GROUP OF TWENTY

G-20 BACKGROUND NOTE ON MINIMIZING SCARRING FROM THE PANDEMIC

Prepared by Staff of the

INTERNATIONAL MONETARY FUND*

*Does not necessarily reflect the views of the IMF Executive Board

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CONTENT

EXECUTIVE SUMMARY

The COVID-19 crisis is likely to have lasting adverse impact on output, with particularly negative consequences for vulnerable groups. Scarring—defined as diminished longer-term output relative to pre-pandemic projections—may occur due to pandemic-induced damage to capital, labor and productivity. Moreover, while the extent of scarring is likely to be more severe in emerging market economies, in all economies, vulnerable groups will be disproportionately hurt. There are several channels through which the pandemic may lead to scarring on output.

- *Labor market disruptions, particularly in emerging market economies, are likely to weigh on productivity through reduced human capital*. G-20 advanced economies have seen strong labor market recoveries, and sectoral mismatch appears limited. In contrast, many previously employed people in G-20 emerging market economies, where economic slack so far has proven more persistent, are experiencing a longer period of non-employment, which could erode human capital. Moreover, the prevalence of informality appears to be increasing, leaving workers at risk of lower incomes and reduced access to social safety nets.
- *Unprecedented disruptions to schooling could diminish human capital for decades to come*. Learning losses from school closures have been severe across the G-20 and have fallen disproportionately on poorer students. If left unaddressed, the consequent impact on human capital will reduce skill levels and aggregate output for decades to come—with greater attendant inequality.
- *High leverage and elevated balance sheet vulnerabilities may result in lower investment, which in turn would reduce the capital stock and productivity.* In the most-affected sectors, leverage and balance sheet vulnerabilities have risen sharply, which is likely to make it more difficult to finance investment. In addition, while the pandemic-induced rise in digitalization has the potential to boost productivity, the digitalization trend could be cut short, as such investments are particularly sensitive to tighter financing conditions.
- *Suboptimal policy settings could result in misallocation of capital and labor*. Credit and labor market interventions have played a critical role in minimizing scarring by reducing business destruction and job losses. However, such policies, if not appropriately adjusted as the recovery takes hold, could slow the process of productivity-enhancing reallocation and risk creating zombie firms.

Policy action can help heal scars and prevent further wounds. Immediate action is needed to limit and repair learning losses. Targeted fiscal measures and the implementation of structural reforms can help raise productivity-enhancing investments and create jobs. Appropriately adjusting macroeconomic and financial policies can contain risks of further scarring. Crisis support measures should also be adjusted to avoid hindering productivity-enhancing reallocation and prevent a debt-induced slump in investment. Multilateral actions to end the pandemic, support the rules-based global order, and strengthen the international financial safety net should complement domestic efforts and help financially constrained developing economies to recover with minimal scarring.

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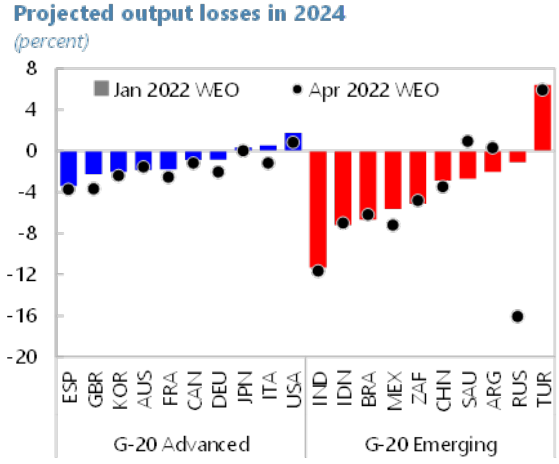
THE PANDEMIC IS PROJECTED TO LEAD TO SCARRING

The COVID-19 pandemic triggered a severe global downturn. This may result in diminished economic prospects over the longer term relative to pre-crisis projections—that is, the pandemic may lead to economic scarring. However, the extent of scarring is likely to vary across and within countries. Advanced economies likely face a lower degree of scarring than emerging market economies, while vulnerable groups, such as low-skilled workers, and current students may face reduced opportunities relative to pre-pandemic expectations. This note analyzes the channels through which pandemic-induced scarring could occur, assesses the likely extent of scarring, and presents policy recommendations for mitigating the damage.

1. The COVID-19 pandemic set off severe economic disruptions across the G-20. The pandemic, along with necessary containment efforts, triggered a decline in global economic output of 3.1 percent in 2020. Though unprecedented policy support prevented even worse outcomes, such support was uneven across economies. G-20 advanced economies and emerging market economies deployed about $9 trillion and $1.2 trillion, respectively, in additional spending and foregone revenues measures, and about $5.8 trillion and $0.6 trillion, respectively, in liquidity support, between the beginning of the pandemic and the fall of 2021.[1] While growth has strengthened since the depth of the recession, activity in service sectors continues to lag that in goods sectors, as some extent of social distancing to minimize virus transmission remains. The pandemic has also led to an increase in poverty and inequality globally—with 75 million additional people in extreme poverty in 2021 relative to pre-pandemic trends.[2]

2. Looking ahead, the crisis is projected to lead to lasting output losses in many economies. Economic scarring—that is, lasting output losses relative to pre-pandemic projections over the medium-to-long term—could be substantial. In this respect, the extent of pandemic-induced scarring is likely to be greater in G-20 emerging market economies than in G-20 advanced economies. Notably, IMF projections prior to the commencement of the war in Ukraine suggest that while output in many G-20 advanced economies was expected to return to near pre-pandemic trends, output in many G-20 emerging market economies were projected to remain well below pre-pandemic trends over the projection horizon (Figure 1). The war in *Ukraine* will have

Figure 1. Projected Output Losses



Sources: IMF, *World Economic Outlook*; IMF staff calculations.
Note: Percent change in projected 2024 real GDP between the October 2019 and January 2022 (bars) and April 2022 (dots) WEO projections, respectively. January 2022: Last WEO vintage prior to outbreak of the war in Ukraine. *AUS*: losses driven by a reduced population due to border restrictions.

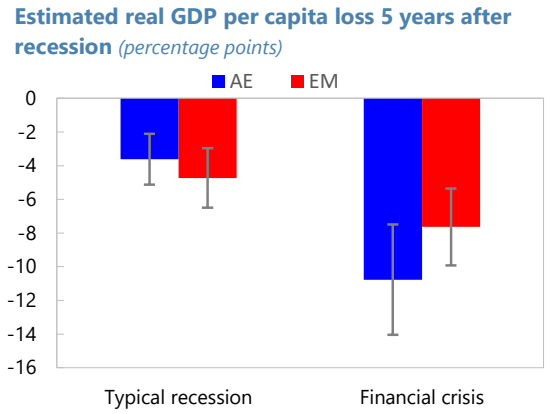
[1] IMF (2021a) estimated that the 2020 output decline could have been at least three times worse absent the policy response. Fiscal support measures as of September, 2021; see also Fiscal Monitor Database of Country Fiscal Measures in Response to COVID-19 at https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19.

[2] World Bank (2022); IMF (2022e).

further adverse impact on global growth and could yield additional long-term damage for some G-20 economies. However, in light of the uncertainty about the impact of the war as well as the large regional differences in the impact, the focus in this note is on the implications for economic scarring as a result of the pandemic and does not reflect changes in projections following the war in *Ukraine*.

3. Economic scarring following recessions may occur through several channels affecting the determinants of aggregate output. An economy's aggregate output depends on the stock of available labor and capital and on aggregate total factor productivity (TFP). In turn, aggregate TFP reflects the human capital of workers, the technologies and management practices deployed for production, and the allocation of capital and labor across firms within an economy. In this respect, past recessions have led to persistent output losses through various channels, as documented in a large literature (Figure 2).[3] In addition, the current pandemic has presented novel mechanisms through which scarring may be either amplified (e.g., through disruptions to schooling) or reduced (e.g., through accelerated digitalization). Conceptually, recessions could leave persistent damage to capital, labor, and productivity through the following channels.

Figure 2. Persistent Losses from Recessions



Source: IMF World Economic Outlook, Chaper 2, April 2021.
Note: Results from impulse response functions, based on data from G-20 and non-G-20 economies. Lines: 90 percent confidence intervals. See IMF (2021b) for details.

- *Labor market disruptions can reduce the amount and quality of labor input.* For example, prolonged periods of non-employment may drive some people to drop out of the labor force, thus reducing labor supply or eroding workers' human capital. Slow economic recoveries could also increase the prevalence of informal work, which is often associated with lower incomes and productivity, and with limited access to safety nets. Some groups of workers—such as new labor force entrants, may be particularly vulnerable to setbacks.
- *Disruption to schooling can adversely impact human capital of future workers.* School closures could significantly slow human capital formation, leaving the future labor force with lower skill levels. Alongside, a rise in poverty, food insecurity, and worsening access to health care could amplify skill losses—with attendant impact on inequality.
- *Corporate sector vulnerabilities may result in lower capital investment.* Falling profits and debt overhang, including amid tighter financing conditions, could undermine investment. If such investment losses are not recouped during the recovery, the capital stock and productivity would be persistently diminished. While a pick-up in digitalization may offer a countervailing source of productivity growth, such investment may be particularly sensitive to financing conditions.
- *Suboptimal policy settings can hold back the reallocation of resources and weigh on productivity.* For example, poorly targeted policy support can keep capital and labor captive in zombie firms,

[3] Cerra and others (2020) and references therein, and IMF (2021b).

hindering their reallocation towards firms with higher marginal products. In contrast, too little support during a crisis may also result in excessive bankruptcies of productive businesses, and the consequent loss of valuable firm-specific know-how.

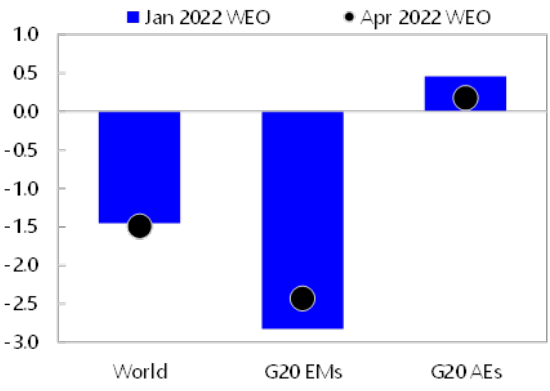
4. This note discusses the likely extent of economic scarring from the COVID-19 pandemic as well as policies to mitigate such damages. While there is substantial uncertainty surrounding the outlook, it is clear that the pandemic caused a deep recession. As such, the note will analyze the importance of the channels through which scarring from the pandemic may occur and their relevance across economies. Given the unequal distribution of shocks within economies, the note will also consider how scarring is likely to disproportionately affect vulnerable groups. It will conclude by presenting policy recommendations to minimize scarring and support a strong, sustainable, and inclusive recovery.

EMPLOYMENT RECOVERIES ARE UNEVEN

The potential for severe scarring from labor market disruptions appears so far to be contained in G-20 advanced economies in light of strong labor market recoveries and limited signs of sectoral mismatch. However, labor markets have been slower to recover in many G-20 emerging market economies, and informality has risen. In all economies, new entrants to the labor force are likely to face long-term income losses relative to entrants during boom times.

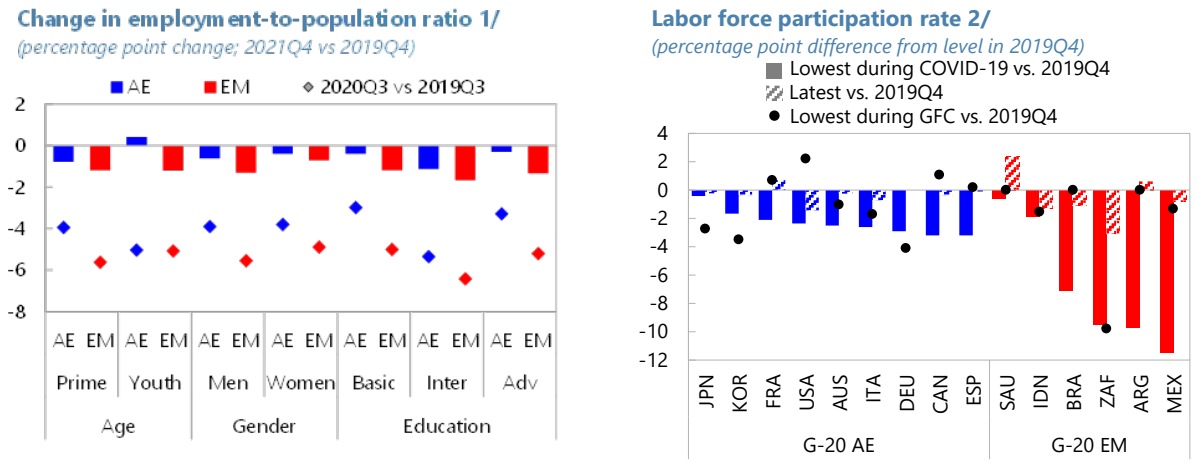
5. Labor market recoveries have remained uneven, with the outlook for employment worst in G-20 emerging market economies—in line with the uneven output recovery. As the pandemic-induced recession took hold in 2020, employment rates fell sharply across the G-20, and across demographic groups within economies (Figure 4, left panel). Labor force participation declined as well, with participation rates in some cases reaching levels below those seen during the Global Financial Crisis (Figure 4, right panel). Since then, the speed of the recovery in economic activity has been faster in G-20 advanced than in G-20 emerging market economies—in large part reflecting differences in the degree of policy support and extent of vaccinations. Alongside, employment recoveries were also stronger in G-20 advanced than in G-20 emerging market economies, though with substantial heterogeneity between economies within each group. Going forward, while employment levels over the medium term are projected to return to pre-pandemic trends on average across G-20 advanced economies, employment is projected to remain about 2½ percent below pre-pandemic trends in a sample of G-20 emerging market economies (Figure 3).

Figure 3. Projected Employment Losses



Sources: IMF, *World Economic Outlook*; IMF staff calculations. Note: Difference in projected 2024 employment levels between Oct. 2019 and Jan. 2022 (bars)/April 2022 (dots) WEOs. CHN, IND: excluded due to changes in employment definition across vintages; SAU: excluded due to data limitations. Jan. 2022: Last WEO prior to the war in Ukraine.

Figure 4. Labor Market Disruptions and Recoveries

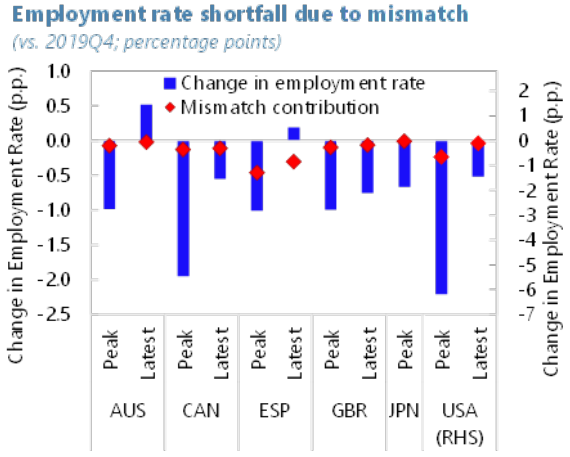


Source: ILO, and IMF staff calculations.
1/ AEs: CAN, FRA, ITA, ESP, KOR, USA; EMs: ARG, BRA, MEX, IDN, ZAF. PPP GDP weighted averages. ARG, IDN: 2021Q3 vs 2019Q3.
2/ Latest data: 2021Q4 for AUS, BRA, CAN, DEU, ESP, FRA, ITA, JPN, KOR, MEX, USA, and ZAF; 2021Q3 for ARG, IDN, and SAU. For the Global Financial Crisis (GFC): no 2007Q1 data available for BRA, IDN, SAU. No data available for CHN.

A. So Far, Labor Market Scarring Appears Limited in Advanced Economies

6. Labor markets have tightened in G-20 advanced economies. Employment rates and hours worked have recovered strongly since the bottom of the crisis, though still remaining below pre-pandemic levels. Labor force participation rates have also partially recovered, with the remaining participation gap reflecting factors such as early retirement, lack of childcare, and continuing health concerns (particularly relevant for holding back low-skilled workers from returning to contact-intensive jobs), with the importance of each factor varying between economies. While employment of low- and medium-skilled workers continue to lag, the labor market recovery has nonetheless been broad-based within advanced economies (Figure 4, left panel). As such, labor market tightness has become increasingly prevalent, including with increasing growth in nominal wages in several economies (e.g., *United Kingdom*, *United States*).[4] In some economies, restrictions on international travel have also limited immigration of workers (e.g., *Australia*, *United States*), reducing the aggregate supply of human capital and labor.

Figure 5. Extent of Sectoral Mismatch



Sources: Duval and others (2022).
Note: Contribution of sectoral mismatch between vacancies and unemployed workers across industries (occupations for CAN and JPN). Computed based on a labor mismatch index, following Sahin and others (2014). Peak: quarter when contribution of rising mismatch to fallling employment rate was the highest (USA: 2020Q3; AUS: 2020Q4; GBR: 2021Q1; CAN, ESP: 2021Q2; JPN: 2021Q4). Latest available: 2021Q4.

7. In G-20 advanced economies, sectoral mismatch does not appear to be a significant source of scarring, but new ways of working may pose other challenges. Even as service sector recoveries remain partial, measures of sectoral mismatch between job vacancies and job seekers have declined to pre-pandemic levels in

[4] Duval and others (2022).

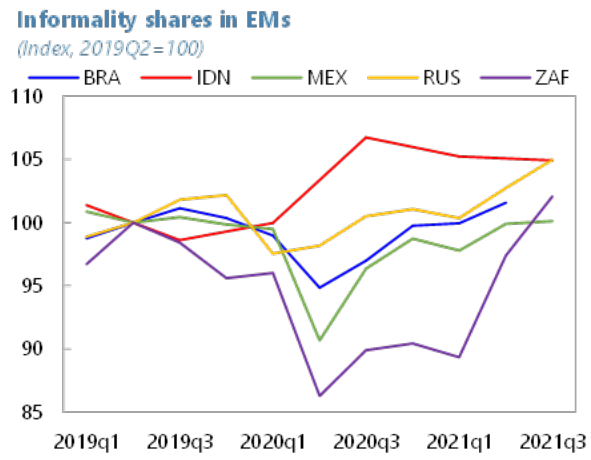
most economies and now contributes little to the continuing employment rate shortfall (Figure 5). However, the pandemic is likely to lead to a persistent re-organization of the workplace, with many employees potentially shifting towards remote or hybrid work. While there is some evidence that remote work can enhance productivity, its effects may be highly uneven across people and locations (e.g., with worse outcomes for those with children at home; and if workers fail to internalize the benefits of in-person interactions that contribute to firm-level productivity).[5]

B. Employment Gains Have Been Slower in Emerging Market Economies

8. Labor markets slack remains prevalent in G-20 emerging market economies, reflecting still-negative output gaps. In particular, employment rates remain further below pre-pandemic levels than in G-20 advanced economies, reflecting slower recoveries in output in emerging market economies, resulting from more limited policy support during the crisis and persistent pandemic concerns.[6] Moreover, continuing pandemic-related barriers to international travel have hampered a recovery in tourism, an important source of low-skilled employment in many G-20 emerging market economies (e.g., *Indonesia*, *Mexico*). In addition, labor force participation remains depressed across demographic groups.

9. While a sharp recovery of informal employment has lessened overall job losses, a larger informal sector brings other concerns. With the onset of the pandemic, the need for reducing contact-intensive activities to contain the spread of infections meant that activity in service sectors—which typically also have higher informal employment in many emerging market economies— contracted more than other sectors.[7] In this respect, evidence from *Brazil*, *Mexico*, *Russia*, and *South Africa* suggests that informal employment fell more than formal employment in the early stages of the pandemic. However, the number of informal jobs subsequently bounced back quickly and the shares of informality in total employment have returned to pre-pandemic levels or higher (Figure 6).

Figure 6. Change in Informal Employment



Sources: National Statistics; IMF staff estimates.
Note: See online annex for details.

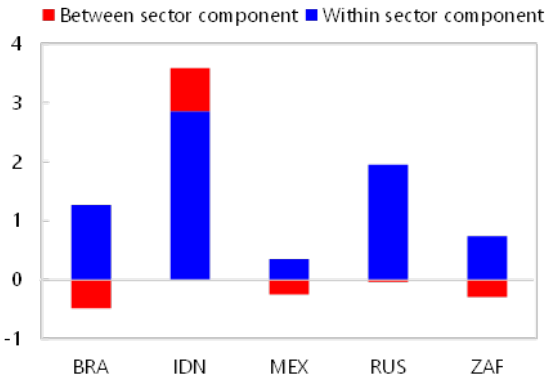
[5] Barrero, Bloom, and Davis (2020) makes this point. Mohring and coauthors (2021) find that people with children at home faced hard working conditions when working remotely, and DeFilippis and coauthors (2020) find that working from home led to increased meetings and emails, and longer working days. Bloom and others (2015), Emanuel and Harrington (2021), Choudhury and others (2021), and Angelici and Profeta (2020) find that working remotely or giving flexibility to employees increase productivity. However, Kunn and others (2020) find lower performance amongst chess players, while Behrens and others (2021) suggest heterogenous effects in general equilibrium.

[6] In some economies (e.g., *South Africa*), labor market rigidities have likely also contributed to holding back employment recoveries.

[7] See also IMF (2021c).

10. A decomposition of the employment recovery suggests that the re-opening of contact-intensive sectors explains only a fraction of the pickup in informal employment. The increase in informality has been largely driven by a rise in informality rates within sectors (within sector component in Figure 7), rather than the faster growth of sectors that tend to have a higher share of informal employment (between sector component).[8] In other words, the data suggests some substitution from formal to informal employment.[9] As the recoveries of contact-intensive sectors continue, overall informality rates could rise further.[10] While the current shift towards informal work in several G-20 emerging market economies may not persist, a long-term failure of formal jobs to recover could prompt a persistently larger informal economy, with attendant lower productivity, reduced incomes, and less protection offered by social safety nets.[11] Moreover, small and informal firms are less aware of policy support programs, weakening the transmission of policy action to the economy.[12]

Figure 7. Decomposition of Informality



Sources: National Statistics; IMF staff estimates.
Note: Changes for MEX, RUS, ZAF over 2019Q2 to 2021Q3; for BRA over 2019Q2 to 2021Q2; and for IDN over 2019Q3 to 2021Q3. See online annex for details.

C. Earnings for New Labor Market Entrants May Suffer from the Crisis

11. Students who entered the labor force during the COVID-19 recession, such as after the completion of education, faced a challenging job market. In 2020Q2, at the peak of the crisis, hiring rates of youth dropped by unprecedented levels across G-20 economies relative to a year prior (e.g., by 11 percent in *Spain*, 5 percent in *France* and *Italy*, 4 percent in *Turkey*).[13] Moreover, unlike in past recessions, college enrollment levels in the *United States* fell during the COVID-19 crisis, as graduating students did not choose to stay in school longer to avoid facing a difficult job market. This could be because of the countervailing impact of school closures and dissatisfaction with distance learning. In turn, the share of graduating students that were not in employment, education, or training, dramatically increased across G-20 economies during 2020.[14] However, evidence from past recessions

[8] The change in informality shares is decomposed as the sum of (i) the change in sector employment shares, holding sector informality rates constant (between sector component); (ii) the change in informality rates within sectors, holding sector shares constant (within sector component); and a covariance term. See technical annex for details.

[9] This result was also found in Colombia by Alvarez and Pizzinelli (2021). See Lambert and others (2020) for an analysis of informality over the business cycle; David and others (2020) and Abdulkarim and others (forthcoming) on how informal employment could slow the recovery in the formal labor markets during upturns.

[10] If the between sector component of the informality share were to return to its pre-pandemic level, such an increase could range between an extra 0.2 to 2.5 percentage points increase in the employment shares.

[11] Ulyssea (2020) and references therein.

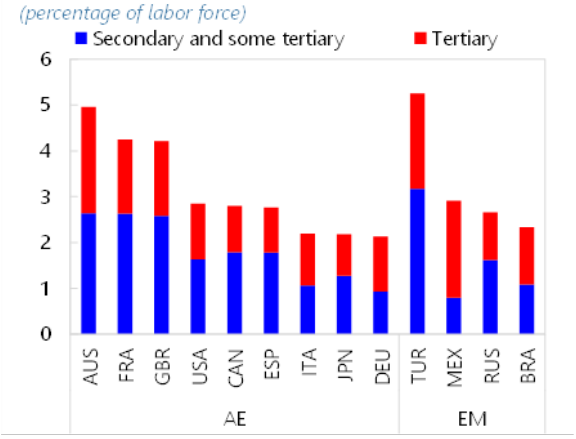
[12] Guerrero-Amezaga and others (2022).

[13] OECD (2021b).

[14] OECD (2021b).

suggests that adverse conditions when entering the labor market are associated with persistently lower employment probabilities and earnings throughout the labor market career. [15] Moreover, the setback to lifetime earnings is particularly severe for entrants with high school diplomas or less. [16] As such, recent findings in the literature suggest that life-time earnings could be reduced by between 3 and 8 percent in the case of the *United States*. [17] Across the G-20, the impact could be significant, as affected new entrants over 2020–22 are likely to represent a large share of the labor force. In fact, in recent years before the pandemic, new entrants accounted for between 2 and 5 percent of the labor force annually across G-20 economies (Figure 8).

Figure 8. New Labor Market Entrants



Sources: OECD, World Bank, IMF staff calcuations.
Note: For each grade level, the number of students leaving school to enter the labor force is estimated as the difference between the number of newly enrolled students in the next grade level and the number of graduating students from the grade level. Data for 2019.

SCHOOL CLOSURES SET TO HAVE DIRE IMPACT

The pandemic triggered a severe disruption to education, with a disproportionate impact among emerging market and developing economies, and among poorer children. As the cohort of affected students will account for a large share of the labor force in decades to come, the damage to their human capital, if not mitigated by policy action, would have a lasting impact on output and inequality.

12. The pandemic has triggered the largest disruption to education in recent history. Globally, school disruptions have impacted 1.6 billion students in 2020 and 2021, and about ¾ billion students continued to face either full or partial school closures as of December 2021. On average, annual schooling was disrupted for about 57 percent of a school year since the beginning of the pandemic. [18] However, disruptions to schooling were uneven across the G-20, with a larger extent of closures in emerging market economies (Figure 9, left panel) and in many economies where education outcomes were weaker already prior to the pandemic (Figure 9, right panel). Such economies not only had longer closures, but mitigation measures such as remote learning were also harder to implement owing to weaker infrastructure (e.g., lower or no access to the internet).

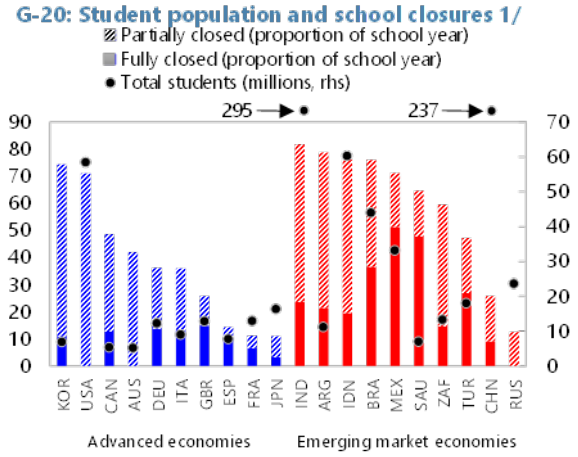
[15] Evidence suggests that students who left school and entered the labor force during the GFC faced reduced employment probabilities and lower wages following their graduation compared to other cohorts. Many new entrants had to take on lower-paid jobs or start careers in smaller, less productive firms, which constrained career opportunities and wage growth (Rothstein and others, 2021; Yagan, 2019; Oreopoulos and others, 2012). See also Aiyar and Ramcharan (2010) for the role of luck in initial conditions for long-term career outcomes.

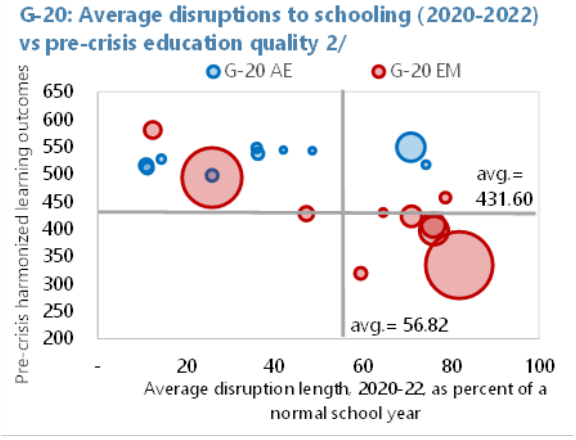
[16] Rothstein and others (2021).

[17] Friedman, J. (2021).

[18] Since March 2020, about 45 percent of school time was disrupted on average across G-20 advanced economies each year, and about 59 percent on average across G-20 emerging market economies.

Figure 9. Extent of School Closures

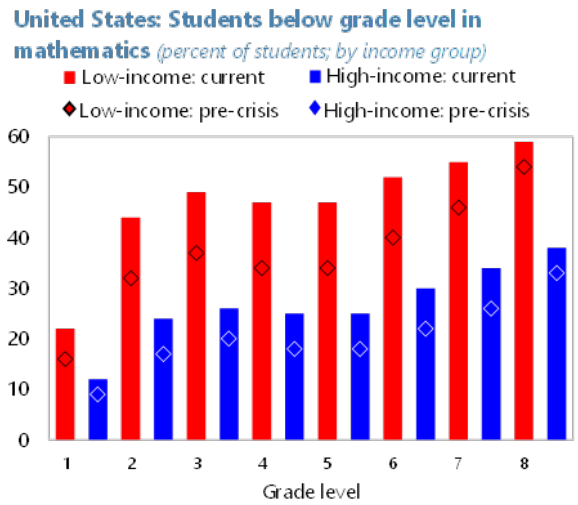




Sources: Angrist and others (2021); UNICEF; IMF staff calculations.
1/ School disruptions include (i) fully closed school days (capturing government-mandated closures affecting at least 80 percent of the student population) and (ii) partial school closure days (capturing days during which only a subset of schools were closed). In some countries, partial closures were very localized and affected a relatively small portion of the student population (e.g., China). Dots depict the total number of enrolled students at the country level. ESP is a permanent invitee.
2/ Data on harmonized learning outcomes correspond to average scores of students at international examinations. Bubble size proportional to school-aged population.

13. School closures have already had a measurable impact on student performance. Several G-20 economies have observed a drop in test scores (e.g., *Brazil*, *India*, *Germany*, *United States*, *United Kingdom*).[19] In addition, in many emerging market and developing economies, school closures have led to a sizeable drop in student enrollment across all education levels and risk leaving many students permanently out of school.[20] Within countries, the impact was more severe among younger students and students from more vulnerable households (Figure 10). In turn, this may have adverse consequences, as parents in more vulnerable households were often less able to substitute for schooling given a higher prevalence of work outside the home throughout the pandemic.[21] In addition, students who had less access to the internet as well as younger students suffered greater losses in basic skills such as reading (e.g., *South Africa*).[22]

Figure 10. Learning Losses

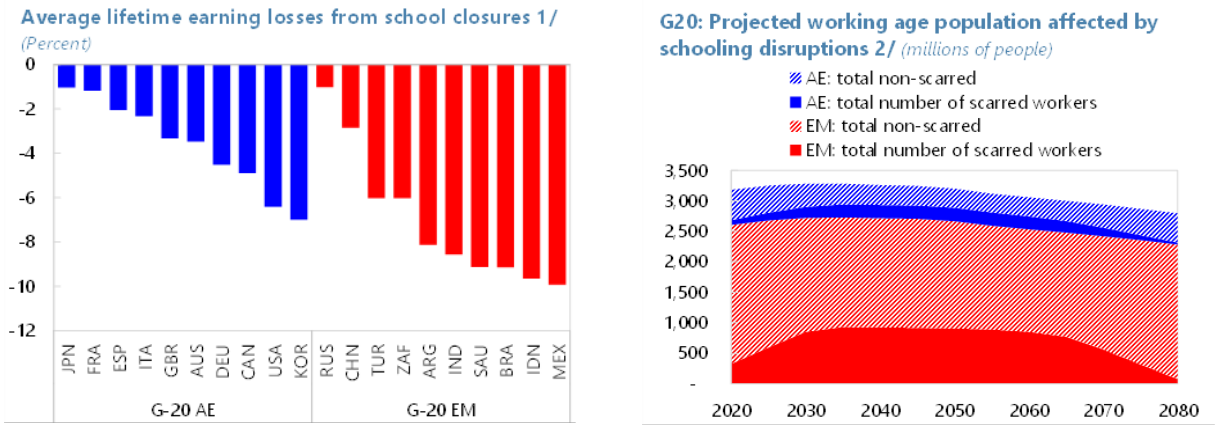


Sources: Curriculum Associates; IMF staff calculations.
Note: Results for grade-level placement fall examinations. Historical: averages over 2017–19; current: results from Fall 2021. The sample consists of 3.4 million students in grades 1–8 who took the diagnostic for mathematics exam in Fall 2021. Students are below grade level if their level in mathematics corresponds to the average level expected from students two or more grades below.

[19] World Bank (2021a), Grewenig and others (2020), Halloran and others (2021), and Andrew and others (2020).
[20] UNESCO (2021).
[21] Agostinelli and others (2022).
[22] World Bank (2021a), Ardington and others (2021).

14. The setbacks to human capital accumulation are likely to result in significant scarring if left unaddressed. Estimates suggest that unfinished learning during the pandemic, if not remediated, could translate into between 1½ and 10 percent in lifetime earnings losses for individuals across G-20 economies (Figure 11, left panel).[23] These losses are likely greater for students from more disadvantaged groups who suffered more severe disruptions, as well as for students in lower grades who are less able to learn independently at home. Moreover, these estimates could constitute a lower bound, as skill losses could accumulate throughout a student's education due to losses in fundamental knowledge that is typically acquired at an early age. These estimates also do not account for second-round effects through reduced employment opportunities, as widespread education disruptions reduce the skill level in the economy, which in turn lowers long-run growth. Demographic projections indicate that the affected student cohort will represent up to 40 percent of the working-age population in G-20 economies in decades to come—with the youngest students projected to account for 10–20 percent of the working-age population for the next several decades (Figure 11, right panel).

Figure 11. Impact of School Closures



Source: UN, UNESCO, and IMF staff calculations.

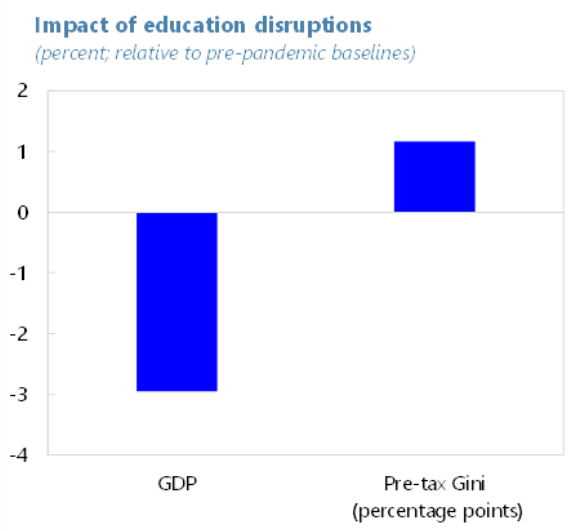
1/ The average length of school closure faced by a typical student is estimated by summing the number of fully closed days and a portion of partial closed days, by assuming that during a partial closed day, half of students were affected. In some countries where partial school closures were highly localized, a smaller portion of students may have been affected (e.g., *China*). In such settings, the estimated average lifetime earning losses represent an upper bound. To translate school closures into skill losses, students are assumed to lose about one third of a standard deviation of skill level per lost school year (as in OECD, 2020). To derive orders of magnitudes for losses in lifetime earnings, estimates for returns to skills derived at the country level in Hampf and others (2017) are used. Estimates of returns to skills were not available for IND and CHN, and the estimate for IDN were used as a proxy for both countries.

2/ Model leverages demographic data and projections from the UN, matched with school attendance statistics and school closure data from UNESCO.

[23] These numbers come from Hampf and others (2017) who perform calculations that pair country-level estimates of the returns to skills with estimates of potential skill losses resulting from observed pandemic-induced school disruptions.

15. The aggregate learning losses could weigh on output and inequality for decades to come. Though much still remains to be learned about the long-term macroeconomic and distributional consequences of the large and unequal education disruptions, a general equilibrium model can help shed light on the possible long-term implications of educational losses once the current student cohort is in the labor force.[24] The model takes into account not just the direct impact of the reduced human capital stock, but also the adverse impact that reduced human capital has on the returns to physical capital, which translates into lower investment. Overall, long-run output could be reduced by about 3 percent in a representative G-20 advanced economy relative to the pre-pandemic baseline (Figure 12). At the same time, the scarcity of high-skilled workers increases their relative skill premium, driving up pre-tax income inequality.[25] Similar channels at play may also lower output and raise inequality in G-20 emerging market economies, and the decrease in skill levels is likely to increase the share of informal employment.[26] In addition, for workers in G-20 advanced economies, an acceleration of automation could further raise inequality, as the loss of human capital leaves low- and medium-skilled workers less prepared to adapt. [27]

Figure 12. Impact of Learning Losses



Sources: IMF staff calculations
Note: Long-run impact based on general equilibrium model simulations, calibrated to an economy similar to the *United States*. Learning losses are assumed to increase (decrease) the share of low-skilled (high-skilled) workers, and decrease the skill level for each group. See technical annex for details.

16. Moreover, the impact of school closures could leave deep scarring on health and poverty, beyond what is captured in the model estimates. During the pandemic, school closures heightened food insecurity and reduced the amount of healthcare services available to many children who relied on school for lunches and medical care—particularly in emerging market and developing economies. [28] For instance, regular in-school vaccination programs were disrupted, which could undermine students' health. School closures also decreased social interactions with peers and may have contributed to a deterioration in mental health, which recent analysis suggests was most severe

[24] The simulation considers the implications of education disruptions, abstracting from other sources of scarring. The disruptions are assumed to lead to an increase (decrease) in the share of low-skilled (high-skilled) workers, as well as a decline in skill levels across groups, with the average skill level declining in line with the estimated reduction in effective schooling in this note. See Lizarazo Ruiz and others (2017) for model details. See also online annex.

[25] 1 point increase in the pre-tax Gini coefficient in advanced economies is approximately about a fifth of the increase observed between 1990 and 2019.

[26] The magnitude of losses could be somewhat attenuated in G-20 emerging market economies given lower baseline schooling levels and quality. See also Samaniego and others (2022).

[27] IMF (2018a); IMF (2018b).

[28] UNESCO (2021a); World Bank (2020).

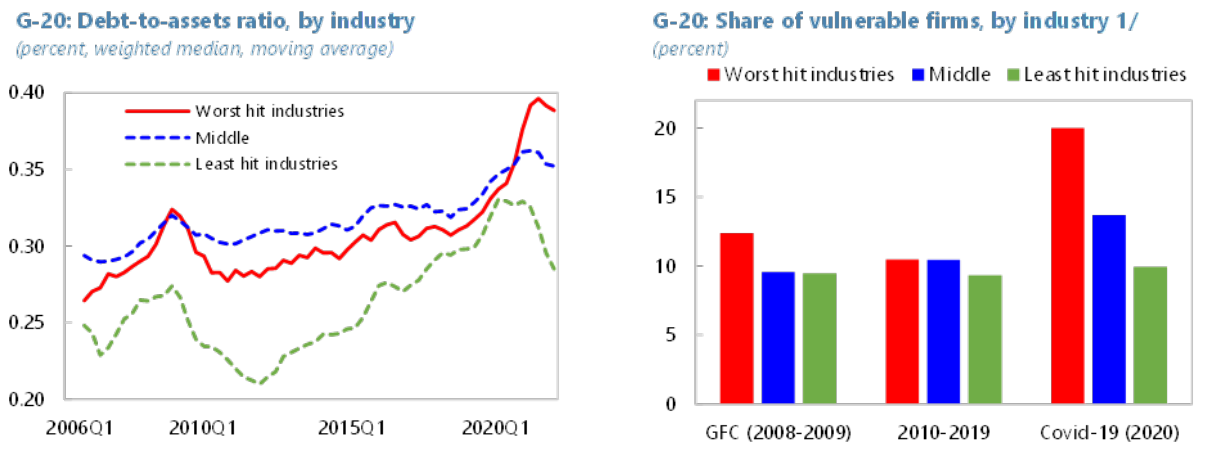
among the youth.[29] The resulting diminished health outcomes could further reduce students' ability to learn and accumulate knowledge and thereby amplify initial learning losses.

ELEVATED DEBT MAY WEIGH ON INVESTMENT

Firms in sectors that were most impacted by the pandemic have seen a sharp increase in leverage and balance sheet vulnerabilities. If left unaddressed, this could hold back investment into the medium term. While pandemic-induced acceleration of digitalization could bring productivity gains, further investment may be at risk from tightening credit conditions, while increased market power may weigh on innovation.

17. Balance sheets have weakened substantially for firms in the most affected sectors. Overall, non-financial corporate debt has risen by about 12 percent of GDP on average across G-20 economies between end-2019 and 2021Q3. However, balance sheet dynamics have differed markedly between industries, with leverage rising sharply in the industries with the largest declines in revenues in 2020 (e.g., consumer services, transportation), while falling in the least-impacted ones (e.g., software and IT services, pharmaceuticals) (Figure 13, left panel). At the same time, the share of vulnerable firms (defined as those in the top tercile of leverage, bottom tercile of return on assets, and an interest coverage ratio below one) have also disproportionately increased in the most affected sectors (Figure 13, right panel).

Figure 13. Private-Sector Debt and Vulnerabilities



Sources: Capital IQ; IMF staff calculations.
1/ Vulnerable firms are defined as top tercile of leverage, bottom tercile of return on assets, and interest coverage ratio less than 1. Industries sorted by decline in asset-weighted revenues in 2020. Least-hit (semiconductors; software and services; pharmaceuticals and biotechnology; health care equipment and services; and household and personal products); most-hit (consumer services; energy; automobiles and components; transportation; and consumer durables and apparel); and middle (capital goods; materials; professional services; utilities; media and entertainment; telecommunication services; food, beverage and tobacco; food and staples retailing; technology hardware and equipment; and retailing).

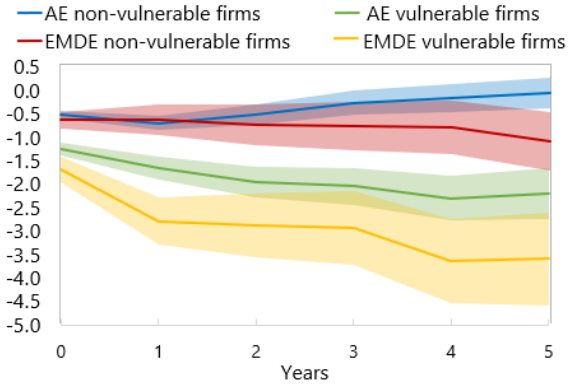
[29] Mulligan (2020).

18. The increase in leverage may take a toll on investment in the medium term. Excessive debt accumulation can hold back future investment for several reasons, including because (i) indebtedness can raise the cost of further borrowing; (ii) higher leverage amplifies the decline in net worth and tightening of credit constraints when credit booms end; and (iii) high debt payments make firms less attractive for further equity financing.[30] Recent IMF analysis finds a substantial impact of excessive leverage on investment for vulnerable firms, particularly in emerging market and developing economies (Figure 14).[31] Moreover, such losses are likely to be more severe in economies with inefficient insolvency regimes, where the options for mitigating investment losses (e.g., firm restructuring or liquidation) are more difficult to implement.

Figure 14. Impact of Corporate Vulnerability on Investment

Cumulative impact on investment from excess leverage

(cumulative percentage points)



Source: World Economic Outlook, Chapter 2, April 2022.
Note: Responses of firm investment ratios following a one standard deviation increase in debt-to-assets accumulation, conditional on firms being vulnerable. Vulnerable firms: top tercile of debt-to-asset ratio, bottom tercile of return on assets, and interest coverage ratio below one. Shaded area: 90 percent confidence interval. Analysis based on 1998-2018 data from 21 advanced economies (6 G-20) and 17 emerging market economies (4 G-20). See IMF (2022b) for details.

19. Meanwhile, the pandemic-induced spurt in digitalization could boost productivity. The pandemic accelerated investment in digitalization, as economies attempted to adjust how they produce, consume, and provide services. Survey findings from several G-20 economies, including the *United States,* show that, across many sectors, businesses have invested in digitalization since the beginning of the pandemic, and many others expect to do so in the near future (Figure 15). Such investments, if sustained, have the potential to boost productivity growth. As discussed in the G-20 Note on *Boosting Productivity in the Aftermath of COVID-19*, a ten percent rise in investment in intangible assets—which includes investment in digitalization—is associated with about a 4½ percent rise in labor productivity, while a similar boost in tangible investment raises labor productivity by about 3½ percent.[32, 33]

[30] As discussed in IMF (2021h), increasing non-financial corporate leverage could also pose macro-financial risks and downside risks to growth.

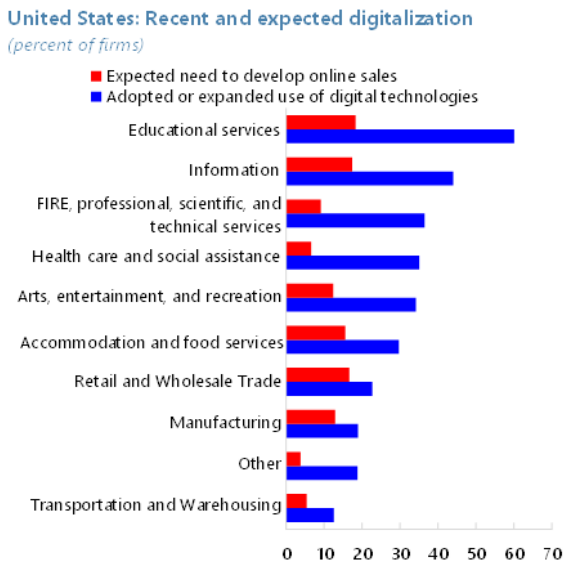
[31] IMF (2022b).

[32] IMF (2021d).

[33] As defined in Corrado and others (2016), intangible capital covers (i) brand, organizational capital, and training ("economic competencies"); (ii) research and development, design, arts and mineral exploration, and financial innovation ("innovative property"); and (iii) software and databases ("computerized information", including digital technologies).

20. However, further digitalization may be hindered if credit conditions tighten, and a potential rise in market power may diminish innovation. Investments in intangible assets, some of which are generally non-pledgeable as collateral, are particularly sensitive to credit conditions. As such, tighter financing conditions—including in the context of withdrawal of monetary policy accommodation to contain inflationary pressures—or worsening corporate balance sheets may make such investments difficult to sustain. Furthermore, unequal access to financing and necessary digital infrastructure could prevent some firms from making otherwise high-return investments. Incentives to undertake productivity-enhancing innovations may also be dulled in the medium term if the pandemic leads to further increases in market power—for example if large firms' current disproportionate investments in digitalization allows them to further gain market share, or if tightening financing conditions lead to an increase in firm failures.[34]

Figure 15. Post-Pandemic Digitalization



Source: US Census Bureau Small Business Survey, Aug-Sep, 2021.
Note: Responses to the questions "In the next 6 months, do you think this business will need to do any of the following? Select all that apply: Develop online sales or websites," (red bars) and "Comparing now to what was normal before March 13, 2020, has this business done any of the following? Select all that apply: Adopted or expanded use of digital technologies" (blue bars). FIRE: Finance, insurance, and real estate. Other: Mining, quarrying, and oil and gas extraction; construction; management of companies and enterprises; administrative and support and waste management and remediation services; utilities; real estate and rental and leasing; Other Services (except public administration).

SUBOPTIMAL POLICIES COULD ADD TO CHALLENGES

Policy support has played a critical role in minimizing scarring by saving businesses and jobs. Thus far, evidence suggests that these interventions likely did not contribute markedly to zombification of firms or misallocation of capital and labor in the early stages of the pandemic. However, if not appropriately adjusted, such measures could slow productivity-enhancing reallocation as recoveries take hold.

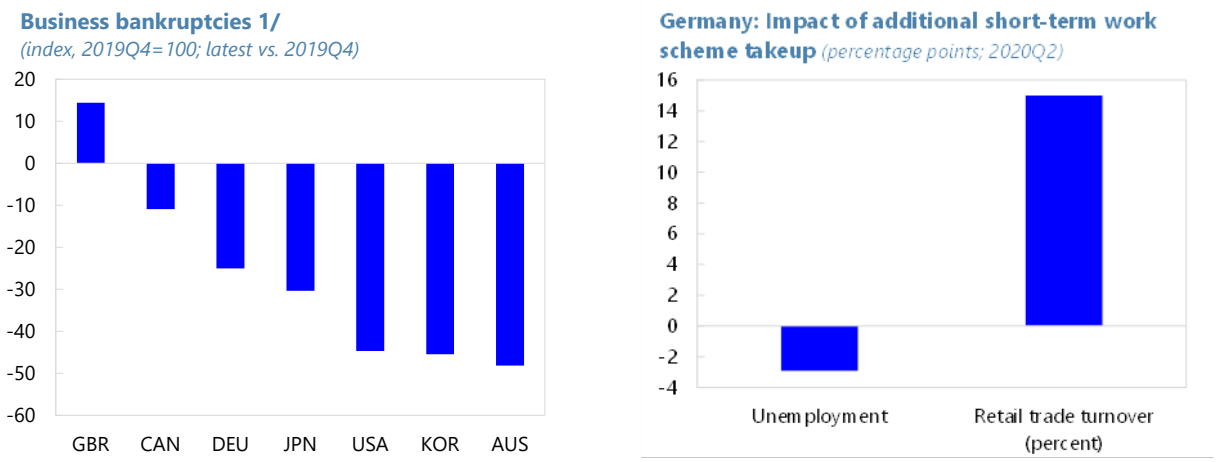
21. Policy support has been instrumental in preventing excessive bankruptcies and preserving productive job matches. A growing body of evidence suggests that policy measures such as credit guarantee programs were critical for allowing firms to survive through lockdown measures, particularly in sectors hard-hit by necessary containment efforts. In fact, unlike during past recessions, business bankruptcies actually declined across many G-20 economies during the pandemic (Figure 16, left panel). At the same time, job retention schemes helped preserve jobs and enhance macroeconomic stabilization by reducing workers' uncertainty and thereby supporting demand (Figure 16, right panel).[35] In this respect, recent analysis from *Australia* and *France* suggests that, at

[34] Ahn and others (2020); IMF (2021d); and Aghion and others (2019).

[35] Aiyar and Dao (2021). See also Ando and others (2022).

least in the early stages of the pandemic, zombification risks were likely limited, and firm exit and worker reallocation remained linked to underlying firm productivity.[36]

Figure 16. Impact of Policy Measures on Bankruptcies, Unemployment, and Demand



Sources: Haver Analytics, CEIC; Aiyar and Dao (2021); IMF staff calculations.
1/ Percent change in number of bankruptcies or insolvencies in the latest quarter (2021 Q4 for GBR and JPN, 2021 Q3 for the other countries) from those in 2019Q4. For KOR, number of SME bankruptcies is used due to data limitations.

22. However, if policy support is not sufficiently scaled back with the recovery, diminished reallocation may inhibit productivity growth going forward. For example, evidence from *Australia* suggests that the initial phase of job retention measures did not introduce many distortions, as the widespread distress caused by the pandemic meant that all types of firms benefited from such support. However, as the economy started to recover, the relationship between firm labor productivity and employment growth weakened, as total take-up of support tilted towards firms with lower productivity.[37] Other analyses of pre-pandemic periods also point to trade-offs: while retention policies are associated with lower job separation probabilities, particularly for lower-skilled workers, they are also associated with reduced job finding probabilities for young workers (Figure 17, left panel). Furthermore, IMF analysis shows that a wider use of such policies is associated with a moderately lower correlation between employment growth and firm productivity, suggesting that such support may hinder the speed of productivity-enhancing reallocation (Figure 17, right panel). Whereas a 10 percent increase in firm labor productivity is associated with 0.73 percent higher firm-level employment growth in an economy at the 20th percentile of job retention policy spending, the increase in the growth rate falls to 0.65 percent in an economy at the 80th percentile of spending.[38] As such, given the sizable amounts spent on job retention schemes during the pandemic crisis (over 2 percent of GDP on average across the G-20 since the beginning of the pandemic), maintaining such policies for too long risks holding back reallocation, which could weigh on productivity growth.[39]

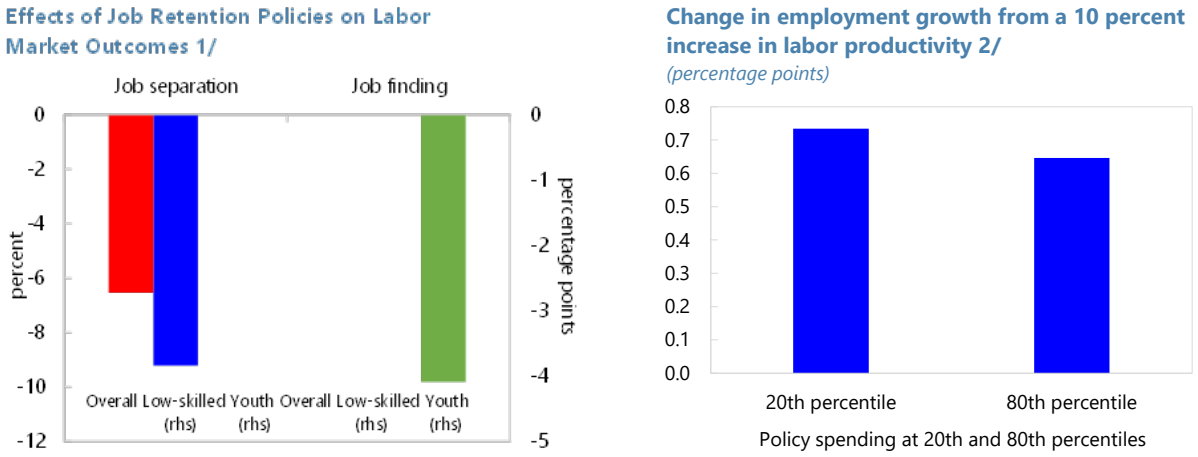
[36] Andrews and others (2021) for *Australia*; Cros and others (2021) for *France*. These analyses suggest that, at least in the early stages of the pandemic, policy interventions did not distort the cleansing effects of recessions (Caballero and Hammour, 1994). Helmersson and others (2021) find limited signs of zombification in the euro area.

[37] Andrews and others (2021).

[38] Spending on job retention measures at the 20th and 80th percentile is about 0.07 and 0.3 percent of GDP, respectively. See online annex for construction of spending measures, and details of the analysis.

[39] Aiyar and Dao (2021) find that short-time work schemes are particularly likely to increase medium-term misallocation of resources in economies where there is a high initial level of misallocation. Demmou and Franco (2021) find that in

Figure 17. Job Retention Policies, Labor Market Outcomes, and Reallocation



Source: EU labour Force Survey; EU Statistics on Income and LIving Conditions; Integrated Public Use Microdata Series, Current Population Survey; OECD; ORBIS; and IMF staff calculations.
1/ Only statistically significant findings shown. Job separation (job finding): probability of individual transitioning from employment (unemployment) to unemployment (employment) in a given year. Overall effects: percent change in the indicated transition probability (relative to its average value) associated with a 1 percentage point increase in job retention policy spending as a share of average income per unemployed person. Sub-group specific effects: percentage points of the indicated transition probability as deviations from the base group (prime-age and higher-skilled men).
2/ Based on panel regression, using cross country firm-level data, of annual firm-level employment growth on lagged firm labor productivity, and interaction of lagged labor productivity with national spending on job retention measures as a share of GDP. Estimated coefficients (including for the interaction term) are statistically significant at 1 percent. See online annex for details.

POLICY ACTION CAN HELP HEAL THE WOUNDS

Determined and early action across several policy dimensions can help minimize scarring. Time is of the essence when it comes to repairing the damage to children's education. Crisis support measures should be adjusted to minimize potential misallocation and complemented by efforts to speed up productivity-enhancing reallocation. Structural reforms can help boost investment and labor market recoveries. Multilateral actions can amplify domestic measures and help strengthen the recovery also in financially constrained developing economies.

23. Domestic health, macroeconomic and financial sector policies are critical to mitigate scarring. The G-20 economies' decisive policy responses to date have helped moderate the potential for scarring in the medium-term by preventing an even deeper crisis.[40] However, amidst elevated public debt and high inflation, the space for further support is increasingly limited, with the challenges facing policymakers exacerbated by the outbreak of the war in Ukraine. As such, appropriately adjusting policies can be instrumental in mitigating further scarring.[41] In addition, as described below, a number of specific policy measures can be essential. In this respect, mutual sharing of experiences across G-20 economies can be helpful in identifying policies to minimize the adverse effects of recessions (Box 1).

normal times, credit guarantee schemes are associated with a reduction in the pace of labor reallocation to more productive firms, possibly adding to misallocation.

[40] IMF (2021e).

[41] See also IMF (2022a).

- *Ensure inflation expectations remain well-anchored and proactively address financial sector vulnerabilities.* Where high inflation is posing challenges, tightening monetary policy to contain inflation expectations can help preempt more disruptive adjustments down the road. The pace of such tightening should be data dependent, and central banks should clearly articulate their policy outlook to limit financial market turbulence. Clear communication by major G-20 central banks can limit damaging spillovers and create more space for emerging market central banks to support their recoveries. Alongside, early action by regulators to tighten appropriate macroprudential tools to contain financial sector vulnerabilities will help prevent damaging financial instabilities from arising, which are particularly salient in the context of tightening monetary policy and elevated geopolitical uncertainties.[42]
- *Enhance medium-term fiscal sustainability while protecting spending on critical needs.* Fiscal policy should proceed in line with country-specific exposure to the war in *Ukraine*, the state of the pandemic, and the strength of the recovery. Where fiscal space allows, consolidation efforts will need to safeguard well-targeted support for the vulnerable, as well as spending on health and education, to minimize scarring.[43] Policymakers will need to ensure sufficient resources for adequate testing, vaccines, and treatments, as well as for tracking variants, to protect lives and minimize economic disruptions. Putting in place credible medium-term fiscal frameworks and pre-committing to revenue and expenditure measures will buttress credibility and help create room for essential support where needed.[44] In some economies, efforts to contain public borrowing will also help to ensure that private investment is not crowded out.

A. Act Swiftly to Recoup Learning Losses

24. Urgent action is needed to quell the impact of the pandemic on education and recoup learning losses. Amid increasing access to vaccines, treatments, and testing, further virus containment measures should be recalibrated to support a safe return to educational activity. In addition, remedying learning losses requires swift, well-sequenced action.[45]

- *While schools remain closed, decisive action should be taken to protect student health and learning*. To protect students' health, alternative arrangements should be implemented to compensate for the loss of school-based nutrition and health programs. Investments should be made to enhance the existing digital technologies so that remote learning can reach all students. Outreach and guidance campaigns are needed to help parents support children's learning. Adequate financing is needed to allow for the reopening of schools while ensuring the safety of students and staff (e.g., installing protective equipment).
- *Once schools reopen, learning losses should be assessed and remediation promptly initiated*. Increased financing should be made available to conduct a thorough assessment of skill losses and to begin recouping learning losses (e.g., additional in-person learning, extended school years, training teachers to assess and redress challenges facing returning students). Action should be undertaken to limit dropouts and ensure that all students come back to school, with greater emphasis on students from lower income groups. The returns on fiscal investments to recoup skill

[42] See also IMF (2022d).

[43] See also IMF (2022e).

[44] IMF (2021f). See IMF (2021g) for revenue measures.

[45] World Bank (2021b).

losses are expected to far outweigh the cost of these investments as they will prevent long-lasting losses in GDP and thereby lift future fiscal revenues, while also limiting other adverse effects of school closures in areas such as public health and crime. [46]

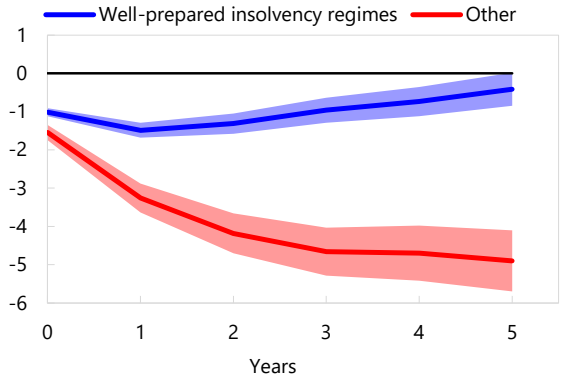
- *Over the longer term, increasing the resilience of the education system will enhance preparedness for future pandemics*. For example, resilience can be increased by protecting and enhancing education financing and scaling up tools to support effective pandemic responses, such as remote learning technologies.

B. Avoid Hindering Reallocation and Mitigate Setbacks to Investment

25. Policy support should be tapered to avoid hindering reallocation, while taking action to avoid excessive firm failures and an investment slump. As the recovery takes hold, crisis support measures will need to be adjusted to restore the normal role of reallocation in the economy. However, the pullback of support may reveal elevated firm distress in the context of deteriorated corporate balance sheets. As such, economies will need to strengthen insolvency regimes and out-of-court restructuring to limit excessive firm failures, support the reallocation of capital and labor to their most productive use, and pre-empt debt overhang from weighing on investment.[47] Indeed, recent analysis suggests that, in economies with well-prepared insolvency regimes, the adverse effects from a build-up of leverage on subsequent firm investment are substantially attenuated (Figure 18). In addition, in economies where spillovers from excess bankruptcies could cause broad economic damage, restructuring could be prioritized over liquidation, and where the requisite fiscal space is available, targeted solvency support for viable firms could be considered.[48] Solvency support will need to take place within frameworks ensuring adequate transparency and accountability. [49] Conditioning public support on private sector participation could help enhance targeting and minimize fiscal costs. To further lessen fiscal costs, especially when targeting is difficult, a temporary tax on higher future profits may help claw back support from firms that did not need it.[50]

Figure 18. Insolvency Regimes, Leverage, and Investment

Impact of leverage on investment, by insolvency regime *(cumulative percentage points)*



Source: IMF, *World Economic Outlook*, Chapter 2, April 2022.
Note: Responses of firm investment ratios following a one standard deviation increase in debt-to-assets accumulation, conditional on country's insolvency regime. Well-prepared insolvency regimes are defined as countries at the top quartile of the IMF SPR-LEG indicator of crisis preparedness in 2020. Shaded areas represent 90 percent confidence intervals. See also IMF (2022b) for details.

26. Reforms can further support productivity-enhancing capital and labor reallocation.

[46] Fuchs-Schundeln and others (2021).

[47] As insolvency framework reforms take time, countries with increasing corporate distress could prioritize addressing the most pressing needs and ramping up capacity through out-of-court mechanisms (Araujo and others, 2022).

[48] Regimes that promote reorganization over liquidation can prevent capital from remaining idle or under-utilized for long-periods, particularly when financing conditions are tight (Bernstein and others, 2019).

[49] IMF (2022b); Diez and others (2021); Araujo and others (2022).

[50] Gourinchas and others (2021); IMF (2022b).

- *Ease hurdles to efficient firm entry and exit and review tax systems to support capital reallocation.*[51] Promoting new business formation and exit of inefficient firms (e.g., reducing barriers to entry, constraints to business operations, and administrative burdens) can speed up the efficient reallocation of capital and labor.[52] Reviewing tax systems for potential barriers to efficient allocation (e.g. tax treatments that discriminate by asset type, financing source, or firm characteristics) could also boost productivity growth.[53]
- *Help workers adjust to labor market needs.* While pandemic conditions could warrant additional time-limited job retention support in sectors that continue to be hard-hit, and as fiscal space permits, enhancing worker reallocation policies (e.g., well-designed job search and matching assistance and hiring subsidies) can boost job finding and on-the-job occupational switching probabilities and are particularly helpful for young workers. Moreover, such active labor market policies are associated with lower earnings losses after job displacements.[54] Support for training can help displaced workers to gain the skills needed for the opportunities available (e.g., in fast-growing digital-intensive occupations).[55] Moreover, policies to support affordable childcare solutions would ease the return to work as well as the adaptation to new forms of working (e.g., hybrid and fully remote work) for workers with children, and with beneficial consequences for productivity and inequality.

C. Fiscal Policy and Structural Reforms Can Lift Growth and Productivity

27. Fiscal measures can help raise long-term private productivity-enhancing capital investment. Avoiding further damage is not enough. Where debt levels allow, G-20 economies will need to take action to boost productivity-enhancing investments and ensure these are broadly shared.

- *Implement fiscal measures to incentivize private R&D.* Well-targeted subsidies for private R&D can be useful in industries that have high external financing needs (e.g., industries in which R&D financing needs are upfront, large, and lumpy), or those with large positive externalities for society (e.g., providing a cleaner environment).[56] Tax incentives can also help, especially if targeted towards new firms with high potential.
- *Carry out public investment to complement private innovation.* Public investment, including in public R&D and workforce training, can raise the incentives for private investment by providing complementary inputs. At the same time, public investment in infrastructure, such as broadband connectivity, is critical to enhancing access to opportunities and ensuring more businesses can take advantage of such opportunities.

28. Growth-enhancing structural reforms can also help boost investment. Product market reforms, such as easing barriers to entry, can promote investment if combined with measures to ease financing constraints, including counter-cyclical macroeconomic policies.[57] Increasing the flexibility of

[51] Aiyar and others (2019).

[52] Aiyar and others (2019).

[53] IMF (2017).

[54] Bertheau and others (2022).

[55] Duval and others (2022). See also Ando and others (2022) for a discussion of hiring subsidies and other policies such as wage loss insurance.

[56] IMF (2016). See also IMF (2021i) for evidence from *Australia*.

[57] Ahn and others (2020).

employment protection laws, in the context of adequate social safety nets, would allow firms to react more quickly to new technologies that require staff reallocation or downsizing, and thus boost investment. As data is now a key input to modern production, policies will need to ensure that its concentration does not lead to undue competitive advantage (e.g., by penalizing abuse of dominance and supporting data portability).[58]

29. Moreover, growth-enhancing reforms can generate jobs. Structural reforms, as outlined in the 2021 G-20 Report on Strong, Sustainable, Balanced, and Inclusive Growth, can significantly boost growth, with a comprehensive set of reforms having the potential to boost G-20 GDP by about 4 percent above the baseline over the long run.[59] This would also translate into the creation of additional formal employment, including for the young in emerging market economies who are currently facing high rates of unemployment. A number of actions could be considered.

- *Ensure appropriate levels of minimum wages*. It will be important that minimum wages, which can help address working poverty and inequality, curb monopsony power, and enhance worker motivation and productivity, are not set so high as to hurt formal employment.[60] Hence, where minimum-to-average wage ratios are especially high, alternative tools to address income inequality, including targeted cash transfers and earned income tax credits, should be considered. Where relevant, enhancing the coordination, representativeness, and firm-level flexibility of sector-level bargaining, or decentralizing collective bargaining to the firm level altogether, could also boost formal employment by allowing for greater labor cost flexibility.[61]
- *Relax unwarranted labor and product market regulations*. For example, inappropriately tight regulations can make formal employment more costly and have been found to reduce formality shares in emerging market and developing economies.[62] As such, their relaxation can help generate new jobs. Moreover, well-designed active labor market policies can complement labor market reforms to boost formal job creation.[63]

30. Strengthening social safety nets and public investments can limit scarring and boost resilience. Pre-existing well-designed social safety nets allowed many G-20 economies to quickly channel additional support to vulnerable households and workers, mitigating the scarring effects of poverty. Going forward, strengthening social safety nets, and closing gaps in coverage, will not only help heal the scars for the most vulnerable, but will also build resilience against future shocks.[64] Shifts in labor markets, including from accelerated digitalization and automation, could accentuate challenges for some workers, such as the low-skilled, and lead to further increases in inequality. In addition, investments in access to high quality education, health care, and digital infrastructure can help address these challenges and support inclusive recoveries for all.[65]

[58] IMF (2021d); Akcigit and others (2021).

[59] IMF (2021e).

[60] See Detragiache and others (2020) on the effects of minimum wages on working poverty and Jaumotte and Osorio Buitron (2015) on the effects on inequality.

[61] See Duval and Shibata (2021) for a discussion of collective bargaining in *South Africa*.

[62] See Duval and Loungani (2019) and Ahn and others (2019).

[63] Duval and others (2021).

[64] See IMF (2021g).

[65] See IMF (2018a); IMF (2019).

D. Complement Domestic Efforts with Multilateral Action

31. Joint efforts to end the global pandemic and invest in global health are essential to minimize further scarring. As the virus persists and continues to evolve, ensuring equitable access to a comprehensive toolkit of vaccines, tests, and treatments worldwide is not only the best strategy to save lives, but also to reduce a key source of uncertainty holding back the global recovery. Notably, such access remains highly unequal, with over 100 countries not on track to reach the IMF pandemic proposal's mid-2022 vaccination target of 70 percent, and in-country capacity to absorb vaccines has emerged as the key bottleneck. [66] As such, G-20 leadership is needed to close the about $15 billion in ACT-A grant needs still unmet for vaccines, tests, and treatments, and to scale-up in-country absorptive capacity. On-going investments in research, disease surveillance, and health systems will also be needed to keep a broad set of tools updated as the virus evolves. Moreover, the fight against COVID-19 will need to be complemented with renewed efforts to combat other diseases, such as malaria and tuberculosis, through enhanced investments in global public health goods.

32. Creating a global environment conducive to growth, along with support for developing economies, would help mitigate scarring everywhere. G-20 economies must work together to address growing fragmentation pressures and bolster the rules-based global order. Undertaking reforms toward a more open, stable, transparent, and rules-based trading system, rather than pursuing reshoring policies, would allow trade to better support shared prosperity. Moreover, the G-20 can help enhance the resilience of global value chains by filling information gaps in supply chains, reducing trade costs, and minimizing policy uncertainty. [67] Implementing a global minimum corporate tax will help ensure equitable burden sharing and boost needed resources to tackle scarring. The G-20 can also help international cooperation on debt and financing issues—in particular by resolving the implementation issues with the G-20 Common Framework for Debt Treatments and by considering voluntary rechanneling of SDRs to more vulnerable countries—which would help developing economies to minimize scarring.

[66] Agarwal and Gopinath (2021).

[67] IMF (2022c).

Box 1. Examples of Policies to Mitigate Adverse Impacts of Recessions

Several countries provided support to preserve employment relationship during the pandemic, and in many cases rolled them back after the hardest part of the crisis. In many countries, wage subsidies were deployed to reduce the economic incentives to dissolve existing jobs (e.g., in *Australia*, *Canada*, , *Japan*, *Saudi Arabia*, *United States*). *Brazil* and the *United Kingdom* deployed a job retention scheme during the current crisis, which mitigated labor market setbacks during the crisis. Furthermore, the UK rolled-back the scheme as the recovery took hold, without substantial adverse effects on unemployment. Short-term working schemes were also adopted, modified, or expanded in Europe (e.g., in *Germany*, *France*, *Italy*, and *Spain*; see also Ando and others, 2022 for a discussion). For instance, *Germany* adjusted its job-retention program (Kurzarbeit), which operates both in recessions and normal times, to lessen the impact of the pandemic on employment. As detailed in Aiyar and Dao (2021), the government temporarily adjusted the program's parameters so that it would absorb more of the impact of the pandemic. Eligibility criteria were loosened, costs to employers were reduced, while benefits became more generous and prolonged for workers. The program helped contain job losses, and its flexibility will make it possible to unwind its deployment as the crisis fades.

Many G-20 economies have taken steps to minimize and redress schooling losses. To reopen schools safely during the pandemic, several G-20 economies (e.g., *France*, *Italy*) have reduced class sizes and adopted shift systems to facilitate in-person classes while protecting student and teacher health. *Brazil's* experience suggest conditioning cash transfers on school attendance can help boost enrollment. The *United Kingdom* has provided funding to support students' mental health and academic recovery, including through catch-up tutoring, interventions targeted to disadvantaged students, longer school days, and training for teachers. To increase resilience of the education system against future disruptions, *Korea* dedicated a significant share of its stimulus package to boost investment in the deployment of digital infrastructure while strengthening teacher capacities in remote teaching. *China*, *Korea*, and *Saudi Arabia* have designed financial assistance programs for low-income families to access digital devices and increase connectivity (UNESCO, 2021; World Bank, 2021a).

A number of G-20 economies have made efforts to support corporate restructuring, including with targeted measures for Small and Medium-sized Enterprises (SMEs).

- *Turkey* introduced an out-of-court restructuring framework in 2001 (revived in 2018) that builds on international best practices. Out-of-court restructuring can allow the formal system to focus on the most complicated cases during times of elevated corporate distress. The approach in *Turkey* is based on a framework agreement, which outlines the rules governing the out-of-court process, including arbitration mechanisms and provisions for new borrowing. A creditor committee is formed if creditors agree to pursue out-of-court resolution. The committee has a maximum of 180 days to reach an agreement with the debtor and is also responsible for commissioning an independent review of the company's long-term viability, drawing on information shared by the creditors (Araujo and others, 2022).
- To enhance reallocation, a number of economies have targeted policies and frameworks to support reorganization amongst SMEs. As SMEs are more likely to lack the resources to navigate reorganization processes, *Japan* and *Korea* have public programs to assist SMEs in accessing legal and financial advice through proceedings. Some G-20 economies (e.g., *Australia*, *United States*) have recently introduced special insolvency frameworks for small enterprises. These frameworks largely allow the debtor to continue to manage operations (rather than appoint insolvency professionals), which tends to provide a strong incentive for debtors to enter reorganization at an early stage, rather than delaying until liquidation becomes the only option (Araujo and others, 2022).

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