administration has indicated it remains committed to the remaining components of the Jobs and Families Plans that were not incorporated into the bipartisan proposal.
7. **While the American Rescue Plan had many positive features, it could have been better targeted.** A sizable share of the package did not go to relieve immediate liquidity constraints and

¹ At the time of the 2020 Article IV, a corporate stress testing exercise projected that 15 percent of non-energy, non-investment grade debt would face financial distress in 2020. However, stronger growth outturns and the large-scale policy support have resulted in only 2.5 percent of non-energy, non-investment grade debt ending up in default.

² New business applications in 2020 were 24 percent above 2019 levels as new opportunities were revealed by the shifts in demand triggered by COVID-19.

other hardships. Rather, resources were disbursed that served to improve household, corporate and subnational government balance sheets at the expense of an increase in the federal debt. An alternative approach would have been to better target the spending. This could include by providing the stimulus payments to a smaller share of the population (e.g. those earning below the median income), to lessen the transfers to state and local governments (meeting their most immediate cash needs but not replenishing their rainy day funds), and to gradually scale back the generosity of supplemental unemployment benefits during the course of 2021 (both to limit “cliff” effects when the benefits expire and to lessen the negative incentive effects from a high benefit replacement rate as labor market conditions improve).

Text Table 1. U.S. Discretionary Spending Packages (US\$ billion)	
Consolidated Appropriations Act (December 2020)	868
Support for small businesses (including Paycheck Protection Plan)	302
One-time stimulus payments	169
Unemployment benefits (including US\$300 per week supplement until March)	119
Funding for schools and colleges	82
Public health (including testing and vaccinations)	79
Other (including food assistance, transportation, broadband, banking)	117
American Rescue Plan (March 2021)	1,850
Funding for schools, colleges, transit, childcare, food assistance, healthcare, housing	486
One-time stimulus payments	402
Transfers to state and local government	362
Unemployment benefits (including US\$300 per week supplement until September)	206
Refundable child tax credit and earned income tax credit	111
Other (including FEMA, support to small businesses, multi-employer pensions)	283
American Jobs Plan (<i>proposed</i>) / Bipartisan Agreement on Infrastructure Plan 1/	2,300 / 579
Transportation (including electric vehicle charging)	630 / 312
Water, power, broadband, resilience, and environmental remediation	360 / 267
R&D and support for domestic manufacturing	580 / 0
Elderly and disabled care	400 / 0
Housing, federal buildings, schools	330 / 0
American Families Plan (<i>proposed</i>)	2,050
Extending child tax credit until 2025 and making it refundable thereafter	545
Tax credits and subsidies for childcare costs	305
Paid parental, family, or sick leave	225
Making permanent tax credits to subsidize health insurance premia	200
Universal pre-school	200
Making permanent expanded earned income tax credit	140
Grants for low income students attending college and nutrition	125
Improving college recruitment and retention and other education initiatives	120
Two-years of tuition-free community college	110
Strengthen IRS enforcement	80
1/ While the recently announced Bipartisan Infrastructure Plan includes some of the proposals under the American Jobs Plan, it is not a strict subset of the plan.	

8. Many of the policy changes proposed in the American Jobs and Families Plans are aligned with past IMF policy advice. Multi-year investments in power, transportation, telecommunications, and water will all help remove bottlenecks and increase productivity. There is solid empirical evidence also of the societal payoffs—in the form of lower poverty, better health and education outcomes, reduced crime, and increased labor force participation, and higher productivity—from providing high-quality childcare, creating a national paid family leave program, investing in pre-school, expanding access to college for low income students, increasing healthcare coverage, and improving college retention.³ Furthermore, many of these investments will directly support working mothers (who have long made up a large share of the poor and were hard hit by the pandemic)⁴ as well as help black and Hispanic families, who are disproportionately poor. The extent to which these proposals are realized will depend, however, on appropriations and tax policy changes legislated by the Congress.

9. The size and ambition of the Families and Jobs Plan are admirable, but a better targeting of policies would further strengthen their impact on macroeconomic and distributional outcomes. For example, the proposed child tax credit starts to phase out at household income of US\$150,000 (for a married couple) and some other types of assistance (like the Child and Dependent Care Tax Credit) are available to households with incomes up to US\$400,000. It would be preferable to phase out such assistance at lower levels of household income (e.g. at 300–400 percent of the federal poverty level or at the state-level median income) to lessen their fiscal cost. Doing so would provide resources to make the refundable child tax credit permanent and create the space to permanently expand unemployment insurance to independent contractors, the self-employed, and gig workers. Spending to support domestic manufacturing, invest in advanced semi-conductors, and incentivize the onshoring of supply chains could be recast as investments to encourage innovation (e.g. in basic research) or improve productivity (e.g. by further strengthening human capital or eliminating infrastructure bottlenecks). Finally, the size of proposed support for home and community-based care for the elderly and disabled could be reconsidered. Reorienting spending in this way would likely imply a slower (but more sustained) demand impulse, do more to relieve supply constraints, and, in so doing, reduce the risks posed by a sustained upswing in inflation.

10. Authorities' views. The American Jobs and Families Plans were viewed as transformational, once-in-a-generation investments to reimagine and rebuild the U.S. economy. The American Rescue Plan had already helped millions of families and lifted 5 million American children out of poverty. The Jobs and Families Plans would ensure these gains are institutionalized. The plans had been carefully designed and were well-targeted to address longstanding shortcomings in U.S. infrastructure and the system for social assistance. The full implementation of the proposed policies would create millions of high-quality new jobs and would put the U.S. on a stronger footing to

³ 38 percent of full-time undergraduate students attending a four-year college do not graduate within six years.

⁴ Even prior to the pandemic, almost one-in-four female-headed households and one-in-eight American children were living below the poverty line (even after taking into account the effect of government assistance programs). For an assessment of the impact of COVID-19 on women in the U.S., see S. Fabrizio, D. Gomes, and M. Mendes Tavares "COVID-19 She-Cession: The Employment Penalty of Taking Care of Young Children", [IMF Working Paper 2021/058](#).

compete internationally. Policies were intended to go well beyond building highways, ports and bridges but would also serve to strengthen the social infrastructure of the economy by modernizing schools and childcare facilities, expanding home and community based care for the elderly and disabled, offering paid family leave, and strengthening the safety net to support poorer households. The policies would help reverse the pandemic's impact on labor force participation and, particularly, help women to rejoin and remain in the workforce. The authorities also underlined the administration's strong political commitment not to raise taxes on any family earning under US\$400,000 and to provide greater federal support for both poorer households and the broader middle class.

B. Proposed Tax Policy Changes

11. The cost of the additional federal spending is expected to be partially offset by raising taxes on corporates and high-income households. Such tax increases are necessary to prevent the proposed increase in the spending envelope from translating into a faster pace of debt accumulation. The proposals have important implications for the international system of corporate taxation (see Box 1) and include:

- An increase in the statutory corporate tax rate (to 28 percent), partially reversing the rate reduction in the 2017 Tax Cuts and Jobs Act (TCJA) and returning the U.S. to the highest (combined average state and federal) corporate tax rate in the OECD.
- A global minimum tax on offshore profits of U.S. multinationals of 15 percent. The tax would be calculated on a country-by-country basis (significantly reducing the incentive to shift profits to low tax jurisdictions). Deductions would be denied for payments that are made to countries that fail to adopt a strong minimum tax.
- Corporations above a certain size would be required to pay at least 15 percent on the "book income" profits they report to investors in their financial statements.
- The current lower corporate rate on income from foreign sales (FDII) would be eliminated.
- Measures would be introduced to reduce the tax benefits of inversions (i.e., where U.S. corporations seek to obtain tax residence in a lower tax jurisdiction through mergers or acquisitions), to incentivize the "onshoring" of jobs back to the U.S., and to remove tax preferences for fossil fuel companies.
- The top personal income tax rate (for married couples earning over US\$622,051) would rise from 37 to 39.6 percent.
- "Qualified" dividends and capital gains would be taxed at the top personal income tax rate (i.e., 39.6 percent plus the existing 3.8 percent Affordable Care Act surtax) for households earning over US\$1 million.

- The “carried interest” provision—that allows high income taxpayers to recharacterize labor income as capital gains—would be eliminated.
- The “step-up basis” for capital gains in excess of US\$2 million (for a married couple) would be eliminated (to prevent individuals from passing appreciated assets to their heirs without incurring tax on the accumulated capital gains).
- The Internal Revenue Service would be fully resourced to upgrade systems, expand audits, and generally strengthen tax administration.

12. Many of the proposed revenue provisions reflect previous IMF policy advice.⁵

Instituting a permanent increase in taxes on corporate profits and on high income households is warranted, especially given the proposed permanent increase in spending obligations. Proposals helpfully include a globally coordinated minimum corporate tax, applied on a country-by-country basis, which will be a crucial step forward in countering the incentives for profit shifting and base erosion. Efforts to disincentivize inversions should help reduce avoidance and eliminating tax preferences for fossil fuel companies will support the administration’s goals to reduce greenhouse gas emissions. Excluding deductions paid to countries without a global minimum tax appears consistent with the “undertaxed payment rule” in the OECD’s Pillar Two proposals and removing the FDII tax preferences for exporters will create a more level playing field (and avoid a potential WTO challenge). The proposed changes to the personal income tax rightly close loopholes that allow high income individuals to recharacterize labor income and escape tax on capital gains (although step-up basis should be fully eliminated rather than having the proposed US\$2 million exemption). There is also a clear need—and potentially large payoff, both in terms of revenues and in improving the equity of the tax system—from increasing funding for the Internal Revenue Service.

13. The combined impact of the various tax provisions on equity-financed investments may incentivize debt finance or deter capital formation. The 28 percent corporate rate and the taxation of dividends and capital gains as ordinary income—when combined with state-level corporate and capital income taxes—will significantly raise the statutory rate on equity-financed investments.⁶ The tax burden on equity-financed investments—particularly intangibles which, arguably, were previously undertaxed—will be further increased by the proposed anti-avoidance mechanisms and the global minimum tax. These potential effects on debt bias and capital formation are, however, lessened by (i) the marginal effective rate being much lower than the statutory rate;⁷

⁵ See, for example, the [2018 U.S. Article IV Consultation](#) which supported the reduction of the corporate tax from 35 percent although noted that the combination of a lower statutory rate, the expensing of capital spending, and continued deductibility of interest spending represented an overly generous benefit to debt-financed investment. See also N. Chalk, M. Keen, and V. Perry, “The Tax Cuts and Jobs Act: An Appraisal”, [IMF Working Paper 2018/185](#).

⁶ For example, the combined federal and state-level marginal statutory rate on income from equity-financed investments would be as high as 72 percent in California.

⁷ The reduction in the statutory rate from 35 to 21 percent was estimated by the Joint Committee on Taxation to have lowered the effective rate on U.S. firms’ profits from 16 to 8 percent (U.S. International Tax Policy: Overview and Analysis, March 2021).

(ii) only around one-quarter of equities are currently in the hands of taxable shareholders;⁸ and (iii) insofar as the tax is largely incident on rents, the high statutory rate would have a lesser effect.⁹ Despite these mitigants, it may still be preferable to tax dividends and capital gains at the same, uniform rate of 20–25 percent in order to align the combined (i.e., corporate plus personal) rate on capital income with the top marginal rate on labor income. This would also lessen the extent to which pass-through entities face a preferential tax rate relative to C-corporations.¹⁰ Also, the concerns around the potential disincentive effects for capital formation could be addressed by reformulating the business tax as a cashflow tax (i.e. by permanently allowing for the expensing of all capital outlays and fully eliminating the deduction for interest spending on newly contracted debt). Finally, prudent planning would suggest the need to build into the fiscal plans a more conservative revenue effect from proposed investments in tax administration.

14. The administration's commitment not to raise taxes on households earning under US\$400,000 per year (which encompasses 98 percent of households) represents an important constraint on the options for raising revenue.

Without this limitation, further tax policy changes could be considered that raise revenues but without increasing the tax burden for households earning around the median income. These could include:

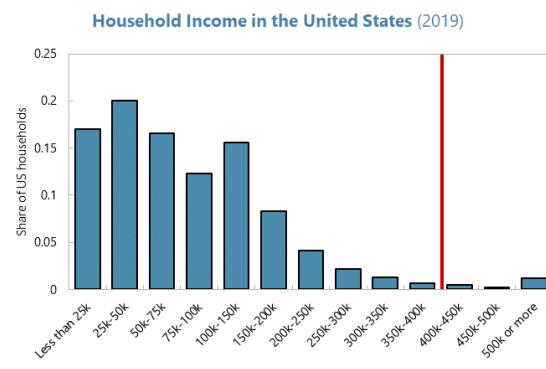
- Increasing the reliance on indirect taxes, particularly those that will help achieve the administration's climate goals such as introducing a carbon tax and/or raising federal fuel taxes. A carbon tax would, though, have to be sensitive to its impact on the income distribution, potentially requiring accompanying increases in targeted social assistance.
- Eliminating the current 20 percent (section 199A) deduction for certain types of pass-through income.
- Scaling back poorly targeted tax expenditures such as the income tax exemption for employer-provided health care, the capital gains tax exemptions for individuals selling their principal residence, and the deductibility of mortgage interest and state and local taxes.

In addition, the minimum threshold for the estate tax could be lowered (from the current level of US\$23.4 million for a married couple).

⁸ The bulk is held by untaxed entities such as institutional investors (like insurance or pension funds), individual retirement accounts, nonprofits, or nonresidents.

⁹ The evidence suggests that the high share of rents in profits was an important factor for why the TCJA corporate rate reduction had relatively small effects on investment (see E. Kopp, D. Leigh, S. Mursula, and S. Tambunlertchai, "U.S. Investment Since the Tax Cuts and Jobs Act of 2017," [IMF Working Paper 19/120](#)).

¹⁰ Currently, around one-half of corporate income is taxed as a pass-through (e.g. as a sole proprietor, partnership, limited liability company or S-corporation) at a federal statutory rate of between 29.6 and 37 percent, depending on the type of business income.



Sources: ASEC March CPS; IMF Staff calculations.

15. Authorities' views. Tax policies had been designed with a view to reversing the decline in federal revenue-GDP that was seen over the past five years in order to fund essential federal government programs. It was equitable to have high net worth individuals and corporations bear much of that burden, particularly in light of the lowering of taxes under the 2017 Tax Cuts and Jobs Act. The proposed "Made in America Tax Plan" strikes a good balance between raising revenues and incentivizing job creation and investment. The effective rate on U.S. corporate profits was still low relative to history and was unlikely to be a significant disincentive to new investment, particularly with much of U.S. corporate profit reflecting rents rather than normal returns to capital. The improvements envisaged in tax enforcement and administration would help address tax evasion and make for a fairer tax code. The goal of many of the proposed tax policy changes was to reward work and not wealth, especially by eliminating those loopholes that are being used by corporations and high net worth individuals to reduce their tax liabilities. Finally, the proposed changes to the international corporate tax system were viewed as consistent with OECD proposals and would help reverse the "race to the bottom" in corporate taxes, curtail wasteful profit shifting to low tax jurisdictions, and bring stability to the global tax system. The proposed legislation was viewed as being fully consistent with the U.S. negotiating position in the OECD process.

Box 1. Implications for the International Corporate Tax System

The international aspects of the U.S. proposed tax plan are broadly in line with the OECD's Pillar 2 proposal.¹ The U.S. plan is also consistent with recent moves by other countries to raise the statutory corporate income tax rate (e.g. the U.K.'s increase in the corporate tax rate from 19 to 25 percent). A higher U.S. rate, as well as a global minimum tax, may help coordinate an end to the downward path for corporate tax rates that has occurred internationally. Also, a higher rate in the U.S., relative to OECD comparators, would be consistent with the theory that larger economies can maintain higher tax rates because of their more immobile tax base.

The tax plan raises the effective average tax rate (EATR) on multinationals that are headquartered in the U.S. (largely because of the higher statutory rate and the elimination of a lower tax rate on profits derived from foreign sales that are in excess of 10 percent of the value of depreciable tangible assets). Specifically, it is estimated that the EATR on equity-financed investment into intangibles would rise from 13.6 to 24.8 percent². Other mechanisms proposed in the tax package to deter base eroding payments (e.g. disallowing deductions for payments to low tax jurisdictions) will further increase the EATR.³

The average (foreign and U.S.) tax paid by U.S. controlled foreign corporations is currently 9.8 percent for all jurisdictions (and 7 percent if only low-tax jurisdictions are included). As such, a 15 percent global tax would be binding for many U.S. multinationals. In the absence of a global agreement on a minimum tax, these various changes will disincentivize companies from headquartering in the U.S.

Therefore, a coordinated global agreement on a minimum tax will be important to level the playing field internationally, disincentivize jurisdictions from maintaining a low corporate tax rate, and mitigate locational disadvantages from the other tax changes proposed by the administration (including the higher statutory rate, more binding anti-avoidance provisions, and minimum tax on book income). A global minimum tax will help raise the EATR for companies that locate in other jurisdictions which adopt the tax, reducing the EATR differential between the U.S. and other locations (especially if agreement can be reached on a common rate for the global minimum). In this regard, it will be important that the U.S. global minimum tax is assessed on a jurisdiction-by-jurisdiction basis and does not provide an exemption based on assets (i.e., compared to the GILTI provision which was calculated based on a worldwide average and with an exemption equal to 10 percent of the foreign-located, depreciable tangible assets).⁴ Such a design will make the tax more binding and independent both of a firm's assets, its allocated expenses, and the share of profits it derives from low tax jurisdictions. Also, denying deductions for payments made to related parties in those low tax jurisdictions that do not have a minimum tax should provide a reinforcing incentive to adopt the global minimum.

¹ The OECD's Inclusive Framework Pillar One seeks to reallocate a share of global residual profits of in-scope multinationals destination countries and Pillar Two seeks to ensure that profits of multinationals are taxed at a globally agreed minimum level.

² Based on calculations from Beer, Klemm, and Matheson (2018).

³ Other provisions in the tax plan may have opposing effects on the EATR. Cost-based R&D tax incentives will lower the EATR but the proposed minimum tax on large corporations' book income increases the EATR.

⁴ The exemption had the undesirable effect of incentivizing firms to move fixed assets abroad in order to lower their GILTI tax liability.

THE SHIFT IN THE MONETARY POLICY FRAMEWORK

16. In August 2020 the Federal Reserve announced important changes to its policy framework. These included (i) the FOMC would seek to achieve inflation that averages 2 percent over time (following periods when inflation has been running persistently below target, policy would

aim to achieve inflation moderately above 2 percent for some time); and (ii) policy decisions would react to mitigate shortfalls of employment from the FOMC's assessment of its maximum level. Policy would continue to take into account the balance of risks, including systemic risks to financial stability. The change in the framework recognizes that policy would be more frequently constrained by the effective lower bound—due to a decline in the neutral rate—which increases the downside risks to both employment and inflation. As a result of these changes, policy is intended to be more accommodative for a longer period after a negative shock as a means to more-quickly get the economy back to full employment and away from the effective lower bound.

17. The change in the framework is consistent with past IMF advice. Given the decline in the neutral rate of interest, and the asymmetries posed by the effective lower bound, past Article IVs have emphasized that the Federal Reserve should be ready to accept some modest, temporary overshooting of its inflation goal so that inflation approaches the 2 percent medium-term target from above. Doing so would provide valuable insurance against the risks of disinflation and having to bring the federal funds rate back down to the effective lower bound. The flexible average inflation targeting framework provides a clear structure to operationalize this approach to policy. Given the complexity of the U.S. economy and the uncertainties in implementing the new framework, it is appropriate to eschew closely parameterizing the policy framework (e.g. by providing a formulaic time horizon over which inflation will be averaged or specific limits on the amount that inflation will be allowed to overshoot). Instead, the size and duration of the intended overshoot should be data dependent.

18. While there were risks to introducing the new monetary framework in the midst of COVID-related uncertainty, the change in framework has been a timely innovation, helping to redefine the Fed's approach to policy as the U.S. emerges from the effects of the pandemic.

The benefits of the framework in the context of the COVID-19 shock were four-fold:

- First, the framework is designed to provide more accommodation over a longer horizon in response to a negative shock. The precommitment to overshoot helps increase expected inflation over the near-term, lowering today's real interest rate and, in so doing, boosting demand.
- Second, the framework allows the Fed to not react pre-emptively based on policymakers' forecasts of inflation and, instead, to place more weight on inflation expectations and realized inflation in its policy calculus. This has proven advantageous at a time when it has been difficult to assess the underlying parameters—such as the natural rate of unemployment or the size of the output gap—that would be needed to accurately predict the path of inflation.
- Third, the new framework embeds clear, outcomes-based forward guidance around the future path of policy rates (i.e., that the federal funds rate will remain at the effective lower bound until inflation rises to 2 percent and is on track to moderately exceed 2 percent for some time).
- Fourth, the more accommodative framework should help repair some of the damage to the income distribution that had been wrought by the pandemic (Box 2).

19. The combination of the new monetary policy framework and the economic boost from fiscal stimulus should be self-reinforcing. The flexible average inflation targeting helps increase

the demand impact of the fiscal support by providing more accommodation. At the same time, the large fiscal boost increases the likelihood that inflation gathers sufficient momentum to sustainably exceed 2 percent (something that the U.S. and other advanced economies have struggled to achieve in the post-global financial crisis period). It is worth noting, also, that the impact of the Fed's new framework would be further reinforced by a similar shift in frameworks by other systemic central banks (Box 3).

20. There is a concern, though, that the unprecedented size of the planned fiscal support will significantly compress the timeline for policy normalization. The reopening of the economy will create considerable unpredictability in PCE inflation during the next several months, making it very difficult to divine underlying inflationary trends. At the same time, presuming staff's baseline outlook and fiscal policy assumptions are realized, policy rates will likely need to start rising in late-2022 or early-2023 (with asset purchases being scaled back in the first half of 2022). Managing this transition—from providing reassurance that monetary policy will continue to deliver powerful support to the economy to preparing for an eventual scaling back of asset purchases and the withdrawal of monetary accommodation—will require deft communications under a potentially tight timeline. Mitigating the risks of market misunderstandings, volatility in market pricing, and/or an unwarranted tightening of financial conditions (with all the negative spillovers to the global economy that such outcomes would entail) will require the FOMC to continue clearly telegraphing its interpretation of incoming data and articulating what economic developments mean for policies. The Federal Reserve's commitment—to communicate well in advance its thinking and to ensure that the eventual withdrawal of monetary accommodation is orderly, methodical, and transparent—is very welcome.

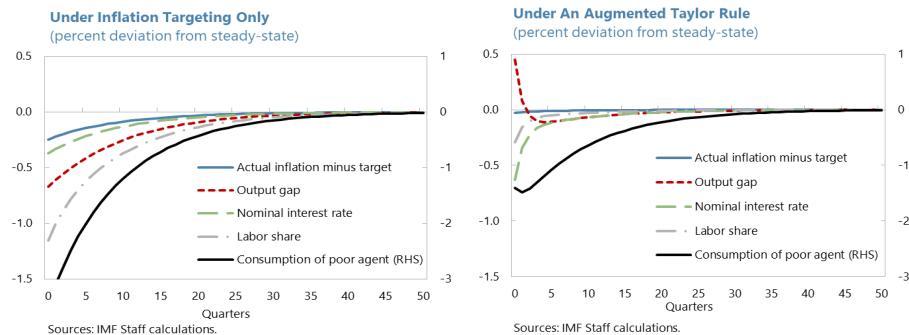
21. Authorities views. The substantial decline in the neutral rate over recent decades has left the FOMC with less policy space to cut rates to spur aggregate demand. As such, the policy rate in the U.S. is more likely to be constrained by the effective lower bound than in the past, raising downward risks to both employment and inflation. These developments necessitated a shift in the Fed's framework to more firmly anchor long-term inflation expectations at the longer-run 2 percent goal and to increase the power of monetary policy to quickly return the economy back to full employment after a negative shock. The new Flexible Average Inflation Targeting approach is expected to achieve both these goals. The FOMC's implementation of the framework embeds clear forward guidance with the FOMC committing to begin raising rates only after labor market conditions are in a place that is consistent with maximum employment and inflation has risen to 2 percent and is on track to moderately exceed that level for some time. On the conjuncture, the recent rise in various prices as the economy reopens is expected to have largely transitory effects on inflation, and employment remains well below estimates of its maximum level. As such, the economy is still judged to be a ways away from the FOMC's goals. It is expected that it will take some time before a withdrawal in monetary accommodation would be appropriate, although such determinations will depend on the performance of the economy. Nonetheless, the Federal Reserve remains conscious of the important spillovers from its policy actions and is committed to continuing to clearly communicate its intentions and telegraph at an early stage any prospective shift in asset purchases or policy rates.

Box 2. Monetary Policy and Consumption Inequality

Traditionally, monetary policy actions are judged against how well they achieve the optimal trade-off between inflation, output, and aggregate labor market outcomes. In a model of heterogeneous agents, the *distribution* of consumption across the population becomes an additional consideration for policy, especially in the presence of productivity shocks. The intuition for the distributional impact of such shocks is straightforward: lower income households have relatively low skills, are mostly reliant on labor income, and hold few claims on capital. As a result, a positive productivity shock predominantly benefits higher income households, boosting their returns to both skills and to their holdings of claims on the capital stock. To analyze this intuition, we draw on a two-agent economy with price and wage rigidities¹ and find that:

- **In theory, welfare outcomes can be improved if monetary policy attaches some weight to the distribution of wages** (in this model that is captured by policymakers attaching some weight to the labor share of income in addition to inflation and the aggregate unemployment gap). In the face of a positive technology shock, monetary policy would weigh both the resulting boost to aggregate employment but also the negative impact the shock will have on the relative wages of unskilled workers. This would result in policy settings being left at more accommodative levels whereby policymakers tolerate temporarily higher inflation and run the economy hotter (so as to offset the effect of the shock on the wages of lower income workers). Following such an approach would improve distributional outcomes and increase welfare.
- **The size of the gains from considering the distribution of wage outcomes depends on which policy approach it is compared to.** The welfare gains are largest when compared to a simple Taylor rule. Welfare gains are more modest, but nonetheless still positive, if the alternative policy is an “optimal control” approach (i.e. where policy minimizes a weighted average of slack and the deviation of inflation from its medium-term target).

Impulse Response to a Positive Technology Shock



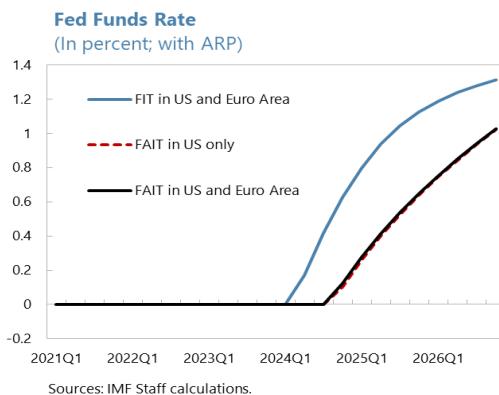
The general approach suggested here—which incorporates information on consumption inequality into policy decisions—has parallels in the recent changes that have been made to the Fed’s operating framework. Specifically, the new framework (i) explicitly targets an overshooting of inflation following a disinflationary shock; and (ii) reacts only to shortfalls from maximum employment. Both of these features lead to a less pre-emptive approach to policy, a tolerance for temporarily higher inflation, and a willingness to run the economy hot. This analysis does not argue for building consumption inequality into the Federal Reserve’s price stability and maximum employment objectives. The insights from such a heterogeneous agent model also argue in favor of the Fed’s longstanding approach of calibrating policies based on a broad “dashboard” of labor market indicators (including the wage and employment outcomes of lower income households) rather than solely focusing on the level of unemployment.

¹ See N.-J. Hansen, A. Lin, R. Mano, “Should Inequality Factor into Central Banks’ Decisions?”, [IMF WP 20/196](#).

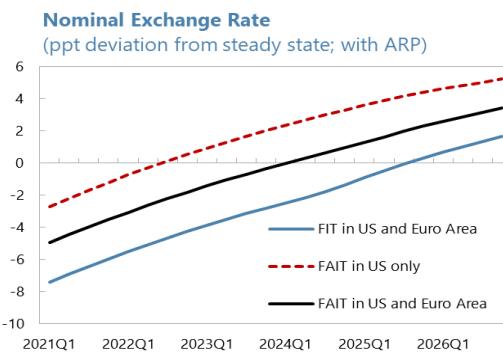
Box 3. Spillover Effects From Flexible Average Inflation Targeting

To examine the impact of the Fed's shift in framework from Flexible Inflation Targeting (FIT) to Flexible Average Inflation Targeting (FAIT), simulations were undertaken in the Fed's two-country SIGMA model (calibrated to the U.S. and Euro Area)¹.

The first thing to note is that the logic of FAIT implies a slower and later pace of normalization in the federal funds rate than under FIT. This more backloaded pace of rate increases supports an overshooting of the 2 percent longer-term goal. Compared to FIT, the lower path for policy rates reduces dollar funding costs, weakens the dollar, and (on net) loosens global financial conditions (creating positive outward spillovers).



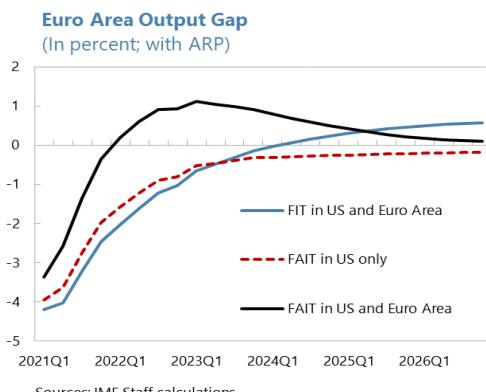
Sources: IMF Staff calculations.



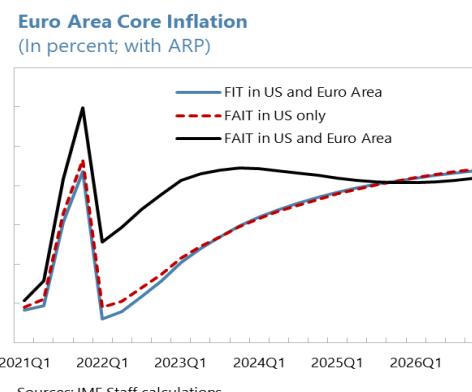
Notes: Positive values indicate US depreciation.
Sources: IMF Staff calculations.

The weaker dollar under FAIT increases U.S. competitiveness and boosts exports. This effect outweighs the higher import demand that arises from stronger U.S. growth. As a result, the U.S. trade balance improves in the near term (by around 0.4 percentage points of GDP relative to FIT) and the positive outward spillovers comparing between FAIT and FIT are relatively small.

If the Euro Area were to adopt a similar “make-up” monetary policy strategy like FAIT, this would lead to a more prolonged monetary accommodation in the Euro Area. As a result, the dollar would depreciate by less, net external demand from the U.S. would be greater, and both Euro Area output and inflation would be higher. The alternative policy framework would also create positive spillovers to the U.S. As such, the adoption of FAIT policies by both central banks would be self-reinforcing and lead to improved outcomes in both the U.S. and Euro Area.



Sources: IMF Staff calculations.



Sources: IMF Staff calculations.

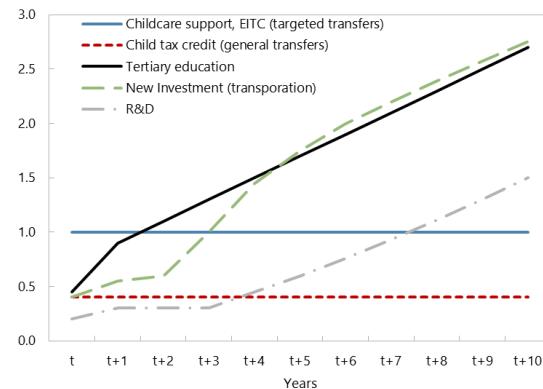
¹ The simulations shown here are based on a baseline incorporating spending under the American Rescue Plan but without the American Jobs and Families Plans.

PUTTING IT ALL TOGETHER

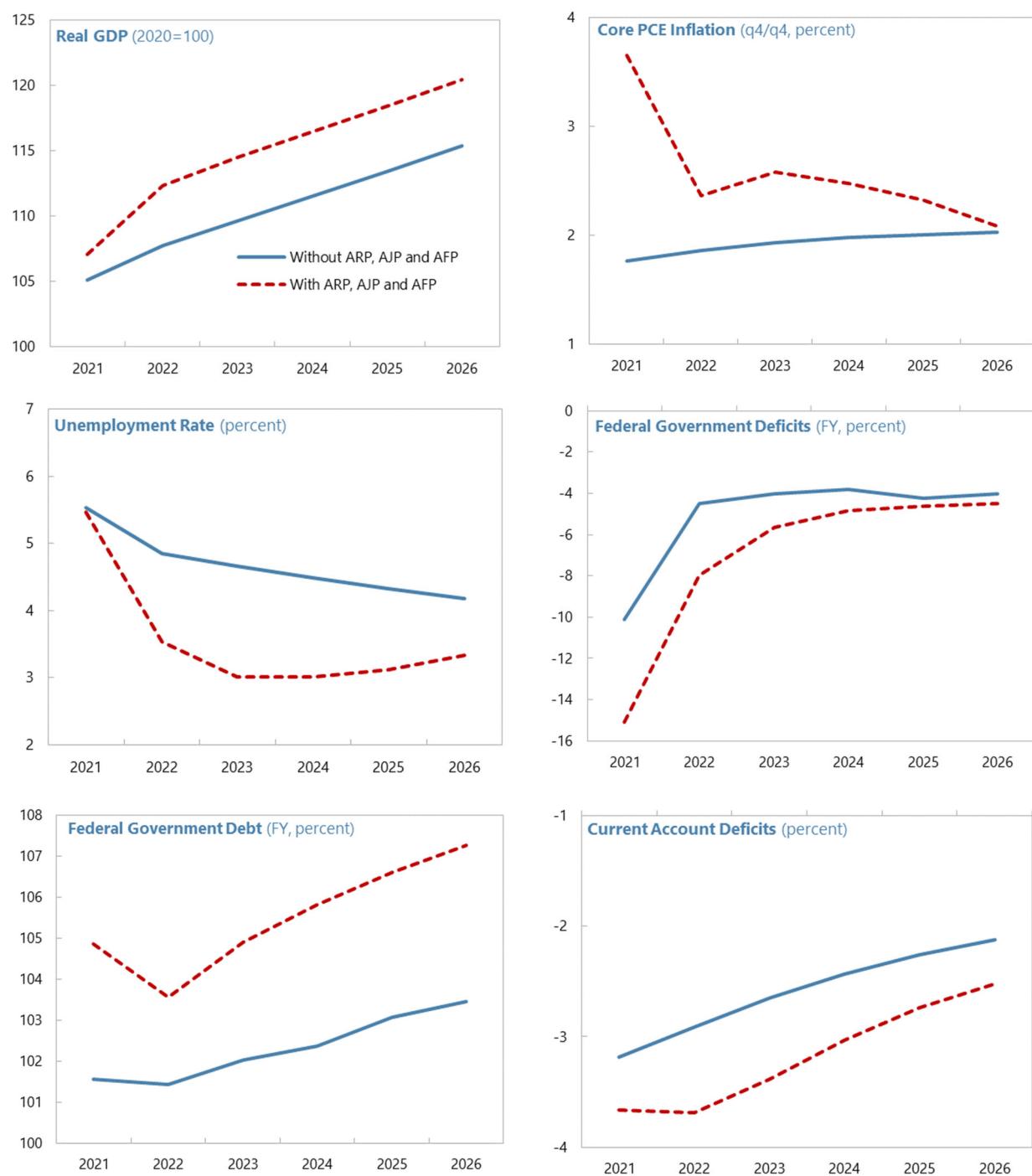
22. The combination of the Rescue, Jobs and Families Plans, in the context of a Flexible Average Inflation Targeting framework, is estimated to add a cumulative 10¼ percent to the level of GDP during 2021–23. The baseline forecast incorporates the effects of both the Jobs and Families Plan based on an assumption that they are passed into law in line with the composition and size described above. Forecasts rely on the empirical and economic modeling literature to define the size of the multipliers for the various policy measures being proposed.¹¹

The proposed fiscal plans, combined with the more accommodative monetary framework, are expected to reduce unemployment to close to 3 percent and bring labor force participation to pre-pandemic levels by end-2022. Supply-side policies—including infrastructure spending, childcare support, paid family leave, expanded healthcare, and a more generous EITC—are expected to help support labor force participation and productivity over the medium-term, helping to offset an expected demographic downtrend in participation. As a result, potential growth is expected to move up (to around 2 percent) and the level of real GDP would be higher by around 1 percent in 2030. Finally, after taking into account the impact on output and inflation, the three fiscal packages together are expected to add 3-4 percent of GDP to federal government debt by 2026 (see Appendix 2).

Cumulative Multipliers



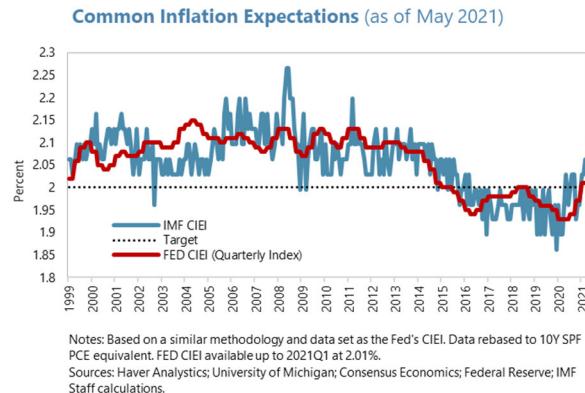
¹¹ The illustrated multipliers represent the (undiscounted) cumulative addition to the level of aggregate demand over a ten year horizon per unit of additional spending.

Figure 1. Macroeconomic Impact of American Rescue, Jobs and Families Plans 1/

1/ The change in the core inflation projection in 2021 reflects both the impact of the fiscal package and idiosyncratic relative price movements.

Sources: Haver Analytics; IMF Staff calculations.

23. PCE inflation is expected to rise to around 2½ percent by end-2022. Data points to significant remaining labor market slack¹² which should serve as a safety valve to dampen underlying wage and price pressures. Inflation expectations are also expected to remain well-anchored. Underlying inflation trends will be obscured in the coming months by significant, transitory movements in relative prices which could lead core PCE inflation to temporarily peak later in the year at close to 4 percent. Once these temporary price realignments have passed through the system, tightening labor markets and a persistent positive output gap should allow underlying inflation to rise above the Fed's 2 percent goal in 2022 and remain above for some time. There are, however, important upside risks to inflation that could have systemic implications (see below).



24. Strong near-term demand will add to the current account deficit. The U.S. external position is judged to be moderately weaker than the level implied by medium-term fundamentals and desirable policies in 2020 and is expected to weaken further in 2021 (see Appendix 3). Indeed, the current account is expected to register a deficit above 3 percent of GDP until 2024. This current account imbalance is largely driven by the sizable increase in the fiscal deficit. As the fiscal deficit falls, the current account deficit should steadily decline (although much will depend on the pace at which the current, high levels of private savings are drawn down).

25. The spillover impact to global activity from the rapid U.S. rebound is generally expected to be positive, particularly so for Mexico and Canada given their strong trade linkages to the U.S. Although the Treasury yield curve has moved in anticipation of larger fiscal support, most countries are generally benefiting from still-loose global financial conditions and the demand spillovers from the rapid recovery of U.S. consumption and investment. Looking forward, some countries—particularly leveraged EMDEs with weak fundamentals, commodity importers and/or countries with an exchange rate pegged to the U.S. dollar—could, though, face greater pressure in the coming months, especially if dollar funding costs rise abruptly.

26. Authorities' views. The American Jobs and Families Plans, in conjunction with the American Rescue Plan, are expected to provide significant near-term support for the economic recovery, offsetting some of the drag from the expiration of earlier pandemic-related fiscal support programs. In addition, these new proposals may raise productivity and labor force participation, increasing income growth over the medium-term and thereby raising living standards. The recovery is expected to be particularly beneficial for low- and middle-income families with a tightening labor market helping to raise wages and fiscal transfers supporting household income. These policy efforts are

¹² As of May, employment was slightly under 10 million persons below the pre-pandemic trend and the underutilization of labor (as measured by U6) was 10.2 percent, around 3½ percent above pre-pandemic levels.

expected to have substantial positive spillovers to trading partners and would result, for a time, in an increase in the current account deficit as U.S. demand expands at a faster pace than many of the trading partners. The increase in the U.S. current account deficit could, however, be lessened by greater efforts to boost domestic demand by trading partners. After some near-term volatility in relative prices, inflation was expected to move over the next few years in a way that is in line with the Federal Reserve's objectives under its new Flexible Average Inflation Targeting framework. Longer-term inflation expectations are expected to remain well-anchored at 2 percent.

27. The principal risk facing the U.S. economy continues to emanate from the pandemic

(Appendix I). The global infection rate accelerated above its previous peak in April and the threat posed by new variants—that are more infectious and potentially could be resistant to vaccines—is evident. As such, public health efforts in the U.S. need to continue to be applied rigorously, including by targeting populations where vaccination rates are low, and undertaking robust contingency planning to manage another surge of infections. Consideration should be given to establishing a “standing army” for public health to create idle capacity in testing and medical supplies as well as build a rapid-response unit that could be deployed for testing, tracking and treatment of viruses. Furthermore, the U.S. has an important role to play in helping other countries contend with the public health crises, particularly the developing world. This is not only for humanitarian reasons. Prompt international assistance—in the form of vaccines, medical supplies, and public health expertise—will pay dividends for the U.S. itself, lessening the COVID-19 risks ahead. In this regard, recent announcements by the administration of their intent to provide significant quantities of vaccines to other countries are highly commendable.

28. There are downside risks to the outlook from the potential that Congress will legislate a fiscal package that is smaller, or less comprehensive, than the one proposed by the administration.

Staff forecasts anticipate an increase in discretionary spending and tax expenditures of US\$4.3 trillion over the next decade from the Jobs and Families plans which translates into a cumulative 5¼ percent increase in GDP during 2022–24. These fiscal plans will also have a meaningful, longer-run effect on aggregate supply. Approval of a smaller and/or less effective package of tax and spending would imply less of a boost to both supply and demand and likely, on net, somewhat reduce inflationary pressures and public debt.

29. As the recovery proceeds, disruptive mismatches of supply and demand are possible in the near term. The shortage of key input material, including semiconductors and labor, have already weighed on growth and boosted inflation outturns. Such supply chain constraints are likely to continue creating idiosyncratic, temporary relative price increases. These, in turn, may well lead to volatility in market pricing and make for a more uneven pace of recovery across sectors.

30. An overheating of the U.S. economy that causes a surge in underlying inflation is not a likely outcome but does represent an important risk to both the U.S. recovery and to global prospects (Appendix I and Box 4). A relatively flat trade-off between wage and price inflation and estimates of slack will defray these risks and well-anchored inflation expectations create valuable room for maneuver. Nonetheless, there are forces that could create higher-than-expected inflation:

- A slower rebound in labor force participation—due to public health concerns, retirements, incentive effects from unemployment benefits, or delays in reopening schools and childcare—could create a larger mismatch in the labor market and push wages and prices higher. Historically, such wage pressures have been largely absorbed by corporate profit margins but, given the unprecedented nature of this recession, firms may believe they have greater pricing power, leading to price increases across a range of goods and services that then feed through the supply chain into a faster pick-up in consumer price inflation.
- There are components of the inflation index that have been artificially compressed over the past year because of the unusual COVID circumstances. As these effects fade there could be an unexpectedly rapid pick up in core PCE.
- There is significant uncertainty about how inflation expectations are formed in the U.S. and, as a corollary, there is little evidence on what it would take for expectations to de-anchor upwards. If supply chain disruptions prove to be persistent—set against the backdrop of a pipeline of significant fiscal and monetary support for the economy—then, what are currently believed to be temporary, relative price movements could start to infect inflation expectations and create more broad-based wage and price pressures.
- Finally, the macroeconomic impact of the fiscal stimulus may be larger and more front-loaded than currently assessed (especially given the more accommodative monetary stance). It is worth noting, though, that even with the Jobs and Families Plan, the general government primary balance is expected to register a 7.5 percent of GDP contraction in 2022-23. The size of this fiscal contraction would be larger if Congress legislates a fiscal package that is smaller or more back-loaded than that being proposed by the administration. Alternatively, the expected supply effects (e.g. on labor force participation, new capital formation, and productivity) of the fiscal packages could be smaller or slower to materialize (although forecasts already assume a relatively small and protracted boost to potential that builds over the course of several years). Nonetheless, imbalances resulting from either a more rapid recovery in private consumption or from a different impact of fiscal policies on supply and demand could be larger, leading inflation to move faster and higher than currently forecasted.

31. In the event that these upside risks to inflation are realized, monetary policy will need to adapt quickly. The monetary policy reaction will have the difficult task of differentiating between two possibilities:

- *Relative price adjustments and/or a more front-loaded impact of fiscal stimulus lead to higher realized inflation but medium-term inflation expectations remain well-anchored at the Fed's longer term goal.* In this case, the premium will be on communicating clearly that the changing environment calls for a withdrawal of monetary accommodation. However, the anchored expectations will provide room for maneuver, allowing these policy adjustments to take place along an orderly timeline (i.e., similar to that already incorporated into staff's baseline outlook). While this would imply a somewhat larger, more prolonged inflation overshoot, inflation should still return to the longer run target relatively quickly.

- *High realized wage and price inflation, resulting from a sustained mismatch in supply and demand, proves persistent and causes a de-anchoring of inflation expectations.* This eventuality would necessitate monetary policy quickly changing tack in order to re-anchor expectations. This would mean accelerating the reduction in asset purchases and even having to consider raising policy rates before net purchases have been brought to zero. This would likely create an abrupt shift in financial conditions and risk premia with negative implications at home and abroad.

Clearly, it will be difficult to distinguish, in real time, these two potential out-of-baseline risk scenarios, especially when there is substantial noise from the expected idiosyncratic and transitory shifts in a range of prices. This will likely mean, in the coming months, placing a relatively heavy weight on the evolution of inflation expectations. As the underlying dynamics of inflation become clearer (later in 2021 and into 2022), a greater weight can then be placed on realized inflation in determining the future path for policy.

32. The consequences of a rapid pick-up in inflation could be systemic for both the U.S. and the global economy. If the exhaustion of slack, higher inflation expectations, or a steeper tradeoff between unemployment and inflation create a faster-than-expected rise in inflation, markets would begin to reprice both the path for policy rates and the inflation risk premium embedded in dollar funding costs. This could create an up-front steepening of the yield curve that may precede—or, for some countries, more-than-offset—the positive demand effects arising from the strong U.S. recovery. Risk premia could rise across a range of assets and the resulting abrupt tightening of financial conditions would pressure firms and households (particularly those that are highly leveraged), slowing the recovery or even tipping the U.S. into a renewed downturn. This confluence of events would be bad news for the global economy. A synchronized tightening of global financial conditions at the same time as the U.S. recovery is slowing would hurt almost all countries but would hit particularly hard Canada, Mexico, and those emerging markets with significant gross external financing needs.

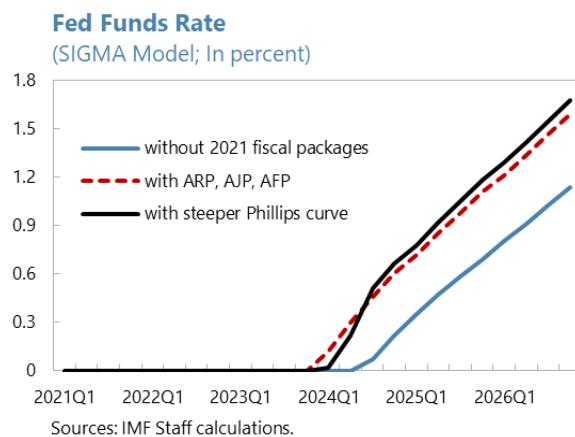
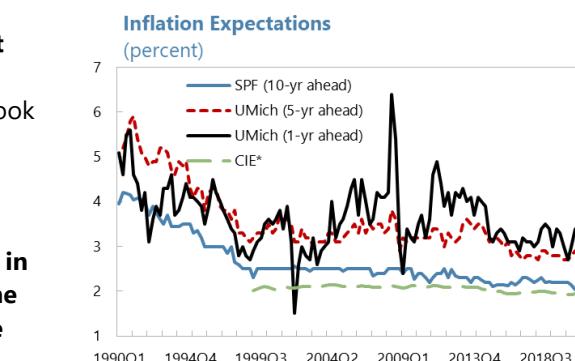
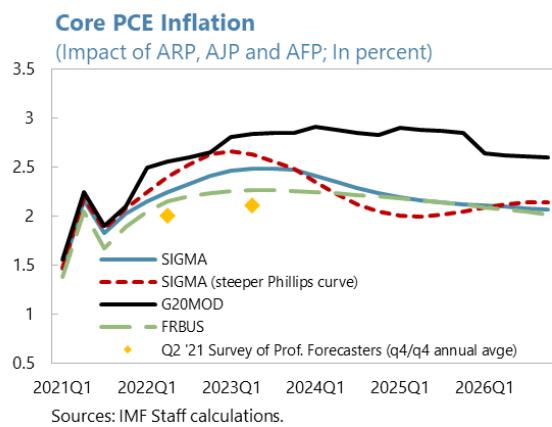
33. Authorities' views. Although unexpected shifts in the trajectory of the pandemic pose an important risk, it was expected that the measures underway to expand vaccinations and contain the virus would significantly mitigate these downside risks. Successful public health efforts may create an upside risk to the path of recovery with demand potentially being faster and more front-loaded than currently expected. An unexpected surge of inflation or a de-anchoring of inflation expectations were viewed as a tail risk but, if realized, would be disruptive. It was expected, though, that the strong credibility of the Federal Reserve would serve to anchor long-term inflation expectations and would dampen any demand-driven wage and price pressures. Nonetheless, the FOMC was committed to acting promptly in the event that there were signs that long-term inflation expectations were becoming de-anchored or if inflation was evolving in a manner that was inconsistent with the Fed's price stability mandate.

Box 4. Assessing Possible Inflation Paths

Following significant volatility in 2021, core PCE inflation (q4/q4) is expected to rise to 2.6 percent by 2023 and then converge to the Fed's 2 percent long-run target from above. In large part, this outlook relies on an assumption that inflation expectations remain anchored (as they generally are assessed to have been since the mid-1990s).

To examine the scope for upside risks to inflation in a general equilibrium setting, simulations are done in the SIGMA model, calibrating the Phillips curve based on the behavior of inflation and unemployment before the Global Financial Crisis. In the model, the Federal Reserve is assumed to follow a flexible average inflation targeting (FAIT) rule with zero as the effective lower bound for the fed funds rate. Simulations from the SIGMA model are complemented by similar exercises using the FRBUS model and the IMF's G20MOD. In general, the path for core inflation demonstrates a modest overshoot, propelled by the American Rescue, Jobs and Families Plans (although G20MOD shows a larger and more persistent inflation impact).

The inflationary impact of a steeper Phillips curve¹ is found to have relatively modest effects in the SIGMA model. In the near term, core inflation would be higher by around 0.4 percentage points. This is largely because the "model-consistent" inflation expectations in the simulation remain well-anchored by the FAIT policy rule. This would suggest that the risks of a sustained pick-up in inflation would likely need to arise from a material shift in expectations (i.e., stronger demand effects or a steeper Phillips curve would likely not be sufficient if expectations remain well-anchored).



¹ The parameter determining the impact of higher marginal costs in the model's New Keynesian Phillips curve is calibrated to be around three times larger than in the baseline simulations.

CONTEMPLATING FUTURE FISCAL CONSOLIDATION

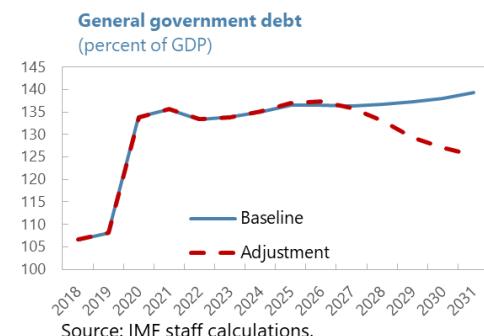
34. The debt-GDP ratio fails to stabilize under the policies assumed in the baseline but the overall risks of sovereign stress are judged to be low and the debt is viewed as sustainable¹³

(Box 5 and Appendix II). The planned changes to the tax system will defray some of the impact of higher spending on the deficit and debt but further actions will be needed over the medium-term to bring the debt down. This reflects the impact that the aging population and rising healthcare costs—which over the medium-term are much more important drivers of debt dynamics than the planned fiscal packages—are likely to have on mandatory spending.

35. In addition to the policies described above—i.e., an improved targeting of spending and tax credits to lower income groups, a reduction in tax expenditures, the introduction of a carbon tax and higher fuel taxes, and an increase in the taxation of inherited wealth—further measures should be considered. These could include:

- Introduction of a broad-based federal consumption tax levied at a relatively low rate with the effect on lower income groups offset through increases in targeted assistance (e.g. by increasing food assistance programs, refundable child tax credits, and the EITC).
- Accelerating the planned increase in the retirement age, increasing the progressivity of social security benefits, raising the maximum taxable earnings for social security contributions, and indexing benefits to chained CPI.
- Containing healthcare cost increases through greater cost sharing with Medicare beneficiaries, efficiency innovations (such as expanded telehealth services), incentives to increase price transparency by healthcare providers, tackling market power among health care providers, and increasing competition in drug pricing.
- An increase in the minimum age for Medicare eligibility alongside an expansion of Medicaid and tax credits to ensure that coverage is maintained to elderly, lower income households.

Such actions on both the revenue and spending side should aim to bring the federal primary balance to 1 percent of GDP (a general government primary balance of ½ percent of GDP). In doing so, the general government debt-to-GDP ratio could be put onto a downward path by 2027 (lowering general government debt to 125 percent of GDP by 2030, which is still well above any pre-pandemic level).



¹³ In previous consultations, debt was characterized as being “on an unsustainable upward path under current policies”. The debt sustainability assessment now reflects the approach taken in the IMF Board-approved definition of public debt sustainability that “the primary balance needed to at least stabilize debt under both the baseline and realistic shock scenarios is economically and politically feasible, such that the level of debt is consistent with an acceptably low rollover risk and with preserving potential growth at a satisfactory level” (see [Review of The Debt Sustainability Framework For Market Access Countries](#), 2021).

36. Authorities views. The U.S. was viewed as having substantial fiscal space which provided important room for maneuver in its conduct of fiscal policy. While projections suggested that the federal debt-GDP ratio would continue to rise slowly over the medium-term, the path for real interest spending as a share of GDP was expected to remain well below historical levels. This suggests that the U.S. debt servicing capacity did not present a particular constraint, even if debt-GDP were to rise further. Nonetheless, it would be desirable, as the economy gets closer to full employment, for the debt-GDP ratio to start declining so as to rebuild fiscal buffers over the medium-term.

Box 5. The Sovereign Risk and Debt Sustainability Framework: An Application to the U.S.¹

The new framework finds the overall risk of sovereign stress in the U.S. to be low.

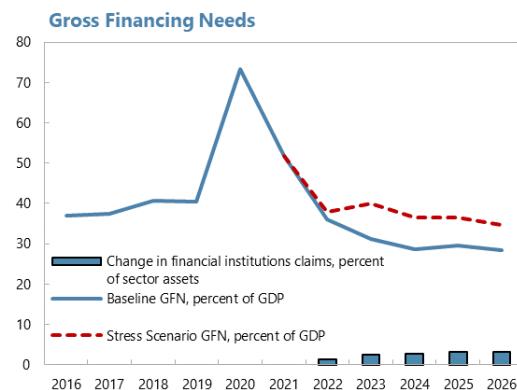
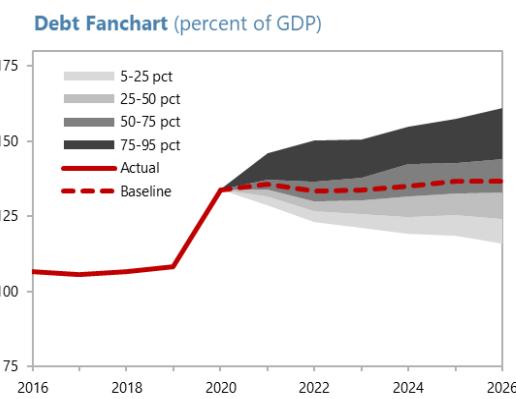
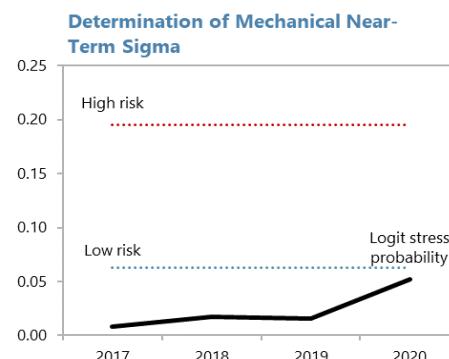
Risk of Sovereign Stress			
	Mechanical signal	Final assessment	Comments
Overall		Low	Assessment reflects mitigating factors: the strength of institutions, the depth of the investor pool, the role of the U.S. dollar in the international system, and the Fed's stabilizing role.
Near term	Low	Low	
Medium term	Moderate	Low	
GFN:	Moderate	Low	
Fan chart:	Moderate	Moderate	
Stress-test:	N.A.		
Long term		N.A.	

The quality of institutions and absence of history of stress imply a **low near-term risk of a debt crisis**. The jump in the debt-GDP ratio in 2020 did, however, lead to a modest rise in the probability of stress during 2020.

Medium-term risks are low. The fan chart's mechanical signal shows a "moderate" risk as a result of the elevated debt level forecast for 2026 (the probability of debt stabilizing in the next five years is assessed to be only 40 percent).

The mechanical signal indicates the **risks from gross**

financing needs module's is moderate. The large GFN is a product of a high stock of debt as well as the sizeable issuance of short-term debt (around one third of general government debt has a residual maturity of less than one year). However, non-bank financial institutions are a major holder of general government debt (in part due to the prevalence of defined contribution pension schemes) so that a sudden rise in financing needs should be easily absorbed the U.S. diversified pool of domestic and international investors.



¹ See Review of The Debt Sustainability Framework For Market Access Countries, [IMF Policy Paper 2021/003](#).

THE CHALLENGE OF BUILDING BACK BETTER

37. The U.S. is facing multiple transitions in the coming years that will have important socio-economic implications.

- A **pandemic** recovery that likely creates lasting shifts (in the U.S. and abroad) in consumer preferences and in the modalities by which the economy operates.
- The move to a **low-carbon economy** will necessitate a significant reallocation of labor and capital (e.g. away from fossil fuels and heavy industry and toward renewables) and, potentially, a very different set of skills.
- A **demographic transition** that is already underway with 22 percent of the population is expected to be over-65 by 2040, the number of Americans over-85 expected will double by 2035, and the population will be increasingly racially diverse.
- Finally, **digitalization** and other evolving technologies will remake both production and consumption in unpredictable ways.

38. The longstanding flexibility and innovativeness of the U.S. system puts it in a good place to manage these transitions. However, great care should be taken to ensure that these multi-faceted changes do not increase income polarization, further hollow out the middle class, and leave behind a material share of the population (particularly lower-skilled, lower-income workers). A more effective social safety net and broader healthcare coverage will help. So too will increased investments in vocational and academic education. Greater spending on public investment can raise labor productivity and help improve living standards. However, other strategies may well be needed. These could include regional development initiatives to facilitate the transition. There may be a need to subsidize labor mobility (especially if newly created jobs are in areas where the cost of living and of housing is higher). Efforts will be needed to ensure schools and colleges are equipped to provide students with the basic technical and critical thinking skills needed for a fast-changing economy. Also, immigration policies will need to be re-examined to ensure there is the right supply of skills needed to meet the demands of the newly-created jobs.

39. Authorities' views. The administration was committed to ensuring that future economic outcomes were as inclusive as possible. Even before COVID-19, too many American families were struggling to make ends meet and too many Americans had been left behind. Policy was, therefore, singularly focused on ensuring that the old economy's structural weaknesses and inequalities were not repeated. Various strategies would be deployed to support households and to facilitate the transition to a greener, more productive, more competitive, and more equitable economy.

A. Health Care

40. The pandemic exposed serious shortcomings and fractures in the extraordinarily complex U.S. health system. The U.S. health system is very costly (Box 6), fragmented, and with highly unequal access and variable quality. Although the share of the population without health

insurance fell markedly after the introduction of the Affordable Care Act, the number of uninsured has been rising since 2016 (adding 2.2 million to the number of uninsured between 2016 and 2019). The uninsured population is typically low income, with at least one worker in the family, and disproportionately black and Hispanic. Also, with over half the population reliant on employer-provided health insurance, millions face the prospect of losing coverage when unemployment surges (as it did during the pandemic).

41. Important steps have been taken in the first few months of the administration to address maintaining and expanding access to healthcare. The American Rescue Plan covered the costs of keeping laid-off workers on their former employer's healthcare plan until September 30. The plan also fully paid for coverage for the lowest income workers, increased premium subsidies for those earning up to 400 percent of the federal poverty level, and capped the costs an individual pays for a benchmark plan. In addition, the American Rescue Plan increased the incentives for states to expand Medicaid (to cover a larger share of low-income households). The administration has reopened the enrollment period for policies sold on the federal health insurance exchange and significantly increased spending to raise public awareness and encourage people to purchase a policy, or even upgrade their existing policy, on the exchange. The early indications are that these efforts are working and that the number of uninsured has been put back on a downward trajectory.

42. Authorities' views. The measures taken under the American Rescue Plan are expected to have an important impact on both the coverage and affordability of healthcare. This was being clearly demonstrated in the number of families signing up for health insurance during the special enrollment period. The administration remains committed to providing people aged 60 or older the option to enroll in the Medicare program. Reforms are also intended to bring down drug prices, including by letting Medicare negotiate payment for certain drugs. U.S. healthcare costs were viewed as very high and this level of spending was not leading to better health outcomes. A number of factors were at work to boost costs including technological innovations that improved health outcomes, adverse incentives created by the pay-per-procedure model, and a lack of transparency in pricing. The increased consolidation of the health sector in recent years was increasing market power, particularly in certain local markets, which was boosting costs. Finally, the uneven quality of U.S. healthcare remains an important concern with lower income communities having less access to high quality care.

Box 6. The High Level of U.S. Healthcare Costs

Healthcare in the U.S. is the most expensive in the world and the cost gap relative to international comparators has grown over time. About three quarters of the cost differential between the U.S. and OECD comparators is accounted for by inpatient and outpatient care. Despite the significant resources devoted to healthcare, the U.S. underperforms across a range of health outcomes (e.g. life expectancy, population coverage, etc.).

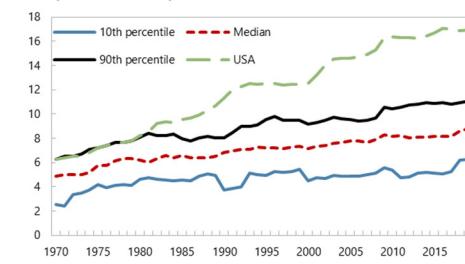
Market power in the U.S. health industry has increased significantly since the 1980s, which has contributed to rising costs.¹ Analysis of micro-data on publicly listed firms in the healthcare sector and hospitals shows that:

- Overall markups (defined as the ratio of price to marginal cost of production) almost doubled since the early 1980s. Hospital markups have also increased significantly (by more than 6 percent on average) since the late 1990s across U.S. states.
- Rising healthcare sector markups are estimated to account for about one quarter of the increase in per capita healthcare costs in the U.S. since the 1980s.
- Hospital markups alone are responsible for 15 percent of the variation in healthcare spending across states.
- Rising hospital markups are not, however, associated with lower labor costs or insurance markups (suggesting that providers use their market power to raise prices to consumers rather than taking advantage of their monopsony power to lower payments to providers further down the supply chain).
- Physicians' salaries have risen above pace for salaries of non-physicians (even after controlling for years of education and experience).
- The Medicaid expansion has increased practitioner wages suggesting a relatively inelastic supply response to the welcome increase in coverage that resulted from the Affordable Care Act.

The significant contribution of market power to healthcare costs suggests the need for carefully-considered policy responses. Licensing requirements or limits on the flow of new medical professionals are necessary to underpin the quality of services but have become an increasingly binding constraint to entry that may need to be recalibrated. Similarly, ongoing mergers and acquisitions may offer providers greater scope to engage in non-competitive pricing. This would argue for a more assertive approach to antitrust policies (at both the federal and state level) to identify and counter any restraints of trade that are unreasonably restricting competition in the provision of health services. Lower markups would help increase efficiency but would also lower the burden that healthcare places on the fiscal accounts.

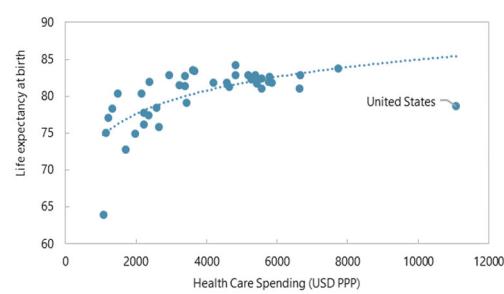
¹ See L. Lin, M. Mrkic, and A. Weber, "U.S. Healthcare: A Story of Rising Market Power, Barriers to Entry, and Supply Constraints." IMF Working Paper 21/180.

OECD Countries: Cost of Healthcare (Percent of GDP)



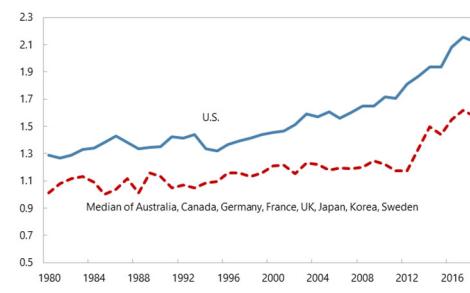
Sources: OECD, IMF Staff calculations.

Life Expectancy and Health Care



Sources: OECD, IMF Staff calculations.

Median Healthcare Sector Markups



Sources: Thomson Reuters, IMF Staff Calculations.

B. A “Greener” Economy

43. The administration has rejoined the Paris Climate Accord and has committed to reducing net greenhouse gas emissions by 50–52 percent by 2030 (relative to 2005 levels). A principal focus of the administration’s plan is to make the U.S. power sector carbon-neutral by 2035 by spurring an expansion of renewables and retrofitting existing thermal and nuclear plants. Investments are also proposed to increase the transmission capacity and resilience of the current electrical grid. In transportation, efforts will be made to tighten fuel efficiency standards, subsidize zero emission cars, build electric vehicle charging infrastructure, invest in public transit, and replace school buses, transit vehicles, and the federal fleet with electric vehicles. To increase the energy efficiency of buildings, resources are proposed to retrofit federal buildings, schools, commercial buildings, and homes for low income households. There are also provisions to support R&D in green technologies as well as remove existing tax preferences for fossil fuel companies.

44. The administration’s new impetus to reduce greenhouse gases represents a critical, and very positive, change of direction. While many of the steps that will be needed to achieve the administration’s climate goals have yet to be defined, the broad scope of the plans that have already been articulated (and the significant investments that are expected to be made), if realized, will jump-start the transition to a low carbon economy. However, it will be costly and difficult to achieve the administration’s climate objectives without a greater focus on carbon pricing (Box 7) and sectoral-based policies to tilt incentives away from carbon-intensive activities (Box 8). In the meantime, as political support is being built for a carbon tax, regulatory actions could be strengthened to increase the disincentives for greenhouse gas emissions. Announced efforts to reduce implicit subsidies for the fossil fuel industry are important. However, a similar approach is needed for the agro-industrial sector (Box 9). Finally, shifting to a low emissions means of generating electricity will be essential to achieve the administration’s climate goals (Box 10).

45. Authorities’ views. The administration is committed to achieving its revised, nationally determined contribution under the Paris Agreement and work is already underway to ensure the power sector would be carbon-neutral by 2035 and that the economy would have net zero emissions by 2050. Policies are being designed to ensure that tackling climate change and creating well-paying, union jobs go hand-in-hand. At the same time, climate policies would be structured so as to protect public health and advance environmental justice. Substantial investments were being proposed to both mitigate climate change and to improve the economy’s resilience to its effects. These include improving the energy efficiency of federal buildings and low-income housing; increasing resilience to wildfires, flooding and drought; building out infrastructure for electric vehicles and electrifying the federal fleet; remediating abandoned oil and gas wells; and investing in climate science and research in clean energy technologies. The administration is also looking for ways to provide incentives for the adoption of conservation practices that reduce emissions and enhance carbon sequestration in soils and ecosystems which should provide meaningful climate mitigation and improve the profitability of agriculture and forestry.

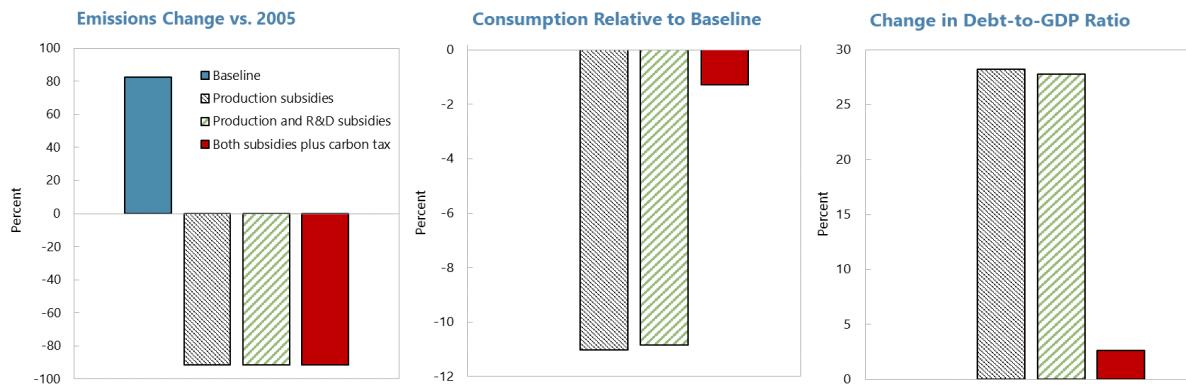
Box 7. Achieving the Administration's Emissions Goals With, and Without, Carbon Pricing

To assess the potential of different policy packages to achieve the administration's climate goals we examine a range of simulations in a macroeconomic climate model with endogenous R&D¹ and find that:

- **Relying on production subsidies alone to incentivize clean energy is fiscally costly.** First, unlike pricing carbon, production and R&D subsidies for clean energy add directly to public expenditures. Second, subsidies lower the relative cost of clean energy which incentivizes a switch away from high carbon energy but also adds to total energy demand. This energy demand channel makes subsidies less effective, especially in cases where carbon-intensive energy cannot be easily substituted for. Third, the fiscal costs of the subsidies rise over time in proportion to the increased use of clean energy. Deficit-financed subsidies serve to boost aggregate demand but also add 28 percent of GDP to the debt stock by 2050.
- **Clean energy subsidies can be more effective if combined with carbon pricing.** Carbon pricing is a highly effective policy tool since it raises the overall cost of energy and creates first-order reductions in energy demand. This can then amplify the incentives to shift away from carbon-intensive energy created by subsidies. Front-loaded subsidies (to both R&D and to the production of clean energy), combined with a carbon tax (that starts at US\$17 per ton of CO₂ and gradually rises by around 9 percent per year), would be able to achieve the administration's targeted reduction in emissions but without adding to debt-GDP.

It is worth noting that the model simulations assume unilateral U.S. actions. The benefits from a comprehensive U.S. approach could also catalyze a more ambitious set of climate policies by other countries. U.S. support for clean energy R&D would also create scale for those investments and have broader positive spillovers, creating new green technologies that could then be adopted by others.

Tax and Subsidy Policies to Achieve the U.S. Emissions Targets



¹ See P. Barrett, "Can International Technological Diffusion Substitute for Coordinated Global Policies to Mitigate Climate Change?", IMF WP 21/173.

Box 8. “Pricing” Policies to Strengthen U.S. Greenhouse Gas Mitigation¹

As discussed in Box 7, economic efficiency argues for a broad-based carbon tax in the U.S. to integrate carbon charges into federal fuel taxes and extend them to coal, natural gas, and other fossil fuels. Such a tax would provide a robust price signal that would reduce energy demand and redirect investment to cleaner technologies.

Sectoral carbon pricing instruments could, however, provide a helpful, reinforcing complement to such a carbon tax. A promising approach is through feebates that impose a revenue-neutral, sliding scale of fees on activities with above-average emission intensities combined with rebates for activities with below-average emission intensities. Feebates would:

- Promote a reduction in the emissions intensity of a particular sector (for example, feebates may encourage investments in lower-emissions vehicles but without, on aggregate, encouraging people to drive less) that would complement a first-order demand response from a carbon tax.
- Be cost-effective compared to regulatory limits (the latter would need to be complemented by a credit trading scheme to achieve a similar degree of efficiency).
- Create certainty over future emissions prices (especially compared to trading systems where pricing is sensitive to the balance of demand and supply).
- Not impose an additional fiscal cost (unlike the clean technology subsidies discussed in Box 7).
- Avoid an additional tax burden (beyond that created by economy-wide carbon pricing) on the average household or firm.
- Be complementary to regulations in providing market incentives to exceed those regulatory standards.

Feebates in the transportation sector. New vehicle sales could be taxed/subsidized at a rate that is equal to the product of (i) the desired carbon price; (ii) the difference between the vehicle’s emissions per mile and the fleet average; and (iii) the average lifetime mileage of the vehicle. Such an approach would provide a more comprehensive incentive to purchase fuel-efficient vehicles than the current system (i.e., electric vehicle subsidies combined with taxes on cars that average less than 16 miles per gallon or CO₂ emission rates above 700 grams per mile). A feebate design would have the advantage of building in an automatic reduction in the size of the subsidy for EVs as the average emission rate falls.

Feebates in the power sector. Generators could be taxed/subsidized based on the product of (i) the desired carbon price; (ii) the difference between the generator’s CO₂ per kWh and the industry average; and (iii) the generator’s total output.

Feebates in other sectors. Similar tools could be used to promote greenhouse gas mitigation in industry (similar to Canada’s output-based performance standard), for new appliances, and in agriculture. Feebate tools could also provide market incentives for carbon sequestration (e.g. through subsidies for wetlands or forests).

¹ See I. Parry, “Implementing the United States’ Domestic and International Climate Mitigation Goals: A Supportive Fiscal Policy Approach.” [IMF Working paper 21/57](#).

Box 9. Meeting the U.S. Climate Goals—The Potential Contribution from Agriculture

During 2019, emissions from U.S. agriculture totaled 669 million metric tons of CO₂-equivalent (10 percent of total U.S. emissions or approximately equal to the CO₂-equivalent emissions of France and Italy combined). U.S. agriculture is fossil fuel-intensive and uses a significant amount of chemical fertilizers and pesticides as inputs. Nearly 80 percent of U.S. agricultural emissions are related to the production of animals and animal feed. These emissions are particularly important because farm animals and their manure, along with the oil and gas industries, are the leading sources of methane emissions (a pollutant that is shorter-lived than carbon dioxide but far more powerful as a greenhouse gas). According to the UN Intergovernmental Panel on Climate Change, rapidly reducing methane is the strongest up-front action available to slow global warming and limit its consequences over the near term.

Various federal policies—including federal payments to supplement farm income, subsidize loans, duties on imported agricultural products, and crop insurance—create distortions that incentivize the overproduction of high-emission crops and animals.¹ In addition, the Renewable Fuel Standard (requiring transportation fuels to contain a minimum biofuel content) adds to agriculture's carbon footprint (by fostering the expansion of industrially-run, chemically-fertilized corn farms) and potentially diverts agricultural capacity away from food production.

The administration's plan for Climate Change and Environmental Justice proposes paying farmers to increase the amount of carbon stored in soil (e.g. by supporting no-till agriculture and the planting of cover crops). A broader, "all-of-government" approach should be considered that examines the full range of federal incentives and restrictions through the lens of their contribution to greenhouse gas emissions. This would both support the administration's ambitious climate goals while offering co-benefits in terms of local communities' jobs, food justice and public health.² Potential policies could involve:

- Phasing out agricultural subsidies that incentivize high-emission farming activities (in a similar vein to the administration's commitment to phase out federal subsidies for fossil fuel providers).
- As discussed in Box 8, designing feebate schemes based on farm output and relative emissions intensity.
- Expanding crop insurance subsidies to a broader set of crops and livestock but conditioning them on recipients meeting benchmarks for greenhouse gas emission reductions. The benchmarks could, for example, be calibrated to attain a gradual reduction in the number of livestock over time.
- Federal insurance could be capped for larger agricultural producers so that their additional insurance needs would be met through actuarially-fair insurance from private providers.
- Targeting subsidies and loans to support fishing and marine farming practices that are compatible with marine biodiversity conservation (such as shallow trawlers and/or regenerative ocean farming).
- Providing federal funding for R&D in lower-carbon agricultural practices and to develop more climate-friendly products.

¹ See, among others, B. K. Goodwin and V. H. Smith, 2013; F. Annan and W. Schlenker, 2015; and E. Njuki, 2020.

² See, for example, N. Batini, *The Economics of Sustainable Food: Smart Policies for People and The Planet*, Island Press and International Monetary Fund, 2021 and N. Batini, J. Scorse and S. Secchi, "The Role of Economic Policy in Reducing Emissions and Protecting Natural Ecosystems in the U.S. Agriculture, Fisheries and Forestry Sector", mimeo, 2021.

Box 10. The Importance of Prioritizing the Greening of the Power Sector

Remaking the power and transportation sectors will be key to achieving the administration's climate targets. The two account for more than half of total emissions and are highly complementary: low power sector emissions help "green" electric vehicles.

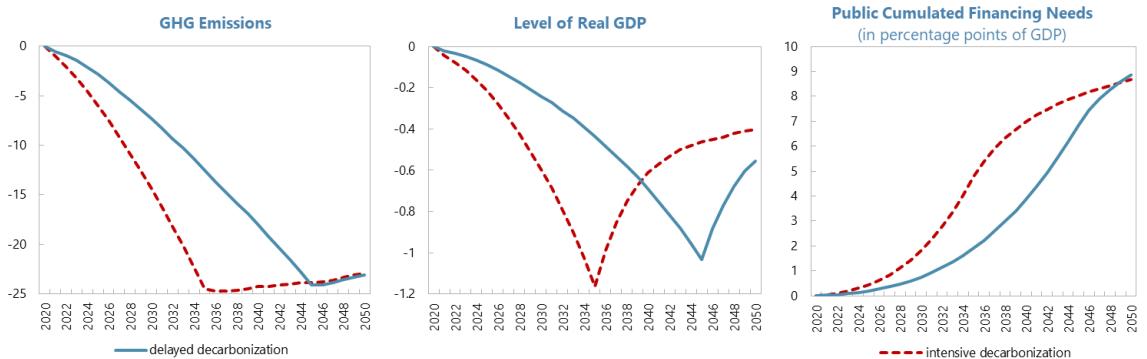
A dynamic computable general equilibrium model¹ is used to simulate two scenarios:

- "Intensive decarbonization" where fossil fuel power generation is phased out by 2035.
- "Delayed decarbonization" where the phase-out is delayed to 2045.

Both scenarios assume a rapid penetration of electric vehicles (see [IEA's Sustainable Development Scenario](#)), which, on its own, would lead to higher emissions in 2021–30. Two power sector policies are also assumed: (i) subsidies for wind and solar power generation; and (ii) a Clean Energy Standard that requires a rising path for non-fossil fuel generation.² Subsidies are progressively scaled back once the emissions targets are achieved.

Intensive decarbonization achieves the administration 2035 goals for the power sector and carries lower GDP costs and public financing needs by 2050 (relative to the delayed decarbonization scenario). Early decarbonization reduces total emissions by 25 percent relative to the baseline by 2035. Cumulative GDP losses peak at 1.2 percent below baseline in 2035 (i.e. less than 0.1 percentage points of GDP per year). On the other hand, "delayed decarbonization" achieves a mere 13 percent reduction by 2035 with similar GDP losses and cumulative public financing needs by 2050. This reflects the early payoffs from supporting green technologies and the fact that costly subsidies can be phased out at a sooner point under "intensive decarbonization".

Scenarios to Decarbonize the Power Sector (Ppts deviations from baseline)



This transition has limited overall labor effects but implies an important rotation from high- to low-emission sectors. By 2035, fossil fuel sectors could lose around 26 percent of their workforce. Losses are larger for fossil-fueled power generation than for extractive sectors (the latter increase their exports and divert supply to non-power sectors). Renewables and electricity distribution see their employment rise by 40 percent. This significant transition of workers will not be frictionless and is likely to give rise to locational and skills differences that will need to be addressed.

¹ See D. Van der Mensbrugghe, "The ENVISAGE model", 2020, and J. Chateau et al., "OECD ENV-Linkages Model", 2014.

² Subsidies are calibrated to reach emission targets while keeping the Clean Energy Standard at a level that imposes a shadow cost similar to a sector-level carbon tax that rises gradually from zero to around US\$70 per ton by 2050. For a set of potential optimal policies, see Stock and Stuart, "Robust Decarbonization of the US Power Sector: Policy Options", 2021.

C. A More Resilient Financial System

46. The unfolding pandemic revealed important shortcomings in the functioning of critical U.S. markets. The Treasury market has long been the deepest and most liquid fixed income market in the world. However, in March 2020, the market showed itself unable to digest the significant shift of assets from prime and tax-exempt funds to money market funds backed by Treasury securities. Unprecedented selling by bond mutual funds, trying to meet investor redemptions, overwhelmed broker-dealer intermediaries facing both balance sheet constraints and internal risk limits. At the same time, foreign official institutions were liquidating reserve assets to provide dollar liquidity to their own markets, market volatility was forcing leveraged investors to exit positions, and margin requirements were increased for investors with derivative exposures. Finally, nonfinancial corporates were active in drawing down their credit lines at banks to prepare for a pandemic-related cash crunch (which further reduced banks' balance sheet space to provide liquidity). All of these forces combined to exacerbate pressures in both Treasury and money markets. The problems in Treasury and short-term funding markets spilled over and created liquidity shortages also in markets for commercial paper, short-term municipal debt, and negotiable certificates of deposit.

47. The confluence of factors quickly forced the Fed to step in to restore market functioning. To short-circuit these fire sale dynamics, the Fed absorbed US\$2 trillion in securities over the space of two months and quickly activated a range of facilities to simultaneously inject liquidity across a broad range of markets.

48. Preventing a recurrence of those vulnerabilities that manifested in March 2020 will require a range of changes across markets and institutions.¹⁴ The size of the U.S. Treasury market and its systemic importance argue for robust measures to prevent another episode of market illiquidity that triggers the need for Fed intervention. In this regard, it is of concern that in March 2021 there were signs of a reoccurrence of deteriorating market liquidity. Possible changes that could be considered include:

- *Central clearing of Treasury market transactions.* With broker-dealer balance sheets increasingly constrained (especially relative to the size of the Treasury market), serious consideration should be given to mandating central clearing of all Treasury transactions (with the clearinghouse subject to strict supervisory oversight as well as robust resolution planning).
- *The introduction of a standing repo facility.* To create greater certainty about the availability of market liquidity in times of stress, the Fed could introduce a standing repo facility aimed at a broad selection of well-supervised banks and nonbanks. The existing FIMA repo facility (for foreign official institutions) should also be made permanent.

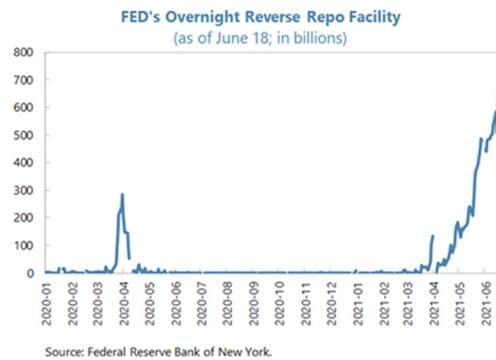
¹⁴ On March 31, the Financial Stability Oversight Council discussed the activities and performance of open-ended mutual funds and hedge funds during the COVID crisis. Chairperson Yellen called for an interagency effort to assess potential financial stability risks associated with open-end funds (focusing on liquidity risks) and to diagnose the causes of recent Treasury market disruptions with a view to enhancing market resilience.

- *Floating net asset value.* Retail prime, institutional government, and tax-exempt money market funds should be required to move to a floating net asset value (so as to mitigate run risks).
- *Stress testing.* There would be merit to subject funds to an annual liquidity stress test—similar to the Fed’s supervisory stress test of bank holding companies—to ensure that funds are able to continue operating effectively in a tail-risk scenario.
- *Enhancing fund liquidity.* More liquidity protections could be required from funds, perhaps applied proportionally to the illiquidity of the funds’ assets. These protections could include more binding (and possibly countercyclical) liquid asset requirements, pre-determined arrangements that lock-in a proportion of an investor’s shares for a minimum amount of time, use of in-kind redemptions to meet withdrawals by institutional investors, swing pricing, and requirements that would temporary gate outflows under certain conditions.

49. Accommodative financial conditions and the rapid pace of economic recovery have encouraged continued risk-taking. Loose financial conditions, that were engineered to support the recovery, have led to an upward surge in asset prices and a compression of risk premia. Most notably, spreads on risky debt have fallen to multi-year lows (although measures of the equity risk premium remain close to historical averages). Corporate leverage is high relative to history although rollover needs are relatively small (only around 5 percent of non-investment grade is due within 1 year as firms have been able to refinance debts at longer maturities and lower costs). Policy support and the longer duration of corporate liabilities have allowed the business sector to weather the COVID shock remarkably well. However, the financial situation of smaller businesses is uncertain with the PPP program potentially masking underlying vulnerabilities.

50. Going forward, rising corporate and nonbank leverage poses a systemic risk. The banking system appears to be in a strong position, despite the very large shock experienced last year. Solid profitability, restrained capital distributions and buybacks, and a relatively small effect of the pandemic on credit quality have ensured that bank capital levels are now above pre-pandemic levels and resilient to even a severe stress test. Banks remain highly liquid and high household savings have increased deposit inflows and reduced funding risks. Credit risks emanating from ongoing structural shifts in commercial real estate are, though, of concern with rising vacancy rates, falling rents, and increasing delinquencies (notably for debt linked to retail and hotels). Also, the phasing out of government support schemes will potentially lead to increased delinquencies but banks have built up loan loss allowances that should allow them to readily absorb such a deterioration of credit quality. On the other hand, leverage in nonbanks has increased and both life insurance companies and hedge funds are exposed to lower-rated corporate debt. This creates the potential for systemic problems to emerge from, or be propagated by, nonbanks. These concerns are not lessened by recent episodes that highlight the incompleteness of the available information on nonbanks’ risk profile (including for family offices). In the absence of well-targeted macroprudential tools to manage such risks, consideration should be given to building larger buffers in the more regulated part of the financial system as a second-best substitute.

51. Over the past several weeks there has been a step-up in usage of the Federal Reserve's overnight reverse repo facility.¹⁵ This reflects the drawdown of the Treasury's balance at the Federal Reserve together with the proceeds of the Fed's ongoing asset purchase program, both of which have injected liquidity into the financial system, adding to depository institutions' reserves held at the Fed. However, this increased usage of the facility also potentially more lasting trends such as an increasing desire for banks to shed deposits as they run up against regulatory constraints (notably the supplementary leverage ratio¹⁶ and G-SIBs surcharge). As these resources migrate out of the banks and into money market funds they then enter into reverse repos with the Fed to earn a small spread. Potentially a shortage of short-dated Treasury securities is amplifying these forces. While not of an immediate concern, these trends bear watching since they could signal increasing disintermediation out of the banking system. Also, when the Federal Reserve eventually begins to raise the federal funds rate, it may require much larger overnight reverse repo operations in order to maintain the federal funds rate within the target range set by the FOMC (as an indication, during the 2014–15 period, overnight repos were broadly in the range of US\$1–200 billion).



52. The housing market appears to be on a vigorous upward path which could raise financial stability concerns in the event of a reversal. The rate of increase of house prices has tripled relative to before the pandemic, spurred by falling mortgage rates, robust growth in disposable income, and shifting housing preferences, also raising concerns about housing affordability and access to the housing market. However, mortgage debt has grown by a fairly modest amount (around 5 percent y/y) and lending has been concentrated in households with high credit scores. Furthermore, even for vulnerable households that were hit hardest by the pandemic, federal and private sector efforts to temporarily defer loan payments have provided important support and has resulted in a decline of mortgage delinquencies.¹⁷

53. A range of FSAP recommendations have not been addressed (see Appendix 4). These include: (i) ensuring each FSOC member has an explicit financial stability objective in their mandate; (ii) intensifying efforts to close data gaps, including reporting disclosures of holdings of CLOs and leveraged loans, to reinforce market discipline; (iii) finalizing the arrangements for market-wide circuit breakers and providing greater budgetary autonomy for the SEC and CFTC; and (iv) reviewing

¹⁵ Under the facility, the Federal Reserve sells a security to an eligible counterparty and simultaneously agrees to buy back the same security at a specified price the next day. Eligible counterparties are typically larger banks, government sponsored entities and certain money market funds.

¹⁶ The SLR affects financial institutions with more than US\$250 billion in assets, requiring them to hold a minimum ratio of 3 percent of Tier 1 capital against their total leverage exposure. On April 1, 2020, the Federal Reserve announced that it would exempt U.S. banks' Treasury bond holdings and reserves held at Federal Reserve Banks from SLR calculations but this temporary exclusion expired on March 31, 2021.

¹⁷ The CARES Act offered homeowners (whose mortgage was guaranteed by Fannie Mae, Freddie Mac, or Ginnie Mae) up to 12 months in payment deferral if they were experiencing hardship associated with COVID-19. Typically, these missed payments are capitalized and the loan's maturity is extended.

prudential requirements for non-internationally active banks (category III and IV) and ensure they continue to be consistent with the Basel framework.

54. Authorities' views. Overall, financial stability risks were seen as being at moderate levels, although vulnerabilities have been increasing as leverage and risk appetite have risen. Asset price valuations appear elevated, visible in the spreads of lower quality credit and other risk assets. The limited visibility into hedge fund leverage was also of concern. On the other hand, the prospect of widespread corporate failures has declined and household balance sheets have strengthened (although the situation of the most financially vulnerable remains of concern). Banks were viewed as well-capitalized and liquid, having weathered the COVID shock well. On the other hand, hedge fund leverage has risen and there were signs of increased risk exposures in a range of nonbank financial institutions. The market turmoil in 2020 highlighted systemic vulnerabilities in some key asset and funding markets as well as among some types of mutual funds. Ensuring these markets remain robust under stress is a key focus of the financial regulators and the Financial Stability Oversight Council. The lessons from the 2020 experience are now being studied carefully.

D. Gaining From Trade

55. The administration has underscored the need for a “worker-centric” trade agenda that ensures that global trade benefits Americans as workers and wage-earners, not just as consumers. In pursuing these objectives, a removal of the obstacles to free trade would help support U.S. workers and create more and better U.S. jobs (particularly in light of the domestic efforts that are being proposed to increase productivity, labor supply, and the competitiveness of U.S. producers).

56. It is of significant concern, therefore, that many of the trade distortions introduced over the past four years remain in place. In particular, tariffs have been kept on imported steel and aluminum, washing machines, solar panels, as well as a range of tariffs imposed on China. The administration has also committed to prioritizing U.S. producers in public procurement, strengthening the “Buy American” requirements put in place by the previous administration. These policies should be reconsidered. The continued imposition of import tariffs, broad restrictions on imports for national security reasons, and expanded preferences for U.S. producers in procurement serve to undermine the multilateral trade and international monetary system as well as harm the U.S. economy. Trade restrictions and tariff increases should be rolled back and “Buy American” requirements should be tightly circumscribed and made consistent with the U.S. international obligations.

57. The entanglement of trade and currency issues over the last four years represents a significant risk to the multilateral trade and international monetary systems. Over the past year, the U.S. has undertaken investigations on currency-based countervailing duties for China and Vietnam and has released affirmative findings in a Section 301 investigation of Vietnam’s currency practices, finding evidence of currency undervaluation that harms U.S. workers and businesses. Furthermore, there is a risk that the pending renewal of Trade Promotion Authority could require

enforceable currency provisions in all new U.S. trade agreements. Treating currency undervaluation as a subsidy to be countervailed raises concerns both in the finance and trade spheres. The threat of trade penalties could potentially impinge on monetary policy decisions and discourage exchange rate flexibility, while complicating the effective dialogue that underpins economic surveillance. Furthermore, other countries might pursue a similar approach to link trade and currency, perhaps using their own standards and methodologies, with the potential for a broadening use of trade restrictions and a further increase in trade tensions. Currency-related trade responses should be avoided and enforceable provisions on currency policy should not be attached to U.S. trade agreements. Instead, the U.S. should work constructively with its trading partners to better address the underlying macro-structural distortions that are affecting external positions.

58. There is a clear need to address longstanding global trade and investment distortions in areas such as tariffs, farm subsidies, industrial subsidies, and services trade. The U.S. should work actively with international partners to strengthen the rules-based multilateral trading system and address these longstanding global trade and investment distortions. Renewed engagement at the WTO—including restoring the proper functioning of the dispute settlement system—could help facilitate progress on these topics.

59. Authorities' views. The administration is focused on ensuring a fair international trading system that promotes inclusive and sustainable growth and a rules-based international order. Trade policies should help address the global climate crisis, respect the dignity of work, and ensure that manufacturing supply chains are resilient. Trade policies and trade agreements can also be valuable tools in supporting the administration's climate objectives, combatting exploitative labor conditions and discrimination, and tackling barriers to free and fair trade. Finally, trade policies should be judged by their impact on, and consequences for, U.S. workers and communities including by ensuring they incentivize strong, enforceable labor standards in trading partners to protect workers' rights and security. Unfair practices by U.S. trading partners were standing in the way of these goals. A comprehensive review of trade tariffs and restrictions is being undertaken. Policies relating to currency practices will aim to put effective pressures on trading partners that are intervening in the foreign exchange market to gain an unfair advantage in trade. Finally, on procurement rules, the Administration is currently undertaking a review of U.S. statutory authority as a result of an executive order on strengthening "Made in America Laws", including Buy American provisions. The administration is committed to executing these provisions consistent with the U.S.'s existing international obligations. Nothing in the executive order is inconsistent with existing U.S. rights or obligations under international agreements, such as the Agreement on Global Procurement or U.S. free trade agreements.

E. A More Equitable Society

60. The U.S. has long-faced high rates of poverty (Box 11). The economic expansion prior to the pandemic had put poverty on a steadily downward trend. However, even after a decade of growth, over 38 million Americans were still living below the poverty line (after accounting for the

impact of social assistance programs), many of them children, minorities and living in female-headed households.

61. The pandemic hit lower income, lower skilled workers the hardest. In March–April 2020, 11½ percent of those without a college degree lost their jobs (more than twice the rate of those with a college degree). Many of these workers were employed at in-person services and many, particularly women, were forced to drop out of the labor force to take care of young children as schools and day care closed. Food insecurity during the early months of the pandemic doubled for the population as a whole, tripling for families with children.¹⁸ Low-income students suffered the largest learning loss, particularly younger children. Although emergency spending under the CARES Act reduced poverty at the start of the pandemic, by March 2021 the poverty [rate](#) was around 1 percent above 2019 levels (although has subsequently fallen due to the impact of spending under the American Rescue Plan). Finally, COVID-related health outcomes have been worse for the poorest households (with higher infection and death rates).

62. The pandemic further increased wealth inequality. Over the past 30 years, median household net worth has fallen in real terms for the bottom 40 percent of the income distribution. Over the same period, the median net worth of the top decile of the income distribution has more than doubled. In addition, the real net worth of the median household was lower in 2019 than it was in 2001. These wealth inequalities grew further over the past year as asset prices accelerated upwards.

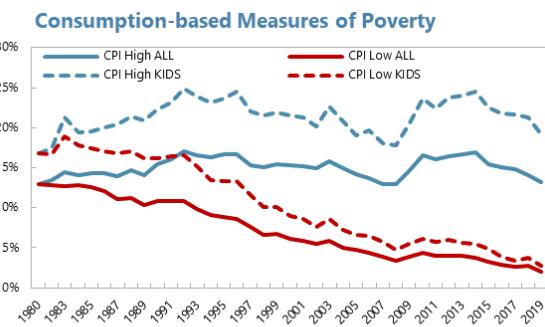
63. There have been long-standing racial disparities in economic and social outcomes in the U.S. (Figure 3) These striking differences in outcomes are related to a range of deep-rooted factors. Data suggests that minority households continue to be more likely to live in poorer neighborhoods, send their children to under-resourced school, lack basic health care coverage, face lower socio-economic mobility, be more impacted by climate change, and be victims of violent crime.

¹⁸ See D. Schanzenbach, and A. Pitts, "How Much has Food Insecurity Risen?" Institute for Policy Research.

Box 11. The Complexity of Measuring Poverty in the U.S.

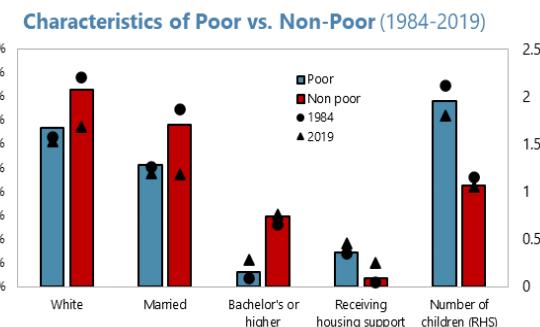
The U.S. official poverty measure compares a family's income to a poverty threshold that is based on a multiple of the cost of a specific food basket. More recent studies have argued that consumption-based measures of poverty—that draw on household expenditure surveys and attach a consumption equivalent to the value of government assistance—provide a more accurate picture of poverty.¹ Consumption based measures are able to (i) capture non-cash benefits; (ii) account for savings; and (iii) be more accurate (since consumption outcomes are typically better-measured for lower income households than is income).

For consumption-based measures, the choice of price index has an important implication for the level of poverty.² The sensitivity of poverty measures to price index creates significant uncertainty about how poverty evolves over time. Work by Meyer-Sullivan suggest that poverty thresholds should be indexed at a rate that is lower than CPI which, if accurate, would imply a significant reduction in poverty over time. On the other hand, recent studies have found evidence that those at the lower end of the income distribution face higher, not lower, inflation than is measured by the CPI (the bottom quintile facing around 0.4 percentage points higher inflation than that the top quintile).³ Relying on a price index that is linked to the consumption patterns of the bottom quintile would mean that the share of the population living in poverty has not fallen materially since 1980.



Notes: Consumption measure excludes education/health as in Meyer and Sullivan (2012).
CPI High adjusts CPI U upwards by 0.4 while CPI Low adjusts it downwards by 0.8 (the latter as in Meyer and Sullivan, 2012).

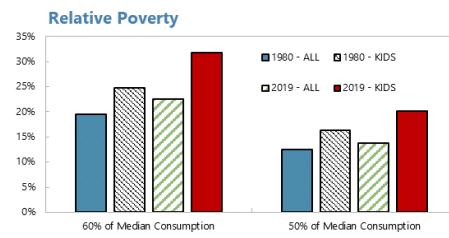
Sources: CE Survey; BLS; IMF Staff calculations.



Notes: Consumption measure excludes education/health as in Meyer and Sullivan (2012). Bar height represents average values for 1984-2019 time period.

Sources: CE Survey; BLS; IMF Staff calculations.

Other metrics point to a more pessimistic interpretation of the progress that has been made in reducing U.S. poverty over time. For example, food insecurity does not appear to have declined over the last 20 years. Also, relative consumption-based poverty measures—such as the share of the population consuming less than 50 or 60 percent of median household consumption—have been rising over time.



Notes: Consumption measure excludes education/health as in Meyer and Sullivan (2012). Sources: CE Survey; BLS; IMF Staff calculations.

¹ B. D Meyer and J.X. Sullivan, 2012, "Winning the War: Poverty from the Great Society to the Great Recession" Brookings Papers.

² E. R. Berndt, 2006, "The Boskin Commission Report after a Decade: After-life or Requiem?" International Productivity Monitor 12: 61–73

³ X. Jaravel, 2019, "The Unequal Gains from Product Innovations: Evidence from the U.S. Retail Sector", Quarterly Journal of Economics, 134: 715–83.

64. The administration has indicated it intends to increase support for those communities that have been historically underserved, marginalized, or adversely affected by persistent poverty. This has been visible in multiple areas. Proposed policy changes aim to increase the progressivity of the tax system and expand spending in areas (like education, childcare, food assistance, and healthcare) that are most incident on those at the bottom of the income distribution. All in all, if realized, these plans would increase the amount of redistribution taking place through federal taxes and transfers. Furthermore, the American Jobs Plan aims to provide 40 percent of the benefits from climate and clean infrastructure projects to disadvantaged communities as well as invest in affordable transportation options for low income families. Finally, the administration has proposed an increase in the federal minimum wage to US\$15 per hour (although prospects for legislating such a change are uncertain).

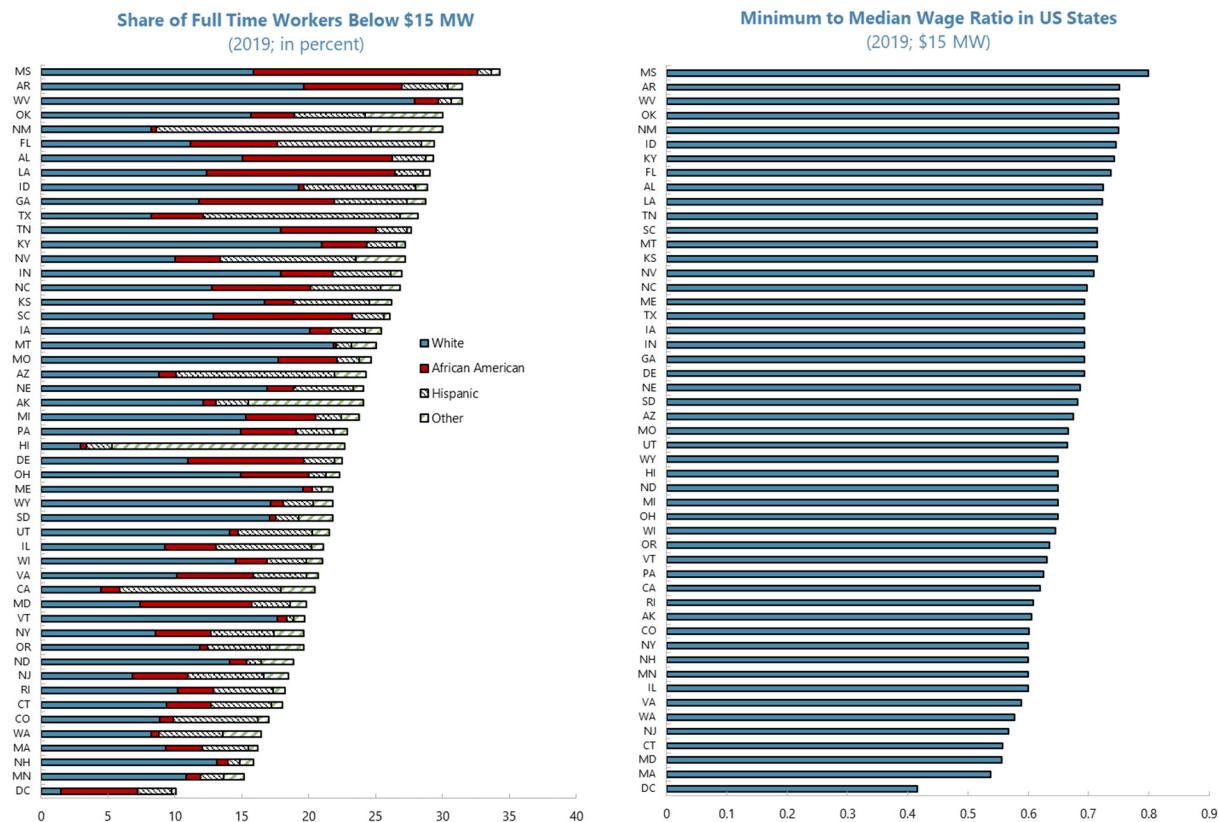
65. Many of the authorities' proposed policies to mitigate poverty and increase social mobility have been advocated for in past consultations. The U.S. has important scope to strengthen its social safety nets and increase the progressivity of its tax system (particularly by closing loopholes that allow high net worth individuals to avoid taxes on labor income, capital income, and inter-generational transfers). Greater attention could be paid to simplifying the multitude of federal, state and local programs to aid the poor and to redesign social programs to remove "cliffs" (i.e., where programs phase-out abruptly as household income rises). To help ensure the benefits of federal tax credits and other assistance are incident on the working poor, there is scope to raise the federal minimum wage.

66. Authorities' views. The U.S. faces a series of structural challenges that have resulted in families at the bottom end of the wage distribution seeing their pay stagnate amidst a persistence in gender and racial pay gaps. Minority households continue to have wealth levels that are only a fraction of that held by the average white family. The American Jobs and Families Plan would begin the process of repairing the fractured foundations of the U.S. economy. Although directing a sizable share of the resources in these programs to historically underserved communities will represent an operational challenge, there was a strong commitment, across a range of agencies, to achieve the "Justice40" goal of delivering 40 percent of the benefits of federal investments to disadvantaged communities. Finally, a US\$15 minimum wage would be a powerful tool to raise incomes, reduce poverty and restore social equity. Empirical evidence suggests that the employment effects of setting the minimum wage at such a level would be small.

Figure 2. The Potential Coverage of a US\$15 Minimum Wage in the U.S.

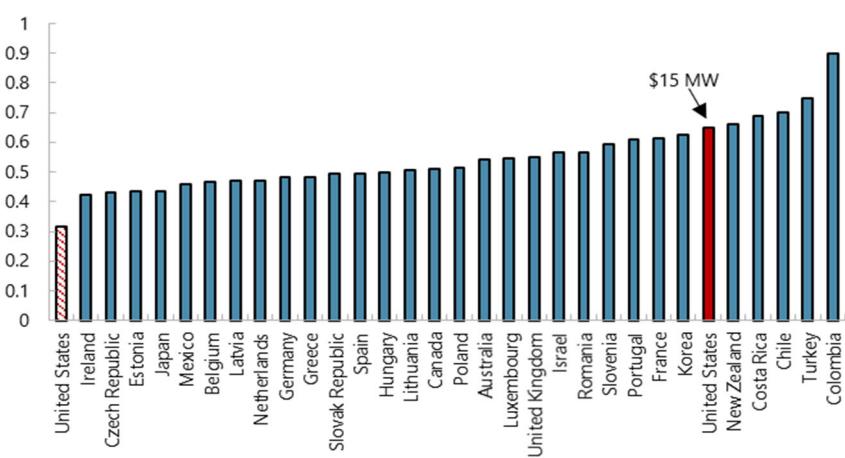
A US\$15 minimum wage would be binding for a significant share of the labor force in certain states, particularly for minority workers

In some states, a US\$15 would constitute a sizable fraction of the median wage



From an international perspective, a US\$15 minimum wage would move the U.S. from having one of the lowest minimum wages (as a share of the median wage) to one of the highest among OECD countries.

Minimum to Median Wage Ratio (2019)

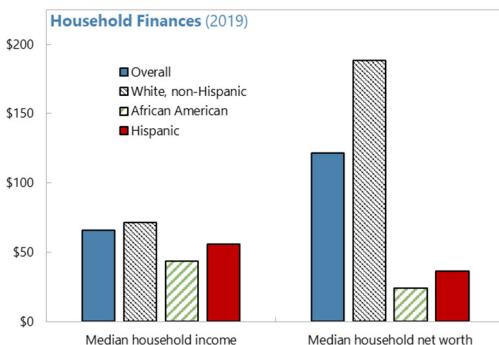


Notes: Sample includes full time wage and salary workers only, excludes the self-employed, ages 16+.

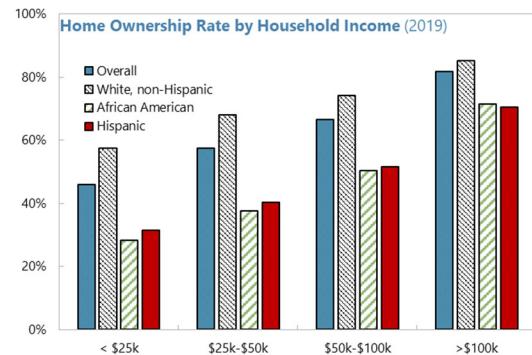
Sources: CPS ORG; EPI; OECD; IMF Staff calculations.

Figure 3. Racial Disparities in Economic Outcomes in the U.S.

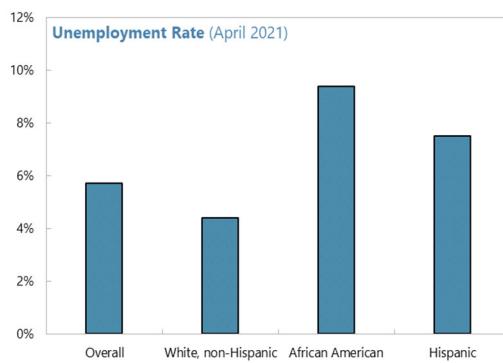
Income and wealth are substantially lower for black and Hispanic households.



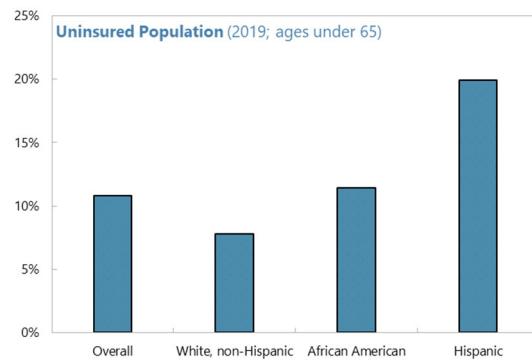
Minorities have lower rates of home ownership, even at relatively high levels of income.



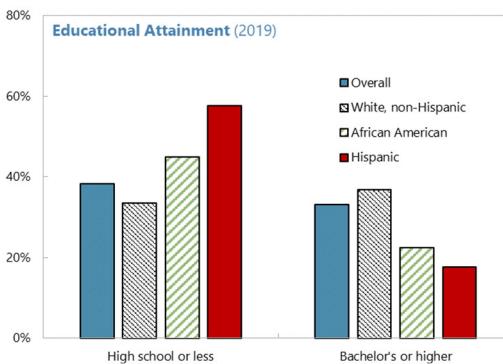
The unemployment rate has been structurally higher for black and Hispanics populations.



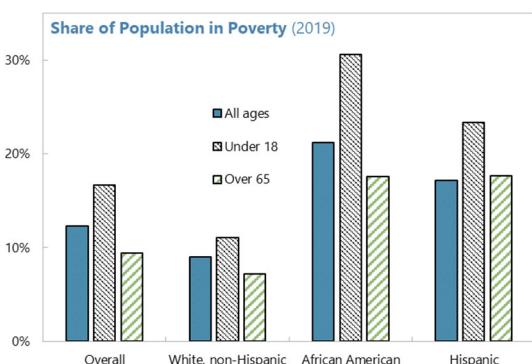
And many minority households lack health insurance.



Educational opportunities and social mobility differ greatly by race.



And African Americans and Hispanics are far more likely to live in poverty.



Sources: U.S. Census Bureau (CPS, ACS); Federal Reserve Survey of Consumer Finances; BLS.

GOVERNANCE AND TRANSPARENCY

67. The United States has further increased its strong enforcement of the U.S. Foreign Corrupt Practices Act (FCPA), maintaining its prominent role in the fight against transnational corruption.¹⁹ The 2020 Phase 4 Report of the OECD Working Group on Bribery in International Business Transactions (WGB)²⁰ recognized that, from the Phase 3 Report in 2010 up to July 2019, 115 individuals and 174 legal persons have been convicted or sanctioned for foreign bribery and related offences in the United States. This achievement results from a combination of enhanced expertise and resources to investigate and prosecute foreign bribery, the enforcement of a broad range of offences in foreign bribery cases, the effective use of non-trial resolution mechanisms, and the development of published policies to incentivize companies' cooperation with law enforcement agencies. The report identified a large number of good practices and positive achievements, including that the U.S. enforcement authorities have made broad use of other statutes and offences to prosecute payments to foreign government officials and intermediaries either in addition to or instead of FCPA charges. They have also increasingly addressed the demand side of bribery by charging foreign public officials or their associates with money laundering or other offences when they use U.S. financial institutions or otherwise fall under U.S. jurisdiction. The U.S. authorities' concerted efforts to build working relationships and to help build capacity with foreign partners has enabled the law enforcement authorities to better investigate and sanction prominent foreign bribery cases with effective, proportionate, and dissuasive sanctions, while also providing legal certainty to the companies involved. The United States has become a driving force in coordinating and cooperating in investigating and resolving multijurisdictional foreign bribery matters. The Dodd-Frank Act's multi-faceted protections, most notably the SEC's ability to enforce the anti-retaliation provisions, constitute a good practice given that they provide powerful incentives for qualified whistleblowers to report foreign bribery allegations against issuers. Additionally, while small facilitations payments remain legal under the FCPA, U.S. authorities and companies have taken significant steps to raise awareness of the risks associated with this practice.

68. The WGB recommends further strengthening of the U.S. efforts against foreign bribery. Among other recommendations, the WGB found that the United States should consider enhancing protections for whistleblowers who report suspected acts of foreign bribery by non-issuers, continue to evaluate the effectiveness of the Corporate Enforcement Policy and to consider consolidating other FCPA enforcement policy and guidance, continue its efforts to enhance

¹⁹ In line with the Framework for Enhanced Engagement on Governance, this section provides an update of the OECD's peer review of the United States framework to assess the implementation and enforcement of the Convention on Combating Bribery of Foreign Public Officials in International Business Transactions ("supply side of corruption"). An update on preventing the concealment of the proceeds of corruption will be reported in 2022, which will include coverage of the recently enacted Corporate Transparency Act which sets up a government-maintained registry of beneficial owners for certain U.S. companies.

²⁰ Information relating to supply-side corruption in this section of the Report draws on the WGB's [Phase 4 Report of the United States](#) (2020). The IMF and the United States may have provided additional views and information whose accuracy have not been verified by the WGB or the OECD Secretariat, and which do not prejudice the WGB's monitoring of the implementation of the OECD Anti-Bribery Convention.

transparency regarding the use of Non-Prosecution and Deferred Prosecution Agreements, and apply appropriate AML/CFT obligations to lawyers, accountants, and trust and company service providers related to foreign bribery. Fund staff agrees with these recommendations and urges the authorities to move forward in implementing them.

STAFF APPRAISAL

69. A remarkable recovery. The new administration's policies have put the U.S. economy on a strong footing. An effective vaccine rollout has put the number of new COVID-19 cases on a firmly downward path. At the same time, unprecedented fiscal support is quickly restoring the economy back to full employment and generating positive outward spillovers to the world economy. These efforts have not been costless: the path for public debt is far higher; the current account imbalance has grown; and very accommodative financial conditions have led to increased corporate and nonbank leverage and rising valuations across a range of assets. The pandemic continues to weigh heavily on those at the lower end of the income distribution, exposing longstanding inequities in access to quality healthcare and education (many of which have an important gender and racial dimension).

70. Moving on multiple fronts. The administration's proposed policy program seeks to address a range of challenges that have long held back the U.S. economy. The pandemic is being viewed as an opportunity to remake the economy with higher productivity, increased labor force participation, and a less polarized distribution of income and wealth. To partially fund the intended increase in federal spending, plans have been developed to close tax loopholes, raise taxes on corporates and higher income households, remake the international system for corporate taxes, and fully resource the Internal Revenue Service. Finally, a renewed effort is underway to lower carbon emissions and increase resilience to climate change.

71. Potential improvements to fiscal policies. The size and ambition of the proposed fiscal packages are admirable, but a better targeting of policies would further strengthen their impact on macroeconomic and distributional outcomes. As the appropriations process moves ahead, more could be done to (i) phase out tax credits at lower levels of household income; (ii) prioritize spending toward programs that have the biggest impact on productivity, labor force participation, reducing poverty, and facilitating a shift to a low-carbon economy; and (iii) fully eliminate step-up basis, lower the threshold for paying the estate tax, eliminate the 199A passthrough deduction, and reformulate the business tax as a cashflow tax. Reorienting the administration's tax and spending proposals in this way would likely imply a slower (but more sustained) demand impulse, create a bigger boost to aggregate supply, and, in so doing, lessen the near-term risks posed by a sustained upswing in inflation. Even with improved targeting, additional steps will be needed over the medium term to bring down the public debt both by raising revenues (through a carbon tax, higher taxation of fuels, and a broad-based federal consumption tax) as well as lessening the impact of an aging demographic on future spending. Also, there are important uncertainties surrounding the final size and composition of these proposals, given the need to build political consensus around them.

72. A tricky task for monetary policy. The Federal Reserve's actions have been highly effective both in the depths of the crisis and in supporting the recovery. While there were risks to introducing the new monetary framework in the midst of COVID-related uncertainty, the low neutral rate of interest and the asymmetries posed by the effective lower bound called for a new approach to policy. The Federal Reserve's new policy framework has helped support a more rapid recovery from the pandemic and rightly commits to a near-term overshooting of the 2 percent longer-run inflation goal (in line with past IMF advice). From a conjunctural perspective, the framework helpfully defers the timing of policy normalization—increasing monetary support as the economy recovers from the COVID-19 shock—while providing clarity on how the Fed intends to achieve its statutory mandate of maximum employment and price stability. In the coming months, the ongoing rapid pace of recovery and expectations of additional fiscal support will necessitate a shift in monetary policy. Managing this transition—from providing reassurance that monetary policy will continue to deliver powerful support to the economy to preparing for an eventual scaling back of asset purchases and a withdrawal of monetary accommodation—will require deft communications, under a potentially tight timeline, to avoid market misunderstandings, volatility in market pricing, and/or an unwarranted tightening in financial conditions.

73. Safeguarding financial stability. The unfolding pandemic revealed important shortcomings in the functioning-under-stress of systemically important U.S. markets and institutions. Serious consideration should be given to structural changes in the operation of the Treasury market, key money markets, and prime money market funds. Systemic financial stability risks appear close to the historical average but the very accommodative financial conditions are encouraging continued risk taking, fueling asset valuations and facilitating rising leverage in the nonbanks and corporates that should be followed carefully.

74. External sector. The pandemic has resulted in a larger current account deficit and left the U.S. external position moderately weaker than the level implied by medium-term fundamentals and desirable policies. The current account deficit is likely to grow further in 2021. Trade restrictions and tariff increases should be rolled back. Doing so, would help support U.S. workers and create more and better American jobs (particularly in light of the domestic efforts that are being proposed to increase productivity, labor supply, and the competitiveness of U.S. producers). "Buy American" provisions should be tightly circumscribed and made consistent with the U.S. international obligations. Currency related trade responses should be avoided. Instead, the U.S. should work constructively with its trading partners to better address the underlying macro-structural distortions that are affecting external positions and to strengthen the rules-based multilateral trading system. Renewed engagement at the World Trade Organization—including restoring the proper functioning of the dispute settlement system—could help facilitate progress on these topics.

75. Looking forward. As the pandemic effects recede, policymakers will have to cope with simultaneous, ongoing transitions. These arise from an uncertain reshaping of the post-pandemic economy (both in the U.S. and abroad), a transition to a lower carbon economic model, an increasing role for digitalization and technology, and an underlying shift in U.S. demographics toward an older and more diverse population. The flexibility and innovativeness of the U.S. system

puts it in a good place to manage these transitions. However, great care should be taken to ensure that these multi-faceted changes do not increase income polarization, further hollow out the middle class, and leave behind a material share of the population (particularly lower-skilled, lower-income workers). It would be a mistake to assume the social and economic impact of these deep-rooted transitions can simply be left to market forces and the hope that a vibrant U.S. economy will lift all boats. Instead, a multi-dimensional policy approach will need to be developed to support rising living standards for all Americans and prevent workers from becoming disenfranchised or detached from the labor force.

76. It is recommended that the next Article IV consultation take place on the standard 12-month cycle.

Table 1. United States: Selected Economic Indicators
 (Percentage change from previous period, unless otherwise indicated)

	2019	2020	Projections					
			2021	2022	2023	2024	2025	2026
National production and income								
Real GDP	2.2	-3.5	7.0	4.9	1.9	1.7	1.7	1.7
Real GDP (q4/q4)	2.3	-2.4	8.0	2.8	1.8	1.7	1.7	1.7
Net exports 1/	-0.2	-0.2	-1.6	-0.7	0.0	0.1	0.1	0.0
Total domestic demand	2.3	-3.3	8.5	5.4	1.9	1.5	1.6	1.6
Final domestic demand	2.3	-2.7	8.2	5.1	1.9	1.5	1.6	1.6
Private final consumption	2.4	-3.9	8.1	4.7	1.4	1.6	1.8	2.1
Public consumption expenditure	1.8	0.3	5.7	3.5	1.8	1.1	1.1	1.1
Gross fixed domestic investment	2.3	-0.8	10.0	7.7	3.6	1.8	1.0	0.4
Private fixed investment	1.9	-1.8	11.1	5.5	3.3	2.6	2.4	2.2
Public fixed investment	4.3	4.3	4.7	18.2	5.0	-1.7	-5.0	-7.8
Change in private inventories 1/	0.0	-0.6	0.2	0.2	0.0	0.0	0.0	0.0
Nominal GDP	4.0	-2.3	10.6	7.9	4.3	4.0	3.9	3.8
Personal saving rate (% of disposable income)	7.6	16.2	15.6	8.9	8.7	9.4	9.7	8.7
Private investment rate (% of GDP)	17.5	17.2	17.9	17.9	18.0	18.0	17.9	17.9
Unemployment and potential output								
Unemployment rate	3.7	8.1	5.5	3.5	3.0	3.0	3.1	3.3
Labor force participation rate	63.1	61.7	62.0	63.0	63.2	63.2	63.1	63.0
Potential GDP	1.6	0.6	2.5	3.1	2.1	2.1	2.2	2.2
Output gap (% of potential GDP)	1.0	-3.1	1.1	3.0	2.9	2.4	1.9	1.4
Inflation								
CPI inflation (q4/q4)	2.0	1.2	4.8	2.6	2.7	2.6	2.5	2.3
Core CPI Inflation (q4/q4)	2.3	1.6	3.9	2.6	2.9	2.8	2.6	2.4
PCE Inflation (q4/q4)	1.5	1.2	4.3	2.4	2.4	2.3	2.2	2.0
Core PCE Inflation (q4/q4)	1.6	1.4	3.7	2.4	2.6	2.5	2.3	2.1
GDP deflator	1.8	1.2	3.4	2.8	2.3	2.2	2.2	2.1
Government finances								
Federal balance (% of GDP) 2/	-4.6	-14.9	-15.1	-8.0	-5.7	-4.9	-4.7	-4.5
Federal debt held by the public (% of GDP)	79.2	100.1	104.9	103.7	105.1	106.0	106.8	107.4
General government budget balance (% of GDP) 2/	-5.7	-14.7	-13.3	-7.4	-5.7	-5.4	-5.3	-5.2
General government gross debt (% of GDP)	108.2	133.6	134.5	132.6	133.3	134.1	134.9	135.6
Interest rates (percent; period average)								
Fed funds rate	2.2	0.4	0.1	0.1	0.5	1.1	1.8	2.3
Three-month Treasury bill rate	2.1	0.4	0.1	0.1	0.5	1.1	1.8	2.2
Ten-year government bond rate	2.1	0.9	1.7	2.2	2.7	2.8	2.8	2.7
Balance of payments								
Current account balance (% of GDP)	-2.2	-2.9	-3.7	-3.7	-3.4	-3.0	-2.7	-2.5
Merchandise trade balance (% of GDP)	-4.0	-4.4	-5.1	-5.3	-5.1	-4.9	-4.7	-4.5
Export volume (NIPA basis, goods)	-0.1	-9.5	7.5	5.3	4.0	2.5	2.2	2.2
Import volume (NIPA basis, goods)	0.5	-6.0	18.3	9.1	3.3	1.3	1.3	1.6
Net international investment position (% of GDP)								
Saving and investment (% of GDP)								
Gross national saving	18.6	17.8	17.4	17.9	18.4	18.6	18.6	18.4
General government	-3.1	-13.1	-10.0	-4.7	-2.7	-2.3	-2.3	-2.6
Private	21.7	30.9	27.4	22.6	21.0	20.9	20.8	21.0
Personal	5.7	13.7	11.7	6.9	6.7	7.3	7.6	6.7
Business	16.0	17.1	15.7	15.7	14.3	13.5	13.3	14.3
Gross domestic investment	21.0	21.0	21.5	22.0	22.2	22.0	21.7	21.3
Private	17.5	17.2	17.9	17.9	18.0	18.0	17.9	17.9
Public	3.5	3.8	3.7	4.1	4.2	4.0	3.8	3.4

Sources: BEA; BLS; FRB; Haver Analytics; and IMF staff estimates.

1/ Contribution to real GDP growth, percentage points.

2/ Includes staff's adjustments for one-off items, including costs of financial sector support.

Table 2. United States: Balance of Payments
 (Annual percent change unless otherwise indicated)

	Projections							
	2019	2020	2021	2022	2023	2024	2025	2026
Real exports growth								
Goods and services	-0.1	-12.9	4.9	7.1	5.2	3.8	3.4	3.3
Goods	-0.1	-9.5	7.5	5.3	4.0	2.5	2.2	2.2
Services	-0.1	-19.2	0.0	11.4	7.8	6.4	5.8	5.6
Real imports growth								
Goods and services	1.1	-9.3	16.1	9.5	4.0	2.2	1.9	2.3
Goods	0.5	-6.0	18.3	9.1	3.3	1.3	1.3	1.6
Nonpetroleum goods	1.2	-5.7	19.5	10.1	3.7	1.6	1.5	1.9
Petroleum goods	-6.4	-13.1	-0.2	-3.2	-3.2	-3.2	-3.2	-3.2
Services	3.7	-22.5	5.5	11.8	7.9	6.8	5.4	5.5
Net exports (contribution to real GDP growth)	-0.2	-0.2	-1.6	-0.7	0.0	0.1	0.1	0.0
Nominal exports								
Goods and services	11.7	10.2	10.7	11.1	11.5	11.8	12.0	12.2
Nominal imports								
Goods and services	14.6	13.2	14.8	15.3	15.4	15.4	15.3	15.3
Current account								
Current account balance	-2.2	-2.9	-3.7	-3.7	-3.4	-3.0	-2.7	-2.5
Balance on trade in goods and services	-2.7	-3.2	-4.1	-4.1	-3.8	-3.5	-3.2	-3.0
Balance on income	0.5	0.3	0.4	0.4	0.5	0.5	0.5	0.5
Capital and Financial Account								
Capital account balance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial account balance	-2.2	-3.1	-3.6	-3.7	-3.4	-3.0	-2.7	-2.5
Direct investment, net	-0.8	0.5	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4
Portfolio investment, net	-0.9	-2.3	-1.2	-1.5	-1.5	-1.1	-0.7	-0.7
Financial derivatives, net	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other investment, net	-0.3	-1.3	-2.0	-1.7	-1.4	-1.4	-1.5	-1.3
Reserve assets, net	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Errors and Omissions	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.0
Net International Investment Position								
Direct investment, net	-8.2	-12.8	-11.9	-11.5	-11.4	-11.4	-11.4	-11.4
Portfolio investment, net	-37.4	-47.7	-44.6	-42.9	-42.7	-42.2	-41.4	-40.7
Financial derivatives, net	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Other investment, net	-8.5	-9.8	-10.8	-11.7	-12.6	-13.5	-14.6	-15.4
Reserve assets, net	2.4	3.0	2.7	2.5	2.4	2.3	2.2	2.1
Memorandum items								
Current account balance (US\$ billions)	-472	-616	-849	-920	-881	-822	-770	-737
Non-oil trade balance (% of GDP)	-2.7	-3.1	-4.0	-4.1	-3.9	-3.6	-3.4	-3.2
Foreign real GDP growth	1.7	-5.2	5.2	4.2	2.8	2.4	2.3	2.3
U.S. real GDP growth	2.2	-3.5	7.0	4.9	1.9	1.7	1.7	1.7
U.S. real total domestic demand growth	2.3	-3.3	8.5	5.4	1.9	1.5	1.6	1.6

Sources: BEA; FRB; Haver Analytics; and IMF staff estimates.

Table 3. United States: Federal and General Government Finances
(Percent of GDP)

	Projections												
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Federal government													
Revenue	16.3	16.3	15.7	18.0	18.5	18.4	18.2	18.7	19.0	18.8	18.7	18.6	18.6
Expenditure	21.0	31.2	30.8	26.0	24.2	23.3	22.9	23.2	23.2	23.2	22.5	23.0	23.2
Non-interest	19.2	29.6	29.4	24.7	22.8	21.6	21.0	21.1	20.8	20.5	19.8	20.1	20.3
Interest	1.8	1.6	1.4	1.3	1.4	1.6	1.8	2.1	2.4	2.7	2.8	2.8	2.9
Budget balance 1/	-4.6	-14.9	-15.1	-8.0	-5.7	-4.9	-4.7	-4.5	-4.2	-4.3	-3.8	-4.3	-4.6
Primary balance 2/	-2.9	-13.3	-13.7	-6.7	-4.3	-3.3	-2.8	-2.4	-1.8	-1.7	-1.0	-1.5	-1.7
Primary structural balance 3/ 4/	-3.0	-10.4	-11.2	-7.5	-5.0	-3.9	-3.3	-2.8	-2.1	-1.9	-1.3	-1.7	-1.8
Change	-0.8	-7.4	-0.8	3.7	2.4	1.2	0.6	0.5	0.7	0.2	0.7	-0.4	-0.1
Federal debt held by the public	79.2	100.1	104.9	103.7	105.1	106.0	106.8	107.4	107.7	108.2	108.1	108.5	109.2
General government													
Revenue	30.0	30.5	29.7	31.8	32.2	32.0	32.0	32.5	32.7	32.6	32.5	32.5	32.5
Expenditure	35.7	45.2	43.0	39.2	37.9	37.4	37.3	37.7	37.9	37.8	37.5	37.9	37.7
Net interest	2.3	2.2	1.5	1.3	1.4	1.6	1.9	2.3	2.6	2.9	3.0	3.1	3.2
Net lending 1/	-5.7	-14.7	-13.3	-7.4	-5.7	-5.4	-5.3	-5.2	-5.1	-5.2	-4.9	-5.4	-5.2
Primary balance 2/	-3.4	-12.6	-11.8	-6.1	-4.3	-3.8	-3.4	-2.9	-2.5	-2.3	-2.0	-2.4	-2.0
Primary structural balance 3/ 4/	-3.9	-8.6	-9.7	-7.3	-5.6	-4.8	-4.2	-3.5	-3.0	-2.7	-2.3	-2.6	-1.5
Change	-0.7	-4.7	-1.1	2.4	1.8	0.8	0.6	0.7	0.6	0.3	0.4	-0.3	1.2
Gross debt	108.2	133.6	134.5	132.6	133.3	134.1	134.9	135.6	136.2	136.9	137.3	138.2	138.8
incl. unfunded pension liab.	135.1	160.4	160.8	158.5	158.8	159.2	159.6	159.9	160.1	160.4	160.9	161.2	

Sources: Congressional Budget Office; Office of Management and Budget; and IMF staff estimates.

Note: Fiscal projections are based on Congressional Budget Office forecast adjusted for the IMF staff's policy and macroeconomic assumptions. Projections incorporate the effects of enacted legislation at the time of the publication of this table and also potential legislation to be passed under the American Jobs Plan and the American Families Plan. Fiscal projections are adjusted to reflect the IMF staff's forecasts for key macroeconomic and financial variables and different accounting treatment of financial sector support and of defined-benefit pension plans and are converted to a general government basis. Data are compiled using SNA 2008, and when translated into GFS this is in accordance with GFSM 2014.

1/ Includes staff's adjustments for one-off items, including costs of financial sector support.

2/ Excludes net interest.

3/ Excludes net interest, effects of economic cycle, and costs of financial sector support.

4/ Percent of potential GDP.

Table 4. United States: Core Financial Soundness Indicators for Deposit Takers
(Percent unless stated otherwise, eop)

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Regulatory capital to risk-weighted assets	14.5	14.4	14.4	14.1	14.2	14.5	14.8	14.7	16.3
Regulatory tier 1 capital to risk-weighted assets	12.7	12.8	13.1	13.1	13.2	13.5	13.8	13.7	14.5
Non-performing loans net of provisions to capital	15.7	11.7	8.8	7.2	6.6	5.7	4.7	4.3	5.2
Non-performing loans to total gross loans	3.3	2.5	1.9	1.5	1.3	1.1	0.9	0.9	1.1
Sectoral distribution of total loans: residents	95.5	95.2	95.6	95.8	96.1	96.0	96.3	96.3	96.7
Sectoral distribution of total loans: deposit-takers	6.0	5.0	4.1	3.6	3.8	3.9	5.5	4.6	6.1
Sectoral distribution of total loans: other financial corporations	4.4	5.2	6.2	6.7	6.7	6.9	7.3	7.8	8.5
Sectoral distribution of total loans: general government	1.1	1.2	1.3	1.4	1.5	1.6	1.5	1.4	1.4
Sectoral distribution of total loans: nonfinancial corporations	32.1	33.3	34.2	35.0	35.5	35.4	35.3	35.4	36.4
Sectoral distribution of total loans: other domestic sectors	51.9	50.5	49.8	49.1	48.5	48.2	46.7	47.1	44.2
Sectoral distribution of total loans: nonresidents	4.5	4.8	4.4	4.2	3.9	4.0	3.7	3.7	3.3
Return on assets	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.3
Return on equity	2.7	3.3	2.8	3.0	3.2	2.9	3.4	2.9	3.0
Interest margin to gross income	60.8	63.5	63.7	63.4	65.1	67.0	68.3	66.9	64.3
Non-interest expenses to gross income	63.6	61.7	64.7	60.7	59.6	61.6	58.4	60.4	62.7
Liquid assets to total assets (liquid asset ratio)	13.4	14.5	14.5	13.2	12.8	13.2	12.7	11.8	17.7
Liquid assets to short term liabilities	74.1	88.3	90.0	91.2	98.2	97.7	89.3	84.3	183.6

Source: Haver Analytics.

Appendix I. Risk Assessment Matrix

Risk	Likelihood	Expected Impact if Risk Materializes	Policy Response and Recommendations
Global Risks			
Global resurgence of the COVID-19 pandemic. Local outbreaks lead to a global resurgence of the pandemic (possibly due to vaccine-resistant variants), which requires costly containment efforts and prompts persistent behavioral changes rendering many activities unviable.	Medium	High	Renewed economic disruptions and high unemployment results in subdued consumption and longer-term damage to participation and human capital. Financial institutions' losses impair the availability of credit, with further adverse implications for growth. Fiscal policy should support the public health response, minimize undue balance sheet dislocations, preserving employer-employee relationships, and support household income. Monetary policy should remain accommodative and support loose financial conditions (including through asset purchases, forward guidance, and the reinstatement of emergency credit facilities).
Disorderly transformations. COVID-19 triggers structural transformations, but the reallocation of resources is impeded by labor market rigidities, debt overhangs, and inadequate bankruptcy resolution frameworks. This, coupled with a withdrawal of COVID-19-related policy support, undermines growth prospects and increases unemployment, with adverse social/political consequences. Adjustments in global value chains and reshoring (partly driven by geostrategic and national security concerns) shift production activities across countries.	Medium	High	Multi-faceted changes to the economy lead to increased income polarization, a further hollowing out the middle class, and leaves behind a material share of the population (particularly lower-skilled, lower-income workers). The longstanding flexibility and innovativeness of the U.S. system puts it in a good place to manage these transitions. Proposed investments in social safety nets, healthcare, vocational and academic education, infrastructure can help. Could also consider regional development initiatives, subsidies to labor mobility, and immigration policies to meet skills needs.
Widespread social discontent and political instability. Social tensions erupt as a withdrawal of pandemic-related policy support results in unemployment and, amid increasing prices of essentials, hurts vulnerable groups (often exacerbating pre-existing inequities).	High	Medium	Political instability complicates reaching consensus on policies to address the pandemic and achieve economic recovery. Perceptions of social and racial injustice are exacerbated. Public protests feed into COVID infection rates. Policies to improve the social safety net, support the unemployed, increase resources to healthcare providers, increase health preparedness, and ensure broad access to affordable, quality health care.
Rising commodity prices amid bouts of volatility. Commodity prices increase by more than expected against a weaker U.S. dollar, post-pandemic pent-up demand and supply disruptions, and for some materials, accelerated plans for renewable energy adoption. Uncertainty surrounding each of these factors leads to bouts of volatility, especially in oil prices.	Medium	Medium	Higher commodity prices reduce corporate profit margins, increase household financial stress (particularly for lower income groups), and raise inflation expectations. Fiscal measures promote green alternatives to fossil fuels. Monetary policy responds assertively to any de-anchoring of inflation expectations.
Cyber-attacks. Cyber-attacks on critical infrastructure, institutions, and financial systems trigger systemic financial instability	Medium	Medium	Disruption is widespread including to supply of Public and private sectors coordinate their investments in

or widespread disruptions in socio-economic activities and remote work arrangements.		essential goods, payments systems, and financial market infrastructure.	cyber-security measures. Contingency plans developed.
Domestic Risks			
Supply and demand mismatches. Supply chains disrupted by the pandemic are unable to respond to rapidly returning demand. Labor supply is inelastic due to health concerns, lack of adequate child-care and availability of unemployment insurance.	Medium	High	
		Wage rises become broad-based. Transitory relative price movements feed into sustained inflation and a de-anchoring of inflation expectations.	Fiscal measures could be designed to incentivize a return to the labor market. Monetary policy looks through higher realized inflation and focus on signs of de-anchoring.
De-anchoring of inflation expectations in the U.S. leads to rising core yields and risk premia. A fast recovery in demand (supported by excess private savings and stimulus policies), combined with COVID-19-related supply constraints, leads to sustained above-target inflation readings and a de-anchoring of expectations. The Fed reacts by signaling a need to tighten earlier than expected. The resulting repositioning by market participants leads to a front-loaded tightening of financial conditions and higher risk premia.	Medium	High	
		High realized wage and price inflation, resulting from a sustained mismatch in supply and demand, proves persistent and causes a de-anchoring of inflation expectations.	A de-anchoring of expectations would necessitate accelerating the reduction in asset purchases and even having to consider raising policy rates before net purchases have been brought to zero.
Rising vulnerabilities in the U.S. corporate sector. The rising share of risky debt—leveraged loans, high yield bond and private debt—create vulnerabilities. Higher corporate leverage and the migration of risks to nonbank financial institutions result in severe financial strain.	Medium	High	
		A shock to earnings and/or tighter financing conditions cause leveraged corporates to experience stress, increasing credit spreads, downgrades, and defaults. Weaker debt covenants increase losses when defaults materialize.	Emergency liquidity support to curtail market dysfunction. Limits on dividend distributions and buybacks to preserve capital. Macropredprudential tools to address vulnerabilities in the nonbanks.
<p>Note: The Risk Assessment Matrix (RAM) shows events that could materially alter the baseline path (the scenario most likely to materialize in the view of IMF staff). The relative likelihood is the staff's subjective assessment of the risks surrounding the baseline ("low" is meant to indicate a probability below 10 percent, "medium" a probability between 10 and 30 percent, and "high" a probability between 30 and 50 percent). The RAM reflects staff views on the source of risks and overall level of concern as of the time of discussions with the authorities. Non-mutually exclusive risks may interact and materialize jointly. Conjunctural risks are especially relevant over shorter horizons (up to two years) given the current baseline. Structural risks (omitted from this streamlined version) remain salient over shorter and longer horizons (up to three years).</p>			

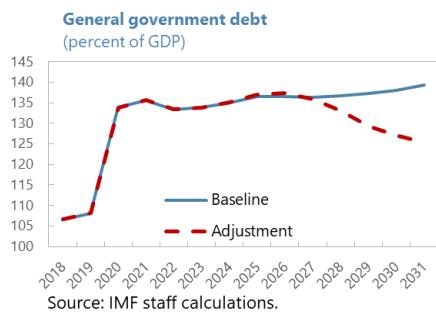
Appendix II. Public Debt Sustainability Assessment

Due to the unprecedented fiscal response to the COVID-19 outbreak, the U.S. budget deficit has increased considerably in 2020 and is expected to stay elevated in 2021. Under the baseline scenario, public debt is projected to stabilize over the medium term as gradually materializing spending under the American Jobs and Families Plans is offset by the implied boost to potential growth. However, age-related spending pressures on entitlement programs will gradually push debt up over the long-run. Gross financing needs are large, albeit manageable given the global reserve currency status of the U.S. dollar. A credible medium-term fiscal adjustment featuring reprioritization of budget programs and revenue-gaining tax reform is needed to put public debt on a downward path. Nonetheless, the risks of debt distress are low and debt is viewed as sustainable¹.

1. Background. An unprecedented scale of fiscal expansion has been introduced in response to the COVID-19 pandemic. As a result, fiscal deficits are projected to stay elevated in the near term.

2. Baseline. The staff's baseline is based on current and likely to be passed laws. Under this baseline, public debt is projected to rise further in 2021 reflecting the automatic and discretionary fiscal responses to the economic downturn which are only partially offset by robust growth. Public debt is to remain elevated in the medium term and to begin rising gradually after 2027 as age-related spending pressures on entitlement programs assert themselves. Federal debt held by the public is projected to increase from about 100 percent of GDP in FY2020 to around 111 percent of GDP in 2030, with general government gross debt rising from about 134 percent of GDP to 138 percent of GDP in the same period.

3. Adjustment scenario. The general government primary deficit was 12.6 percent of GDP in 2020 and is projected at 11.8 percent of GDP in 2021. Nevertheless, gradually raising the primary general government surplus in the medium-term to around ½ percent of GDP (1 percent of GDP for the federal government) would be necessary to return the debt-to-GDP ratio to a lower path. The target primary surplus would have to be larger to bring the debt ratio closer to pre-Great Recession levels by 2030.



4. Debt servicing costs. The fiscal projections benefit from the current favorable interest rate-growth differential, reflecting accommodative monetary policy and the safe-haven status of the United States. Under staff's baseline, the effective nominal interest rate is projected to rise gradually

¹ In previous consultations, debt was characterized as being "on an unsustainable upward path under current policies". The debt sustainability assessment now reflects the approach taken in the Review of the Debt Sustainability Framework for Market Access Countries whereby public debt is "regarded as sustainable when the primary balance needed to at least stabilize debt under both the baseline and realistic shock scenarios is economically and politically feasible, such that the level of debt is consistent with an acceptably low rollover risk and with preserving potential growth at a satisfactory level." This assessment is distinct from whether (or not) the debt stabilizes under policies assumed in the baseline outlook.

from the projected level of 1.6 percent in 2021 to 2.7 percent by 2030, which is close to its 2010–18 average level. Thus, real interest rates will act as a debt-reducing flow over the medium-term.

5. Realism. Baseline economic assumptions are generally within the error band observed for all countries. The baseline fiscal projections and implied near-term adjustment are outliers compared with historical and cross-country experience, but are nevertheless realistic, reflecting the large but temporary fiscal expansion in response to the pandemic.

6. Stress tests. Public debt dynamics are sensitive to growth and interest rate assumptions. An increase of 100 basis points in the sovereign risk premium would raise the public debt ratio to about 141 percent of GDP by 2030, about 3 percentage points of GDP above the baseline. Similarly, were real GDP growth to be one standard deviation below the baseline, the public debt ratio would increase by about 7 percentage points above the baseline. A scenario involving a 1 percentage point of GDP larger fiscal deficit over the next two years would increase public debt ratio by about 4 percentage points above the baseline by 2030. A combined macro-fiscal shock could raise the public debt ratio to as high as 154 percent of GDP by 2030. An exchange rate shock does not have major implications for debt sustainability in the United States given that all debt is denominated in local currency and the reserve currency status of the dollar.

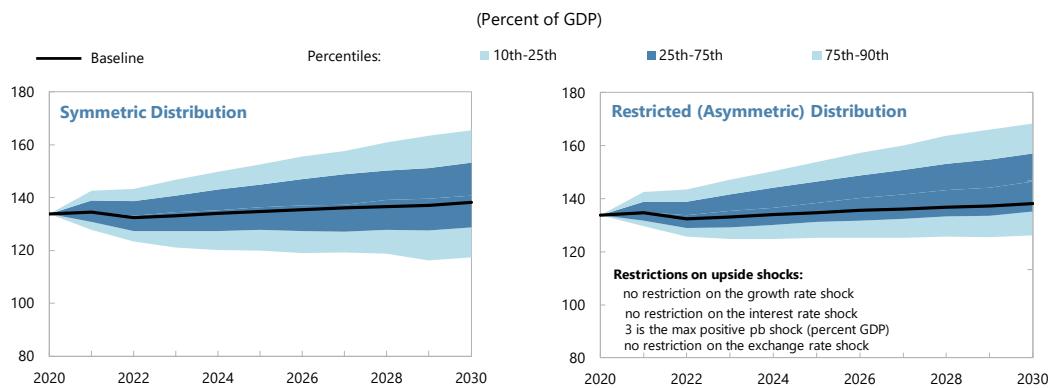
7. Mitigating factors. The depth and liquidity of the U.S. Treasury market as well as its safe-haven status represent a mitigating factor for the high external and gross financing requirements.

Appendix II. Figure 1. United States: Public DSA—Risk Assessment

Heat Map Baseline (2020-2030)

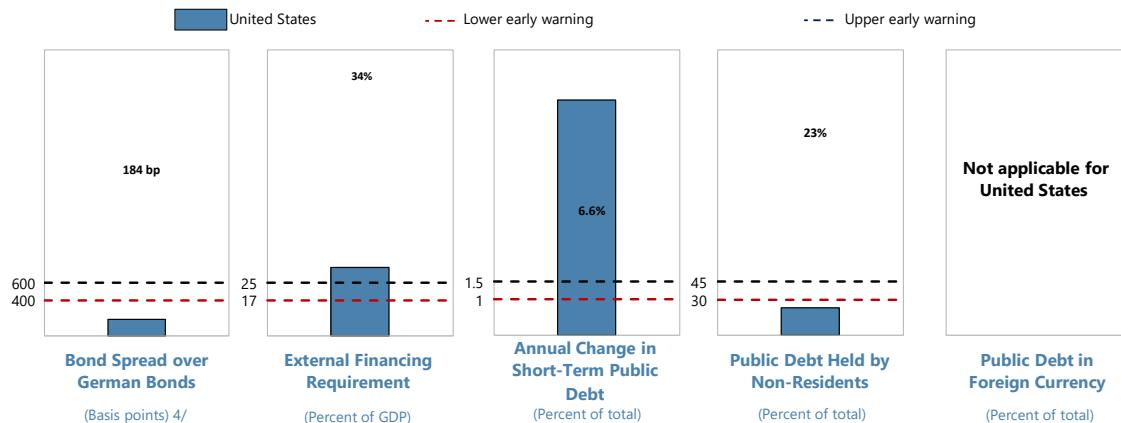
Debt level 1/ Gross financing needs 2/ Debt profile 3/	Real GDP Growth Shock	Primary Balance Shock	Real Interest Rate Shock	Exchange Rate Shock	Contingent Liability shock
	Real GDP Growth Shock	Primary Balance Shock	Real Interest Rate Shock	Exchange Rate Shock	Contingent Liability shock
	Market Perception	External Financing Requirements	Change in the Share of Short-Term Debt	Public Debt Held by Non-Residents	Foreign Currency Debt

Evolution of Predictive Densities of Gross Nominal Public Debt



Debt Profile Vulnerabilities

(Indicators vis-à-vis risk assessment benchmarks)



Source: IMF staff

1/ The cell is highlighted in green if debt burden benchmark of 85% is not exceeded under the specific shock or baseline, yellow if exceeded under specific shock but not baseline, red if benchmark is exceeded under baseline, white if stress test is not relevant

2/ The cell is highlighted in green if gross financing needs benchmark of 20% is not exceeded under the specific shock or baseline, yellow if exceeded under specific shock but not baseline, red if benchmark is exceeded under baseline, white if stress test is not relevant

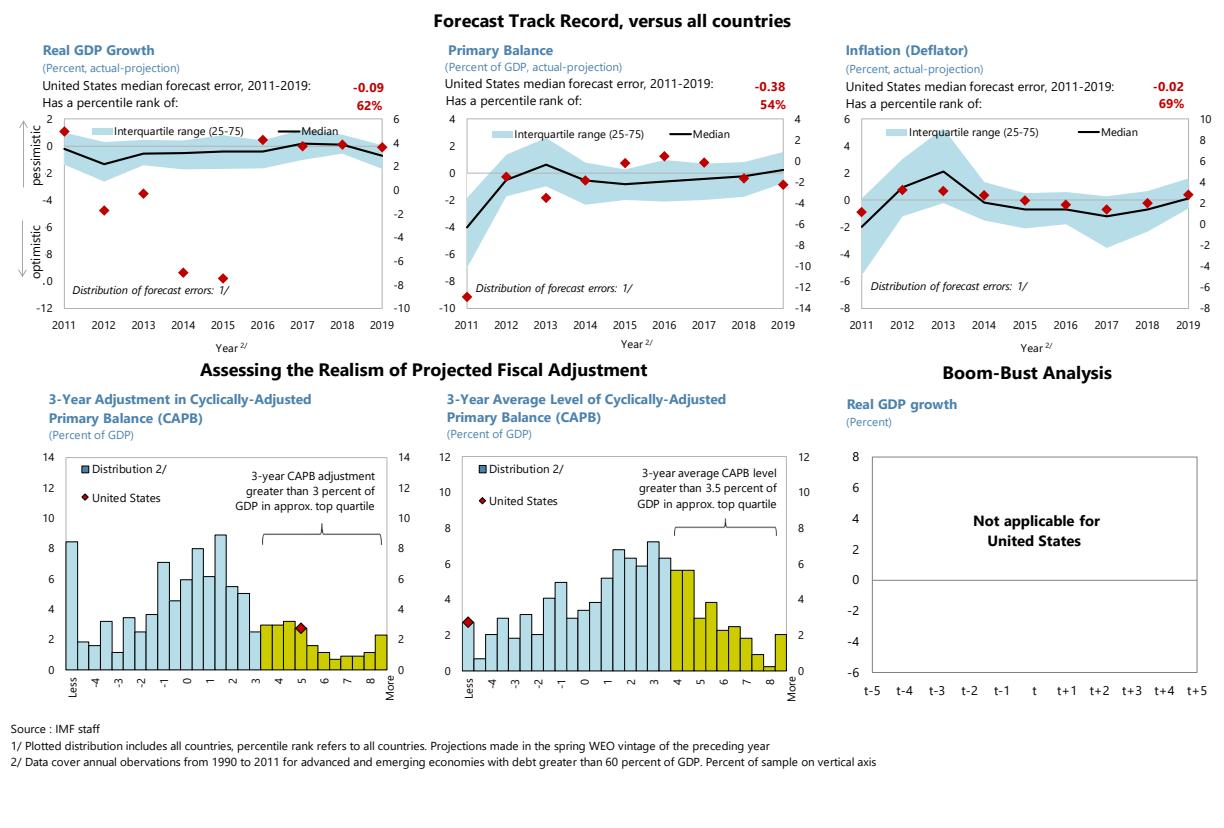
3/ The cell is highlighted in green if country value is less than the lower risk-assessment benchmark, red if country value exceeds the upper risk-assessment benchmark, yellow if country value is between the lower and upper risk-assessment benchmarks. If data are unavailable or indicator is not relevant, cell is white.

Lower and upper risk-assessment benchmarks are:

400 and 600 basis points for bond spreads; 17 and 25 percent of GDP for external financing requirement; 1 and 1.5 percent for change in the share of short-term debt; 30 and 45 percent for the public debt held by non-residents

4/ An average over the last 3 months, 20-Mar-21 through 18-Jun-21

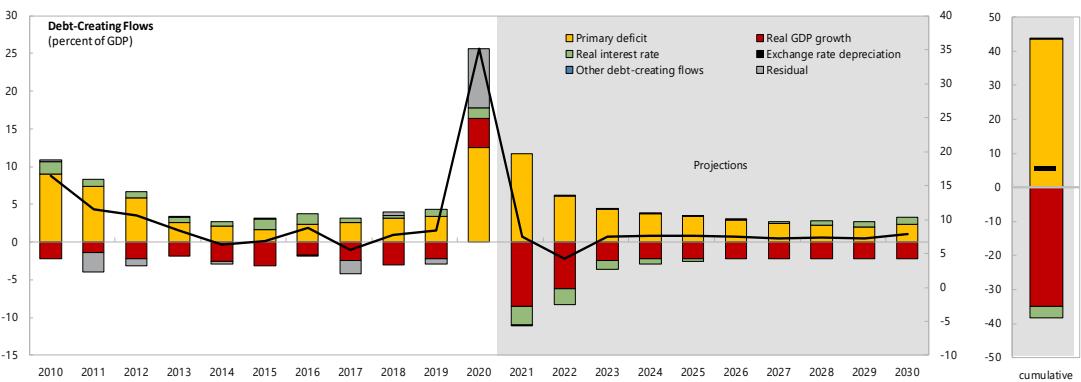
Appendix II. Figure 2. United States: Public DSA—Realism of Baseline Assumption



Appendix II. Figure 3. United States: Public DSA—Baseline Scenario
 (Percent of GDP, unless otherwise indicated)

	Debt, Economic and Market Indicators 1/										As of June 08, 2020						
	Actual			Projections								Sovereign Spreads					
	2010-2018 2/	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CDS (bp) 3/	Ratings	Foreign	Local
Nominal gross public debt	103.5	108.1	133.8	134.6	132.4	133.1	133.9	134.8	135.5	136.1	136.7	137.1	138.2	0			
Public gross financing needs	38.5	40.4	73.3	51.8	36.1	31.1	28.7	29.6	28.4	28.6	28.8	28.8	28.7	0			
Real GDP growth (percent)	2.3	2.2	-3.5	7.0	4.9	1.9	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7			
Inflation (GDP deflator, percent)	1.7	1.8	1.2	3.4	2.9	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0			
Nominal GDP growth (percent)	4.0	4.0	-2.3	10.7	8.0	4.3	4.0	3.9	3.8	3.8	3.8	3.8	3.8	3.8			
Effective interest rate (percent) 4/	2.7	2.7	2.4	1.6	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.6	2.7				

	Contribution to Changes in Public Debt												Cumulative	Debt-stabilizing primary balance 9/	
	2010-2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
Change in gross public sector debt	2.2	1.5	25.7	0.8	-2.2	0.7	0.8	0.8	0.8	0.5	0.6	0.5	1.0	4.3	-1.4
Identified debt-creating flows	2.8	2.1	17.8	0.8	-2.2	0.7	0.8	0.8	0.8	0.5	0.6	0.5	1.0	4.3	
Primary deficit	4.1	3.4	12.6	11.8	6.1	4.3	3.7	3.4	2.9	2.5	2.3	2.0	2.4	41.3	
Primary (noninterest) revenue and grants	29.9	29.4	30.0	29.3	31.3	31.7	31.6	31.6	32.0	32.3	32.1	32.0	31.9	315.7	
Primary (noninterest) expenditure	33.9	32.9	42.6	41.1	37.4	36.0	35.3	34.9	34.9	34.7	34.4	34.0	34.3	357.0	
Automatic debt dynamics 5/	-1.3	-1.3	5.2	-11.0	-8.3	-3.6	-2.9	-2.6	-2.1	-1.9	-1.7	-1.5	-1.4	-37.0	
Interest rate/growth differential 6/	-1.3	-1.3	5.2	-11.0	-8.3	-3.6	-2.9	-2.6	-2.1	-1.9	-1.7	-1.5	-1.4	-37.0	
Of which: real interest rate	0.9	0.9	1.4	-2.5	-2.2	-1.1	-0.8	-0.4	0.1	0.3	0.6	0.7	0.8	-4.4	
Of which: real GDP growth	-2.3	-2.2	3.9	-8.5	-6.1	-2.5	-2.2	-2.2	-2.2	-2.2	-2.2	-2.2	-2.2	-32.6	
Exchange rate depreciation 7/	0.0	0.0	0.0	
Other identified debt-creating flows	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Net privatization proceeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Contingent liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other liabilities (bank recap. and PSI sweetener)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Residual, including asset changes 8/	-0.6	-0.6	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	



Source: IMF staff

1/ Public sector is defined as general government

2/ Based on available data

3/ Yield over German Bonds

4/ Defined as interest payments divided by debt stock at the end of previous year

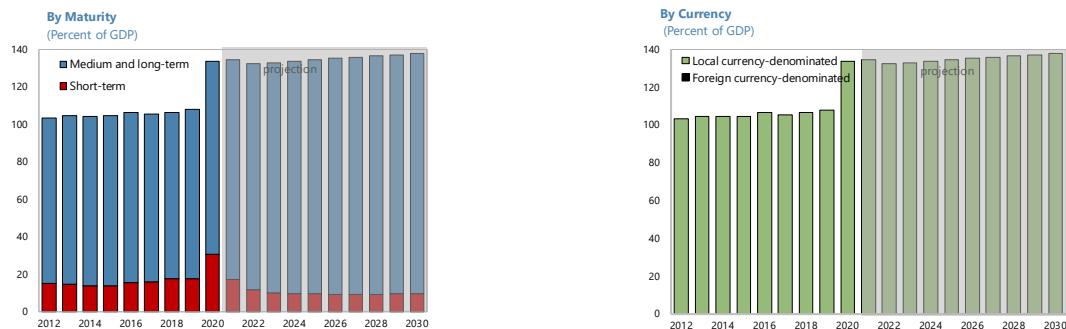
5/ Derived as $(r - p(1+g)) \cdot g + ae(1+r)(1+g+p+gp)$ times previous period debt ratio, with r = interest rate; p = growth rate of GDP deflator; g = real GDP growth rate; a = share of foreign-currency denominated debt; and e = nominal exchange rate depreciation6/ The real interest rate contribution is derived from the denominator in footnote 4 as $r - n(1+g)$ and the real growth contribution as $-g$ 7/ The exchange rate contribution is derived from the numerator in footnote 2 as $ae(1+r)$.

8/ For projections, this line includes exchange rate changes during the projection period. Also includes ESM capital contribution, arrears clearance, SMP and ANFA income, and the effect of deferred interest

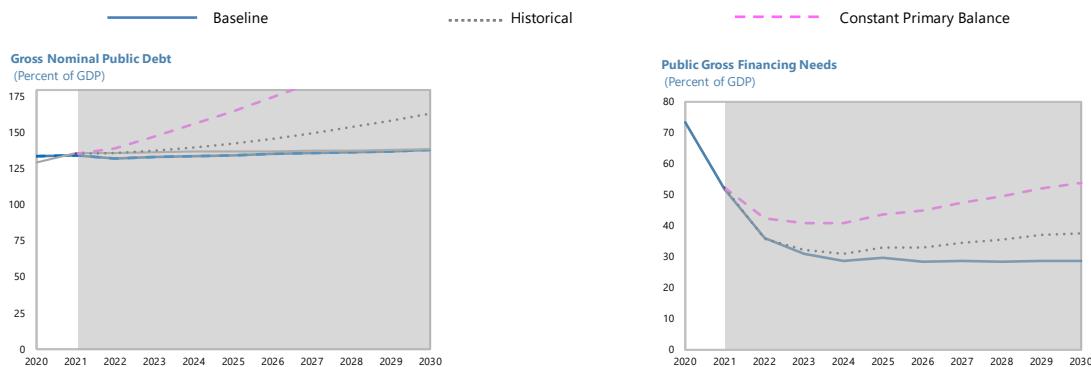
9/ Assumes that key variables (real GDP growth, real interest rate, and other identified debt-creating flows) remain at the level of the last projection year

Appendix II. Figure 4. United States: Public DSA—Composition of Public Debt and Alternative Scenarios

Composition of Public Debt



Alternative Scenarios

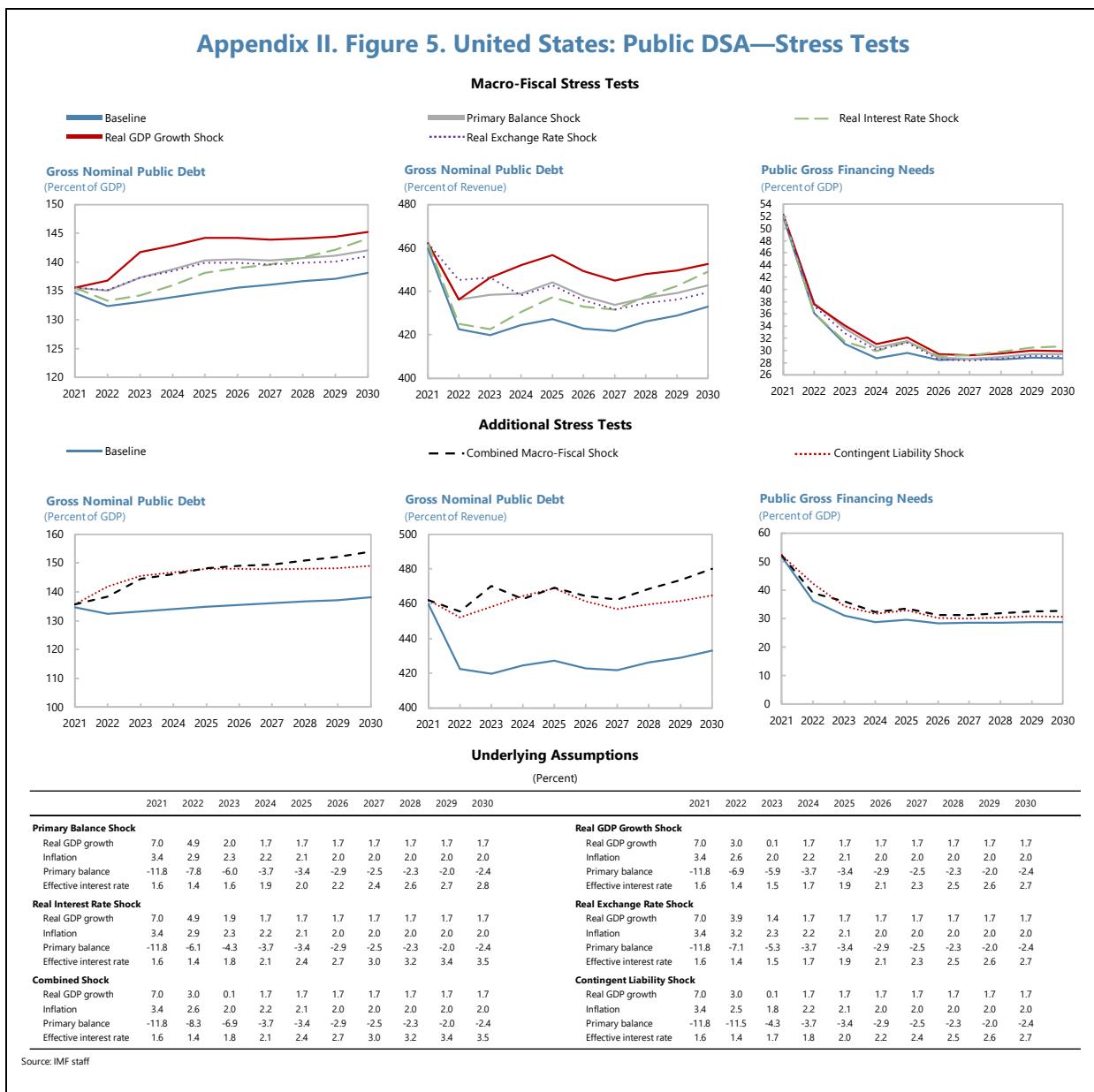


Underlying Assumptions (Percent)

Baseline scenario											Historical scenario										
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Real GDP growth	7.0	4.9	1.9	1.7	1.7	1.7	1.7	1.7	1.7	1.7	Real GDP growth	7.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Inflation	3.4	2.9	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	Inflation	3.4	2.9	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0
Primary balance	-11.8	-6.1	-4.3	-3.7	-3.4	-2.9	-2.5	-2.3	-2.0	-2.4	Primary balance	-11.8	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Effective interest rate	1.6	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.6	2.7	Effective interest rate	1.6	1.4	1.9	2.3	2.7	3.1	3.4	3.7	3.9	4.0
Constant primary balance scenario																					
Real GDP growth	7.0	4.9	1.9	1.7	1.7	1.7	1.7	1.7	1.7	1.7	Real GDP growth	7.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Inflation	3.4	2.9	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	Inflation	3.4	2.9	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0
Primary balance	-11.8	-11.8	-11.8	-11.8	-11.8	-11.8	-11.8	-11.8	-11.8	-11.8	Primary balance	-11.8	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4	-4.4
Effective interest rate	1.6	1.4	1.5	1.7	1.9	2.2	2.4	2.6	2.7	2.8	Effective interest rate	1.6	1.4	1.9	2.3	2.7	3.1	3.4	3.7	3.9	4.0

Source: IMF staff

Appendix II. Figure 5. United States: Public DSA—Stress Tests



Appendix III: External Sector Assessment

Overall Assessment: The external position in 2020 was moderately weaker than the level implied by medium-term fundamentals and desirable policies. Larger private sector saving has largely offset the 2020 fiscal packages, resulting in a transitory modest deterioration of the CA balance. The deep economic contraction, and ongoing changes in fiscal, trade, and labor-market (including, for example, immigration) policies, add uncertainty to the assessment.

Potential Policy Responses: In the near term, given the unprecedented social and economic fallout from the pandemic, front-loaded fiscal support is needed to ease the burden on households and firms, and to support the economic recovery. Over the medium term, fiscal consolidation will be critical to place debt on a sustainable footing, support external rebalancing, and bring the current account balance closer to its norm. Consolidation should target a medium-term general government primary surplus of about 1 percent of GDP to put the debt-to-GDP ratio on a downward path. Structural policies to increase productivity, including of tradables sectors, such as upgrading infrastructure and enhancing schooling, training, and the mobility of workers, can further contribute to external rebalancing. Tariff barriers should be rolled back, and trade and investment disputes should be resolved in a manner that supports an open, stable, and transparent global trading system.

Foreign Asset and Liability Position and Trajectory	Background. The NIIP, which averaged about -42.6 percent during 2015–18, decreased further from -51.6 percent of GDP in 2019 to -67.3 percent of GDP in 2020. Under the IMF staff baseline scenario, the NIIP is projected to remain broadly unchanged through the medium term as the CA balance reverts to its pre-COVID average.						
	Assessment. Financial stability risks could surface in the form of an unexpected decline in foreign demand for US fixed-income securities, which are a main component of the country's external liabilities. This risk, which could materialize, for example, due to a failure to reestablish fiscal sustainability, remains moderate given the dominant status of the US dollar as a reserve currency. About 60 percent of US assets are in the form of FDI and portfolio equity claims.						
2020 (% GDP)	NIIP: -67.3	Gross Assets: 153.6	Res. Assets: 3.0	Gross Liab.: 220.9	Debt Liab.: 102.6		
Current Account	Background. The US CA deficit increased from 2.2 percent of GDP in 2019 to 3.0 percent in 2020 (from 2.0 to 2.7 in cyclically adjusted terms) compared with a deficit of 2.2 percent of GDP in 2015. The evolution since 2015 is explained mostly by deterioration in the non-oil and income balances. In 2020 the trade balance declined slightly from 2019 (-2.7 versus -3.2 percent of GDP) mostly due to changes in the non-oil balance, while the income account declined slightly due to a weaker primary account balance. The large increase in the fiscal deficit (relative to other countries), mostly due to COVID-19, led to only a small increase in the CA deficit in 2020 due to the large increase in private savings. The CA deficit is expected to remain above 2 percent of GDP over the medium term.						
	Assessment. The EBA model estimates a cyclically adjusted CA balance of -2.8 percent of GDP and a cyclically adjusted CA norm of -0.5 percent of GDP. The norm increased from -0.7 percent GDP in 2019 due to an increase of 1.3 percent of GDP in the medium-term desirable cyclically adjusted general government fiscal balance. The EBA model CA gap is -2.3 percent of GDP for 2020, reflecting policy gaps (-1.8 percent of GDP, almost all of which, -1.8 percent, corresponds to fiscal policy) and an unidentified residual (about -0.5 percent of GDP) that may reflect structural factors not included in the model. On balance, the IMF staff assesses the 2020 cyclically adjusted CA to be 1.8 percent of GDP lower than the level implied by medium-term fundamentals and desirable policies. This assessment includes an IMF staff adjustor of 0.5 percent of GDP to account for the effects of COVID-19 on the oil, medical, and travel services (including tourism) balances (0.1 percent of GDP each) as well as the shift of household consumption from services to consumer goods (0.2 percent of GDP).						
2020 (% GDP)	CA: -3.1	Cycl. Adj. CA: -2.8	EBA Norm: -0.5	EBA Gap: -2.3	COVID-19 Adj.: 0.5	Other Adj.: 0.0	Staff Gap: -1.8

Real Exchange Rate	<p>Background. After appreciating by 2.8 percent in 2019, the REER appreciated by 1.4 percent in 2020. Through the second quarter of 2020, the REER appreciated 4.3 percent in relation to the end of 2019. Despite depreciating in the second half of 2020 by 5.4 percent, as of the end of 2020 the REER was still about 14 percent higher than the average for 2015. As of end-May 2021, the REER had depreciated by 3.9 percent compared to the 2020 average.</p> <p>Assessment. Indirect estimates of the REER (based on the IMF staff CA assessment) imply that the exchange rate was overvalued by 8.8 percent in 2020 (applying the estimated elasticity of -0.2). The EBA REER index model suggests an overvaluation of 8.3 percent, and the EBA REER level model suggests an overvaluation of 12.4 percent. Considering all the estimates and their uncertainties, the IMF staff assesses the 2020 average REER to be somewhat overvalued, in the 5.8–11.8 percent range, with a midpoint of 8.8 percent.</p>
Capital and Financial Accounts: Flows and Policy Measures	<p>Background. The financial account balance was about -3.7 percent of GDP in 2020 compared with -1.8 percent of GDP in 2019. An increase in net direct investment (0.5 percent GDP) was offset by decreases in net portfolio investments (0.8 percent GDP) and other net investments.</p> <p>Assessment. The United States has an open capital account. Vulnerabilities are limited by the dollar's status as a reserve currency, with foreign demand for US Treasury securities supported by the status of the dollar as a reserve currency and, possibly, by safe haven flows.</p>
FX Intervention and Reserves Level	<p>Assessment. The dollar has the status of a global reserve currency. Reserves held by the United States are typically low relative to standard metrics. The currency is free floating.</p>

Appendix IV. Implementation of 2020 FSAP Recommendations¹

FSAP Recommendations	Developments	Status (Implemented, partially implemented, not implemented)
Systemic Risk Oversight and Macroprudential Framework		
<p>Provide an explicit financial stability mandate to all federal FSOC members.</p> <p>Prioritize the development of macroprudential tools to address risks and vulnerabilities in the nonbank sector.</p>	<p>This legislative recommendation has not been implemented.</p> <p>During the March 31st Council meeting, the Secretary identified risks related to nonbank financial intermediation as one of the priorities for the Council going forward.</p> <p>It is important to assess the risks posed by open-end mutual funds and money market funds given that those risks materialized during last spring's market stress.</p> <p>On open-end funds, the Secretary called for an interagency assessment to determine if additional measures should be taken to address the financial stability vulnerability associated with open-end funds, and, if so, to develop recommendations for the FSOC.</p> <p>On money market funds, the Secretary has stated that it is encouraging that regulators are considering substantive reform options for money market mutual funds, and that she supports the SEC's efforts to strengthen short-term funding markets.</p> <p>The Secretary also announced the reestablishment of the FSOC Hedge Fund Working Group to help share data,</p>	<p>Not Implemented</p> <p>Partially Implemented</p>

¹ This annex contains the U.S. authorities' self-assessment of the status of implementation of the recommendations of the 2020 FSAP and is not necessarily the assessment of IMF staff.

	identify risks, and work to strengthen the financial system.	
Intensify efforts to close data gaps, including reporting disclosures of holdings of collateralized loan obligations (CLOs) and repo markets, to reinforce market discipline.	In February 2019, the OFR promulgated 12 CFR Part 1610, a rule regarding “Ongoing Data Collection of Centrally Cleared Transactions in the U.S. Repurchase Agreement Market”. Data collection from private entities deemed “covered reporters” began in October 2019. In September 2020, the OFR launched its Short-Term Funding Monitor, which integrates data collected from centrally cleared repo transactions with triparty repo transaction data from the New York Federal Reserve Bank and other existing data sets previously scattered across many sources, into a combined monitor which users can download via a public application programming interface.	Partially Implemented
Banking Regulation and Supervision		
Review prudential requirements for non-internationally active banks (Category III and IV) and ensure they are and continue to be broadly consistent with the Basel capital framework and appropriate concentration limits; and consider extending the full liquidity coverage ratio (LCR) to them.	No material developments to report. As stated in the U.S. Executive Director’s statement in the 2020 Article IV, “in recent years, U.S. authorities have reviewed regulation and supervision and have made carefully considered changes to maintain safety and soundness while better aligning enhanced requirements to the risks that specific banks pose to the financial system. This tailoring considers not only asset size but also a number of risk indicators, including cross-jurisdictional activity, reliance on short-term wholesale funding, and off-balance sheet exposures. With this context, we disagree with [IMF] staff’s focus on and interpretation of standards regarding non-internationally active banks. Subjecting these banks to G-SIB requirements would impose restrictions that are	Implemented

	disproportionate to their lower risk and impede their ability to facilitate credit to the domestic economy."	
Streamline regulatory requirements and consider rewriting key prudential guidance as regulation.	No material developments to report.	Not Implemented
Introduce heightened standards on the governance of large and complex bank holding companies (BHCs), enhance the related-party framework, introduce rules on concentration risk management, and include more quantitative standards regarding interest rate risk in the banking book.	No material developments to report. As stated in the U.S. Executive Director's statement in the 2020 Article IV, "in recent years, U.S. authorities have reviewed regulation and supervision and have made carefully considered changes to maintain safety and soundness while better aligning enhanced requirements to the risks that specific banks pose to the financial system. This tailoring considers not only asset size but also a number of risk indicators, including cross-jurisdictional activity, reliance on short-term wholesale funding, and off-balance sheet exposures. With this context, we disagree with [IMF] staff's focus on and interpretation of standards regarding non-internationally active banks. Subjecting these banks to G-SIB requirements would impose restrictions that are disproportionate to their lower risk and impede their ability to facilitate credit to the domestic economy."	Not Implemented
Insurance Regulation and Supervision		
Increase independence of state insurance regulators, with appropriate accountability.	It is not substantiated that supervisory independence is undermined if commissioners are appointed and/or elected. Further, recommended reforms at the state government level are beyond the purview of individual state insurance departments. The method of commissioner selection is determined by the legislatures in each state. NAIC has sent this recommendation over	Not Implemented

	to NCOIL, NCSL and to the Legislative Liaisons Bulletin Board for their awareness.	
Require all in-force life insurance business be moved to principles-based reserving (PBR) after a five-year transition period, adjust asset valuation approach to ensure consistency between assets and liabilities, and recalibrate risk-based capital (RBC) to the revised valuation approach.	It would require a very significant effort for life insurance companies to set up PBR modeling for their in-force business. PBR applies only to new business for several reasons: (1) formulaic reserves are generally conservative for in-force life insurance products, and under PBR, whole life policies will generally pass exemption tests and continue to be valued under the old reserve methodology; (2) Term insurance products will move to PBR relatively quickly since they have a limited duration and will expire; and (3) State law prevents new valuations on existing products that have minimum non-forfeiture benefits derived at the date of issue of the contract.	Not Implemented
Develop a consolidated group capital requirement similar to GAAP-Plus insurance capital standard (ICS) for internationally active groups and optionally for domestic groups in parallel with the development of aggregation approaches by the FRB and NAIC.	The FRB and NAIC continue to develop their aggregation approaches, and the United States—along with other interested jurisdictions—is developing an Aggregation Method at the IAIS. The IAIS has developed high-level principles and is working to develop criteria to assess whether the Aggregation Method provides comparable outcomes to the ICS by the end of the monitoring period. No U.S. regulator intends to adopt the ICS in its current form.	Not implemented
Regulation, Supervision, and Oversight of FMIs		
Increase CFTC resources devoted to CCP supervision and strengthen rule-approval process to an affirmative approval with a public consultation.	On December 28, 2020, Congress approved additional resources to the CFTC, https://www.govinfo.gov/content/pkg/BILLS-116hr133enr/pdf/BILLS-116hr133enr.pdf	Implemented

<p>Collaborate to analyze differences in outcomes of CCP risk management practices and adopt an appropriately consistent, conservative implementation of risk management standards across CCPs.</p>	<p>The FRB, SEC, and CFTC, respectively, have implemented regulatory frameworks as mandated by Title VIII of the Dodd-Frank Act and that are consistent with the PFMI. The authorities also continue to actively cooperate, coordinate, consult, and collaborate on oversight of CCPs, including risk management practices. For example, the authorities coordinate and collaborate on examinations of CCP risk management practices as well as on reviews of proposed changes to those frameworks. While acknowledging that CCPs operate in different markets, which may require different approaches to managing risk, the authorities continue to discuss differences in the outcomes of risk management practices at CCPs, with considerations taken for financial stability and market impact.</p>	<p>Partially Implemented</p>
<p>Develop and execute more comprehensive systemwide CCP supervisory stress tests.</p>	<p>Preparatory work to conduct a joint supervisory stress test of CCPs began in 2019. Progress has been temporarily delayed as resources were necessarily diverted to address unprecedented COVID-related developments, but engagement will resume. During the pandemic, the authorities endeavored to address these challenges and their effects on registered entities, including CCPs. The SEC developed a COVID-19 Market Monitoring Group to assist in the SEC's efforts to coordinate with and support the COVID-19-related efforts of other federal financial agencies and other bodies, including the President's Working Group on Financial Markets (PWG), Financial Stability Oversight Council (FSOC) and the Financial Stability Board (FSB), among others. The CFTC led a multi-agency default drill in which CCPs from around the world simulate the default and liquidation of a large clearing member during a period of extreme market stress. This exercise is</p>	<p>Fully Implemented with regard to collaboration and implementation of robust risk management standards. Partially Implemented to reflect continued discussion by authorities.</p>

	<p>designed to quantify the effects of individual CCP actions on the clearing system due to simultaneous liquidations and to identify operational or systemic concerns. The CFTC is also co-chairing an international working group focused on the effects of margin demands on the financial system during the period of extreme market stress in March and April of 2020. See also U.S. FSAP Technical Note: Supervision of Financial Market Infrastructures, Resilience of Central Counterparties and Innovative Technologies (July 2020) ("FMIs appeared so far sufficiently robust to manage surges in volumes and volatility in financial markets during the COVID-19 crisis.").</p>	
Securities Regulation and Supervision		
Give CFTC and SEC greater independence to determine their own resources, with appropriate accountability.	This legislative recommendation has not been implemented.	Not Implemented
Assess financial stability risks related to mutual funds and stable net asset value (NAV) money market funds (MMFs), including through SEC-led liquidity stress testing.	<p>The SEC published a request for comment earlier this year at https://www.sec.gov/rules/other/2021/ic-34188.pdf.</p> <p>On June 11, 2021 the SEC also noted forthcoming work on money market funds in its Annual Regulatory Agenda at https://www.sec.gov/news/press-release-2021-99.</p> <p>SEC staff also participated in related work in the PWG, IOSCO and the FSB.</p>	Partially Implemented
Conclude implementation of new broker-dealer capital rules; finalization of market-wide circuit breakers, and	Implementation of new broker-dealer capital rules. On June 21, 2019, the SEC adopted final rules addressing the Title VII requirements for, among other things, capital and segregation requirements for broker-dealers;	Fully Implemented (as of October 6, 2021)

<p>delivery of the Consolidated Audit Trail.</p>	<p>the compliance date for this rulemaking is October 6, 2021 See https://www.sec.gov/news/press-release-2019-105.</p> <p>Finalization of market-wide circuit breakers. The market-wide circuit breakers ("MWCB") operate on a pilot basis that expires on October 19, 2021, unless extended or made permanent. The MWCB were triggered four times in March 2020, providing the self regulatory organizations (SROs) and the SEC with an opportunity to assess its performance. SEC and industry assessments are underway.</p> <p>Delivery of the Consolidated Audit Trail. The SEC charged the SROs with developing and building a Consolidated Audit Trail. For information on the SROs' progress, links to the CAT Implementation Plan, which was filed with the Commission on July 22, 2020, as well as the quarterly progress reports ("QPRs") see https://www.catnmsplan.com/implmentation-plan.</p>	<p>Partially Implemented</p> <p>Partially Implemented</p>
<p>Increase scrutiny of new registrants and reduce reliance on self-attestations where applicable.</p>	<p>Whether a registered investment adviser is a newly registered firm is one of the risk factors that the Division of Examinations considers in selecting firms for examination.</p> <p>Newly registered commodity pool operators (CPOs) immediately become eligible for examination utilizing NFA's risk assessment/model function. There are a number of factors that, if present, may result in a newly registered CPO being scheduled for examination including background of firm personnel.</p>	<p>Partially Implemented</p>

AML/CFT	The AML Act of 2020, which includes the Corporate Transparency Act, was enacted on January 1, 2021, and requires that reporting companies disclose their beneficial owners when they are formed (or, for non-U.S. companies, when they register with a State to do business in the U.S.), and when they change beneficial owners.	Implemented
Ensure that investment advisers, lawyers, accountants, and company service providers are effectively regulated and supervised for AML/CFT in line with risks.	The FATF most recently assessed the United States' progress on these action items as a part of the Third Follow-Up to the U.S. Mutual Evaluation. The United States will continue to engage with the FATF on addressing the gaps identified in that assessment. https://www.fatf-gafi.org/media/fatf/documents/reports/fur/Follow-Up-Report-United-States-March-2020.pdf	Partially Implemented
Systemic Liquidity		
Promote the fungibility of Treasury Securities and Reserves by adjusting assumptions about firms' access to the Discount Window in liquidity metrics.	No changes have been made since the FSAP was conducted.	Not Implemented
Continue to operate regular fine-tuning OMOs.	In the current operating environment, fine-tuning or reserve management OMOs are not needed. The FOMC currently instructs the desk to: Undertake OMOs as necessary to maintain the federal funds rate in a target range of 0 to 1/4 percent. Increase the SOMA holdings of Treasury securities by \$80 billion per month and of agency mortgage-backed securities (MBS) by \$40 billion per month.	Implemented

	<p>Increase holdings of Treasury securities and agency MBS by additional amounts and purchase agency commercial mortgage-backed securities (CMBS) as needed to sustain smooth functioning of markets for these securities.</p> <p>Conduct repurchase agreement operations to support effective policy implementation and the smooth functioning of short-term U.S. dollar funding markets.</p> <p>This policy has been in place since December 2020.</p>	
Advance arrangements for providing liquidity to systemic nonbanks and CCPs under stress, and reconsider restrictions on bilateral emergency liquidity assistance (ELA) to designated systemically important nonbanks.	<p>No changes have been made since the FSAP was conducted.</p> <p>The Federal Reserve has the ability to provide liquidity to systemic nonbanks under stress through broad-based liquidity facilities under Section 13(3) of the Federal Reserve Act. In addition, for a CCP that the FSOC has designated as systemically important, the Federal Reserve is authorized to provide liquidity on a bilateral basis in unusual or exigent circumstances (among other restrictions). (The recommendation to reconsider restrictions on bilateral emergency liquidity assistance to systemic nonbanks should be directed to Congress.)</p>	Not Implemented
Develop robust and effective backup plans in the event the sole provider, Bank of New York Mellon (BNYM), is not able to settle and clear repo transactions.	<p>The Federal Reserve has conducted outreach to market participants to develop awareness and support for the development of robust plans in the event that BNYM is not able to settle and clear repo transactions. Market participants offered widespread interest and support for this effort. The Federal Reserve has since started discussions to form a working group that would consist of market participants and infrastructures in order to develop and implement these plans.</p>	Partially Implemented
Enhance arrangements to provide liquidity support in	No changes have been made since the FSAP was conducted.	Not Implemented

foreign currencies to banks and designated systemically important CCPs.		
Crisis Preparedness and Management		
Intensify crisis preparedness.	<p>Following the financial crisis of 2008, FSOC was created to identify threats to the financial stability of the country, promote market discipline, and respond to emerging risks to the stability of the nation's financial system. It serves as an effective venue for information sharing and coordination among financial regulatory agencies.</p> <p>FSOC is not intended to serve as the primary responder during times of financial crisis. Rather, its purpose is to identify potential vulnerabilities and emerging threats to financial stability, and to develop recommendations for addressing those risks.</p> <p>While comprised of members who have significant regulatory authority, FSOC is not a regulator. However, FSOC does provide a forum for information sharing and coordination among regulators.</p> <p>FSOC leverages the resources and expertise of its member agencies. For example, a number of financial regulators organize tabletop exercises, and FSOC staff regularly participate in those activities.</p> <p>During the spring 2020 market stress, the federal government's response was timely, forceful, and helped preserve financial stability, as noted in the 2020 FSAP. We believe our experience in the recent crisis shows that crisis preparedness processes are sufficiently robust to</p>	Partially Implemented

	<p>have us well positioned should the federal government need to respond to future market stress.</p> <p>The FBAs led and participated in 2020, and continues to maintain, significant principal and staff-level engagements, both interagency and with foreign jurisdictions, to discuss cross-border issues and potential impediments that could affect the resolution of a G-SIB, including in the context of ongoing trilateral work with U.S., UK, and European financial regulatory authorities. In addition, the FBAs works with staff from the U.S. financial regulatory authorities, and with foreign supervisors and resolution authorities and within international groups, to understand risks, identify resolution options, and address related CCP resolution planning issues.</p>	
Continue to use agency discretion actively to subject a wider array of firms to RRP.	No material developments to report.	Not Implemented
Continue to undertake, at least yearly, Dodd-Frank Act (DFA) Title II plans, resolvability assessments, and crisis management group (CMG) discussions of RRPs and assessments.	<p>The FBAs continue to review RRPs submitted by firms with an increasing focus on testing a range of firms' capabilities that support resiliency, recoverability, and resolvability.</p> <p>The FDIC and FRB also continue to co-chair annual Crisis Management Group (CMG) meetings for U.S. G-SIBs, with the participation of the OCC and SEC, as applicable, and relevant host authorities, to discuss home-and-host resolvability assessments for the firms to facilitate cross-border resolution planning.</p> <p>Further, the FDIC has undertaken institution-specific strategic planning to carry out its orderly liquidation</p>	Implemented

	authorities with respect to the largest G-SIBs operating in the United States. The FDIC continues to build out process documents to facilitate the implementation of the framework in a Title II resolution.	
Extend OLA powers to cover FBOs' U.S. branches; ensure equal depositor preference ranking for overseas branch deposits with domestic deposits; introduce powers to give prompt and predictable legal effect to foreign resolution measures.	This legislative recommendation has not been implemented.	Not Implemented

2021 Comprehensive Surveillance Review—Modalities for Modernizing Surveillance



IMF POLICY PAPER

2021 COMPREHENSIVE SURVEILLANCE—MODALITIES FOR MODERNIZING SURVEILLANCE

May 2021

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 May 10, 2021 consideration of the staff report.
- The **Staff Report**, prepared by IMF staff and completed on April 7, 2021 for the Executive Board's consideration on May 10, 2021.

The IMF's transparency policy allows for the deletion of market-sensitive information and premature disclosure of the authorities' policy intentions in published staff reports and other documents.

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**International Monetary Fund
Washington, D.C.**



IMF Executive Board Concludes the 2021 Comprehensive Surveillance Review

FOR IMMEDIATE RELEASE

- The review provides the strategic direction for the IMF's surveillance and aims to make it more timely, topical, targeted, interconnected, and better informed.
- A macroeconomic landscape characterized by elevated uncertainties about the recovery from the COVID-19 pandemic creates difficult trade-offs for policymakers as they seek to achieve inclusive and sustainable growth and stability. Important trends—in digital technology, climate change, inequality, demographics, and geopolitics—affect economic sustainability and present opportunities and challenges.
- Against this background, the priorities that will guide IMF surveillance are confronting risks and uncertainties, preempting and mitigating spillovers, fostering economic sustainability and a unified approach to policy advice.

Washington, DC – May 20, 2021: On May 10, 2021, the Executive Board of the International Monetary Fund (IMF) concluded a comprehensive review of the IMF's surveillance activities. The 2021 Comprehensive Surveillance Review (CSR), which takes place in the context of the global crisis resulting from the COVID-19 pandemic, provides the strategic direction for the Fund's surveillance work for the coming years.

The review identifies key surveillance priorities, which are informed by the major trends impacting on the global economy. The priorities that will guide the IMF surveillance are confronting risks and uncertainties, preempting and mitigating spillovers, fostering economic sustainability and a unified approach to policy advice. The priorities should better position Fund engagement and policy advice to help the membership confront the challenges posed by the emerging macrofinancial landscape. The review aims to strengthen the practice of Fund surveillance by making it more timely, topical, targeted, interconnected, and better informed.

The CSR's main findings on trends, policy challenges, surveillance priorities are reflected in the [Overview Paper](#), while the paper on [Modalities for Modernizing Surveillance](#) outlines how surveillance will change in practice.

The Fund's comprehensive surveillance review builds on extensive background work, including in-depth analysis of [Confronting Risks and Uncertainties](#), [Preempting and Mitigating Spillovers](#), and [Ensuring Economic Sustainability](#). Additional background papers are dedicated to [Integrating Climate Change into Article IV Consultations](#) and [Systemic Risk and Macropolicy Advice in Article IV Consultations](#). The review was further informed by analysis on the [Traction](#) of Fund advice, [Scenario Planning](#) exercises that informed the priorities, and a report on the [Stakeholder Surveys](#).

Executive Board Assessment

Executive Directors broadly agreed with the main conclusions of the Comprehensive Surveillance Review (CSR). They noted that the CSR will serve as a blueprint for Fund

surveillance to help the membership navigate the challenges of the next five-to-ten years, informing forthcoming work on capital flows, climate change, and data, among other issues. Directors agreed that Fund surveillance needs to be better interconnected, more timely, topical, and targeted, and welcomed the CSR's ambitions to modernize surveillance modalities.

Directors agreed with the CSR's assessment that a macroeconomic landscape characterized by elevated uncertainties about the recovery from the COVID-19 pandemic will create difficult trade-offs for policymakers as they seek to achieve inclusive and sustainable growth and stability. Important trends—in digital technology, climate change, inequality, demographics, and geopolitics—affecting economic sustainability will also present opportunities and challenges and, where macro-critical, will need to be incorporated in the Fund's surveillance.

Directors agreed with the four proposed surveillance priorities:

Confronting risks and uncertainties. Directors generally welcomed better integrating risks and uncertainties in the Fund's surveillance, including by increasing the emphasis on the range of potential outcomes relative to the baseline and offering more contingent policy advice, although some Directors cautioned against making surveillance excessively risk-centric. Directors welcomed the emphasis on clearer communication on risks, although the communications should be carefully framed to avoid unintended consequences.

Pre-empting and mitigating adverse spillovers. Directors agreed that the Fund should continue to strengthen its work on spillovers, drawing on better data, tools, and information-sharing frameworks, while strengthening the dialogue with the membership. Directors broadly agreed that the Spillovers Tool and the Spillovers Forum would help in this regard.

Fostering economic sustainability. Directors welcomed a broader focus on sustainability, which can be affected by factors such as demographics, digitalization, inequality, socio- and geopolitical developments, and climate change under certain circumstances. They supported incorporating the macro-financial and distributional impacts of policies, where macro-economically relevant, while considering country-specific political economy, and institutional and capacity constraints. At the same time, Directors recognized the need for Article IV consultations to remain selective and focused in their coverage of new topics and cautioned against over-stretching Fund surveillance. They called on the Fund to coordinate closely with other organizations and better leverage outside expertise whenever possible.

Unified policy advice. Directors agreed that, in an environment of constrained policy space where members may deploy multiple policy tools simultaneously, a more unified approach to the policy mix is needed. They considered that the completion of the Integrated Policy Framework would be helpful in this context.

Directors underscored the importance of strengthening the traction of Fund advice through higher quality analysis, stronger engagement on country-specific issues, more continuous dialogue with all relevant stakeholders, and clear communication. In this context, Directors considered further integration of capacity development (CD) in surveillance as a priority area, including strengthening the use of the CD country strategies. They considered that virtual engagement could be leveraged but stressed that in-person missions were still essential to build relations and trust and ensure a close policy dialogue with the authorities.

Directors welcomed the novel approaches of Board engagement to enhance its strategic role, take up cross-cutting issues in a more comprehensive manner, and be more strategic and forward-leaning. They welcomed the Board Country Matters Meetings (CMMs) as an instrument to focus on conjunctural cross-country policy-relevant issues, with a few requesting opportunities for the Board to provide input and select topics, and looked forward to further detail on the interaction of CMMs and regular surveillance. Directors generally supported the Granular Policy Initiative as a way to provide more specific advice to the membership as they face new challenges.

Directors agreed that focused Article IV Consultations, with topics selected in collaboration with the authorities and while continuing to cover core areas, would help better balance selectivity and comprehensiveness. In this context, Directors emphasized the need to adhere to the principles of evenhandedness and macro-criticality. A number of Directors stressed that more focused reports should not come at the expense of the reports' broad macroeconomic coverage and their use as reference documents.

Directors agreed on the need to deepen macro-financial analysis and further integrate it into bilateral surveillance. They called for additional efforts in the areas of systemic risk analysis to better anchor macroprudential policy advice. Directors agreed that Article IV staff reports should provide a well-articulated view about systemic risk grounded in a rigorous analysis of financial vulnerabilities. In this context, they stressed the need for closer integration of FSAP findings and recommendations with the Article IV Consultations. They also underscored the need to expand macro-financial talent at the Fund, particularly in country teams, while taking into account budget considerations. Directors further noted that, as digital money gains prominence, Fund surveillance should explore its potential benefits, as well as risks and spillovers.

Directors recognized the importance of a more systematic integration into surveillance of macro-critical emerging topics, including climate change. They generally agreed that coverage of climate change mitigation in Article IV consultations would be strongly encouraged for the largest emitters of greenhouse gases. A few Directors underlined the need to account for past emissions and the energy needs of developing countries as they grow. Directors stressed that Fund surveillance should be open to different policy approaches to climate change mitigation, that coverage of climate issues in surveillance needs to be consistent with the Fund's surveillance mandate and in line with the Paris Agreement. They underscored that, wherever macrocritical, climate change adaptation and transition risk in the context of a global shift to a low-carbon economy should be covered in Article IV reports.

Directors emphasized that better data is critical to deliver on surveillance priorities. They looked forward to closing critical data gaps in surveillance in the areas of public sector data, foreign-exchange intervention data, and indicators for macrofinancial analysis through the forthcoming review of Data Provision to the Fund with a few Directors calling for a cautious approach to foreign-exchange intervention data. Some Directors noted that increased data requirements might place undue additional demands on authorities and should be balanced against capacity considerations.

Directors welcomed the proposed flexible and gradual approach to implementing the new modalities, which revolve around the principle of experimentation, adaptation, and flexibility, while working within the confines of existing formal frameworks. They looked forward to a revised surveillance guidance note, and sought Board engagement on implementation of

modalities as well as coordination across departments in advance of the guidance note and in the context of the semi-annual work program discussions.

Directors recognized that modernizing surveillance might require additional resources and that the specifics will be taken up in the context of the Fund's overall budget discussions.

Directors concurred that no changes to the Integrated Surveillance Decision are required. They agreed that progress on CSR implementation will be reassessed in about two years in the context of an interim review and that the comprehensive review will remain on a five year-cycle.



April 7, 2021

2021 COMPREHENSIVE SURVEILLANCE REVIEW— MODALITIES FOR MODERNIZING SURVEILLANCE

EXECUTIVE SUMMARY

Modern Fund surveillance needs to be...

...more targeted, topical and timely. A *Granular Policy Initiative (GPI)* would build on the Policy Tracker to help identify common issues affecting the membership, tailor policy advice to country specific circumstances, and catalyze Fund policy views on cross-cutting issues. Board *Country Matters Meetings (CMMs)* on conjunctural cross-region policy-relevant issues would provide guidance to feed back into bilateral surveillance. *Focused AIV Consultations* would provide space for discussions of macro-critical topical issues. Virtual engagement can complement Fund missions and allow for nimbler surveillance if leveraged correctly. All of these would consider country-specific needs and constraints, including for Low Income Countries/Fragile States (LIC/FS).

...better interconnected. Improved analysis and clarity around a well-articulated view or an *Assessment of Systemic Financial Risks*, a new process for more seamless *FSAP Integration*, and *Expanding Macrofinancial Talent* would strengthen macrofinancial integration in Article IV reports. *Contingent Policy Advice* can help members better address the range of potential outcomes. A *Spillovers Tool* for major policy spillovers and a *Spillovers Forum* for producers and receivers to informally discuss incipient issues would foster more structured and candid discussion of spillovers. Supported by the development of new tools, *Climate* would be systematically integrated into bilateral surveillance when macro-critical. Improved integration of Capacity Development (CD) would increase traction and help deliver on priorities, including through the elaboration of a *CD Country Strategy* and the support of the *CD Management and Administrative Program (CDMAP)*. *Collaboration with External Partners* would strengthen the Fund's understanding of issues outside its core areas of expertise.

...and better informed. A *Revamped Internal Economics Training (IET)* would support CSR modalities as would *Better Tools*. Efforts to enhance the availability of more and better data through *Data Provision to the Fund, Encouraged Data Provision* and the *iData Initiative* would strengthen fact-based analysis. The ongoing *Integrated Digital Workplace (iDW)* and various *Knowledge Management Projects*

aim to support staff's operational and analytical work. A reimagined ***Country Portal*** would serve as a "one-stop shop" for all relevant Fund content on a given country.

Modernizing surveillance will likely require additional resources, although estimates are highly uncertain at this stage. The paper offers a tentative costing of new proposals with significant budgetary implications. Other proposals could rely on optimizing processes, while others are underway and funded separately; the resource implications of yet others are being picked up in context of other workstreams. Estimates do not include short-term transition costs or pressures on support services and are subject to a significant degree of uncertainty. A flexible approach to implementing the new modalities, characterized by experimentation and learning-by-doing—a "sandbox" for new modalities—is proposed.

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INTRODUCTION

1. As laid out in the 2021 CSR Overview Paper (IMF, 2021), the Fund is facing a challenging landscape with the world changing more rapidly than before. Alongside accelerated change, uncertainty is here to stay. The emerging macrofinancial landscape involves subdued and divergent growth prospects, widening imbalances, rising financial complexity, and limited policy space that pre-dated COVID—but have all become more salient.
2. To help the membership confront this landscape and better position Fund surveillance, the CSR Overview Paper proposes four surveillance priorities:
 - **Confronting risks and uncertainties.** Risks and uncertain implications of major underlying long-term trends like demographics, technological change, inequality, socio-political and geo-political developments, and climate change will increasingly test growth prospects and economic and financial stability. In this context, Fund surveillance should explicitly discuss these risks through a better understanding of growth-stability trade-offs, contingency planning and policies geared towards risk management, including seizing upside risks.
 - **Preempting and mitigating spillovers.** Cross-border spillovers are evolving and intensifying, as global economic integration is shifting on multiple fronts including trade, global value chains, new types of financial intermediaries, relocation of foreign direct investment (FDI), and new patterns for migration and remittances. Rapid advances in digital and financial technologies may also result in more rapid policy and risk transmission and impact on the International Monetary System (IMS). Fund surveillance will need to prioritize the identification of familiar and potentially new, less understood, sources of spillovers, as well as approaches to pre-empt and/or mitigate them.
 - **Fostering economic sustainability.** Secular trends (e.g., digitalization, demographics, and climate change), distributional considerations, and the quality of governance and institutions, should be considered to achieve sustainable economic growth and stability. A broader understanding of economic sustainability is necessary to better account for how different economic and non-economic developments can come to bear on the Fund's macroeconomic stability mandate. These and other similar considerations require applying a wider lens or a longer horizon to assessments of stability than has typically been the case so far in Fund surveillance.
 - **Adopting a more unified approach to policy advice.** Balancing different priorities with limited policy space will require advice that better accounts for the tradeoffs and synergies among different policy combinations. Such an approach would increase the coherence of Fund advice to support strong and sustainable economic growth.

3. This paper elaborates on how Fund surveillance can change in practice to address the four surveillance priorities. The proposed modalities aim to make Fund surveillance more targeted, topical and timely, better integrated, and better informed. Modalities include new proposals and better leveraging of ongoing initiatives to modernize Fund surveillance, building on past successes while making surveillance nimbler, commensurate with the challenges posed by faster change and increased uncertainty in the global landscape. The proposed modalities also need to duly consider country-specific needs and constraints, including of Low-Income Countries/Fragile States (LIC/FS), cognizant that the approach cannot be one-size-fits-all.

4. Proposed modalities revolve around the principle of experimentation, adaptation, and flexibility. The Fund needs to continuously adapt and be flexible through learning-by-doing and experimentation, particularly at a time of high pressure on resources with multiple ongoing medium-term and COVID-19-related initiatives. As experience is accumulated, modalities that prove useful should be strengthened and refined, while others are dispensed with. The revised Surveillance Guidance Note will take on the more detailed implementation aspects not covered in this paper. Progress should be reassessed in about two years in the context of an Interim Surveillance Review.

MODALITIES FOR STRENGTHENING SURVEILLANCE

*This section presents **key proposals** (see table in Annex I)¹ for making Fund surveillance more timely, topical, targeted, interconnected, and better informed. It elaborates on new proposals and how to leverage ongoing initiatives.*

5. A modern surveillance framework requires a more flexible approach that embraces experimentation and adaptation. The structure of surveillance products (e.g., Article IV staff reports) and engagement has served the membership well. Yet, it has remained largely unchanged in the past several decades—centered around annual cycles with comprehensive and self-contained reports that are often not sufficiently timely, and not always well synchronized with national policy debates. A growing list of requirements on Article IV staff reports that has accumulated from the past has also contributed to the perception that they are formulaic and stale. In the shifting global landscape, surveillance will need to be nimble and more responsive to emerging priorities at the country-level, particularly when critical developments occur in-between consultations, which would greatly help increase traction (see CSR background paper on traction, IMF, 2021a).

6. Surveillance will also need to better surface issues of strategic and cross-cutting importance so that the international community, represented by the Board, can offer its collective views. Fund surveillance is exercised by the Executive Board. The Board’s discussion—normally articulated in the Summing Up—establishes the Funds’ views on the economic risks and policy priorities for the member country, as well as areas of debate. When well-balanced, the exercise of Board surveillance provides the opportunity to consider both country-specific issues and strategic trends that cut across the membership. This helps identify policy areas or risks that require

¹ New CSR proposals and ongoing initiatives are highlighted in blue italics throughout the paper.

deeper analysis, provides strategic direction, and informs future surveillance. While cross-cutting issues that are of strategic interest to other members frequently arise in Article IV consultations, they are nevertheless not systematically captured by dedicated multilateral surveillance products, such as the flagship reports. Indeed, beyond the flagship discussions and regional briefings, the Board has limited opportunities to provide views on breaking developments of importance to a subset of members spanning geographies or the international community at large (see IMF 2014, 2018, 2019 and findings from a survey to stakeholders in the background paper IMF, 2021b).

7. To achieve these objectives, surveillance, in particular surveillance through Article IV consultations, would benefit from more flexibility to adapt to rapidly evolving demands. Thus, the modalities discussed in this section, both new and ongoing initiatives, together aim to make Fund surveillance limber against an underlying principle of experimentation and adaptation. Modalities need to be continuously evaluated for alignment with the surveillance priorities and the principle of effective delivery mindful of resource constraints and work pressures, which have greatly increased during the COVID-19 pandemic, while remaining current with technological developments.

8. Modern Fund surveillance needs to be:

- **More timely, topical, and targeted.** Surveillance should continuously inform the membership and provide “real time” policy advice while rebalancing comprehensiveness and selectivity. An undue amount of time, effort, and focus is spent preparing and discussing details of Article IV consultations, whose reports are often dated and end up being too spaced out across time, making it difficult to surface cross-cutting issues. Rebalancing staff reports away from a strict sectoral approach, in which all macro areas are roughly equally weighted, to in-depth discussion of issues of imminent relevance and for which circumstances have most markedly changed, is needed. Being timely and topical can greatly enhance the provision of more targeted advice that fully considers country-specific circumstances. Pre-pandemic surveillance modalities, therefore, need to evolve to bolster both the Fund’s ability to respond to country-specific needs and augment the Board’s capacity to engage on topical issues more strategically. There is scope for the Fund to take up cross-cutting issues in a more comprehensive manner, be more strategic and forward-leaning, endorse more broad-based policy advice, and guide the Fund’s response to emerging risks, challenges, and trends that affect many members at the same time. Recent experience with virtual engagement further shows that Fund surveillance can be enhanced using new technology and tools, both in speed and relevance, complementing continued physical contact with authorities that is crucial for traction.
- **Better interconnected.** A modern surveillance framework can better integrate key aspects of the Fund’s work by tapping into knowledge dispersed across the Fund and beyond. This includes the core areas of macrofinancial surveillance, assessment of risks and contingent policy advice, more candid discussions of spillovers, and capacity development, as well as new topics like those related to climate change, digitalization of both financial and fiscal sectors, and income and social inequities. External expertise will need to be married with a more relevant staff skill-mix to respond to this challenge in a resource conscious manner.

- **Better informed.** The Fund must take full advantage of new technologies and data availability and management to modernize business practices and enhance the relevance of surveillance. Better knowledge management, systems and production processes—supported by strengthened peer-learning and by leveraging technology—are needed to deliver time-sensitive work on cross-cutting themes and emerging risks. New analytical tools, better data, and knowledgeable staff will ultimately deliver more relevant and cost-effective surveillance. Surveillance products and communication need to reach a broad set of audiences to enhance traction.

A. Support Timely, Topical, and Targeted Surveillance

9. Novel ways of Board engagement can enhance its strategic role, initiating a virtuous circle between the analysis of cross-cutting issues and bilateral policy advice. Board **Country Matters Meetings (CMMs)** could focus on conjunctural policy-relevant issues facing two or more members (Box 1). CMMs would collate and distill issues across the membership, spanning area and functional departments, and would be different from the contents of the Fund's flagships—by focusing on issues being faced at the country level, including by non-systemic countries, that would have lessons or bearings for other countries. They would also be different from regional briefings—by capturing policy issues relevant across regions, rather than within regions. **CMMs** would also be distinct from thematic briefings in that they would be aimed at explicitly soliciting the Board's views on key policy questions that would be expected to feed into bilateral Article IV consultations.² Other initiatives like the **Granular Policy Initiative (GPI)** would also facilitate the distilling and synthesizing of issues to be brought for discussion at the Board in a timely way. **CMMs** can also help strengthen traction with member countries. This approach would better rebalance Board discussions between the details of individual country surveillance cases and the need to share emerging policy lessons within more relevant timeframes. By providing more frequent insights into emerging developments and drawing early lessons from country experiences, this approach could enhance the relevance of peer surveillance and support more **Focused AIV Consultations** (see below).

Box 1. Country Matters Meetings (CMMs)

Board CMMs are envisioned to focus primarily on conjunctural policy-relevant developments facing a group of countries. They would collate and distill issues across the membership, spanning area and functional departments to feed further into bilateral surveillance. **CMMs** would be distinct from the Fund's flagship and regional briefings as they would seek to capture—in a regular and timelier manner—policy issues relevant for countries across regions rather than within regions. They would also be different from thematic briefings because **CMMs** aim to incorporate Board views into forthcoming bilateral surveillance engagements.

CMMs would synthesize and help formulate more timely and topical advice to individual members based on peer experience. **CMMs** seek to enrich the dialogue with the membership, without replacing the assessment of members' obligations under the Articles of Agreement provided by the regularly scheduled Article IV consultations. **CMMs** would offer the Board and the membership timelier Fund views about

² Thematic briefings could continue as needed, depending on resource availability.

Box 1. Country Matters Meetings (CMMs) (Concluded)

emerging risks and cross-cutting themes, including on how different countries are tackling similar challenges. The **GPI** (see below) could usefully support **CMMs** but is not required for their success.

CMMs would also provide strategic guidance. They would better inform the Fund's work in a timely and targeted manner and help establish a virtuous feedback loop into future Article IV reports. The result would be that subsequent Article IV consultations would be more strategic and focused on topic selection and more informed by other country experiences. Such **Focused Article IV Consultations** (Box 3) would in turn become more relevant for the membership and help inform future **CMMs**. Board **CMMs** could be formal or informal, depending on the issue discussed and whether the Fund is sufficiently well placed to formulate a position on the specific issues at hand. Previous Board engagements that were similar to **CMMs** in scope include the work on correspondent banking relations (formal) board meeting in 2017, or housing market challenges (informal) board briefing in 2019. Specific proposals for topics and nature of the Board meetings (informal to engage / formal) would be made in the context of the semi-annual board work programs. The operational costs and effectiveness of **CMMs** as a surveillance mechanism should be reassessed after about two years of experience.

10. Flexible and real-time surveillance tools, designed to surface and answer pressing policy questions of common interest, can help lay the groundwork for timelier and more targeted Fund advice. The Policy Tracker on Policy Responses to the COVID-19 shock garnered much attention, particularly at the onset of the crisis, and served as a real-time repository of member's policy actions, helping to disseminate information and peer-learning of outcomes.³ The Tracker, however, does not include Fund advice or an assessment of the measures, limiting its usefulness for Fund surveillance of other countries considering similar measures. To bring country-specificity and actionability to Fund surveillance, a proposed **Granular Policy Initiative (GPI)** can help staff better and more systematically identify policy questions that affect the membership and tailor policy advice to country specific circumstances (Box 2). The initiative would better leverage

Box 2. Granular Policy Initiative (GPI)

The need for granularity of bilateral Fund advice and for fostering real-time peer-learning has only grown over the COVID-19 crisis. Country teams need better access to technical expertise in bilateral surveillance as well as better tools to draw on experiences from other countries. These challenges are further exacerbated by the COVID-19 crisis. Policymakers are dealing with new, but also common, questions, including how to provide temporary tax relief, design targeted fiscal support, provide relief to the informal sector, avoid corruption when disbursing large support packages, or provide equity-like support to SMEs. The need for granular advice that can quickly leverage on peers' experiences has increased, and can be supported by integrating work across functional and area departments, including capacity development.

Building on existing coordination mechanisms, the GPI aims to:

- Facilitate and proactively expand targeted or granular policy advice on pressing and evolving exigencies that go beyond standard macro-fiscal issues. Such advice frequently requires deep sectoral expertise from

³ The policy tracker summarizes the key economic responses governments are taking to limit the human and economic impact of the COVID-19 pandemic. The tracker includes 197 economies and is available at: <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>.

Box 2. Granular Policy Initiative (GPI) (Concluded)

functional departments but specifically calibrated to country-specific circumstances. As such, it would be based on greater and closer collaboration across departments and business lines (i.e. surveillance and TA).

- Synthesize lessons from experience on a limited set of topics to provide a live internal repository for country teams to draw on, thus enhancing peer-learning opportunities. Case studies along with preliminary takeaways can be used by country teams in their policy dialogue with authorities. Lessons from cumulated experiences could be published in the external website after AIV consultations are concluded to preserve the Board's ultimate responsibility to conduct surveillance.

The GPI is envisioned to be broader in scope than the policy tracker, more country specific than the COVID-19 Special Series of notes prepared by departments, and more systematic than current mechanisms for providing granularity.

The policy tracker is a useful repository of members' policy actions for knowledge sharing, but it is not a surveillance tool as it does not provide normative views on those actions. Papers under the COVID-19 Special Series are cast at a relatively high level of generality. In contrast, the takeaways and advice in the GPI would feed directly into Article IV dialogues and naturally bring in peer experiences, including through innovative media.

and combine expertise from functional and area departments, including technical assistance. Policy questions and lessons emerging from the **Granular Policy Initiative** would feed into a live repository of key lessons organized by topic, Article IV consultations, and the Fund's policy dialogue in public fora (e.g., G7, G20, IMFC). Emerging macro-relevant issues, best practices, and evolving Fund views could thus be identified and distilled for the advantage of the membership at large, many of whom could be facing similar challenges and considering policy options.

11. A shift towards *Focused Article IV Consultations* would help better balance selectivity and comprehensiveness, guided by where the Fund can provide the most value-added. A more selective, issue-driven approach to surveillance would be most appropriate where extensive information is already publicly available (Box 3). For members with limited data availability or low overall capacity and with broad macro challenges, such as many LIC/FS, the current comprehensive coverage may still be warranted. Such a differentiated approach may create less uniformity in staff reports, but surveillance in countries in similar circumstances would still be treated in a similar way, consistent with the principle of evenhandedness. **CMMs** and **Focused Article IV Consultations** would encourage more continuous engagement between the Fund and its membership on topics of strategic importance, creating scope for the Fund to sharpen its attention on cross-cutting issues of strategic relevance in a more flexible and time-sensitive manner. **Focused Article IV Consultations** would help customize the Article IV process and possibly reduce the lag between the completion of the staff report, its consideration by the Board, and subsequent publication. Enhanced focus on a specific topic would remain consistent with existing Fund policies and Board decisions, but would require a change in the surveillance practices and expectations across the Fund—including the review process, country teams, and the Board—and account for the challenges Area Departments face to implement this shift.

Box 3. Focused Article IV Consultations

Focused Article IV Consultations would be organized around issues—thematic reports—that change more flexibly from country to country and from year to year. Focused staff reports organized around issues rather than sectors—de-emphasizing the “checklist” approach—would allow for individual Article IVs to surface to the Board issues of common interest to larger subsets of the membership in a timely manner.

Staff reports prepared for Focused Article IV Consultations would continue to address the core elements necessary for surveillance. These core elements, as laid out in the Integrated Surveillance Decision (ISD), include a staff appraisal of fiscal, monetary, financial, and exchange rate policies as part of a brief assessment of the economy. The report would also include the external sector and debt sustainability assessments, and a well-integrated analysis of macrofinancial linkages. However, if the policy stance and Fund policy advice is largely unchanged from the previous consultation, coverage would be very succinct, more so than is typically the case now, and previous reports would be referenced. The reports would combine these core elements with a deeper look at one or two macro-critical issues, with the discussion of core elements addressing the challenges posed by the macro-critical issues—for instance, how demographic trends affect fiscal sustainability or how technology impacts financial stability. The coverage of these issues would be anchored by country-specific plans discussed with authorities and would ultimately serve to enhance traction. **CMMs** and **GPI** would help to set the stage for producing **Focused Article IV Consultations**.

Some country teams have been experimenting with focused consultations, for instance, Japan ([2019 Article IV](#), with a focus on Demographics) and The United States ([2019 Article IV](#), with focus on social indicators and inequality). However, unlike in these cases, **Focused Article IV Consultations** would further eschew the comprehensive coverage of issues and sectors previously covered recently where there have been no significant changes since. Such streamlining of coverage will require changes in the culture and expectations across the institution at all levels, including the need for the review process to hold back on asking for coverage of additional issues and topics.

12. Real-time, topical, and thematic surveillance can greatly leverage on the complementarity of virtual engagement.

In this respect, the COVID-19 crisis has provided important lessons:

- It has paved the way for new modalities of engagement with the membership outside of standard missions during the Article IV consultation. If time-zone differences allow, staff visits could move to virtual settings, at least in part, as continuous off-cycle technical meetings have become more common. Experts from within the Fund can more easily join discussions and provide targeted advice, greatly supporting the integration of several workstreams in surveillance (see the next sub-section) and the **Granular Policy Initiative (GPI)**.
- In-person visits, however, cannot be dispensed with entirely and remain essential to build relations and traction, gather effective and comprehensive information, and reach out to broader audiences. But these visits could be shorter and more pointed if complemented with advance virtual engagement on technical matters.

13. However, a one-size-fits-all approach is inconceivable; virtual modalities will need to respond to country specific circumstances, and may need particular adaptation when engaging with LIC/FS.

As important recipients of technical assistance and in need of capacity

building, LIC/FS surveillance can greatly benefit from the participation of non-country team experts or of staff from other country teams that have faced similar issues in the past. At the same time, logistical and technological challenges are greater for these countries and thus solutions would need to be evaluated on a country-by-country basis. As such, this is another area where experimentation and adaptation can bring best practices to light.

14. Successful implementation on an experimental basis of the proposed modalities requires striking the right balance from a resource management perspective. For instance, there is a risk that more frequent engagement throughout the year could be more resource intensive for authorities (e.g., data requests, authorities' views needed on issues outside of the Article IV cycle) and staff (e.g., more frequent engagement with authorities and the Board, shorter internal review, increased need for interpretation and other support services). On the other hand, a greater use of LOT procedures under the current LOT policy for member surveillance would free up some staff resources and reduce bunching in the Board calendar.^{4,5} Realistically, several of the proposals here may well entail short-term transition costs, particularly on Area Departments, which should be continuously assessed and paired with streamlining elsewhere as needed.

B. Promote More Interconnected Surveillance

15. Bilateral surveillance can better connect core areas and integrate emerging priorities. In many ways, establishing and internalizing such connections is at the core of the surveillance priority of providing more unified policy advice. Through the internal review process and cross-departmental collaboration, country teams already benefit greatly from work across the institution and beyond, for instance, on monetary, fiscal, and financial policy analysis and advice, and technical assistance and training. However, a more systematic integration of some areas, such as macrofinancial, risk analysis and capacity development, as well as of work on emerging priorities, such as climate change, digitalization, and broader sustainability, would help (i) increase traction; (ii) better identify emerging themes across countries; and (iii) increase the specificity and timeliness of Fund advice by deploying existing resources more flexibly and effectively. External expertise can also be better leveraged, particularly in areas outside the Fund's core mandate.

16. New proposals, building on existing knowledge and supported by expanding staff's macrofinancial expertise, can help further integrate and deepen macrofinancial work into bilateral surveillance (see CSR background paper, IMF, 2021c). To achieve a well-integrated analysis of systemic financial risks and macrofinancial linkages into bilateral surveillance:

- Article IV staff reports should provide a well-articulated view about systemic financial risks—an ***Assessment of Systemic Financial Risks***—grounded in rigorous analyses of financial sector

⁴ *Compendium of Executive Board Procedures*, March 2018. Section VII, pages 53–59. Also, Part A of Decision No. 14766-(10/115), as amended.

⁵ The recent number of Article IV Consultations considered on LOT suggests that there is room for balancing Board engagement via CMMs—LOTs were 14 in 2019 and 9 in 2020, compared with 26 in 2017.

vulnerabilities, that can act as generators of shocks or as propagators through real-financial linkages. This would support a better integration of the discussion of these risks into the outlook and help anchor macroprudential policy advice. The revised Guidance Note will provide further directions to help country teams articulate such a view and conduct the analysis in line with the examples and approaches presented in IMF (2021c).

- As articulated in the Financial Sector Assessment Program (FSAP) review, closer **FSAP integration** can help strengthen systemic risk analysis and anchor policy advice in Article IV consultations (IMF, 2021b). To this end, a coordinated proposal with the FSAP Review envisages a new process for early interaction between country teams and MCM, well ahead of Policy Consultation Meetings, to agree on how best to follow up on FSAP findings and recommendations. The same would apply to FSSR findings and recommendations for relevant countries, often LIC/FS.
- As noted in IMF (2021c) and the IEO evaluation of the Fund's Financial Surveillance (IEO, 2019), gaps in macrofinancial expertise among Fund staff has constrained further progress in fully embedding macrofinancial analysis in Article IV consultations. This need pre-dates the challenges being brought by the emergence of digital currencies. Making major strides in core macrofinancial integration in Article IV reports requires **Expanding Macrofinancial Talent** through additional hiring of economists with macrofinancial expertise. Additional recruitment supported also by ongoing HR initiatives and training should help strengthen Fund-wide macrofinancial expertise, including in the review process. More expertise complemented with an expanded availability of data and tools should facilitate strengthening systemic risk analysis in bilateral surveillance (see the next sub-section).

17. More generally, a deeper discussion of risks can be further integrated in the policy analysis and advice. Despite progress since the GFC, Fund surveillance is still overly focused on the baseline scenario. It is proposed that staff reports place greater emphasis in their discussion with members of the range of potential outcomes, naturally leading to clearly articulated **Contingent Policy Advice** (Box 4). The discussion should highlight how best to seize on upside opportunities, manage downside risks, as well as provide more specific policy advice contingent on the materialization of different risks. The flexible use of better data and tools will play an important supporting role (see the next sub-section). Consideration should be placed in carefully managing communication challenges in pursuing such an approach, since the emphasis on policies that better take into account a multitude of possible eventualities may dilute messages and confound audiences.

Box 4. Contingent Policy Advice

Staff reports continue to be overly focused on a baseline scenario (see CSR background paper, IMF, 2021d). The coverage of risks has become more systematic since the Global Financial Crisis (GFC). Staff reports now regularly identify major risks and provide an assessment of their likelihood and economic impact, summarized in Risk Assessment Matrices (RAM). Fund surveillance can widen its emphasis to a fuller range of possible outcomes and encourage more proactive policy formulation on managing risks in a relevant manner. To support such efforts, the G-RAM/RAM framework can be further strengthened through greater use of quantitative scenarios.

The COVID-19 crisis further strengthens the case for Contingent Policy Advice. Policymakers are now operating in a highly uncertain environment, a situation that is likely to persist over the medium-term. Policies would need to be more robust to alternatives around the baseline macro projections. This would mean, besides being better prepared for downside risks, also seizing upside risks, both through the design of ex-ante policies like vaccination efforts, green investments that are robust to alternative scenarios, as well as through re-enforcing policies as upside risks materialize—for example, how to take best advantage of vaccines to boost tourism.

The communication challenges of Contingent Policy Advice should not be understated. As staff discusses policies for alternative scenarios, baseline advice may naturally become diluted. These important messaging challenges will need to be carefully considered.

18. A more candid discussion of spillovers in surveillance with member countries would improve the timeliness, relevance, and traction of Fund advice in this area (see CSR background paper, IMF, 2021e, for more details). The increasing significance of spillovers calls for strengthening the internal discussion among spillover producing and receiving country teams, and between country teams and functional departments. It also calls for more dialogue between the Fund and member countries of key spillover issues that are still in the incipient stages to induce more peer-to-peer discussions of key policy implications. Together, these efforts would help integrate better spillover discussions in flagships with those of members in the context of Article IV surveillance, in support of timely and targeted policy advice.

- In addition, there may be merit in developing an institutional level understanding on the types of spillovers that are relevant to consider at a given juncture, and the channels through which they are likely to operate. This would strengthen the link between bilateral and multilateral surveillance. A **Spillovers Tool** can help improve the understanding of key spillovers relevant in a given juncture and their propagation channels to enable a more coordinated approach to spillover analysis at the institutional level. The assessment would be updated periodically, to provide concrete and specific guidance for country teams (for instance, on key transmission channels, size and potential alternative or mitigating policy advice) for a limited set of global spillovers that are relevant under the baseline and alternative scenarios, with the identification of spillovers supported by the WEO, G-RAM and Spillover Taskforce (see more details in IMF, 2021e).
- A proposed **Spillovers Forum** would be an informal closed-door meeting to bring together the membership to discuss incipient policy issues with potentially large spillovers. It can support the systematic and timely sharing of experiences and views from spillover-producer and receiver countries. The **Spillovers Forum** would take place once a year during the Spring or Annual

Meetings, anchored around one or two spillover topics. The discussions would be forward leaning rather than on discussing spillovers that may already be playing out, which is often the case in Article IV reports. Such a forum would also complement, rather than substitute for the EWE exercise, which has both a wider mandate and greater focus on tail risks and would speak to the gap at the Fund relative to other institutions for informal peer engagement among the membership (see more details in IMF, 2021e).

19. Closer interconnection of surveillance with Capacity Development (CD) can greatly increase traction and help deliver on the surveillance priorities, including for LIC/FS. Several ongoing initiatives aim at improving this interconnection (Box 5). Major recipients of CD prepare a **CD Country Strategy** and discuss it in country documents if relevant, allowing an alignment of CD efforts with surveillance priorities as well as authorities' needs, and aiming at closing capacity gaps that hinder the take-up of policy advice. Interconnection can also be intensified, either through targeted cross-mission participation—proven effective during the recent mainstreaming of virtual engagement—or overlapping in-person missions. These considerations are particularly pressing for LIC/FS, who are heavy users of CD and whose Article IV reports would benefit the most from this integration. Furthermore, better information through the **Capacity Development Management and Administrative Program (CDMAP)**, supports early engagement between area and CD departments during CD prioritization. New ways to transfer technical knowledge with—and between—countries through online discussions and webinars, could also prove helpful for surveillance purposes and to enhance peer learning. Experimenting with new channels for interacting with the membership and for receiving quick feedback on issues that the Fund may wish to raise may be needed. In that sense, the **Granular Policy Initiative** may also provide a further avenue for better CD integration into surveillance (see above).

Box 5. Integrating Capacity Development and Surveillance

Strengthening the integration of Fund surveillance and capacity building is a key recommendation of the 2018 CD Strategy Review.¹ Integration means in practice that institutional and capacity weaknesses that constrain the adoption of recommended policies and contribute to risks are covered in surveillance and targeted through CD prioritization. Conversely, advice in Article IV reports should be tailored to existing capacity constraints, while ensuring CD recommendations are followed up over time. Guidelines to better achieve this integration have been developed following the 2018 CD Strategy Review and will be reflected in the revised Surveillance Guidance Note.

Improved integration of Capacity Development revolves around a CD country strategy and continuous engagement across country teams and CD providing departments. Country teams develop a coherent **CD country strategy**, in collaboration with CD departments and discussed with the authorities, to ensure an alignment between CD resources and the surveillance priorities. When critical to surveillance, area department country teams should discuss relevant parts of the CD strategy in country documents, during pre-mission interdepartmental meetings, and with the authorities and other country-based stakeholders. CD providers and area department country teams should engage regularly in the prioritization, design, implementation, and monitoring/ assessment of CD projects. The depth and frequency of these engagements would depend on the criticality and relevance of CD activity to surveillance, and more broadly the country's ability to implement sound policies. These considerations appear especially relevant in the case

Box 5. Integrating Capacity Development and Surveillance (Concluded)

of LIC/FS. Integration of CD needs to be mindful of confidentiality issues surrounding the provision of advice and data usage.

The ***Capacity Development Management and Administrative Program (CDMAP)*** is an internal tool that facilitates the integration of CD and surveillance and reinforces results-driven CD delivery. In making CD planning more transparent and harmonized across departments, ***CDMAP*** will provide comparable and easily accessible information on CD plans, budgets, and results to area department teams. Country teams will be able to, for the first time, review targeted and actual results and workplans for all existing projects, upload new demands for CD, and prioritize demand related to their country all within the same system.

¹ [2018 Review of the Fund's Capacity Development Strategy](#).

20. The surveillance priorities require a more systematic integration of macro-critical emerging topics, with Climate being a key example (IMF, 2021f). Fiscal policies for climate adaptation and transition to a low carbon economy—including efforts of countries to achieve their Nationally Determined Contributions under the Paris climate accord—will need to be more seamlessly placed in the broader macro-context. Climate change mitigation is a global public good whose supply needs to be stepped up urgently to preserve global macroeconomic and financial stability; a pragmatic approach is proposed that focusses especially on the largest emitters of greenhouse gases. The analysis of monetary and financial policies can also cushion the impact of climate risks and will also be expanded—through the expansion of climate analysis in FSAPs, better governance and financial integrity safeguards to strengthen climate change policies, and adaptation of monetary policies to address risks of lower productivity growth, increased volatility of supply shocks, and higher inflation due to climate change. Climate Change Policy Assessments (CCPAs) could also be important inputs for Article IV consultations, notably for the discussion of adaptation and resilience building. The operational considerations presented in IMF (2021f) will be reflected and further refined in the revised Surveillance Guidance Note. To meet the challenge of interconnecting this new area into surveillance, staff skills will also need to be expanded, including through hiring new talent and internal training to upgrade the skills of existing staff. Access to data, knowledge, and collaboration with other stakeholders will be an important element of successful interconnection.

21. In addition to climate, other sustainability priorities may also need to be treated in surveillance (IMF, 2021g). Trends in demographics, technological change, inequality, socio-political and geo-political developments also pose challenges to economic sustainability, and interact in important ways with traditional core surveillance areas. Modern surveillance needs to integrate the analysis of the channels through which such trends affect sustainability to provide members with topical and targeted actionable policy advice. Building on the experience gained on inequality, the integration of sustainability priorities into surveillance would be supported by inter-departmental groups, including for operationalizing policy, capacity building, knowledge exchange, and developing analytical tools, databases, and models.

22. *Collaboration with External Partners* on emerging macro-critical issues can be key in building capacity and coordinating action at the international level. Building on effective collaboration frameworks, including on debt vulnerabilities, FSAP, and social spending, collaboration with partner institutions can support/inform Fund surveillance. It can benefit the Fund’s work and advice on macro-structural issues, including through exchanging knowledge, delineating the responsibilities of each institution in international fora, and collaborating on developing tools to integrate the analysis of emerging issues into surveillance. The World Bank is a prime partner for collaboration on **Climate**, including in sharing information and specialist knowledge, developing a climate-focused internal training program, and integrating climate-related risk analyses in existing frameworks such as the FSAP and Debt Sustainability Frameworks (DSF). Relatedly, the Fund will incentivize Fund-Bank collaboration by leveraging on the new HR performance management system, fostering staff exchanges, including at senior staff level, and improving access and exchange of information and knowledge (see [IEO, 2020](#), for a discussion on collaboration on macro-structural issues). At the same time, it is important to keep in mind that greater collaboration will not always come easily or that it will lead to immediate outcomes—other institutions have their own work agendas, governance structures, and incentives. Collaboration will only work when incentives and timetables align sufficiently.

C. For Better-Informed Surveillance

23. Better-informed surveillance depends on mutually reinforcing synergies between training, tools, and data. Better-informed surveillance depends critically on continuous training of staff, including research assistants. Upgraded human capital should be complemented by better tools and peer-learning. Tools enable staff to do analyses, including new types of analysis, efficiently and collaboratively; they also allow peer-learning at various levels, for instance, cross-country, within country-team, and across departments, through new collaboration capabilities and an efficient exchange of knowledge. Training, tools, and peer-learning are further complemented by data and knowledge availability. Taken all together, they help close existing information gaps. Several initiatives are ongoing that can meaningfully support Fund surveillance, but it is still early to judge whether they can be as impactful as currently envisioned.

Training

24. Expanding and upgrading staff skills will complement other modalities. A **Revamped Internal Economics Training (IET)** would ensure alignment with the CSR priorities, so that relevant knowledge, skills, and competencies can be developed (Box 6). Key priorities are consistent with areas of institutional focus, spanning traditional core areas as well as **Climate**, fragile state policies, macro-structural reforms, impact of digitalization, and inclusive growth, which would also be supported by **Collaboration with External Partners**. The upgrades in data access and the introduction of new tools also require upgrading the Fund’s staff expertise. For example, to maximize the benefits of the **Integrated Data initiative (iData Initiative)**, more data science specialists with advanced data analytics are needed (Box 7).

Box 6. Revamped Internal Economics Training (IET)

The IET program is being reviewed to ensure it continues to play a critical role in upskilling Fund staff knowledge. The new IET Strategy proposes three closely intertwined objectives: (a) better anchor IET in the Fund's institutional objectives; (b) more closely serve the needs of Fund economists and the economics training needs of other staff; and (c) facilitate the transfer of knowledge to promote learning within the Fund. The upcoming review of the Structured Curriculum will ensure a close alignment of knowledge, skills, and competencies with the gaps identified in the CSR papers, ensuing update of the Guidance Note for Surveillance, and any other operational guidelines that underpin the Fund's core activities. Steps are being taken to enhance economists' skills on macrofinancial issues (e.g., through training on the Systemic Risk Tracker, Policy on FinTech, Growth at Risk), and develop and deliver a training program on **Climate** Change (e.g., new Climate 101 and Climate Bootcamp courses) among other important areas of institutional focus. Training uptake continues to be constrained by work pressures, and a concerted effort to enhance accountability of economists and managers is likely needed as envisioned in the revamped IET Strategy.

Tools

25. Delivering on the surveillance priorities requires expanding analytical capabilities.

Tools—models, methodologies, templates, apps—are not a panacea to operational or analytical problems, and there is no one-size-fits-all. But **Better Tools**, especially if building upon data initiatives (see below), provide flexibility to perform routine tasks in a more efficient manner and/or ensure the application of a common level of analytical rigor, mindful of country-specific circumstances and country-team needs. Improved tools are being developed in multiple areas:

- *Tools for analyzing financial risk* (IMF, 2021c), e.g., to study feedback effects across real and financial sectors, to detect relevant sources of systemic risk, and to assess the resilience of the financial system to shocks, are important inputs into forming an **Assessment of Systemic Financial Risks**. Stress testing tools, as detailed in the recent FSAP review, (IMF, 2021h, and IMF, 2021c), can also support better **FSAP Integration** into Article IV surveillance by serving as a useful reference, especially during the period between FSAPs or for countries that have not benefited from one. The FSAP review also proposes to develop methodologies to assess risks related to **Climate**, fintech, and cybersecurity can help accumulate experience that can be brought to Article IV surveillance in the medium-term.
- *Tools to understand long-term underlying trends* (IMF, 2021g)—on demographics, technology, inequality, socio-political and geopolitical developments, and climate—and how they impact macro stability and economic sustainability. Empirical and conceptual analysis and new modelling will help study climate risks and policies, and provide a better understanding of macroeconomic, distributional, and climate impacts of mitigation policies. The recent Debt Sustainability Assessment (DSA) update and planned upgrades to the External Balance Assessment (EBA) aim to capture issues related to economic sustainability. Regarding **Climate**, a suite of tools will provide country-level emissions projections, as well as fiscal and economic incidence, and emissions impact of climate policies; the new tool will also deepen our understanding of the distributional impacts of climate change with a focus on adaptation (see IMF, 2021f for details).

- *Models of risk assessment and management*—for example quantile-regression, risk-focused structural and crisis prediction models—can support the provision of ***Contingent Policy Advice***. Strategic foresight techniques (as applied in the CSR Background paper on Scenario Planning, IMF, 2021i) can also be used to crystalize unforeseeable but plausible high-impact events, which could then feed into the G-RAM, contingency plans, and long-term risk analysis (as argued in the CSR background paper on Risks, IMF, 2021d). These techniques can capture issues related to the importance of key infrastructure and systems, technology regulations across countries and regions, and on digital risks management (including cybersecurity, outages, digital frauds, data privacy) and recovery capacity in central banks, financial systems, public financial management, and the broader economy.
- *Methods and tools to increase the digitalization of internal processes* will help improve the quality of Fund surveillance. Flow automation of routine or repetitive tasks such as data collection and information sharing activities can help increase timeliness, accuracy, and productivity. As mentioned earlier, **CDMAP** serves as a platform for CD planning and easier integration with surveillance. Digital templates can facilitate comparison and assessment of macroeconomic frameworks, and keyword searches of minimum Article IV requirements will simplify and better inform the review process; they will also reduce operational risks and make the process more efficient. Modern data analytics will help unify multiple data sources to create interactive dashboards and analytical reports. Text analytics will help connect topics and issues with cross-country knowledge, guidance, and relevant expertise, as well as signal degree of relative coverage of a topic across members and over time.

Box 7. The iData Initiative

The **iData Initiative** is a data management and dissemination platform to modernize economic data management. It was articulated in the 2018 Overarching Strategy on Data and Statistics, launched in November 2020, and is expected to be completed by end-2023. The **iData Initiative** will support high-quality forecasts and data-driven analysis and improve the overall user experience with Fund data.

This initiative will replace the existing custom-built platform, which is almost at its end-of-life. The existing custom-built platform supports the production of the Fund's key multilateral and cross-country databases, including the WEO and IFS databases, and the dissemination of data to external users on data.imf.org. The new platform will address access to economic data—a long-standing challenge for Fund users—by providing users a simple interface to easily browse and search across datasets.

The new platform will improve data access and visualization. Users will be able to access data from desktops and mobile devices, and use data in multiple analytic environments, including Python, R, MATLAB, and STATA. The **iData Initiative** will also leverage industry-leading visualization tools, allowing users to produce customized views of the data and generate new insights. Access to Fund data by member countries and other external stakeholders will be facilitated by a redesigned mobile-friendly external interface (data.imf.org) with enhanced search and visualization capabilities.

The iData Initiative expands the possibilities for data management. In its next development phase, the **iData Initiative** platform will be used for more types of data, including Big Data and market data, and support a single dissemination solution for internal and external users. Over time, **iData Initiative** is expected to become the Fund's sole data repository.

26. New surveillance modalities and ongoing initiatives provide the basis for better peer-learning, leveraging on training and the flexible use of tools. In particular:

- The **Integrated Digital Workplace (iDW)** will help strengthen the Fund's collaboration capabilities to support remote working, and transform the ways teams communicate, collaborate, and manage work within and across departments, and with external stakeholders (Box 8). **iDW** will help improve the efficiency of internal production processes, including surveillance review, and create an environment conducive to better peer-learning, facilitated by new tools to communicate and share knowledge. It will also ease virtual engagement with country authorities.
- Completed and planned **Knowledge Management Projects** aim to support staff's operational and analytical surveillance work. First, the completed Knowledge Exchange (KE) portal revamp has made the Fund's knowledge more easily accessible through a country engagement timeline, which captures technical assistance, surveillance, and program missions and documents allowing for a unified view of country engagement and facilitating the integration of these different types of work. Second, the intranet's Enterprise Search Engine has already facilitated surfacing relevant content in a more intuitive user interface. Third, documents are now being automatically tagged with relevant fields to help improve searchability. Finally, the New Document Management project will ease the storage and sharing of knowledge content in a central repository of documents.

Box 8. Integrated Digital Workplace (iDW)

The **Integrated Digital Workplace (iDW)** is a key modernization initiative to leverage modern technology to improve the efficiency and effectiveness of the Fund's core surveillance, lending, and capacity building operations. The new integrated solution seeks to strengthen collaboration and teamwork in a hybrid work environment continuously being shaped by technological change; enable better knowledge sharing and management; augment the Fund's external stakeholder engagement and management; streamline and integrate document flow and review process; and automate and enhance access to economic and financial analytical tools and applications. The **iDW** also seeks to improve productivity and risk management through enhanced, secure, and mobile access—at lower resource costs—to analytical and process tools.

The **iDW** program will support the effective implementation of recommendations coming out of recent and ongoing major Fund policy and operations reviews, including the CSR, CD strategy, and the Review of Conditionality and Program Design. The program is built around five modules:

- *Collaboration.* Improves collaboration and communication internally and with the membership.
- *Intranet.* Deliver a modern Intranet that is better aligned with Fund operations, supports the Fund's communication strategy, and promotes improved knowledge sharing through a topical- and country-based modern knowledge hub, including a new version of the KE Country pages.
- *External Relationship Management.* Improve management of the Fund's external relationships, including with members and other stakeholders.
- *Document Journey.* Create a more comprehensive, integrated, and smoother document flow process with efficient review and clearance functions and better access to documents and comments.

Box 8. Integrated Digital Workplace (iDW) (Concluded)

- *Digital modernization.* Replace outdated and standalone tools and applications with modern cloud-based technology to improve productivity and access to real time information and analysis.

Implementation of the *iDW* began in November 2020 and the current program is expected to be completed by the end of 2023.

Data

27. Better data are critical to deliver on the surveillance priorities. Closing critical data gaps in surveillance is the objective of the ongoing review of ***Data Provision to the Fund*** for Surveillance (IMF, 2021j). The ongoing review also discusses data that members are encouraged to provide (***Encouraged Data Provision***). In some instances, provision of additional data may generate some costs to members countries. Public sector data, foreign exchange intervention (FXI), and indicators for macrofinancial analysis are areas of immediate data needs, where the case for enhanced data provision to the Fund is the strongest and most urgent. In particular:

- Broader and more granular coverage of the public sector data (including debt data beyond the central government) would support analysis of fiscal risks—one of the key areas of Fund surveillance.
- Access to timely and comprehensive FXI data is key for bilateral and multilateral surveillance, including oversight of members' exchange rate policies, conducting external sector assessments, and monitoring the functioning of the international monetary system, including policy spillovers and spillbacks. Provision of FXI data would also facilitate more integrated policy advice.
- While macro-financial analysis is a core area of Fund surveillance, the data provision requirements are currently minimal in this area. Minimum mandatory data provision, including of the main financial sector indicators, would ensure proper monitoring of the core financial system and key sources of systemic risk. In many cases better data coverage for non-bank financial institutions, the stocks and flows of credit, cross-border activity, and nonfinancial corporates would also be critical for assessing potential sources of systemic risk—from within and outside the banking system—akin into account key interlinkages across sectors and policies.

28. The ongoing expansion of data infrastructure will further support the use of more granular data. As part of the effort to improve data management, ***iData Initiative*** will bring modern data management and dissemination tools to help strengthen data analysis, including by facilitating data access to staff, member countries and external stakeholders, and enhancing search and visualization capabilities. ***Encouraged Data Provision*** can also facilitate the analysis of:

- High frequency and granular information—available in partnership with IFIs and the private sector—to have more timely and comprehensive signals of economic activity (e.g., vessel traffic, satellite images, mobility and travel related data) and emerging risks across countries or regions, as well as new ways to fill data gaps in official statistics—for instance, the [Development Data Partnership](#) and the [COVID-19 High Frequency Data Hub](#).

- Data related to economic sustainability, including on inequality, **Climate** change, demographics, technological advances, and socio-political and geo-political developments are critical under the new surveillance priorities. Such data will help understand the impact of digital technologies on macroeconomic and distributional outcomes in an environment of rising inequality. External sources will complement data availability (e.g., World Bank, UN, OECD), and further guidance on the use of available indicators will be provided in the revised guidance note. At the same time, the Fund has launched initiatives to improve data availability, including the work on the Climate Change Indicators Dashboard.
- Macro-critical issues that could feature in **Focused Article IV Consultations**, including one or more topics relevant for the surveillance priorities—for instance, on implications for growth and stability of trends on digital technology, demographics, climate change, and shifting global economic power.
- Better information on household debt, real estate sector, including housing prices, would support macrofinancial integration in several areas—including **FSAP integration** and forming an **Assessment of Systemic Financial Risks**. Data on links between non-financial corporations and the wider economy would inform risk assessments and **Contingent Policy Advice**. It is also important to maintain databases that support the surveillance of macroprudential policy (for instance, the macroprudential survey and the integrated Macroprudential Policy database).

29. In the medium-term, a reimagined *Country Portal* would serve as a “one-stop shop” for all Fund content on that country. A modern and intuitive portal that serves as the face of the Fund’s engagement with each member could greatly improve external communication and facilitate internal peer-learning. Using a clean and visually appealing format, the external version of such a portal could feature the latest WEO projections for the country and key policy advice, along with all Fund documents pertaining to the member in the public domain. An internal version of the website would, in addition, collect all country-relevant documents for official use. Peer-learning and knowledge dissemination would be facilitated by a consistent document labeling system, under which all Fund documents are tagged at the time of production. In this last regard, recent efforts to automate the identification of cross-cutting themes using the Enterprise Business Vocabulary are a step in the right direction. This would reduce the need to reproduce previous analyses and advice in earlier Article IV consultations that remain relevant and as such support **Focused Article IV Consultations**. It would also allay concerns that for many members, the Fund’s Article IV staff report remains the “go-to” source for information—by replacing a single paper report produced annually with a comprehensive digital platform that retains all relevant information in one place regardless of when it was produced. Such a vision would require further thinking, including a clear view on the possibly considerable resource implications.

COSTING

30. This section discusses the costing of the CSR. The previous section discussed key CSR proposals (see Annex I), including new modalities, for making Fund surveillance more timely, topical, targeted, interconnected, and informed. Below we expand on the tentative cost of new proposals that have significant budgetary implications. Other proposals could, in the first instance, rely on optimizing processes, while others (such as *iData Initiative* and *iDW*) are underway and funded separately; and the resource implications of yet others (such as climate, digital currencies, FSAP) are being picked up in context of the discussion of those specific workstreams.

31. The most significant need for resources is for *Expanding Macrofinancial Talent*. An assessment of depth and integration of systemic risk analysis and macroprudential policy advice in Article IV Consultations found that limitations in macrofinancial expertise compounded by competing priorities have constrained progress in this area, which requires additional recruitment with the proper skill set. This finding echoes the conclusions from the IEO's evaluation of the Fund's financial surveillance (IEO, 2019), which noted that resource constraints have slowed the needed buildup of macrofinancial expertise. The assessment finds that half of all Article IV reports presented gaps in the depth and integration of these core elements of macrofinancial analysis (see IMF 2021c). An additional 24 FTEs with macrofinancial expertise, if spread over the identified Article IV teams with gaps, would translate into about 80 percent coverage of the gap, assuming each additional staff would cover on average about 2 Article IVs per year. The remaining gap would be closed through training and reprioritization.

32. Four other new proposals would require an additional 5-7 FTEs. The annual cost of **CMMs** will vary with the number of such meetings during the year, the number of topics discussed in each CMM, and the novelty of the material presented—CMMs based on material already available would be less costly than CMMs based on new material. On average, and assuming efficiency gains elsewhere (see below), the tentative cost of one CMM is currently placed at about 2-3 FTEs. Costs for the **GPI** reflect the collection and selection of policy questions from country teams for which help from functional departments is sought, as well as the effort to summarize lessons learned. Depending on the number of countries and policy questions and the extent and frequency with which any lessons are publicized following Board discussions (including in the context of individual Article IV consultations) to replace the current policy tracker, resource costs range between 2-3 FTEs. Importantly, the estimated costs assume functional departments provide support within their current envelope for engaging with area departments. As regards the new **Spillovers Tool** and **Spillovers Forum**, it should be possible to implement these with about 1-1.5 FTEs in total. It is estimated that the Spillovers Tool will absorb about the same amount of resources as the G-RAM, i.e. just under 1 FTE per year. As for the Forum, organizing and preparing the material would take most time, while staff and Management attendance account for only a small fraction of the costs and the overall cost is estimated also at under 1 FTE.

33. Cost considerations do not include short-term transition costs and are subject to a significant degree of uncertainty. Estimated costs, for instance, assume that ongoing initiatives to improve technology and improve workflow are fully successful; if that is not the case, actual costs

may well be higher. They also do not account for additional cost pressures on other support services. Depending on how the uncertainties around the global outlook materializes, Area Departments may need to prioritize on short-term exigencies, which would also mean that any efficiency gains that could potentially be directed toward the CSR priorities will need to go in that direction instead, raising the net costs for the latter—for example, it may not be possible to streamline the discussion in staff reports of traditional areas to partially compensate for the taking up of longer term sustainability issues. Also, particularly for Area Departments, there are short-term transition costs and experimentation costs that are hard to capture in the estimates. The divergent global exit from the pandemic, with LIC/FS more likely dealing with the crisis longer than advanced or emerging economies, will also have differential impacts on individual country teams, limiting the space for some to experiment with the new modalities. Furthermore, the experimental nature of the approach limits the feasibility to provide very durably long-term cost implications—for example, potential long-term trade-offs involved when hiring more staff in certain areas of expertise (for instance, climate, and data scientists) as opposed to fungible staff who by definition can better move across issues and areas are not accounted for. Training costs—resource and staff time—also need to be incorporated into the baseline estimation. Finally, the costs of implementing a new country portal are left to the medium-term and are not included in the analysis. At the same time, potential savings from process improvement are also not factored in, including those from any changes to the review process. If costs end-up being larger than estimated, staff may need to come back to the Board for guidance on how to proceed, including on further streamlining the large number of existing requirements on Article IV consultations.

34. A flexible approach to implementing the new modalities, characterized by experimentation and learning-by-doing—a “sandbox” for new modalities, helps in this regard. Under such an approach, the new modalities can be implemented, with their continuation and/or scaling remaining subject to re-assessment in two years. This approach will help the Fund deal with the uncertainty associated with the implementation of the CSR priorities, balanced against already high work pressures. Many of the proposed modalities are not only scalable but also malleable, so that their implementation can adapt to changing needs and circumstances over time.

Annex: Matrix of CSR Proposals

Main Areas	Proposals	Priorities		
		Risks	Spillovers	Sustainability
Timely, Topical and Targeted	CMMs	✓	✓	✓
	Granular Policy Initiative		✓	✓
	Focused AIV consultations	✓	✓	✓
Connected	Assessment of Systemic Financial Risks	✓	✓	✓
	FSAP Integration	✓	✓	✓
	Expanding Macrofinancial Talent	✓	✓	✓
	Contingent Policy Advice	✓	✓	✓
	Spillovers Tool		✓	✓
	Spillovers Forum		✓	✓
	CD Country Strategy			✓
	CDMAP		✓	✓
	Climate	✓	✓	✓
	Collaboration with External Partners		✓	✓
Informed	Revamped Internal Economics Training (IET)	✓	✓	✓
	Better Tools (modeling, estimation, review process)	✓	✓	✓
	The iData Initiative	✓	✓	✓
	Integrated Digital Workplace (iDW)	✓	✓	✓
	Knowledge Management Projects	✓	✓	✓
	Data Provision to the Fund (public sector, FX intervention, macrofinancial)	✓	✓	✓
	Encouraged Data Provision (indicators related to economic sustainability)	✓		✓
	Country Portal	✓	✓	✓

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2021 Comprehensive Surveillance Review—Modalities for Modernizing Surveillance



IMF POLICY PAPER

2021 COMPREHENSIVE SURVEILLANCE—MODALITIES FOR MODERNIZING SURVEILLANCE

May 2021

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 May 10, 2021 consideration of the staff report.
- The **Staff Report**, prepared by IMF staff and completed on April 7, 2021 for the Executive Board's consideration on May 10, 2021.

The IMF's transparency policy allows for the deletion of market-sensitive information and premature disclosure of the authorities' policy intentions in published staff reports and other documents.

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**International Monetary Fund
Washington, D.C.**



IMF Executive Board Concludes the 2021 Comprehensive Surveillance Review

FOR IMMEDIATE RELEASE

- The review provides the strategic direction for the IMF's surveillance and aims to make it more timely, topical, targeted, interconnected, and better informed.
- A macroeconomic landscape characterized by elevated uncertainties about the recovery from the COVID-19 pandemic creates difficult trade-offs for policymakers as they seek to achieve inclusive and sustainable growth and stability. Important trends—in digital technology, climate change, inequality, demographics, and geopolitics—affect economic sustainability and present opportunities and challenges.
- Against this background, the priorities that will guide IMF surveillance are confronting risks and uncertainties, preempting and mitigating spillovers, fostering economic sustainability and a unified approach to policy advice.

Washington, DC – May 20, 2021: On May 10, 2021, the Executive Board of the International Monetary Fund (IMF) concluded a comprehensive review of the IMF's surveillance activities. The 2021 Comprehensive Surveillance Review (CSR), which takes place in the context of the global crisis resulting from the COVID-19 pandemic, provides the strategic direction for the Fund's surveillance work for the coming years.

The review identifies key surveillance priorities, which are informed by the major trends impacting on the global economy. The priorities that will guide the IMF surveillance are confronting risks and uncertainties, preempting and mitigating spillovers, fostering economic sustainability and a unified approach to policy advice. The priorities should better position Fund engagement and policy advice to help the membership confront the challenges posed by the emerging macrofinancial landscape. The review aims to strengthen the practice of Fund surveillance by making it more timely, topical, targeted, interconnected, and better informed.

The CSR's main findings on trends, policy challenges, surveillance priorities are reflected in the [Overview Paper](#), while the paper on [Modalities for Modernizing Surveillance](#) outlines how surveillance will change in practice.

The Fund's comprehensive surveillance review builds on extensive background work, including in-depth analysis of [Confronting Risks and Uncertainties](#), [Preempting and Mitigating Spillovers](#), and [Ensuring Economic Sustainability](#). Additional background papers are dedicated to [Integrating Climate Change into Article IV Consultations](#) and [Systemic Risk and Macropolicy Advice in Article IV Consultations](#). The review was further informed by analysis on the [Traction](#) of Fund advice, [Scenario Planning](#) exercises that informed the priorities, and a report on the [Stakeholder Surveys](#).

Executive Board Assessment

Executive Directors broadly agreed with the main conclusions of the Comprehensive Surveillance Review (CSR). They noted that the CSR will serve as a blueprint for Fund

surveillance to help the membership navigate the challenges of the next five-to-ten years, informing forthcoming work on capital flows, climate change, and data, among other issues. Directors agreed that Fund surveillance needs to be better interconnected, more timely, topical, and targeted, and welcomed the CSR's ambitions to modernize surveillance modalities.

Directors agreed with the CSR's assessment that a macroeconomic landscape characterized by elevated uncertainties about the recovery from the COVID-19 pandemic will create difficult trade-offs for policymakers as they seek to achieve inclusive and sustainable growth and stability. Important trends—in digital technology, climate change, inequality, demographics, and geopolitics—affecting economic sustainability will also present opportunities and challenges and, where macro-critical, will need to be incorporated in the Fund's surveillance.

Directors agreed with the four proposed surveillance priorities:

Confronting risks and uncertainties. Directors generally welcomed better integrating risks and uncertainties in the Fund's surveillance, including by increasing the emphasis on the range of potential outcomes relative to the baseline and offering more contingent policy advice, although some Directors cautioned against making surveillance excessively risk-centric. Directors welcomed the emphasis on clearer communication on risks, although the communications should be carefully framed to avoid unintended consequences.

Pre-empting and mitigating adverse spillovers. Directors agreed that the Fund should continue to strengthen its work on spillovers, drawing on better data, tools, and information-sharing frameworks, while strengthening the dialogue with the membership. Directors broadly agreed that the Spillovers Tool and the Spillovers Forum would help in this regard.

Fostering economic sustainability. Directors welcomed a broader focus on sustainability, which can be affected by factors such as demographics, digitalization, inequality, socio- and geopolitical developments, and climate change under certain circumstances. They supported incorporating the macro-financial and distributional impacts of policies, where macro-economically relevant, while considering country-specific political economy, and institutional and capacity constraints. At the same time, Directors recognized the need for Article IV consultations to remain selective and focused in their coverage of new topics and cautioned against over-stretching Fund surveillance. They called on the Fund to coordinate closely with other organizations and better leverage outside expertise whenever possible.

Unified policy advice. Directors agreed that, in an environment of constrained policy space where members may deploy multiple policy tools simultaneously, a more unified approach to the policy mix is needed. They considered that the completion of the Integrated Policy Framework would be helpful in this context.

Directors underscored the importance of strengthening the traction of Fund advice through higher quality analysis, stronger engagement on country-specific issues, more continuous dialogue with all relevant stakeholders, and clear communication. In this context, Directors considered further integration of capacity development (CD) in surveillance as a priority area, including strengthening the use of the CD country strategies. They considered that virtual engagement could be leveraged but stressed that in-person missions were still essential to build relations and trust and ensure a close policy dialogue with the authorities.

Directors welcomed the novel approaches of Board engagement to enhance its strategic role, take up cross-cutting issues in a more comprehensive manner, and be more strategic and forward-leaning. They welcomed the Board Country Matters Meetings (CMMs) as an instrument to focus on conjunctural cross-country policy-relevant issues, with a few requesting opportunities for the Board to provide input and select topics, and looked forward to further detail on the interaction of CMMs and regular surveillance. Directors generally supported the Granular Policy Initiative as a way to provide more specific advice to the membership as they face new challenges.

Directors agreed that focused Article IV Consultations, with topics selected in collaboration with the authorities and while continuing to cover core areas, would help better balance selectivity and comprehensiveness. In this context, Directors emphasized the need to adhere to the principles of evenhandedness and macro-criticality. A number of Directors stressed that more focused reports should not come at the expense of the reports' broad macroeconomic coverage and their use as reference documents.

Directors agreed on the need to deepen macro-financial analysis and further integrate it into bilateral surveillance. They called for additional efforts in the areas of systemic risk analysis to better anchor macroprudential policy advice. Directors agreed that Article IV staff reports should provide a well-articulated view about systemic risk grounded in a rigorous analysis of financial vulnerabilities. In this context, they stressed the need for closer integration of FSAP findings and recommendations with the Article IV Consultations. They also underscored the need to expand macro-financial talent at the Fund, particularly in country teams, while taking into account budget considerations. Directors further noted that, as digital money gains prominence, Fund surveillance should explore its potential benefits, as well as risks and spillovers.

Directors recognized the importance of a more systematic integration into surveillance of macro-critical emerging topics, including climate change. They generally agreed that coverage of climate change mitigation in Article IV consultations would be strongly encouraged for the largest emitters of greenhouse gases. A few Directors underlined the need to account for past emissions and the energy needs of developing countries as they grow. Directors stressed that Fund surveillance should be open to different policy approaches to climate change mitigation, that coverage of climate issues in surveillance needs to be consistent with the Fund's surveillance mandate and in line with the Paris Agreement. They underscored that, wherever macrocritical, climate change adaptation and transition risk in the context of a global shift to a low-carbon economy should be covered in Article IV reports.

Directors emphasized that better data is critical to deliver on surveillance priorities. They looked forward to closing critical data gaps in surveillance in the areas of public sector data, foreign-exchange intervention data, and indicators for macrofinancial analysis through the forthcoming review of Data Provision to the Fund with a few Directors calling for a cautious approach to foreign-exchange intervention data. Some Directors noted that increased data requirements might place undue additional demands on authorities and should be balanced against capacity considerations.

Directors welcomed the proposed flexible and gradual approach to implementing the new modalities, which revolve around the principle of experimentation, adaptation, and flexibility, while working within the confines of existing formal frameworks. They looked forward to a revised surveillance guidance note, and sought Board engagement on implementation of

modalities as well as coordination across departments in advance of the guidance note and in the context of the semi-annual work program discussions.

Directors recognized that modernizing surveillance might require additional resources and that the specifics will be taken up in the context of the Fund's overall budget discussions.

Directors concurred that no changes to the Integrated Surveillance Decision are required. They agreed that progress on CSR implementation will be reassessed in about two years in the context of an interim review and that the comprehensive review will remain on a five year-cycle.



April 7, 2021

2021 COMPREHENSIVE SURVEILLANCE REVIEW— MODALITIES FOR MODERNIZING SURVEILLANCE

EXECUTIVE SUMMARY

Modern Fund surveillance needs to be...

...more targeted, topical and timely. A *Granular Policy Initiative (GPI)* would build on the Policy Tracker to help identify common issues affecting the membership, tailor policy advice to country specific circumstances, and catalyze Fund policy views on cross-cutting issues. Board *Country Matters Meetings (CMMs)* on conjunctural cross-region policy-relevant issues would provide guidance to feed back into bilateral surveillance. *Focused AIV Consultations* would provide space for discussions of macro-critical topical issues. Virtual engagement can complement Fund missions and allow for nimbler surveillance if leveraged correctly. All of these would consider country-specific needs and constraints, including for Low Income Countries/Fragile States (LIC/FS).

...better interconnected. Improved analysis and clarity around a well-articulated view or an *Assessment of Systemic Financial Risks*, a new process for more seamless *FSAP Integration*, and *Expanding Macrofinancial Talent* would strengthen macrofinancial integration in Article IV reports. *Contingent Policy Advice* can help members better address the range of potential outcomes. A *Spillovers Tool* for major policy spillovers and a *Spillovers Forum* for producers and receivers to informally discuss incipient issues would foster more structured and candid discussion of spillovers. Supported by the development of new tools, *Climate* would be systematically integrated into bilateral surveillance when macro-critical. Improved integration of Capacity Development (CD) would increase traction and help deliver on priorities, including through the elaboration of a *CD Country Strategy* and the support of the *CD Management and Administrative Program (CDMAP)*. *Collaboration with External Partners* would strengthen the Fund's understanding of issues outside its core areas of expertise.

...and better informed. A *Revamped Internal Economics Training (IET)* would support CSR modalities as would *Better Tools*. Efforts to enhance the availability of more and better data through *Data Provision to the Fund, Encouraged Data Provision* and the *iData Initiative* would strengthen fact-based analysis. The ongoing *Integrated Digital Workplace (iDW)* and various *Knowledge Management Projects*

aim to support staff's operational and analytical work. A reimagined ***Country Portal*** would serve as a "one-stop shop" for all relevant Fund content on a given country.

Modernizing surveillance will likely require additional resources, although estimates are highly uncertain at this stage. The paper offers a tentative costing of new proposals with significant budgetary implications. Other proposals could rely on optimizing processes, while others are underway and funded separately; the resource implications of yet others are being picked up in context of other workstreams. Estimates do not include short-term transition costs or pressures on support services and are subject to a significant degree of uncertainty. A flexible approach to implementing the new modalities, characterized by experimentation and learning-by-doing—a "sandbox" for new modalities—is proposed.

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INTRODUCTION

1. As laid out in the 2021 CSR Overview Paper (IMF, 2021), the Fund is facing a challenging landscape with the world changing more rapidly than before. Alongside accelerated change, uncertainty is here to stay. The emerging macrofinancial landscape involves subdued and divergent growth prospects, widening imbalances, rising financial complexity, and limited policy space that pre-dated COVID—but have all become more salient.
2. To help the membership confront this landscape and better position Fund surveillance, the CSR Overview Paper proposes four surveillance priorities:
 - **Confronting risks and uncertainties.** Risks and uncertain implications of major underlying long-term trends like demographics, technological change, inequality, socio-political and geo-political developments, and climate change will increasingly test growth prospects and economic and financial stability. In this context, Fund surveillance should explicitly discuss these risks through a better understanding of growth-stability trade-offs, contingency planning and policies geared towards risk management, including seizing upside risks.
 - **Preempting and mitigating spillovers.** Cross-border spillovers are evolving and intensifying, as global economic integration is shifting on multiple fronts including trade, global value chains, new types of financial intermediaries, relocation of foreign direct investment (FDI), and new patterns for migration and remittances. Rapid advances in digital and financial technologies may also result in more rapid policy and risk transmission and impact on the International Monetary System (IMS). Fund surveillance will need to prioritize the identification of familiar and potentially new, less understood, sources of spillovers, as well as approaches to pre-empt and/or mitigate them.
 - **Fostering economic sustainability.** Secular trends (e.g., digitalization, demographics, and climate change), distributional considerations, and the quality of governance and institutions, should be considered to achieve sustainable economic growth and stability. A broader understanding of economic sustainability is necessary to better account for how different economic and non-economic developments can come to bear on the Fund's macroeconomic stability mandate. These and other similar considerations require applying a wider lens or a longer horizon to assessments of stability than has typically been the case so far in Fund surveillance.
 - **Adopting a more unified approach to policy advice.** Balancing different priorities with limited policy space will require advice that better accounts for the tradeoffs and synergies among different policy combinations. Such an approach would increase the coherence of Fund advice to support strong and sustainable economic growth.

3. This paper elaborates on how Fund surveillance can change in practice to address the four surveillance priorities. The proposed modalities aim to make Fund surveillance more targeted, topical and timely, better integrated, and better informed. Modalities include new proposals and better leveraging of ongoing initiatives to modernize Fund surveillance, building on past successes while making surveillance nimbler, commensurate with the challenges posed by faster change and increased uncertainty in the global landscape. The proposed modalities also need to duly consider country-specific needs and constraints, including of Low-Income Countries/Fragile States (LIC/FS), cognizant that the approach cannot be one-size-fits-all.

4. Proposed modalities revolve around the principle of experimentation, adaptation, and flexibility. The Fund needs to continuously adapt and be flexible through learning-by-doing and experimentation, particularly at a time of high pressure on resources with multiple ongoing medium-term and COVID-19-related initiatives. As experience is accumulated, modalities that prove useful should be strengthened and refined, while others are dispensed with. The revised Surveillance Guidance Note will take on the more detailed implementation aspects not covered in this paper. Progress should be reassessed in about two years in the context of an Interim Surveillance Review.

MODALITIES FOR STRENGTHENING SURVEILLANCE

*This section presents **key proposals** (see table in Annex I)¹ for making Fund surveillance more timely, topical, targeted, interconnected, and better informed. It elaborates on new proposals and how to leverage ongoing initiatives.*

5. A modern surveillance framework requires a more flexible approach that embraces experimentation and adaptation. The structure of surveillance products (e.g., Article IV staff reports) and engagement has served the membership well. Yet, it has remained largely unchanged in the past several decades—centered around annual cycles with comprehensive and self-contained reports that are often not sufficiently timely, and not always well synchronized with national policy debates. A growing list of requirements on Article IV staff reports that has accumulated from the past has also contributed to the perception that they are formulaic and stale. In the shifting global landscape, surveillance will need to be nimble and more responsive to emerging priorities at the country-level, particularly when critical developments occur in-between consultations, which would greatly help increase traction (see CSR background paper on traction, IMF, 2021a).

6. Surveillance will also need to better surface issues of strategic and cross-cutting importance so that the international community, represented by the Board, can offer its collective views. Fund surveillance is exercised by the Executive Board. The Board’s discussion—normally articulated in the Summing Up—establishes the Funds’ views on the economic risks and policy priorities for the member country, as well as areas of debate. When well-balanced, the exercise of Board surveillance provides the opportunity to consider both country-specific issues and strategic trends that cut across the membership. This helps identify policy areas or risks that require

¹ New CSR proposals and ongoing initiatives are highlighted in blue italics throughout the paper.

deeper analysis, provides strategic direction, and informs future surveillance. While cross-cutting issues that are of strategic interest to other members frequently arise in Article IV consultations, they are nevertheless not systematically captured by dedicated multilateral surveillance products, such as the flagship reports. Indeed, beyond the flagship discussions and regional briefings, the Board has limited opportunities to provide views on breaking developments of importance to a subset of members spanning geographies or the international community at large (see IMF 2014, 2018, 2019 and findings from a survey to stakeholders in the background paper IMF, 2021b).

7. To achieve these objectives, surveillance, in particular surveillance through Article IV consultations, would benefit from more flexibility to adapt to rapidly evolving demands. Thus, the modalities discussed in this section, both new and ongoing initiatives, together aim to make Fund surveillance limber against an underlying principle of experimentation and adaptation. Modalities need to be continuously evaluated for alignment with the surveillance priorities and the principle of effective delivery mindful of resource constraints and work pressures, which have greatly increased during the COVID-19 pandemic, while remaining current with technological developments.

8. Modern Fund surveillance needs to be:

- **More timely, topical, and targeted.** Surveillance should continuously inform the membership and provide “real time” policy advice while rebalancing comprehensiveness and selectivity. An undue amount of time, effort, and focus is spent preparing and discussing details of Article IV consultations, whose reports are often dated and end up being too spaced out across time, making it difficult to surface cross-cutting issues. Rebalancing staff reports away from a strict sectoral approach, in which all macro areas are roughly equally weighted, to in-depth discussion of issues of imminent relevance and for which circumstances have most markedly changed, is needed. Being timely and topical can greatly enhance the provision of more targeted advice that fully considers country-specific circumstances. Pre-pandemic surveillance modalities, therefore, need to evolve to bolster both the Fund’s ability to respond to country-specific needs and augment the Board’s capacity to engage on topical issues more strategically. There is scope for the Fund to take up cross-cutting issues in a more comprehensive manner, be more strategic and forward-leaning, endorse more broad-based policy advice, and guide the Fund’s response to emerging risks, challenges, and trends that affect many members at the same time. Recent experience with virtual engagement further shows that Fund surveillance can be enhanced using new technology and tools, both in speed and relevance, complementing continued physical contact with authorities that is crucial for traction.
- **Better interconnected.** A modern surveillance framework can better integrate key aspects of the Fund’s work by tapping into knowledge dispersed across the Fund and beyond. This includes the core areas of macrofinancial surveillance, assessment of risks and contingent policy advice, more candid discussions of spillovers, and capacity development, as well as new topics like those related to climate change, digitalization of both financial and fiscal sectors, and income and social inequities. External expertise will need to be married with a more relevant staff skill-mix to respond to this challenge in a resource conscious manner.

- **Better informed.** The Fund must take full advantage of new technologies and data availability and management to modernize business practices and enhance the relevance of surveillance. Better knowledge management, systems and production processes—supported by strengthened peer-learning and by leveraging technology—are needed to deliver time-sensitive work on cross-cutting themes and emerging risks. New analytical tools, better data, and knowledgeable staff will ultimately deliver more relevant and cost-effective surveillance. Surveillance products and communication need to reach a broad set of audiences to enhance traction.

A. Support Timely, Topical, and Targeted Surveillance

9. Novel ways of Board engagement can enhance its strategic role, initiating a virtuous circle between the analysis of cross-cutting issues and bilateral policy advice. Board **Country Matters Meetings (CMMs)** could focus on conjunctural policy-relevant issues facing two or more members (Box 1). CMMs would collate and distill issues across the membership, spanning area and functional departments, and would be different from the contents of the Fund's flagships—by focusing on issues being faced at the country level, including by non-systemic countries, that would have lessons or bearings for other countries. They would also be different from regional briefings—by capturing policy issues relevant across regions, rather than within regions. **CMMs** would also be distinct from thematic briefings in that they would be aimed at explicitly soliciting the Board's views on key policy questions that would be expected to feed into bilateral Article IV consultations.² Other initiatives like the **Granular Policy Initiative (GPI)** would also facilitate the distilling and synthesizing of issues to be brought for discussion at the Board in a timely way. **CMMs** can also help strengthen traction with member countries. This approach would better rebalance Board discussions between the details of individual country surveillance cases and the need to share emerging policy lessons within more relevant timeframes. By providing more frequent insights into emerging developments and drawing early lessons from country experiences, this approach could enhance the relevance of peer surveillance and support more **Focused AIV Consultations** (see below).

Box 1. Country Matters Meetings (CMMs)

Board CMMs are envisioned to focus primarily on conjunctural policy-relevant developments facing a group of countries. They would collate and distill issues across the membership, spanning area and functional departments to feed further into bilateral surveillance. **CMMs** would be distinct from the Fund's flagship and regional briefings as they would seek to capture—in a regular and timelier manner—policy issues relevant for countries across regions rather than within regions. They would also be different from thematic briefings because **CMMs** aim to incorporate Board views into forthcoming bilateral surveillance engagements.

CMMs would synthesize and help formulate more timely and topical advice to individual members based on peer experience. **CMMs** seek to enrich the dialogue with the membership, without replacing the assessment of members' obligations under the Articles of Agreement provided by the regularly scheduled Article IV consultations. **CMMs** would offer the Board and the membership timelier Fund views about

² Thematic briefings could continue as needed, depending on resource availability.

Box 1. Country Matters Meetings (CMMs) (Concluded)

emerging risks and cross-cutting themes, including on how different countries are tackling similar challenges. The **GPI** (see below) could usefully support **CMMs** but is not required for their success.

CMMs would also provide strategic guidance. They would better inform the Fund's work in a timely and targeted manner and help establish a virtuous feedback loop into future Article IV reports. The result would be that subsequent Article IV consultations would be more strategic and focused on topic selection and more informed by other country experiences. Such **Focused Article IV Consultations** (Box 3) would in turn become more relevant for the membership and help inform future **CMMs**. Board **CMMs** could be formal or informal, depending on the issue discussed and whether the Fund is sufficiently well placed to formulate a position on the specific issues at hand. Previous Board engagements that were similar to **CMMs** in scope include the work on correspondent banking relations (formal) board meeting in 2017, or housing market challenges (informal) board briefing in 2019. Specific proposals for topics and nature of the Board meetings (informal to engage / formal) would be made in the context of the semi-annual board work programs. The operational costs and effectiveness of **CMMs** as a surveillance mechanism should be reassessed after about two years of experience.

10. Flexible and real-time surveillance tools, designed to surface and answer pressing policy questions of common interest, can help lay the groundwork for timelier and more targeted Fund advice. The Policy Tracker on Policy Responses to the COVID-19 shock garnered much attention, particularly at the onset of the crisis, and served as a real-time repository of member's policy actions, helping to disseminate information and peer-learning of outcomes.³ The Tracker, however, does not include Fund advice or an assessment of the measures, limiting its usefulness for Fund surveillance of other countries considering similar measures. To bring country-specificity and actionability to Fund surveillance, a proposed **Granular Policy Initiative (GPI)** can help staff better and more systematically identify policy questions that affect the membership and tailor policy advice to country specific circumstances (Box 2). The initiative would better leverage

Box 2. Granular Policy Initiative (GPI)

The need for granularity of bilateral Fund advice and for fostering real-time peer-learning has only grown over the COVID-19 crisis. Country teams need better access to technical expertise in bilateral surveillance as well as better tools to draw on experiences from other countries. These challenges are further exacerbated by the COVID-19 crisis. Policymakers are dealing with new, but also common, questions, including how to provide temporary tax relief, design targeted fiscal support, provide relief to the informal sector, avoid corruption when disbursing large support packages, or provide equity-like support to SMEs. The need for granular advice that can quickly leverage on peers' experiences has increased, and can be supported by integrating work across functional and area departments, including capacity development.

Building on existing coordination mechanisms, the GPI aims to:

- Facilitate and proactively expand targeted or granular policy advice on pressing and evolving exigencies that go beyond standard macro-fiscal issues. Such advice frequently requires deep sectoral expertise from

³ The policy tracker summarizes the key economic responses governments are taking to limit the human and economic impact of the COVID-19 pandemic. The tracker includes 197 economies and is available at: <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>.

Box 2. Granular Policy Initiative (GPI) (Concluded)

functional departments but specifically calibrated to country-specific circumstances. As such, it would be based on greater and closer collaboration across departments and business lines (i.e. surveillance and TA).

- Synthesize lessons from experience on a limited set of topics to provide a live internal repository for country teams to draw on, thus enhancing peer-learning opportunities. Case studies along with preliminary takeaways can be used by country teams in their policy dialogue with authorities. Lessons from cumulated experiences could be published in the external website after AIV consultations are concluded to preserve the Board's ultimate responsibility to conduct surveillance.

The GPI is envisioned to be broader in scope than the policy tracker, more country specific than the COVID-19 Special Series of notes prepared by departments, and more systematic than current mechanisms for providing granularity.

The policy tracker is a useful repository of members' policy actions for knowledge sharing, but it is not a surveillance tool as it does not provide normative views on those actions. Papers under the COVID-19 Special Series are cast at a relatively high level of generality. In contrast, the takeaways and advice in the GPI would feed directly into Article IV dialogues and naturally bring in peer experiences, including through innovative media.

and combine expertise from functional and area departments, including technical assistance. Policy questions and lessons emerging from the **Granular Policy Initiative** would feed into a live repository of key lessons organized by topic, Article IV consultations, and the Fund's policy dialogue in public fora (e.g., G7, G20, IMFC). Emerging macro-relevant issues, best practices, and evolving Fund views could thus be identified and distilled for the advantage of the membership at large, many of whom could be facing similar challenges and considering policy options.

11. A shift towards *Focused Article IV Consultations* would help better balance selectivity and comprehensiveness, guided by where the Fund can provide the most value-added. A more selective, issue-driven approach to surveillance would be most appropriate where extensive information is already publicly available (Box 3). For members with limited data availability or low overall capacity and with broad macro challenges, such as many LIC/FS, the current comprehensive coverage may still be warranted. Such a differentiated approach may create less uniformity in staff reports, but surveillance in countries in similar circumstances would still be treated in a similar way, consistent with the principle of evenhandedness. **CMMs** and **Focused Article IV Consultations** would encourage more continuous engagement between the Fund and its membership on topics of strategic importance, creating scope for the Fund to sharpen its attention on cross-cutting issues of strategic relevance in a more flexible and time-sensitive manner. **Focused Article IV Consultations** would help customize the Article IV process and possibly reduce the lag between the completion of the staff report, its consideration by the Board, and subsequent publication. Enhanced focus on a specific topic would remain consistent with existing Fund policies and Board decisions, but would require a change in the surveillance practices and expectations across the Fund—including the review process, country teams, and the Board—and account for the challenges Area Departments face to implement this shift.

Box 3. Focused Article IV Consultations

Focused Article IV Consultations would be organized around issues—thematic reports—that change more flexibly from country to country and from year to year. Focused staff reports organized around issues rather than sectors—de-emphasizing the “checklist” approach—would allow for individual Article IVs to surface to the Board issues of common interest to larger subsets of the membership in a timely manner.

Staff reports prepared for Focused Article IV Consultations would continue to address the core elements necessary for surveillance. These core elements, as laid out in the Integrated Surveillance Decision (ISD), include a staff appraisal of fiscal, monetary, financial, and exchange rate policies as part of a brief assessment of the economy. The report would also include the external sector and debt sustainability assessments, and a well-integrated analysis of macrofinancial linkages. However, if the policy stance and Fund policy advice is largely unchanged from the previous consultation, coverage would be very succinct, more so than is typically the case now, and previous reports would be referenced. The reports would combine these core elements with a deeper look at one or two macro-critical issues, with the discussion of core elements addressing the challenges posed by the macro-critical issues—for instance, how demographic trends affect fiscal sustainability or how technology impacts financial stability. The coverage of these issues would be anchored by country-specific plans discussed with authorities and would ultimately serve to enhance traction. **CMMs** and **GPI** would help to set the stage for producing **Focused Article IV Consultations**.

Some country teams have been experimenting with focused consultations, for instance, Japan ([2019 Article IV](#), with a focus on Demographics) and The United States ([2019 Article IV](#), with focus on social indicators and inequality). However, unlike in these cases, **Focused Article IV Consultations** would further eschew the comprehensive coverage of issues and sectors previously covered recently where there have been no significant changes since. Such streamlining of coverage will require changes in the culture and expectations across the institution at all levels, including the need for the review process to hold back on asking for coverage of additional issues and topics.

12. Real-time, topical, and thematic surveillance can greatly leverage on the complementarity of virtual engagement.

In this respect, the COVID-19 crisis has provided important lessons:

- It has paved the way for new modalities of engagement with the membership outside of standard missions during the Article IV consultation. If time-zone differences allow, staff visits could move to virtual settings, at least in part, as continuous off-cycle technical meetings have become more common. Experts from within the Fund can more easily join discussions and provide targeted advice, greatly supporting the integration of several workstreams in surveillance (see the next sub-section) and the **Granular Policy Initiative (GPI)**.
- In-person visits, however, cannot be dispensed with entirely and remain essential to build relations and traction, gather effective and comprehensive information, and reach out to broader audiences. But these visits could be shorter and more pointed if complemented with advance virtual engagement on technical matters.

13. However, a one-size-fits-all approach is inconceivable; virtual modalities will need to respond to country specific circumstances, and may need particular adaptation when engaging with LIC/FS.

As important recipients of technical assistance and in need of capacity

building, LIC/FS surveillance can greatly benefit from the participation of non-country team experts or of staff from other country teams that have faced similar issues in the past. At the same time, logistical and technological challenges are greater for these countries and thus solutions would need to be evaluated on a country-by-country basis. As such, this is another area where experimentation and adaptation can bring best practices to light.

14. Successful implementation on an experimental basis of the proposed modalities requires striking the right balance from a resource management perspective. For instance, there is a risk that more frequent engagement throughout the year could be more resource intensive for authorities (e.g., data requests, authorities' views needed on issues outside of the Article IV cycle) and staff (e.g., more frequent engagement with authorities and the Board, shorter internal review, increased need for interpretation and other support services). On the other hand, a greater use of LOT procedures under the current LOT policy for member surveillance would free up some staff resources and reduce bunching in the Board calendar.^{4,5} Realistically, several of the proposals here may well entail short-term transition costs, particularly on Area Departments, which should be continuously assessed and paired with streamlining elsewhere as needed.

B. Promote More Interconnected Surveillance

15. Bilateral surveillance can better connect core areas and integrate emerging priorities. In many ways, establishing and internalizing such connections is at the core of the surveillance priority of providing more unified policy advice. Through the internal review process and cross-departmental collaboration, country teams already benefit greatly from work across the institution and beyond, for instance, on monetary, fiscal, and financial policy analysis and advice, and technical assistance and training. However, a more systematic integration of some areas, such as macrofinancial, risk analysis and capacity development, as well as of work on emerging priorities, such as climate change, digitalization, and broader sustainability, would help (i) increase traction; (ii) better identify emerging themes across countries; and (iii) increase the specificity and timeliness of Fund advice by deploying existing resources more flexibly and effectively. External expertise can also be better leveraged, particularly in areas outside the Fund's core mandate.

16. New proposals, building on existing knowledge and supported by expanding staff's macrofinancial expertise, can help further integrate and deepen macrofinancial work into bilateral surveillance (see CSR background paper, IMF, 2021c). To achieve a well-integrated analysis of systemic financial risks and macrofinancial linkages into bilateral surveillance:

- Article IV staff reports should provide a well-articulated view about systemic financial risks—an ***Assessment of Systemic Financial Risks***—grounded in rigorous analyses of financial sector

⁴ *Compendium of Executive Board Procedures*, March 2018. Section VII, pages 53–59. Also, Part A of Decision No. 14766-(10/115), as amended.

⁵ The recent number of Article IV Consultations considered on LOT suggests that there is room for balancing Board engagement via CMMs—LOTs were 14 in 2019 and 9 in 2020, compared with 26 in 2017.

vulnerabilities, that can act as generators of shocks or as propagators through real-financial linkages. This would support a better integration of the discussion of these risks into the outlook and help anchor macroprudential policy advice. The revised Guidance Note will provide further directions to help country teams articulate such a view and conduct the analysis in line with the examples and approaches presented in IMF (2021c).

- As articulated in the Financial Sector Assessment Program (FSAP) review, closer **FSAP integration** can help strengthen systemic risk analysis and anchor policy advice in Article IV consultations (IMF, 2021b). To this end, a coordinated proposal with the FSAP Review envisages a new process for early interaction between country teams and MCM, well ahead of Policy Consultation Meetings, to agree on how best to follow up on FSAP findings and recommendations. The same would apply to FSSR findings and recommendations for relevant countries, often LIC/FS.
- As noted in IMF (2021c) and the IEO evaluation of the Fund's Financial Surveillance (IEO, 2019), gaps in macrofinancial expertise among Fund staff has constrained further progress in fully embedding macrofinancial analysis in Article IV consultations. This need pre-dates the challenges being brought by the emergence of digital currencies. Making major strides in core macrofinancial integration in Article IV reports requires **Expanding Macrofinancial Talent** through additional hiring of economists with macrofinancial expertise. Additional recruitment supported also by ongoing HR initiatives and training should help strengthen Fund-wide macrofinancial expertise, including in the review process. More expertise complemented with an expanded availability of data and tools should facilitate strengthening systemic risk analysis in bilateral surveillance (see the next sub-section).

17. More generally, a deeper discussion of risks can be further integrated in the policy analysis and advice. Despite progress since the GFC, Fund surveillance is still overly focused on the baseline scenario. It is proposed that staff reports place greater emphasis in their discussion with members of the range of potential outcomes, naturally leading to clearly articulated **Contingent Policy Advice** (Box 4). The discussion should highlight how best to seize on upside opportunities, manage downside risks, as well as provide more specific policy advice contingent on the materialization of different risks. The flexible use of better data and tools will play an important supporting role (see the next sub-section). Consideration should be placed in carefully managing communication challenges in pursuing such an approach, since the emphasis on policies that better take into account a multitude of possible eventualities may dilute messages and confound audiences.

Box 4. Contingent Policy Advice

Staff reports continue to be overly focused on a baseline scenario (see CSR background paper, IMF, 2021d). The coverage of risks has become more systematic since the Global Financial Crisis (GFC). Staff reports now regularly identify major risks and provide an assessment of their likelihood and economic impact, summarized in Risk Assessment Matrices (RAM). Fund surveillance can widen its emphasis to a fuller range of possible outcomes and encourage more proactive policy formulation on managing risks in a relevant manner. To support such efforts, the G-RAM/RAM framework can be further strengthened through greater use of quantitative scenarios.

The COVID-19 crisis further strengthens the case for Contingent Policy Advice. Policymakers are now operating in a highly uncertain environment, a situation that is likely to persist over the medium-term. Policies would need to be more robust to alternatives around the baseline macro projections. This would mean, besides being better prepared for downside risks, also seizing upside risks, both through the design of ex-ante policies like vaccination efforts, green investments that are robust to alternative scenarios, as well as through re-enforcing policies as upside risks materialize—for example, how to take best advantage of vaccines to boost tourism.

The communication challenges of Contingent Policy Advice should not be understated. As staff discusses policies for alternative scenarios, baseline advice may naturally become diluted. These important messaging challenges will need to be carefully considered.

18. A more candid discussion of spillovers in surveillance with member countries would improve the timeliness, relevance, and traction of Fund advice in this area (see CSR background paper, IMF, 2021e, for more details). The increasing significance of spillovers calls for strengthening the internal discussion among spillover producing and receiving country teams, and between country teams and functional departments. It also calls for more dialogue between the Fund and member countries of key spillover issues that are still in the incipient stages to induce more peer-to-peer discussions of key policy implications. Together, these efforts would help integrate better spillover discussions in flagships with those of members in the context of Article IV surveillance, in support of timely and targeted policy advice.

- In addition, there may be merit in developing an institutional level understanding on the types of spillovers that are relevant to consider at a given juncture, and the channels through which they are likely to operate. This would strengthen the link between bilateral and multilateral surveillance. A **Spillovers Tool** can help improve the understanding of key spillovers relevant in a given juncture and their propagation channels to enable a more coordinated approach to spillover analysis at the institutional level. The assessment would be updated periodically, to provide concrete and specific guidance for country teams (for instance, on key transmission channels, size and potential alternative or mitigating policy advice) for a limited set of global spillovers that are relevant under the baseline and alternative scenarios, with the identification of spillovers supported by the WEO, G-RAM and Spillover Taskforce (see more details in IMF, 2021e).
- A proposed **Spillovers Forum** would be an informal closed-door meeting to bring together the membership to discuss incipient policy issues with potentially large spillovers. It can support the systematic and timely sharing of experiences and views from spillover-producer and receiver countries. The **Spillovers Forum** would take place once a year during the Spring or Annual

Meetings, anchored around one or two spillover topics. The discussions would be forward leaning rather than on discussing spillovers that may already be playing out, which is often the case in Article IV reports. Such a forum would also complement, rather than substitute for the EWE exercise, which has both a wider mandate and greater focus on tail risks and would speak to the gap at the Fund relative to other institutions for informal peer engagement among the membership (see more details in IMF, 2021e).

19. Closer interconnection of surveillance with Capacity Development (CD) can greatly increase traction and help deliver on the surveillance priorities, including for LIC/FS. Several ongoing initiatives aim at improving this interconnection (Box 5). Major recipients of CD prepare a **CD Country Strategy** and discuss it in country documents if relevant, allowing an alignment of CD efforts with surveillance priorities as well as authorities' needs, and aiming at closing capacity gaps that hinder the take-up of policy advice. Interconnection can also be intensified, either through targeted cross-mission participation—proven effective during the recent mainstreaming of virtual engagement—or overlapping in-person missions. These considerations are particularly pressing for LIC/FS, who are heavy users of CD and whose Article IV reports would benefit the most from this integration. Furthermore, better information through the **Capacity Development Management and Administrative Program (CDMAP)**, supports early engagement between area and CD departments during CD prioritization. New ways to transfer technical knowledge with—and between—countries through online discussions and webinars, could also prove helpful for surveillance purposes and to enhance peer learning. Experimenting with new channels for interacting with the membership and for receiving quick feedback on issues that the Fund may wish to raise may be needed. In that sense, the **Granular Policy Initiative** may also provide a further avenue for better CD integration into surveillance (see above).

Box 5. Integrating Capacity Development and Surveillance

Strengthening the integration of Fund surveillance and capacity building is a key recommendation of the 2018 CD Strategy Review.¹ Integration means in practice that institutional and capacity weaknesses that constrain the adoption of recommended policies and contribute to risks are covered in surveillance and targeted through CD prioritization. Conversely, advice in Article IV reports should be tailored to existing capacity constraints, while ensuring CD recommendations are followed up over time. Guidelines to better achieve this integration have been developed following the 2018 CD Strategy Review and will be reflected in the revised Surveillance Guidance Note.

Improved integration of Capacity Development revolves around a CD country strategy and continuous engagement across country teams and CD providing departments. Country teams develop a coherent **CD country strategy**, in collaboration with CD departments and discussed with the authorities, to ensure an alignment between CD resources and the surveillance priorities. When critical to surveillance, area department country teams should discuss relevant parts of the CD strategy in country documents, during pre-mission interdepartmental meetings, and with the authorities and other country-based stakeholders. CD providers and area department country teams should engage regularly in the prioritization, design, implementation, and monitoring/ assessment of CD projects. The depth and frequency of these engagements would depend on the criticality and relevance of CD activity to surveillance, and more broadly the country's ability to implement sound policies. These considerations appear especially relevant in the case

Box 5. Integrating Capacity Development and Surveillance (Concluded)

of LIC/FS. Integration of CD needs to be mindful of confidentiality issues surrounding the provision of advice and data usage.

The ***Capacity Development Management and Administrative Program (CDMAP)*** is an internal tool that facilitates the integration of CD and surveillance and reinforces results-driven CD delivery. In making CD planning more transparent and harmonized across departments, ***CDMAP*** will provide comparable and easily accessible information on CD plans, budgets, and results to area department teams. Country teams will be able to, for the first time, review targeted and actual results and workplans for all existing projects, upload new demands for CD, and prioritize demand related to their country all within the same system.

¹ [2018 Review of the Fund's Capacity Development Strategy](#).

20. The surveillance priorities require a more systematic integration of macro-critical emerging topics, with Climate being a key example (IMF, 2021f). Fiscal policies for climate adaptation and transition to a low carbon economy—including efforts of countries to achieve their Nationally Determined Contributions under the Paris climate accord—will need to be more seamlessly placed in the broader macro-context. Climate change mitigation is a global public good whose supply needs to be stepped up urgently to preserve global macroeconomic and financial stability; a pragmatic approach is proposed that focusses especially on the largest emitters of greenhouse gases. The analysis of monetary and financial policies can also cushion the impact of climate risks and will also be expanded—through the expansion of climate analysis in FSAPs, better governance and financial integrity safeguards to strengthen climate change policies, and adaptation of monetary policies to address risks of lower productivity growth, increased volatility of supply shocks, and higher inflation due to climate change. Climate Change Policy Assessments (CCPAs) could also be important inputs for Article IV consultations, notably for the discussion of adaptation and resilience building. The operational considerations presented in IMF (2021f) will be reflected and further refined in the revised Surveillance Guidance Note. To meet the challenge of interconnecting this new area into surveillance, staff skills will also need to be expanded, including through hiring new talent and internal training to upgrade the skills of existing staff. Access to data, knowledge, and collaboration with other stakeholders will be an important element of successful interconnection.

21. In addition to climate, other sustainability priorities may also need to be treated in surveillance (IMF, 2021g). Trends in demographics, technological change, inequality, socio-political and geo-political developments also pose challenges to economic sustainability, and interact in important ways with traditional core surveillance areas. Modern surveillance needs to integrate the analysis of the channels through which such trends affect sustainability to provide members with topical and targeted actionable policy advice. Building on the experience gained on inequality, the integration of sustainability priorities into surveillance would be supported by inter-departmental groups, including for operationalizing policy, capacity building, knowledge exchange, and developing analytical tools, databases, and models.

22. *Collaboration with External Partners* on emerging macro-critical issues can be key in building capacity and coordinating action at the international level. Building on effective collaboration frameworks, including on debt vulnerabilities, FSAP, and social spending, collaboration with partner institutions can support/inform Fund surveillance. It can benefit the Fund’s work and advice on macro-structural issues, including through exchanging knowledge, delineating the responsibilities of each institution in international fora, and collaborating on developing tools to integrate the analysis of emerging issues into surveillance. The World Bank is a prime partner for collaboration on **Climate**, including in sharing information and specialist knowledge, developing a climate-focused internal training program, and integrating climate-related risk analyses in existing frameworks such as the FSAP and Debt Sustainability Frameworks (DSF). Relatedly, the Fund will incentivize Fund-Bank collaboration by leveraging on the new HR performance management system, fostering staff exchanges, including at senior staff level, and improving access and exchange of information and knowledge (see [IEO, 2020](#), for a discussion on collaboration on macro-structural issues). At the same time, it is important to keep in mind that greater collaboration will not always come easily or that it will lead to immediate outcomes—other institutions have their own work agendas, governance structures, and incentives. Collaboration will only work when incentives and timetables align sufficiently.

C. For Better-Informed Surveillance

23. Better-informed surveillance depends on mutually reinforcing synergies between training, tools, and data. Better-informed surveillance depends critically on continuous training of staff, including research assistants. Upgraded human capital should be complemented by better tools and peer-learning. Tools enable staff to do analyses, including new types of analysis, efficiently and collaboratively; they also allow peer-learning at various levels, for instance, cross-country, within country-team, and across departments, through new collaboration capabilities and an efficient exchange of knowledge. Training, tools, and peer-learning are further complemented by data and knowledge availability. Taken all together, they help close existing information gaps. Several initiatives are ongoing that can meaningfully support Fund surveillance, but it is still early to judge whether they can be as impactful as currently envisioned.

Training

24. Expanding and upgrading staff skills will complement other modalities. A **Revamped Internal Economics Training (IET)** would ensure alignment with the CSR priorities, so that relevant knowledge, skills, and competencies can be developed (Box 6). Key priorities are consistent with areas of institutional focus, spanning traditional core areas as well as **Climate**, fragile state policies, macro-structural reforms, impact of digitalization, and inclusive growth, which would also be supported by **Collaboration with External Partners**. The upgrades in data access and the introduction of new tools also require upgrading the Fund’s staff expertise. For example, to maximize the benefits of the **Integrated Data initiative (iData Initiative)**, more data science specialists with advanced data analytics are needed (Box 7).

Box 6. Revamped Internal Economics Training (IET)

The IET program is being reviewed to ensure it continues to play a critical role in upskilling Fund staff knowledge. The new IET Strategy proposes three closely intertwined objectives: (a) better anchor IET in the Fund's institutional objectives; (b) more closely serve the needs of Fund economists and the economics training needs of other staff; and (c) facilitate the transfer of knowledge to promote learning within the Fund. The upcoming review of the Structured Curriculum will ensure a close alignment of knowledge, skills, and competencies with the gaps identified in the CSR papers, ensuing update of the Guidance Note for Surveillance, and any other operational guidelines that underpin the Fund's core activities. Steps are being taken to enhance economists' skills on macrofinancial issues (e.g., through training on the Systemic Risk Tracker, Policy on FinTech, Growth at Risk), and develop and deliver a training program on **Climate** Change (e.g., new Climate 101 and Climate Bootcamp courses) among other important areas of institutional focus. Training uptake continues to be constrained by work pressures, and a concerted effort to enhance accountability of economists and managers is likely needed as envisioned in the revamped IET Strategy.

Tools

25. Delivering on the surveillance priorities requires expanding analytical capabilities.

Tools—models, methodologies, templates, apps—are not a panacea to operational or analytical problems, and there is no one-size-fits-all. But **Better Tools**, especially if building upon data initiatives (see below), provide flexibility to perform routine tasks in a more efficient manner and/or ensure the application of a common level of analytical rigor, mindful of country-specific circumstances and country-team needs. Improved tools are being developed in multiple areas:

- *Tools for analyzing financial risk* (IMF, 2021c), e.g., to study feedback effects across real and financial sectors, to detect relevant sources of systemic risk, and to assess the resilience of the financial system to shocks, are important inputs into forming an **Assessment of Systemic Financial Risks**. Stress testing tools, as detailed in the recent FSAP review, (IMF, 2021h, and IMF, 2021c), can also support better **FSAP Integration** into Article IV surveillance by serving as a useful reference, especially during the period between FSAPs or for countries that have not benefited from one. The FSAP review also proposes to develop methodologies to assess risks related to **Climate**, fintech, and cybersecurity can help accumulate experience that can be brought to Article IV surveillance in the medium-term.
- *Tools to understand long-term underlying trends* (IMF, 2021g)—on demographics, technology, inequality, socio-political and geopolitical developments, and climate—and how they impact macro stability and economic sustainability. Empirical and conceptual analysis and new modelling will help study climate risks and policies, and provide a better understanding of macroeconomic, distributional, and climate impacts of mitigation policies. The recent Debt Sustainability Assessment (DSA) update and planned upgrades to the External Balance Assessment (EBA) aim to capture issues related to economic sustainability. Regarding **Climate**, a suite of tools will provide country-level emissions projections, as well as fiscal and economic incidence, and emissions impact of climate policies; the new tool will also deepen our understanding of the distributional impacts of climate change with a focus on adaptation (see IMF, 2021f for details).

- *Models of risk assessment and management*—for example quantile-regression, risk-focused structural and crisis prediction models—can support the provision of ***Contingent Policy Advice***. Strategic foresight techniques (as applied in the CSR Background paper on Scenario Planning, IMF, 2021i) can also be used to crystalize unforeseeable but plausible high-impact events, which could then feed into the G-RAM, contingency plans, and long-term risk analysis (as argued in the CSR background paper on Risks, IMF, 2021d). These techniques can capture issues related to the importance of key infrastructure and systems, technology regulations across countries and regions, and on digital risks management (including cybersecurity, outages, digital frauds, data privacy) and recovery capacity in central banks, financial systems, public financial management, and the broader economy.
- *Methods and tools to increase the digitalization of internal processes* will help improve the quality of Fund surveillance. Flow automation of routine or repetitive tasks such as data collection and information sharing activities can help increase timeliness, accuracy, and productivity. As mentioned earlier, **CDMAP** serves as a platform for CD planning and easier integration with surveillance. Digital templates can facilitate comparison and assessment of macroeconomic frameworks, and keyword searches of minimum Article IV requirements will simplify and better inform the review process; they will also reduce operational risks and make the process more efficient. Modern data analytics will help unify multiple data sources to create interactive dashboards and analytical reports. Text analytics will help connect topics and issues with cross-country knowledge, guidance, and relevant expertise, as well as signal degree of relative coverage of a topic across members and over time.

Box 7. The iData Initiative

The **iData Initiative** is a data management and dissemination platform to modernize economic data management. It was articulated in the 2018 Overarching Strategy on Data and Statistics, launched in November 2020, and is expected to be completed by end-2023. The **iData Initiative** will support high-quality forecasts and data-driven analysis and improve the overall user experience with Fund data.

This initiative will replace the existing custom-built platform, which is almost at its end-of-life. The existing custom-built platform supports the production of the Fund's key multilateral and cross-country databases, including the WEO and IFS databases, and the dissemination of data to external users on data.imf.org. The new platform will address access to economic data—a long-standing challenge for Fund users—by providing users a simple interface to easily browse and search across datasets.

The new platform will improve data access and visualization. Users will be able to access data from desktops and mobile devices, and use data in multiple analytic environments, including Python, R, MATLAB, and STATA. The **iData Initiative** will also leverage industry-leading visualization tools, allowing users to produce customized views of the data and generate new insights. Access to Fund data by member countries and other external stakeholders will be facilitated by a redesigned mobile-friendly external interface (data.imf.org) with enhanced search and visualization capabilities.

The iData Initiative expands the possibilities for data management. In its next development phase, the **iData Initiative** platform will be used for more types of data, including Big Data and market data, and support a single dissemination solution for internal and external users. Over time, **iData Initiative** is expected to become the Fund's sole data repository.

26. New surveillance modalities and ongoing initiatives provide the basis for better peer-learning, leveraging on training and the flexible use of tools. In particular:

- The **Integrated Digital Workplace (iDW)** will help strengthen the Fund's collaboration capabilities to support remote working, and transform the ways teams communicate, collaborate, and manage work within and across departments, and with external stakeholders (Box 8). **iDW** will help improve the efficiency of internal production processes, including surveillance review, and create an environment conducive to better peer-learning, facilitated by new tools to communicate and share knowledge. It will also ease virtual engagement with country authorities.
- Completed and planned **Knowledge Management Projects** aim to support staff's operational and analytical surveillance work. First, the completed Knowledge Exchange (KE) portal revamp has made the Fund's knowledge more easily accessible through a country engagement timeline, which captures technical assistance, surveillance, and program missions and documents allowing for a unified view of country engagement and facilitating the integration of these different types of work. Second, the intranet's Enterprise Search Engine has already facilitated surfacing relevant content in a more intuitive user interface. Third, documents are now being automatically tagged with relevant fields to help improve searchability. Finally, the New Document Management project will ease the storage and sharing of knowledge content in a central repository of documents.

Box 8. Integrated Digital Workplace (iDW)

The **Integrated Digital Workplace (iDW)** is a key modernization initiative to leverage modern technology to improve the efficiency and effectiveness of the Fund's core surveillance, lending, and capacity building operations. The new integrated solution seeks to strengthen collaboration and teamwork in a hybrid work environment continuously being shaped by technological change; enable better knowledge sharing and management; augment the Fund's external stakeholder engagement and management; streamline and integrate document flow and review process; and automate and enhance access to economic and financial analytical tools and applications. The **iDW** also seeks to improve productivity and risk management through enhanced, secure, and mobile access—at lower resource costs—to analytical and process tools.

The **iDW** program will support the effective implementation of recommendations coming out of recent and ongoing major Fund policy and operations reviews, including the CSR, CD strategy, and the Review of Conditionality and Program Design. The program is built around five modules:

- *Collaboration.* Improves collaboration and communication internally and with the membership.
- *Intranet.* Deliver a modern Intranet that is better aligned with Fund operations, supports the Fund's communication strategy, and promotes improved knowledge sharing through a topical- and country-based modern knowledge hub, including a new version of the KE Country pages.
- *External Relationship Management.* Improve management of the Fund's external relationships, including with members and other stakeholders.
- *Document Journey.* Create a more comprehensive, integrated, and smoother document flow process with efficient review and clearance functions and better access to documents and comments.

Box 8. Integrated Digital Workplace (iDW) (Concluded)

- *Digital modernization.* Replace outdated and standalone tools and applications with modern cloud-based technology to improve productivity and access to real time information and analysis.

Implementation of the *iDW* began in November 2020 and the current program is expected to be completed by the end of 2023.

Data

27. Better data are critical to deliver on the surveillance priorities. Closing critical data gaps in surveillance is the objective of the ongoing review of ***Data Provision to the Fund*** for Surveillance (IMF, 2021j). The ongoing review also discusses data that members are encouraged to provide (***Encouraged Data Provision***). In some instances, provision of additional data may generate some costs to members countries. Public sector data, foreign exchange intervention (FXI), and indicators for macrofinancial analysis are areas of immediate data needs, where the case for enhanced data provision to the Fund is the strongest and most urgent. In particular:

- Broader and more granular coverage of the public sector data (including debt data beyond the central government) would support analysis of fiscal risks—one of the key areas of Fund surveillance.
- Access to timely and comprehensive FXI data is key for bilateral and multilateral surveillance, including oversight of members' exchange rate policies, conducting external sector assessments, and monitoring the functioning of the international monetary system, including policy spillovers and spillbacks. Provision of FXI data would also facilitate more integrated policy advice.
- While macro-financial analysis is a core area of Fund surveillance, the data provision requirements are currently minimal in this area. Minimum mandatory data provision, including of the main financial sector indicators, would ensure proper monitoring of the core financial system and key sources of systemic risk. In many cases better data coverage for non-bank financial institutions, the stocks and flows of credit, cross-border activity, and nonfinancial corporates would also be critical for assessing potential sources of systemic risk—from within and outside the banking system—akin into account key interlinkages across sectors and policies.

28. The ongoing expansion of data infrastructure will further support the use of more granular data. As part of the effort to improve data management, ***iData Initiative*** will bring modern data management and dissemination tools to help strengthen data analysis, including by facilitating data access to staff, member countries and external stakeholders, and enhancing search and visualization capabilities. ***Encouraged Data Provision*** can also facilitate the analysis of:

- High frequency and granular information—available in partnership with IFIs and the private sector—to have more timely and comprehensive signals of economic activity (e.g., vessel traffic, satellite images, mobility and travel related data) and emerging risks across countries or regions, as well as new ways to fill data gaps in official statistics—for instance, the [Development Data Partnership](#) and the [COVID-19 High Frequency Data Hub](#).

- Data related to economic sustainability, including on inequality, **Climate** change, demographics, technological advances, and socio-political and geo-political developments are critical under the new surveillance priorities. Such data will help understand the impact of digital technologies on macroeconomic and distributional outcomes in an environment of rising inequality. External sources will complement data availability (e.g., World Bank, UN, OECD), and further guidance on the use of available indicators will be provided in the revised guidance note. At the same time, the Fund has launched initiatives to improve data availability, including the work on the Climate Change Indicators Dashboard.
- Macro-critical issues that could feature in **Focused Article IV Consultations**, including one or more topics relevant for the surveillance priorities—for instance, on implications for growth and stability of trends on digital technology, demographics, climate change, and shifting global economic power.
- Better information on household debt, real estate sector, including housing prices, would support macrofinancial integration in several areas—including **FSAP integration** and forming an **Assessment of Systemic Financial Risks**. Data on links between non-financial corporations and the wider economy would inform risk assessments and **Contingent Policy Advice**. It is also important to maintain databases that support the surveillance of macroprudential policy (for instance, the macroprudential survey and the integrated Macroprudential Policy database).

29. In the medium-term, a reimagined *Country Portal* would serve as a “one-stop shop” for all Fund content on that country. A modern and intuitive portal that serves as the face of the Fund’s engagement with each member could greatly improve external communication and facilitate internal peer-learning. Using a clean and visually appealing format, the external version of such a portal could feature the latest WEO projections for the country and key policy advice, along with all Fund documents pertaining to the member in the public domain. An internal version of the website would, in addition, collect all country-relevant documents for official use. Peer-learning and knowledge dissemination would be facilitated by a consistent document labeling system, under which all Fund documents are tagged at the time of production. In this last regard, recent efforts to automate the identification of cross-cutting themes using the Enterprise Business Vocabulary are a step in the right direction. This would reduce the need to reproduce previous analyses and advice in earlier Article IV consultations that remain relevant and as such support **Focused Article IV Consultations**. It would also allay concerns that for many members, the Fund’s Article IV staff report remains the “go-to” source for information—by replacing a single paper report produced annually with a comprehensive digital platform that retains all relevant information in one place regardless of when it was produced. Such a vision would require further thinking, including a clear view on the possibly considerable resource implications.

COSTING

30. This section discusses the costing of the CSR. The previous section discussed key CSR proposals (see Annex I), including new modalities, for making Fund surveillance more timely, topical, targeted, interconnected, and informed. Below we expand on the tentative cost of new proposals that have significant budgetary implications. Other proposals could, in the first instance, rely on optimizing processes, while others (such as *iData Initiative* and *iDW*) are underway and funded separately; and the resource implications of yet others (such as climate, digital currencies, FSAP) are being picked up in context of the discussion of those specific workstreams.

31. The most significant need for resources is for *Expanding Macrofinancial Talent*. An assessment of depth and integration of systemic risk analysis and macroprudential policy advice in Article IV Consultations found that limitations in macrofinancial expertise compounded by competing priorities have constrained progress in this area, which requires additional recruitment with the proper skill set. This finding echoes the conclusions from the IEO's evaluation of the Fund's financial surveillance (IEO, 2019), which noted that resource constraints have slowed the needed buildup of macrofinancial expertise. The assessment finds that half of all Article IV reports presented gaps in the depth and integration of these core elements of macrofinancial analysis (see IMF 2021c). An additional 24 FTEs with macrofinancial expertise, if spread over the identified Article IV teams with gaps, would translate into about 80 percent coverage of the gap, assuming each additional staff would cover on average about 2 Article IVs per year. The remaining gap would be closed through training and reprioritization.

32. Four other new proposals would require an additional 5-7 FTEs. The annual cost of **CMMs** will vary with the number of such meetings during the year, the number of topics discussed in each CMM, and the novelty of the material presented—CMMs based on material already available would be less costly than CMMs based on new material. On average, and assuming efficiency gains elsewhere (see below), the tentative cost of one CMM is currently placed at about 2-3 FTEs. Costs for the **GPI** reflect the collection and selection of policy questions from country teams for which help from functional departments is sought, as well as the effort to summarize lessons learned. Depending on the number of countries and policy questions and the extent and frequency with which any lessons are publicized following Board discussions (including in the context of individual Article IV consultations) to replace the current policy tracker, resource costs range between 2-3 FTEs. Importantly, the estimated costs assume functional departments provide support within their current envelope for engaging with area departments. As regards the new **Spillovers Tool** and **Spillovers Forum**, it should be possible to implement these with about 1-1.5 FTEs in total. It is estimated that the Spillovers Tool will absorb about the same amount of resources as the G-RAM, i.e. just under 1 FTE per year. As for the Forum, organizing and preparing the material would take most time, while staff and Management attendance account for only a small fraction of the costs and the overall cost is estimated also at under 1 FTE.

33. Cost considerations do not include short-term transition costs and are subject to a significant degree of uncertainty. Estimated costs, for instance, assume that ongoing initiatives to improve technology and improve workflow are fully successful; if that is not the case, actual costs

may well be higher. They also do not account for additional cost pressures on other support services. Depending on how the uncertainties around the global outlook materializes, Area Departments may need to prioritize on short-term exigencies, which would also mean that any efficiency gains that could potentially be directed toward the CSR priorities will need to go in that direction instead, raising the net costs for the latter—for example, it may not be possible to streamline the discussion in staff reports of traditional areas to partially compensate for the taking up of longer term sustainability issues. Also, particularly for Area Departments, there are short-term transition costs and experimentation costs that are hard to capture in the estimates. The divergent global exit from the pandemic, with LIC/FS more likely dealing with the crisis longer than advanced or emerging economies, will also have differential impacts on individual country teams, limiting the space for some to experiment with the new modalities. Furthermore, the experimental nature of the approach limits the feasibility to provide very durably long-term cost implications—for example, potential long-term trade-offs involved when hiring more staff in certain areas of expertise (for instance, climate, and data scientists) as opposed to fungible staff who by definition can better move across issues and areas are not accounted for. Training costs—resource and staff time—also need to be incorporated into the baseline estimation. Finally, the costs of implementing a new country portal are left to the medium-term and are not included in the analysis. At the same time, potential savings from process improvement are also not factored in, including those from any changes to the review process. If costs end-up being larger than estimated, staff may need to come back to the Board for guidance on how to proceed, including on further streamlining the large number of existing requirements on Article IV consultations.

34. A flexible approach to implementing the new modalities, characterized by experimentation and learning-by-doing—a “sandbox” for new modalities, helps in this regard. Under such an approach, the new modalities can be implemented, with their continuation and/or scaling remaining subject to re-assessment in two years. This approach will help the Fund deal with the uncertainty associated with the implementation of the CSR priorities, balanced against already high work pressures. Many of the proposed modalities are not only scalable but also malleable, so that their implementation can adapt to changing needs and circumstances over time.

Annex: Matrix of CSR Proposals

Main Areas	Proposals	Priorities		
		Risks	Spillovers	Sustainability
Timely, Topical and Targeted	CMMs	✓	✓	✓
	Granular Policy Initiative		✓	✓
	Focused AIV consultations	✓	✓	✓
Connected	Assessment of Systemic Financial Risks	✓	✓	✓
	FSAP Integration	✓	✓	✓
	Expanding Macrofinancial Talent	✓	✓	✓
	Contingent Policy Advice	✓	✓	✓
	Spillovers Tool		✓	✓
	Spillovers Forum		✓	✓
	CD Country Strategy			✓
	CDMAP		✓	✓
	Climate	✓	✓	✓
	Collaboration with External Partners		✓	✓
Informed	Revamped Internal Economics Training (IET)	✓	✓	✓
	Better Tools (modeling, estimation, review process)	✓	✓	✓
	The iData Initiative	✓	✓	✓
	Integrated Digital Workplace (iDW)	✓	✓	✓
	Knowledge Management Projects	✓	✓	✓
	Data Provision to the Fund (public sector, FX intervention, macrofinancial)	✓	✓	✓
	Encouraged Data Provision (indicators related to economic sustainability)	✓		✓
	Country Portal	✓	✓	✓

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2021 Comprehensive Surveillance Review—Background Paper on Integrating Climate Change into Article IV Consultations



IMF POLICY PAPER

2021 COMPREHENSIVE SURVEILLANCE REVIEW— BACKGROUND PAPER ON INTEGRATING CLIMATE CHANGE INTO ARTICLE IV CONSULTATIONS

May 2021

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:

- The **Staff Report**, prepared by IMF staff and completed on April 7, 2021 for the Executive Board's consideration on May 10, 2021.

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**International Monetary Fund
Washington, D.C.**



April 7, 2021

2021 COMPREHENSIVE SURVEILLANCE REVIEW— BACKGROUND PAPER ON INTEGRATING CLIMATE CHANGE INTO ARTICLE IV CONSULTATIONS

EXECUTIVE SUMMARY

Climate change has emerged rapidly as a pressing challenge for macroeconomic policymakers. Among other things, climate change redistributes income and affects asset valuations, with repercussions for public and private sector balance sheets, financial flows and financial stability, trade, and exchange rates. Fiscal policies are key for mitigating climate change and ensuring a socially balanced transition to a low carbon economy. Countries that are vulnerable to natural disasters need to build fiscal space and deepen access to financing in order to build resilience.

While the IMF has been involved in the climate debate since at least 2008, a systematic account of how to integrate climate change into surveillance has been lacking to date. This paper seeks to fill the gap. It argues that *domestic* policy challenges related to climate change—such as adaptation efforts for climate vulnerable countries, or policies to deliver a country's Nationally Determined Contribution under the Paris climate accord—are covered by the IMF's bilateral surveillance mandate and therefore valid topics for Article IV consultations wherever these challenges cross the threshold of macro-criticality. Climate change mitigation is a *global* policy challenge and therefore falls under multilateral surveillance. The paper proposes a pragmatic approach that focusses especially on the mitigation efforts of the 20 largest emitters of greenhouse gases.

Approved By
Ceyla Pazarbasioglu

Prepared by Johannes Wiegand (SPR). The paper is based on the work of an interdepartmental group that included Florence Jaumotte (RES), Catherine Pattillo (AFR), Julianne Ams, Nadia Rendak (both LEG), James Daniel, Ian Parry, James Roaf (all FAD), Prasad Ananthkrishnan (MCM), Martin Cihak, Tito da Silva and Johannes Wiegand (all SPR),¹ and that worked under the general guidance of Sanjaya Panth (SPR)¹

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¹ Catherine Pattillo was in FAD when most of the work of the interdepartmental group was conducted, Martin Cihak in MCM.

INTRODUCTION

1. The IMF has been involved in the climate change debate for more than a decade. In 2008, a chapter in the World Economic Outlook identified climate change as “a potentially catastrophic global externality and one of the world’s greatest collective action problems” and concluded that “climate change can be addressed with minimum damage to the economy, if policy solutions follow some basic principles.”

2. The IMF’s contributions to the climate change debate have been manifold and impactful. Since 2008, IMF staff has published numerous policy papers and chapters in flagship publications (WEO, GFSR, Fiscal Monitor) and Regional Surveillance Reports on climate-related policy challenges. Climate change has also been covered in country-specific Article IV reports and Financial Sector Stability Assessments. On substance, IMF contributions have focused on topics with a close link to macroeconomic management, such as carbon pricing, energy subsidies, resilience building to natural disasters, or containing the impact of climate change on financial stability. For a small number of pilot countries, in-depth Climate Change Policy Assessments (CCPAs) have been conducted jointly with the World Bank, which have served as inputs into Article IV reports, especially on resilience building and climate change adaptation.

3. However, coverage of climate change in Article IV reports has been largely ad-hoc, driven primarily by the interests of country authorities and IMF country teams. This has given rise to questions to what extent such coverage is consistent with the IMF’s surveillance mandate, expertise and comparative advantage relative to other institutions. Views on this issue differ: some stakeholders argue that climate change should play a key role in IMF surveillance, given the grave repercussions of unconstrained global warming for macroeconomic and financial stability, as well as the macroeconomic significance of policies needed to meet countries’ mitigation and adaptation objectives. Others, however, advise caution, viewing climate change primarily a topic for environmental rather than economic policies—and therefore as an area where the IMF has limited expertise.

4. This background paper seeks to clarify to what extent climate change is a relevant topic for IMF surveillance. Among other things, it seeks to address the following questions:

- What macroeconomic policy challenges arise in the context of adapting to/seeking to contain climate change?
- To what extent does the IMF’s surveillance mandate allow/call for covering climate change related policies in Article IV consultations, and what are the relevant criteria for when and whether to include climate change?
- What climate-related topics should IMF surveillance cover?
- How specific should the IMF’s advice be on climate-related policies?

5. The focus of this paper is squarely on conceptual and strategic issues. How to cover climate in surveillance in practice will be elaborated on in subsequent guidance. A parallel workstream focusses on integrating climate change issues into Financial Stability Assessments; the results from this workstream will be summarized in the FSAP-review that is proceeding in parallel with the Comprehensive Surveillance Review.

CLIMATE CHANGE AND THE IMF'S SURVEILLANCE MANDATE

6. The IMF's surveillance mandate is defined by the Articles of Agreement and elaborated further in the 2012 Integrated Surveillance Decision (ISD). The ISD made Article IV consultations a vehicle for both bilateral and multilateral surveillance, and thereby provides two angles for when a topic should be discussed (see Annex I for a more complete description of the legal surveillance framework as it pertains to the coverage of climate change):

- **Bilateral surveillance/direct impact.** In its bilateral surveillance, the IMF “will focus on policies that can significantly influence present or prospective balance of payments and domestic stability” (ISD¶16).
- **Multilateral surveillance/spillovers.** As part of multilateral surveillance, Article IVs consultations “shall include a discussion of the spillover effects of a member’s exchange rate and domestic economic and financial policies that may significantly influence the effective operation of the international monetary system, for example, by undermining global economic and financial stability”. (ISD¶126).

Policies and topics that fall outside these parameters can still be discussed in Article IV consultations, provided there is agreement with the member.²

7. For assessing how climate change relates to this mandate, it is helpful to distinguish between the three types of policy challenges.

- **Climate change mitigation.** Mitigation policies seek to contain global warming, primarily by limiting and/or offsetting the concentration of greenhouse gases in the atmosphere. Mitigation is a *global policy challenge*: no individual country can provide sufficient climate change mitigation on its own. A country can, however, make an appropriate contribution to the global mitigation effort.³

² The IMF's policy advice on these issues is in the legal sense technical assistance rather than surveillance, but can be included in the member's Article IV consultation report.

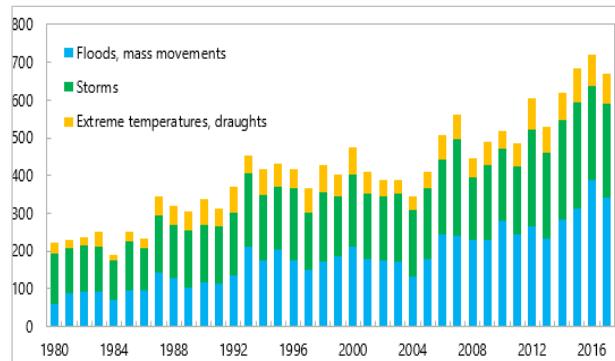
³ Put differently, climate change mitigation is a global public good. As with other public goods, mitigation will be undersupplied in the absence of an effective coordination and enforcement mechanism.

- **Adaptation to climate change.**

Adaptation policies deal with and/or prepare for the economic and social consequences of climate change. This includes the need to build resilience to natural disasters and other disruptive weather patterns—events that are bound to increase in both frequency and intensity with climate change.

Beyond resilience building, adaptation also encompasses issues like financial regulation to contain stability risks from possible climate-induced losses, or the need for monetary policy to deal with larger shocks and heightened volatility. Adaptation is a *domestic policy challenge*.

Figure 1. Example of an Adaptation Challenge: Climate-Related Natural Disasters: 1980–17
(Number, in each year)



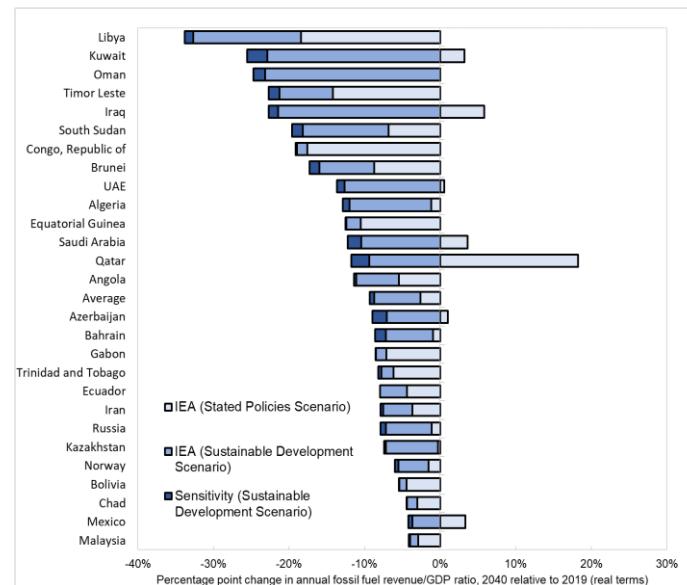
Source: Munich RE.

- **Manage the transition to a low-carbon economy.** As

countries move to a low-carbon mode of production, another set of policy challenges can emerge—triggered either by a country's own or by global mitigation efforts. As adaptation, transition management is a domestic policy challenge.

An example of transition management in response to a country's own mitigation efforts are challenges that arise in the context of delivering a country's Nationally Determined Contribution (NDC) under the Paris accord: how to modify taxes and/or environmental regulations, and how to offset potential negative impacts of such measures on equity, labor markets, or external competitiveness.⁴

Figure 2. Example of a Transition Risk: Fiscal Revenue Losses for Oil Exporter



Source: IMF staff estimates. Analysis estimates long-term revenue impact under climate mitigation scenarios using the IEA's World Energy Outlook fossil fuel production scenarios. The IEA's Stated Policies broadly reflects the adoption of Nationally Determined Contributions under the 2015 Paris Agreement, and the Sustainable Development Scenario reflects a path which meets the 2°C target.

⁴ Mitigation and domestic transition management are related and the dividing line between them can be somewhat blurry. As discussed above, for the purpose of categorizing climate-related policies in the context of IMF surveillance

(continued)

Transition management in response to *global* mitigation efforts includes the need for fossil fuel exporters to diversify their export base and address the fiscal impact of lower oil receipts in response to global de-carbonization efforts.

8. The Integrated Surveillance Decision contains a clear mandate to cover the *domestic policy challenges* related to climate change—provided they cross the threshold of macro-criticality. Specifically, coverage in Article IV consultations is called for where (i) climate change creates a need for adaptation in order to preserve present or prospective BOP and domestic stability, or where (ii) the need to manage the transition to a low-carbon economy gives rise to policy challenges that can significantly influence present or prospective BOP and domestic stability (ISD¶6).

9. Adaptation and transition management are potentially relevant for large part of the IMF's membership.

- As discussed above, **transition management** is a possible topic for every country with an NDC, as most countries will need to adjust macroeconomic policies to meet their obligations under the Paris agreement. Transition management often includes policy challenges that are fiscal or financial in nature, and therefore are well within the realm of IMF expertise: tax policies to incentivize the reduction of greenhouse gas emissions, designing redistribution schemes to mitigate the social and labor market impact of mitigation measures, or reinforcing financial regulation to contain risks from 'stranded assets' (see IMF, 2020a, for a discussion of a comprehensive policy package).
- **Adaptation** is relevant for a wide range of countries that are vulnerable to natural disasters, but also to slower-moving, climate-driven phenomena, such as rising sea levels or droughts that can, for example give rise to migration pressures. Adaptation requires resilience building along several dimensions (IMF, 2019a, 2020b). Among these, building financial resilience to climate change is well-aligned with macroeconomic analysis, especially the need to build fiscal buffers for climate vulnerable countries. Policies to build physical resilience, by contrast, often require a different type of analysis—such as the selection and evaluation of public investment projects for climate-resilient infrastructure. Drawing on or cooperating with other institutions is hence important for in-depth coverage.
- **Climate finance** can be relevant for the discussion of both transition management and adaptation, especially for countries that are less endowed with resources and that need to

it is helpful to distinguish between domestic policies on the one hand, and policies with a global/cross-border component on the other—such as containing negative spillovers and/or contributing to the provision of a global public good. In line with this categorization, policies to achieve a *given domestic target* (such as an NDC) are discussed here under "transition management", while "mitigation" covers *a country's contribution to the global climate change mitigation effort*. An implication is that measures well-suited to achieve a country's NDC may not result in an adequate mitigation policy if the NDC itself is insufficient (see the discussion below). In practice, Article IV reports will typically discuss mitigation and transition management as a package.

implement large-scale investments to transition to a low-carbon mode of production and/or to adapt to climate change.⁵

10. Different from transition management and adaptation, climate change mitigation is not primarily a domestic policy challenge: mitigation efforts of even the largest economies in isolation will not suffice to contain global warming and its harmful economic and financial repercussions. As a result, it seems improbable that a lack of mitigation effort would undermine a country's stability directly.

11. This suggests that climate change mitigation is a theme for multilateral rather than bilateral surveillance and should be discussed in the context of the ISD's spillover provision. Several conceptual and practical issues arise when applying the spillover provision to climate change, however; these are discussed in the next section.

CLIMATE CHANGE MITIGATION IN ARTICLE IV CONSULTATIONS: THREE ISSUES

A. Does the ISD Contain a Mandate to Discuss Climate Change Mitigation in Article IV Consultations?

12. The macroeconomic relevance of climate change mitigation is beyond doubt.

- **Global warming.** According to the Intergovernmental Panel on Climate Change, unmitigated global warming would raise average global temperatures by the end of this century to more than 4°C above pre-industrial levels. This would exceed temperatures experienced at any time in the past 3 million years (and hence since the emergence of mankind). Global warming is driven primarily by the emission of greenhouse gases, with carbon dioxide accounting for about three-quarters of the total impact.
- **Economic damages.** Such a degree and pace of warming is bound to have severe macroeconomic and financial repercussions. While economic damage estimates are inherently uncertain—reflecting *inter alia* the need to quantify events for which there are no experience values, such as higher sea levels, surges in vector-born diseases, and more frequent and severe natural disasters—the literature points to GDP-losses large enough to matter in net-present-value terms. This implies that present-day policy makers should seek to mitigate climate change—see Annex II for a more complete discussion of economic damages from climate change.

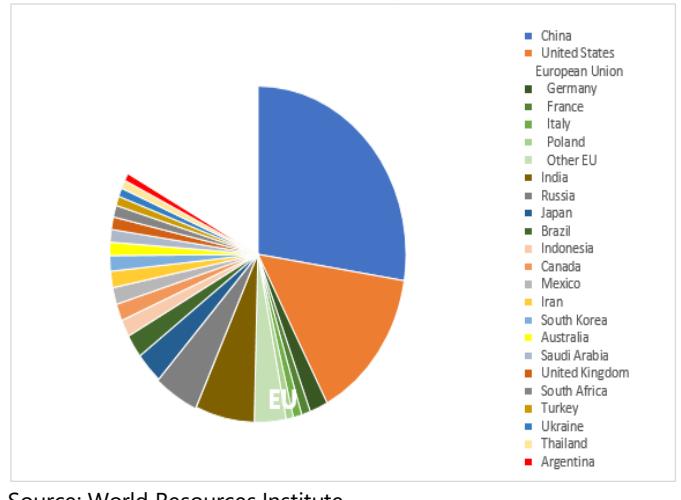
⁵ This principle—developed countries are to provide financial resources to assist developing countries with achieving their climate objectives—is also inscribed into the Paris agreement.

- **Risk management.** Unconstrained warming also holds a sizeable potential for potentially catastrophic “tail risks”. Minimizing the likelihood for such risks provides a second, risk management rationale for mitigation action.
- **Distributional aspects.** Climate-related damages are expected to be distributed unevenly, harming countries disproportionately that are already hot and—often—poor. Thus, global distributional and equity objectives also argue in favor of mitigation action. Losses would extend beyond GDP to welfare indicators such as mortality, health indicators, and displacement cost.

13. Global macroeconomic relevance does not translate automatically into an IMF surveillance mandate at the individual country level, however. The critical provision in the ISD is that the spillovers from a member’s policies may *significantly* influence the effective operation of the international monetary system, for example, by undermining global economic and financial stability. While it is evident that climate change results from insufficient mitigation action, and that insufficient mitigation puts global economic and financial stability at risk, establishing which countries contribute “significantly” to this risk—as opposed to those that do not—is not straightforward.

- **Large emitters of greenhouse gases.** Given the close link between greenhouse gas emissions and global warming (see above), an intuitively compelling indicator for ‘significance’ is the share a country contributes to global emissions. Identifying the largest emitters is straightforward: the top three—China, the United States, the European Union (if considered in the aggregate)—account for about half of global greenhouse gas emissions. The difficulty is with drawing an exact line where “significance” begins or ends.

Figure 3. The Largest 20 Greenhouse Gas Emitters
(In 2017, percent of global total)



Source: World Resources Institute.

- **Alternative yardsticks.** Further, there are legitimate questions as to whether current greenhouse gas emissions are the right yardstick for significance. From a policy perspective, combatting climate change requires curbing future—not present-day—emissions. Hence, a policy angle would suggest a stronger focus on the mitigation policies of large, rapidly growing emerging markets. Conversely, from an equity or fairness perspective, past emissions also matter: advanced economy emissions have used up most of the atmosphere’s absorptive

capacity. One may argue that, as a result, advanced economies also bear greater responsibility for preserving whatever capacity remains.⁶

- **Beyond emissions.** While curbing greenhouse gas emissions is arguably the most important challenge for mitigating climate change, other policies are also systemically important, notably preserving (or destroying) carbon sinks such as rainforests.

14. To summarize, the implications of the ISD for the coverage of climate mitigation—or more precisely: a country's contribution to the global mitigation effort—in Article IV consultations are somewhat indeterminate. On the one hand, the 'significant spillover' provision clearly points to a need to discuss mitigation systematically, especially with large emitters of greenhouse gases. On the other hand, it is difficult to translate this judgmental standard into a metric robust enough to underpin this assessment.

15. In view of this, IMF surveillance should take the following, pragmatic approach to covering climate change mitigation in Article IVs consultations:

- **Coverage of a country's contribution to the global mitigation effort will be strongly encouraged for the 20 largest emitters of greenhouse gases.** For these countries, the expectation is that Article IV consultations would include a discussion of mitigation policies and their adequacy at least every three years. Keeping this group relatively broad ensures that the countries most relevant for climate change mitigation should be captured independent of the precise underlying metric. The "largest 20" group will be determined on the basis of current greenhouse gas emissions.⁷ Staff will update the list every 3 years or so.⁸
- **For all other countries, coverage of mitigation will be encouraged but not necessarily expected.** In practice, this means that climate change mitigation—or more precisely: a country's contribution to the global mitigation effort—can be discussed if both the authorities and staff agree on coverage. However, country authorities and IMF country teams will need to weigh the relative importance of mitigation relative to other macroeconomic policy priorities to assess whether it merits coverage.

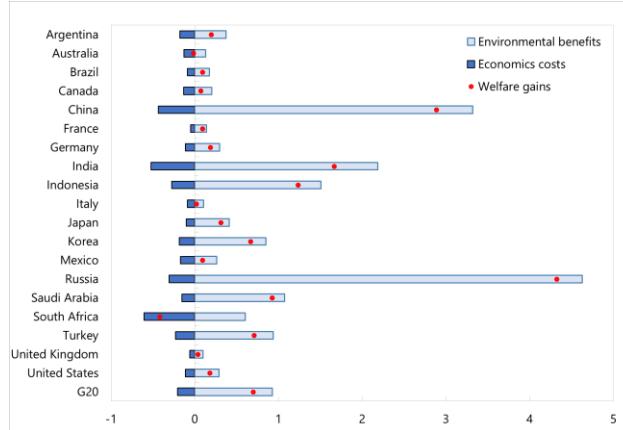
⁶ Per-capital emissions are also sometimes suggested as an indicator to reflect equity considerations.

⁷ In contrast to backward or forward-looking metrics, current emissions can be observed without requiring elaborate estimates or assumptions. Current emissions also 'compromise' between the metrics discussed above and the various considerations that speak in their favor.

⁸ At present the list includes China, the United States, the European Union (to be covered in the report on common Euro area policies in the context of Article IV consultations with member countries), India, Russia, Japan, Brazil, Indonesia, Canada, Mexico, Iran, Korea, Australia, Saudi Arabia, the United Kingdom, South Africa, Turkey, Ukraine, Thailand, and Argentina. Within the European Union, the Article IV reports for Germany, France, Italy and Poland should also cover climate change mitigation (as they cross the "top 20" threshold when assessed on their own). Even though the IMF's Article IV surveillance mandate pertains to individual members, covering mitigation in the report on common Euro area policies suggests itself, as many aspects of the members' mitigation policies are determined at the European level.

- Beyond these recommendations, ***there can be angles different from global mitigation objectives to engage***, notably the co-benefits of mitigation policies to reduce the cost from domestic pollution. In many emerging economies, such benefits are sizeable.
- In terms of substance, coverage in Article IV consultations will seek to balance what is important with what macroeconomics can deliver.*** This will typically include the analysis of emission trends and projections based on current policies, a description of the authorities' mitigation objectives and policies, and an assessment of their effectiveness, as well as options to further strengthen policies to minimize outward spillovers while promoting the country's own BOP and domestic stability (see the next section). More concise guidance will need to be developed in the period ahead.

Figure 4. Economic Impact of a US\$50 Carbon Tax by 2030
(Percent of GDP)



Note: G20 is a simple average. Economic cost is a comparative static efficiency cost for 2030 reflecting changes in consumer and producer surplus in fossil fuel markets.

Source: IMF staff calculations.

B. What Yardsticks Should Article IV Consultations Use to Assess the Adequacy of Mitigation Efforts?

16. Even-handed coverage of climate change mitigation requires ideally a yardstick about what mitigation effort is appropriate, i.e., what contribution a country should deliver to the global mitigation effort. This question goes beyond macroeconomics, however, and also stretches beyond the IMF's mandate and expertise (among other things, the adequacy of the mitigation may depend on country characteristics—see the discussion in the previous section). Working out a fair burden sharing for climate change mitigation needs to be resolved through a political process at this juncture.

17. A possible alternative could be to use a generally accepted yardstick that is already in the public domain. However, the most common indicators have shortcomings for their use in surveillance.

- The NDCs under the Paris accord—short: 'Paris targets'***—are part of a multilateral process whose very objective is to deliver sufficient global mitigation. However, the Paris process advances in steps that involve periodic revisions, with the next round of revisions falling due in the fall of this year in the context of COP26. As they are defined presently, the Paris targets fall well short of delivering sufficient mitigation in the global aggregate. According to IMF estimates,

the Paris targets are consistent with global warming of about 3°C relative to pre-industrial levels by end-century, compared to the objective enshrined in the Paris accord to limit warming to 1.5–2°C (IMF, 2019b).

Further, the Paris targets imply fairly different mitigation efforts between countries: demanding in some cases, requiring little or no effort for others. As a result, questions about even-handedness would arise if the Paris targets were used as yardsticks in surveillance.

- **Many recent policy pronouncements on mitigation are formulated in terms of net carbon neutrality** by a certain date, typically 2040, 2050 or 2060. However, by their nature these are medium-term targets, with no mitigation effort specified for the near term. Hence—unless such targets are complemented by a short-term emissions objective—they fail to provide much guidance for the typical time horizon of an Article IV report (3–5 years).

18. Against this backdrop, IMF surveillance should take the following, pragmatic approach to mitigation yardsticks in Article IVs Consultations:

- The **starting point** will typically be a country's National Determined Contribution.⁹
- Article IV reports will provide **relevant context** for assessing the ambitiousness of a country's Paris target. In particular, (i) Article IV reports will stress that NDCs remain, at this stage and in the aggregate, insufficient to achieve the mitigation ambition enshrined in the Paris accord, and (ii) they will compare a country's Paris target with that of peers—i.e., countries with similar income levels and economic structures. This will provide a useful benchmark to assess the appropriateness of mitigation objectives, without IMF staff setting mitigation targets itself.

C. How Specific Should the IMF's Mitigation Policy Advice Be?

19. There is a fairly robust consensus among economists about the elements needed for an efficient, first-best climate change mitigation policy (IMF 2019b, 2020a).

- **Comprehensive carbon pricing**, either in the form of a carbon tax or a broad-based emissions trading system. Carbon pricing promotes energy efficiency and shifts demand from dirty to clean energy sources; this also provides incentives for low-carbon investments. The revenues from carbon pricing can be used to reduce other distortionary taxes, to finance green investment, and/or to finance support to vulnerable groups most affected by mitigation policies. Regulations and/or feebate may need to complement carbon pricing in sectors that are hard to de-carbonize (for example, transport).

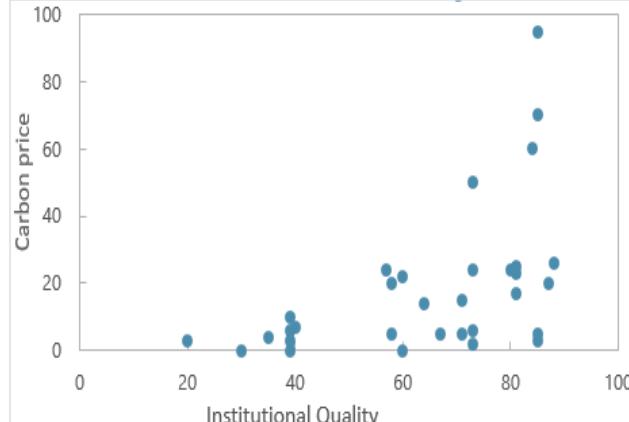
⁹ It can also be an otherwise defined domestic policy target, in particular when the latter is more recent than the NDC. In the rare case where a country does not have an NDC, a global yardstick implied by the Paris objectives may have to be used (not NDCs): measures equivalent to an average carbon price of US\$75 per ton in 2030 (IMF, 2019) and/or Net Carbon Neutrality by 2050. However, this question will require further elaboration should such a case arise.

A carbon-price based mitigation policy also facilitates the comparison of mitigation efforts across countries—which can provide the basis for a policy with global reach. Countries' mitigation efforts could be coordinated, for example, by means of an international carbon price floor. Absent such an arrangement, cross-border differences in carbon prices could be mitigated through border carbon adjustments to avoid trade distortions and carbon leakage.

- **Structural policies** to address market failures and facilitate structural change. These can, for example, include green infrastructure investments (e.g., public monopolies such as electricity grids that tend to be under-supplied by the private sector) or incentives for R&D and 'green' technology deployment. More generally, a 'green investment push' would strengthen the macroeconomy in the short term and help lower the costs of adjusting to higher carbon prices (IMF, 2020a).

20. In practice, however, implementing a first best policy package can be challenging. Effective carbon pricing—that generates carbon prices high enough to have a significant impact on greenhouse gas emissions—has been introduced mostly in countries with high perceived institutional quality.¹⁰ Actual policy proposals (e.g., the "New Green Deal") focus often instead on economically less efficient mitigation strategies, such as emissions regulation (that camouflages the shadow price of carbon) or measures to increase the supply capacity for green energy. In this context, it is important to note that boosting supply capacity *alone* is insufficient as a mitigation policy, as it fails to incentivize energy efficiency (IMF, 2020a).

Figure 5. Effective Carbon Price and Perceived Institutional Quality



Source: Klenert et al. (2018).

21. Discussing climate change mitigation requires openness to different policy approaches.

The purpose of multilateral surveillance is to discuss options to contain destabilizing spillovers, not to insist on specific policies.¹¹ Against this backdrop, IMF surveillance should take the following, pragmatic approach to mitigation policies:

¹⁰ A possible explanation is that confidence in governments to implement re-distributional policies is a prerequisite for making carbon pricing politically acceptable—where such confidence is lacking, carbon pricing thus risks running into political economy constraints.

¹¹ ISD ¶9 stipulates: "*in the context of multilateral surveillance, the Fund may not and will not require a member to change its policies in the interests of the effective operation of the international monetary system. It may, however, discuss the impact of members' policies on the effective operation of the international monetary system and may suggest alternative policies that, while promoting the member's own stability, better promote the effective operation of the international monetary system.*"

- Article IV reports will primarily ***assess policies for whether they are effective for achieving mitigation*** and therefore help contain potentially destabilizing climate spillovers.
- This said, ***comparing an actual mitigation policy package with an economically (more) efficient package is legitimate.***
- ***Article IV reports will typically discuss mitigation and the management of the transition to a low carbon economy as a comprehensive policy package.*** This includes in particular measures to address distributional and competitiveness issues than can arise from climate change mitigation policies (IMF, 2020a).

SUMMARY AND CONCLUSIONS

22. To summarize, the IMF's Articles of Agreement and the Integrated Surveillance Decision...

- ... ***contain a clear mandate to cover climate change adaptation and the management of the transition to a low-carbon economy in Article IVs*** wherever the associated policy challenges are macro-critical. This includes a wide range of potential topics, for example, resilience building to natural disasters, or policies to achieve a country's Nationally Determined Contribution in the context of the Paris climate accord. As with other surveillance topics, the assessment of macro-criticality—i.e. i.e., whether policies can significantly influence members' present or prospective balance of payments and domestic stability—needs to be done on a case-by-case basis and prioritized relative to other policy challenges.
- ... ***point also to a need to discuss systemically countries' contributions to the global mitigation effort under the ISD's spillover provision, even though operationalizing this provision on the basis of a credible metric is challenging.*** As a result, staff proposes a pragmatic approach that strongly encourages coverage of mitigation for the largest emitters of greenhouse gases, while stopping short of making it mandatory. Discussions should focus on options to contain the spillover from inadequate mitigation policies, which implies openness to different policy approaches. In case of agreement between country authorities and staff, more extensive and specific coverage is always possible.

23. In practice, the scope and depth of climate change coverage in Article IV consultations will depend on resource availability. Scaling up and intensifying the coverage of transition risk management, climate change adaptation, and mitigation will require significant additional resources—including staff that is 'literate' in both macroeconomics and climate, training, the development of toolkits, and better data.

24. Surveillance in the context of Article IV consultations should be complemented by regular discussions of climate-related policy challenges in IMF flagships (WEO, GFSR, Fiscal Monitor), regional surveillance reports and departmental papers. These publications are ideal outlets to cover climate change mitigation, given the global public goods character of mitigation policies.

Further, a large number of countries need to deal with transition management and adaptation; cross-country coverage will allow, *inter alia*, to analyze common challenges, identify best practices, and cover a wider range of diverse issues. Flagship reports also tend to do well in terms of traction.

Annex I. The Legal Framework for Article IV Consultations as it Pertains to the Coverage of Climate Change¹

- 1. Many policies that are key for addressing climate change fall within the Fund's surveillance remit.** While the Fund is not an environmental agency and its mandate does not include the protection of the environment per se, many aspects of climate change pertain to its mandate: for example, the effects of climate policies on domestic economic and financial performance, and the impact of climate change on global economic and financial stability. Such issues are relevant for the Fund's bilateral and multilateral surveillance.
- 2. Bilateral surveillance requires the Fund to oversee the compliance of each member with its obligations under Article IV, Section 1.²** Members have an obligation to collaborate with the Fund and other members to assure orderly exchange arrangements and to promote a stable system of exchange rates; and in particular: (i) to endeavor to direct economic and financial policies toward the objective of fostering orderly economic growth with reasonable price stability, with due regard to their circumstances; and (ii) to seek to promote stability by fostering orderly underlying economic and financial conditions and a monetary system that does not tend to produce erratic disruptions. In its bilateral surveillance, the Fund assesses whether a member's exchange rate and other economic and financial policies promote the member's own domestic and BOP stability. The legal framework for bilateral surveillance under Article IV is specified in greater detail in the Integrated Surveillance Decision (ISD).³
- 3. In this context, there are three channels whereby discussion is mandatory, each with relevance for climate change.**
 - First, the ISD provides that the macroeconomic and macroeconomically relevant structural aspects of **monetary, fiscal and financial sector policies will always be covered**.⁴ Therefore, where such policies are being implemented or proposed and relate to climate change, they should be discussed.
 - Second, other policies must be discussed if they **significantly influence present or prospective balance of payments or domestic stability**.⁵ This can include, for example, structural policies

¹ Prepared by Julianne Ams and Nadia Rendak (LEG).

² Article IV, Section 1 and Section 3(a). Members also have obligations on the conduct of their exchange rate policies.

³ Decision No. 15203-(12/72), adopted July 18, 2012.

⁴ ISD para. 6: "In its bilateral surveillance, the Fund will focus on those policies that can significantly influence present or prospective balance of payments and domestic stability. ...[E]xchange rate policies will always be the subject of the Fund's bilateral surveillance with respect to each member, as will monetary, fiscal, and financial sector policies (both their macroeconomic aspects and macroeconomically relevant structural aspects)."

⁵ ISD para. 6: "... Other policies will be examined in the context of surveillance only to the extent that they significantly influence present or prospective balance of payments or domestic stability."

related to climate change that have stability implications. This determination of macro-criticality is country-specific.

- Third, Article IV consultations should assess “**inward spillovers**,” i.e., the actual or potential impact of global developments and policy actions in other countries on a member’s economic and financial stability, as well as the appropriate policy response.⁶ Many adaptation challenges—e.g., to rising sea levels that require investment in infrastructure—can be considered a consequence of inward spillovers. Transition risks can also be triggered by inward spillovers, such as changes in energy prices due to mitigation action by other countries.

4. Multilateral surveillance requires the Fund to oversee the international monetary system (IMS) to ensure its effective operation.⁷ While members obligations on the conduct of their exchange rate and other economic and financial policies are limited to the promotion of their own domestic balance of payment stability, members must consult with the Fund on issues pertaining to multilateral surveillance and provide information requested for that purpose. Recognizing that members’ policies may have a significant impact on other members and on global economic and financial stability, the Fund encourages members to implement exchange rate and domestic economic and financial policies that, in themselves or in combination with the policies of other members, are conducive of the effective operation of the international monetary system.⁸ Further, in its multilateral surveillance the Fund will focus on issues that may affect the effective operation of the international monetary system, including the spillovers from policies of individual members that may significantly influence the effective operation of the international monetary system, for example by undermining global economic and financial stability. A member’s policies that may be relevant for this purpose include exchange rate, monetary, fiscal, and financial sector policies, as well as policies respecting capital flows.

5. As Article IV consultations are a vehicle for both bilateral and multilateral surveillance, the ISD provides scope to discuss spillovers from climate related economic and financial policies in these consultations. In particular, Article IV consultations “shall include a discussion of the spillover effects of a member’s exchange rate and domestic economic and financial policies that may significantly influence the effective operation of the international monetary system, for example, by undermining global economic and financial stability”.⁹ In such a case, the Fund may “discuss the impact of a members’ policies on the effective operation of the IMS and may suggest alternative policies that, while promoting the member’s own stability, better promote the effective

⁶ ISD paras. 16, 17, Guidance Note for Surveillance Under Article IV Consultations, paras. 8, 23. This follows from the principle of integration of multilateral and bilateral surveillance, ISD para. 4.

⁷ Article IV, Section 3(a).

⁸ ISD para. 23.

⁹ ISD para. 26.

operation of the IMS.¹⁰ Climate mitigation economic policies—or the lack thereof—would fall under this provision where they meet this standard.

6. Even if important climate-related policies fall outside of the parameters of bilateral and multilateral surveillance, it is legally possible to discuss them in an Article IV consultation with the agreement of the relevant member. While the surveillance framework defines the scope of issues that members are required to discuss with the Fund under Article IV, it is also possible for members to voluntarily agree to discuss other issues with the Fund in an Article IV consultation. The Fund’s policy advice on these issues would be technical assistance under Article V, Section 2 (b) and not surveillance but could be included in the member’s Article IV consultation report.

¹⁰According to footnote 10 of the Guidance Note for Surveillance Under Article IV Consultations, “outward spillovers are deemed significant if by themselves, or in combination with spillovers from other members’ policies, or through their regional impact, they would enter the macro-financial policy considerations of members representing a significant portion of the global economy.” There operational implications of “in combination with spillovers from other members’ policies” are not specified, however.

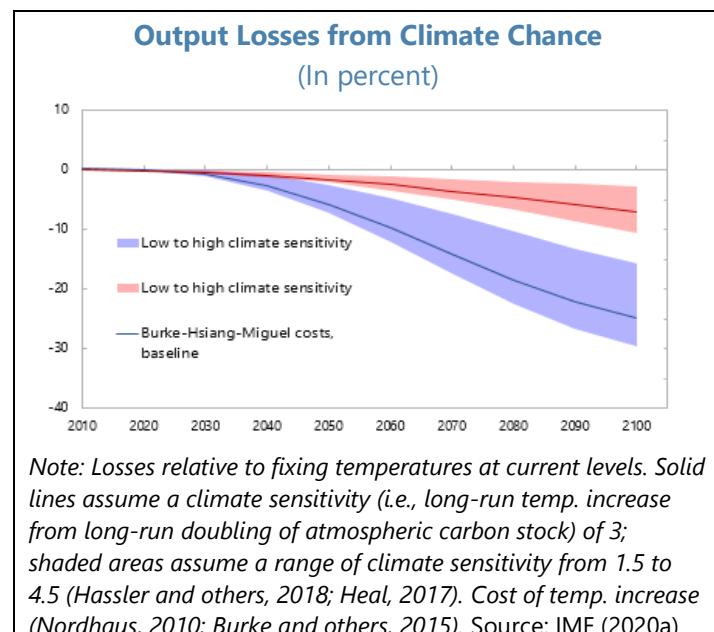
Annex II. The Detrimental Impact of Climate Change on Growth and Macroeconomic Stability¹

1. Climate change can have significant detrimental effects on macroeconomic stability

acting through several environmental pathways, including rising global temperatures; greater frequency and intensity of natural disasters; rising sea levels and ocean acidification; changes in precipitation (weather patterns); and impacts on biodiversity. The economic pathways include lower productivity in agriculture and fishing, and due to the effect of hotter temperatures on outside work, more frequent disruption of activity and destruction of productive capital due to weather events and natural disasters, diversion of resources towards adaptation and reconstruction, increased morbidity and mortality due to more prevalent infectious diseases and natural disasters, increased climate-related migration pressures and risk of conflict, and the potential for catastrophic losses related to changes in ocean currents and key weather patterns such as monsoons.

2. Estimates of the economic cost of climate change are subject to a high degree of uncertainty, as the pace of increase in temperatures is unprecedented compared to the last 20,000 years, and temperatures could rise to levels that have not been seen in millions of years. Uncertainties also arise due to the mitigating effects of endogenous policy responses on the one hand, and amplifying effects due to potential non-linear climate shifts on the other.

3. There is broad agreement in the literature that the effect of rising temperatures on the level of GDP are non-linear. An increase in temperature raises GDP in countries where annual average temperatures are low, but reduces GDP where they are high. The tipping point is at an average temperature of about 13–15°C.² IMF estimates suggest that a temperature increase of 1°C in low-income countries lowers growth in the same year by 1.2 percentage points (IMF, 2017). While these historical estimates point to more moderate (or in some cases, positive) effects for colder regions, these do not include a number of damages (for example, rise in sea levels, natural disasters, damage to infrastructure from thawing of permafrost in Russia) and negative global spillovers from large economic disruptions in other parts of the world.



¹ Prepared by Adil Mohammad, Oya Celasun and Florence Jaumotte (RES).

² See Burke, Hsiang and Miguel (2015); Dell, Jones, and Olken (2014); Carleton and Hsiang (2016); and Heal and Park (2016) for literature reviews.

4. Further, some estimates also suggest an additional impact of rising temperatures on growth (e.g., Burke and others 2015), though this is open to debate. This would result in much larger GDP losses over the long term. In the absence of climate mitigation policies, losses in GDP could be of the order of 25 percent by 2100 relative to holding temperatures fixed at current levels (Figure).³

5. The fact that global warming has negative economic effects above 13–15°C matters for low-income countries, as many of them are in hotter parts of the world. These are also countries which are more vulnerable, as they have less resources to invest in adaptation and resilience.⁴ Some estimates set output losses under unmitigated climate change at 60–80 percent by 2100 for hot-climate countries.

6. Moreover, there is the prospect of more frequent and intense weather events and natural disasters with unchecked climate change.⁵ Low-income countries are more vulnerable to such events, which could reduce per capita income by 1.5 percentage points (compared to smaller, even negligible effects in emerging and advanced economies). Countries more prone to natural disasters may also experience slower convergence than less vulnerable countries.⁶

7. A major source of uncertainty in assessing the damages from climate change is around “tipping points.” If critical environmental thresholds are crossed, this could lead to rapid locking-in of a new climatic state, with potentially devastating consequences. These types of situations are not currently factored into climate damage assessments. To give an example, melting of the Antarctic and Greenland ice-sheets would be a tipping element, as their melting could quickly become irreversible and lead to sea levels rising by several meters. The thawing of the permafrost is another potential tipping element, as it could release large quantities of CO₂ and methane currently locked away under the ice into the atmosphere, triggering a runaway greenhouse effect. Other tipping points include melting of the Himalayan glacier, change in monsoon patterns, and weakening or reversal of ocean currents.

³ IMF (2020a).

⁴ IMF (2017) and IMF (2020b).

⁵ These can be imperfectly captured in damage functions based only on temperatures.

⁶ Cantelmo, Melina and Papageorgiou (2019) find that disaster-prone countries grow by 1 percent less each year than non-disaster-prone countries, and that climate change may triple the growth gap.

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2021 Financial Sector Assessment Program Review—Towards A More Stable And Sustainable Financial System



IMF POLICY PAPER

2021 FINANCIAL SECTOR ASSESSMENT PROGRAM REVIEW—BACKGROUND PAPER ON QUANTITATIVE ANALYSIS

May 2021

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**International Monetary Fund
Washington, D.C.**



April 15, 2021

2021 FINANCIAL SECTOR ASSESSMENT PROGRAM REVIEW—BACKGROUND PAPER ON QUANTITATIVE ANALYSIS

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Glossary

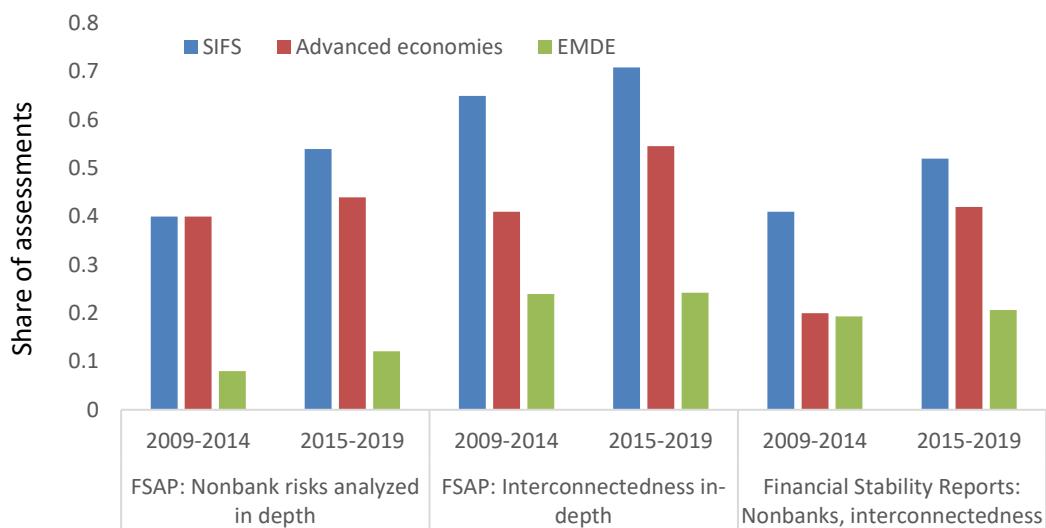
ABM	Agent-based models
BIS	Bank of International Settlement
BMA	Bayesian Model Averaging
BSA	Balance sheet analysis
CCP	Central counterparty
CDS	Credit default swap
CoVaR	Conditional Value at Risk
DSGE	Dynamic stochastic general equilibrium
DTI	Debt-to-income ratio
EMDEs	Emerging and developing economies
ESRB	European Systemic Risk Board
FMI	Financial market infrastructure
FSAP	Financial Sector Assessment Program
FSB	Financial Stability Board
FX	Foreign exchange
GaR	Growth-at-risk
GFC	Global financial crisis
GFM	Global macro-financial model
GFSR	Global Financial Stability Review
GPM	Global projection model
G-SIB	Global systemically important bank
G-SIFI	Global systemically important financial institution
GST	Global bank stress test
IAM	Integrated assessment model
IFRS9	International Financial Reporting Standard 9
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
ITD	Information Technology Department (of the IMF)
LCR	Liquidity coverage ratio
LDG	Loss-given-default
LTV	Loan-to-value
MCM	Monetary and Capital Markets Department
NBFI	Nonbank financial institution
NFC	Nonfinancial corporate
NGFS	Network for Greening the Financial System
NPL	Non-performing loan
NSFR	Net Stable Funding Ratio
PD	Probability of default
RCP	Representative concentration pathway
SIFI	Systemically important financial institution
SSM	Single Supervisory Mechanism
SSP	Shared Socioeconomic pathway
SVAR	Structural vector auto-regression
UN	United Nations
VAR	Vector auto-regression

INTRODUCTION

1. This paper reviews quantitative tools of financial stability assessments under the Financial Sector Assessment Program (FSAP). A key focus of FSAPs is on methodologies to gauge risks on a system-wide level and propose mitigating measures. Therefore, the paper concentrates on the main elements of the FSAP's macroprudential stress testing framework: (i) the interaction among solvency, liquidity, and contagion risks in the banking sector, (ii) the assessment of the health of nonbank financial institutions (NBFIs), their interactions with banks and their impact on financial markets, (iii) the assessment of the health of nonfinancial sectors and their links to the financial sector, and (iv) macroprudential policy analysis. The paper also reviews recent improvements in microprudential bank solvency stress testing—an important foundation for the macroprudential stress testing framework—and discusses new tools for emerging risks (climate change, fintech, and cyber). In each area, the paper explains the current toolkit, references more experimental work, and discusses the scope for improving the approaches used by staff. The paper also discusses challenges from data constraints, the adoption of quantitative tools by Article IV teams, and the potential for improvements in tool efficiency to allow for enhanced FSAP risk analysis with limited resources.

Figure 1. FSAP's Quantitative Tools Are Getting More Macroprudential

The quantitative work has been shifting towards analysis of NBFIs and interconnectedness, in line with similar trend in central banks' financial stability reports (FSRs).



Source: IMF staff based on FSAP Tracking System and information in central banks' financial stability reports.

2. Since the 2014 FSAP Review, quantitative tools for risk analysis have adapted to evolving stability risks and vulnerabilities, including further analysis of systemic risk

(**Figure 1**). The 2014 FSAP Review suggested focusing more on systemic risks. In response, while analysis of banking system risks remains core in many FSAPs, Fund staff has expanded FSAP quantitative tools to include models to study vulnerabilities in nonfinancial sectors and NBFIs, and interconnectedness between banks, NBFIs, and nonfinancial sectors (Adrian, Morsink, and Schumacher, 2020). Some FSAPs have started to analyze links between solvency, liquidity,

and contagion risks. The Fund has also been making substantial efforts to account for the two-way feedback effects between the financial sector and the real economy. Moreover, Fund staff have developed a range of approaches, including growth-at-risk (GaR), structural vector autoregression (SVAR) models, dynamic stochastic general equilibrium (DSGE) models, and agent-based models (ABM) to model macrofinancial linkages. As the understanding of macroprudential policies deepened, some FSAPs started to focus more on the quantitative calibration of macroprudential tools.

3. Going forward, work will continue to enhance the macroprudential stress testing framework. The focus of the work will be guided by staff's assessment of the priority areas and the results of the FSAP Review's survey of stakeholders (Figure 2):

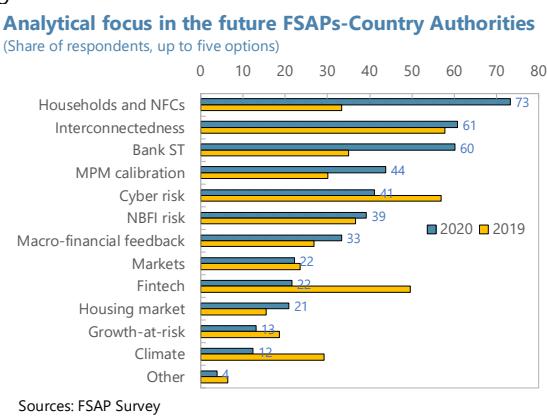
- ***Interaction between solvency, liquidity, and contagion risks.*** Staff is developing models that incorporate complex interactions between the risks to provide a better picture of systemic risk.
- ***Risks in nonbank financial sectors.*** To make NBFI risk analysis more macroprudential, staff plan to focus more on cross-sectoral interactions and impacts on markets, though data limitations will constrain progress in this area.
- ***Risks in nonfinancial sectors.*** Staff is developing models to analyze links between the health of nonfinancial sectors and the soundness of banks' balance sheets.
- ***Interconnectedness analysis.*** The scope of interconnectedness analysis could be expanded to include cross-financial segments and cross-sectoral linkages more fully.
- ***Macro-financial interactions.*** GaR and DSGE models have been used in FSAPs mainly to build the macro scenarios underpinning the stress testing exercise, but they have not yet been used jointly with stress tests to measure feedback effects from financial distress to economic outcomes. More micro and structural approaches under development by staff (see Section on Macrofinancial Linkages) have the potential to integrate the results of stress tests—including at the institutional level—back to macro-financial developments.
- ***Macrop prudential policy.*** Cyclical assessments and policy advice could rely more on the results of macroprudential stress tests, alongside early warning indicators of borrowers' vulnerabilities, such as debt-at-risk and debt-service-to-income ratios (DSTI), among others. Stress test results could inform the size of adequate buffers and be used to assess the impact of possible future measures ex-ante. Also, analytical tools using microdata could be considered more explicitly to calibrate borrower-based tools.

4. Heightened risks arising from the pandemic have increased authorities' interest in risk analysis, especially nonfinancial sector vulnerability analysis and bank stress testing. Unlike many past crises, the current shock did not originate in the financial system. Instead, the impact has thus far been felt mostly by other economic sectors. Corporate vulnerabilities have increased as firms have taken on more debt to cope with cash shortages amid extreme earning shocks. Underlying liquidity risks could morph into insolvencies, especially if the recovery is

delayed, which could spill over to the financial sector. In this context, interest from authorities for FSAPs to include household and nonfinancial corporate (NFC) sector vulnerability assessments and bank stress tests has jumped in the update of the FSAP Review survey undertaken in the fall of 2020. With some national authorities having released macroprudential buffers, the interest in the quantitative calibration of macroprudential policy measures (MPMs) has also increased.

Figure 2. FSAP Analytical Focus—Survey Results

Demand for household and NFC analysis and bank stress tests have risen in the context of the COVID-19 crisis while interest in interconnectedness remains high.



Source: FSAP Survey and staff calculation.

MPM = macroprudential policy measure; ST: stress test

5. Enhancements to quantitative tools will be complemented by increased standardization and automation for core risk analysis where feasible. While expert staff judgment and engagement will continue to remain integral, some operational improvements could reduce costs of standard risk analysis tools without sacrificing their quality or cutting down an integral component of risk analysis. A good example is the development of the GaR tool (IMF, 2017b), which involved close collaboration with the Information Technology Department (ITD) and public dissemination on a popular software development site. Staff are working to standardize core risk analysis (especially bank stress tests, including satellite models—one of the most time-consuming parts of the FSAP stress testing exercise) for different data environments, which will be accompanied by detailed guidance notes and files/codes on a refreshed IMF webpage dedicated to the topic. More broadly, shifting quantitative analysis away from excel-based tools to program codes could increase efficiency and accuracy.

6. More effective use of quantitative tools will require alleviating data constraints.

Quantitative risk analysis in FSAPs faces two types of data constraints: the availability (i.e., data gap) of and access to data. National authorities and international institutions have made substantial efforts to start collecting more data relevant for granular financial stability analysis, including across sectors and jurisdictions, following, for example, the G20 Data Gap Initiatives. In many cases, technical assistance from the IMF Statistics Department has supported the authorities in these efforts. However, certain data are still not adequately collected, including granular sectorized risk exposures across borders, cyberattacks, and data in emerging areas such as climate and fintech. In terms of access, virtually all national authorities now share with

FSAP teams—with stringent safeguards—their confidential supervisory data for bank stress tests. However, access to some data is still limited, including the Global Systemically Important Banks (G-SIBs) data collected by the Bank of International Settlement (BIS). Access and analysis using transaction and settlement data—namely activity-based data that encompasses all types of regulated and unregulated entities active in certain markets—is still rare, in part because of the technical challenge to handle such “Big (confidential) Data.” On occasion, FSAP teams have conducted joint analyses with national authorities who have access to data, working with codes and information sharing platforms that do not require the FSAP team to have direct access to data.

7. An operational approach to assessing financial stability risks from emerging risks, especially climate change and the concomitant need for adaptation in the financial sector, is a key priority.¹ Climate change poses distinct challenges to financial stability analysis, reflecting very high uncertainty over its timing, likelihood, complex micro-level dependencies, and data availability. The staff envisage a three-stage approach to assessing these risks (see Section on Emerging Risks, Climate Change). First is a climate financial risk diagnostic to decide on the scope of the assessment and relevant climate physical and transition risks. The second is designing climate scenarios. And third is designing macro-financial scenarios and the integration of these economic scenarios into standard FSAP stress tests. The approach parallels that chosen by central banks, but key features for the Fund will be a focus also on risks over the three- to five-year FSAP horizon—by contrast with the mostly longer-term focus by other institutions—and close scrutiny of physical risks which may be relatively more relevant for many Fund members. Given the high degree of uncertainty, reverse stress testing approaches will be explored as a potential complementary perspective.

8. Quantitative tools will also incorporate ongoing regulatory and accounting reforms. Such reforms require adjustments to bank stress test tools. For example, in 2017, the Basel Committee on Banking Supervision (BCBS) introduced additional requirements to Basel III that limit the application of an internal ratings-based (IRB) approach to calculate risk-weighted assets. The adoption of international financial reporting standards 9 (IFRS 9) in many jurisdictions changed the ways loan-loss-provisions are estimated (called expected credit losses, ECLs) to calculate bank regulatory capital. The introduction changes the model and data structure for estimating bank credit risks, the core of a bank stress test.

9. The staff use the scoping process to determine the approach to and methodologies for quantitative analysis in any given FSAP. The process first identifies material risks and vulnerabilities for an FSAP to prioritize based on the preliminary Risk Assessment Matrix (see the background paper on scope SM/21/54). These risks and vulnerabilities guide the choice of quantitative approaches, combined with the availability and

¹ October [2020 Global Policy Agenda](#). Some FSAPs have already been assessing financial stability risks from physical risks (such as natural disasters) as a part of a macro scenario for bank and insurance stress tests in the past several years, with more sophisticated approaches being brought to bear recently (e.g., Philippines 2021). Other recent FSAPs have started to assess the implications of effects of transition risk, i.e., the risk of abrupt changes in public policy or technology.

structure of data and jurisdiction specific characteristics, including the supervisory framework and accounting rules.²

MACROPRUDENTIAL STRESS TESTING

10. IMF staff use macroprudential stress tests to assess systemic risk as part of the IMF's mandate to monitor financial stability in the membership. An IMF macroprudential stress test is a methodology to assess financial vulnerabilities that can trigger systemic risk and be used to support the recommendation of mitigating measures for the system. The main difference between a macroprudential and a microprudential stress test lies in the nature of the assessment and the consequences of the results.

- **A microprudential stress test** is a forward-looking supervisory tool that assesses the soundness of an individual bank's balance sheet. Key to the supervisory purpose is the ability of the bank "to pass or not to pass the test" and the subsequent bank-specific supervisory measures to increase capital and liquidity buffers when the bank does not pass the test.
- **A macroprudential stress test** is built on a similar framework to a microprudential stress test but focuses on systemic risk by incorporating amplification and contagion channels affecting the whole financial system. Examples include modeling interactions between solvency, liquidity, and contagion risks in the bank stress tests. Moreover, staff have expanded the FSAP analytical toolkit to include models to study risks in NBFIs, vulnerabilities of the nonfinancial sectors, and interconnectedness between banks and NBFIs and with the nonfinancial economic sectors. Work is underway to incorporate two-way feedback effects between the real economy and bank health through macro-financial channels (requiring also modeling bank balance sheets dynamically). The objective of the analysis is to recommend macroprudential measures to mitigate risks.

A. Improving Core Bank Solvency Stress Tests³

11. Staff continue to upgrade the bank solvency stress test toolbox currently used by FSAP teams. The focus of the upgrades is to enhance satellite models that translate macro-financial scenarios into banks' bank balance sheets and income statements and incorporate new methods to address changes in regulatory and accounting rules and new sources of risks. Table 1 summarizes ongoing upgrades.

² For example, while FSAPs always assess bank solvency risks, different methodologies may be used depending on the jurisdiction specific reporting format for credit risks (e.g., probability of default for banks when they are regulated using Internal-Rating Based approach, non-performing loan data or transition among loan classifications when banks are regulated following the Basel standardized approach, and lifetime probability of default when International Financial Reporting Standard (IFRS) 9 data are available).

³ This paper focuses on improvements with regards bank solvency stress tests, as the methodologies for standard liquidity stress tests, including cash-flow based analysis and (modified) liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) analyses, are now mature. The "frontier" of liquidity stress tests is the systemic liquidity analysis discussed separately in this paper.

Table 1. Bank Solvency Stress Test Model: Upgrades		
Enhancements	Stress test model versions	
	Previous version	Upgrades in progress
New risks	Limited to financial risks	Climate change, and cyber-risk are incorporated as part of bank clients' distress analysis. Bank operational risks and counterparty risks are also modeled. Impact of fintech on banks' income.
Calculation of provisions	Approximation based on expected losses approach (often proxied by changes in probability of default × loss-given default).	Use of accounting (IFRS9) expected loss metrics as opposed to the regulatory one. Based on accounting definitions of 12 months and lifetime expected credit losses in line with changes in accounting requirements. Disentangling accounting and prudential layer and their interplay.
Satellite models	Econometric models, specifications chosen on an ad-hoc basis	Bayesian Model Averaging (BMA) models; based on more granular data
Risk-weights and hurdle rates	Based on Basel III	Among others: revisions to risk weights in the standardized approach, removing the use of internal risk models for certain asset classes, and a minimum leverage ratio.

Satellite Models

12. Macro scenario stress testing requires satellite models to link macroeconomic and market factors to forecast key bank parameters. Satellite models translate macro-financial scenarios into granular risk factors and project bank balance sheets and capital. The most important satellite models include those forecasting loan default rates (credit risk), net interest income, and capital requirements. Additional efforts are underway to model trading losses, fees and commission income, and operational losses.

13. The satellite models capture relevant risk factors. The modeling choices and calibration decisions usually consider the interactions among different risks and models.⁴ The complexity of the models reflects data availability and the materiality of the portfolio. For example, models can be built at the loan, portfolio, bank, or country levels, among others. The explanatory variables in the models typically include a set of macroeconomic drivers (e.g., GDP growth, inflation, unemployment, income, output gap, policy rate, property prices, equity prices, yield curves), and a range of financial market indicators (e.g., foreign exchange (FX), equities, credit spreads, commodities, rates, FX volatilities, equities volatilities, and rates volatilities).

14. Models are compared and validated based on a variety of performance measures. A combination of criteria are used to inform the choice of satellite models: (i) in-sample forecast performance measures; (ii) out-of-sample forecast performance based on a truncated sample, measured by the root mean squared error (or similar measures) over the forecasting period; and (iii) the sign and significance of coefficient estimates. Expert judgment may be applied to the

⁴ For example, models for default rates include loan interest rates to capture the dependence of credit risk on changing interest rate risk, in particular for portfolios with a significant share of variable interest rate loan contracts.

projected paths to assess how the banks' risk metrics have behaved historically relative to their macro environment against benchmark crisis episodes (e.g., the GFC or the European sovereign debt crisis).

15. One of the most important satellite models project loan default (credit) risk, typically with an econometric-based approach. Credit risk models project credit costs (i.e., newly required provisions) under a given scenario, which will reduce bank profits and capital. Credit costs are changes in the expected losses on loans. They are usually calculated as the changes of the probability of default (PDs) multiplied by the loss-given-default (LGD), as both PDs and LGDs deteriorate in downside scenarios. More specifically:

- **Probability of default** is assessed differently across jurisdictions depending on the structure of supervisory data, including changes in non-performing loan (NPL) ratios and the transition matrix of credit rating. Independent variables include local, regional, and global risk factors grouped by exposures to material geographies. The stress testing approach requires a robust econometric framework using traditional and non-traditional approaches to cope with technical challenges, including related the fundamental forecasting uncertainty with predicting tail events such as defaults and doing this using proxy data. Traditional approaches include linear regression techniques with adjustments to address the variance properties in the data, and more recently, quantile regressions to explore non-linear effects in the tail of the distribution, and Bayesian Model Averaging (BMA) approaches to address model uncertainty.⁵ Non-traditional approaches, including machine learning, random forests, and neural networks, are also considered in some cases.
- **Loss given default** is more likely to be calibrated rather than estimated. If PDs are proxied by NPLs, the required provisioning rates by regulation and historically observed provision coverage rates could be used as proxies for LGDs. More generally, LGDs can also be calibrated based on experience summarized academic studies on credit risk modeling.

16. The Fund is making further efforts to project more granular pre-provision net revenue (PPNR). The objective here is to project components of PPNR, including trading losses, fees and commissions income, and others. Modeling these components of PPNR requires many separate sub-models for the stock of assets and liabilities, their contractual run-offs, pre-payments, new lending, defaulted assets, and broader profit and loss (P&L) items beyond net interest income such as fees and commissions. PPNR models also need to incorporate and project 'idiosyncratic risk' factors such as banks' pricing behavior, business strategy, and solvency and funding interactions, in contrast with credit and trading losses models that primarily reflect 'systemic drivers.'

⁵ Throughout 2018/2019, the BMA methodology has been explored and employed for satellite model purposes in various FSAPs (e.g., Canada, Italy, Korea, France, and others). The corresponding methodology is documented in Gross and Población (2017). The BMA toolbox is currently under further development, considering the addition of other algorithms for model selection.

17. More granular data would be needed to improve the estimation of the impact on P&L from fair valued instruments. For example, valuation changes from a bond portfolio are often estimated, taking into account its duration, which is a linear approximation of the valuation change to an interest rate shock. However, a full valuation effect should also incorporate various non-linear effects that arise for large shocks. It would require additional data such as delta sensitivities by major index/counterparty, with a breakdown of long vs. short positions and cash vs. derivative positions. The scenario also needs to account for a break in the correlations between cash and derivative curves to stress the basis risk of hedged portfolios. When granular data are not available, a modified duration approach—a simple method that partially reflects non-linear effects—can provide reasonable proxy estimates.

18. Structural credit risk models can be effective when historical data is short or absent or when the structure of bank portfolios has recently shifted. In the absence of long-run historical data on banks' credit risk or a lack of data on events generating tail losses, econometric models tend to provide biased estimates of the true average loss rates. In such cases, a structural approach combining risk measures of borrowers (e.g., leverage, default rates) with estimates of behavioral and macroeconomic risk drivers (e.g., income, profitability, interest rates) can produce more reasonable estimates of losses.⁶ Structural models typically rely on micro (or granular) data on borrowers (e.g., credit registry, household, and corporate surveys). Structural models more naturally permit counterfactual policy experiments, where some factors can be held constant. Other structural approach includes Merton-type credit risk models based on option pricing models, that use individual firms' balance sheet structure and their equity prices.

Changes in Regulatory and Accounting Rules

19. The FSAP stress testing approach is being modified to account for the major changes in accounting standards, such as the introduction of IFRS 9 in many jurisdictions (Gross, Laliotis, Leika, and Lukyantsau, 2000). Supervisory practice to calculate loan-loss-provisions (i.e., credit costs) to cover expected losses varies substantially across jurisdictions. Some, though not all, jurisdictions adopted IFRS 9 to calculate regulatory loan-loss-provisions and capital. For some jurisdictions, the IFRS9 could be tighter than prudential provision requirements. For some others, existing prudential requirements are more conservative. For the former, stress testing becomes more conservative by using accounting provisions. Moreover, IFRS 9 provisions are meant to cover lifetime expected loss of exposures, rather than one-year ahead losses under Basel rules. This makes accounting provisions more responsive to cyclical factors—consistent with the economic capital approach—and they may be larger than prudential impairments during a recession. In addition, both provisioning layers and their interplay need to be explicitly modeled to provide accurate estimates for banks' capital positions under an adverse scenario and help model banks' behavioral responses, including macro-financial amplification mechanisms.

⁶ Some recent FSAPs (Finland, New Zealand, France, Switzerland) have applied a structural approach to the measurement of residential mortgage lending risk by risk bucket (for example, by LTV, DTI, and loan vintage).

20. The 2017 Basel rules represent the finalized Basel III framework, and these will be integrated into solvency stress test tools in the jurisdictions that adopt them. For instance, the BCBS introduced reforms on risk-weighted assets, which, among others, introduced a floor in 2017 on risk weights for banks using the internal-rating-based approach. This was in response to concerns over the appropriate use of this flexibility, including with excessive reduction of risk-weighted assets. The solvency stress test tools are being updated to reflect this reform for the jurisdictions that adopt these regulatory changes. The updates incorporate transitory arrangements, because some countries have different timelines to implement these reforms than the Basel timeline.

Simplified Tools

21. Staff have been developing simplified bank stress testing tools for supporting financial surveillance in Article IV consultations, including in response to the COVID-19 crisis. As indicated in the survey of country authorities, interest in household and corporate sector analysis and bank stress tests has increased in the context of the current crisis. Staff developed the Global Bank Stress Test (GST), which is a macro scenario stress testing tool using publicly available bank-level financial statements and covering 33 jurisdictions. In the Fall 2020 GFSR, the tool was modified to incorporate various COVID-19 related mitigation measures (such as loan guarantees) in the analysis. MCM has prepared a methodology note and which will be shared along with relevant codes so that desk economists can update the data and scenarios (and, if needed, models) to update stress test exercises. The GST is being expanded to include more countries using country-aggregate banking sector data (called the universal stress test, UST). Staff are also developing macro scenario stress testing tools for NFCs and households using firm-level and household survey data.

Linking Solvency, Liquidity, and Contagion Risks in Bank Stress Tests

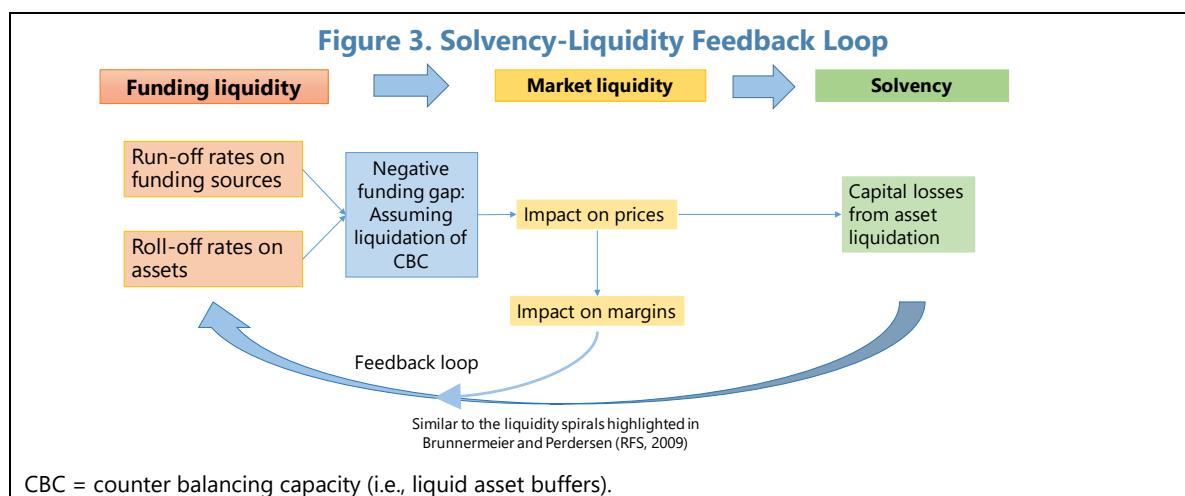
22. The interaction of solvency and liquidity risks is an important driver of the severity of financial crises. Faced with a run on liabilities, solvent banks can be forced to liquidate assets, face losses, and risk becoming insolvent. The interlinkages between solvency and funding and market liquidity risks can reinforce each other, leading to “liquidity spirals” from margin calls and loss spirals. Many central banks and academics (Adrian and Shin, 2008, and Coen and others, 2019) recognize that stress tests should integrate such feedback loops because models focusing solely on solvency risks may significantly underestimate the overall impact of liquidity and contagion shocks and fire-sale episodes.⁷ Loops have to reflect how capital losses lead to liquidity problems and contagion during stress episodes: banks with higher solvency risks are also likely to experience higher funding costs and tighter access to funding and trigger contagion to other banks. At the same time, funding withdrawals may force banks to liquidate assets at fire-sale prices, adversely impacting capital.

⁷ Isolated liquidity and solvency shocks may not capture the systemic impact of the herding behavior of many banks. Such behavior may arise due to i) holdings of similar liquid assets across many institutions, ii) insufficient geographical/sectoral diversification of securities portfolios, and iii) the need to meet regulatory requirements in times of stress.

23. Some recent FSAPs have analyzed the interaction between solvency and liquidity risks. Bank solvency stress tests in recent FSAPs (e.g., [2018 Euro Area](#), [2018 France](#), and [2017 Japan](#)) include the effects of higher wholesale funding costs due to deterioration of solvency position of banks in the stress scenario. Other FSAPs have incorporated the interaction between banks' solvency and contagion effects via the interbank network. In addition to a typical standalone contagion exercise, 2018 Brazil FSAP performed the contagion analysis as part of the bank solvency stress tests to gauge the additional impact on banks' capital due to credit losses associated with exposures to the defaulting banks.⁸

24. Building on those recent FSAPs, work is underway to further integrate the interaction between solvency and liquidity risks into FSAP bank stress testing (Figure 3). Models need to capture two-way interaction. First, solvency stress tests will identify banks with low capital adequacy in response to macro-financial shocks (1st round impact). These banks would then experience higher funding costs and liquidity shortages. Higher funding costs and losses from fire-selling liquid asset buffers would reduce the solvency ratio even more (2nd round effect). These effects are typically non-linear, and the amplification effects become disproportionately larger as banks' capital falls closer to the required minimum. To support the effort of analyzing the interaction between solvency and liquidity risks, staff have developed structural models that capture joint stress testing of solvency, liquidity, and their interactions (Cont, Kotlicki, and Valderrama, 2020, and Gross, Leika, and Valderrama, forthcoming), and Krzner and Matheson, 2017). Other models gauge the impact of haircuts on liquid assets using transaction-level data and apply them to analyze the impact on asset valuation and capital adequacy of banks (Han and Leika, 2019).

25. The next frontier in modeling the systemic risk associated with solvency-liquidity interactions is agent-based models. Thus far, models have not accounted for demand and supply conditions, market microstructure, redistribution of losses/gains, and liquidity gaps and surpluses among institutions. Agent-based models (such as Valderrama, forthcoming) could help incorporate these factors.



⁸ At the end of each year during the stress testing horizon, additional credit loss from the failure of other banks is calculated, and the level of capital after the contagion analysis would be the starting point for banks' solvency in the subsequent period for the solvency stress tests.

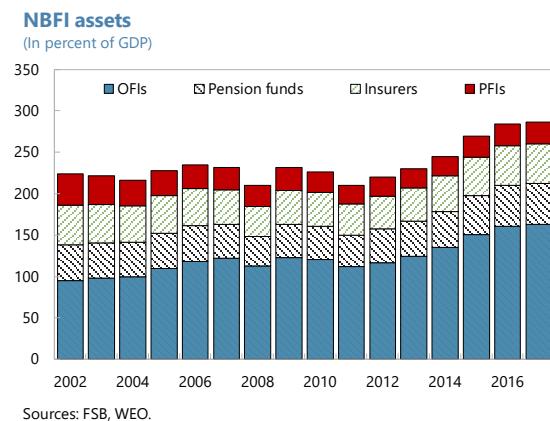
B. Risks in Nonbank Financial Sectors

26. The rapid growth of NBFIs after the GFC has seen them provide an increased contribution to systemic risk. NBFIs are institutions engaged in shadow banking activity or financial intermediation outside the traditional banking system (IMF, 2014b). They are diverse: notable examples include mortgage/leasing companies, asset managers, insurers, and pension funds. Their footprint has been growing in the global financial system over the past quarter-century (Figure 4, first panel). By contrast with banks, solvency distress of some NBFIs (e.g., investment funds and insurers) should in principle be contained by the fact that their investors and policyholders are usually expected to absorb losses contractually, unlike bank depositors.⁹ However, shocks to their financial positions could generate systemic impacts for the financial system through their interconnectedness with other financial institutions and markets. NBFIs are interconnected with the system through their lending to banks (e.g., in the form of deposits or wholesale funding), borrowing from banks (e.g., credit lines activated on the onset of COVID-19 related market turbulence), NFCs (bonds), and households (mortgages), or market activities (e.g., repos, securities lending, credit derivatives, and insurance) and their impact on asset prices.

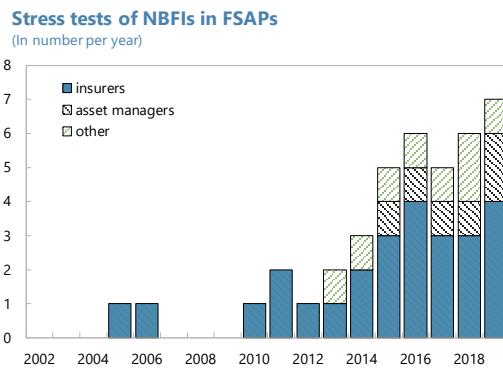
27. Risks to NBFIs have received increased attention in recent FSAPs. The first FSAP to include stress tests of NBFIs was Norway in 2005, which analyzed the insurance sector. Since then, more FSAP exercises have incorporated stress tests of NBFIs, culminating in seven out of eight FSAPs in 2019 (Figure 4, second panel). Some FSAPs undertook stress tests for insurers and investment funds and their impact on asset prices.

Figure 4. Systemic Risk and Nonbank Financial Institutions

NBFIs are growing in economic importance...



...and in risk analyses within the FSAP.



⁹ Moreover, (life) insurers do not typically “fail” suddenly because their liabilities are long-term, and policyholders cannot cancel contracts prematurely without large haircuts, unlike bank deposits. Many large life insurers also have “mutual” structures where policyholders are equity holders and are expected to absorb losses in the event of bankruptcy even when their insurance contracts offer “guaranteed” returns. As for investment funds, they are highly substitutable, i.e., investors can find other funds that offer similar services quickly. The default of an asset manager is unlikely to affect the industry-wide capacity to continue providing services.

Insurance Solvency Stress Tests

28. Solvency stress tests of insurers are the most common stress test of NBFIs in FSAP.

Stress tests have been applied to life and general insurers, but more often to life insurers. These are more systemic because they build up large asset holdings through their business model.¹⁰

29. Whereas banks are most exposed to credit risk from loans, insurers—especially life insurers with large balance sheets—are most exposed to market risk from securities.

FSAPs tend to analyze the market risk of insurers by examining the impact of a scenario that includes falling prices of stocks, real estate, and corporate bonds.¹¹ The effect of the scenario on capital is derived by applying discounts to the values of insurers' assets and by revaluing their policy liabilities at new interest rates. Risk-based capital requirements are also modeled by adjusting down the values of the assets in line with the scenario. Since asset values fall under the scenario, capital requirements, therefore, tend to relax.

30. Apart from market risk, FSAPs have also analyzed the interest rate risk of insurers, especially the potential effects of a “low-for-long” scenario. Given that many long-term insurance policies were issued when interest rates used to be higher, they were priced assuming high-interest rates, which now appear unrealistic. As their higher-yielding bond assets mature, the proceeds have to be invested in the lower-yielding bonds currently available, which lowers the average yield on the bond portfolio and slowly erodes net interest income.

31. Some FSAPs have used bottom-up sensitivity tests to investigate the impact of shocks on liabilities leading to larger insurance claims and expenses. For life insurers, these tests include losses that would arise if morbidity or mortality were to increase or decrease. In aging economies, longevity risks are the main threat to the sustainability of long-term insurance products. For non-life insurers, key threats include losses from natural disasters and, in some cases, cyber risk, often through standard business insurance (e.g., [2019 Singapore FSAP](#)). Catastrophe risk insurance and re-insurance for natural disasters are critical for diversifying property-insurance related tail risks from severe cyclones and floods. These risks are likely to rise with climate change, but the solvency impact on insurers could be limited as contracts and premiums are usually revised every year.

32. Risk analysis of insurance in some FSAPs has explicitly considered interactions with banks. A good example is where banks and insurers (or other NBFIs) are part of the same financial conglomerate, or where banking groups own insurance subsidiaries so that spillovers to the insurance firm from its parent or affiliates are a source of risk. The [2018 Belgium FSAP](#) stress-tested such bank-insurance conglomerate models.

¹⁰ General insurers tend not to build up large asset holdings because most of their contracts are short-term, reducing cumulative premium payments per contract.

¹¹ For bonds, the valuation change (market risk) reflects the change in credit risk.

Asset manager Liquidity Stress Test

33. Stress tests of asset managers tend to examine their knock-on effects on securities markets through liquidity stress. For most asset managers, solvency risk is not material because they are usually funded by equity (e.g., mutual and investment fund shares and exchange-traded-fund, ETF, shares), or they pass on all investment risks to their clients (IMF, 2015).¹² Exceptions are when the funds are leveraged directly by borrowing or by investing in complex instruments with embedded leverage. However, many are exposed to liquidity risk in the face of mismatches between their funding and investment. Most open-ended mutual and investment fund shares are redeemable on demand, so any rush to redemption could trigger a sell-off of the funds' assets, possibly at a large discount if the investment is illiquid. While stress facing a fund (or funds investing in certain asset classes) per se might not directly generate a systemic impact as funds are highly substitutable, it can trigger systemic market turbulence and distress of other financial institutions through their interconnectedness. In particular, if liquidity-crunch asset managers fire sale their assets, market liquidity could dry up market funding for banks, other NBFIs, and NFCs, and asset prices might decline excessively.

34. Several FSAPs undertook liquidity stress tests, and some attempted to measure the contribution to systemic risk from feedback effects through fire sales and contagion to banks.

- **Redemption pressures:** Some FSAPs analyzed historical redemption behavior—at the level of individual funds or classes of funds depending on data availability—to calibrate a severe yet plausible scenario for redemptions.
- **Fire sale pressures:** To gauge systemic impact, some FSAPs measured the amounts that asset managers would sell of each asset type by considering pro-rata and waterfall selling strategies in response to an industry-wide redemption scenario. Some have estimated elasticities separately for different types of assets, and they have varied the order in which asset managers sell their assets.
- **Fire sale impact:** The most challenging part of systemic risk analysis of the asset management industry is to gauge the market price impact of the fire sales appropriately. The 2015 FSAP for the United States compared these hypothetical sales to dealer inventories, flagging asset classes with insufficient inventories. Other FSAPs compared these sales to investment funds' liquid assets (Luxembourg) or market turnover ([2016 Sweden FSAP](#)). The 2018 [Brazil FSAP](#) estimated the effect of sales on asset prices using elasticities, which, in turn, were estimated from market liquidity measures.
- **Contagion effects:** The Luxembourg FSAP measured the impact on banks from liquidity stress to investment funds, as the funds keep substantial deposits in banks. The Brazil FSAP introduced second-round effects, where asset price falls lead to another round of redemptions and another fall in asset prices.

¹² Nevertheless, asset managers could be exposed to solvency risks if they have guaranteed returns to their investors.

35. The severe market turbulence right after the onset of the COVID-19 crisis re-emphasized the need to strengthen systemic risk analysis of asset managers. The liquidity mismatch issue resurfaced once again despite various reforms to monitor, manage, and mitigate liquidity risks with asset management products. In particular, the fund industry contributed to building up vulnerabilities in NFCs in the run-up to the pandemic, as many funds invested in higher-risk NFC bonds and papers with leverage. The resulting market freeze led to unprecedented central bank liquidity support in money and corporate bond markets in some jurisdictions. The link between the fund industry and banks strengthened after the market turbulence as many funds activated credit lines from banks. The pandemic experience underscores the continuously evolving nature of risks and vulnerabilities from the asset management industry and the need for adapting risk analysis accordingly.

Pension Fund Solvency Stress Tests

36. Pension funds can contribute to systemic risk in some cases. Pension funds in most countries are too small and disconnected from the financial system to be considered a significant source of systemic risk. Their assets and liabilities are also long-term, making them stable institutional investors. However, in some countries, pension funds have the potential to contribute to systemic risk, including in a context of low-for-long interest rates, and therefore have been the subject of FSAP stress tests (Mexico, Namibia, Netherlands). Life insurers often administer pension plans for employers or individuals and sell annuities to retirees, so the health of insurers and pension funds tend to be linked. Both defined contribution and defined benefit pension funds can contribute to systemic risk. Defined contribution pension funds pass on market risk to their active members and, therefore, bring similar systemic risks to those identified for asset managers above. The solvency of defined benefit pension funds is sometimes underwritten by a sponsor, which could be a company, association (of workers or firms), or the government. As such, capital shortfalls in the fund could generate a contingent liability for its sponsors. If an economy has many large defined benefit pension plans that invest in similar assets, then a fall in those asset prices could pose a systemic risk through the resulting simultaneous rise in contingent liabilities of the government and many firms. The solvency positions of unfunded (pay-as-you-go) pension plans are masked by the lack of balance sheet information and, therefore, cannot be stress-tested in an FSAP.

37. Pension fund stress tests follow a similar methodology to those for insurers. Stress tests of pension funds in FSAP follow the two approaches for insurers described above. They analyze the effects of a sudden drop in the prices of assets held by the pension funds, or they analyze the effect of a low yield environment on net interest income over several years.

Challenges and Work Going Forward

38. Future FSAPs will focus more on assessing NBFIs' contribution to systemic risk. Unlike banks, the "failure" of NBFIs per se may not necessarily threaten system-wide stability. For instance, (life) insurers tend to fall into insolvency only gradually, and policyholders mostly bear the losses. Losses to investment funds are also absorbed by their shareholders. However, NBFIs could be conduits of contagion and thus contribute to systemic risk. Therefore, the focus

should be on contagion and interconnectedness effects, especially on banks, including cross-sectoral interactions and impacts on markets.

39. Scenarios for stress testing insurance companies need to overcome special design challenges. A key question in stress testing insurers is how closely to align the adverse scenario to those used in the bank solvency stress tests. In particular, how should the adverse scenario treat government bond yields? These yields may rise under the adverse scenario to the extent that the jurisdiction experiences capital flight, but they may also fall if the central bank lowers domestic interest rates. The scenario assumed in the bank solvency stress test may provide a guide of which outcome is more likely. Aligning the adverse scenarios of the bank and insurer solvency stress tests also facilitates comparisons. However, stress tests also need to ensure that adverse scenarios are actually stressful. Insurers' liabilities are usually longer-term than their assets—while the reverse is typically true for banks—so the immediate valuation effects of shocks to government bond yields tend to go in opposite directions. Therefore, generating an additional scenario (or a battery of single-factor sensitivity shocks) focused on insurance companies is often needed to ensure stress tests are sufficiently prudent.

40. Moreover, more progress needs to be made to overcome remaining data constraints and the lack of globally agreed prudential rules for NBFIs. There are no Basel-like international standards on prudential requirements for NBFIs.¹³ For instance, for insurers, there is no globally accepted definition of capital or financial soundness indicators (FSIs). Therefore, the FSAP will benefit greatly from 's project of the Statistics Department on a methodology for FSIs for the insurance sector. Data gaps for some NBFIs—such as hedge funds and new types of NBFIs that emerged for regulatory arbitrage (e.g., wealth management products in China)—remain large, limiting the scope to cover them in risk analysis.

41. Quantitative analysis of NBFIs could also contribute to macroprudential policy and crisis management discussion. As the footprint of NBFIs and market financing rises, macroprudential policies that only target banks and their borrowers could lose effectiveness. For instance, standard toolkits are likely to have little impact on containing the credit boom when NFCs borrow more from financial markets. Such concerns may call for developing macroprudential tools for NBFIs and markets and consideration of a liquidity provision framework in case of a crisis, as highlighted by the market turbulence experienced at the onset of the COVID-19 crisis. At the same time, there is a need for caution and to avoid rushing to

¹³ The banking sector is subject to an international standard for the definition of capital, but NBFIs are not. This means that capital is calculated differently from one jurisdiction to the next. Solvency II in the European Union (EU) has provided standardized capital calculation and reporting templates that have made it possible to develop portable stress testing tools within the EU. International principles on broad NBFI issues have been set by the International Organization of Securities Commissions (IOSCO) and a separate standard for insurers (Insurance Core Principles, ICPs). However, compared to Basel rules, these principles are given at higher levels and do not specify the details of prudential requirements.

introduce prudential measures without fully understanding the systemic importance of certain vulnerabilities.¹⁴

C. Risks in Nonfinancial Sectors

42. Quantitative analysis of vulnerabilities in NFCs, households, and governments has grown, given the potential for spillovers to the financial sector. Experiences of recent decades have demonstrated that vulnerabilities of NFCs and/or households can impact financial stability. For example, NPLs associated with sharply increased corporate lending were the root causes of the Asian crisis in the late 1990s. More recently, bank weaknesses and high NPLs in Italy have been related to NFCs debt burden. Household vulnerabilities and unsound mortgage lending were the causes of the U.S. subprime market crisis, and the banking crises in Ireland and Spain. More generally, loans to NFCs and retail loans to households are often the largest portfolio items of banks, making analysis of vulnerabilities related to these exposures a crucial element of credit risk analysis in bank solvency stress tests, and of financial stability risk analysis more generally.¹⁵ Sovereign-bank linkages came at the forefront of financial stability concerns at the time of the European sovereign debt crisis. Moreover, to the extent that distress in the nonfinancial sector reduces the valuation of securities issued by such entities, banks' liquidity risks could rise as the value of liquid asset buffer deteriorates.

43. FSAP risk analysis has been incorporating link between nonfinancial and financial sector distress to varying degrees. To the extent possible, the same macro scenario assumptions are applied to both bank and nonfinancial sector stress tests. NFC stress testing results are cross-checked with the prediction from credit risks models for banks' NFC exposures, where useful. Household sector analysis could be also cross-checked with banks' credit risk models. In a few cases, such analysis has helped with estimating the effects of borrower-based measures. The bank-sovereign nexus is usually fully incorporated in bank stress tests.

Nonfinancial Corporations

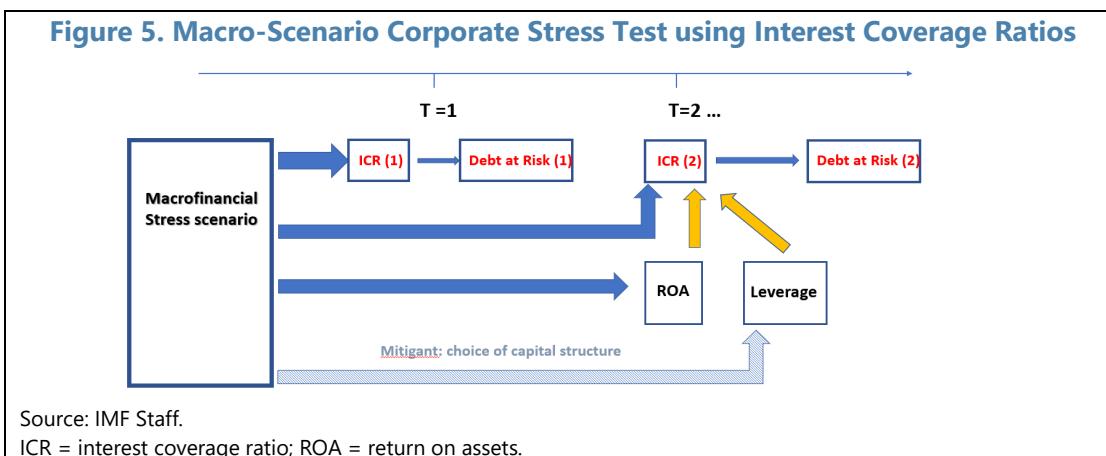
44. NFC leverage has risen in both advanced economies and emerging markets since the GFC. Borrowing by NFCs has increasingly been driven by global factors relative to firm-level characteristics (Herwadkar, 2017). This, in turn, has made firm balance sheets more sensitive to changes in the global price of risk (Moreno and Serena-Garralda, 2018). In some cases, NFC leverage has continued to rise even after the onset of the pandemic as many NFCs facing earnings and liquidity shocks increased borrowing. The borrowing demand has been in part supported by various public support measures to NFCs and a re-emergence of the search for

¹⁴ For example, a sell-off in the corporate bond market may have a smaller overall impact on the real economy, depending on the investor base and link to the rest of the financial system. For instance, Giesecke and others (2014) studied 150 years history of corporate bond defaults and their macroeconomic impact in the United States, where the size of the market has been comparable to those of bank loans. While there were severe corporate default crises in which 20-50 percent of all outstanding bonds defaulted, they found that corporate bond crises had far fewer real effects than banking crises.

¹⁵ For example, among EU banks included in the European Banking Authority's Transparency Exercise, loans and advance account for more than 60 percent of bank balance sheets, among which loans to nonfinancial corporations account for 27 percent and loans to households for 29 percent.

yield as major central banks have injected liquidity on a large-scale into market to mitigate the crisis.

45. Quantitative analysis of NFC vulnerabilities in FSAPs has typically focused on the interest coverage ratio (ICR), as summarized in Chow (2016). The analysis uses NFC financial statement data and defines distress as the risk of failing to repay any type of borrowing, including bank loans, payables, bonds, and international borrowings. The stress test estimates the impact of shocks to the interest rate, exchange rate, and profits (before interest and tax payments) on the ICR, defined as earnings divided by interest payments. The shocks could be applied one by one, similar to sensitivity tests, or in combination. Alternatively, the shocks could reflect a certain adverse macro scenario (IMF, 2016b, Figure 5). An ICR of below two is often considered as a sign of distress. Then, debt-at-risk (amounts of corporate debt issued by firms with an ICR of below pre-specified thresholds) measures the potential extent of corporate debt distress.



46. Another approach is to work with the PD. A firm's ICR is related to credit risk, but it is, in the first instance, a liquidity indicator rather than a solvency indicator. Regarding solvency risk, there are three approaches to assess corporate default risks: structural, empirical, and hybrid. Each approach has strengths and limitations. However, the current academic consensus is that the hybrid approach has the best predictive performance (Campbell and others, 2008).

- **Structural approach:** This builds on Merton-type asset pricing models for corporate debt based on option pricing models, including the so-called contingent claims approach (CCA) developed by IMF staff (Gray and Malone, 2008) and Moody's KMV. It heavily relies on market-based indicators and is well suited for higher frequency monitoring. However, it is not applicable to firms without traded equity or bonds. Its forecasting performance tends to be weaker than other approaches.
- **Empirical approach:** This is a reduced form empirical model that regresses the indicators of actual defaults on various firm characteristics, popular in the corporate finance literature. Historically, the literature focused on explaining cross-firm differences and included only firm-specific characteristics and indicators as explanatory variables. However, as the interest from the financial stability community rose, some authors

developed models including macro-financial variables (Bruneau and others, 2012). The approach could cover a broader sample of firms than a structural approach but tends to be of lower frequency.

- **Hybrid approach:** This approach is an empirical approach that includes some outputs from structural models—in particular, distance-to-default (Campbell and others 2008). The Bottom-up Default Analysis (BuDA) developed jointly by IMF staff and the National University of Singapore also adopts this approach (Credit Research Initiative, CRI, 2019a and 2019b). This type of model tends to show the best (out-of-sample) forecasting performance. Some FSAPs (e.g., [2017 Indonesia](#)) have used BuDA.

47. NFC risk analysis is a useful input and complement to bank stress testing. FSAPs could treat NFC analysis as an independent exercise from bank stress tests as robustness checks of bank credit risk models or as substitutes for credit risk models. This is because NFC stress tests and banks' credit risk models for NFC exposures are closely related but different. First, the coverage of firms is different. NFC analysis could include listed and unlisted companies irrespective of whether these firms have bank loans or not. Bank stress tests only reflect the credit risk from firms that have bank loans. Second, the concept of the credit stress event, or "default," can be different. In the context of bank stress tests, the event considered is of loans being classified as nonperforming. In NFC analysis, credit stress can be conceptualized in many ways, including bankruptcy, default on any loans or bonds, or key metrics (such as the interest coverage ratio) falling below specific thresholds.

48. The COVID-19 crisis has highlighted the need to further integrate corporate sector analysis into bank stress tests going forward. Unlike previous NFC distress episodes, the variance of the impact of the pandemic shock across different economic sectors has been unusually high with continued uncertainty over the underlying solvency and liquidity positions of corporates, including once extraordinary pandemic-related policies are gradually withdrawn. In such cases, conducting (multi-year) macro scenario-based stress tests for NFCs and integrating them back to bank credit risk modeling could provide a more granular understanding of the potential financial stability impact of corporate stress. Tressel and Ding (forthcoming) establishes a framework for such analysis and complements the ICR-based analysis with additional indicators such as cash and equity buffers while being based on the same macro scenarios used for bank stress tests (e.g., GST). These stress indicators are mapped into aggregate bank PDs using the historical relationship between corporate defaults and these indicators, providing important potential input for bank credit risk modeling. Such corporate stress tests could also be useful inputs for bank stress tests when (historical) supervisory data are incomplete or of low quality.

Households

49. Several indicators have been used to assess household balance sheet

vulnerabilities. The main source of household vulnerability is debt, especially mortgages. The measures of household indebtedness include (i) leverage such as the debt-to-income ratio (DTI) and the debt-to-asset ratio, and (ii) ability and willingness to repay measured respectively by the

DSTI and the LTV. The LTV ratio also affects loss-given-default (LGD) incurred by lenders. Risks of household debt tend to rise with lower bank lending standards. Understanding the characteristics of borrowers (such as income brackets) and the purpose of loans (primary residence vs. investments) is also helpful. Risks from household debt are mitigated when households have financial asset buffers that can be monitored by tracking saving ratios and financial asset allocations. Last, the assessments of residential real estate market prices and their potential overvaluation are essential to determine households' balance sheet vulnerabilities.

50. Microdata, such as household surveys, has been essential for assessing risks and calibrating borrower-based macroprudential tools. A lesson of the GFC is that vulnerabilities concentrated in a small segment of mortgages and their borrowers can harm the financial stability of the system. Focusing only on aggregate indicators could miss important sources of systemic risks, as the risky segments of the market would be masked. Various FSAP exercises have relied on the household survey to assess whether pockets of vulnerabilities are developing among categories of households. More recently, some FSAPs relied on household survey data to calibrate LTV and DSTI ratios for mortgages.

51. Some FSAPs undertook single factor stress tests of household balance sheets based on microdata. Examples include FSAPs for Italy, Luxembourg, the Netherlands, Ireland, and Brazil. The [2019 France FSAP](#) and the [2017 Luxembourg FSAP](#) analyzed households' vulnerabilities based on microdata, and both estimated a model of residential real estate prices. The [2019 Switzerland FSAP](#) relied upon a structural model calibrated on microdata to estimate PDs and LGDs for mortgages.

52. Going forward, staff plan to increase the use of microdata and better integrate household vulnerability analysis into system-wide stress testing. Methodologies based on household microdata are important for (i) assessing the effects of downturn scenarios on household risk parameters, (ii) gauging the effects of policies including borrower-based measures such as LTVs, DSTIs, DTIs, and (iii) enhancing the assessment of household credit dynamics (mortgages, consumer credit). Staff is working on a household model framework to tackle these issues.¹⁶ The framework will also consider second-round macro feedback effects and be integrated into bank stress tests where households' risk parameters will be modeled as a function of scenarios.

Public Sector

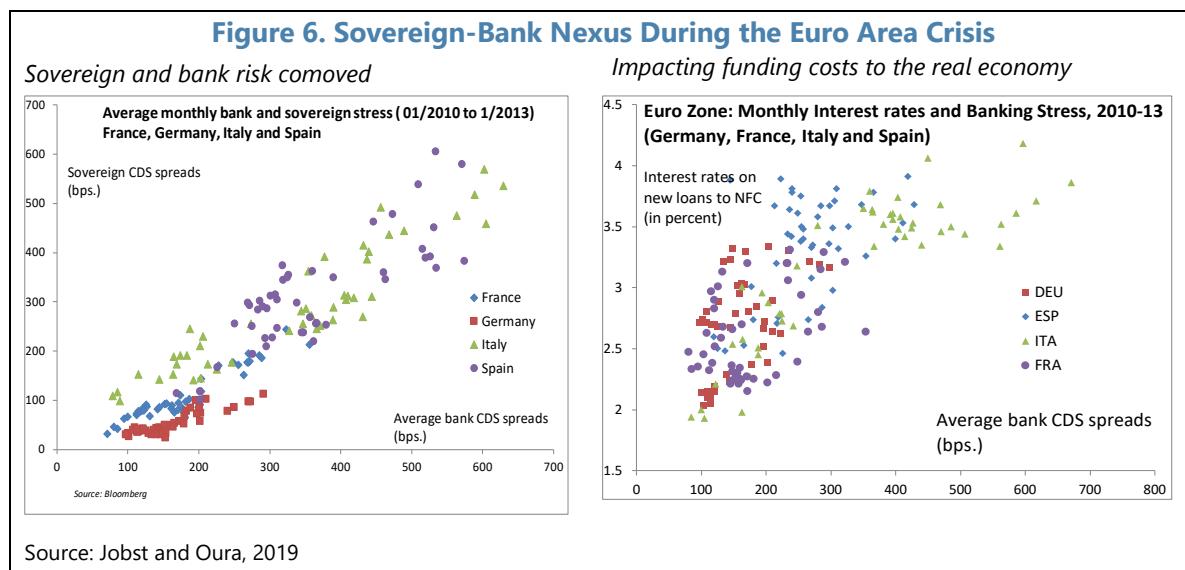
49. Most FSAP stress tests have treated sovereign risk as market risk from valuation changes in sovereign securities (Jobst and Oura, 2019). These stress tests face important challenges:

- **Size of sovereign shocks:** Sovereign distress remains a relatively rare event in the post-World War II period for advanced economies and many emerging and developing economies. Historical data may not include sufficient distress events and generate too

¹⁶ The framework is documented in Gross, M. and Población, J. (2017).

small shocks compared to what could potentially happen. Referencing cross-country experiences and using risk-sensitive market data (such as sovereign CDS spreads) when available could be useful.

- **Treatment of sovereign exposures:** Basel capital rules have mechanisms to smooth out volatile, short-term effects to avoid introducing excessive pro-cyclicality. As a result, the same sovereign exposures could be valued or provisioned differently depending on how they are labeled. For instance, banks do not need to apply market valuation to securities in the held-to-maturity account (Jobst and Oura, 2019). However, such smoothing could reduce the effectiveness of macroprudential stress tests in the face of a sudden jump in sovereign risk. As a result, FSAP stress tests have often deviated from the strict application of regulatory standards and rules and have applied stressed market valuations of sovereign portfolios as deemed necessary for the risk analysis.
- **Amplification and feedback mechanisms:** Sovereign distress could trigger a wide range of spillover effects on all the sectors of the real economy, making the overall impact highly uncertain. Designing an adequate macroeconomic scenario, therefore, is challenging. One might need to focus on a few channels that could be particularly relevant for the specific country.



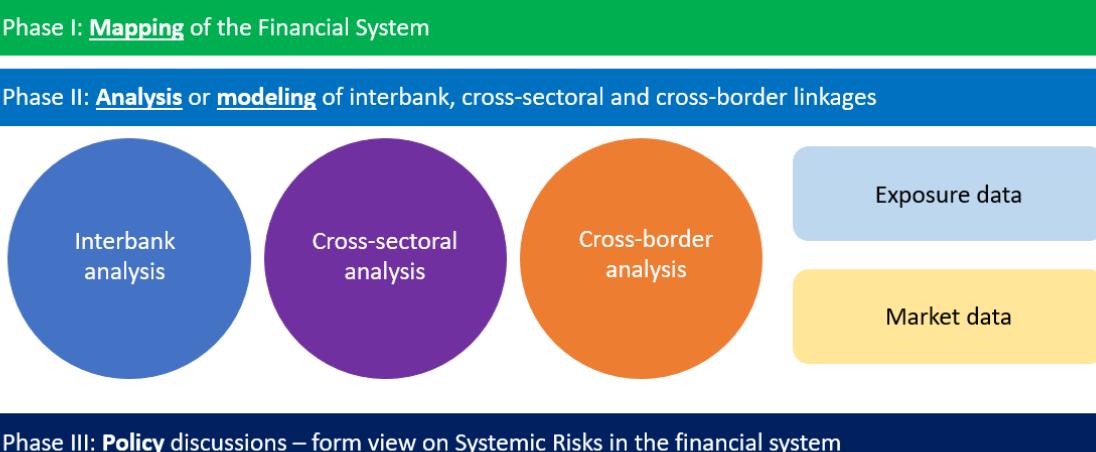
50. The pandemic could increase the relevance of sovereign risks for a broad range of economies, requiring new approaches to risk assessment. Many governments, including those in emerging and developing economies (EMDEs), have undertaken sizable deficit-financed fiscal expansions. The increased debt burden could increase sovereign risks in the years to come. As discussed by Jobst and Oura (2019), “sovereign distress” in EMDEs is more likely to be outright default than those experienced by advanced economies including explicit default on external debt, monetization of domestic debt, elevated bank loans to governments with evergreening, and accumulation of arrears among others. Indeed, the unprecedented unconventional monetary policy adopted by many EMDEs poses new challenges to assessing sovereign risks to financial stability in these jurisdictions. To assess these risks, FSAPs will need

to consider alternative techniques, potentially such as incorporating sovereign default and its macroeconomic impact in scenarios and accounting explicitly for credit risks from government exposures.

D. Interconnectedness

51. Quantitative analysis of interconnectedness has expanded significantly since the 2014 FSAP Review. Reflecting data availability, FSAPs have focused on exposure-based interconnectedness in the domestic interbank market and cross-border bank lending, as well as price-based interconnectedness. More recently, improvements in data availability for sectoral financial accounts have allowed broader analysis of cross-sectoral and cross-border financial linkages. Interconnectedness analysis in FSAPs typically includes (i) mapping of the financial system, (ii) analysis or modeling of interbank, cross-sectoral, and cross-border linkages, and (iii) policy discussions (Figure 7).

Figure 7. Interconnectedness and Contagion Analysis in FSAP



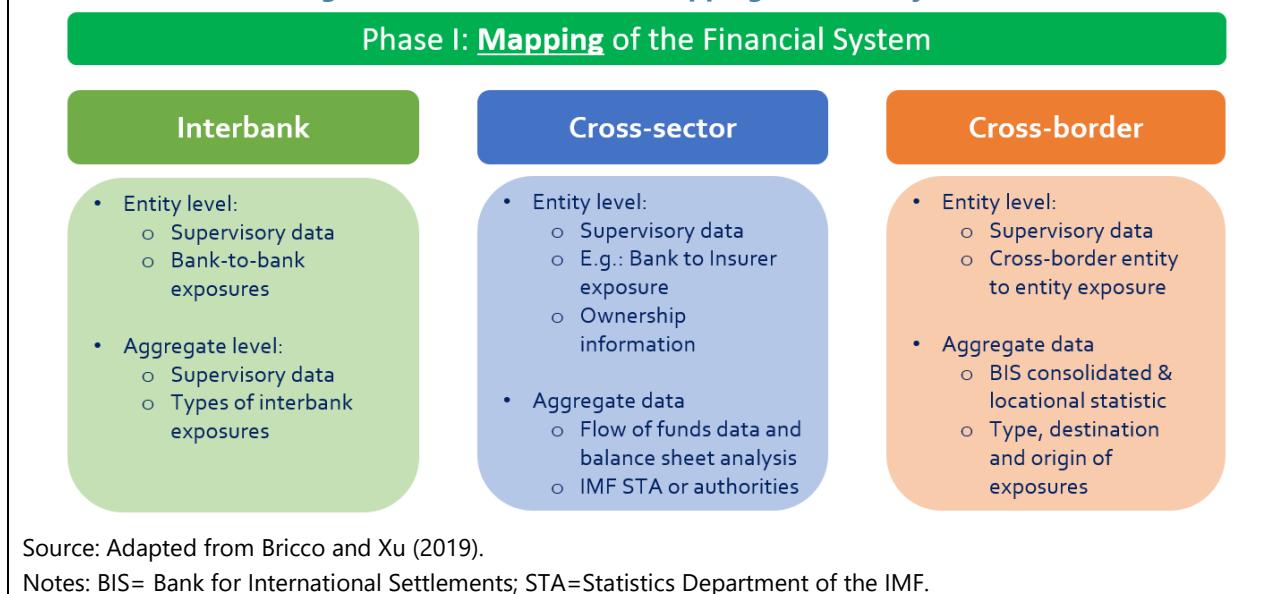
Source: Adapted from Bricco and Xu (2019).

52. Maps of financial system interlinkages help improve the understanding of shock amplification and spillovers (Figure 8):

- **Interbank:** FSAP teams have used supervisory data to map different types of interbank exposures, such as loans, bonds, capital participation, and off-balance sheet exposures, and compared interbank with intra-group exposures (e.g., [Spain](#)).
- **Cross-sectoral:** The balance sheet analysis approach (BSA) (IMF 2015) has been used to map cross-sectoral exposures based on the aggregated sectoral balance sheets of an economy (e.g., [Romania](#)), detailed supervisory data has been used to map the ownership structure within a country's financial system (e.g., [Poland](#)), and security-level data has been used to map cross-segment linkages in the financial system (e.g., [France](#)).

- **Financial Market Infrastructures (FМИs)**: On occasion, authorities have shared FМИ data, allowing the mapping of settlement and clearing linkages across a range of financial institutions. For example, the [China](#) FSAP used network analysis to map the linkage between FМИs and banks.
- **Cross-border banking**: Many IMF assessments have used the consolidated and locational banking statistics from the Bank of International Settlements (BIS), which show cross-border financial flows intermediated by banks. The data allow mapping cross-border linkages between countries, analyzing the type, destination, and origin of these exposures, which also shed light on the business models of international banks (e.g., [Spain](#)).

Figure 8. Data Sources for Mapping Financial Systems



Source: Adapted from Bricco and Xu (2019).

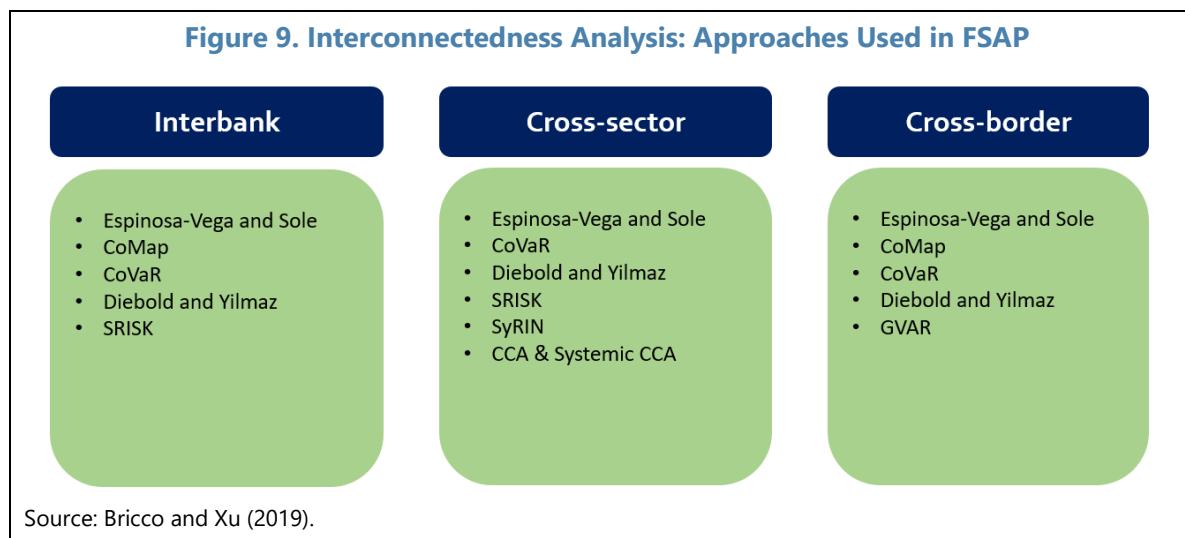
Notes: BIS= Bank for International Settlements; STA=Statistics Department of the IMF.

53. The modeling of interconnectedness has used a combination of exposure- and price-based approaches (see Figure 9, based on Bricco and Xu, 2019):

- **Exposure-based approaches**: The Espinosa-Vega and Sole (2010) model has been used to analyze the impact of credit and funding shocks and their propagation across financial institutions (e.g., [Luxembourg](#)). The Contagion Mapping (CoMap) approach developed by Covi, Gorpe, and Kok (2019) was applied to a rich dataset of the euro area banking network in the [Euro Area FSAP](#), allowing for bank-specific default thresholds. It was also added to the bank stress test to capture the impact of second-round effects through interbank contagion ([Indonesia](#) and [Poland](#)).
- **Price-based approaches**: The Diebold and Yilmaz (2014) approach has been used by many FSAP teams to analyze interconnectedness based on equity prices and other market prices (e.g., [Finland](#) and [Spain](#)). The CoVaR (Conditional Value at Risk) method by Adrian and Brunnermeier (2016) was used in the [New Zealand FSAP](#) to assess the contribution of systemic risks stemming from the parent banks to New Zealand banks. The SRISK (Systemic Risk) approach by Acharya and coauthors (2012) and the SyRIN (Systemic Risk and Interconnectedness) approach by Cortes and others (2018) were

applied in the [United Kingdom FSAP](#) to measure systemic risk in the banking and insurance sectors.

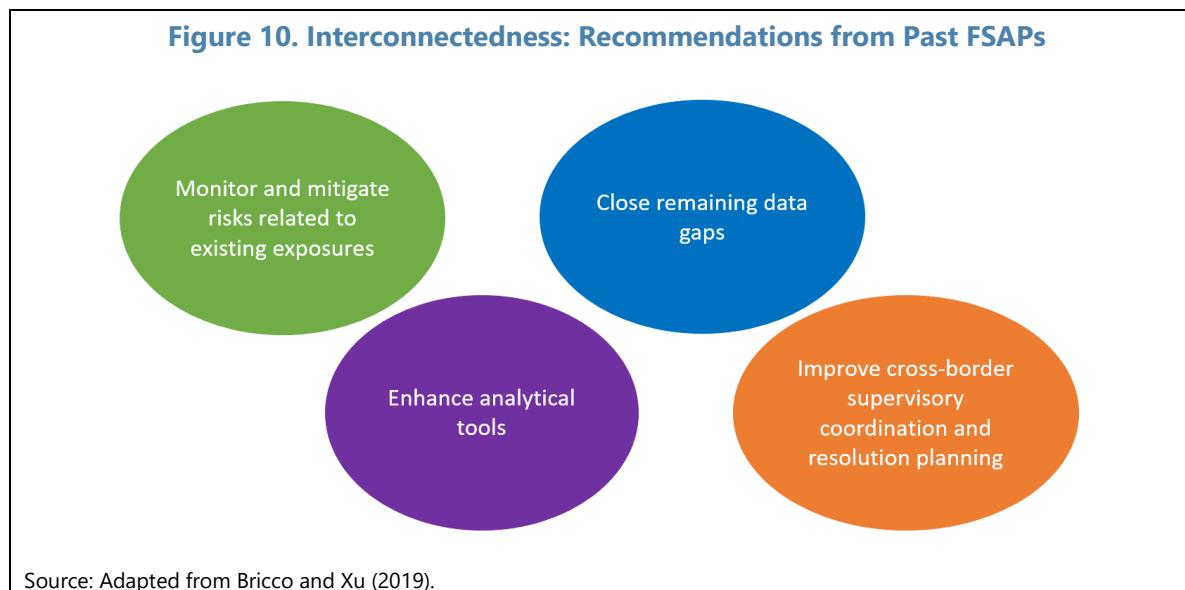
- **Hybrid approach:** The contingent claims analysis (CCA) and the systemic CCA (Gray and Jobst, 2013) are built on both market and balance sheet data. CCA combined with vector auto-regression (VAR) and global VAR (GVAR, Dees and others, 2017) allow measuring various cross-sector and cross-border interlinkages such as bank-sovereign linkage assessed in [Euro Area](#) and the [United States](#) FSAPs. The [Spain FSAP](#) analyzed cross-border interconnectedness from macro-financial perspectives by considering the international transmission of credit shocks, following Xu (2012). A combined CCA-GVAR application was used in the [Euro Area FSAP](#), involving individual banks, insurance, sovereigns, and economies, following Gross, Kok, and Zochowski (2016).



54. A combination of exposure- and price-based approaches provides a more comprehensive analysis of interconnectedness than either approach on its own. Exposure data alone do not reflect indirect linkages and potential amplification channels through market perceptions. Most price-data-based models are not structural and typically cannot pinpoint the channels of contagion. Therefore, applying both exposure- and market-based approaches has been the best strategy. Also, the results of interconnectedness and contagion analysis have been viewed in conjunction with different workstreams of financial stability analysis, including stress tests and nonbank and market analysis, to form a holistic view of risks and vulnerabilities in the financial system and interpreted with caution.

55. The results of the interconnectedness analysis have been used to formulate policy advice. FSAP recommendations based on interconnectedness and contagion analysis can be grouped into four main areas (Figure 10). The first is about strengthening monitoring of the linkages among financial institutions or between financial institutions and the real economy. The second is about closing major data constraints. The most common data constraints are related to cross-sectoral linkages at the entity level, for example, between banks and insurers and for conglomerates. The third is about enhancing analytical tools, often by expanding the coverage of cross-sectoral and cross-border linkages. The fourth about improving cooperation in cross-

border supervision and resolution. Examples include the development of resolution plans for foreign subsidiaries and the enhancement of inter-agency and college collaboration and coordination.



56. Broader coverage of institutions and activities would be desirable in future FSAPs.

An example is institution-level interconnectedness analysis among all types of financial institutions (banks and NBFIs), including both direct and indirect (e.g., through common exposures) channels. The task is even harder when there are large institutions that are supervised only lightly or are entirely outside of financial supervisors' responsibility (such as nonfinancial corporations, NFCs). Also, a full interlinkage map is hard to construct in financial markets—securities, money market instruments, derivatives, and FX—where NFCs, government (agencies), and foreign institutions take part.

57. To strengthen interconnectedness analysis, it is critical to improve FSAP teams' data access.

For example, FSAP teams do not have access to data on exposures across G-SIBs, data on financial conglomerates (which include banks and nonbanks), activity-based data collected by FMs, or cross- and common-exposure data among banks and NBFIs. By contrast, some national authorities are using activity-based data (which cover transactions in certain markets by all types of participants) from clearing and depository institutions.¹⁷

E. Systemic Liquidity

58. Systemic liquidity analysis is closely linked to broader interconnectedness assessments.

Systemic liquidity risk is the risk that multiple institutions simultaneously face liquidity difficulties. The key difference between institution-level and systemic liquidity risks is the amplification effect through interconnectedness in the whole financial system. It could

¹⁷ A rapidly growing literature uses activity-based data to gauge contagion in credit default swap (CDS) markets (Paddrik and others 2016 and Levels and others, 2018) and interconnectedness through central counterparties (CCP, Huang and others, 2019).)

emerge in certain markets (e.g., repos) involving a broad range of participants and require activity-based analyses. A liquidity shock to some segments of the system could spill over to another (e.g., investment funds suffering from mass redemptions to banks where they keep their liquid deposit assets).

59. A liquidity stress in a part of the financial system could turn into systemic shock through different mechanisms, depending on the system's structure and main funding sources. Examples of systemic liquidity risk are:

- **Market dislocation:** In financial systems that are primarily reliant on wholesale market instruments, systemic liquidity risks can arise when institutions face difficulties obtaining funding (funding risk) because of widespread dislocations of money and capital markets (IMF, 2011). The dislocation involves a wide range of institutions and financial instruments. The interaction of market and funding liquidity stresses could amplify the effects of a relatively small trigger to the overall liquidity stress of market participants (Brunnermeier and Pedersen, 2008, and Adrian and Shin, 2010) who may, in turn, fire-sell their assets and further depress the market.
- **System-wide liquidity shortage:** In bank-dominated financial systems with little market funding, systemic liquidity risk could arise from maturity mismatch and a system-wide loss of deposits, either wholesale (e.g., government, corporate, and NBFI deposits) or retail. It could be triggered by common underlying drivers such as capital outflows, commodity price shocks, sovereign distress, or other issues that lead to a spike in risk aversion and liquidity need of various economic sectors.

60. Complete system-wide liquidity stress testing remains a challenge for staff and authorities. Despite strong interest, developing assessment tools has been challenging because of significant gaps in collating data cutting across different types of financial institutions and economic sectors. To conduct such a comprehensive stress test, one would need granular activity-based data, possibly through FMs or by merging multiple databases collected by various financial regulatory agencies.¹⁸ However, these data have been rarely made available to FSAPs or, in other cases, would involve such a large volume of confidential data processing that would be hard to accomplish without longer and more intensive engagement. The need to model participants' behavior in stress—similarly to in bank liquidity stress tests—is another outstanding challenge. Progress amongst national authorities here has also been slow, reflecting in part a need for significant collaboration across multiple regulatory agencies to integrate their extremely detailed databases.

61. Recent FSAPs have mapped the main aggregate financial linkages in the whole system as a step to understand the potential contours of systemic liquidity risks. Such mapping exercises can help identify key funding and liquidity markets, including the interconnections and the role played by different types of participants. The ideal data for such

¹⁸ For example, Paddrik and others (2016) took the U.S. Comprehensive Capital Analysis and Review assumptions and examined its impact on CDS market participants through margin calls. Levels and others (2018) analyzed the impact of Brexit on the drivers of CDS transactions in the Netherlands.

efforts include granular information on who-to-whom exposures (e.g., the flow of funds by counterpart or balance sheet approach, BSA, data) and exposure data by instruments (Romania, Nigeria, Thailand, and Philippines FSAPs, for example).

62. Some FSAPs have undertaken more in-depth analysis and assessed systemic liquidity risk by connecting liquidity stress tests of main institutions and sectors. For instance, the 2017 Luxembourg FSAP conducted a detailed liquidity analysis of mutual funds, while the Article IV examined the link between banks and mutual funds through deposits. MCM has also developed a new tool to assess system-wide liquidity stress caused by balance of payment shocks in small open economies and their spillovers across economic sectors using the BSA data.¹⁹ The 2020 Philippines FSAP applied the tool to assess the potential liquidity stress spillovers between banks and NFCs under loan moratorium programs introduced to counter COVID-19.

63. Given the critical role of behavioral assumptions, understanding the operational set-up of markets and regulation on key participants becomes particularly relevant. The propagation of liquidity stress depends heavily on participants' behavior, such as fire selling of assets and their pecking order, hoarding cash, discontinuing market-making, etc. Regulatory requirements are likely to drive parts of the behavior. The FMs and their operational frameworks are likely to be different in each key market, which could affect their own resilience as well as their role in transmitting liquidity shocks across participants. Some supervisory reporting—such as contingent financing plans of financial institutions—could also help informing the choice of assumptions.

64. The crisis management framework and the backstopping capacity of the government could also affect participants' behavior and the impact of systemic liquidity stress. While typical liquidity stress tests do not incorporate central bank support, it would be more appropriate to judge system-wide resilience, including liquidity support, in case of systemic liquidity stress. Financial institutions should hold sufficient liquidity buffers to counter institution-specific shocks, but not necessarily under a system-wide distress. Moreover, the perimeter of systemic liquidity support—especially to NBFIs and certain markets—could affect liquidity stress test results. The availability of deposit insurance, government backstops to emergency liquidity facilities, and FMs would also alter the likely behavior of agents in these markets.

65. The magnitude of the economic and financial disruption caused by systemic liquidity stress depends on the characteristics of the financial system. For example, stress could be successfully mitigated in jurisdictions with reserve currencies because the backstop capacity of the central banks is little constrained. As observed during the GFC and the early months of the COVID-19 crisis, major central banks managed to mitigate systemic liquidity stress successfully even though they needed to expand the perimeter of liquidity support to non-traditional counterparts and develop new instruments. The same does not necessarily apply

¹⁹ See MCM COVID-19 note "System-wide Foreign Exchange Liquidity Stress Tests (with excel tool)" by Oura and Leika.

to small open economies without reserve currencies, especially when the sources of systemic liquidity shocks are from the balance of payment stress. Such economies would need external finance to mitigate systemic liquidity stress.

66. Developing more comprehensive systemic liquidity analysis tools in FSAPs is an important objective. The near-term effort will include targeted and manageable pilot exercises building on experience gained in past FSAPs. A comprehensive systemic liquidity stress test would include the liquidity stress tests of key institutions, incorporating any spillover effects through direct exposures and major liquidity markets. It should use both institution-level liquidity position data and activity-based market transaction and positioning data. Conducting such analysis at the contract and securities level could require substantial investments in big data processing capacity – options for collaboration with regulatory agencies in such processing and analysis could also be explored given the specific challenges here.

F. Macrofinancial Linkages

67. FSAP risk analysis addresses macrofinancial linkages in several ways. First, macrofinancial linkages are often embedded in the models used to build macro scenarios for stress testing. FSAPs usually draw on existing DSGE models available at the IMF or models developed by national authorities. Second, reduced-form models to quantify macro-financial linkages—such as GaR and structural VAR (SVAR), including macro-level economic and financial variables—are also deployed. Such models describe the extent of macro-financial linkages parsimoniously at the aggregate levels but are not linked to core stress testing exercises (though they could be used to build scenarios). Third, FSAPs also seek to assess so-called “second-round effects” and measure the impact of financial sector distress—the output of the bank-level solvency stress tests—back to economic growth. This analysis of feedback loops between financial and macro stress is at the frontier of current research at the Fund and major central banks. Staff are also working on agent-based models, which model tail risks away from rational behavior in DSGE models and can include both macro- and micro-level linkages, but these have not been yet used in FSAPs.

Macro-Level Macrofinancial Linkage Analysis

Growth-at-Risk (GaR)

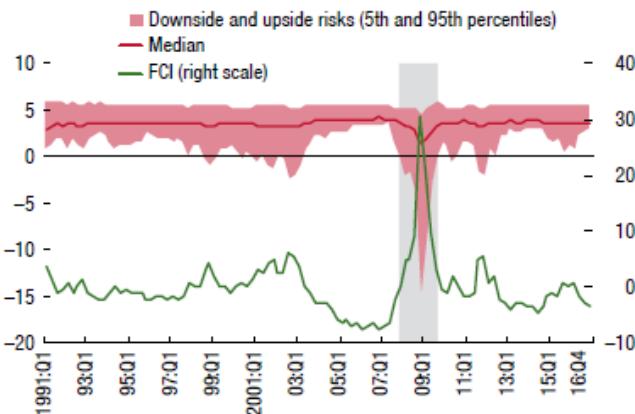
68. The GaR framework provides a high-level summary relationship between the real economy and financial conditions in an unlikely but plausible tail event.²⁰ It is based on the insight that macro-financial vulnerabilities can affect downside risks to economic growth differently from the median growth forecast. GaR forecasts the entire probability distribution of GDP growth conditional on a set of macrofinancial indicators. The non-linear relationship between GDP growth and financial conditions is estimated using quantile regression. For

²⁰ For technical details of GaR, see [IMFGAR on GitHub](#). See Prasad and others (2019) for the application of GaR in IMF surveillance.

instance, in the United States in early 2007, the forecasted bottom five percentile growth rate started to deteriorate more noticeably than the median forecast (Figure 11).

Figure 11. Growth-at-Risk and the Global Financial Crisis

(One-year-ahead GDP growth rate density forecast;
left scale = percent; right scale = standard deviations)



Source: IMF (2017b).

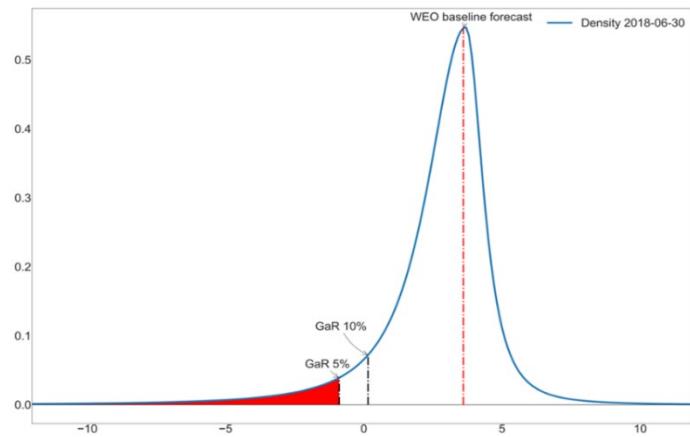
FCI = financial condition index.

The figure shows the time series of estimated, conditional 5th, 50th, and 95th quantiles of one-year ahead GDP growth. The median (red) line is the forecast of the 50th quantile of GDP growth made a year earlier. The shaded area in red shows the range between the 5th and 95th quantiles.

69. GaR estimation involves three steps. The first is to partition macro-financial indicators (such as credit spreads, interest rates, leverage, and external conditions) into distinct categories and extract common factors in each category using principal component analysis. The second step is to apply quantile regulations to measure the link between GDP growth and the common factors, to separate the strength of the link when the growth rate is close to median and at tails. The last step is to generate a full conditional distribution of GDP growth by fitting a distribution to the estimated conditional quantiles (Figure 12). Such a distribution enables an assessment of the upside and downside risks to growth as well as the probability of weak GDP growth at given future horizons.

70. Some recent FSAPs have used GaR to benchmark the severity of adverse scenarios in stress tests. Examples include Peru, Italy, France, Thailand, Canada, and Latvia. Historically, FSAPs relied primarily on the standard deviation of a two-year cumulative GDP growth rate to determine the severity of adverse scenarios. FSAP teams typically aimed at a two-standard-deviation shock, but the actual size varied as teams applied judgment to reflect the extent of vulnerabilities (i.e., bigger vulnerabilities, larger downturn). GaR provides a systematic, model-based approach to incorporating the extent of vulnerabilities in the severity of the adverse scenario. In particular, GaR will show more severe tail events when vulnerabilities are high.

**Figure 12. One-Year Ahead Conditional GDP Density Forecast
(In percent)**



Source: IMF staff calculations.

Note: WEO = World Economic Outlook.

The quantile regression results reflect the cumulative distribution of GDP growth—the bottom 5th percentile estimate means the likelihood of GDP growth rate being at that estimate or lower is five percent.

Dynamic Stochastic General Equilibrium (DSGE) Approach

71. DSGE models with financial sectors are widely used in macro-financial analyses to generate theoretically coherent and empirically-based dynamic interrelationships. These models encompass firms, households, financial institutions, the fiscal authority, and the central bank acting optimally in response to shocks in general equilibrium. Interpretable structural shocks—such as preference, technology, and risk premium shocks—drive the dynamics. Unlike reduced-form empirical macro models, there is no need to estimate structural shocks by imposing somewhat arbitrary assumptions on the order of spillovers among economic variables. DSGE models have many variants. Policymaking institutions often use the estimated New Keynesian DSGE models that incorporate a range of nominal and real rigidities. Since the GFC, researchers have been expanding the model with an array of macro-financial linkages and financial intermediation.

72. FSAPs have used DSGE models mostly for generating stress test scenarios. In most cases, teams used either the global macro-financial model (GFM) (Vitek, 2018) or IMF's Research Department's global projection model (GPM) (Carabenciov and others, 2013). GFM incorporates a variety of financial spillover channels while GPM mainly focuses on the trade channel. Given the role of the IMF as a multilateral policy institution, these models consider multiple countries and emphasize cross-border spillovers in contrast with the models used by national authorities. Such a feature is very important for FSAP for the home jurisdictions of global financial institutions.

73. The GFM is a New Keynesian DSGE model of the world economy. It covers 40 major advanced and emerging market economies—featuring extensive macro-financial linkages and diverse spillover transmission channels. It features a range of nominal and real rigidities, extensive macro-financial linkages, and diverse spillover transmission channels. These macro-

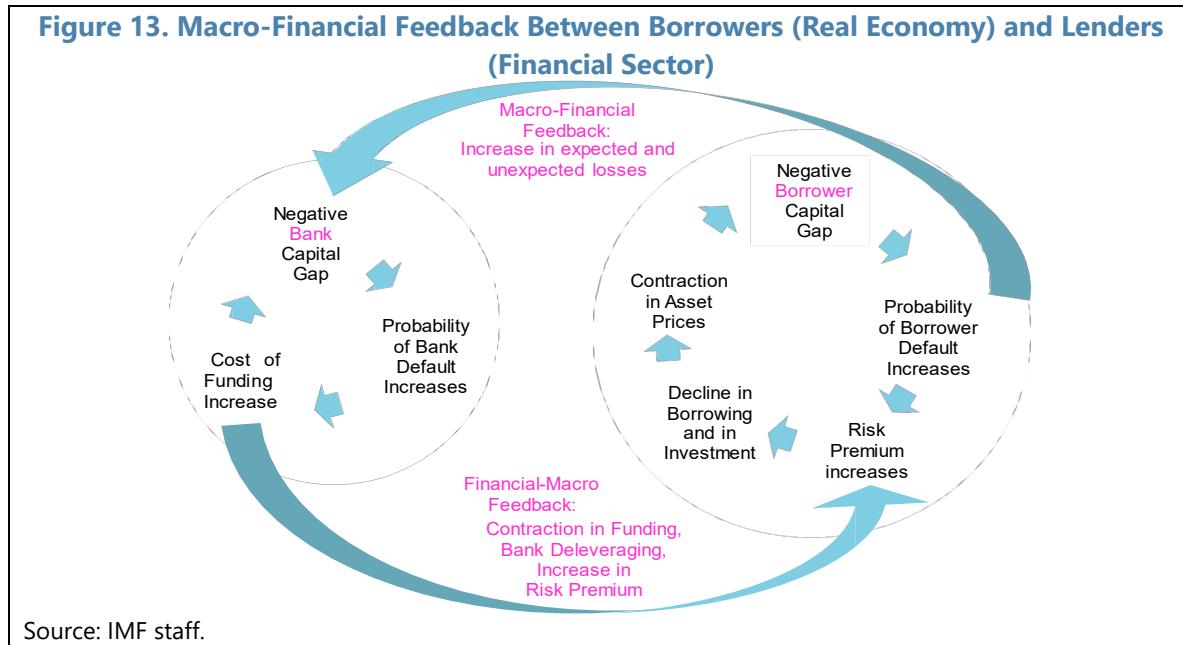
financial linkages encompass bank and capital market-based financial intermediation, with financial accelerator mechanisms linked to the values of the housing and physical capital stocks. Spillovers are transmitted via international trade, financial, and commodity price linkages. These international financial linkages encompass cross-border balance sheet exposures and contagion effects. Policies are represented in the GFM by sets of monetary, fiscal, and macroprudential policy instrument rules. The parameterization of the model is based on a mix of calibration and estimation. It has been used to analyze macro-financial policy, risk, and spillover effects for these and other Fund surveillance products.

74. More recently, DSGE models have also been used for the analysis of macroprudential policies. Examples include the effects of borrower-based measures in housing markets—and the adequacy of risks and capitalization. DSGE models are particularly suited for counter-factual analyses for new policy instruments as their dynamics are driven by structural shocks that have a clear interpretation and offer a narrative behind historical realizations and future simulations of macro-financial variables.

75. In the 2017 Netherlands FSAP, a DSGE model with the financial sector was used to simulate how different loan-to-value (LTV) ratios affect the volatility of macroeconomic variables. The response of aggregate consumption and investment to positive and negative income shocks was compared when households face an 80, 90, and 100 percent LTV ratio. A higher LTV ratio moderately increases financial intermediation in tranquil times. But the negative effects of higher LTV ratios during downturns from increased defaults and lower consumption and investment outweigh the benefits. The adverse response is non-linear, and the costs of increasing the LTV ratio from 90 to 100 percent are much higher than increasing it from 80 to 90 percent.

76. Another DSGE model has been used to identify financial cycles and capital gaps that may trigger macroprudential measures (Lipinsky and Miescu, 2019).²¹ The model estimates the deviations of bank and corporate capital from “desired” levels, where the desired levels of capital are determined to account for evolving risks. Actual capital accumulates only slowly, in line with bank and corporate income (Figure 13). The 2019 France FSAP used this approach to identify risks from the banking and corporate sector jointly and estimate capital needs.

²¹ The model features extensive balance sheet linkages between the banks and corporates as well as non-standard financial shocks. The model extends Christiano, Motto, and Rostagno (2014) with a banking sector. Bank-corporate feedback effects were particularly important in France because the corporate sector has been leveraging up sharply with both bank loans and corporate bonds.



Macro-Financial Analysis Linked to Stress Testing Exercises

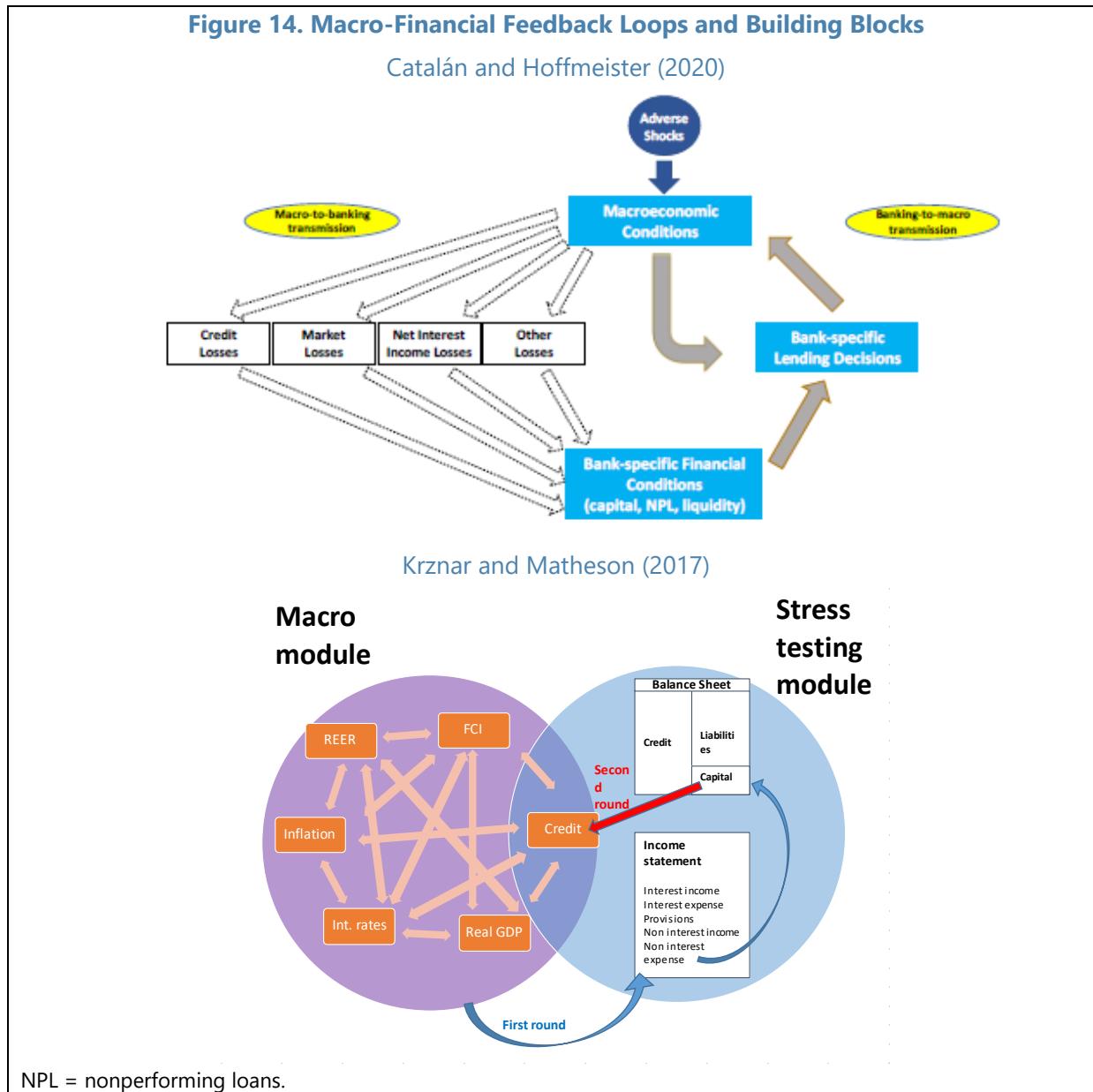
Structural Vector Auto Regression (SVAR) and Semi-Structural Approach

77. Staff have also developed empirical approaches to integrate macro-financial feedback effects into bank-level stress tests. Catalán and Hoffmeister (2020) developed a credit response and externalities analysis model that integrates bank by bank stress tests into an otherwise standard macroeconomic SVAR model. Krzner and Matheson (2017) developed a semi-structural modeling framework that facilitates the analysis of both the direct effects of macroeconomic shocks on the solvency of individual banks and feedback effects that allow for the amplification and propagation of shocks that result from bank deleveraging and credit crunches. The main feedback channel of both models operates via bank credit. Capital losses from adverse macro-financial shocks prompt banks to cut lending and contract their balance sheets. The resulting credit crunch amplifies the initial macro shocks. They have been developed in the context of technical assistance and AIV surveillance and are yet to be applied in FSAPs.

78. The models have several building blocks (Figure 14).

- **Catalán and Hoffmeister (2020):** The main macro block is estimated using an SVAR that includes endogenous macroeconomic variables and exogenous aggregate bank indicators. Then, a bank-by-bank satellite model block estimates the losses (credit, market, interest income, and others) in response to the changes in macroeconomic variables. The losses are put together to calculate key financial ratios (capital, liquidity, and non-performing loan ratios) for each bank, and the indicators are aggregated up for the whole banking sector. The aggregate bank indicators in the stress scenario are then put back into the macro block, and the process continues until micro-macro consistency is achieved.
- **Krzner and Matheson (2017)** embed a standard stress-testing framework based on individual banks' data in a semi-structural macroeconomic model. The macro model

characterizes an open economy where the relationships between the variables are determined by theoretical and empirical considerations. The stress testing module is a set of panel regression models that describe the behavior of the individual banks' income and expenses to key variables from the macro module. Panel credit equations link individual banks' capital (from the stress-testing module) to bank credit and output. The whole framework is estimated using Bayesian methods.



79. These approaches point to the limitations of applying static and quasi-static assumptions of bank balance sheet growth and exogenous scenarios in standard bank stress tests. The relative performance of banks under the test (i.e., the ranking of impact on capital ratios) changes depending on the balance sheet growth assumptions and incorporating macro-feedback effects. Banks that appear resilient (vulnerable) under a static balance sheet and exogenous scenarios could turn out to be vulnerable (resilient) when assessed through a

dynamic balance sheet approach and incorporating macro-feedback effects and endogenous scenarios.

Agent-Based Models

80. Agent-based models (ABMs) are a promising new simulation-based approach to capture macro-financial linkages. ABMs are an alternative to econometric/empirical and dynamic equilibrium models used by some central banks (though not yet in FSAPs). ABMs are simulation-based models that allow modeling macro-financial system dynamics “from the bottom-up,” based on individual agents, including firms, households, banks, central banks, and sovereigns. They involve heuristic behavioral rules, often with bounded rationality in contrast with rational expectation critical for equilibrium models.^{22,23}

81. Stress tests have always had some elements of ABMs, as they assume certain behavior of individual financial institutions. Yet, compared to an ABM, a typical stress test model does not have sufficiently rich behavioral rules, comprehensive agent groups (besides banks), explicit financial contracts, financial markets, or regulatory constraints. In an ABM, the agents may include banks, nonbanks, central banks, sovereigns, households, and firms. Financial contracts represent interlinkages between institutions (e.g., common asset holdings, counterparty exposures, funding provision, and collateral channels). Markets are crucial to determine the price formation process and the fair valuation of instruments. Constraints include regulatory constraints (e.g., capital, liquidity ratios), market constraints (e.g., leverage ratios), and internal constraints (e.g., internal risk limits). Agent behavior drives the overall dynamics of the macro-financial system.²⁴

82. Indeed, ABMs enable assessing complex interactions of many micro-elements of the financial system and evaluating their systemic impact, which is essential for macro-financial stress tests. In contrast with the mainstream macroeconomic approach with representative agents and equilibrium relationships, stress tests try to capture tail events, which usually entail sudden shifts in markets, so historical distributions may not adequately capture the non-linear dynamics under stress (Bookstaber, 2012). Financial instability assessment requires modeling behavioral assumptions and realistic constraints that explain out of equilibrium behavior. More specifically, a meaningful macro-financial stress test should include a granular agent-based economic system with financial sector focus, macro-financial feedback effects including dynamic balance sheets, and state dependence (i.e., non-linearities of some

²² LeBaron and Tesfatsion (2008) observe that mainstream macroeconomic models miss important elements, e.g., subsistence needs, incomplete markets, imperfect competition, inside money (credit creation), strategic behavioral interactions; and, therefore, call for the exploration of ABMs. Tesfatsion (2006a and b) are two general framework papers exploring the role of agent-based economics next to traditional equilibrium-based economics, including definitions of complex and complex adaptive systems.

²³ Heuristics (Simon, 1955) are decision rules which ought to reflect agents’ behavior who are cognitively limited and not able to understand the complexity of the world and to absorb and process all relevant information.

²⁴ For a general discussion in a stress test-oriented framework, see Aymanns and others. (2018).

kind). It is ideal to explicitly account for network interconnectedness between all agents in an economy as well.

83. The financial stability community has been developing agent-based stress testing models based on simplified balance sheet structures (BIS, 2015). It incorporates solvency-liquidity and macro feedback effects. The framework would allow policymakers to examine the capacity and willingness of the banking sector to support the economy under stressful conditions. The model incorporates behavioral responses of banks and nonbanks, examines the interaction of risks (credit risk, market risk, liquidity risk), endogenizes funding access (leverage), fire sales (portfolio rebalancing), and capital dynamics. When banks hit a constraint, they become destabilizing agents as they are forced to cut credit or sell undervalued assets triggering fire sales and curtailing financial intermediation. However, agent-based stress testing models are still experimental, and FSAPs have not yet used them for stress testing.

84. Staff are developing two prototype models to assess the macro-financial impact of a range of adverse scenarios in different banking sector structures. In the prototype model (Valderrama, forthcoming), simulations show that a temporary shock may morph into a long-lived shock eroding the solvency of the banking sector, depressing credit growth, and undermining economic growth. The analysis shows that attempts to regulate risk by tightening only bank regulatory requirements or restricting market access at the local level may be ineffective to contain systemic risk due to the linkages between the banking sector, the securities market, and the credit market. Instead, a system-wide perspective to prudential regulation, including banks and nonbanks, is needed.

85. A second prototype model is a larger-scale macro-financial ABM that features banks, households, firms, a sovereign, and a central bank. The purpose of the model is to assess the effects of both borrower-based and capital-based macroprudential policy measures in one model, which has a rich structure in terms of the bank loan granting process to households (for mortgages) and firms (for investment). The Eurace 2.0 model comprises an integrated balance sheet structure between micro agents within and across groups of agents (Gross, Hilberg, Hoog, and Kohlweyer, forthcoming).

G. Macroprudential Policy

86. FSAPs have made progress in using quantitative analysis to provide macroprudential policy advice. Most FSAP reports provide a comprehensive assessment of potential vulnerabilities, including broad-based vulnerabilities from rapid overall credit growth, sectoral vulnerabilities from the indebtedness of the household and corporate sectors, vulnerabilities from liquidity and FX mismatches, and structural vulnerabilities from interconnectedness, including between the bank and nonbank financial system. FSAPs can formulate macroprudential policy recommendations based on early warning and leverage indicators in the guidance note (Table 1 in IMF, 2014) and FSAP risk assessment incorporating existing risk mitigants. For instance, the 2018 France FSAP identified vulnerabilities in the corporate sector based on its analysis of interest coverage ratios (debt-at-risk) and recommended action to control these risks. It also argued that household sector vulnerabilities

were more contained as a result of a shift towards fixed-rate mortgages and a leveling off of house prices.

87. Some FSAPs have more recently conducted a dedicated analysis to help guide the calibration or assess the impact of macroprudential tools. For example, the 2018 Romania FSAP used credit register data to identify thresholds for the sensitivity of borrowers' probability of default to DSTI, thereby guiding the calibration of a cap on DSTI. As discussed earlier, the 2017 Netherlands FSAP used a DSGE model to assess the macroeconomic impacts of a housing shock for different LTV ratios. And the 2018 Peru FSAP assessed the impact on bank lending of a tightening of capital buffers, using bank-level data in an event study around an increase in capital requirements.

88. The more explicit use of solvency and liquidity stress test methods to inform the assessment of the macroprudential stance may be explored in the future. To adequately inform macroprudential policy, the stress test scenario should be more severe when economic and financial conditions are more buoyant. Such test results can then inform buffer sizes (e.g., for the countercyclical capital buffer or sectoral buffers). Stress testing tools and models can also be used to conduct an ex-ante impact assessment of possible future measures. In addition, analytical tools using microdata can be considered more explicitly in the future to inform the calibration of borrower-based tools (such as LTV and DSTI). As the financial system continues to involve, tools will also need to be developed and refined to allow for a quantitative assessment of risks in the nonbank financial system and the calibration of policy responses in this increasingly important area.

H. Improving Efficiency

89. Improving the efficiency of core quantitative tools is critical to expanding risk analysis in FSAPs within the established resource envelope. Results of the survey of stakeholders suggest an expectation for more work on emerging risks, broader types of interconnectedness, and macro-financial linkages. At the same time, staff see a crucial need to continue core bank stress tests to support the value of independent FSAP assessments. Therefore, improving the efficiency of core risk assessment tools is critical for preserving the quality and breadth of FSAP risk assessment.

90. Over the past five years, the use of quantitative tools has expanded, while the overall FSAP cost has remained broadly flat. In addition to bank stress tests, more FSAPs have covered the risks from NBFIs and interconnectedness. The trend is similar to the scope of central banks' financial stability reports. However, the central banks have substantially increased resources allocated to financial stability analysis.

91. Going forward, staff will standardize core quantitative tools, which will improve efficiency. Staff are undertaking work to standardize core risk analysis for different data environments, accompanied by detailed guidance notes and files/codes on a refreshed webpage dedicated to the topic to support FSAP teams. Staff are also working to develop a tool to efficiently estimate various satellite models for stress tests and check their performance—one

of the most time-consuming parts of building a stress testing framework. More broadly, shifting quantitative analysis away from excel-based tools to program codes could increase efficiency and accuracy and help validate stress testing frameworks.

92. Nonetheless, such efforts will be constrained by the need to tailor risk analysis to country-specific conditions. For one, bank-level supervisory reporting format differs substantially across jurisdictions, in part owing to the difference of accounting standards, bank business models, and main risks. Economies also adopt different supervisory approaches—such as on loan-loss provisions, collateral valuations and loan-to-value calculation, securities and derivatives valuation, and off-balance sheet items—and intrusiveness, which require adjustment for cross-country consistencies. While internationally active banks are subject to Basel III rules, some jurisdictions apply different rules for domestic banks, and many jurisdictions without global banks follow Basel II or I rules. A standardized tool should be flexible enough to handle these country-specific characteristics in key risks, transmission channels, regulations, and data.

93. Several projects are already underway to improve the efficiency of existing tools.

- **Bank stress test tools:** MCM has been producing numerous internal guidance notes and mostly excel tools posted on the internal Knowledge Exchange site in addition to published policy notes and working papers. These internal notes and toolkits are now being updated and expected to be finalized in the next couple of years. Staff will collate these in an internal operational reference note for FSAP teams. There are also ongoing technical projects, including a tool to rapidly estimate satellite models using various techniques and a project to develop stress testing codes rather than spreadsheets. Staff is also operationalizing and planning to disseminate the simplified bank stress testing tools with publicly available data—the GST and the UST—which could also help financial surveillance in Article IVs.
- **Stress test scenarios:** Recent FSAP stress test scenarios have been usually simulated by the GFM, but the maintenance and implementations of the model had been dispersed among a handful of MCM staff across divisions. The creation of the modeling unit in MCM and its role in implementing the model for FSAP scenario design should improve efficiency and also support the consistency of scenarios across FSAPs.
- **Growth-at-Risk:** The GaR tool is unique for two reasons. First, the user-friendly package—Excel interface with underlying Python codes—was developed with close coordination of MCM and ITD. Second, the whole package is published in [GitHub](#)—the largest community for software developers—free of charge. Applying the same approach for other tools could improve the efficiency of the FSAP risk analysis process despite initial development costs.
- **Corporate sector stress test tools:** As discussed in the NFC stress test section, a corporate risk assessment tool is under development to support FSAPs and bilateral based on Tressel and Ding (forthcoming). In addition, staff are able to access the BuDA tool to implement macro scenario corporate stress tests with little human resources.

94. External dissemination of FSAP quantitative tools will improve communication with national authorities. The publication of methodological notes will facilitate discussions with authorities.

EMERGING RISKS

95. Quantitative methods in FSAPs have been adapted to support analysis of emerging risks, and new approaches will continue to be developed in the future. Unlike the assessment of financial sector oversight and safety nets, there are no prescriptive global standards for quantitative risk assessment. Given the rapid evolution of data availability and statistical and quantitative techniques in the field, the financial stability community has considered broad best practice “principles,” supporting a wide range of tools including those that may have been recently developed (BCBS, 2018 and IMF, 2012).²⁵ These approaches have been useful for many members of the Fund (see SM/21/53, background paper on traction), and staff would continue to develop new approaches to assess emerging risks.

A. Climate Change

96. Analyzing the financial stability implication of climate change raises key new analytic and data challenges for FSAPs. There is a need to obtain data and build a framework to assess which risks are material for members. And then to design plausible scenarios at different horizons. The choice of horizon is an important issue in financial stability analysis. Typical bank stress tests focus on the 3-5-year horizon. The climate science literature usually considers long-term “pathways” up to 2100 (see Box 1). Thus, a key feature of the staff’s proposed approach for FSAPs is to assess both short- and long-term financial stability risks from climate change. And finally, to map macro-financial consequences of these into FSAP stress testing framework. The landscape here is complex and is summarized in the appendices.

97. Financial stability risks from climate-change-related events can be broadly categorized into physical and transition risks:

- **Physical risks** represent physical damages related to the direct and indirect consequences of climate change. They can materialize as extreme events (acute physical risk caused by natural disasters such as cyclones, floods) or via the effects of more slow-moving, long-term changes in climate patterns (chronic physical risk such as sea-level rise, and drought among others).
- **Transition risks** pertain to the consequences of changes in public policies and technology aimed at mitigating the effects of climate change and adjusting towards a lower-carbon economy. They are often modeled as higher carbon price scenarios aimed at mitigating rising temperatures.

²⁵ BCBS (2018) listed nine principles, including “stress testing framework should capture material and relevant risks and apply stress that are sufficiently severe” and “stress testing practices and finding should be communicated within and across jurisdictions.” IMF (2012) listed seven principles, including “focus on tail risks” and “define appropriately the institutional perimeter for the tests.”

Box 1. Long vs. Near-Term Scenarios for Analyzing Climate Risk

The Network for Greening the Financial System (NGFS)—an expanding international group of central banks and financial supervisors, currently comprising 75 members that the IMF has joined as an observer—is developing scenarios over an 80-year horizon (2020-2100). The scenarios are based on specific global temperature targets and the “Middle of the road” Shared Socioeconomic Pathway built by an international team of climate scientists, economists, and energy systems modelers. They are to be used in assessing the impact of climate policy and technology shocks (NGFS, 2020).

Some of the “representative” climate scenarios published by the NGFS in June 2020 have been used, *inter alia*, by Banque de France staff in their scenario analysis to assess the implications of climate-related transition risks for financial stability in France (Allen et al., 2020). The Bank of England also plans to adopt NGFS scenarios in its bottom-up “Biennial Exploratory Scenario (BES)” analysis of climate-related risks (Bank of England, 2019).

Staff from the Dutch Central Bank, on the other hand, analyzed the exposure of Dutch financial institutions to policy and technology-related transition risks over a 5-year risk horizon by adopting energy transition scenarios not explicitly tied to a temperature outcome (Vermeulen et al. 2018). Similarly, the European Systemic Risk Board (ESRB) adopted two interrelated exploratory scenario analyses to assess transition risks for the EU banking and insurance sectors over a 5-year horizon with no explicit link to a specific global temperature path (ESRB, 2020).

The two types of analysis can be seen as complementary to each other: the use of longer-term scenarios allows to better capture the impact of climate change itself and of the societal response to it along the pluri-decadal horizons over which they’re expected to manifest themselves in full; the near-term perspective, on the other hand, allows to focus on the immediate dangers and challenges for financial stability and to draw more operational indications for action in the shorter term. The latter perspective is more closely aligned with the use of quantitative analysis in FSAPs, i.e., as a tool meant to gauge risks on a system-wide level and propose mitigating measures.

98. FSAPs have been assessing the impact of climate-related natural disaster events on financial stability, including banks, for some time. A textual analysis of 192 FSAP reports (up to 2019) found that 33 (17 percent) contained meaningful references to risk factors such as droughts, floods, and storms. Many of these are for small island states (such as the Bahamas, Jamaica, and Samoa), but some assessments for advanced economies (such as the United States, France, Belgium, Denmark, and Sweden) have also covered natural catastrophe risks as part of insurance stress testing. More recent FSAPs have developed new approaches to assessing climate change risk, e.g., transition risk in the 2019 [Norway FSAP](#) (Box 1) and physical risk in the 2021 [Philippines FSAP](#).

99. Significant effort and collaboration will be needed to develop stress testing tools for climate change risks and deploy them regularly in FSAPs. This work will require close inter-departmental collaboration within Fund departments and with partners such as the World Bank, the United Nations (UN), and the NGFS (Box 2 describes the scenario design agenda of the NGFS). Technical details are discussed in the appendices.

Box 2. Transition Risk in the Norway FSAP 2020

In the pilot, three possible transmission channels for transition risk shocks to the financial system were explored:

- The impact of a substantial increase in domestic carbon pricing on banks' credit exposures, such as loans, via its effect on corporates' operating costs and profitability, under severe assumptions.
- The impact of a drastic increase in global carbon prices on the domestic economy on banks' loan losses via the fall in the revenues of domestic oil producers.
- The impact of a forced reduction in the production of domestic oil firms on their share prices and, in turn, on the net wealth of domestic shareholders (such as households or financial and nonfinancial corporates).

Results show that a sharp increase in carbon prices would have a significant but manageable impact on banks (IMF, 2020b and Grippa and Mann, 2020).

B. Cyber Risk

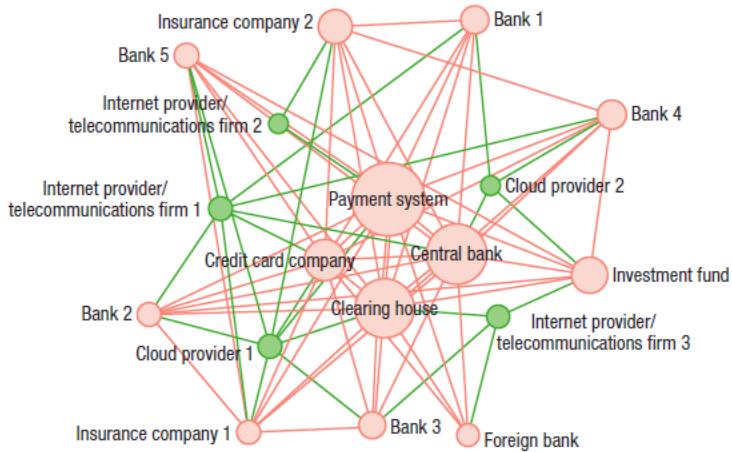
100. Cyber risk is a growing source of potential systemic risk to financial sectors.²⁶

Financial systems are particularly vulnerable to cyberattacks, given the increasing reliance on information and communication technology (ICT) systems. The “entry points” of attacks could be diverse, including in-house systems as well as the systems of the third-party vendors, contractors, clients, retail partners, or counterparties in trades. An attack on a handful of firms could spread to the whole financial system quickly both through the interconnection of the ICT as well as the inherent interconnectedness in the financial system through cross and common exposures, the collapse of key liquidity markets and FMIs, and correlated reputational risks. Cyberattacks can be systemic if they target several financial institutions simultaneously or a systemically important financial institution (SIFI), such as Global-SIFIs, central banks, and FMIs. Spillovers may also come indirectly from attacks to key ICT providers and physical infrastructures (such as utilities, Figure 15). Cyberattacks could also exacerbate an emerging financial crisis by propagating disinformation, undermining confidence, or disrupting safety nets (Healey and others, 2018). Direct and indirect cyberattacks to the financial system could stall key payments and settlement transactions, liquidity crunch to banks, and mass insurance claims from the policies that cover the cyber risk, among others.

101. Quantitative analysis of fintech and cyber risks has been limited, and further experimentation will be needed, also reflecting data constraints.

Some FSAPs have gathered descriptive information on cybersecurity practices through interviews (Namibia) and on potential losses from cyberattacks through questionnaires (Poland). Bouveret (2019) explores potential loss estimates as research work, but not in FSAP's financial stability risk assessment.

²⁶ The term cyberattack is used here generically, and it includes Distributed Denial of Service attacks, website vandalism, data breaches, data manipulation, and theft of funds.

Figure 15. A Cyber Mapping Exercise: An Example

Source: IMF (2019b).

Notes: Supervised financial institutions are in pink and third-party technology providers (could be service and internet providers) are in green. The size of the circle on the diagram is proportional to the degree of centrality, the measure of interconnectedness, and the importance of an entity (i.e., the note of the network). The stylized scheme illustrates a network in which important and central institutions—for example, a payment system—depends on a single internet provider, making a technology firm a crucial piece of the system and revealing potential vulnerabilities.

102. The Euro Area FSAP conducted a cyber risk-motivated liquidity stress test of banks. The stress test simulated a scenario in which banks could not access their collateral at central counterparties for five business days.²⁷ It identified some vulnerabilities, especially at internationally active banks. This approach has shown that a stress tester can assess some aspects of cyber risk with the conventional stress test toolkits for liquidity, solvency, and interconnectedness. For example, a cyberattack on a bank could be the reason behind the funding stress simulated in a liquidity stress test or behind the initial bank failure in a network analysis of contagion risk. Similarly, conventional capital and liquidity buffers can also be considered sources of resilience against cyber risk.

103. The Singapore FSAP broadened the types of cyber risk analyses to assess financial stability. The authorities provided data on historical cyberattacks that the team analyzed over time and across firms. Banks provided cyber risk scenarios that they thought would be most impactful to themselves, as well as the associated loss estimates and management actions. These scenarios assisted the authorities in developing their inventory of scenarios. Selected scenarios were presented in a Cyber Risk Assessment Matrix, which is an application of the FSAP Risk Assessment Matrix concept to cyber risk. Insurers were asked to estimate the losses they would incur if their ten largest policyholders of affirmative and silent cyber coverage were to experience cyberattacks and thus claim on their insurance policies.²⁸ These losses were assessed

²⁷ The other scenario parameters, like deposit run-off rates, were chosen to match the traditional five-day liquidity stress tests. In particular, run-off rates were not increased for the cyber risk scenario.

²⁸ Some policies are explicitly targeted at insuring cyber risk (affirmative coverage). Cyberattacks could also lead to claims on other types of insurance policy, like fire insurance, which the insurer would have to pay (silent or non-affirmative coverage).

to be manageable after accounting for reinsurance recoveries, but insurers identified a need to restrict their implicit cyber coverage.

104. Data constraints on cyberattacks and losses remain a key challenge. Towards overcoming challenges from the data constraints, Goh and others (2020) discuss methods and data that can be used to analyze cyber risks in FSAP and country surveillance. Key indicators of cyber risk such as event frequency, distribution across sectors, and cybersecurity budgets can be tracked over time. Kamiya and others (2018) and Bouveret (2019) analyze historical data to estimate the likelihood and severity of cyberattacks, but to be applied in FSAP, they must overcome the sparsity of cyberattack data in any one individual country. To do so, Goh and others (2020) suggest applying existing models to data from the country of interest rather than attempting to re-estimate them using data from the given country. Another analytical approach recommended by IMF (2019b) is to develop a list of financial and nonfinancial institutions and the information technology links and financial exposures between them—namely, the cyber risk mapping exercise (Figure 9). Once data become available, one could estimate institution-level impact using the techniques from broader operational risk assessment tools. Under the Basel rule, banks are required to set aside capital to cover potential losses from operational risks, including cyber risks. Recent IMF papers (e.g., Bouveret, 2019) and FSAP ([2019 Singapore](#)) have taken these techniques. The challenge is to assess their systemic impact, incorporating potentially devastating contagion effects, including those from third-party IT service providers.

C. Fintech

105. Quantitative analysis of financial stability risks from fintech is still at an early stage. This reflects in part the still early stages of development of these technologies and that many of the nascent risks are operational in nature.²⁹ There is also a need to build a conceptual framework to understand the interplay between financial innovation, financial stability, and fintech policies reflecting efficiency-stability tradeoff. Full assessments will require the development of a framework to model the incentives for financial innovation and risk-taking by incumbents and entrants and the roles of market structure and government policies in balancing risk-return tradeoffs from innovation versus stability. Data gaps and rapidly changing landscape also hinder quantitative assessment.

106. Quantitative analyses of some aspects of fintech risks have been piloted in some recent FSAPs ([2019 Singapore](#) and [2019 Korea](#)). The analysis aimed to understand the impact of fintech on financial stability both in the medium- and long term, addressing efficiency-stability tradeoffs, the impact of policy, and highlighting the role of market structure and uncertainty surrounding technology. The exercises estimated the potential non-interest income reduction for incumbent banks, conditional on the increased competition by new entrants. In the case of Singapore, it also estimated potential gains from fintech with the changes in the unit

²⁹ See, for example, “FinTech and market structure in financial services: Market developments and potential financial stability implications,” FSB, 2019.

cost of financial intermediaries.³⁰ The analysis suggested that the unit cost of financial intermediation in Singapore has been around 1.5 to 2 percent for the past decade, similar to that of the United States, pointing both to the scope for eroding earnings and putting pressure on banks and to the potential gains from fintech development going forward in Singapore. In Korea, the income shock was introduced into the stress testing framework to illustrate the potential impact on bank capital.

DATA CONSTRAINTS

107. FSAP missions face two sources of data constraints: availability (i.e., gap) and access. Some data do not exist—especially data for interconnectedness, shadow banks, and emerging risks. When the financial sector landscape is rapidly changing—such as fintech and shadow banks—existing reporting formats are likely to be obsolete quickly. At the same time, not all data collected by country authorities or international organizations are accessible to FSAP due to their confidentiality. Accessibility depends critically on authorities' willingness to share them. For global data that include financial institutions from multiple jurisdictions, the Fund would need permission from all of them.

108. For conventional risks, data availability has improved notably since the GFC.

- **G-20 Data Gap Initiatives:** The [G20 Data Gaps Initiatives](#) (G20 DGI) aim to close the data gap considered relevant after the GFC. It includes 1) monitoring risk in the financial sector (Financial Soundness Indicators, leverage and maturity mismatches, and complex structured products); 2) international network connections (G-SIFI data, international banking statistics, coordinated portfolio investment survey, international investment positions (IIPs), and cross-border activities of NBFIs; and 3) sectoral and other financial and economic datasets (sectoral financial accounts). As of 2020, while notable progress has been made in many areas, gaps remain with the data for systemic risks for insurers, sectoral accounts, currency composition of IIPs, and commercial property prices (FSB and IMF, 2020). There is also an ongoing discussion to extend the exercise beyond the end of the current initiative in 2021. In addition, the FSB now publishes an annual global report on NBFIs.
- **Activity-based data:** Creations of new and centralized FMIs—such as CCPs—and the development of big data techniques leveraging digitalization of finance allow supervisors to monitor activity-based transactions and exposures that include all entities active in markets. Such data include shadow banks and NBFIs required to report or disclose little data (e.g., hedge funds). As a result, there is new and quickly expanding literature on financial stability analysis using data collected by FMIs (see the discussion on systemic liquidity in the interconnectedness section).

³⁰ Financial institutions channel sources of funds to users of funds by overcoming information asymmetries and managing the associated credit, liquidity, and other risks. They are rewarded for providing these financial services. Following academic research (Philippon, 2015), the total cost of financial intermediation in a country can be measured as the value-added of the financial sector that includes both labor wages and profits. The total quantity of intermediated assets by the financial sector includes all debt and equity contracts that are newly written and serviced in the economy.

109. FSAP access to confidential supervisory data from national authorities has improved over time, though with resource-intensive arrangements in several cases. For mandatory financial stability assessments, the share of jurisdictions providing access to confidential supervisory data for quantitative analysis has increased from 75 percent in the first assessments to 97 percent in the latest. However, for many jurisdictions—including European countries where the Single Supervisory Mechanism (SSM) supervises their banks—access has been allowed only in a specific physical location (a secure “data room”), increasing the FSAP team’s costs of the bank stress test exercise. For voluntary financial stability assessments in the past five years, all jurisdictions have shared at least some confidential supervisory data, even though the breadth of access and quality of data varied across FSAPs.

110. Future FSAPs could deepen cross-border interconnectedness analysis with access to more granular data collected by the BIS. Many FSAPs have benefited from publicly available country-level BIS cross-border banking statistics to assess vulnerabilities from cross-border interconnectedness. Country-aggregate ultimate-borrower-basis data—the data that labels banks’ nationality using their headquarters’ location of incorporation—are publicly available. When national authorities permit, FSAPs have also benefitted from access to locational data—the data that labels banks’ nationally using the physical location of their affiliates and therefore relevant especially for international financial centers. The institution-level G-SIB interconnectedness data—which are treated with utmost confidentiality including within the BIS—could further strengthen FSAP’s cross-border contagion analysis.

111. The Fund typically has little access to activity-based data collected by FMIs, but some recent FSAP exercises have made notable exceptions. FMIs—many are private sector companies—typically share data with authorities that have supervisory power over them or a subset of data that involves institutions or assets supervised by a certain agency.³¹ As a result, the Fund has rarely had access to these data, especially some FMIs that handle global transactions and therefore critical for monitoring cross-border market transactions, except for a few cases. Some Fund staff worked with counterpart authorities on the side of the FSAP to produce a research paper using FMI data. 2019 France FSAP attempted to create an interconnection map for banks, insurers, and investment funds using their respective security holding data. Nonetheless, the data had to be created from multiple sources under the supervision of different agencies; each of them has different confidentiality protocols and structures. This made data management extremely challenging, even when authorities are willing to conduct such exercises.

112. For emerging risks, data existence and access vary across the risks.

³¹ For example, the Depository Trust & Clearing Corporation (DTCC) in the United States provides clearing and settlement services for equities, bonds, unit investment trusts, mortgage-backed securities, money market instruments, and over-the-counter derivatives—including CDS. During the height of the European sovereign debt crisis, the Bank of Italy monitored Italian sovereign CDS positions using the DTCC data, as most sovereign CDS were traded in the United States. Nonetheless, the bank could not access the data for other sovereigns except for the positions held by Italian institutions.

- **Climate change:** There are relatively ample climate data and forecasts from climatology literature. Regarding the economic impact, the potential likelihood and impact of physical risk have long been a subject of catastrophe modeling developed by insurers.³² However, the industry's estimates tend to focus on events in advanced economies with high insurance coverage and potential claims.³³ The underlying data and models are useful for developing stress testing tools for broader types of financial institutions.
- **Cyber-risk:** Cyberattack databases are being constructed by national authorities and private sector platforms, though they may not be comprehensive. Financial supervisors may not have access to incidents for nonfinancial corporations, including companies that offer IT systems for financial institutions. Incident reports may not include monetary loss figures, and even when there are, information tends to be limited to legal costs. Access by FSAP missions may require a national security clearance, well beyond the level of confidentiality agreement FSAP typically handles.
- **Fintech:** Fintech suffers the most from data gaps. Fintech firms and the technologies and services they offer are all new. The challenges are similar to those with shadow banks and even more severe. New technologies could quickly and completely transform the industry landscape with many new and unregulated-monitored entities and markets.

113. Data constraints for FSAP risk analysis could be improved by both assisting the authorities to develop new data and by increasing access to confidential data.

- **Improving data existence:** IMF's statistics department, sometimes jointly with the IT department, has been actively providing technical assistance to develop many country-aggregate data in the context of the G20 Initiatives. FSSR for lower-income economies discusses financial data development in their diagnosis, and its TA roadmap usually includes data components.
- **Improving access to data:** Staff welcomes Board's support for encouraging national supervisory agencies in their constituencies to share data with FSAP teams as standard practice. In particular, electronic remote access to data could substantially improve efficiency and save costs for FSAP risk analyses.
- **Exploring alternative approaches:** An alternative approach to managing data access challenges is to develop codes to implement the analysis and ask counterparty authority to run it and receive the results. So far, the core risk analysis tools are built in Excel—the main workhorse of the IMF country team's macroeconomic forecast. Excel is also suited for disseminating tools to the diverse membership of the IMF. However, it requires direct access to the data. While a code-based approach would make FSAP-like risk analysis less accessible by Article IV teams, the potential benefit for circumventing data access constraints could be sufficiently large.

³² For example, see Lloyd's 2014 [Catastrophe Modeling and Climate Change](#).

³³ For instance, Lloyd's maintains a set of mandatory Realistic Disaster Scenarios to stress test both individual syndicates and the market as a whole. Most of these events take place in the US, Europe, and Japan, where disaster insurance coverage is high.

SUPPORTING FINANCIAL SURVEILLANCE IN ARTICLE IV

114. FSAP quantitative tools can help strengthen macrofinancial analysis in Article IV consultations. Article IV reports have used a variety of vulnerability indicators, balance sheet analysis, and, more recently, Growth-at-Risk tools.

- **Vulnerability indicators.** Indicators used in FSAPs have been used to analyze the links between the financial cycle and the business cycle. In particular, the credit-to-GDP gap, defined as a deviation of credit from the simple HP trend or a trend estimated using a semi-structural model, has been used to inform the recommendations on system-wide macro-prudential tools such as the countercyclical capital buffer.
- **Growth at risk.** Some Article IV teams have used the GaR as a forward-looking tool for the assessment of downside risks to growth and the identification of vulnerabilities that can trigger systemic risk.

115. Going forward, staff plan to provide a broader menu of FSAP quantitative tools to help strengthen financial surveillance in Article IV consultations. Depending on the financial vulnerabilities of their country, desk economists could choose the priority area and the corresponding quantitative tools.

- **Simple stress testing tools.** The standardized GST and UST tools using publicly available data would allow Article IV teams to carry forward the bank solvency analysis. The system-wide FX liquidity stress testing tool uses BSA data and links system-wide liquidity shortages from balance of payment shocks to bank liquidity stress test analysis. The tool could enrich the reserve adequacy discussion in Article IVs.
- **NFC and household vulnerability assessment tools.** The new macro scenario stress testing tools developed by Tressel and Ding (forthcoming) for NFCs could help Article IV teams to strengthen their NFC vulnerability assessment, especially in the context of COVID-19. MCM is also developing multiple household vulnerability assessment tools, and some are explicitly linked to calibrate borrower-based MPMS.
- **Tools to analyze macro-feedback effects and inform macroprudential policy advice.** The macro-financial linkages models that are currently under development could be used in Article IV surveillance to capture the two-way macro-financial feedback effects. Some of these models can also help inform the calibration of broad-based macroprudential tools.
- **Stress testing results and other policies.** Some elements of FSAP stress testing can also inform policies not covered by an FSAP but relevant in the context of Article IV surveillance. For example, liquidity stress tests can be used to calibrate the reserve requirement as a prudential tool rather than a monetary policy tool when adequate. Foreign currency liquidity stress tests could be used to inform the adequacy of international reserves and assessment

of exchange rate misalignment. Borrower-based MPMs could be informed by household and corporate sector analysis, and cyclical capital measures could be calibrated using the macro-financial feedback effect models that incorporate bank stress tests. The analysis of the sovereign–bank nexus in the solvency stress test could be used to inform the public debt sustainability analysis. The stress tests for climate risk could trigger policy advice on demographic, industrial, labor policies to limit the ultimate financial stability impact of climate change.

Appendix I. Approach to Assessing Climate Change Risk in FSAPs

1. Three stages. We envisage a three-stage approach to assessing climate risk in FSAPs.

First, we will begin with a diagnostic and assessment of what are the principal sources of risk facing individual jurisdictions that may arise from climate change. Second, risks identified in the previous first step will then be linked to specific scenarios of the evolution of physical and transition climate risks. Third, to map climate scenarios into the resiliency of banks, two approaches could be used depending on the level of data granularity and the scope of the analyses.¹ In some cases, a macro approach would be to map climate risk scenarios from stage 2 into corresponding macro-financial scenarios and use them in standard stress testing methodologies based on financial institution data to assess the implications of climate risks for the banking system's resiliency. If granular data is available, a micro approach focusing on borrower-level assessments could be considered. This would involve a comprehensive analysis of the impact of climate and macro scenarios on the performance of corporates, households, and the public sector, building up to bank-level stress tests. While the staff will seek to build a common general framework for climate risk scenario analysis, the approach in each FSAP will be country-specific, depending on data granularity.

2. Climate risk scenario analysis is not a standard stress test. It is important to note that climate risk scenario analysis is not a standard stress test where bank resilience is assessed based on fail-or-pass criteria and the hurdle rates. In contrast, the objective of the climate risk scenario analysis is to assess pressures on capital to gauge the magnitude of the challenge facing the banking system and the concomitant need and opportunity for adaptation. This would also spread the awareness of the challenge and the need to develop tools to manage the risk by banks and supervisors and potentially drive gradual early adjustment by banks.

3. Challenges. Developing credible climate scenarios, given the unprecedented uncertainty, is difficult. This will require drawing on external expertise to develop paths for physical and transition risks and associated macro-financial scenarios. On top of these fundamental uncertainties, the sectoral and geographical granularity of the impact of shocks is likely more pronounced in the case of climate as opposed to standard macro-financial shock analysis.²

¹ Ideally, granular data needed would include information on banks' exposures to companies/households stratified by geography (e.g., flood plain) and carbon intensity (e.g., lending to utilities generating power from fossil fuels).

² Climate risk is a long-term phenomenon where the benefits of policy actions today will emerge towards the end of the 21st century. This is well beyond the typical stress testing horizon for banks. There is a high degree of uncertainty in climate science models and associated policy scenarios, partly because the risk is "black swan"—something that never happened before but could happen in the future. The difference across scenarios may appear mostly at the far tail, e.g., once in 250- or 500-years events that are commonly used in the insurance sector but not in the banking sector, which tends to be the focus of most systemic risk analysis. Lastly, unlike typical macro-financial risk factors, climate change is expected to have a differentiated impact across industries and locations. As such, economic and credit risk models with multiple industries linked to detailed analyses of nonfinancial corporations and geographical characteristics will be needed to conduct a more accurate assessment.

Stage 1—Climate Financial Risk Diagnostic

4. A diagnostic of the exposure of a member to specific climate risks is the place to start. MCM will build a heatmap to help FSAP teams in deciding on the scope of the assessment and relevant physical and transition risks. Climate risks span physical risks (stemming from exposure to extreme weather-related events and the effects of more slow-moving, long-term changes in climate patterns) and transition risks (from the impact on balance sheets of changes in public policies, technology, market sentiment, and consumer preferences linked to climate change mitigation and to the transition to a lower-carbon economy). Exposures to these risks are different across countries and financial systems. FSAP teams will need to develop a climate risk assessment matrix (C-RAM). The C-RAM would identify specific and material climate risks and their likely channel of impact and would be informed by the global climate risk assessment in the G-RAM.

5. The heatmap would pull together data from identified datasets to provide an operational assessment of the potential exposure of each country to different climate risks. We expect that the FSAP teams going forward will increasingly be able to apply the climate risk stress testing methodologies (stage 2 and 3) for climate risks that appear material. It will also be important to consider spillovers of climate risk from other countries as relevant (e.g., higher imported energy prices due to higher carbon taxation in trading partners or a materialization of hazards in a country where banks have exposure). The heatmap could also inform bilateral surveillance work by AIV teams.

Stage 2—Designing Climate Scenarios

6. While there is much debate over the relevant horizon, climate change is generally considered a long-term challenge. For physical risk, designing climate scenarios entails mapping scenarios for emissions and global temperature pathways into projections of climate-related events typically over a 50-80-year horizon. For transition risk, climate scenarios consider the endogenous impact of policies to mitigate climate change, technological change, and consumer preference shifts as a function of emissions and temperature scenarios. Regarding emissions and temperature pathways, the climate community relies on standard scenarios agreed upon within international groupings which span the period 2020-2100. These Representative Concentration and Shared Socioeconomic Pathways (RCPs and SSPs) are the basis for scenarios developed for financial stability analysis and policy formulation by the NGFS.

7. Climate change risks could, in principle, prove material for the financial sector within the 3-to-5-year horizon typically considered by stress testing exercises in FSAPs. Key channels differ depending on the nature of risks and judgment about how the likelihoods of natural disasters will change because of climate change and how (and with what probability) transition risks could materialize. These uncertainties motivate the possibility that physical or transition risks could arise within the 5-year horizon of FSAPs. Moreover, the increasing likelihood of the realization of long-term costs (including from stranded assets) could feed back into shorter-term horizons via a reassessment of market valuation of companies and thus banks

and potentially into forward-looking assessments of credit losses for very long-term investments.

8. Staff, therefore, propose to build a climate risk stress testing methodology for FSAPs that will consider both medium-term and longer-term climate risk scenarios. This reflects that financial sector resilience could be undermined by both the uncertainties and delays with reallocating financial resources across sectors in the face of climate change and the transition to a low carbon economy. The elements feeding into the specifics of climate scenario design are developed further below.

Physical Risk

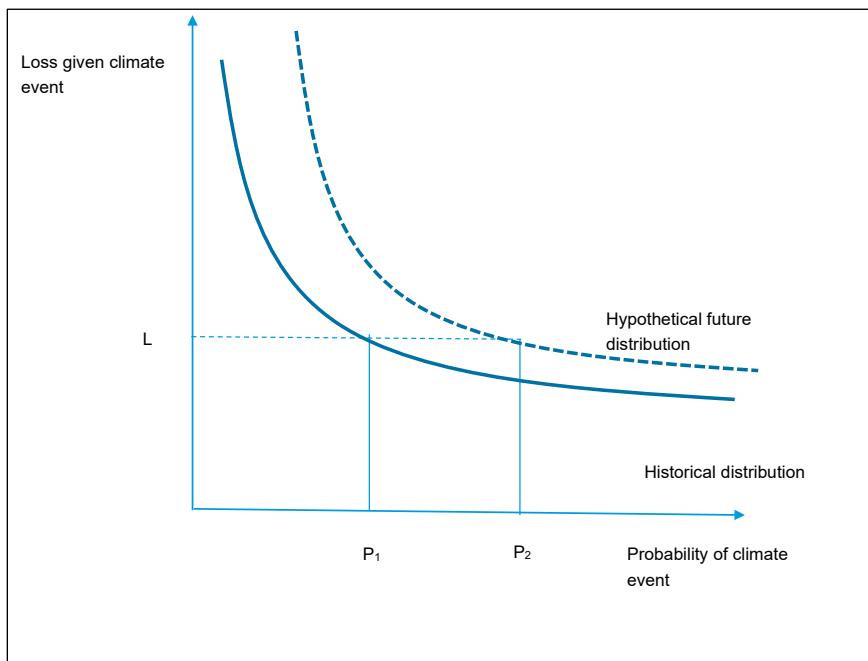
- Acute physical risks could be simulated as the occurrence of immediate extreme weather events based on either projected or historical distributions (the former would be the preferred approach as feasible). As a first step, we would generate such scenarios by looking into the historical distribution of disasters and losses. However, limiting the analysis to that of historically observed shocks could fail to incorporate ahistoric tail risks.³
- Climate change will likely change weather-related natural disaster risks over the next 50–80 years, especially in the scenario with faster global warming. The scenario analysis to assess physical risks should ideally use the future projected distribution of disasters, compare the range of results with the currently observed historic disaster distribution, and apply the near-term and long-term future disaster distribution to assess damages, losses, and their impact on the economy and balance sheets of financial institutions over the near and long term (i.e., the approach to scenario design for the near and long term is broadly similar). While losses may potentially not be large in expected value terms over the near term, the projected distribution of hazards over the long term could be used in calibrating a severe climate-related shock over the near term to account for uncertainty over the magnitude of the shock.⁴
- Projecting future distributions of extreme weather events and damages, however, will require additional resources and external expertise. If modeling the future distribution of natural hazards is not feasible, staff could go further into the tail of events in the historical distribution to mimic the climate shock as illustrated in the Text Figure. We will explore developing rules of thumb for making such a mapping in as generalized a fashion as feasible.

³ As an illustration, catastrophe insurance models (CAT models) often consider tail events with a once in 250–500-year probability, which may in effect have not been observed in recorded history. Moreover, these scenarios are disaster scenarios, not climate change scenarios per se.

⁴ This is the approach taken in the 2021 Philippines FSAP.

Appendix 1. Figure 1. Impact of Climate Change on the Likelihood and Damages from Extreme Weather Events

The example below shows one of the possible combination of future likelihood of extreme weather events and their damages under a climate scenario compared to current combination. In this case, climate change increases both the likelihood and damages of weather events.



Source: IMF staff.

Transition Risk

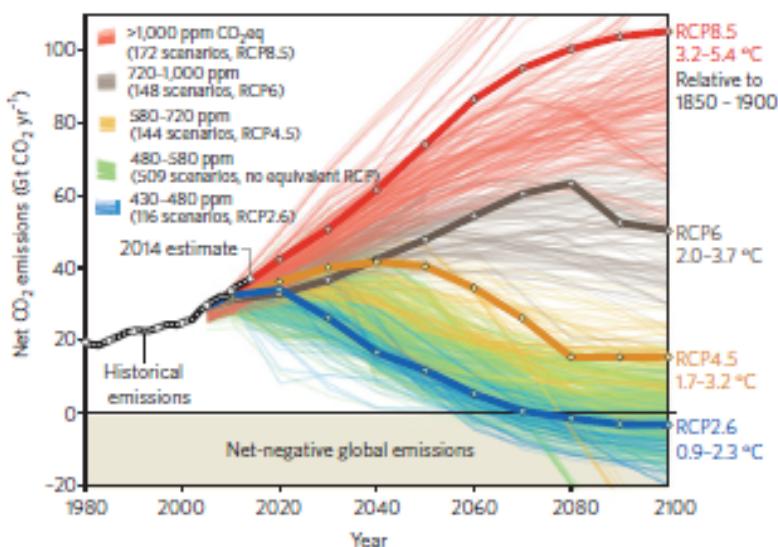
- The progression to a low-carbon economy is typically thought of as a long-term process. As carbon policies are gradually introduced, technologies and consumer preferences evolve, the overall sectoral structure of the economies' energy matrix will shift. But there is significant uncertainty regarding the path and probability distribution of emissions and temperatures over time for a given RCP scenario (Text Figure). This means that there is a distribution of trajectories of carbon prices for any given RCP scenario⁵ such that there is uncertainty over the likely trajectory of carbon prices in any temperature scenario. As such, there is a reasonable probability that carbon prices may need to be raised earlier and at a faster pace to higher levels than considered under median global scenarios.
- Accordingly, different central banks in the NGFS have adopted a range of approaches to simulating the evolution of carbon prices (Table 2 and Annex). These typically consider variations of lower temperature increase paths with higher carbon price trajectories and

⁵ While policies supporting a transition to a low-carbon economy can take different forms (e.g., subsidies to renewable energy production, caps on fossil-fuel-based power generation, etc.), the assumed shock is often represented by a (sharp) increase in carbon prices. This is a convenient, powerful, and relatively manageable assumption that allows to effectively and parsimoniously characterize and model a decarbonization scenario, which is also extensively used in the scenario design for transition risk by central banks.

vice versa. Essentially, the different paths trade-off transition versus physical risk (the slower the transition, the greater the odds of increased physical risk). The staff propose to leverage initially the NGFS scenarios in the climate risk stress testing framework to assess financial stability risks over the traditional three-to-five-year horizon in FSAP work. The NGFS scenarios include a range of carbon tax increases, from no increase in carbon taxes to \$100 in 2025. We would also explore NGFS scenarios over the long term to analyze the opportunities from higher carbon prices over the next 30 years and moving to a low-carbon economy. We will also consider alternatives for a higher carbon price trajectory—relative to the NGFS scenarios—for sensitivity analysis. Some initial work on mapping the NGFS scenarios into shorter-term horizons can be carried out now, but further work on the sensitivity of transition scenarios and examining alternative paths will require additional resources.

Appendix I. Figure 2. Carbon Dioxide Emission Pathways until 2100

The projected pathways of CO₂ emission—the main component of greenhouse gasses—and corresponding global temperature at 2100 compared to 1850–1900 (pre-industrial period) average vary substantially depending on climate scenarios.



Source: Fuss and others (2014). RCP = representative concentration pathway from IPCC's fifth assessment report (AR5, IPCC, 2014), ppm = parts per million. Dark colored pathways corresponds to the four RCPs from IPCC's AR5. CO₂ emissions in gigaton per year.

Sudden Transitions

- While climate change is a long-term process, stress testing exercises may consider up-front shocks to carbon prices to illustrate pressure points in the financial system. One approach used by some central banks is to consider the sensitivity of financial system capital to a large up-front change in carbon prices.⁶ Alternatively, the impact of

⁶ See Vermeulen, Robert, Edo Schets, Melanie Lohuis, Barbara Kölbl, David-Jan Jansen, and Willem Heeringa, "An Energy Transition Risk Stress Test for the Financial System of the Netherlands", De Nederlandsche Bank Occasional Studies 16–7, 2018; and European Systemic Risk Board, "Positively green: Measuring climate change risks to financial stability", June 2020.

transition risk could materialize abruptly if there is a technological breakthrough or if consumers, firms, or financial markets suddenly change their expectations regarding how future policies, technologies, or physical risks may impact asset valuations. In such a “Minsky moment,”⁷ agents could reassess the value of carbon-producing sectors based on the present discounted value of the impact of prospective carbon price policies, sectoral technology shocks, and physical risks linked to specific temperatures and emissions pathways. In such a case, the climate scenarios would be simulated as a one-off shock affecting macro-financial variables and industry-specific (or even firm-specific) asset valuations. Overall, the staff will explore methodologies for parameterizing reasonable values for such one-off shocks arising from sudden transitions.

Stage 3—Mapping Climate Scenarios into Financial Stability

9. Financial stability analysis of climate risk requires a mapping from temperature paths, physical risk distributions, and materialization of transition risks to impacts on the macroeconomy and bank capital. Projections of climate events and their damages and the impact of transition risks would be used as input in macro-financial models in the third step to estimate the impact of the materialization of physical and transition risks on economic or sectoral growth and other macro and financial variables. Once macro-financial scenarios are built, the standard FSAP stress testing approach for credit and market risks would be applied to assess the risks and the impact on bank capital.

10. The scope and depth of the analysis that maps climate scenarios into the banking sector’s health will be determined by the granularity of data and available models. There are two general approaches. The macro approach focuses on macro-financial transmission channels of climate scenarios and assesses the impact of macro scenarios on the banking sector (possibly using data on the distribution of financial exposures by industry or regions). The micro approach builds on geographical exposures of the financial sector, detailed sectoral analysis, industry and firm-level data, data on balance sheets of households and the government, and collateral values to link them to the earnings of financial institutions. As NGFS’ [scenario guideline](#) points out, a more micro approach will provide a more accurate assessment because the effects of physical and transition risk will vary across different sectors and firms. However, it requires granular bank exposure data, macro models that account for differentiated shocks across industries, as well as the analysis of the corporate and household sectors integrated with bank stress tests. Depending on specific climate risk and data granularity, a combination of the macro and micro approaches could also be considered (including the impact of macrofinancial scenarios on sectors’ financial statements). In practice, FSAPs may fall in a spectrum between these two approaches depending on the availability of data and models, though we anticipate

⁷ This concept—introduced by Mark Carney in his 2015 speech on “The Tragedy of Horizons”—refers to the possibility of newly enforced and more stringent environmental regulations producing or reinforcing financial failures in credit markets, or abrupt reallocations of assets from brown to green activities motivated by market repricing of risks and/or attempts to limit reputational risks and litigations (see also “The Green Swan - Central Banking and Financial Stability in the Age of Climate Change,” BIS January 2020). The current generalized mispricing of climate risks in financial assets, as evidenced by research (including in the GFSR), and low interest rate environment adds to the plausibility of such a scenario.

that in the short term, the macro approach may be the more feasible option, also given the current resource constraints.

Appendix I. Table 1. Assumptions on Carbon Price Paths for Transition Risk Scenarios

	Up-front Shock (if applicable)	Level of assumed carbon prices in scenario (2020 US\$/ton CO ₂)				
		2020	2025	2030	2050	
Institution						
NGFS						
Orderly		0	103	132	350	
Disorderly		2	10	17	841	
Hothouse		7	7	7	11	
Bank of France						
Orderly transition		0	50	75	180	
Delayed transition		0	0	0	700	
Sudden transition		0	0	170	900	
Bank of Canada						
2°C (consistent) scenario		0	80	190	600	
2°C (delayed action) scenario (abrupt transition)		0	0	0	800	
Nationally determined contributions		0	20	70	190	
ECB						
Orderly		7	60	114	360	
Disorderly		7	54	68	845	
Hothouse		7	14	14	16	
ESRB						
Sudden transition	USD 100 per tonne carbon price shock		100			
Dutch National Bank						
Sudden transition	USD 100 per tonne carbon price shock		100			
WEO						
Adverse (average) 1/		7	19	27	101	

1/ Assumes the baseline is the NGFS hothouse scenario.

Macro Approach

11. There are several modeling approaches that vary in their complexity to account for cross-industry and geographical differences when mapping climate scenarios into macro-financial shocks.

- **Standard macro-financial models.** Standard macro-financial models used in the IMF (or by FSAP counterpart authorities) with relatively less cross-industry detail could be extended to incorporate features that would allow simulation of the impact of climate shocks on macro and financial variables. Staff in the Research Department are

developing extensions of the Funds multi-country models with climate features that could be used to support FSAPs once ready. In the meantime, staff are exploring using models provided by external vendors, also used by the NGFS, and a small macro model developed in-house in MCM. For assessing physical risks, empirical findings from disaster/climate economic models could help calibrate the adequate shocks (such as productivity and capital depreciation shocks). For transition risks, these models could incorporate the economy-wide effects of the carbon tax, technology and preference shocks, and modeling opportunities from transition risk (the rise of green industry).

- ***Macro models used in combination with models with cross-industry differences.***

The impact of physical and transition risks will likely vary by industry and geography. Physical risks are more likely to affect the agricultural, real estate, and mortgage sectors, while the transition risk would weigh on brown industries and benefit green industries. Macro models will be used in combination with CGE models (such as the GTAP model maintained by the Research Department), which are well known for their richness in incorporating cross-industry differences and will be explored for generating a greater degree of sectorization in the scenario design. Also, for physical risks, there are distinct models to analyze disaster impact across industries (e.g., those separating the infrastructure sector from the sectors that produce final goods and services), which could be used as an input to macro models.

Micro Approach

12. The micro approach would directly examine the financial performance of affected sectors, to which banks are exposed. This approach has a very high requirement for granularity of data and industry-specific knowledge. More specifically, implementing this approach would require micro-data on the (industry and geographical) characteristics of the financial institutions' underlying sectoral exposures and the assessment of borrowers' capacity to pay, incorporating cross-industry effects. Models using micro-data (e.g., cash flow models) would be used to estimate the vulnerability of sectors (in terms of earnings and their volatilities) to physical or transition risks. The vulnerability analysis would be used to revalue the financial institutions' exposures related to the affected sectors, based, for example, on incorporating long-term losses into the valuation of assets they hold. Given this complexity and resource constraints, this approach is likely to be feasible in only a few FSAPs where the relevant central banks have themselves been developing the needed data and modeling.

Additional Background

13. This Annex lays out a general approach to climate risks analysis in FSAPs. The application of the approach will necessarily be country specific and reflecting also available data and modeling tools. The staff will need to experiment and learn from experience in this new and challenging area in the period ahead. Further details of the approach that could inform the specific work of FSAP and country teams will be developed in an MCM paper on the issue planned for later this year. Some important operational areas that staff will reflect on as the work advances include:

- **Collaboration.** The work on incorporating climate risks analysis into FSAPs will require close collaboration with country teams, functional departments, the World Bank and the NGFS. Among opportunities here are work on (i) judging the materiality of different climate risks for individual country cases, (ii) scenario design including projecting different hazards and estimating their damages and losses, (iii) carbon price paths, (iv) implications for scenario design of the use of carbon tax proceeds, (v) modeling approaches (including modeling opportunities from climate change, considering the coverage of all member countries since not all countries are covered by widely used models), and (vi) the challenge of physical climate risk for financial stability in smaller members. We see particular scope for collaboration with the World Bank on the assessment of materiality of risks and deeper analysis of physical risks, leveraging the Banks expertise in catastrophe insurance and financing.
- **Data needs.** Climate change analysis requires novel and very granular data. The staff will coordinate closely internally, and also with the World Bank, NGFS partners, and outside vendors to seek synergies and cost efficiencies on access to needed data.
- **Beyond banks.** While this note focuses on climate risk scenario analysis for banks, the methodology could be applied to other financial sectors such as insurance companies and mutual funds. For both insurance companies and mutual companies, stage 1, 2 and part of the stage 3 that pertains to macro scenarios would be the same while scenario analysis methodology for each sector would be different.
- **Beyond FSAPs.** We hope that this framework for climate risk scenario analysis will also be of value to members through our capacity development work including in support of FSSRs. Resources permitting, there could be an important opportunity to provide assessments of physical risk facing financial systems in fragile states).

Appendix II. Approaches to Climate Risk Scenario Analysis by Selected Central Banks and Institutions

	Bank of England	Central Bank of Denmark	Bank of Canada
"Stress Testing"			
Approach: bottom up vs top down	Bottom up	Top down	Top down
"Stress testing" objective	Size the exposures to climate related risks (impairment charge; how banks will adjust their business model; identify data gaps; develop management of climate-related financial risks)	Size mortgage exposure book to the risk of higher sea levels	This is a scenarios analysis only
Scope	Banks, insurers	Bank mortgage book	NA
Climate risks covered	Transition (early and late policy action scenarios) and physical risks (no policy action)	Physical risk (rising sea levels)	Transition risk
Climate Scenarios	3 scenarios provided by BoE (from NGFS): early, late, no policy action (carbon price, tech change, consumer preferences, emissions, temperature; frequency and severity of climate events; productivity)	Two scenarios (from IPCC): no policy action, reduction of emissions	4 scenarios (from IPCC): no action, NDCs, 2C (consistent), 2C (delayed action)
Macro Scenarios	Provided by BoE consistent with climate scenarios (at the required sectoral and geographic granularity)	NA	CGE to map climate scenarios to macro variables
Data granularity	Corporate exposures, household exposures (assessment done by banks)	Household mortgages by geo. Location	18 regions, 33 sectors
Stress testing horizon	30 years (60 years for physical risk)	80 years	30 years
Reporting frequency	Every 5 years	NA	Every 5 years
Static versus dynamic balance sheet	Static (dynamic responses captured through a qualitative questionnaire))	NA	NA

	Bank of France	Dutch National Bank	ESRB	ECB
"Stress Testing"				
Approach: bottom up vs top down	Bottom up	Top down	Top down; similar to DNB	Top down
	Assessing vulnerabilities to climate risk, raising awareness among firms of climate risk and encouraging them to develop risk management tools	Assess total losses and, for banks, capital shortfalls	For banks assess mark-to-market losses, credit losses in the banking book and an increase in credit risk capital charges	NA
"Stress testing" objective				
Scope	Banks, insurers	Banks, insurers, pension funds	Banks, insurers	Banks (but worldwide firms)
Climate risks covered	Transition and physical risk	Transition risk	Transition risk	Transition and physical risk
Climate Scenarios	3 scenarios provided by BdF (from NGFS/IPCC): orderly, delayed, sudden transition + "business as usual" for physical risk	4 scenarios/shocks: consumer confidence, tech. shock, carbon price shock, combination of shocks	3 scenarios: no action, abrupt policy response, positive tech. breakthrough	4 scenarios (from NGFS/IPCC): orderly, disorderly transition (two scenarios), hot house world; projections for 427 on physical risk
Macro Scenarios	NIGEM (macro impact), CGE (sectoral impact), other models for financial vars	Macroeconometric model (NIGEM) to map climate scenario into macrofinancial vars	Macroeconometric model (NIGEM) to map climate scenario into macrofinancial vars	Impact on macro variables from NGFS
Data granularity	55 sector in CGE model (assessment done by banks)	Bond and equity holdings (at the level of individual securities); banks' corporate loan exposures disaggregated by risk classes and industries	Bond and equity holdings (at the level of individual securities); banks' corporate loan exposures disaggregated by risk classes and industries	Bond and equity holdings (at the level of individual securities); banks' corporate loan exposures (at the level of individual firms), country-level assessment for HHs
Stress testing horizon	30 years	5 years	5 years	30 years
Reporting frequency	Every 5 years	1 year	1 year	1 year
Static versus dynamic balance	Static (2020-25) and Dynamic (2025-50)	Static	Dynamic	Static and Dynamic (10 years)

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2021 Financial Sector Assessment Program Review —Background Paper On Scope



IMF POLICY PAPER

2021 FINANCIAL SECTOR ASSESSMENT PROGRAM REVIEW—BACKGROUND PAPER ON SCOPE

May 2021

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**International Monetary Fund
Washington, D.C.**



April 15, 2021

2021 FINANCIAL SECTOR ASSESSMENT PROGRAM REVIEW— BACKGROUND PAPER ON SCOPE

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Glossary

AML/CFT	Anti-Money Laundering/Combating Terrorist Financing
BCBS	Base Committee for Banking Supervision
BCP	Basel Core Principles
CCP	Central Counterparty Clearing House
CPMI	Committee on Payments and Market Infrastructures
DAR	Detailed Assessment Report
FATF	Financial Action Task Force
FASN	FSAP Approach and Staffing Note
FMI	Financial Market Infrastructure
FSAP	Financial Sector Assessment Program
FSB	Financial Stability Board
FSLC	Financial Sector Liaison Committee
FSPN	FSAP Financial Sector Policy Note
FSSA	Financial System Stability Assessment
FX	Foreign exchange
GFC	Global financial crisis
GFSR	Global Financial Stability Report
G-SIFI	Global Systemically Important Financial Institutions
GST	Global Bank Stress Test
G20	Group of 20
IAID	International Association of Deposit Insurers
IAIS	International Association of Insurance Supervisors
ICP	Insurance Core Principles
ICT	Information and communication technology
IEO	Independent Evaluation Office (of the International Monetary Fund)
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
KA	Key Attribute
MCM	Monetary and Capital Markets Department
MPM	Macroprudential policy measure
NBFI	Nonbank financial institution
NFC	Nonfinancial corporation
NGFS	Network for Greening the Financial System (Central Banks and Regulators)
NPL	Nonperforming loan
RAM	Risk Assessment Matrix
ROSC	Report on the Observance of Standards and Codes
SSB	Standard Setting Body
TA	Technical Assistance
TN	Technical Note
UST	Universal Bank Stress Test

INTRODUCTION

1. Financial stability assessments under the Financial Sector Assessment Program (FSAP) have been based on a three-pillar framework since 2009. The 2009 FSAP Review (IMF, [2009a](#), [2009b](#), and [2009c](#)) established financial stability assessments as a key responsibility of the Fund and defined the three pillars of such an assessment: risk analysis, oversight, and safety net. This framework allows the scope of topics to be examined in FSAPs to consider that member countries differ in their risk profiles, levels of complexity of policy frameworks and practices. In recent years, new financial stability risk factors have emerged, including risks from nonbanks, climate change, fintech, and cybersecurity.

2. This background paper reviews the development of the scope of financial stability assessments under the FSAP since the 2014 FSAP Review ([IMF, 2014a](#)). It starts with the overall scope issues such as the robustness of the three-pillar approach, drawing on the qualitative risk assessment matrix to set the scope of work, risk-focused approach for standard assessments, and possibilities for thematic approaches. On specific topics covered in each pillar, it is important to note that the financial stability landscape and international standards continue to evolve. Therefore, the choice of topics and assessment methods will need to continue to adapt. The paper summarizes past experiences of such adaptation and observed trends with respect to the coverage of specific topics and then discusses possible directions to adjust the scope of future FSAPs over the next five years given the likely changes in the financial stability landscape. The paper also discusses collaboration with the World Bank as it pertains to the scope of financial stability assessments. It does not examine issues such as analytical approaches, participation, and resources, which are covered elsewhere in the FSAP Review.

3. Striking a balance between the FSAPs analysis of long-standing and new issues will be a challenge. New potential sources of financial stability risks are arising, with the growth of non-bank financial institutions (NBFIs), increasing cross-border and cross-sectoral interconnectedness, and new risks from digitalization and climate change. Existing international standards continue to be updated and new standards may be introduced. An example is the methodology to assess Key Attributes of Effective Resolution Regimes for insurers, which staff are asking the Board to endorse as the assessment benchmark in FSAPs and stand-alone assessments. At the same time, traditional macrofinancial risks, especially those facing banks, remain very relevant in most of the IMF membership. Given resource constraints, FSAP teams will need to further leverage the scoping process to prioritize new risks.

4. More generally, staff analysis and surveys of authorities suggest opportunities to strengthen prioritization to scope FSAPs (Table 1). Specifically, the risk focused approach to scoping financial stability assessments can make even greater use of flexibility within the three-pillar framework, especially to incorporate the growing risks from nonbank financial intermediation, climate change, and digital technologies. Striking a balance between the FSAP's analysis of traditional and new risks within a given budget will require effective prioritization. Staff will leverage the findings of recent detailed standards assessments to tailor the scope of

the FSAP. FSAPs should continue to use a risk-based approach to decide whether to conduct a detailed standards assessment or a more focused review.

Table 1. Proposals to Strengthen Scoping

#	Proposal
I-1	Use the flexibility in the three-pillar framework to capture emerging risks and prioritize scope according to systemic importance.
I-2	If a recent positive comprehensive standards assessment is available, structure the financial stability assessments around one or two cross-cutting themes while preserving assessments across all the three pillars.
I-3	Continue to use the risk-focused approach to international standards, as per IMF (2017a)
I-4	Endorse the Key Attributes of Effective Resolution Regimes as the assessment benchmark for insurance resolution frameworks in FSAPs and stand-alone assessments and the Key Attributes Methodology for the Insurance Sector.

OVERALL SCOPE

A. The Three Pillar Framework for Financial Stability Assessments

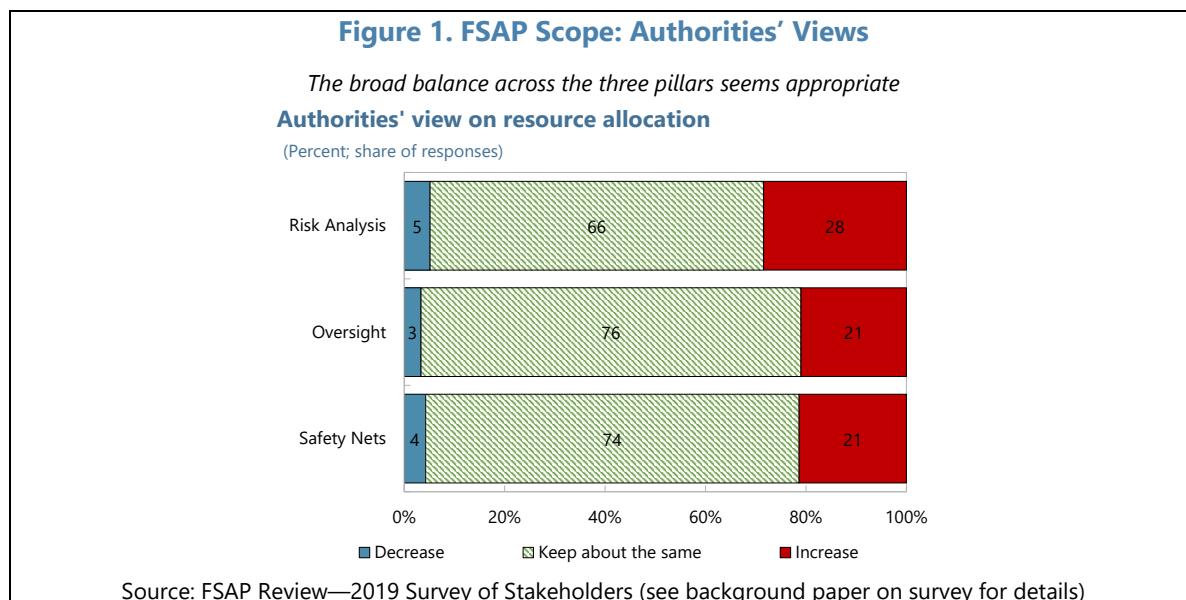
Experience in the Decade before COVID-19

5. Country authorities generally reported that the three pillars provide a useful, risk-based framework for scoping financial stability assessments. In their survey responses in 2019, more than 90 percent of authorities agreed or strongly agreed that the financial stability assessment was clearly structured around the three pillars—risk assessment, financial sector policy framework, and financial safety net. Also, more than 90 percent of the authorities agreed or strongly agreed that the FSAP analysis focused on the most relevant financial sector issues. Similarly, more than 90 percent of the respondents agreed or strongly agreed that the FSAP provided the appropriate breadth of coverage of the financial sector and the appropriate depth of analysis.

6. Surveys suggested a high degree of satisfaction with the customization of FSAPs. The scope of an FSAP is tailored to each jurisdiction, guided by the FSAP Risk Assessment Matrix (RAM). The RAM focuses on the main systemic risks facing a financial system including the macroeconomic environment, characteristics of the financial system, and the position of real and financial cycles. Overall, 87 percent of the respondents agreed or strongly agreed that analysis was appropriately framed within the country's circumstances, with the remainder calling for greater customization. Some—mostly respondents from jurisdictions that had pre-2014 FSAPs—noted that assessments had relied heavily on international standards, and a majority (60 percent) highlighted that the standardized principle-by-principle assessments of compliance with international standards is among the most useful aspects of the FSAP.

7. Authorities supported the balance across the three pillars of the financial stability assessment. For each of the three pillars, about 95 percent of respondents thought that the pillars' resources should be kept the same or increased, with only about 5 percent suggesting a

reduction (a somewhat higher fraction of respondents called for increasing resources on risk assessments) (Figure 1).



Implications of COVID-19

8. Overall, strong bank buffers and massive policy interventions have thus far limited the impact of the pandemic on the financial system. In the context of the significant global regulatory reform agenda, many banks have strengthened their capital and liquidity buffers over the past ten years, which has helped them absorb the initial impact of the shock. Extensive policy measures (e.g., income support for borrowers, credit guarantees, moratoria, among others) have also helped mitigate the impact on financial institutions temporarily. However, credit risks facing banks could materialize as policy support is withdrawn. Meanwhile, the salience of role of NBFIs in generating potential risks to financial stability has risen since the Global Financial Crisis (GFC). In particular, asset managers in advanced economies entered the pandemic with already elevated vulnerabilities, such as sizeable liquidity mismatches. Their role in the credit market has also increased since the GFC, including in risky leveraged-loan markets and elevating the feedback from their stress to the economic recovery (Global Financial Stability Report, [GFSR, October 2020](#)). Moreover, during this crisis, liquidity-strapped asset managers have become even more connected to banks as they drew credit lines, increasing the potential contagion from market selloffs to banks.

9. The economic impact of the pandemic raises new sources of risks that FSAPs will need to consider going forward. Unlike many past crises, the current shock did not originate in the financial system. Instead, the impact has thus far been felt mostly by other economic sectors. Corporate vulnerabilities have increased as firms have taken on more debt to cope with cash shortages amid extreme earning shocks. Underlying liquidity risks could morph into insolvencies, especially if the recovery is delayed, which could spill over to the financial sector. Public finances have deteriorated as fiscal deficits have widened to support the economy, which may eventually elevate sovereign-financial linkages. The future path of default risks in various

economic sectors will ultimately be shaped by the extent of policy support (including accommodative monetary policy, which could raise risks associated with lower for even longer rates), its withdrawal, and the pace of recovery. The implementation of the global regulatory reform agenda has also slowed down during the pandemic ([Financial Stability Board, FSB](#), 2020 annual report).

10. The updated survey results following the pandemic show increased interest in all pillars of the FSAP. Compared to the results of the survey of stakeholders conducted in 2019, the update in 2020 points to an increased demand by stakeholders for analysis across all three pillars of FSAP (Figure 2). This increase is most marked in the case of authorities followed closely by Executive Directors, with staff also flagging increased needs in the first and third pillars. These results underscore the importance of covering all three pillars in any FSAP, while prioritizing among specific risk factors within each pillar.

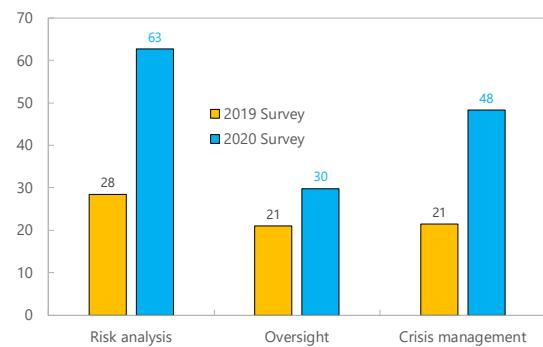
Figure 2. FSAP Prioritization—Survey Results

The share of country authorities that consider more work in each pillar of FSAP rose noticeably across all the three pillars.

Executive Directors share similar views.

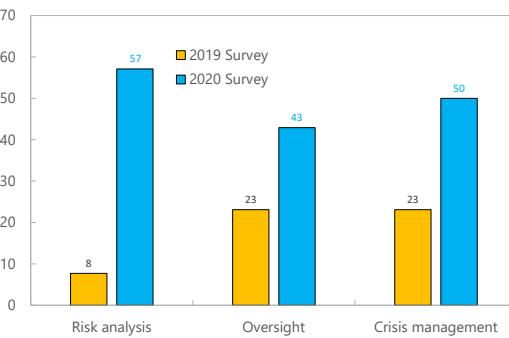
FSAP Prioritization: Country Authorities

(Share of "increase" in total respondents)



FSAP Prioritization: Executive Directors

(Share of "increase" in total respondents)



Source: FSAP Survey and staff calculation.

11. FSAPs in the next five years will likely face several common themes whose relevance will vary depending on the recovery phase from the pandemic. Most countries are still in the first phase requiring continued policy support while uncertainty over the pandemic and economic prospects remains high. Monetary policy looks set to remain accommodative; support measures for the nonfinancial private sector could be expanded/extended, room for regulatory support is being used and macroprudential buffers have been released where feasible. Once the health crisis is under control, policy measures may shift to starting to unwind extraordinary measures such as liquidity support while balancing supporting the recovery. Part of the corporate sector might go through a major restructuring with non-viable firms filing for bankruptcy. Banks will need to support financing the economic recovery by restructuring problem assets. This restructuring could be accompanied by a significant reallocation of resources across industries—while this occurs, the debt overhang will likely weigh on investment. Once economic recovery is underway, prudential buffers will need to be rebuilt. The global regulatory reform agenda will likely be refocused on areas of stress revealed during the pandemic, including the role of NBFIs and market liquidity and functioning.

12. In this context, the flexibility of the three-pillar approach can be applied in FSAPs over the next several years as the effects of the pandemic are addressed. New sources of financial stability risks from the pandemic could be handled by shifting the focus within respective pillars.

- **Pillar 1:** FSAPs may need to dive deeper into assessing granular risks arising in the household, corporate, and the public sectors. One distinct feature of the pandemic shock is that the impact on the real economy differs substantially across industries. Some industries could face long-term business model challenges and persistent earnings losses. The impact of the pandemic on bank capital will depend on banks' exposures to troubled business sectors, which could be quite heterogeneous in the context of the current crisis. Bank-sovereign linkages could re-emerge given the deterioration of fiscal positions across the membership. The impact of the pandemic also underlines the importance of assessing systemic risks arising from interconnectedness, domestic and cross-border feedback effects, and the vulnerabilities of the NBFIs.
- **Pillar 2:** FSAPs will need to assess the effectiveness and adequacy of various regulatory responses and recommend adaptations as needed. The joint IMF-World Bank staff paper on regulatory issues ([IMF and World Bank, 2020](#)) and various MCM staff COVID-19 notes (such as IMF, [2020a](#) and [2020b](#)) on regulatory and supervisory responses to the pandemic will support the consistency of assessments and policy advice across countries. As the regulatory reform agenda on NBFIs progresses, new principles and guidance will strengthen the assessment of these institutions and market functioning. The pandemic has also elevated the role of Fintech solutions and could accelerate the adoption of these new technologies with potential implications for the structure and stability of payments and financial systems, including potential risks on cybersecurity.
- **Pillar 3:** the emergence of systemic financial system distress in some jurisdictions as a result of the pandemic, would test the frameworks for resolution, safety nets, and crisis management. In addition, the uncertainty over the longer-lasting effects of the crisis for the real economy could raise challenges for some FSAPs to discuss the implications of corporate debt restructuring for the financial system and the adequacy of corporate insolvency frameworks.

B. Risk Assessment Matrix

13. By focusing on systemic risks, the RAM plays a critical role in FSAP scoping and prioritization. The RAM focuses on the main systemic risks facing a financial system, including the macroeconomic environment, the characteristics of the financial system, and the position of real and financial cycles. Both the design of the RAM and the discussion of scope are conducted in close consultation with Article IV teams.¹ Respondents to the surveys of country authorities

¹ Furthermore, the FSAP Approach and Staffing note, an internal document prepared before the scoping discussion with authorities, is required to include a summary of recent Article IV analysis and policy recommendation on financial sector issues.

and Executive Directors expressed a high degree of satisfaction with RAMs' focus on the most relevant risks, including their ability to trace the relevant propagation channels of such risks and to incorporate the role of mitigating policies when estimating the shocks' impact. Indeed, the RAM has helped expand the scope of FSAPs to include new sources of systemic risks such as NBFIs and capital markets. The use of RAMs has also strengthened the analysis of interconnectedness, cross-border exposures, and spillovers.

14. In contrast to the Global RAM and Article IV RAM's, the FSAP RAM focuses on the financial sector and looks further into the tail of the risk distribution. RAMs prepared for both FSAPs and Article IV surveillance are linked to the semi-annually updated Global-RAM, representing the Fund-wide view of the key risks in the global economy. However, while the G-RAM and RAMs for Article IV's emphasize high and medium likelihood events, the FSAP RAM includes "low likelihood but plausible" events if they could result in systemic distress of the financial system. Also, Article IV and FSAP RAMs differ as the former covers a wider range of macroeconomic risks, while the latter has a deeper coverage of financial stability risks.

C. Modalities

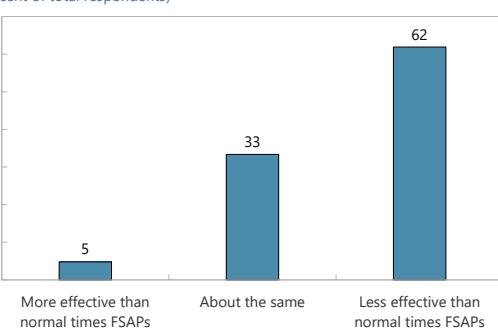
15. Going forward, staff will need to carefully consider whether and if so how remote engagement could improve the effectiveness of FSAPs. The 2021 FSAP Review survey shows that MCM staff consider that remote engagement is less effective than physical missions, given the challenges of building relationships with authorities and engaging in sensitive conversations (Figure 3). Time zone differences and remote sharing of confidential data are other impediments. In MCM staff's view, the lower effectiveness of remote engagement may offset travel cost savings, at least for some types of missions. The survey comments suggest that remote engagement could be considered for the scoping mission, but that physical visits would be more effective for main missions.

Figure 3. FSAP Experiences with Remote Engagements

Q: How was your experience with remote FSAP missions compared to "normal-time" FSAPs?

MCM staff consider that remote engagement is less effective.

Experience with Remote FSAP Missions: MCM Staff
(In percent of total respondents)



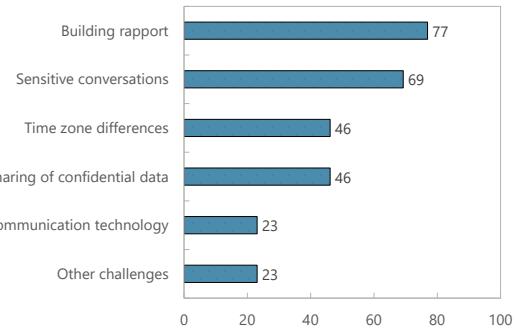
Sources: 2020 FSAP Review Survey and staff calculation.

Source: 2021 FSAP Review Survey.

Q: Why was this FSAP less effective than normal-time FSAPs?

Building rapport, holding sensitive conversations, followed by time zone differences and sharing of confidential data are key contributors

Factors Reducing the Effectiveness of Remote FSAP: MCM
(In percent of total respondents)



Sources: 2020 FSAP Review Survey and staff calculation.

D. Risk-Focused Approach to Assessing International Standards

16. FSAP assessments of microprudential oversight, financial safety net, and financial integrity are based on international standards set by standard-setting bodies (SSBs). The Basel Committee for Banking Supervision (BCBS), the International Association of Insurance Supervisors (IAIS), the International Organization of Securities Commissions (IOSCO), the Committee on Payments and Market Infrastructures (CPMI), the Financial Stability Board (FSB), and the International Association of Deposit Insurers (IADI) each issue standards that express the international community's expectations for regulation and supervision. The Financial Action Task Force (FATF) sets standards for Anti-Money Laundering and Counter Financing of Terrorism (AML/CFT). The standards can be used in one of two ways:

- **A graded assessment:** given that the various principles under-pinning best practices for oversight are interrelated, in this approach the standard will be assessed in full grades based on the assessment methodology laid out by the individual SSB that sets the standard and assessment methodology. The output is a "Detailed Assessment Report (DAR)." It provides the most comprehensive pictures of the prudential framework and strong incentives to countries to improve their regulatory frameworks and supervisory practices.
- **A focused review:** a standard can also be used as a benchmark to analyze specific prudential or supervisory gaps, which could exacerbate or fail to contain systemic risk. The output of the focused review is an FSAP Technical Note (TN). It allows FSAPs to focus on the most relevant activities, particularly for standards that include numerous subsectors (e.g., securities standards that include asset managers, audit firms, rating agencies, among others).

17. Authorities are generally comfortable with the guidance on how to use standards in FSAPs. The guidance, spelled out in IMF ([2017a](#) and [2017b](#)), is that "the decision about whether to conduct a graded assessment or a focused review drawing on a supervisory standard in a specific area will continue to be by agreement between staff and the authorities. The decision will be based on the relative importance of the specific sector, the degree of vulnerabilities, the overall priorities of the FSAP, the extent of changes in the sector or the oversight framework, and the extent of changes in the standard or assessment methodology since the last graded assessment." In responding to the FSAP survey, 86 percent of the respondents thought the IMF guidance was appropriate. Overall, respondents supported the greater flexibility enabled by the focused review of supervisory issues, although some observed that the DARs had some benefits due to standardization and comparability. Among the specific suggestions in this area was to discontinue a ROSC when a DAR is published.

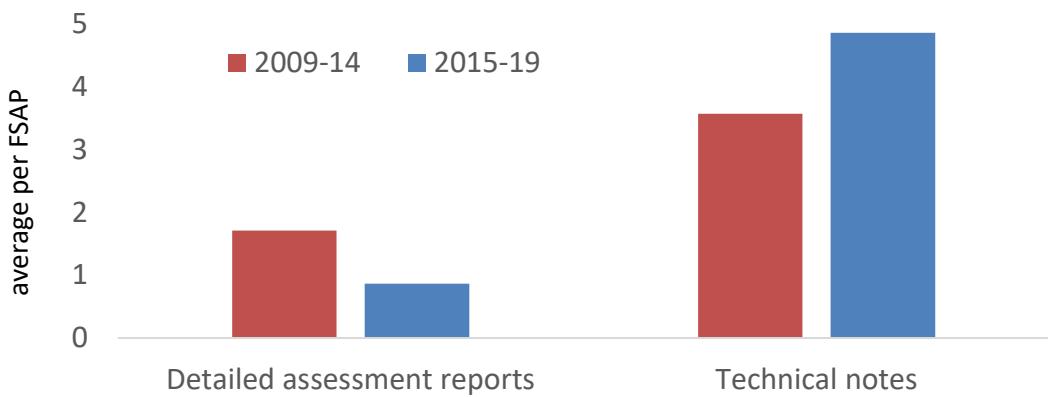
18. The number and modality of the assessments are chosen jointly with national authorities during the scoping discussions, balancing resources and desired scope. It is based on the relative importance of the specific sector, the degree of vulnerabilities, the overall priorities of the FSAP, the extent of changes in the sector or the oversight framework, and the extent of changes in the standard or assessment methodology since the last graded assessment. Staff draw upon desk analysis of macrofinancial risks, structural and conjunctural factors, recent

institutional and supervisory developments, and an up-to-date self-assessment provided by the authorities.

19. Given the emphasis on systemic risk, FSAP coverage of oversight and financial safety nets has become more risk-based since 2014. Since the 2014 Review ([IMF 2014a](#)), in countries where compliance with updated financial sector standards has been established in previous FSAPs, assessments under the FSAP have made less use of formal graded assessments of standards and more use of focused reviews, which allow for a deeper dive into selected topics. As a result, the number of DARs per FSAP has declined while the number of TNs has increased (Figure 4). Also, the emphasis in the FSSA and the Key Recommendations Table is placed on those regulatory and supervisory shortcomings that are more related to systemic risk. Since the 2012 update of the Basel Core Principles (BCP) and the 2011 update of the Insurance Core Principles (ICP), most jurisdictions with mandatory FSAPs have undergone full assessments, providing the foundation for the subsequent FSAPs to focus on progress in addressing previously flagged weaknesses.

Figure 4. Changes in Scope: Detailed Assessment Reports and Technical Notes, 2009–14

The structure of FSAP outputs has been shifting, with lower use of Detailed Assessment Reports.



Source: IMF staff based on Mission Tracking System and a survey of relevant central bank websites.

Note: The IMF and World Bank have recognized international financial sector standards in the areas of banking supervision, securities regulation, insurance supervision, deposit insurance, financial market infrastructures, and resolution regimes for banks. In addition, FSAPs occasionally assess other standards concerned with market integrity such as corporate governance, accounting, auditing, and insolvency and creditor rights, led by the World Bank.

20. The shift largely reflects the fact that many jurisdictions have already been fully assessed based on the standards that were updated after the GFC. However, the ICPs were updated in November 2019 with substantive changes including new provisions focused on systemic risk. This may trigger some more insurance DARs in future FSAPs. In the securities sector, a targeted review of the IOSCO principles is generally more suitable. A full assessment covers all the subsectors of the securities business (e.g., asset managers, brokers, dealers, hedge funds, rating agencies, and auditors), not all of which are relevant in all jurisdictions.

21. Ensuring a sound regulatory framework and effective supervision continue to be core to the FSAP. This requires adequate resourcing of the assessment of sectoral supervision. For members subject to mandatory FSAP participation every five years, adequate coverage and intensive review of key topics must be considered over time. Full assessments for banks and

insurers should be recommended at least every ten years and also when the last assessment was conducted using an outdated version of the principles, or when there has been a major change to the regulatory architecture in the jurisdiction (such as a move into or out of a single regulatory authority).

E. Thematic Approach

22. A thematic focus on one or two issues in an FSAP can work well when a previous FSAP has provided a recent and positive comprehensive standards assessment. For example, the [2013 Singapore FSAP](#) undertook a comprehensive assessment of the financial system, finding its regulation and supervision “among the best globally,” facing “manageable” risks, and its crisis management and resolution arrangements “generally strong.” Therefore, the [2019 FSAP](#) focused on two themes: the financial system’s cross-border links and the challenges posed by current and prospective financial innovation. This choice was warranted by Singapore’s role as a financial center and the country’s rapidly evolving fintech sector. In addition to a focused review of bank regulation and supervision, the FSAP also paid special attention to two areas where standards have evolved considerably since the last FSAP: financial markets infrastructures and crisis management and resolution. A thematic approach would not be appropriate without a recent and positive comprehensive assessment.

23. The choice of the 1-2 themes would be based on their relevance to financial stability in the particular jurisdiction. The scoping process is a risk-based approach anchored by the FSAP RAM. The same criterion and process would apply to 1–2 themes. The thematic approach would allow selecting a topic that does not cut across all three pillars, as long as the topic is important to financial stability.

24. The thematic approach may also be useful for regional exercises in regions with strong financial linkages but without supra-national authorities. For example, in the past, in the Nordic countries, staff have made efforts to cluster FSAPs over two years and closely coordinate approaches across FSAPs. A formal “regional FSAP” for a region without common supra-national authorities would be difficult, given the absence of a clear counterpart to engage with the mission and follow up on recommendations. Instead, a regional exercise on a thematic topic, could be conducted to complement national FSAPs, subject to resource constraints.

PILLAR 1: SCOPE OF RISK ANALYSIS

The Evolving Scope

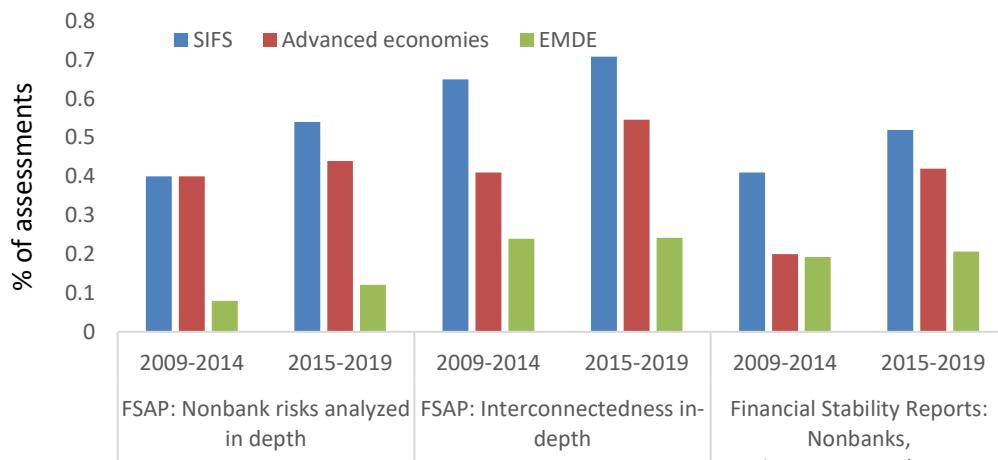
25. A review of financial stability assessments since 2009 points to shifts in the focus of the risk analysis in line with the evolving financial landscape. Potential sources of financial stability risks have been expanding with the growth of NBFIs in asset, funding, and credit markets,² increasing cross-border and cross-sectoral interconnectedness, and new risks from digitalization. The most visible aspects of this evolution are shifts in risks from banks to NBFIs in many major jurisdictions and the growing emphasis on interconnectedness. In

² See the [Global Monitoring Report on NBFIs](#) by the Financial Stability Board (FSB).

response, FSAPs have been expanding the menu of potential risk analysis, increasing their focus on NBFIs and interconnectedness, largely in line with similar changes in scope and focus observed in financial stability reports issued by central banks (Figure 5). Notwithstanding the broader menu of potential topics, resource costs have been broadly flat, suggesting that prioritization efforts have been successful.

Figure 5. Changes in Scope: FSSAs and FSRs, 2009–14

The scope of the quantitative work has been shifting towards analysis of nonbank financial institutions and interconnectedness, in line with similar trend in central banks' financial stability reports.

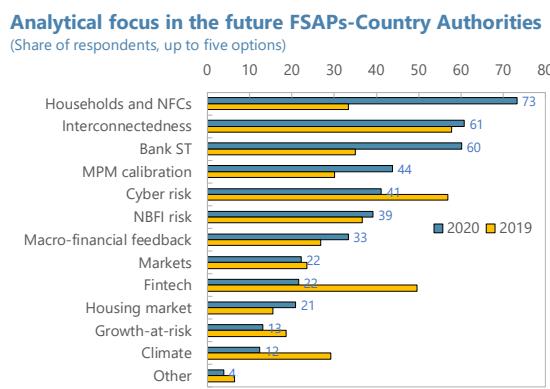


Source: IMF staff based on Mission Tracking System and a survey of relevant central bank websites.

26. The pandemic will put increased focus on risks to financial stability from corporate and household vulnerabilities and bank-sovereign linkages. The 2020 survey of stakeholders revealed increased interest in analytical focus on crisis-related risks. Country authorities are now more interested in vulnerability assessments of the household and corporate sectors and bank stress testing, followed by macrofinancial feedback effects and quantitative calibration of macroprudential measures (MPMs). Demand for interconnectedness analysis remains strong. Staff view that risks from potential bank-sovereign loops and emerging risks related to climate change and cyber issues also merit further analysis.

Figure 6. FSAP Analytical Focus—Survey Results

Demand for household and NFC analysis and bank stress tests rose upon COVID-19 crisis while interest in interconnectedness remains high.



Source: FSAP Survey and staff calculation. MPM = macroprudential policy measure; ST: stress test

27. In response to these shifts, staff have launched efforts to strengthen analytical tools in several areas. As detailed more in the background paper on analytical foundations, some FSAPs have started to include more detailed analysis of household and corporate sector vulnerabilities, quantitative calibration of MPMs, NBFI risks and their link to the banking system or financial markets. Additional analysis on selected emerging risks (climate, cyber, and fintech) have also been carried out on a pilot basis depending on their potential systemic relevance. Also, staff have continued efforts to refine and standardize bank stress testing tools. For example, a new credit risk approach is being developed to adapt to the Expected Credit Loss (ECL) framework under the new accounting standard, International Financial Reporting Standard (IFRS) 9, while the staff have also developed Bayesian model averaging techniques that show promise in applications to improve the fit of models used to underpin stress testing. Staff are also developing macro scenario stress testing tools for nonfinancial corporations (NFCs) and households using firm-level and household survey data.

28. The scope of interconnectedness analysis has also been deepened drawing on improved data. In the early years, FSAPs primarily examined interbank and cross-border banking interconnectedness using direct exposure data, partly because similar data did not exist for the other types of financial institutions. As initiatives to close data gaps have borne fruit, recent FSAPs have started to look into cross-financial-segments interlinkages (e.g., banks and asset managers or insurers) and contagion in financial markets (i.e., systemic liquidity). Reflecting stakeholder interest in analysis of risks arising from interconnectedness, NBFI, and financing markets, it will be important for FSAPs to continue deepening these analyses. In this regard, staff have recently developed a tool to assess system-wide foreign exchange (FX) liquidity risks, investigating liquidity spillover across economic sectors, particularly relevant for small open economies without reserve currencies.

29. Continued effort will be needed to adapt the scope of FSAP risk analysis to the evolving financial stability landscape. Challenges include: extending risk assessment tools (such as stress testing) to cover NBFI, nonfinancial sectors, and emerging risks, while containing resource needs; (ii) alleviating data constraints, especially with regards the broad interconnectedness and nonfinancial sector analyses discussed above and emerging risks, and (iii) the development of new tools to assess emerging risks and expand the use of stress tests to assess macrofinancial linkages and calibrate MPMs. Specific methodologies are discussed in the background paper on Quantitative Analysis.

A. The Role of FSAP Stress Tests

The Value Added of FSAP Stress Tests

30. Bank stress testing is a core element of the independent financial stability assessment in FSAPs. The 2019 Independent Evaluation Office (IEO) Review on Financial Surveillance ([Caprio, 2019](#)) suggested that in the jurisdictions where national authorities have sophisticated stress testing framework, FSAPs should only review the authorities' stress testing framework rather than undertake an independent exercise. The FSAP Review survey suggests that most authorities value the independence of FSAP assessments, including for jurisdictions

other than their own. Moreover, the updated 2020 survey of stakeholder for this review reveals substantially increased interest from authorities in core bank stress testing. The staff consider FSAP stress tests are an essential element of an independent assessment of financial sector risks, similar to the independent assessment of macroeconomic risks in an Article IV consultation. Moreover, Article IV surveillance has frequently leveraged FSAP risk analysis to strengthen macrofinancial integration. Indeed, adaptations of FSAP stress testing tools, such as the Global Bank and Universal Bank Stress Tests (GST and the UST) currently under development, could be shared with area departments and used to enhance financial surveillance in Article IV's (see the background paper on traction and analytical foundations for more).³

31. Independent stress tests are essential for assessing frameworks used in different jurisdictions. Stress tests conducted by FSAP teams allow for comparing risk analysis across different models, which is effective approach to discuss model and parameter uncertainty and assess the robustness of specific stress testing results. Moreover, model comparison exercises by running the same scenarios with the same data across different models is an important and accepted validation technique to understand complex models more generally. Indeed, supervisors in many jurisdictions validate banks' internal models by comparing bank-produced results to the supervisors' top-down models.⁴

32. FSAP stress tests also add value by providing a more macroprudential perspective than is typical in supervisors' stress tests. Most stress testing exercises by national authorities are microprudential exercises. They focus on individual banks' results and use them to inform supervisory actions (such as limiting dividend distributions). These exercises usually do not incorporate contagion and feedback effects that add to systemic risk. FSAP stress tests are designed to be more macroprudential and examine systemic risks⁵ by incorporating amplification and feedback effects (e.g., solvency-liquidity feedback, bank-sovereign linkage, bank-NBFI linkage, and second-round effects to the real economy, among others).⁶ Moreover, many of these exercises require use of granular bank stress testing models. For example, to estimate the extent of the second-round effects from bank distress to the real economy, one would need an integrated model that includes a bank stress test module and a macrofinancial module (see the background paper on analytical foundation for more details). As such,

³ GST is a tool to conduct bank solvency stress test using publicly available individual bank financial statement data for about 30 jurisdictions (see October 2020 GFSR, [Chapter 4](#) for details). UST aims to expand the sample countries to about 70, using the jurisdiction-aggregated data from the IMF's Financial Soundness Indicator database and a simplified methodology.

⁴ Similarly, the Basel Committee on Banking Supervision (BCBS) has examined banks' internal models for those adopting the Internal Rating Based (IRB) approach by requesting banks to calculate risk-weighted-assets using the same hypothetical portfolio. [BCBS \(2013\)](#) Regulatory Consistency Assessment Programme, Analysis of risk-weighted assets for credit risk in the banking book. The exercise found that calculated risk-weighted assets are widely different across banks.

⁵ The [IMF defines](#) (IMF, 2013) systemic risk as "the risk of widespread disruption to the provision of financial services that is caused by an impairment of all or parts of the financial system, which can cause serious negative consequences for the real economy."

⁶ See Anderson, and others, [2018](#), and [MCM departmental paper](#) (Adrian and others, 2020) for IMF views on macroprudential stress tests.

effectively operationalizing fuller macrofinancial linkage analysis in FSAPs places a premium on teams running their own stress testing models.

Challenges from COVID-19

33. The pandemic shock is raising new challenges for FSAP risk analysis. As shown in Figure 6, authorities' demand for household and NFC analyses, bank stress test, and MPM calibration jumped sharply in the context of COVID-19. The new macro-scenario-based household and NFC vulnerability assessment tools currently under development should help near-term FSAPs. The challenge is how to link these vulnerability assessments to bank stress tests. Also, to the extent possible, the bank stress test should consider cross-industry differences as COVID-19 impacted certain industries more than the others. Another challenge to bank stress tests is how to incorporate the effects of mitigating policies at the sectoral level (e.g., guarantees, moratoria, among others). The GST approach presented in [October 2020 GFSR](#) illustrated methods to incorporate the effects of government guarantees and capital adequacy policies (i.e., the effects of limiting dividend distribution) in such analyses. The 2020 Philippines FSAP also examined the effects of moratoria on the liquidity shock spillovers between banks and NFCs. Moreover, FSAPs in the next years that use balance sheet data from during the pandemic to anchor their analysis will need to consider making adjustments for the size and duration of supportive policies to reveal the underlying capital position of financial institutions.

B. Data Issues

34. The increases in breadth and depth of risk analysis have been possible in part thanks to improved data quality and access to data in individual country FSAPs. Member countries' sharing of confidential institution-by-institution supervisory data has improved since the 2014 FSAP Review. In all but one jurisdiction, staff working on recent assessments were able to access confidential supervisory data. But accessing confidential data also brings challenges. For example, country authorities often require additional arrangements, such as limited access via a dedicated data room, which adds significantly to mission travel costs and requires highly skilled staff to spend time on data collection and entry-level tasks. Recently, the travel restrictions associated with the pandemic have prevented access to data rooms. Remote data access is critical for successful FSAPs while travel restrictions last [and could be considered more broadly as a resource saving mechanism].

35. In particular, the quality of interconnectedness analysis depends critically on data availability and access. Global efforts, such as the G-20 Data Gaps Initiative (due to be completed by end-2021), have helped close some of the significant data gaps highlighted by the global financial crisis but considerable gaps remain (IMF and FSB, 2019). Authorities have started to collect more data based on activities, including all types of participating institutions and cross-financial segments.⁷ At a more aggregate level, more countries have started to

⁷ These standards are updated periodically—most recently in 2012 for the BCPs; 2012 for the Principles for Financial Market Infrastructures (PFMI); 2017 for the IOSCO Principles; and 2019 for the ICPs. The PFMI principles are complemented by the CPMI/IOSCO Guidance on Cyber Resilience for FMI, the CPMI/IOSCO on Recovery of FMI, and the Financial Stability Board's (FSB) KAs. At this stage, there are no formal standards for digital financial services yet, with the exception of the October 2018 FATF related to virtual asset service providers.

compile cross sectoral data such as flow of funds by counterpart, including on a who-to-whom basis (the so-called balance sheet approach data). These efforts have been supported by technical assistance from the Statistics Department's or as a part of Financial Sector Stability Reviews (FSSR). Using newly available data, some FSAPs have started to analyses interconnectedness and contagion in financial markets (i.e., systemic liquidity). However, gaps remain, including data on NBFIs, sectoral accounts, and cross-border exposures, among others. Moreover, due to confidentiality constraints, FSAPs have generally not benefitted from improved data collection from Global Systemically Important Financial Institutions (G-SIFIs) and market-finance data.

36. Pursuing more efficient confidential data sharing arrangements with national authorities can contribute to lowering FSAP costs and increasing quality. Member countries' sharing of confidential institution-by-institution supervisory data has improved since the 2014 FSAP Review. In most jurisdictions, staff working on recent assessments were able to access confidential supervisory data for bank stress tests, though FSAPs have generally not benefitted from improved data collection from Global Systemically Important Financial Institutions (G-SIFIs) and market-activity data. But accessing confidential data also brings challenges. For example, country authorities often require additional arrangements, such as limited access via a dedicated data room, which adds significantly to mission travel costs and requires highly skilled staff to spend time on data collection and entry tasks. Recently, the travel restrictions associated with the pandemic have prevented access to data rooms. Modalities for remote data access would thus be very helpful to ensure continuity of FGSAP engagement and could save resources more broadly going forward

PILLAR 2: SCOPE OF OVERSIGHT FRAMEWORK ASSESSMENT

A. Macroprudential Policy

Overview

37. The coverage of macroprudential policy issues in FSAPs has become more consistent since the 2014 Review. This was spurred in part by the Staff Guidance Note on Macroprudential Policy ([IMF 2014b](#)), which set out a framework for the Fund's advice in surveillance. Virtually all FSAPs now feature a dedicated section in the FSSA supported by a dedicated Technical Note on macroprudential frameworks and tools. FSAPs generally assess three dimensions of macroprudential policy: institutional underpinnings, operational capacity, and a mapping of the risk analysis to priority actions.

38. Advice on institutional arrangements is based on the principles featured in the Board-endorsed Key Aspects of Macroprudential Policy. Together with associate guidance notes, it stresses the need to ensure (i) willingness to act, (ii) ability to act, and (iii) cooperation in risk assessment and mitigation while being cognizant of constraints flowing from the country's legal and institutional traditions.

39. FSAPs also assess operational capacity. Typical recommendations include enhancing analytical capacity, filling data gaps, and expanding the policy toolkit. Analytical capacity assessment is based on the availability and use of indicators of systemic vulnerability, such as the measure of leverage and debt-service capacity. These indicators can be used to assess the potential for macrofinancial feedback effects. Data gaps are often related to NBFIs and real estate prices, and recommendations can also include credit registries and household surveys. Policy toolkit discussion typically includes broad-based tools such as countercyclical capital buffers and systemic risk buffers, more targeted tools such as borrower-based measures such as loan-to-value (LTV) and debt-service-to-income (DSTI) ratios. Policy instruments could be set countercyclically or target structural vulnerabilities. One challenge has been how to design borrower-based measures for the corporate sector, which can switch to non-bank financing sources.

40. FSAPs and authorities have made progress in mapping risk analysis to macroprudential policy actions, although further progress is needed. Most FSAPs provide a comprehensive assessment of different potential vulnerabilities, including broad-based vulnerabilities, vulnerabilities from the indebtedness of the household and corporate sectors, liquidity and FX risks, and structural vulnerabilities from interconnectedness. FSAPs have increasingly leveraged the solvency, liquidity, and interconnectedness analysis to provide macroprudential advice. Some have conducted dedicated analyses to help guide the calibration or assess the impact of macroprudential tools (see background note on analytical foundations for more details). However, there is no widely accepted benchmark framework to provide guidance on macroprudential policy settings. Further progress in mapping risk analysis to policy actions will depend on advances in analytical foundations

The Next Five Years

41. The COVID shock will provide an opportunity for many FSAPs to discuss the effectiveness of macroprudential policy over the medium-term. This will naturally include (i) the agility of policy authorities in taking macroprudential measures in support of the financial system and the economy, (ii) the effectiveness of such support in reducing procyclical contractions in credit, as well as (iii) the mix between the release of dedicated macroprudential buffers on the one hand and regulatory relief on microprudential constraints, such as loan classification rules, etc., on the other.

42. A starting point of such discussion could be to link macroprudential policy calibration more closely with the Pillar 1 risk analysis. This requires that standard stress testing tools are augmented to include macrofinancial feedback, such that lending helps maintain spending (GDP) and/or debt service of the household and corporate sectors. Such models are starting to be developed using Dynamic Stochastic General Equilibrium models and Structural VAR models. These analyses can be used to assess the effect on losses and macroeconomic outcomes of actual and counterfactual policy paths (e.g., 2020 Philippines FSAP).

43. The COVID-19 crisis raised the question whether countries should strive for higher macroprudential buffers in normal times. A classic tenet of macroprudential policy is that

buffers should be “built up in good times” so that they can be “drawn down in bad times”. However, the crisis revealed dedicated buffers turned out not to be sufficient in many countries to counter the COVID shock. For instance, only around 15 jurisdictions had built up a positive Countercyclical Capital Buffer (CCyB) before the COVID shock, despite multilateral messages to this effect in the GFSR (see also [Nier and Olafsson 2020](#)). Some authorities suggest building up and maintaining a positive “normal” CCyB before imbalances start to build up—the “insurance approach” as in the Czech Republic, [Lithuania](#), and the [United Kingdom](#)—instead of doing so when indicators are signaling growing vulnerabilities. The former would secure additional resilience to unforeseen shocks such as pandemic. The approach may be particularly attractive for those countries that struggle to define and track useful indicators of vulnerabilities (e.g., in low income countries, see IMF, [2014d](#)), too. Staff can have a useful role in discussing with the authorities the policy options they have within the flexibility of the standards and against the background of the country-specific experience.

B. Microprudential Policy

Overview

44. Financial sector oversight assessments examine the quality of the institutional setting, the oversight of governance, and the resilience of capital and liquidity in financial institutions. The international SSBs set globally agreed standards and assessment methodologies, covering financial sectors and infrastructure.⁸ FSAP assessments start with structural issues such as the independence, resources, accountability, powers, legal protection, and governance of authorities tasked with financial sector supervision. Robust institutional structures and strong independence are essential to address risks to financial institutions and counter political and industry interference. With respect to supervision, assessments cover national requirements and effectiveness of supervisory practices, including a forward-looking identification of risks and supervision of capital adequacy, liquidity, and governance of financial institutions. Oversight assessment is not just about examining the legislative and regulatory frameworks. Since the GFC, the assessment methodology emphasized the importance of the implementation of the legal framework in practice.

45. The assessments by the SSBs themselves complement but are not substitutes for FSAP assessment. SSBs’ assessments differ from the FSAP approach, as they depend on self-assessment and peer review. The Regulatory Capital Assessment Process (RCAP) of the BCBS is a very detailed review that focuses on the transposition of the rules and not on implementation. The SSBs acknowledge the significance of the role of the IMF and World Bank in reinforcing the importance of observing their standards and the continuing relevance of international standard setting. Assessments of the oversight framework in FSAPs are a global public good that must continue to be adequately resourced.

⁸ These standards are updated periodically—most recently in 2012 for the BCPs; 2012 for the Principles for Financial Market Infrastructures (PFMI); 2017 for the IOSCO Principles; and 2019 for the ICPs. The PFMI principles are complemented by the CPMI/IOSCO Guidance on Cyber Resilience for FMs, the CPMI/IOSCO on Recovery of FMs, and the Financial Stability Board’s (FSB) KAs. At this stage, there are no formal standards for digital financial services yet, with the exception of the October 2018 FATF related to virtual asset service providers.

Developments Since the 2014 Review

46. The last five years have seen significant headway in implementing the international regulatory reform agenda. These efforts improved the resilience of the global financial systems, as observed in the wake of the COVID-19 crisis. The higher capital and liquidity buffers at the onset of the crisis and swift and bold actions by central banks, fiscal authorities, and financial regulators have been essential in cushioning the economic and financial fallout of the pandemic.

47. FSAPs have examined jurisdictions at various stages of reforms, and some common themes have emerged. Among the main findings were weaknesses in the independence, resources, and accountability of the supervisory authorities. Such weaknesses undermine the supervisors' ability to be assertive, timely, and effective. The importance of gaps in corporate governance have also been increasingly recognized since the GFC. The topic has taken a more central role in both the FSAP and broader IMF work on governance ([IMF, 2018](#)). Potential risks associated with related parties and complex conglomerate structures (including mixed conglomerates that include nonfinancial entities or new areas such as fintech) have also gained attention. Even where de jure frameworks have been modernized de facto application could be limited. Many jurisdictions show weakness with regards corporate governance and risks arising from related parties and complex conglomerate structure.

48. National authorities have made significant progress in implementing Basel III. All major jurisdictions adopted the core elements of Basel III risk-based capital and liquidity rules and higher loss absorbency requirements for G-SIBs banks. However, they lag behind the schedule to implement recently finalized additional standards (e.g., interest rate risk in the banking book, IRRBB). Some standards (e.g., leverage ratio) were diluted compared to the initial proposals. FSAPs have increasingly emphasized the importance of incorporating the revised regulations in actual supervisory practices. For example, some FSAPs have observed that the supervision of SIFIs became more intensive than before, but practices were uneven. The need to reprioritize regulatory and supervisory efforts in the face of the COVID-19 has led to several SSBs extending the transitional timetables to implement the new standards. Figure 7 shows more details of how FSAPs examine bank oversight, which is also echoed in the oversight of other sectors.

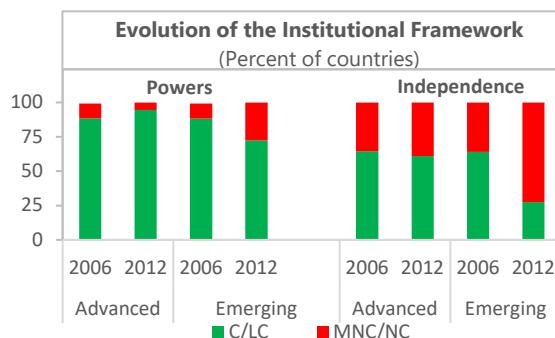
49. In the insurance sector, the ICPs were enhanced significantly in 2019, which could leave significant implementation challenges to some authorities. The ICPs now incorporate Common Framework for the Supervision (ComFrame) of Internationally Active Insurance Groups (IAIGs)—the first global insurance standards for internationally active insurers similar to advanced criteria in the BCPs for banks. The standards and guidance are meant to be applied to 48 currently identified IAIGs⁹ with group-wide supervisors in 16 countries, more relevant IAIGs

⁹An IAIG is one which means the internationally active criteria and size criteria specified. Internationally active criteria are: premiums are written in three or more jurisdictions and gross written premiums outside of the home jurisdiction are at least 10 percent of the group's total gross written premiums. Size criteria are total assets are at least US\$50 billion or total gross written premiums are at least US\$10 billion (calculated on a three-year rolling average).

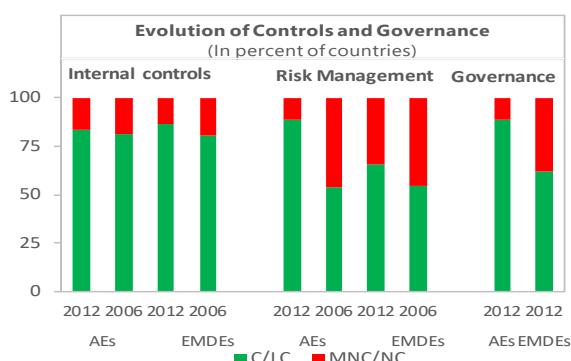
and group-wide supervisors are likely to emerge over time. The ICPs and ComFrame also include new requirements for supervisors to address systemic risk in the insurance sector. Insurance supervisors are now facing significant implementation challenges.

Figure 7. Gaps with Supervision Identified by FSAPs

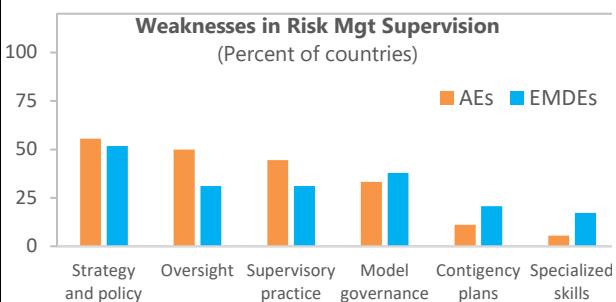
The new standards raised the bar for the institutional framework which many jurisdictions have not met.



Advances in risk management and corporate governance have consolidated improvements in oversight of internal controls.

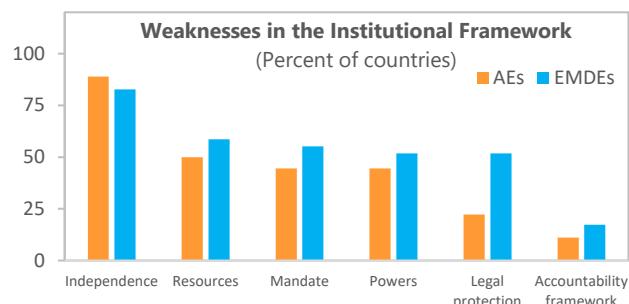


Risk management supervision needs to deliver clear guidance to the industry which can be challenging.

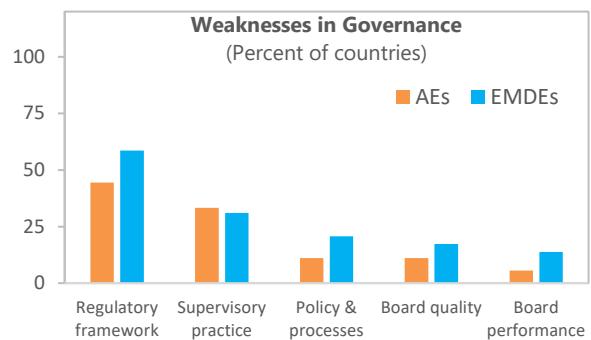


Source: Bank for International Settlements, Basel Core Principles for Effective Banking Supervision database, IMF staff.

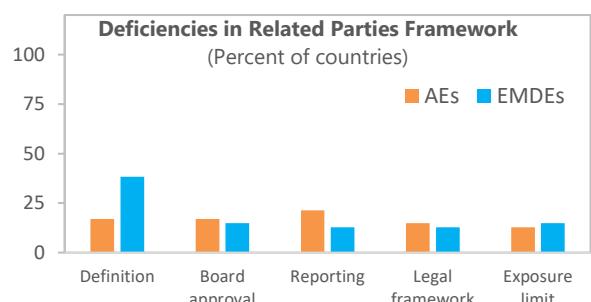
Insufficient independence of supervisors is the most common weakness, followed by lack of resources and absence of a clear mandate for financial stability.



Establishing the regulatory framework for bank governance and adapting supervisory practices are the key challenges faced by many jurisdictions.



Supervision of related party risks has been poor; a significant flaw has been the absence of or overly narrow definition of related parties' transactions.



**Table 2. BCP Performance
(By jurisdictions)**

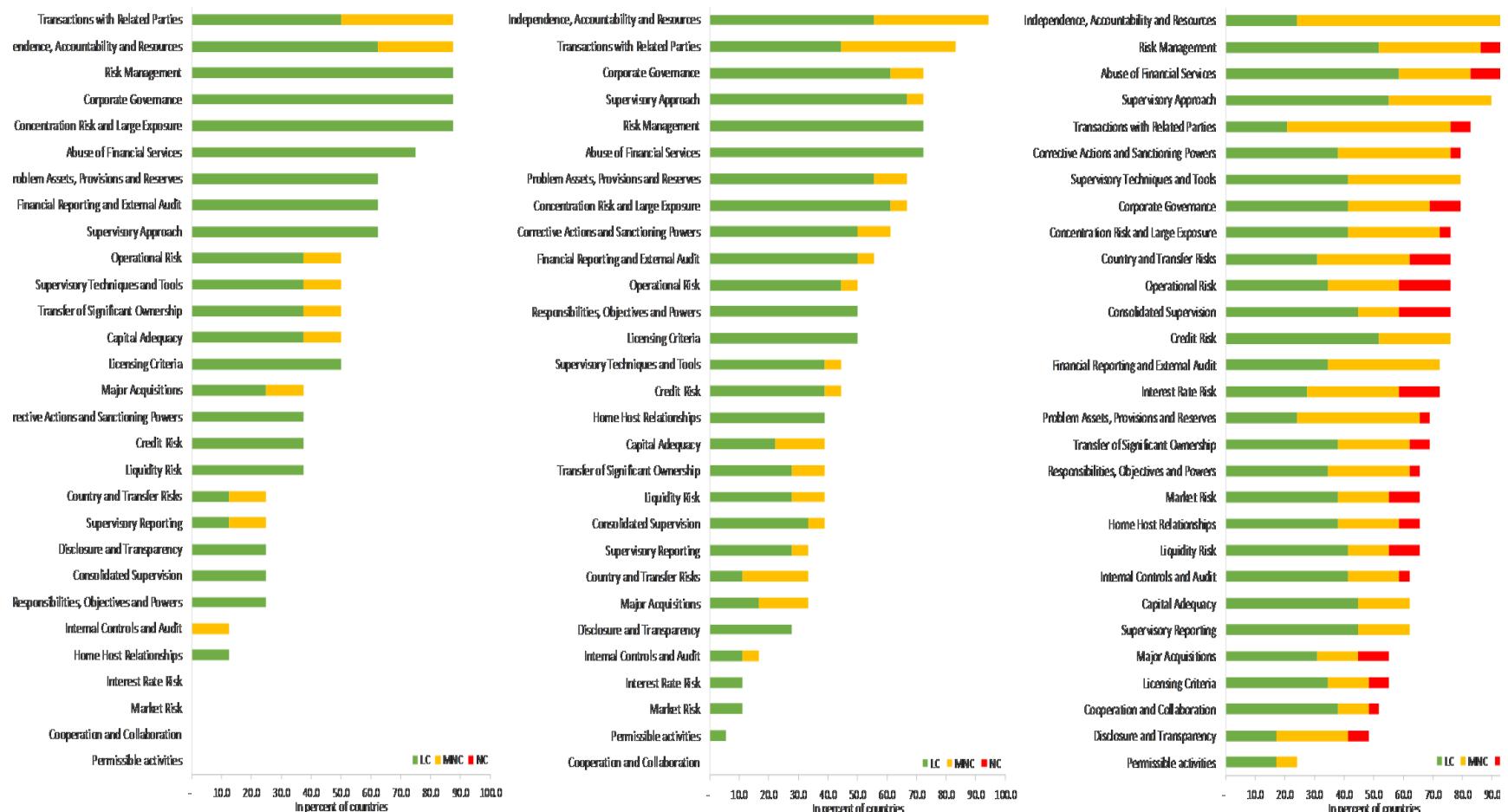
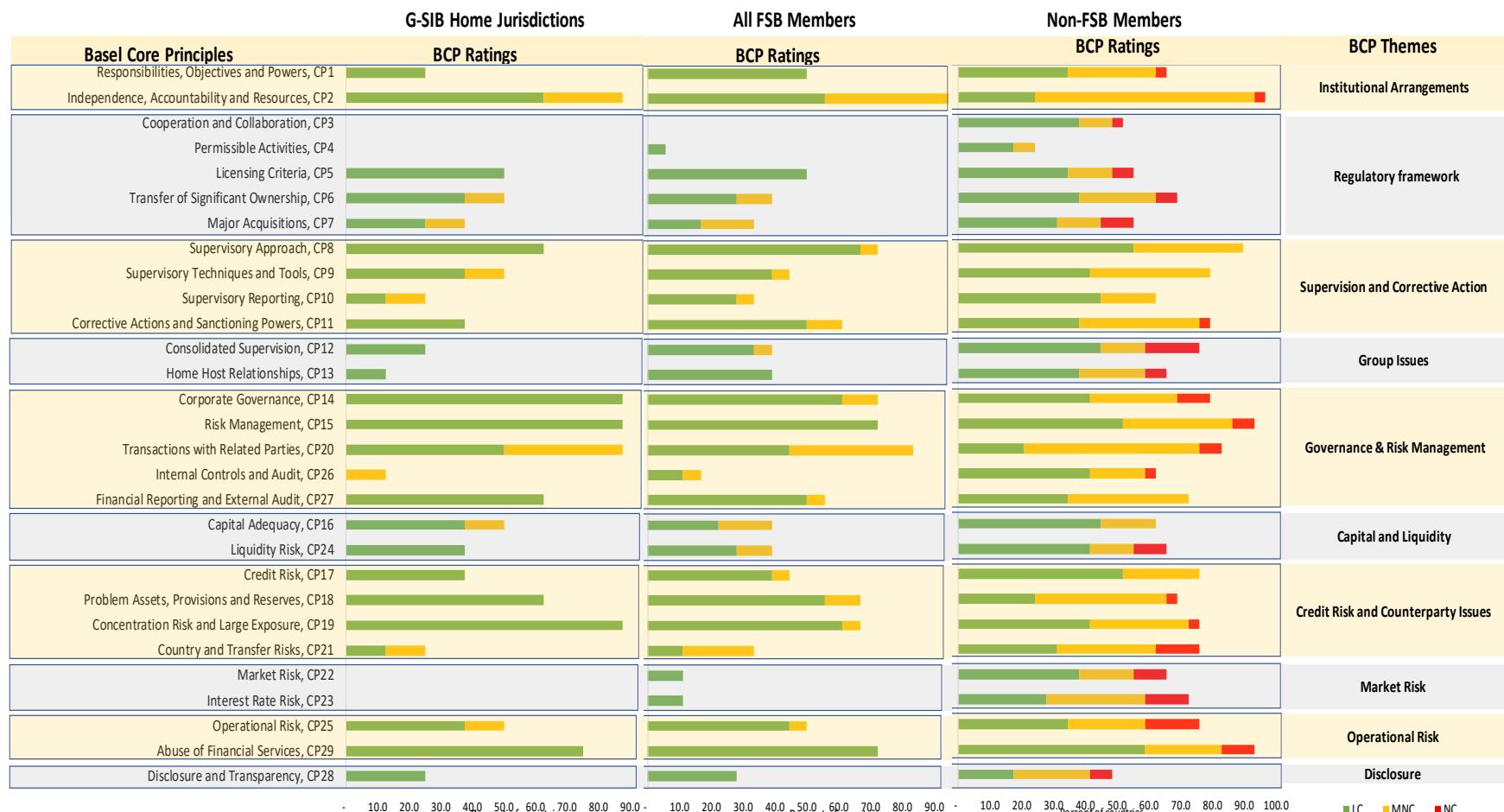


Table 2. BCP Performance (concluded)
(By themes)



Notes: LC = largely compliant; MNC = materially non-compliant; NC = not compliant (three rating categories set by the BCBS)

SB = financial stability board; G-SIB = Global systemically important banks.

50. In the securities sector, COVID-19 revealed vulnerabilities in investment funds, which are likely to require additional regulatory reforms. Since the GFC, the FSB and IOSCO have strengthened the regulatory framework for investment funds. For example, FSB's 2017 Recommendations to Address Structural Vulnerabilities from Asset Management Activities identified that the critical sources of vulnerabilities are liquidity and leverage of investment funds. FSAPs also confirmed the relevance of these vulnerabilities and suggested reforms. However, the emergence of COVID-19 triggered large outflows from money market funds (MMFs) and open-ended funds invested in risky credit assets and led to market turmoil. Central banks stepped in, acting directly and indirectly as the "market maker" of last resort in multiple markets involving NBFIs. Such intervention was unprecedented in the sense that NBFIs are not usually counterparts of the central bank operation and liquidity facilities. Their actions provided timely and necessary backstops and helped to calm markets. The challenges faced by NBFI suggest that more regulatory and supervisory action and reforms would be needed in the asset management industry.

51. The payments and financial market infrastructure (FMI) sector underwent drastic structural changes in the past decade. FMIs include payment systems, securities settlement systems (SSSs), central securities depositories (CSDs), central counterparty clearing houses (CCPs), and trade repositories. The FMIs play a central role in interbank, money, and capital markets by providing the central infrastructure to clear and settle payments, securities, and derivatives contracts. Since the GFC, there have been conscious efforts to shift bilateral transactions to CCPs, given the difficulty to clear positions vis-à-vis Lehman brothers after its bankruptcy, among others. The shift made some CCPs highly interconnected and systemically important, elevating the importance of their supervision, crisis management framework, and resolution planning. The emergence of digital payments, including fintech and digital currencies, brought in new service providers in the market. It raised new issues such as cyber risk, competition, creating equal footing by expanding regulatory perimeter, and their potential impact on financial stability.

The Next Five Years

52. The COVID-19 crisis has reinforced the lessons learned during the GFC—notably the importance of adequate capital, sufficient liquidity, and comprehensive risk coverage of the regulatory framework. The pandemic experience also highlights the importance of good governance and effective risk management by financial institutions, proactive supervision, and early intervention by authorities.

53. Assessments of the effectiveness of prudential oversight under pillar 2 will remain a critical component of the FSAPs as international standards continue to evolve. The global financial system continues to undergo profound changes, not least from digitization and the rising roles of NBFIs in asset, funding, and credit markets, and market finance. These changes produce new channels for the propagation and transmission of systemic risk. In response, existing standards continue to be modified and new standards continue to be developed, especially for NBFIs. For example, the revised insurance standards came out only in

2019. Regulatory reforms for investment funds are also relatively new¹⁰ and may need further enhancement in the light of lessons learned from the market turbulence during the pandemic. International standards for payments have not yet fully caught up with digitalization. Also, the evolution of these risks is country specific. Thus, the scope of Pillar 2 work in individual FSAPs will need to integrate country specific characteristics into the assessment of evolving global regulatory reform measures.

54. The regulatory response to COVID-19 and exit strategies could affect oversight assessments in the period ahead. The pandemic has tested oversight frameworks for the first time since the global regulatory reforms. National authorities took various crisis-response measures, such as loan moratoria, expanding government guarantees, releasing additional capital and liquidity buffers, limiting capital distributions to strengthen buffers while downside risks remained high, intervention in markets as the market maker of last resort, and, in some cases, took measures that are not compatible with international standards. The SSBs, IMF, and World Bank issued guidance and statements clarifying international best practices, including on supervisory reporting to assess these measures. Near-term FSAPs will also need to discuss how to adequately withdraw these measures when the pandemic calms down.

55. The coverage on the payment systems and FMIs may need to be enhanced to capture financial stability risks from digital innovations. The treatment of payments and FMIs as an optional element of FSAPs may need to be reconsidered given the rapid growth and transformation of the sector and increasing vulnerability to operational risks from Information Technology (IT) disruptions and cyberattacks. The retail payment segment has registered the most change—fast payments, application programming interface (API), E-wallets, mobile platforms, open banking, distributed-ledger technology (DLT), and new intermediaries. They will need greater coverage as some platforms are becoming critical infrastructures for some jurisdictions. At least, stock takes of digital payments should become an integral part of FSAP assessments to understand the impact on the market structure and ensure that systemic risks do not build up unnoticed.

56. Additional interim assessment tools will need to be developed to complement PFMI and other standards for assessing payments, clearing, and settlement risks. The international standards remain the backbone for FMI assessment. However, standards develop more slowly than digital innovations: there are inherent challenges to establish a forward-looking oversight framework in a rapidly evolving part of the financial system. Thus, the Fund and the Bank will need interim assessment frameworks based on a close dialogue with the SSBs. Furthermore, greater attention may need to be paid to certain operational risks such as IT and cybersecurity, although FSAPs did not assess operational risks historically (as declared on the cover page of FSSAs). There is also a need for assessing how digital innovations alter bank funding and its stability and operational and reputational risks caused by the greater sharing of data and IT connectivity among diverse market players. The perimeter of assessment may need

¹⁰ FSB's 2017 Recommendations to Address Structural Vulnerabilities from Asset Management Activities.

to include third parties, BigTech payment service infrastructure, data governance, the legal basis for DLT-based services.

C. Coverage of Financial Integrity Issues

57. Updates on AML/CFT issues are an essential part of the FSAP.¹¹ Current Fund policy requires timely and accurate input of AML/CFT information into every FSAP. Including AML/CFT issues in the FSAP process is intended to enable staff to incorporate financial integrity issues into broader financial sector reform efforts and financial stability. High-profile incidents in the past few years have highlighted ML/FT challenges, including in sophisticated financial systems, and that could elevate reputation risks and risks from loss of corresponding banking relationships. For smaller, less developed economies, weak assessment results could also adversely impact correspondent banking relationships and affect international trade and remittances. Furthermore, weaknesses in AML/CFT framework could also lead to delayed payout by deposit insurers in the event of bank failures.

58. Since 2014, discussion of AML/CFT issues in FSAPs has been mandatory but flexible in scope ([IMF, 2014c](#)). The scope, depth and modalities of staff's analysis has varied. Depending on the availability of a recent assessment and other relevant information, AML/CFT discussions take the form of technical notes, annexes, background notes to the Aide Memoire, or several paragraphs in the FSSA.

59. The flexibility allows for more focused discussions and more targeted recommendations. It also helps avoid unnecessary duplication with the formal AML/CFT assessment process by the FATF and FATF-style regional bodies. In line with the Executive Board's guidance, the AML/CFT input is, where possible, based on a comprehensive AML/CFT assessment or, in due course, a targeted reassessment against the prevailing standard finalized prior to the FSAP. If such an assessment is unavailable, staff may derive main findings based on other relevant sources of information (e.g., previous AML/CFT assessment reports, Fund reports, national risk assessment reports, the authorities' responses to questionnaires prepared for the FSAP, and other reliable information). Greater reliance on assessment reports by the FATF, FATF-style Regional Bodies, and other assessment groupings is expected as the current assessment round advances.

60. The inclusion of AML/CFT issues in the FSAP has helped deepen global understanding of the standards and highlighted that robust AML/CFT implementation contributes to financial stability and development. The issues discussed in FSAPs have varied, depending on the severity of AML/CFT challenges in the country and their relevance to the financial sector. Most of the issues raised have pertained to preventive measures (e.g., customer due diligence measures), the country's assessment of its money laundering and terrorist financing risks, risk-based AML/CFT supervision, and transparency of beneficial

¹¹ In keeping with the terminology used in 2014 (see [IMF 2014c](#)), this text refers to "AML/CFT updates," which, in practice, covers financial integrity issues more broadly (see [IMF 2019](#).)

ownership of legal persons and arrangements. Other issues discussed include terrorist financing and targeted financial sanctions, suspicious transactions reporting, the effectiveness in the use of financial intelligence, and international cooperation.

PILLAR 3: SCOPE OF FINANCIAL SAFETY NETS

Overview

61. Effective frameworks for crisis management, safety nets, and resolution of financial institutions are a critical component of the financial stability framework. FSAPs have a central role in assessing the robustness of countries' financial safety nets, i.e., the arrangements for supervisory intervention; resolution of financial institutions; deposit insurance; and emergency liquidity assistance (ELA). Just as past crises have underscored the importance of well-developed financial safety nets and good planning (e.g., institution-specific recovery and resolution plans, contingency plans for systemic distress), the COVID-19 pandemic places a premium on authorities' capacity to respond effectively to any distress that may emerge as exceptional measures are being phased out, and the long-term economic fallout becomes clear.

62. The GFC highlighted deficiencies in existing frameworks. They were primarily designed for the idiosyncratic distress of a financial institution. They were not sufficient to handle systemic financial crisis where many institutions or systemically important financial institutions (SIFIs, i.e., large and/or interconnected FIs whose distress could cause sizeable spillover effects to the rest of the system). Financial globalization also brought in cross-border spillovers and challenges to handle cross-border resolution of a FI with clearer roles set for home and host supervisors.

Developments Since the 2014 Review

63. Recent FSAP assessments have followed the substantially revised international standards. The FSB adopted the [Key Attributes of Effective Resolution Regimes for Financial Institutions](#) (KA), in 2011 and issued additional guidance in 2014. The KA set out the core elements of regimes that could enable authorities to resolve financial institutions in an orderly manner without exposing taxpayers to losses and while maintaining continuity of vital economic functions. The [Core Principles \(CP\) for Effective Deposit Insurance Systems](#), revised in 2014, provide benchmarks for establishing or reforming deposit insurance schemes, covering governance, membership, coverage limits, funding modalities, and arrangements for quickly reimbursing insured depositors. The KA were designed to apply to both banks and non-bank financial institutions, using a modular approach to assessment. The IMF Board endorsed the inclusion of the Deposit Insurance Core Principles and KA in the Standards and Codes Initiative in 2011 and 2017, respectively.

64. While many jurisdictions have strengthened the resolution framework since the 2014 FSAP Review, less progress has been made in low-income and developing countries. Advanced economies have continued to align their bank resolution regimes with international standards and to enhance resolution planning for systemically important non-banks in train.

Still, further progress remains necessary to ensure that all G-SIBs can be effectively resolved, especially regarding the development of resolution funding strategies; frameworks for conducting valuations in resolution; continuity of access to FMs; and the finalization of cross-border cooperation agreements.¹² Experience with bank failures in low income and developing countries since the 2014 Review has highlighted continuing weaknesses in the financial safety nets. The principles of proportionality should guide their design and implementation so that the reforms do not impose undue burdens on financial institutions and/or distort the functioning of financial markets ([Nolte and Hoelscher, 2020](#)).

The Next Five Years

65. Global safety net standards continue to evolve. In 2016, the FSB issued the [Assessment Methodology for the Banking Sector](#), and the Board endorsed it for the purpose of undertaking graded assessments (IMF 2017a and b). In 2020, the FSB—in consultation with the International Association of Insurance Supervisors, WB, and IMF—developed an Assessment Methodology for the Insurance Sector, setting out essential criteria to guide compliance assessments of jurisdictions' insurance resolution framework against the Key Attributes (KA). Fund staff provided significant support in developing the methodology, including undertaking a pilot assessment as part of the [2019 France FSAP](#). As for deposit insurance, a [comprehensive handbook](#) was released by the International Association of Deposit Insurers in 2016, designed to provide additional guidance for assessing a jurisdiction's compliance with the Core Principles.

66. The Fund and the Bank intend to use the KA methodology as the assessment benchmark for insurance resolution frameworks in FSAPs and stand-alone standards assessments. Accordingly, the Board is asked to endorse the KA as they apply to assessment of insurance resolution regimes and the related assessment methodology, which will be used as the benchmark for reviewing insurance resolution regimes in the context of FSAP and stand-alone assessments—namely, the assessments conducted outside of FSAP—(see Proposed Decision [to be drafted by LEG]). The complexity of the standard—on top of the work associated with other elements of Pillar 3 of the FSAP—will place a heavy demand on staff. Therefore, careful prioritization and allocation of resources will be critical to ensure that full (graded) assessments of the observance of the KA, when undertaken, are appropriately resourced.

67. The COVID-19 crisis does not fundamentally change the desirable design of financial safety nets (IMF, 2020b). Early intervention frameworks allow supervisors to require prompt corrective actions and monitor emerging weaknesses. Corrective actions should be geared towards restoring capital and liquidity buffers and ensuring long-term viability while curbing excessive risk-taking. The COVID-19 crisis has given rise to substantial uncertainties over economic impact and recovery speed. Thus, supervisors may need to give more time for rebuilding capital and temporarily suspend automatic triggers for prompt corrective actions where relevant (see [IMF 2020c](#)). Similarly, initiating *bank resolution* may not always be

¹² Also see [Evaluation of the effects of too-big-to-fail reforms \(consultative paper\)](#), FSB, June 2020 and “[2020 Resolution Report: be prepared](#)”, FSB, November 2020.

practicable while the pandemic continues because of, for example, operational challenges and high uncertainty over asset valuations. However, efforts to strengthen resolution regimes, improve operational capabilities and maintain up-to-date resolution plans should continue to ensure that authorities are ready to intervene if significant problems emerge after the removal of exceptional policy support. In addition, the operational readiness and capacity of *deposit insurance schemes* and *ELA frameworks* should be ascertained to ensure they can help underpin confidence and reduce contagion risks.¹³

COVERAGE OF CROSS-CUTTING ISSUES

A. Systemic Liquidity

68. Systemic liquidity assessments have become an increasing topic of interest in FSAP since the GFC. These analyses examine the risk that multiple institutions would simultaneously face liquidity difficulties. The main difference between institution-level and systemic liquidity risks is the amplification effect through interconnectedness in the whole financial system. Systemic liquidity risk differs across countries depending on financial system structures. In systems with well-developed money and capital markets, initial liquidity shocks to a part of the system could spill over to other institutions and markets. Behaviors, such as liquidity hoarding and asset fire sales, could amplify shocks. When financial markets are less developed, such as a system dominated by banks mostly funded by deposits, a system-wide liquidity shortfall could happen when there is a net aggregate outflow of liquidity from the whole system (for example in the case of external drains in the case of balance of payment shocks or domestic financial disintermediation when residents switch out of bank money).

69. For certain jurisdictions, systemic liquidity could be the central macrofinancial topic, closely related to Article IV consultation's external sector assessment. While systemic liquidity is the most evident type of systemic risk, major central banks have successfully mitigated the impact by providing ample liquidity in recent crises. The main policy challenges are establishing an adequate framework to monitor the origin and transmission channels of the risks and avoid the moral hazard problem of market participants. However, central banks in some jurisdictions—small open economies without reserve currencies (including advanced economies)—may not be able to mitigate aggregate FX liquidity shocks fully. Without additional private or official foreign funding, these central banks cannot play the lender of last resort function as their firepower is often limited to international reserves. These are indeed the economies subject to the assessment of reserve adequacy (ARA) of the Article IV consultation, where financial stability risk is considered one of the contributors to external balance distress.¹⁴

¹³ Given the potential ML/TF risks when reimbursing insured depositors, adequate AML/CFT safeguards should be in place, including, effective coordination with relevant AML/CFT authorities, and active channels for cooperation and information sharing.

¹⁴ See IMF, 2016, [Guidance note on the assessment of reserve adequacy and related considerations](#). MCM has also developed a new tool to assess the impact of FX liquidity shock from the balance of payment stress to various economic sectors and their spillover to the financial system and the international reserves held by the central bank.

70. A systemic liquidity assessment spans the three pillars of a financial stability assessment. Pillar 1 examines vulnerabilities by type of institution (e.g., banks, asset managers, or potentially CCPs) or by activities (e.g., repo markets including all participants). Pillar 2 discusses prudential measures to prevent liquidity stress at the level of individual institutions (e.g., liquidity requirements to banks and investment funds) and at the system level (macroprudential requirements, if any). The robustness of FMI is another oversight issue. Pillar 3 covers liquidity support by central banks and its design (e.g., eligible collateral and lending terms), including cross-border backstops such as central bank swap arrangement for systemic FX liquidity shocks. Ideally, an assessment of systemic liquidity would include a qualitative and quantitative description of financial linkages of a system integrated with liquidity stress tests of systemically important segments (such as banks, mutual funds, and CCPs) or activity-based analysis in most relevant liquidity markets to the extent possible.

71. The depth of systemic liquidity assessments in FSAPs has varied, mostly reflecting data gaps and methodological challenges. Some assessments have focused on a description of core liquidity markets and their financial market infrastructures with a qualitative assessment of their vulnerabilities under stress based on which prudential and safety net recommendations have been made. Quantitative liquidity stress tests have focused on banks (and occasionally investment funds).¹⁵ The nonavailability of needed extremely granular data and methodological challenges to model complex interconnectedness and main participants' behavior in an extreme stress scenario have limited the depth of coverage of systemic liquidity assessments in FSAPs.

B. Borrower Vulnerabilities and Distressed Asset Restructuring

72. The potential scarring effects of the pandemic are bringing renewed attention to nonperforming loan (NPL) management, which could be relevant for FSAPs in the near future.^{16, 17} Borrower distress could become more visible as extraordinary support measures are gradually unwound requiring balance sheet workouts in the real and financial sectors. FSAPs may thus need to consider enhancing the supervision of asset quality—including asset quality reviews as needed—and reviewing frameworks for NPL restructuring given the possibility of a spike in the volume of distressed assets over the next few years. These are cross-cutting topics spanning regulation and supervision and corporate insolvency and enforcement of creditor right. FSAPs over the next years may need to address these topics given the high likelihood of large-scale balance sheet workouts in the non-financial sectors.

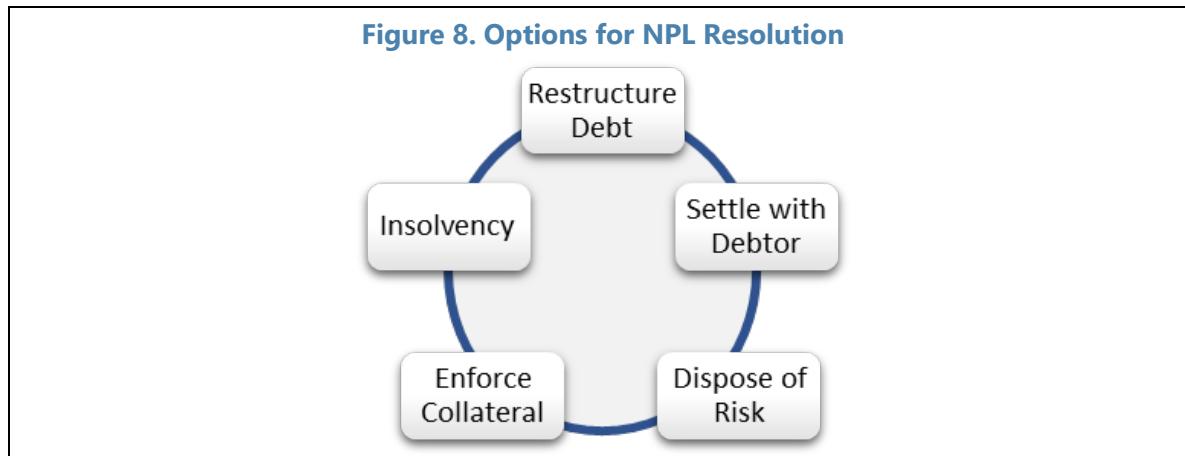
73. Experience suggests that coordination across multiple government agencies is needed to establish comprehensive NPL restructuring strategies at the national level. As shown in Figure 8, banks have five options for dealing with large stocks of NPLs. Their

¹⁵ Exceptions include 1) 2017 Luxembourg FSAP conducted detailed liquidity analysis of mutual funds, and Article IV examined the link between banks and mutual funds through deposits; 2) 2020 Philippines FSAP examined liquidity linkage between banks and nonfinancial corporations triggered by COVID-19 related earnings shocks.

¹⁶ See “[GFSR: Markets in the Time of COVID-19](#)”, April 2020 and “[GFSR: Bridge to Recovery](#)”, October 2020.

¹⁷ See, for example, recent FSAPs for France ([2019](#)), Italy ([2020](#)), Korea ([2020](#)) and the United States ([2020](#)).

effectiveness hinges on the legislative frameworks and institutional capacity. Therefore, country authorities have a role to play in pillar 2 and 3 areas, including (i) strengthening regulation and supervisory oversight; (ii) enhancing insolvency and creditor rights frameworks; and (iii) facilitating asset disposal (see [IMF 2020b](#)). Building on experiences gained in recent FSAPs, deep dives in these areas are likely to become more important in the post-COVID era.¹⁸



- **Supervision and regulation.** To avoid moral hazard, supervisors need to ensure that loans are appropriately classified and provisioned, with particular attention paid to collateral valuation and the treatment of restructured loans. Banks should also be encouraged to write off uncollectible loans promptly before exhausting all legal remedies. Enhanced oversight of banks with high NPL levels can help foster timely action by requiring banks to develop bank-specific NPL resolution strategies and spurring the improvement of banks' internal capabilities for handling distressed assets—including via the creation of dedicated workout units. Reviews of supervisory and regulatory policies relevant for NPL resolution should be informed by and coordinated with financial sector oversight evaluations, as conducted through formal assessments such as the BCP.
- **Insolvency and creditor rights.** Effective NPL resolution requires an insolvency regime that enables the rehabilitation of viable firms and liquidation of nonviable ones and robust enforcement and foreclosure processes that help maximize recoveries (see [IMF 2020d](#)). Efficient insolvency and enforcement mechanisms can also incentivize borrowers and creditors to engage in meaningful out-of-court restructurings. Such restructurings can provide effective solutions for dealing with large numbers of over-indebted enterprises and households without overloading the judicial system. Reviews of insolvency regimes and frameworks for creditor rights can be conducted following the [World Bank's Principles for Effective Insolvency and Creditor/Debtor Regimes](#) and the comprehensive guidance on [insolvency law from the United Nations Commission on International Trade Law](#).

¹⁸ See, for example, technical notes on NPL resolution prepared for the [2017 Bulgaria](#) and [2020 Italy](#) FSAPs.

- **Asset disposal.** Timely disposal of distressed assets can facilitate balance sheet clean-up while supporting market efficiencies by involving specialized investors. The development of a distressed asset market typically hinges on reforms that seek to remove structural impediments (e.g., incomplete credit information, legal obstacles to asset transfers, a level regulatory and consumer protection playing field, unfavorable tax treatment) and improve the enforcement of creditor rights.

COVERAGE OF EMERGING ISSUES

A. Overall Considerations

74. Emerging risks such as those arising from climate change, cyber, and fintech are becoming increasingly important for financial stability. Central banks and financial regulators are paying increased attention to the implications of climate change for the stability of financial systems financial stability and opportunities for green investment. There have been intensified discussions and work programs in international fora such as the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). Meanwhile, rapid advances in financial technologies are transforming the economic and financial landscape. The exponential growth in digitalization and interconnectedness of financial services and infrastructures has increased substantially the potential risks to financial stability from cyberattacks. And while Fintech can support potential growth and poverty reduction, it may pose risks to consumers and investors and, more broadly, financial stability, development, and integrity.

75. Tackling these emerging issues in FSAPs calls for a combination of approaches across the three pillars. Within Pillar 1, stress testing exercises could include scenarios of the impact of climate change and fintech over extended horizons. Pillar 2 may need to develop a comprehensive approach to address emerging challenges from climate change, cyber risks, and fintech based on new standards and guidance for these risks under consideration by SSBs as they become available.¹⁹ In addition, increased role of fintech in payments and cyber risks mean that FSAP may need to examine more closely operational resilience of market intermediaries and FMIs.

76. Addressing emerging issues calls for collaboration and investing in human capital at the Fund. Climate change analysis will require collaboration with climate scientists and hazard risk specialists (such as catastrophe insurance experts) to correctly identify risks and transmission channels relevant for financial stability and assess their potential impact. In the case of cyber risks and fintech, there is a need to work with technology specialists and ideally security/law enforcement agencies, although collaboration has been limited so far. To address expertise limitations in the emerging areas, staff will need to continue working with external experts and broadening expert rosters. In addition to building expertise through hiring and close cooperation with World Bank Group, staff have been intensifying cooperation with other stakeholders on the emerging issues. Work on FSAPs could also benefit from cross-fertilization

¹⁹ For instance, the FATF issued [standards for virtual asset and virtual asset service providers](#) in 2019.

of ideas and analysis from other Fund-wide workstreams, including on climate change, fintech (including digital money), and cyber risks.

77. Future FSAPs will need to strike a balance between traditional topics and emerging issues based on country circumstances. The pace of digitization of the financial sector and policy efforts to prevent, mitigate, and adapt to climate change will only increase over the next five years. The SSBs are making efforts to incorporate these new risks into their standards and guidance and there will be a need for FSAPs to adapt and develop approaches to evaluate practice. Analytical frameworks for assessing these risks across the globe are at an early stage but developing rapidly. Meanwhile, traditional macrofinancial risks and assessment of existing (and evolving) standards and codes will remain core topics. Given the resource constraints, FSAP teams will need to leverage the scoping process to prioritize the balance of considering emerging risks, leveraging the Risk Assessment Matrix to inform staff judgment. It will be important to take a forward-looking approach here given the rapidly evolving landscape and attendant material risks.

78. Pilot assessments offer a pragmatic approach in the near future. As discussed in detail below, recent FSAPs have covered some of emerging risks on a pilot basis, working with external experts in respective fields. Pilot cases are chosen based on the potential systemic importance of a given emerging risk in the country. Use of pilots has helped develop assessment techniques that could be used in future FSAPs and allowed deeper examination of these issues in relevant FSAPs. Gaining further pilot experience together with broader MCM and IMF/World Bank policy projects, technical assistance, flagships, and collaboration with the SSBs and other central banks and financial regulators, should allow FSAP teams to increase the coverage on these topics.

B. Climate Change Risk

79. Climate risk stress testing in FSAPs can help our members better understand potential pressure points for the financial system due to physical climate shocks and in the transition to a low-carbon economy. It will help inform policies needed to enhance risk management and the resilience of the financial system. Unlike conventional stress testing, climate risk stress testing is not focused on quantifying possible capital needs of financial institutions relative to regulatory minima.

80. There has been some discussion of risks associated with climate related issues already in past FSAPS.

- **Risk analysis:** A textual analysis of 192 FSAP reports (up to 2019) found that 33 (17 percent) contained meaningful references to risk factors such as droughts, floods, and storms. Many of these are for small island states (such as the [Bahamas](#), [Jamaica](#), and [Samoa](#)), but some assessments for advanced economies (such as the [United States](#), [France](#), [Belgium](#), [Denmark](#), and [Sweden](#)) have also covered natural catastrophe risks as part of insurance stress testing. More recently, some FSAPs have piloted new approaches to incorporate climate change in bank stress tests ([Norway](#) on transition risk

and the Philippines on physical risk), while others discussed the risks without necessarily conducting stress tests.

- **Oversight:** The oversight section of FSAP also started to cover climate issues. In the [2020 US FSAP](#), the regulatory response to the increasing incidence and severity of natural catastrophes was considered as part of the assessment of supervision and regulation of the insurance sector. Assessing progress with disclosure rules on climate change risk (for all types of firms) is another area. IMF staff are developing an approach to embed climate risk considerations in the review of supervision and regulation; this approach to climate risks will be pilot tested in upcoming FSAPs.

81. The approach to climate risk stress testing will require adaptations to the conventional approach to stress testing along several dimensions:

- **Horizon.** Climate risk stress testing will consider financial stability risks at both the conventional medium-term (3-5 year) horizon and the long-term (30-50 year) horizon, given the nature of climate risks. The examination of both medium- and long-term climate risks is important, as many others in the field focus only on long-term risks.
- **Nature of risks.** FSAPs will need to consider both physical and transition risks. In any given country, the scope of the analysis would be based on an assessment of each country's specific vulnerabilities.
- **Scenarios for physical risk.** The highly micro-sectoral and geo-spatial sources of climate-related financial stability risks present important data and modeling challenges. FSAPs will need to draw on external expertise on physical risk and obtain granular data.
- **Scenarios for transition risk.** The large uncertainties surrounding the carbon price path and associated spending of carbon tax proceeds present important modeling challenges. FSAP stress testing will need to assume a range of carbon price paths, from large up-front price increases to more gradual increases, drawing on approaches being used by leading central banks and leveraging models developed within the Fund and external experts, linking close to the approach of the NGFS.

82. FSAPs will need to leverage other climate work in the Fund, the Bank, and international fora. Staff are engaging with the NGFS for stress tests and supervision, and the Task Force on Climate related Financial Disclosures on the taxonomy of green assets as well as disclosure standards. Recent issues of the GFSR discuss the impact of climate change on asset prices and sustainable finance. Going forward, more effort will be needed on macroeconomic modeling²⁰ of climate change to build climate stress test scenarios and integration of discussions with the revised Climate Change Policy Assessment (CCPA) as well. Collaboration with the Bank could be particularly relevant for the jurisdictions with joint Bank-Fund

²⁰ Climate change—whether it is physical or transition risks—would have different impacts across economic industries (e.g., “brown” industries vs. “green” industries) and geography. Therefore, one would need to use economic models suited for analysis by industry, such as computational general equilibrium (CGE) models and global trade analysis project (GTAP) models. Currently, such models are not part of the Fund’s macroeconomic modeling toolkit.

responsibilities. The cooperation is especially vital for building physical risk stress test scenarios, where expert knowledge on climate science and disaster models (e.g., catastrophe (CAT) risk models for cyclones and flood) related to Bank's work on disaster financing and insurance programs and sectoral expertise (e.g., agriculture, energy) would be salient. We will seek to extend climate risk analysis—including on materiality and, as relevant, physical and transition risk modeling—to more FSAPs, as feasible within the prospective resource envelope.

C. Cyber Risk

83. Financial systems are particularly vulnerable to cyberattacks, given the increasing reliance on information and communication technology (ICT). The "entry points" of attacks could be diverse, and an attack on a handful of firms could spread to the system quickly through both the ICT's interconnection and the inherent interconnectedness in the financial system. Cyberattacks can be systemic if they target several financial institutions simultaneously, a systemically important financial institution or market infrastructure. Spillovers may also come indirectly from attacks on ICT providers and physical infrastructures. Cyberattacks could also exacerbate an emerging financial crisis by propagating disinformation, undermining confidence, or disrupting safety nets. Direct and indirect cyberattacks to the financial system could stall payments and settlement transactions, liquidity crunch to banks, and mass insurance claims from the policies that cover the cyber risk, among others.

84. Coverage of cyber risks in FSAPs has been increasing. Some FSAPs have gathered descriptive information on cybersecurity practices through interviews ([Namibia](#)) and on potential losses from cyberattacks through questionnaires ([Poland](#)). There have been several pilot cases where FSAPs investigated the risks from Pillars 1 and 2 perspectives in depth. In addition, MCM has been providing workshops and technical assistances (TA) for emerging and developing economies by connecting the supervisors from these economies to extremal experts in the field and supervisors from more developed economies. MCM has also organized crisis management simulation exercises for some countries in collaboration with a major global bank and cybersecurity experts. These capacity development experiences could also help to develop in-house expertise and tools for FSAPs. The pandemic has further heightened concerns regarding cyber and operational resilience and led to the inclusion of these topics in the scope of forthcoming FSAPs.

85. Some FSAPs developed new approaches for quantitative risk assessment of cyber risks, despite data challenges. The Euro Area FSAP conducted a cyber risk-motivated liquidity stress test of banks, simulating a scenario assuming banks could not access collateral at CCPs. It exhibited a case where standard stress testing tools could be used to discuss cyber risks. The Singapore FSAP further broadened the types of cyber risk analyses, thanks to detailed data from authorities on cyberattacks. Also, banks provided cyber risk scenarios most impactful to themselves and associated loss estimates and management actions. These scenarios were used to develop an inventory of scenarios, and some were presented in a cyber RAM. Insurers were asked to estimate policy payouts if their significant policyholders were to experience cyberattacks. Data gap is a critical constraint. Cyber security breach data could be considered as national security information, raising the bar to access even more than standard stress testing

data. Publicly available data depends on voluntary reporting and often misses some information such as losses.

86. Developing regulation and supervisory processes are also essential, and two pilot FSAP exercises were undertaken in Norway and South Africa. The objective was to examine the potential systemic implications of cyber risk and policy actions to improve cyber resilience, focusing on the regulatory and supervisory framework using international best practices and guidance. The pilot exercises developed a cross-sectoral approach covering systemically important FMs and banks. The [United States](#) FSAP also discussed cyber risk within financial oversight, including banks and FMs. These exercises emphasized the need for strong collaboration with the authorities, given the sensitive subject matter and the need for ensuring sufficient confidentiality of the information provided by different authorities. Narrowing the scope of the analysis to systemically important FMs and banks was crucial to understanding systemic vulnerabilities.

87. To clarify expectations of cyber risk coverage in FSAPs, staff proposes to amend the FSSA disclaimer. FSSAs include a disclaimer noting that FSAPs do not cover some categories of risk, such as operational, legal, and fraud risks.²¹ While still broadly appropriate, the disclaimer could create confusion in some of the emerging areas, such as cyber risk, which could give rise to systemic risk. The wording could therefore be clarified to highlight the distinction between systemic risk (which financial stability assessments focus on) and idiosyncratic risk (which they do not necessarily cover).

D. Fintech

88. Rapid advances in “fintech” are transforming the financial landscape, offering opportunities but posing risks. Financial innovation has not only changed the nature of financial products and services but has also altered production processes and organizational structures. These changes offer benefits, but they are also introducing new risks, including potentially to financial stability. In addition to cyber risk, fintech also poses risks to established financial institutions through competitive forces, which may undermine their business models and require adaptation.

89. Fintech issues have already been covered in 13 assessments, with 5 ongoing FSAP missions focusing on fintech. The assessments have been primarily focusing on oversight issues so far. The World Bank has been discussing fintech from the perspective of improving access to finance, financial inclusion, financial development, and reducing the cost of retail payments, including cross-border payments. Quantitative analysis of financial stability risks from fintech is still at an early stage.

90. Fintech impacts financial sector oversight in many ways. FSAPs have approached the topic by integrating fintech elements into the existing components of the oversight pillar.

²¹ The disclaimer reads, “FSAPs assess the stability of the financial system as a whole and not that of individual institutions. They are intended to help countries identify key sources of systemic risk in the financial sector and implement policies to enhance its resilience to shocks and contagion. Certain categories of risk affecting financial institutions, such as operational or legal risk, or risk related to fraud, are not covered in FSAPs.”

Regulators and supervisors are monitoring fintech developments to evaluate whether regulatory frameworks and supervisory processes need to be adapted given the often rapid changes occurring in the financial sector (such as by creating sandboxes, innovation hubs, enhanced monitoring, clarifying and adjusting existing regulations, and strengthening resources). Some authorities have amended the legal and regulatory framework for the new entities and services. The general objective has been to strike a good balance between allowing financial innovation and preserving financial stability and integrity and consumer protection. Pilot exercises have been conducted in some jurisdictions (e.g., [Malta](#), [Singapore](#), [Switzerland](#), and [United States](#)) where rapid fintech developments and regulatory changes have been observed. With a focus on financial inclusion, the World Bank has included fintech in various development modules of FSAPs (such as India, Indonesia, South Africa, and Thailand).

91. The pilot experience highlighted some common challenges. These are (i) resource limitations given specific skills needed; (ii) lack of reliable data due to the existing regulatory perimeter; (iii) the importance of international cooperation due to the cross-border nature of fintech activities; and (iv) the need to further develop international standards in some areas. As emerging market and developing economies (EMDEs) are facing more rapid development of fintech and BigTech, there may be a higher demand from these authorities to include the analysis of fintech and BigTech in future FSAPs.

92. A few FSAPs have attempted to assess quantitative risks from fintech developments on a pilot basis. The 2019 Singapore FSAP took a multi-pronged approach. The national authority conducted bottom-up stress tests on capital and liquidity based on scenarios the participating banks considered the most relevant. Additionally, staff estimated potential gains from fintech by gauging the unit cost of financial intermediaries and the reduction of incumbent banks' noninterest income. Staff also discussed the desirability of the sandbox approach to encourage competition and innovation using an industrial organization model. The 2020 FSAP for Korea overlayed the effects of competition from fintech firms on banks' interest income and funding costs in the standard bank stress tests. The results critically depend on the extent of likely competitive pressures, as the market structure in the financial services sector evolves which hinges on the regulatory framework and market infrastructures for fintech firms (such as whether digital retail payment firms can access banks' payment networks or not).

93. Future analysis of fintech risks will need new frameworks and data sources to potentially assess efficiency-stability tradeoffs. Assessing the benefits and risks of fintech innovations calls for frameworks that can help model the incentives for financial innovation and risk-taking behavior for both incumbent institutions and entrants, the roles of market structure and government policies, and their overall mapping to increased efficiency and inclusion versus generation of financial stability and integrity risks. As noted by the FSB ([2019](#)), risks here are nascent in many sectors barring critical infrastructures such as for third party cloud service providers. Moreover, large data gaps persist reflecting in part the challenge of monitoring the activities of new fintech entrants as well as the role in finance of BigTechs. Developing frameworks and obtaining data on emerging activities are key challenges facing FSAPs to examine these new risks.

COORDINATION WITH THE WORLD BANK

94. In EMDEs, FSAPs are usually conducted jointly with the World Bank, except in the case of separate stability or development modules. World Bank staff participate in FSAPs in all countries that are members of the International Bank for Reconstruction and Development (IBRD, one of the five institutions of the World Bank Group), in addition to any other country in which the World Bank has a country engagement, even if there is no World Bank lending involved. In financial sector areas that have both stability and developmental aspects, the Fund and the World Bank take the lead in aspects of their responsibility. These cases often involve the appointment of two experts, one for each institution. For example, Basel Core Principles assessments in joint Bank-Fund FSAPs have almost always been carried out by two experts, one for the Bank and one for the Fund.

95. The World Bank's role in FSAPs in EMDEs is critically important. Given the interplay between financial stability and development as well as the World Bank's role in nonbank sectors and emerging topics, such as fintech and climate finance, the involvement of the World Bank is extremely helpful. For these reasons, IMF-led FSAP stability modules in EMDEs tend to involve one or two World Bank staff or experts, and World bank-led FSAP development modules tend to include one or two IMF staff or experts. Even some advanced economy FSAPs included World Bank experts when relevant and feasible. Staff's analysis suggests that—controlling for factors such as financial sector size—joint FSAPs have been able to provide a broader scope.

96. In joint FSAPs, coordination with the Bank has been effective. The Fund mission chiefs share with the Bank mission chiefs the *FSAP Approach and Staffing Note* and the *FSAP Financial Stability Policy Note* (FSPN). A summary of the Bank's work plan should be included in both documents. The Fund mission chiefs and deputies always attend the pre-mission Bank review. Likewise, the Bank mission chief always participates in the FSPN review. The Fund mission chief also attends the Bank's review of the FSAP Aide-Mémoire. On specific World Bank matters, the FSAP mission chief consulted with the staff-level Secretariat of the joint Fund-Bank Financial Sector Liaison Committee (FSLC).

97. The FSLC coordinates the aspects of FSAPs that are conducted jointly. The FSLC, co-chaired by senior Fund and Bank staff, is an important vehicle for coordinating Bank-Fund work in financial sector issues, including the FSAP. Regarding the FSAP, the FSLC's principal focus has been the coordination of scheduling and procedures, but it has also been active in other areas. For example, it has been a forum for discussing issues raised by international standard-setters regarding standards and codes, approaches to quality assurance for the DARs and ROSCs, and special topics such as financial inclusion, climate change, fintech, and cyber risks (IMF, [2014a](#)).

98. The FSLC also maintains rosters of external experts for joint FSAP assessments. The rosters comprise experts that have been certified by each institution in its area of specific responsibility and have been consented by the FSLC. In the areas of Fund responsibility, the experts are certified by relevant MCM divisions.

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