RECESSIONS AND RECOVERIES IN LABOR MARKETS: PATTERNS, POLICIES, AND RESPONSES TO THE COVID-19 SHOCK

Despite remarkable adaptation and extraordinary policy support in many economies, economic turmoil and labor market dislocations from the COVID-19 pandemic shock continue, with highly unequal effects across workers. Youth and the lower-skilled are among the most heavily impacted, with sharp rises in unemployment rates, which already tend to be at higher levels. Some of these effects reflect the asymmetric, sectoral, and occupational nature of the COVID-19 shock, with less-skill-intensive sectors tending to be hit harder. The shock is also accelerating preexisting employment trends, hastening a shift away from sectors that are more vulnerable to automation. Worker reallocation across sectors and occupations is more likely after an unemployment spell, but it comes at a high cost, as average earnings fall for those who switch. Job retention policies—those aimed at maintaining existing employment matches—can help reduce job separations, particularly for the lower-skilled, while measures to support worker reallocation can boost job finding prospects. A new, model-based analysis shows how job retention policies are extremely powerful at reducing scarring and mitigating the unequal impacts of a pandemic shock across workers, while reallocation policies supporting job creation can help ease the adjustment to the more permanent effects of the COVID-19 shock on the labor market. Retention measures are best while the shock is acute and social distancing high to preserve ultimately viable job matches, with support relying more on reallocation measures as the pandemic subsides. Careful monitoring of the intensity of the pandemic (including cases and deaths, the extent of social distancing, and rollout of vaccines) is needed to gauge when the economy can cope with the reduction of job retention support and switch toward greater reliance on reallocation.

Introduction

Over a year since its onset, the COVID-19 pandemic continues to generate widespread economic disruptions and worker dislocations. Even with the extraordinary policy support already deployed (outlined in Chapter 1 of the April 2021 *World Economic Outlook* (WEO) and of the April 2021 *Fiscal Monitor*), average unemployment rates are up and labor force participation down compared with their pre-pandemic averages in both advanced and emerging market and developing economies, according to the latest data (Figures 3.1 and 3.2, panels 1 and 2).

The employment impacts from the pandemic have been highly unequal across groups of workers (Figures 3.1 and 3.2, panels 3–8). In particular, youth and the lower-skilled have been hit harder in the average advanced and emerging market and developing economies, with larger rises in unemployment rates and declines in labor force participation. Women in emerging market and developing economies have seen a slightly higher rise in unemployment and larger drop in participation than men, on average, while in advanced economies there is little difference in average unemployment across genders.[1] These movements in unemployment and labor force participation rates imply that average employment rates have declined across groups.

In the near term, the consequences for these more vulnerable demographic groups are potentially dire, as they face earnings losses and difficult searches for job opportunities after unemployment spells. Even after the pandemic abates, some of the effects on the structure of employment may be persistent, with some sectors and occupations (job types) permanently shrinking and others growing.[2] For these persistent effects, the speed
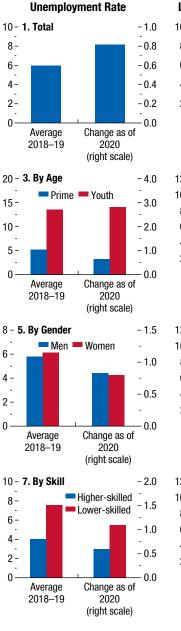
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[1]Early in the crisis, studies indicated that women's employment was impacted more than men's in some advanced economies, unlike most previous downturns (Alon and others 2020). However, with some recovery as the year proceeded, the average differences have diminished. See Bluedorn and others (2021) for a more in-depth exploration of the phenomenon.

[2]Barrero, Bloom, and Davis (2020) focuses on the experience of the United States and argues that 32 percent to 42 percent of layoffs from the COVID-19 pandemic shock are likely to be permanent.

Figure 3.1. Labor Market Conditions in Advanced Economies
(Percentage points)

The COVID-19 pandemic has caused large worker dislocations in advanced economies, with highly unequal impacts across workers, on average, hitting youth and the lower-skilled harder.
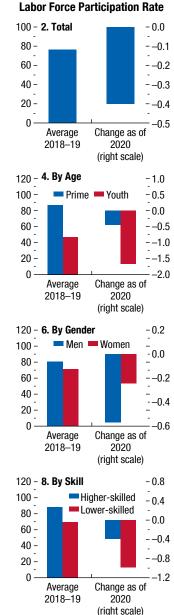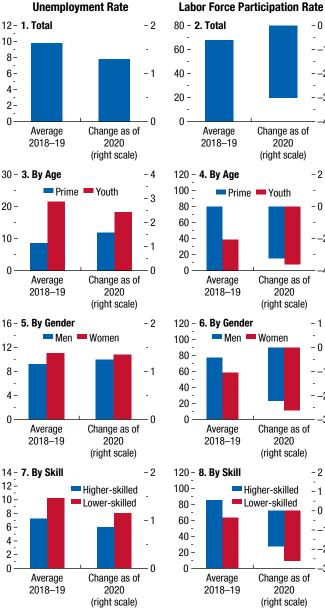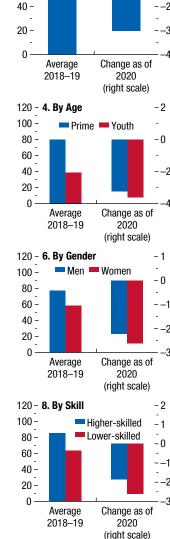

Figure 3.2. Labor Market Conditions in Emerging Market and Developing Economies
(Percentage points)

The COVID-19 shock has led to sharp deteriorations in labor markets in emerging market and developing economies, hurting youth, women, and the lower-skilled worse, on average.

Sources: International Labour Organization; Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: "Change" is the average change in the indicated variable across countries in the group, calculated relative to its average value over 2018–19.
Higher-skilled = tertiary education and above; Lower-skilled = above secondary and nontertiary education and below. Prime age = 25 to 54 years old; Youth = 15 to 24 years old. To account for sample coverage changes, the average within the group over time is calculated from the normalized time fixed effects from a regression of the indicated variable on country and time fixed effects (Karabarbounis and Neiman 2014). See Online Annex 3.1 for further details.

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with which economies can reemploy and reallocate workers across sectors and occupations will determine how long lived the effects on employment are.

With an eye to understanding the potential aftermath of the COVID-19 shock, this chapter studies unemployment, labor market transitions (job findings, separations, and employment changes across sectors and occupations), and earnings over the business cycle and across demographic groups. It investigates how policies—specifically those supporting job retention (preserving and maintaining existing employment matches) and worker reallocation (fostering new matches, assisting job search, and helping workers obtain useful new skills)—can mitigate the damage done by the shock. Given that the ultimate effects of the pandemic on the economy's structure remain highly uncertain and may vary across countries, the chapter uses a newly developed labor market model to examine how policies and the shock's persistence interact. Drawing on empirical and model-based analyses, the chapter investigates the following key questions:

- What is the sectoral character of the COVID-19 pandemic recession so far and how does it compare with past recessions?
- How have labor market inflows and outflows across sectors behaved in recessions and recoveries? Do recessions tend to amplify sectoral employment trends (in vulnerability to automation)?
- How do individual-level labor market outcomes (including sectoral and occupational employment transitions and associated earnings gains/losses) behave and differ across demographic groups (such as age, gender, and skill) and the business cycle?
- How effective are labor market policies encouraging job retention versus worker reallocation against the adverse effects from asymmetric shocks across sectors and occupations? Does the persistence of the shock matter?

Importantly, the chapter reflects on what the findings imply for the labor market during and after the COVID-19 pandemic recession and the role of policies. Due to data availability constraints, much of the historical empirical analysis is based on a sample of largely advanced economies over the past 30 years. As such, the patterns in labor markets identified and assessments of policy effectiveness and options may be less applicable to economies where large shares of employment are informal (as in some emerging market and developing economies).

The main findings of the chapter are:
- *The COVID-19 pandemic shock is accelerating preexisting employment trends with uneven impacts across demographic groups.* The shock has hit sectors that are more vulnerable to automation harder. Around the world, youth and the lower-skilled are more heavily impacted, on average, partly reflecting differences in workforce composition across sectors. In emerging market and developing economies, women's unemployment has risen more than men's, on average, while in advanced economies there is not much difference.
- *The pandemic recession is likely to inflict sizable costs on unemployed workers, particularly the lower-skilled.* While it is not uncommon for workers to reallocate across sectors and occupations after spells of unemployment, such reallocation is costly. On average, workers finding reemployment in an occupation different from their previous job experience an average earnings penalty of about 15 percent, pointing to large costs—both personal and social—from reallocation via unemployment.[3] Lower-skilled workers experience a triple whammy: they are more likely to be employed in sectors more negatively impacted by the pandemic; are more likely to become unemployed in downturns; and, those who are able to find a new job, are more likely to need to switch occupations and suffer an earnings fall.
- *Both retention and reallocation policies can help mitigate the impact on workers.* The persistence and asymmetry of the pandemic shock are crucial for the choice between retention and reallocation. Job retention policies—such as wage subsidies and short-term work schemes—are effective in lowering separations, while worker reallocation policies—such as hiring incentives, job search-and-matching assistance, and retraining programs—boost job finding and on-the-job occupational switches by those still in employment. Historically, the lower-skilled have tended to benefit more from job retention policies, while worker reallocation policies have bolstered women's and youth's prospects more.
  - For a transitory and asymmetric shock (such as a lockdown or sharp rise in social distancing affecting sectors differently), job retention policies are extremely powerful in reducing unemployment and providing near-term income insurance.

[3]See Helliwell and Huang (2014) and Reichert and Tauchmann (2017) for evidence on the large social costs of unemployment arising from spillovers across individuals to the larger labor market and increasing perceptions of job insecurity.

○ For a permanent shock (such as a permanent shift in demand across sectors or drop in productivity in some sectors), worker reallocation policies that foster job creation perform better in the long term and hasten adjustment toward the new equilibrium.

○ Where the shock is a mix of transitory and permanent components, a policy package that favors job retention while social distancing is pervasive, and then reallocation once it lifts, better mitigates unemployment dynamics.

Taken together, the findings suggest that countries with fiscal space should maintain support for job retention until the pandemic abates markedly, helping to avoid socially costly unemployment spells and to dampen the effects on more disadvantaged worker groups. In particular, the findings suggest that the use of retention policies could be linked to the duration and intensity of the pandemic. Uncertainties about the pandemic and its path mean that the phaseout of such measures is more complicated in practice; it requires careful monitoring of the pandemic (including rollout of vaccines) and judgment of the economy's ability to weather a reduction in support. Although the model-based analysis is unable to take account of tight fiscal space constraints, the powerful effects of job retention policies in avoiding deeper and more protracted employment deterioration from the pandemic suggest that such measures should be prioritized.

Policies could also be designed to target more-affected worker groups—for example, increasing wage subsidies for youth or lower-skilled workers—to discourage firms from letting these workers go and reduce the unequal impact of the shock. As a recovery gets under way, a more vigorous deployment of worker reallocation support can hasten labor market adjustment. However, it is important to be realistic about how quickly progress in reallocation—particularly the long-term shifting of workers from occupations more-to less-vulnerable to automation—can be achieved given skill mismatches. Human capital investments to help workers reskill for new occupations will take time.[4]

There are some important caveats to the findings. First, country and time coverage vary across empirical exercises because of differences in data availability and are typically more representative of advanced economies' experiences. Recent studies of emerging market and developing economies suggest that economies with larger shares of informal employment are suffering initially sharper declines in employment from the pandemic, but that they may also be poised to experience faster labor market recoveries after the shock passes as informal jobs can be (re)created more quickly.[5] The lack of channels to provide job retention support to informally employed workers may also mean that greater reliance on policies such as cash transfers may be needed to provide income insurance.[6] Second, given that national policies and individual labor market outcomes may be affected by many different variables for which the analysis is unable to fully account, the estimated effects of national-level job retention and worker reallocation policies on individual-level labor market transition probabilities should be interpreted as associational rather than causal. Third, the model-based analysis should be considered illustrative, highlighting key considerations relevant to the choice between job retention and worker reallocation support. Uncertainties about the size and structure of permanent effects from the COVID-19 shock are large, and past recoveries may not be fully representative. Policymakers may need to be nimble in their responses (see also Chapter 2).

This chapter begins with a look at differences in the labor market impact of the COVID-19 pandemic recession across sectors; how past downturns compare; and the relationship between sectoral reallocation and the business cycle through the lens of worker flows, focusing on vulnerability to automation. It then turns to individual-level labor market transitions, earnings changes, and differences across demographic groups. It also estimates how these have varied across past business cycles and what these patterns may imply for the COVID-19 shock. The penultimate section presents empirical estimates of the associations of job retention

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[4]See World Bank (2018, 2019) for how policymakers can adjust policies and improve education and lifetime learning systems to help workers adapt to the changing nature of work as technology advances. See also Edelberg and Shevlin (2021) for a discussion of how policies to boost workforce training may help ease the employment recovery from the pandemic in the United States.

[5]For in-depth looks at specific emerging market and developing economies and how informality in employment may affect the impact of the COVID-19 shock, see Alfaro, Becerra, and Eslava (2020); Balde, Boly, and Avenyo (2020); Kesar and others (2020); and Levya and Urrutia (2020), among others. Historically, greater informality has been associated with a lower cyclical sensitivity of employment (Ahn and others 2019).

[6]See Díez and others (2020) for a discussion of delivery modalities for support to informal workers during the pandemic.

and worker reallocation policies with labor market transitions and the findings from a model-based analysis illustrating the effectiveness of these policies in responding to a lockdown or social-distancing shock. The chapter concludes with a summary of the main takeaways and policy implications.

Sectoral Shocks, Trends in Reallocation, and the Business Cycle

Reflecting the larger direct impact of the pandemic on more contact-intensive work and sectors, the COVID-19 shock has been highly asymmetric in its employment effects across sectors (Figure 3.3, panel 1; see also Chapter 2).

The COVID-19 Shock's Impacts Differ across Sectors

In advanced economies, the sharpest drops in employment were in the wholesale and retail trade, transportation, accommodation and food service, and arts and entertainment sectors, unlike during previous recessions over the past 50 years, when the manufacturing and construction sectors were typically the most negatively impacted (Figure 3.3, panel 2). Some sectors, such as information and communication and finance and insurance, have even experienced employment growth during the pandemic, further highlighting divergent fortunes. Interestingly, the broad sectoral pattern is similar to that observed in previous recessions, which seem to accelerate preexisting structural trends hastening a shift in employment away from sectors more vulnerable to automation (Figure 3.3, panel 3).[7]

The Shock Hits Workers Unequally, with Youth and the Lower-Skilled More Affected

Inequalities in the labor market impacts of the pandemic across demographic groups highlighted in the introduction may in part reflect these asymmetric sectoral impacts of the COVID-19 shock.

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[7]Some recent studies have also classified jobs according to their "teleworkability" (for example, Dingel and Neiman 2020). Most teleworkable jobs are found in sectors that are classified as less vulnerable to automation, meaning there is also a trend toward greater teleworkability in employment. However, there are some differences. Sectors that are less vulnerable to automation but not teleworkable include utilities and arts and entertainment, while sectors that are teleworkable but more vulnerable to automation include administrative services. See Online Annex 3.1 for a tabulation.

Figure 3.3. Sectoral Employment Growth and the Business Cycle

COVID-19 has hit sectors unevenly, with the most-impacted different than in past recessions, but still hastening an uptick in automation trends.
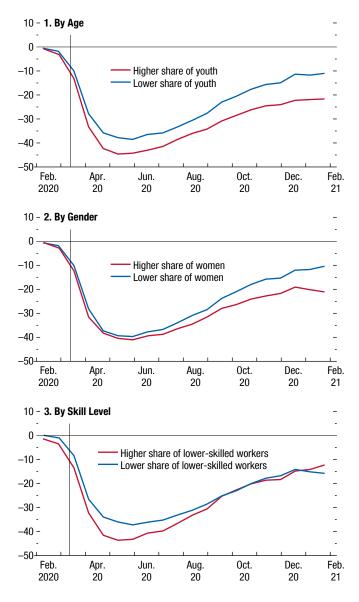

Sources: Choi and others (2018); EU KLEMS; International Labour Organization; Organisation for Economic Co-operation and Development; Statistics Canada; US Bureau of Economic Analysis; World KLEMS; and IMF staff calculations.
Note: Sector groupings in panel 1 are slightly different from those in panels 2 and 3 due to reporting differences in the quarterly sectoral national data. Total economy indicates employment for the economy as a whole. Sectors are classified according to ISIC Revision 4. Sectors are classified as more (less) vulnerable to automation if more (less) than half their share of employment is in occupations classified as highly exposed to routinization (Carrillo-Tudela and others 2016). Underlying data for panel 1 cover 2019:Q1–2020:Q4 and for panels 2 and 3 span 1970–2019, as available. Patterns in average trend growth are similar over the shorter period, 2010–19. See Online Annex 3.1 for further details, including the list of abbreviations.

Figure 3.4. Changes in Sectoral Online Job Posting Trends
(Percent; gap in trend from a year ago, indexed to February 1, 2020)

Sectoral workforce composition accounts for some of COVID-19's unequal impact across groups of workers.

1. By Age

2. By Gender

3. By Skill Level

Sources: EU Labour Force Survey; Indeed; Integrated Public Use Microdata Series, Current Population Survey; and IMF staff calculations.
Note: Data are as of February 16, 2021. Higher (lower) demographic representation in employment by sector is defined as whether the share of young or lower-skilled workers is above (below) the economy-wide average or whether the share of women employed is above (below) 50 percent in a sector. The sample includes a mix of advanced and emerging market economies. Vertical line = March 10, 2020 (Italy enters country-wide lockdown). See Online Annex 3.1 for further details, available at www.imf.org/en/Publications/WEO.

When split according to the proportion of these demographic groups represented in a given sector, the latest high-frequency data on trends in online job postings suggest that sectors that tend to have more youth, women, or lower-skilled workers are likely to have underperformed more than other sectors (Figure 3.4). In other words, demographic differences in employment across sectors and occupations—such as a concentration of workers from disadvantaged groups—are likely contributing to differences in outcomes across groups in the current crisis.[8]

Past Recessions Suggest COVID-19 Shock Requires Worker Reallocation

Based on past shocks, it seems likely that some of this uneven sectoral impact from the COVID-19 pandemic shock reflects a longer-lived labor reallocation shock that is contributing to the unemployment rise.
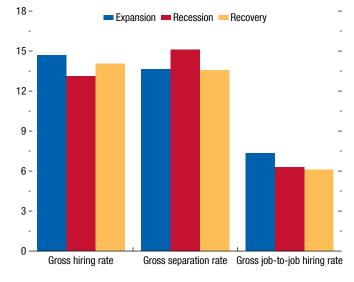
As seen in the behavior of gross worker flows, built up to the country level from microdata on workers, recessions are typically characterized by declines in gross hiring rates (hires into new or existing jobs as a share of employment) and rises in gross separations (job terminations, whether voluntary or involuntary, as a share of employment), consistent with a rise in unemployment during downturns (Figure 3.5).[9]

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[8]See Cajner and others (2020) on how the sectoral nature of the COVID-19 shock may drive much of the disparity in effects across worker groups. Dam and others (2021) and Klein and Smith's (2021) early analysis of the COVID-19 pandemic's impact in the United States indicate that workers from ethnic minorities (African American and Hispanic) have been disproportionately hurt. Previous research has also pointed out the unequal effects of downturns, with historically more disadvantaged groups (youth and ethnic minorities, among others) more likely to experience protracted unemployment and income losses (Altonji and Blank 2004; Raaum and Røed 2006; Oreopoulos, von Wachter, and Heisz 2012; among others). Earlier work has also suggested that composition of employment across sectors and occupations, and hence unequal exposure to shocks, may account for some differences (Davis and von Wachter 2011; Peiró, Belaire-Franch, and Gonzalo 2012; Albanesi and Şahin 2018). Beyond differences in the sectoral or occupational exposure to the shock, other features that could be associated with sector of employment and occupation may contribute to inequalities across worker groups (for example, the prevalence of temporary versus permanent employment contracts, strength of worker bargaining power). See Kikuchi, Kitao, and Mikoshiba (2020), which finds that more employment on temporary contracts may account for the large impact of the COVID-19 shock on women in Japan in the early phase of the pandemic.

[9]Recessions are years of negative real GDP growth. Recoveries are years after a recession when output remains below its previous historical maximum. See Online Annex 3.1, available at www.imf.org/en/Publications/WEO, for a description of the business cycle dating algorithm used to identify phases.

Figure 3.5. Labor Market Turnover across Business Cycles
(Percent)

Hiring falls and separations rise in recessions compared with expansions, reversing somewhat in recoveries.

Sources: EU Labour Force Survey; Integrated Public Use Microdata Series, Current Population Survey; and IMF staff calculations.
Note: Hiring and separation rates and their components are calculated as annual hires/separations divided by average employment over the current and previous years. All rates are statistically significantly different, except those for job-to-job hiring rates for recession and recovery and those for separation rates for recovery and expansion. See Online Annex 3.1 for further details about the data and business cycle dating.

The job-to-job hiring rate (hires from the employed as a share of employment) also tends to drop, suggesting that reallocation through job-to-job changes is inhibited during downturns. Within the job-to-job flows, about two-thirds of all flows are within the same sector. All of these mechanisms are likely to be operating during the COVID-19 pandemic recession.

Sectors More Vulnerable to Automation Are Harder Hit, Similar to Past Recessions

Over time, employment has been shifting away from sectors that are more vulnerable to automation, and the share of employed workers with lower skills has fallen (Figure 3.6, panel 1). The shift reflects in part direct movement of workers from more vulnerable to less vulnerable sectors, but more often it results from net hiring of workers from unemployment and nonparticipation (Figure 3.6, panel 2). This suggests that sectoral reallocations often happen after a spell of nonemployment. Because reallocation

Figure 3.6. Sectoral Employment, by Vulnerability to Automation, Skill Level, and Business Cycle

Employment trends favoring higher-skilled sectors that are less vulnerable to automation occur more as a result of joblessness spells than on-the-job sectoral changes, accelerating during recessions.

Sources: EU Labour Force Survey; Integrated Public Use Microdata Series, Current Population Survey; and IMF staff calculations.
Note: Sectors are classified as more vulnerable to automation if more than half their share of employment is in occupations classified as highly exposed to routinization (Carrillo-Tudela and others 2016). Sectors are classified as more lower-skilled if the sectoral share of lower-skilled employment is greater than the economy-wide average. Net hiring rates are calculated as the difference between annual hires and separations, divided by the average employment over the current and previous year. See Online Annex 3.1 for further details.
[1]To account for sample coverage changes, the average share of employment in working-age population across selected economies over time is calculated according to the normalized time fixed effects from a regression of the indicated variable on country and time fixed effects (Karabarbounis and Neiman 2014).

tends to work more through joblessness, its social costs can be high, particularly during recessions when sectors that are more vulnerable to automation exhibit large outflows into unemployment, as is likely with the COVID-19 shock (Figure 3.6, panel 3). Indeed, as remarked above, employment in sectors that are more vulnerable to automation has declined more steeply during the COVID-19 pandemic, similarly to earlier recessions.

In sum, the COVID-19 pandemic shock has been highly asymmetric in its employment impacts across sectors and demographic groups. Moreover, if the past is any guide, these effects may have a long half-life and entail the need for some reallocation. In particular, the shock is accelerating preexisting automation trends, leading more vulnerable sectors to shrink, and encouraging employment growth in expanding sectors. Differences in workforce composition across sectors imply that some worker groups—particularly the lower-skilled—face more tenuous job prospects.

Labor Market Transitions, Inequality, and Recessions

An alternative perspective to aggregate worker flows emerges from an examination of individual-level labor market transitions—such as an unemployed person finding a job, an employed person losing or separating from a job, and sectoral and occupational changes in employment (either on the job or after an unemployment spell)—which allows for demographic differences in prospects to be identified. As shown here, lower-skilled workers are likely to be particularly hurt by the COVID-19 pandemic recession.

Job Finding Is Lower and Job Separation Higher in Recessions than in Expansions

The probability of finding a job is lower in recessions and recoveries than in expansions, while the reverse is true for job separations (Figure 3.7, panel 1). The likelihood of switching the sector of employment while on the job also tends to follow the cycle—rising in expansions and falling in recessions—although the estimated difference across business cycle phases is not statistically significant.[10]

These average labor market transition likelihoods mask systematic differences across demographic groups. Using a linear probability model augmented with individual-level characteristics, the average effects of these characteristics on labor market transitions are estimated. The results suggest that finding a job is easier for young than prime-age workers while, on average, it is more difficult for women than men and the lower-skilled than the higher-skilled (Figure 3.7, panel 2). Losing a job tends to be more likely for the young or lower-skilled,

[10]The procyclicality of sectoral switches in employment is also found in the literature (Carrillo-Tudela, Hobijn, and Visschers 2014; Carrillo-Tudela and Visschers 2014; and Carrillo-Tudela and others 2016).

Figure 3.7. Labor Market Transition Probabilities across Business Cycles and Demographic Groups

Individual labor market transitions exhibit business cycle patterns similar to those of worker flows, but there is significant variation in prospects across demographic groups, with youth and the lower-skilled at particular disadvantage in the labor market.

Sources: EU Labour Force Survey; Integrated Public Use Microdata Series, Current Population Survey; and IMF staff calculations.
Note: Job finding calculations comprise individuals who were unemployed in the previous year and are employed in the current year. Job separation calculations comprise individuals who were employed in the previous year and are unemployed in the current year. On-the-job sectoral switches comprise individuals who are employed in the previous and current years and changed their sector of occupation. The whiskers indicate the 95 percent confidence band. See Online Annex 3.1 for further details.
[1]Base group is prime-age and higher-skilled men.

while the separation likelihood for women appears about the same as that of men. At the same time, youth are also more likely than prime-age individuals to change jobs across sectors while employed.

Youth and the Lower-Skilled Were Also Most Affected in Past Recessions

Zooming in on transitions during past recessions, systematic differences across groups are also evident (Figure 3.7, panel 3). Youth tend to be particularly disadvantaged in finding a job and more likely to lose one than prime-age workers in a downturn. Historically, women have seen smaller drops in job finding and rises in separations than men during a recession. The story for the lower-skilled is more complex, with both a higher likelihood of finding a job than the higher-skilled, but also of losing it in a recession. However, the separation effect likely dominates, leading the lower-skilled to be more prone to end up unemployed in a recession than the higher-skilled. On-the-job sectoral switches in employment show no clear pattern.

These findings suggest that past recessions showed many similar features to the current crisis, with youth and the lower-skilled particularly disadvantaged in the labor market. The earlier signs that women in advanced economies were also hurt more on average by the COVID-19 shock—different from the typical patterns of previous recessions—appear to be fading.

Switches in Occupations Are More Frequent after Unemployment Spells and Inflict Earnings Penalties

Beyond shifts in sectoral employment, labor market adjustment may also reflect workers changing not only jobs, but occupations.[11] This dimension has become particularly relevant with the COVID-19 shock, given the premium placed on occupations that allow individuals to work from home.[12] However, occupational switches by workers and their associated earnings

changes do not occur in a vacuum; they likely depend on a worker's employment history.

Based on a panel data set of individuals from a sample of European economies, the probability of an occupational switch and earnings change reflect this dependence. Among those who are "on the job" (continuously employed over the past two years), occupational switch incidence is only about 10 percent; for a worker reemployed after a one-year unemployment spell ("via unemployment"), it is nearly five times higher, at almost 50 percent (Figure 3.8, panel 1).[13] In other words, workers appear to generally prefer sticking with their current occupation, unless circumstances—such as prolonged unemployment—force them to switch.

These worker preferences are also evident in the earnings changes associated with occupational switches when comparing those who switched with those who stayed in their original occupations (Figure 3.8, panel 2). Among the employed, those who switched occupations saw an average earnings gain of about 2 percent, suggesting that they changed occupations because it was advantageous. In contrast, among unemployed workers who successfully found new employment, those who switched occupations saw an average earnings penalty of about 15 percent, indicating that they may have had to take a less desirable job.[14]

The state of the business cycle does not appear to significantly impact the occupational switch probabilities and the associated earnings changes.[15] Even so, the fact that unemployment rises in a recession and that the incidence of occupational switches is larger after unemployment spells, indicates that mechanically there are likely to be more occupational switches and more workers suffering earnings penalties on reemployment after recessions, including the COVID-19 pandemic recession.

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[11]For the analysis here, these are classified into broad categories, such as managers, clerical support workers, craftspeople, and plant and machine operators, as per the International Standard Classification of Occupations 2008 major groups occupational classification. See Online Annex 3.1 for more details.
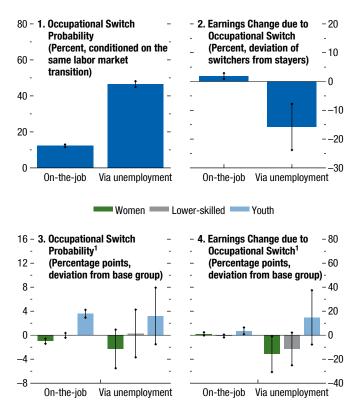
[12]For instance, Hensvik, Le Barbanchon, and Rathelot (2021) finds that job seekers tend to redirect their search toward less severely hit occupations, beyond what is predicted by the drop in vacancies during the COVID-19 pandemic. See also Shibata (forthcoming), which finds that more teleworkable jobs are more insulated from the business cycle, including the pandemic recession, in the United States.

[13]The probability of an occupational switch via nonparticipation is similar to the probability via unemployment.

[14]Although it is not possible to precisely compare the magnitudes of this measure in the literature because of differences in the sample of countries and level of disaggregation of occupation categories, these results are broadly in line with previous studies—see Huckfeldt (2018) and Gertler, Huckfeldt, and Trigari (2020). The stylized facts are also consistent with theories of sequential bargaining in which a worker's bargaining position is affected by their recent employment history (see, for example, Postel-Vinay and Robin 2002; Cahuc, Postel-Vinay, and Robin 2006; and Jarosch 2015). An earnings penalty with an occupational switch after an unemployment spell also arises in a model of selective hiring (Huckfeldt 2018). Furthermore, the earnings change is due mainly to changes in the hourly wage change and not changes in hours worked.

[15]The one exception is the earnings change associated with an on-the-job occupational switch, which is smaller during a recession.

Figure 3.8. Occupational Switches

Occupational switches after periods of unemployment are common but costly in earnings.

Sources: EU Statistics on Income and Living Conditions; and IMF staff calculations.
Note: Occupational switches on-the-job are calculated from individuals who are employed in the current and previous year and switched occupations. Occupational switches via unemployment are calculated from individuals who are employed in the current year and were unemployed last year and switched occupations (based on their occupation of record two years before when last employed). The whiskers indicate the 95 percent confidence band. See Online Annex 3.1 for further details.
[1]Base group is prime-age and higher-skilled men.

When comparing the incidence and earnings consequences of occupational switches across demographic groups, some notable differences are apparent. Women are less likely than men to switch occupations, either while on the job or after a period of unemployment. However, once women switch occupations, the associated earnings change (whether gain or penalty) tends to be larger than it is for men.[16] Youth are much more likely than prime-age individuals to switch occupations, either on the job or via unemployment (although the difference via unemployment is not

statistically significant). Youth also see larger earnings gains from on-the-job occupational switches. Comparing the lower-skilled to the higher-skilled, there are no statistically significant differences in occupational switch incidence nor their associated earnings changes, although there are some signs that the lower-skilled may experience a larger earnings penalty after an occupational switch via unemployment.

These findings on occupational switches and their associated earnings changes across demographic groups do not differ much between expansion and recession periods. However, among lower-skilled workers able to find reemployment, the likelihood of switching occupations via unemployment increases during a recession.[17] This is particularly worrisome in light of the COVID-19 pandemic recession, given that it suggests that the lower-skilled are likely being hit with a triple whammy: they are more likely to be employed in sectors more negatively impacted by the pandemic; are more likely to become unemployed in downturns; and those who find a new job are also more likely to have had to switch occupations and suffer an associated earnings penalty.

Policy Responses to the COVID-19 Shock: Job Retention versus Worker Reallocation

As the previous sections have shown, labor market transitions tend to track the business cycle, with the probabilities of job separation rising and job finding falling with adverse shocks, and youth and the lower-skilled tending to be hurt even more, on average. Can policies help mitigate these effects while also easing any needed labor market adjustment?

The COVID-19 pandemic has prompted extraordinary policy support in many countries, devoted largely to preserving employment relationships and providing workers with income insurance (often through expanded eligibility for and generosity of unemployment benefits; Figure 3.9).[18] As the pandemic continues, discussion focuses more and

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[16]See Montenovo and others (2020) and Shibata (forthcoming) for related evidence on the distributional impacts of COVID-19 in the US labor market.

[17]It is important to emphasize that the results shown here on occupational switch probabilities and associated earnings changes for the lower-skilled already select for lower-skilled workers who found a job after a period of unemployment and exclude lower-skilled workers who could not find a job.
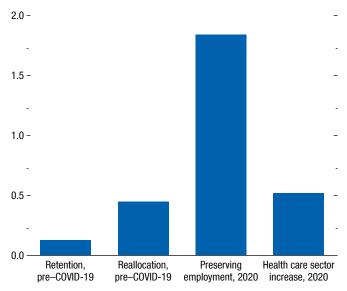
[18]See the IMF's COVID-19 Policy Tracker for details on specific measures. Importantly, any disincentives for reemployment from extensions to unemployment benefit schemes—key insurance for those who have lost jobs—appear to be markedly reduced during recessions (Schmieder, von Wachter, and Bender 2012).

Figure 3.9. Public Spending on Retention and Reallocation Policies: Before COVID-19 and Response to COVID-19
(Percent of GDP)

Average public spending to preserve employment after the COVID-19 shock is dramatically larger than job retention spending in the past. The rise in health sector spending alone is on par with average spending on reallocation in the past.

Sources: IMF, COVID-19 Policy Tracker; Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: Bars show the average public spending on the indicated area as a share of GDP. See Online Annex 3.1 for further details.

more on the roles of two broad sets of policies and when to use them: those aimed at job retention (maintaining existing matches between workers and employers) and those aimed at worker reallocation (creating new jobs and facilitating workers' shift away from shrinking and toward growing sectors and occupations).[19]

To make some headway on this question, this section first provides an empirical assessment of the effects of country-level public spending in the broad areas of job retention and worker reallocation policies on individual-level labor market transitions. However, recognizing that these estimates should be interpreted as associational rather than causal, and that the pandemic shock possesses features not seen in recent history, it then presents a newly developed search-and-matching model to study the choice

[19]Specifically, policy tools to encourage job retention include wage subsidies, short-term work schemes, and partial unemployment benefits, while those that foster worker reallocation include hiring and start-up incentives, job search-and-matching assistance, and retraining programs.

between retention and reallocation policies in responding to an adverse lockdown or social-distancing shock. The laboratory of the model enables key features of the pandemic shock—such as its asymmetric impacts across occupations—and policies to be considered.

Empirical Estimates of Labor Market Policy Effectiveness

Building on the analysis of individual-level labor market transitions, variables capturing spending as a share of average income per unemployed person on labor market policies aimed at job retention and worker reallocation are included in the linear probability model. Although this model incorporates fixed effects (country and time) and macroeconomic controls (such as the output gap), omitted variables correlated with the labor market policy variables remain a concern, such that the results should be interpreted as associational rather than causal.[20]

Focusing only on relationships that were estimated to be statistically significant, job retention policies are found to lower job separation probabilities, on average, while worker reallocation policies raise the likelihood of job finding and on-the-job occupational switches, consistent with what many models of such policies suggest (Figure 3.10, panel 1).[21] At the same time, retention policies also appear to be associated with a higher overall likelihood of on-the-job occupational switches and reallocation policies with a lower separation probability, which are more puzzling. These results may reflect imperfect measurement of job retention and worker reallocation policies as aggregates of spending to improve labor market functioning. These include spending on training programs—delivered either on the job in the case of retention, or outside of work where reallocation is the aim. To the extent that such programs increase a worker's productivity, they may also raise their value to their employers
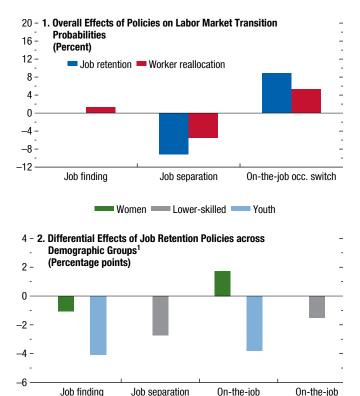
[20]Although the fixed effects do effectively capture the average impacts of country-specific characteristics (such as the stringency of labor market regulations and the structure of labor market institutions) on the outcomes, the impacts of these characteristics on the effectiveness of the policy interventions explored here cannot be independently assessed. The policy effects shown represent the average policy effect.
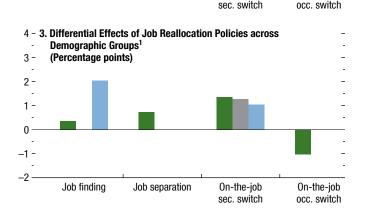
[21]In a canonical Diamond-Mortensen-Pissarides search-and-matching model of the labor market, layoff taxes (a kind of job retention policy) reduce job destruction while having an ambiguous effect on job creation (Pissarides 2000). In contrast, hiring subsidies (a kind of worker reallocation policy) in the model increase both job creation and job destruction.

Figure 3.10. Effects of Job Retention and Worker Reallocation Policies

Job retention and worker reallocation policies can help mitigate adverse shocks and improve labor market functioning.

1. Overall Effects of Policies on Labor Market Transition Probabilities
(Percent)

■ Job retention ■ Worker reallocation

2. Differential Effects of Job Retention Policies across Demographic Groups[1]
(Percentage points)

■ Women ■ Lower-skilled ■ Youth

3. Differential Effects of Job Reallocation Policies across Demographic Groups[1]
(Percentage points)

Sources: EU Labour Force Survey; EU Statistics on Income and Living Conditions; Integrated Public Use Microdata Series, Current Population Survey; and IMF staff calculations.
Note: Panel 1 shows the percent change in the indicated transition probability (relative to its average value) associated with a 1-percentage-point increase in the indicated policy spending as a share of average income per unemployed person. Panels 2 and 3 show the percentage points of the indicated transition probability as deviations from the base group. Only estimated effects that are statistically significant at the 95 percent level are shown. See Online Annex 3.1 for further details, including for the specific means of the labor market transition probabilities. occ. = occupational; sec. = sectoral.
[1]Base group is prime-age and higher-skilled men.

(reducing separations) as well as their interest in and capability of switching occupations while on the job.

Retention and reallocation policies may also have different impacts across demographic groups, potentially reflecting demographic differences in employment in sectors and occupations benefiting from these policies as well as direct targeting of specific groups.[22] The empirical results suggest that job retention policies have tended to lower job separation probabilities more for the lower-skilled than the higher-skilled, while worker reallocation policies have tended to boost job finding chances for youth and women more than for prime-age individuals and men (Figure 3.10, panels 2 and 3). The results are consistent with a greater risk of layoff for the lower-skilled after an adverse shock and, thus, their greater benefit from retention policies. In the case of youth, the results may reflect a greater capability to benefit from reallocation spending related to training. Women's typically weaker labor force attachment may also translate into a greater sensitivity to reallocation policies that enhance job finding.

Economic Policy Responses to a Pandemic: Model-Based Analysis of Job Retention and Worker Reallocation

The preceding empirical analysis suggests that retention and reallocation policies can be effective tools to respond to the labor market deterioration caused by the COVID-19 pandemic recession. As remarked earlier, to address concerns that the empirical estimates are associational and better disentangle the effects of policies, this chapter also presents a newly-developed labor market search-and-matching model to study the roles of job retention versus worker reallocation policies in responding to the COVID-19 shock.[23]

The model incorporates several features that are essential to a better understanding of labor market support measures at this juncture. There are two occupations in the economy, which differ in their contact intensity (and exposure to the pandemic shock). Workers in the two occupations differ in their productivities. Firms enter and exit freely in the model, paying a cost to post a vacancy (create a job). Firms also make different employment offers, depending on workers'

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[22]These estimated differential effects are likely better identified than those for the overall policy effects, given that they are adjusted for the impact of any omitted variables by country-year that could be confounded with labor market policies.

[23]The model calibration is partially informed by the empirical results. See Online Annex 3.1 for further details.

productivity.[24] As in the empirical results, workers in the model who switch occupations while on the job experience a modest earnings gain, whereas workers who switch after an unemployment spell see a marked drop in earnings. An unemployment benefit system operates in the background, offering some insurance to unemployed workers.

The COVID-19 shock is modeled as an adverse "lockdown" shock associated with an increase in social distancing that hurts one of the two occupations more than the other. The shock is set to replicate the initial increase in unemployment observed in the United States and is presumed to last for four periods (quarters). Given uncertainties about the persistence of the shock, two cases are considered: (1) a transitory shock, where productivities return to their initial levels after the shock abates; and (2) a more likely hybrid shock, which is largely transitory but with some permanent component (specifically, half of the shock to the more-impacted occupation is permanent).

Three policy scenarios are considered and compared against a no-policy intervention benchmark: (1) job retention support, in which the government provides transfer payments to firms to support a portion of their wage bill when the match between a firm and worker becomes unprofitable; (2) worker reallocation support, in which the government offers a subsidy to firms to reduce their vacancy cost and stimulate job creation; and (3) a package, which first provides job retention support and then worker reallocation support.[25] In the first two scenarios, support is coincident with the transitory component of the shock (for four quarters), while in the package, worker reallocation support is offered after the transitory component has passed but the permanent effects are still unfolding.

To get a sense of what the persistence of the lockdown shock means for the economy, consider the no-policy intervention benchmarks under the transitory and hybrid shocks (Figure 3.11, panels 1 and 2). When the shock hits the economy, it reduces the output produced by firms and workers, making some job matches unprofitable and leading to job losses and a sharp rise in unemployment. Given that a firm's profitability increases with worker productivity, lower-skilled

[24]Wages are fixed for the duration of the job match once the firm and the worker agree.

[25]Government transfers for job retention have an upper limit calibrated to replicate public expenditure on job retention policies observed in the data. Policies are financed using public debt in the short term, which the government pays back over time.

Figure 3.11. Model Simulations with Lockdown Shocks and Labor Market Policies

The unemployment rise is larger for the same-size lockdown shock when part of the shock is permanent. Retention policies are powerful in reducing unemployment over the short term, while reallocation policies work better over the long term and after a permanent shock.

Unemployment Rate and Distribution of Workers, by Occupation (No-policy scenario)

Effect and Cost of Labor Market Policies during Different Shocks (Deviation from no-policy scenario)

Source: IMF staff calculations.
Note: The x-axis indicates the number of quarters after the shock starts. Package comprises a sequence of retention and reallocation policies. Panels 3 and 4 show responses to the hybrid shock. See Online Annex 3.1 for the definition of different shocks and policy measures. occ. = occupation.

workers are particularly affected and account for a large share of the drop in employment from the more-impacted occupation. In contrast, despite the adverse shock, employment in the less-impacted occupation is essentially unchanged because some workers opt to switch occupations.

Comparing the two shocks, it is clear that the unemployment path is worse with the hybrid shock, even though the initial size of the shock is the same as in the transitory shock case. This happens because firms anticipate that matches on the more-impacted occupation will become less profitable in the future as a result of the shock's permanent effects and, so, they go ahead and lay off workers. Over the long term, employment in the more-impacted occupation never fully recovers, unlike in the transitory shock case.

Focusing on the hybrid shock case, policy support through job retention measures is the most effective option for tamping down the rise in unemployment over the near term from the lockdown shock (Figure 3.11, panel 3). Note that the unemployment rate rises across all of the policy scenarios, but it rises less with policy support: about 4½ percentage points less with job retention measures and about ¼ percentage point less with worker reallocation measures. As the economy recovers over the longer term, worker reallocation support has a slight advantage over job retention measures in reducing unemployment by easing the adjustment to the permanent component of the shock. The policy package, which sequences job retention measures during the lockdown shock and then worker reallocation measures afterward to help address the permanent effects, provides the best of both worlds—a lower near-term unemployment rise and a faster decline in unemployment compared with the no-policy benchmark.

Moreover, by stemming the rise in unemployment, job retention measures could actually reduce the increase in government deficits compared with the no-policy scenario, largely through savings from lower unemployment benefit payouts (Figure 3.11, panel 4). In contrast, worker reallocation measures lead deficits to increase further because they incur some costs with the creation of new jobs and are not as effective at stemming the increase in unemployment. The policy package generates a more volatile deficit path, as spending on worker reallocation measures ramps up after the lockdown is lifted. However, it also does better over the longer term, given that the improvement in unemployment from enhanced reallocation

ends up lowering spending more than in the other scenarios (by enabling reductions in spending on unemployment benefits).

The effectiveness of the labor market measures varies with the persistence of the shock (Figure 3.11, panels 5 and 6). Job retention measures show very little difference between the transitory and hybrid shocks, once the initial lockdown passes. In contrast, worker reallocation measures are more effective than the no-policy benchmark in reducing unemployment durably in response to the hybrid shock. Intuitively, worker reallocation measures are more helpful the more permanent the shock.

The choice of policy responses can also have distributional consequences for incomes. Job retention support is the most powerful in reducing inequality over the short term, compared with a no-policy benchmark in which inequality rises sharply (Figure 3.12, panel 1). Retention policies work to reduce the inequality impact because they preserve job matches and prevent workers from falling into unemployment, which can be costly and have long-lasting impacts (as the empirical analysis indicates).

Focusing on the poorest workers in the bottom quintile of the initial income distribution, it is clear that they benefit most from job retention support, particularly over the short term (Figure 3.12, panel 2). The policy package even does a bit better for them over the medium term, given that unemployment comes down faster when reallocation support is deployed to ameliorate the permanent component of the shock. The model results also indicate that higher-skilled workers are less impacted by the shock initially and see their prospects as a group recover faster. Because they are also more likely to find productive job matches, they tend to benefit more from worker reallocation measures (which generate more new jobs) than from job retention measures.

The overall picture from the model results indicates that the better response to the COVID-19 pandemic recession would be a policy package that combines retention and reallocation measures to respond to the mix of transitory and permanent components. The illustrative package shown here uses retention measures to dampen the rise in unemployment during the acute pandemic or lockdown phase, followed by reallocation measures during the recovery to facilitate workers' shift toward less-impacted sectors through faster job creation. The model results suggest that the use of retention policies should be linked to the duration and intensity

Figure 3.12. Impact of Policies on Income Inequality

Retention policies lower inequality in the short term, while reallocation policies lower inequality in the long term. Lower-skilled workers benefit more from retention policies in the short term while reallocation helps more in the long term.

1. Income Inequality
(Gini point deviation from no-policy scenario)

2. Income Share of Bottom 20 Percent
(Percent deviation from initial steady state)

Source: IMF staff calculations.
Note: The *x*-axis indicates the number of quarters after the hybrid shock starts. Package comprises a sequence of retention and reallocation policies. See Online Annex 3.1 for the definition of different shocks and policy measures.

of the transitory shock. In practice though, uncertainties about the pandemic shock mean that the phaseout of such measures is likely to be more complex and may need to balance fiscal space considerations alongside impacts on output and employment dynamics. Careful monitoring of COVID-19 cases and deaths, the extent of social distancing, and other key measures of the intensity of the pandemic (including the rollout of vaccines) will be required to gauge whether the economy can withstand the step-down in job retention policies and a switch in emphasis toward easing reallocation.

Conclusions

The COVID-19 pandemic and its consequences continue to unfold, with profound effects already visible in labor markets around the world, despite extraordinary policy support. The shock has been highly asymmetric in its effects across sectors and

occupations, contributing to inequality across workers. Large uncertainties about the ultimate persistence of the shock and the potential need for structural transformation in its wake remain. Against this backdrop, this chapter attempts to shed light on the labor market effects of the COVID-19 pandemic recession so far, how it compares with past downturns, and how policies—particularly job retention and worker reallocation measures—may improve unemployment dynamics after such an adverse and asymmetric shock.

There are signs that the COVID-19 shock is accelerating preexisting trends, with employment shifting away from sectors and occupations that are more vulnerable to automation. These broad effects were also visible in movements in worker flows during past recessions, although the specific sectors that are most hurt—such as wholesale and retail trade and accommodation and food—differ with the pandemic shock. Around the world, youth and the lower-skilled have been more heavily affected, on average, a pattern also evident in past downturns. Women's unemployment has risen more than men's, on average, in emerging market and developing economies. These unequal effects across demographic groups appear in part to reflect differences in workforce composition across sectors.

Historically, sectoral labor reallocation picks up during recessions, which seems to be the case for the COVID-19 pandemic recession. Moreover, worker reallocation across sectors tends to occur more from hiring out of joblessness than from job-to-job hires. Relatedly, at the individual level, a worker's likelihood of switching occupations is greater after an unemployment spell than it is while they are still employed. But occupational switches via unemployment are costly, with workers typically incurring a large earnings penalty compared with similar workers who find reemployment without having to change occupations. Together, these point to the potential for large and uneven losses across workers from the COVID-19 shock—with youth and the lower-skilled hurt most—and a tough climb back as the economy recovers.

Measures that support job retention can be powerful tools to mitigate the damage from an adverse labor market shock such as the COVID-19 pandemic, according to the model-based analysis. The deployment of such measures while the shock is ongoing has been essential in keeping unemployment from rising even further and helping shield more-affected groups of workers, such as the lower-skilled. Examples of

such measures include the extensive activations of the *Kurzarbeit* scheme in Germany and the *Expediente de Regulación Temporal de Empleo* program in Spain, revisions to increase eligibility for wage subsidies provided through the *Cassa Integrazione Guadagni* program in Italy, and the more limited wage subsidy program through the US Paycheck Protection Program and the Employee Retention Tax Credit.[26] In general, job retention policies are the best option to address the temporary (but sometimes lengthy) disruption caused by an adverse pandemic shock, helping to maintain job matches and prevent sharper rises in unemployment while the shock is occurring. Worker reallocation policies that boost job creation can then help ease the labor market adjustment to the permanent changes in the economy's structure wrought by the pandemic shock, particularly after the shock passes and the economy enters a more normal recovery.

Looking ahead, although there are many uncertainties, it seems likely the COVID-19 shock will have some permanent effects, hastening a move away from employment that is more vulnerable to automation and less teleworkable. In this case, a policy package, with strong use of job retention measures during the shock and then support for worker reallocation measures when it lifts, performs better than either job retention or worker reallocation measures alone. The disproportionate, negative impact on lower-skilled workers is also reduced with the policy package: retention support helps to preserve more marginal but ultimately viable job matches, while the reallocation support after the acute pandemic shock helps the unemployed find new jobs more quickly over the medium term. Other policy support measures may also be considered. For example, although not incorporated into the model used here, (re)training and more general human capital investments that boost worker productivity could be deployed. These have the potential to make existing job matches more profitable (and hence more resilient) and also help workers become more able to switch occupations. However, as with most investments, these may take time for their

returns to manifest; they are not suited to dealing with the near-term fallout from a negative shock.

Beyond the broad contours for the policy choice presented in this chapter, specific design elements of job retention and worker reallocation policies and their interaction with country-specific characteristics can matter for their effectiveness.[27] For example, the literature suggests that job retention measures, such as wage subsidies and short-term work schemes, can be highly successful in safeguarding employment but must take into account country-specific circumstances and be calibrated to the nature of the shock.[28] Similarly, the success of (re)training programs depends heavily on the specific content and program delivery details.[29] Finally, there is an opportunity to broaden the response to the COVID-19 pandemic to structurally improve the economy's resilience and growth prospects. For example, reallocation measures could be designed to favor the creation of more green jobs, helping to tackle climate change challenges (see Chapter 3 of the October 2020 WEO for a discussion of some options). In parallel, greater support for workers to successfully acquire the skills needed for these jobs will be essential, including through revamping educational systems and improving learning opportunities more generally.[30]

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[26]See OECD (2020) for further details on these and other job-retention policies implemented across countries to respond to the COVID-19 shock. Program design specifics can differ markedly across countries, depending on their country-specific circumstances and previous experience with such policies. Countries with preexisting short-term work schemes (such as Germany, Italy, and Spain) have expanded eligibility, while those without broad availability of such measures have had to resort to more ad hoc approaches to provide support (for example, the United States).

[27]Among others, see Kluve (2010) and Card, Kluve, and Weber (2018) for summaries of the evidence gleaned from program evaluations for various labor market policies, including wage subsidies, shared work schemes, and training programs, and how they may differ in their effects across different demographic groups. In some cases, policies have been designed to boost employment opportunities for disadvantaged demographic groups. For example, see Ahn and others (2019) for an overview of policies that can be targeted to improve youth's labor market prospects. There has been much more limited experience with sector-specific targeting in the design of labor market policies (OECD 2018). In general, policy support provided to more adversely impacted firms and workers will in effect end up funneled toward firms and workers in more-affected sectors without explicit sectoral targeting. Moreover, sectoral targeting independent of individual firm or worker circumstances raises risks of misallocation, given that less-impacted firms and workers within a recipient sector could receive resources. See OECD (2018) for a fuller discussion of considerations in designing more targeted policy support.

[28]Regarding job retention policies, Boeri and Bruecker (2011) credits European short-term work schemes activated during the Great Recession with helping prevent job losses, but they note that these schemes tend to be most useful in countries with strict employment protections and/or centralized bargaining, which can otherwise limit wage and hours flexibility. In the current context, Basso and others (2020) advocates that these schemes should transform as much as possible into wage insurance schemes, which would allow for worker-initiated job changes, while also providing incentives to maintain existing job matches.

[29]See Kluve and Schmidt (2002), among others.

[30]See World Bank (2018, 2019) for a discussion of such options.

Helliwell, John F., and Haifang Huang. 2014. "New Measures of the Costs of Unemployment: Evidence from the Subjective Well-Being of 3.3 Million Americans." *Economic Inquiry* 52 (4): 1485–502.

Hensvik, Lena, Thomas Le Barbanchon, and Roland Rathelot. 2021. "Job Search during the COVID-19 Crisis." *Journal of Public Economics* 194 (February): 104349.

Huckfeldt, Christopher. 2018. "Understanding the Scarring Effect of Recessions." Society for Economic Dynamics 2018 Meeting Papers 1207, Minneapolis, MN.

Jarosch, Gregor. 2015. "Searching for Job Security and the Consequences of Job Loss." Unpublished.

Karabarbounis, Loukas, and Brent Neiman. 2014. "The Global Decline of the Labor Share." *The Quarterly Journal of Economics* 129 (1): 61–103.

Kesar, Surbhi, Rosa Abraham, Rahul Lahoti, Paaritosh Nath, and Amit Basole. 2020. "Pandemic, Informality, and Vulnerability: Impact of COVID-19 on Livelihoods in India." CSE Working Paper 2020–01, Centre for Sustainable Employment, Azim Premji University, Bengaluru, India.

Kikuchi, Shinnosuke, Sagiri Kitao, and Minamo Mikoshiba. 2020. "Who Suffers from the COVID-19 Shocks? Labor Market Heterogeneity and Welfare Consequences in Japan." Center for Advanced Research in Finance Working Paper F-490, University of Tokyo.

Klein, Aaron, and Ember Smith. 2021. "Explaining the Economic Impact of COVID-19: Core Industries and the Hispanic Workforce." Brookings Institution report, Washington, DC.

Kluve, Jochen. 2010. "The Effectiveness of European Active Labor Market Programs." *Labour Economics* 17 (6): 904–18.

Kluve, Jochen, and Christoph M. Schmidt. 2002. "Can Training and Employment Subsidies Combat European Unemployment?" *Economic Policy* 17 (35): 409–48.

Levya, Gustavo, and Carlos Urrutia. 2020. "Informal Labor Markets in Times of Pandemic: Evidence from Latin America and Policy Options." Unpublished.

Montenovo, Laura, Xuan Jiang, Felipe Lozano Rojas, Ian M. Schmutte, Kosali I. Simon, Bruce A. Weinberg, and Coady Wing. 2020. "Determinants of Disparities in COVID-19 Job Losses." NBER Working Paper 27132, National Bureau of Economic Research, Cambridge, MA.

Nekarda, Christopher J. 2009. "A Longitudinal Analysis of the Current Population Survey: Assessing the Cyclical Bias of Geographic Mobility." Unpublished.

Oreopoulos, Philip, Till von Wachter, and Andrew Heisz. 2012. "The Short- and Long-Term Career Effects of Graduating in a Recession." *American Economic Journal: Applied Economics* 4 (1): 1–29.

Organisation for Economic Co-operation and Development (OECD). 2018. "Back to Work: Lessons from Nine Country Case Studies of Policies to Assist Displaced Workers." In *OECD Employment Outlook 2018.* Paris.

Organisation for Economic Co-operation and Development (OECD). 2020. "Job Retention Schemes during the COVID-19 Lockdown and Beyond." In *Tackling Coronavirus (COVID-19): Contributing to a Global Effort.* Paris.

Peiró, Amado, Jorge Belaire-Franch, and Maria Teresa Gonzalo. 2012. "Unemployment, Cycle, and Gender." *Journal of Macroeconomics* 34: 1167–75.

Pissarides, Christopher A. 2000. *Equilibrium Unemployment Theory*, 2nd edition. Cambridge, MA: MIT Press.

Postel-Vinay, Fabien, and Jean-Marc Robin. 2002. "The Distribution of Earnings in an Equilibrium Search Model with State-Dependent Offers and Counteroffers." *International Economic Review* 43 (4): 989–1016.

Raaum, Oddbjørn, and Knut Røed. 2006. "Do Business Cycle Conditions at the Time of Labor Market Entry Affect Future Employment Prospects?" *The Review of Economics and Statistics* 88 (2): 193–210.

Reichert, Arndt R., and Harald Tauchmann. 2017. "Workforce Reduction, Subjective Job Insecurity, and Mental Health." *Journal of Economic Behavior & Organization* 144: 187–212.

Roy, A. D. 1951. "Some Thoughts on the Distribution of Earnings." *Oxford Economic Papers* 3 (2): 135–46.

Schmieder, Johannes F., Till von Wachter, and Stefan Bender. 2012. "The Effects of Unemployment Insurance over the Business Cycle: Evidence from Regression Discontinuity Estimates over 20 Years." *The Quarterly Journal of Economics* 127 (2): 701–52.

Shibata, Ippei. Forthcoming. "The Distributional Impact of Recessions: The Global Financial Crisis and the COVID-19 Pandemic Recession." *Journal of Economics and Business.*

World Bank. 2018. *World Development Report 2018: Learning to Realize Education's Promise.* Washington, DC.

World Bank. 2019. *World Development Report 2019: The Changing Nature of Work.* Washington, DC.