This report provides a comprehensive analysis and valuable new evidence on the impact of the COVID-19 pandemic and the importance of industrial capabilities and digitalization in mitigating the negative impact of the pandemic and in strengthening resilience for post-pandemic recovery. It highlights the role of digital transformation, international coordination and global cooperation of industrial policy for building back better for all. The report is an important, timely and visionary guide for governments and policymakers at various levels to develop an effective solution for a more inclusive, resilient and sustainable development in the post-pandemic world.

Xiaolan Fu, University of Oxford

UNIDO brilliantly underpins policy responses and the contributions of the industrial sector in overcoming the challenges of the COVID-19 crisis. An endemic SARS CoV-2 can lead to recurrent aggressive variants, particularly if less developed countries do not receive massive immunization assistance. Long-term economic growth is also threatened by the jump in poverty and underemployment, foreshadowing a deepening of the social, industrial and digital divide between developed and developing societies. More than ever, international cooperation for both a broad, post-pandemic recovery of investments in sustainable energy and infrastructure as well as increased digitalized industrial development is essential to socially equitable and sustainable global growth.

Luciano Coutinho, University of Campinas
The COVID-pandemic had a severe global impact

From work to commerce and social interaction, all human activities and regions worldwide have been affected by the pandemic and the measures taken to contain it.

Estimated world output loss due to COVID-19 by 2021

USD 5,842 billions projected world output loss

4.2% projected decline in world output

Industrialized Economies (IEs) vs. Developing and Emerging Industrial Economies (DEIEs):
The average estimated loss of output of these two groups in 2021 relative to pre-pandemic estimates is 3.9 percent (IEs) and 7.7 percent (DEIEs), respectively.

The COVID-19 pandemic has hit all countries, but some were more affected than others, reflecting deep underlying differences in their resilience against extreme events.

Note: Projected world output loss by 2021 is defined as the difference in 2017 PPP dollars between the level of GDP projected before the pandemic (October 2019, dotted line) and the latest available projection (October 2021, solid line). GDP= gross domestic product; PPP = purchasing power parity.

As the COVID-19 pandemic spread, its impact was felt more acutely in some industries, firms and workers than in others.

Two types of industries have emerged: Those that suffered a comparatively low impact or a strong negative impact with a swift recovery, and those which were hit hard and have not recovered fast.

Typology of global industries according to the observed impact of COVID-19 and the speed of recovery, 2019 Q4–2021 Q2

Heterogeneity of initial impact and speed of recovery in selected Industries

Note: The IIP is seasonally adjusted. The figures show weighted averages for all countries with available data. The change in IIP since the start of the pandemic is defined as the difference in the level of the IIP between 2019 Q4 and 2021 Q2 (latest available data). IIP = Index of Industrial Production.
As the COVID-19 pandemic spread, its impact was felt more acutely in some industries, firms and workers than in others. SMEs have been disproportionately affected by the pandemic relative to large firms.

**Impact of COVID-19 on firms, 2019-2020**

- **SMEs in vulnerable industries** reported a decline in sales after the pandemic which, on average, was 14 times higher than that reported by large firms in robust industries.

**Workers**

- **Elasticity of employment to sales**: percentage of lost jobs for every 1 percent decrease in the value of money sales

  - **a. By industry type**
    - Women: 0.85
    - Men: 0.74
  - **b. By worker type**
    - Temporary workers: 1.29
    - Permanent workers: 0.85

The pandemic has affected female and temporary workers more negatively than others. A given decrease in sales is associated with a larger decrease in the number of female workers than of male workers.

**Note:** Robust and vulnerable industries classified based on previous page. Permanent workers work for a term of one or more fiscal years. Temporary workers work for a term of less than one fiscal year. Sample includes about 1,000 manufacturing firms in 26 developing and emerging industrial economies.

Why did some countries fare better than others?  
The role of industrial capabilities

Countries with a larger share of manufacturing in GDP weathered the pandemic crisis better.

The correlation between the manufacturing sector’s size and the impact suffered may be influenced by a number of factors. Let us take a closer look at them.

Note: The graphs show simple averages. Projected output loss by 2021 is defined as the difference between the pre-pandemic projection of the level of GDP (October 2019) and the latest available projection (October 2021) and presented as share of the pre-pandemic projection. The solid line indicates the linear regression estimate. DEIEs = developing and emerging industrial economies; IEs = industrialized economies; LDCs = least developed countries.

Determinants of the impact of COVID-19 on economic activity and manufacturing firms

A country's preexisting industrial capabilities has had a mitigating effect on the pandemic's impact, while the stringency of containment measures has had the opposite effect.

Note: The figure depicts coefficients (dots) and confidence intervals (at 95 percent) (lines) for the average marginal effects of the variables of interest on the projected output loss of each country for the year 2021 (first panel), and the probability of firm survival (second panel). Stringency of containment measures is defined as the cumulative average level of Oxford’s Stringency Index by October 2021; level of industrial capabilities is defined as the level of UNIDO CIP Index in 2019. Firm survival is proxied with a binary variable that takes the value of 1 if the firm is fully operational at the time of the World Bank Enterprise follow-up survey, and 0 if it closed operations (temporarily or permanently).

Why did some firms fare better than others? Readiness to respond

Five changes were introduced by manufacturing firms.

- Introduced organizational changes to fulfil new health and safety requirements
- Introduced new equipment to reduce the workers needed on the shop floor
- Started or increased online business activity and delivery of goods or services
- Released new product(s) to meet changing market demands
- Fully or partially converted production to address the health emergency

These changes pursued two aims:
- A more proactive one to exploit opportunities created by the pandemic shock
- A more defensive one to cope with the constraints imposed by the crisis

The readiness to introduce transformational change across the board was continuously lower than average among SMEs.

Transformational changes, by size

- Organizational change: 40% SMEs, 20% Large
- Business activity online: 60% SMEs, 55% Large
- New product: 25% SMEs, 36% Large
- Repurposing: 29% SMEs, 28% Large
- New equipment: 29% SMEs, 25% Large

Transformational changes, by firm type

- Organizational change: 74% Digitally advanced, 63% Non-digitally advanced
- Business activity online: 67% Digitally advanced, 47% Non-digitally advanced
- New product: 37% Digitally advanced, 35% Non-digitally advanced
- Repurposing: 33% Digitally advanced, 29% Non-digitally advanced
- New equipment: 40% Digitally advanced, 29% Non-digitally advanced

Note: Sample includes about 2,800 manufacturing firms in 26 developing and industrial emerging economies. SMEs have up to 99 employees. Large firms have 100 or more employees. Digitally advanced firms are those adopting advanced digital production (ADP) technologies.

Three megatrends are reshaping industrial development

Megatrends share three characteristics:

They last several decades
They affect the social, economic and political spheres of industrial development
They have a global impact

A. TECHNOLOGICAL CHANGE

World industrial robot density (robots per thousand workers)

Robots are one out of several technological solutions that are revolutionizing industrial production. Robot density in manufacturing industries has increased fourfold globally in the last 20 years.

B. GLOBAL SHIFTS IN MANUFACTURING

Asia-Pacific DEIEs share in world MVA (%)

Industrial production is rapidly shifting towards Asia, not only in terms of quantity but also in terms of quality. Asia’s share in world manufacturing value added has increased almost threefold in the last 20 years.

C. INDUSTRIAL GREENING

World industrial CO₂ emissions per unit of MVA (kilograms per 2015 $)

Until 2010, the share of CO₂ emissions per unit of manufacturing value added continued to increase. A sustained decline after 2010 puts the level of 2018 at 15% below that of 2000.

Note: Industrial robot density is defined as the total stock of industrial robots divided by the total number of manufacturing employment. CO₂ = carbon dioxide; DEIEs = developing and emerging industrial economies; MVA = manufacturing value added.

Preliminary evidence shows that COVID-19 is reinforcing these megatrends

The pandemic has accelerated technological change, global shifts in manufacturing and industrial greening in developing countries. These changes are here to stay.

A. TECHNOLOGICAL CHANGE
Firms introducing new equipment to reduce workers on the shop floor (i.e. automation) in response to the pandemic

The pandemic has forced many manufacturing firms to make decisions on automation. This was particularly important in large firms, where about 30 percent indicated that they introduced these changes in response to the pandemic. The majority expect these changes to be permanent.

B. GLOBAL SHIFTS IN MANUFACTURING
Firms planning to increase post-pandemic investments in new equipment

52 percent of Asian firms planned to increase investments in new equipment. Their responses differ from those of other regions, where the majority of firms expected their level of investment to decrease or to remain the same.

C. INDUSTRIAL GREENING
The pandemic has triggered the adoption of new environmental-friendly practices

Manufacturing firms in developing countries expect the pandemic to induce the adoption of environmentally friendly practices. This trend is visible in both large firms and SMEs, and across the three regions where data has been collected.

Note: Sample includes manufacturing firms from 26 developing and emerging industrial economies. SMEs have up to 99 employees. Large firms have 100 or more employees.
## Building Back Better

### A Call For Action to the International Community —
to Support an Inclusive, Sustainable and Resilient Industrial Recovery

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<th>SHORT TERM</th>
<th>MEDIUM TERM</th>
<th>LONG TERM</th>
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### Short-term goals
Support global efforts to contain COVID-19 and ensure that the fight against the pandemic and subsequent recovery leaves no one behind.

1. **Address vaccine rollout and access, ensuring global protection against COVID-19**
   - Accelerate production and deployment of COVID-19 vaccines, especially to developing countries
   - Eliminate export restrictions on ingredients essential to COVID-19 vaccines and medications
   - Expand technology transfer commitments to increase global manufacturing capacity of the vaccines and treatments

### Medium-term goals
Coordinate global efforts to address future development challenges.

2. **Expand the policy space**
   - Promote recapitalization of development banks
   - Facilitate developing countries’ efforts to expand fiscal space needed for packages

3. **Strengthen government capabilities**
   - Assist governments in the design of SDG-oriented industrial strategies
   - Support the revitalization of synergistic partnerships with the private sector
   - Support sustained, long-term investments in public institutions

### Long-term goals
Ensure that the world build back based on inclusive and sustainable means.

4. **Tackle digital divides**
   - Support the establishment of an international programme that creates and shares knowledge on advanced digital production technologies
   - Scale investment and strengthen domestic capacities in digital infrastructure, education, skills and R&D

5. **Foster a green transition**
   - Scale investments in industrial decarbonization, energy switching and circular economy principles
   - Facilitate global access to green technologies
   - Foster partnerships created to fight COVID-19

6. **Promote local industrial resilience**
   - Foster opportunities for local production capabilities in health-related strategic goods and devices
   - Integrate crisis resilience, risk management and socio-economic goals into industrial policy practices

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Note: R&D = research and development; SDG = Sustainable Development Goal.
“This report provides a comprehensive analysis and valuable new evidence on the impact of the COVID-19 pandemic and the importance of industrial capabilities and digitalization in mitigating the negative impact of the pandemic and in strengthening resilience for post-pandemic recovery. It highlights the role of digital transformation, international coordination and global cooperation of industrial policy for building back better for all. The report is an important, timely and visionary guide for governments and policymakers at various levels to develop an effective solution for a more inclusive, resilient and sustainable development in the post-pandemic world.”

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