After-Effects of the COVID-19 Pandemic: Prospects for Medium-Term Economic Damage

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Motivation

- The COVID-19 pandemic has led to a severe global recession
  - Output declined three times as much as in GFC, in half the time
  - A unique crisis with differential impacts
  - An unprecedented policy response
  - And great uncertainty about the recovery path

- This chapter tackles the following questions:
  - What can we learn from historical experience about prospects for scarring, and the most relevant channels through which it occurs?
  - How important are sectoral spillovers in propagating shocks to the broader economy?
  - What are the implications of the COVID-19 crisis for the medium-term outlook?
Roadmap

1. Anatomy of the COVID-19 shock

2. Recent developments and near-term outlook (from WEO Chapter 1)

3. Three sections to the analysis:
   1. Historical evidence on recessions
   2. Historical evidence on sectoral spillovers
   3. Implications of the COVID-19 crisis for the medium-term outlook
The COVID-19 shock: Demand and supply in a low-contact economy

- Sectors can be grouped into:
  - **High contact, affected**: restaurants, transportation, brick-and-mortar retail, etc.
  - **High contact, less affected**: health, groceries, construction, etc.
  - **Low-contact services**: professional and business services
  - **Other low contact**: e.g. manufacturing

- **High-contact, affected** sectors most severely impacted by lockdowns and other pandemic containment measures

- But activity fell across the board, with demand declining due to reduced mobility, heightened uncertainty, and network spillovers

**Value Added by Sector Group During Recessions**

*Index, last prerecession quarter = 100*

- **1. High Contact Affected**
- **2. High Contact Less Affected**
- **3. Low-Contact Services**
- **4. Low Contact, Other**

Sources: OECD; US Bureau of Economic Analysis; and IMF staff calculations.

Note: Data are for 1990:Q1–2020:Q4 from 38 countries (the number of countries used for each recession line varies). Time since the shock (in quarters) on the x-axis. Lines are averages weighted by country's GDP. For the COVID-19 crisis, quarter 0 is 2019:Q4. For the Global Financial Crisis (GFC), quarter 0 is the country-specific date of peak real GDP during 2007–08. Other recessions are country-specific.
The COVID-19 shock: Differential impacts within and across economies

Within:

- Employment declines disproportionately among lower-skilled workers
- Exits for small businesses appear to be increasing

Across:

- Countries with larger share of high-contact sectors faced larger contractions
  - Particularly those dependent on tourism, and commodity exporters

Employment, by Sector Group
(Total hours worked, cumulative percent change from 2019:Q4)

Sources: International Labor Organization; and IMF staff calculations.
Note: Data are from 43 economies (27 AEs, 16 EMDEs) for 2019:Q4–2020:Q3. AEs = advanced economies; EMDEs = emerging market and developing economies.
Recent Developments and Near-Term Outlook (from WEO Chapter 1)
Renewed waves, but activity not as sensitive to restrictions
Manufacturing-led recovery, merchandise trade rebound

Global Activity Indicators
(Three-month moving average, annualized percent change; deviations from 50 for manufacturing PMI, unless noted otherwise)

Sources: CPB Netherlands Bureau for Economic Policy Analysis; Haver Analytics; Markit Economics; and IMF staff estimates.

Global Imports: Contributions, by Types of Goods and Regions
(Contribution to year-over-year percent change, percentage points; based on value in US dollars)

Sources: Haver Analytics; and IMF staff calculations.
Access to vaccines a key driver of the recovery

A Race between Virus and Vaccines
(Per thousand, seven-day moving average; latest observation: March 8, 2021)

Confirmed Vaccine Procurement
(Percent of population)

Sources: Duke Global Health Innovation Center, Johns Hopkins University COVID-19 statistics; and national government reports via Our World in Data.
### Growth projections: Advanced economies

*(percent change from a year earlier)*

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<th>World</th>
<th>Advanced Economies</th>
<th>U.S.</th>
<th>Euro Area</th>
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## Growth projections: Emerging markets and LIDCs

(Percent change from a year earlier)

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<th></th>
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<th>Emerging Market and Developing Economies ex. China</th>
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Risks related to vaccine rollout

AEs Real GDP
(Percent; deviation from baseline)

Sources: IMF, G20 Model simulations.

EMDEs Real GDP
(Percent; deviation from baseline)

Sources: IMF, G20 Model simulations.
Historical evidence on economic recessions
Channels of scarring

- Scarring: persistent damage to supply potential from job losses and firm bankruptcies, and resulting loss of economic ties in production and distribution networks

TFP
- loss of firm-specific know-how due to bankruptcies
- reduction in technology adoption and innovation
- obstacles to resource reallocation

Capital
- delayed or reduced investment during the crisis
- debt overhang, uncertainty, and tighter financial conditions after the recession

Labor
- discouraged unemployed exit labor force
- education interruptions affect long-term human capital accumulation
Medium-term output losses are larger for certain types of recessions

- We estimate the impact of recessions for a sample of about 600 recession episodes in 115 countries, from 1957-2019

- Local projection method with standard macroeconomic control variables, interaction terms for recession types, and country and year fixed effects

  - There are permanent output losses, on average, after all types of recessions
  - The greatest scarring has occurred following financial crises
  - Previous epidemics and pandemics featured lower scarring than recessions with financial crises

Impact on Real GDP per Capita
(Percentage points)

Sources: Penn World Table 10.0; and IMF staff calculations.
Note: The solid lines represent the estimated cumulative impulse response functions and shaded areas represent 90 percent confidence intervals. Past modern pandemics and epidemics include Hong Kong flu, SARS, H1N1, MERS, Ebola, and Zika.
Channels of medium-term output losses

- For typical recessions, medium-term losses in GDP per capita can be attributed mainly to persistently weaker productivity.
- Financial crises are associated with permanent deteriorations in TFP, capital-to-worker ratio, and employment.

**Impact on Total Factor Productivity (Percentage points)**  
**Impact on Capital-Employment Ratio (Percentage points)**  
**Impact on Employment per Capita (Percentage points)**

Sources: Penn World Table 10.0; and IMF staff calculations.

Note: The solid lines represent the estimated cumulative impulse response functions and shaded areas represent 90 percent confidence intervals. Past modern pandemics and epidemics include Hong Kong flu, SARS, H1N1, MERS, Ebola, and Zika.
Education losses worse in EMDEs

Global Education Losses Due to the COVID-19 Pandemic
(Average missed days of instruction in 2020)

Where Are Education Losses Larger?
(Average number of missed days of instruction)

Sources: UNESCO-UNICEF-World Bank Survey on National Education Responses to COVID-19 School Closures; World Bank, WDI; and IMF staff calculations.

Note: Each bar corresponds to the average number of missed days of instruction across countries with a given infrastructure characteristic. The differences are statistically significant at the 5 percent level.
Historical evidence on sectoral spillovers
Economic shocks: the sectoral dimension

- We quantify size and persistence of effects from historical sectoral shocks
  - Focus on outcomes at sector-level
  - Effect from shocks in own sector vs. shocks in other sectors/countries
  - Inter-country input-output tables to quantify linkages for 4 transmission channels
    - From suppliers: Downstream effects, Domestic and Foreign
    - From customers: Upstream effects, Domestic and Foreign
  - Sample: 31 AEs and 12 EMEs over 1995–2014

- Building on Acemoglu and others (2016), local projections
  \[
  \Delta \log Y_{s,c,t} = \beta_{own}^{Shock} s_{s,c,t} + \beta_{Dn,Dom}^{Dn} n_{s,c,t} + \beta_{Dn,For}^{Dn} n_{s,c,t} + \beta_{Up,Dom}^{Up} n_{s,c,t} + \beta_{Up,For}^{Up} n_{s,c,t} + \Gamma(s,c,t) + \epsilon_{s,c,t}
  \]

- Analyze different shocks
  - SUPPLY: sectoral TFP changes
  - DEMAND: sectoral government spending changes

Own and Spillover Effects

Source: IMF staff.
Note: Solid, black arrows correspond to (net) trade flows. Dashed, colored arrows correspond to shocks and their resulting effects on the focal sector (automotive).
Supply shocks: large and persistent downstream effects

- Shock: year-on-year change in sectoral TFP
- Outcome: cumulative sectoral real value-added growth
  - Total network effects 2 times larger than own effect
  - Downstream effects dominate
  - Effects persist up to 5 years

Own and Network Effects of TFP Shock
(Cumulative change in GVA, percentage points)

Sources: World Input-Output Database; and IMF staff calculations.
Note: Bars and dots represent the estimated coefficients of the cumulative impulse response function for sectoral GVA from a one standard deviation increase in each shock type.
Demand shocks: large and persistent network effects

- Shock: year-on-year change in government spending in each sector
- Outcome: cumulative sectoral real value-added growth
  - Total network effects 7 times larger than effect of own shock
  - Network effects persist up to 5 years

**Own and Network Effects of Govt. Spend Shock**

*(Cumulative change in GVA, percentage points)*

Sources: World Input-Output Database; and IMF staff calculations.
Note: Bars and dots represent the estimated coefficients of the cumulative impulse response function for sectoral GVA from a one standard deviation increase in each shock type.
Network effects amplified the COVID-19 shock

- Back-of-the-envelope quantification of COVID-19 sectoral spillovers
- Relative size of spillovers from ‘peripheral sectors’ is smaller than in previous recessions, still sizable
- Downstream domestic spillovers from supply shocks dominate, limited role of foreign shocks

**Relative Own and Spillover Effects from the COVID-19 Shock**

*(Percent contribution to the 2020 GVA decline)*

Sources: World Input-Output Database; OECD Quarterly National Accounts; International Labor Organization; and IMF staff calculations.
Implications of COVID-19 for the Medium Term
A wide range of possible medium-term outcomes

- Historical evidence suggests that most recessions leave persistent scars
  - Mainly through lower productivity growth and slower capital accumulation
  - Sectoral shocks can also propagate, contributing to a broader downturn

- Divergent recoveries could result from differences in:
  - Path of the pandemic
  - Sectoral composition across countries and capability of businesses and workers to adapt
  - Policy responses and policy space
  - Amplification through the financial system
  - Global spillover channels (e.g. portfolio flows and remittances)
Expected medium-term output losses

Medium-term Output Losses
(Percent difference from precrisis forecast)

- Global financial crisis
- COVID-19

Source: IMF staff estimates.
Note: Bars show the percent difference in real GDP four years after the crisis and anticipated GDP for the same period prior to the crisis for the indicated group.

Medium-Term GDP Losses Relative to Pre-COVID-19, by Region
(Revisions to projected 2024 GDP levels between the January 2020 and April 2021 WEO forecasts, percent)

Source: IMF staff estimates.
Cross-country variation in expected medium-term output losses

- The average income level, sectoral structure of economy, and size of fiscal policy response in 2020 help explain the variation across economies:
  - Countries that implemented larger fiscal responses are projected to experience smaller losses
  - Largest impacts of the crisis are on the most tourism-dependent economies
  - Economies with larger services sectors are also projected to experience persistent output losses
- But large uncertainty remains
A sequenced approach for policies to limit persistent damage

- Important to avoid financial distress

- Targeted support to the most-affected sectors and workers may be most effective while supply constraints remain in place, whereas public investment can help boost both supply and demand as constraints ease

- Where fiscal space permits, policymakers should deploy a combined package of better-targeted support for affected households and firms and public investments aimed at the following:
  - Reversing setbacks to human capital accumulation and encouraging employment
  - Supporting productivity, including policies to facilitate resource reallocation
  - Boosting investment
Conclusion

- Historically, deep recessions have led to persistent output losses, driven largely by TFP losses.

- Spillovers have been large amplifiers of sectoral shocks in the past, and have also amplified the COVID-19 shock.

- World output anticipated to be 3 percent lower in 2024, with variation across countries:
  - Emerging market and developing economies are expected to suffer more scarring.

- Addressing the setback to human capital accumulation, measures to support reallocation, and lift investment will be key to limit long-run GDP losses.
World Economic Outlook
April 2021

THANK YOU!