Evaluating the effectiveness of labor market interventions on reducing the impacts of the COVID-19 pandemic

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Abstract
This paper evaluates whether different labor market policy interventions taken in response to the COVID-19 pandemic have been effective in reducing its adverse impacts. We construct a database covering 165 countries and 39 labor market interventions grouped into four pillars: stimulating the economy and jobs (pillar 1); supporting enterprises, employment, and incomes (pillar 2); protecting workers (pillar 3); and social dialogue (pillar 4). The results revealed that measures taken under pillars 1, 2, and 3 have reduced the impacts of the pandemic on economic growth; measures under pillar 4 were significantly associated with reducing its impacts on employment and those under pillar 2 with reducing its impacts on working hours.

Keywords
COVID-19, labor market measures, pandemic

1 | INTRODUCTION
The coronavirus (COVID-19) outbreak emerged in Wuhan, China, in December 2019 and still persists globally. The COVID-19 pandemic has spread to 213 countries and territories, resulting in more than 366 million cases and 6 million deaths as of the end of February 2022. In addition to human suffering and loss of lives, the outbreak generated a major global economic downturn. Without any exceptions, almost all economies, including the world’s largest ones, have been affected negatively with mass layoffs, deepened economic inequality, and social stratification (Avgar, Eaton, Givan, & Litwin, 2020), as well as radical changes in traditional work arrangements due to quarantine arrangements (Hodder, 2020). According to estimates by the International Labor Organization (ILO, 2020a), 81% of the global workforce witnessed the full
or partial closure of their workplaces (ILO, 2020b) at some point during the pandemic. To mitigate the negative effects of the pandemic on the economy, governments have adopted various economic packages, including fiscal, monetary, and macro-financial policy measures. These economic measures targeting households, firms, and health systems vary across countries in breadth and scope; however, overall, according to Elgin, Basbug, and Yalaman (2020) the average size of the packages is unprecedented in the economic history of the world.

The aim of this paper is to evaluate the effectiveness of these economic packages/different labor market interventions in mitigating the impacts of the COVID-19 pandemic and whether the pandemic has had a greater impact on some countries rather than others. To assess the labor market interventions taken in 165 countries globally, the ILO have been tracking (ILO, 2020c) the labor market measures taken by governments across four pillars: (1) stimulating the economy and jobs (e.g., financial support to sectors, including the health-care sector); (2) supporting enterprises, employment, and incomes (e.g., extending social protection and implementing employment retention policies); (3) protecting workers in the workplace (e.g., expanding access to paid leave and strengthening health and safety measures); and (4) using social dialogue between governments, employers, and workers (e.g., tripartite meetings). Examining whether countries had adopted the 39 labor market measures under these four pillars, this paper evaluates whether this influenced the impacts of the pandemic on the labor market of countries, measured here in terms of annual gross domestic product (GDP) growth, working hours, and employment participation rates.

This will reveal that richer countries generally have adopted a wider set of labor market measures and that this reduced the impact of the pandemic on growth rate performance in these countries. A study of whether different sets of labor market measures were effective at reducing the negative impacts of the pandemic showed that pillars 1 (measures to stimulate the economy and jobs), 2 (measures to support enterprises, employment, and incomes), and 3 (measures to protect workers in the workplace) were more relevant for mitigating the impact of the pandemic on growth rate performance. Meanwhile, pillar 4 (social dialogue) is significantly associated with mitigating the impacts of the pandemic on employment participation rates. As expected, pillar 2 (measures to support enterprises, employment, and incomes) was significantly associated with mitigating the impacts of the pandemic on working hours; fewer working hours were lost during 2020. The contribution of our paper to the literature is twofold. First, we believe that it provides a framework to quantify and evaluate the labor market measures taken during the pandemic. Second, it also allows us to understand the association of these implemented measures with several outcome variables in the labor market.

The rest of the paper is structured as follows. Section 2 reviews the economic impacts of the pandemic and the adopted policy responses as a response to it. Section 3 outlines the data used and the empirical methodology adopted. Section 4 presents the empirical results on the degree to which these labor market interventions have been adopted, and Section 5 presents an evaluation of which labor market interventions were effective at reducing the negative impacts of the pandemic on growth, working hours, and employment. It also includes the policy relevance of our results. Section 6 provides the conclusions and discusses the implications for future shocks.

2 | ECONOMIC IMPACTS OF THE COVID-19 PANDEMIC AND POLICY RESPONSES

Globally, countries have engaged in labor market policy interventions to try to limit the impacts of the pandemic on their economies. These economic interventions targeting households, firms,
and health systems have varied across countries in breadth and scope. For example, South Korea introduced cash transfers for quarantined individuals, consumption coupons for low-income households, and wage and rent support for small businesses. Germany expanded access to short-term work subsidies, increased childcare benefits for low-income parents, and provided grants to small-business owners and self-employed persons affected by the outbreak. The United Kingdom provided funding for the health service; introduced measures to support businesses, including property tax holidays and direct grants for small firms; and introduced employment retention schemes for workers; and strengthened the social safety net to support vulnerable groups. Some countries, such as Spain, Singapore, and Turkey, banned worker dismissal.

The pandemic has also created a vast literature on the evolution of several issues pertinent to the labor market, as well as the evaluation of various economic responses. According to the findings in the literature, the pandemic affected especially informal employment, immigrants, and women (Khamis et al., 2021).

For example, Borjas and Cassidy (2020) document that the employment decline was particularly severe for immigrants. In another related study, Spurk and Straub (2020) mention the emergence of flexible employment relationships and careers during the COVID-19 pandemic. They argue that the focus should not be on the changes in the work arrangements (e.g., switch to remote work) but instead on the increase in flexible employment relationships. In yet another paper, Reichelt, Makovi, and Sargsyan (2021) study the asymmetric effects of the pandemic on gender in the labor market. Particularly, they (along with some others) find that female workers are more adversely affected by the pandemic. Regarding the implications on informal employment, Webb, McQuaid, and Rand (2020) study both short-term and long-term implications of the pandemic on the informal economy and employment and that the informal sector is disproportionately affected by the pandemic, particularly so due to the lack of or little government support. There are also findings about the asymmetricity of the impact on national economies and particularly on the labor market. For example, Fana, Perez, and Fernandez–Macias (2020) show that employment impact is asymmetric within and between countries. In particular, they find that countries that were more adversely impacted by the pandemic suffered most in their labor markets. Moreover, there are severe and drastically different effects of the pandemic on different sectors. Investigating one of the most adversely affected sectors, Sobieralski (2020) find a notable negative effect on airline employment by 7%–13%. All these adverse effects are also strengthened by further psychological and social effects. For example, Mimoun, Amichai, and Margalit (2020) investigate the psychological effects of employment instability due to the pandemic, indicating significantly higher distress on workers.

The literature also focuses increasingly on the design and implementation of economic policies. Some efforts have already been made since the beginning of the pandemic to keep track of governments’ responses in macroeconomic policy (Elgin et al., 2020) and in nonpharmaceutical public health controls (Hale et al., 2021). There is also a line of literature that aims to understand the variation in the policy responses across countries and whether issues pertinent to the labor market play a role in this variation. In one such example, Elgin, Colin, Oz-Yalaman, and Yalaman (2022) show that countries with a relatively larger shadow economy before the pandemic have adopted a smaller fiscal policy package.

There are also findings (Hershbein & Holzer, 2021) indicating that the labor market effects were not smoothly distributed over time and have been drastically changing over the course of the pandemic. Particularly, this paper documents that the labor market in the United States was affected much in the beginning of the pandemic, recovered in mid- to late summer and
early fall (of 2020), and stagnated again in late fall and early winter. The main conclusion here is that the policy measures toward the labor market have the potential to affect the course of these effects.

Motivated by this potential, in our study, we primarily aim to focus on the labor market measures adopted by governments during the COVID-19 pandemic and investigate if there is a significant variation across countries. Moreover, we discuss whether certain country characteristics could explain the extent of such a variation and also whether these measures were helpful to mitigate the adverse effects of the pandemic.

### 3 | DATA AND METHODOLOGY

Regarding the issue of policy interventions to reduce the impact of COVID-19 on businesses, jobs, and the most vulnerable in society, the ILO Policy Tracker website\(^1\) has documented the policy measures taken by governments across four main pillars: (1) stimulating the economy and jobs (e.g., financial support to sectors, including the health-care sector); (2) supporting enterprises, employment, and incomes (e.g., extending social protection and implementing employment retention policies); (3) protecting workers in the workplace (e.g., expanding access to paid leave and strengthening health and safety measures); and (4) using social dialogue between governments, employers, and workers (e.g., tripartite meetings). Notice that these pillars are determined by the ILO, which comprised a variety of specific measures.

Table 1 documents 39 policy measures that can be identified under these four pillars of action identified by the ILO. Our pillars of action are defined by the ILO to reduce the impact of COVID-19 on businesses, jobs, and the most vulnerable members of society. Notice that these are only “extra”\(^2\) measures that were adopted by the national government to mitigate the adverse impact of the pandemic. The four pillars outlined in Table 1 are originally defined by the ILO Policy Tracker. Therefore, pillar 1 is about stimulating the economy and jobs. Under this pillar, ILO includes the size of the fiscal policy, accommodative monetary policy, and macro-financial measures in the form of lending and financial support (all also quantified by Elgin et al., 2020).

Pillar 1 focuses on five measures primarily targeting labor markets. Measure 1 is the policy of providing cheap and/or easy-to-get loans to businesses. This has generally been used as a part of the macro-financial policy and was useful in retaining employment in certain sectors. Measure 2 is about providing financial support to the public or private health-care sector. Measure 3 focuses on provision of cheap and/or easy-to-get loans for consumers through public or private financial institutions. Measure 4 concerns deferrals of outstanding loans to both businesses and consumers, and, finally, measure 5 is regarding easing the application processes to obtaining business licenses.

Pillar 2 comprises a wide set of measures that aim to support enterprises, employment, and incomes. ILO generally includes social protection extension, employment retention measures, and financial and tax reliefs for businesses under this pillar. In this regard, we include the following 23 measures under this pillar. Measure 1 involves implementing price controls of necessity goods and services, including food items. Measures 2 and 3 provide support to the education sector (one of the severely impacted sectors in many countries) and workers with disabilities. Measure 4 focuses on support to the care of the aged, who are the most vulnerable to the COVID-19 disease, in the society. Measure 5 concerns providing childcare support to working families, including those who are eligible or not eligible to remote work arrangements.
| **Table 1** | Labor market policy measures documented by ILO Policy Tracker |
|-------------|--------------------------------------------------------------|
| Pillar 1: stimulati**ng the economy and jobs** | 1. Provision of cheap and easy-to-get loans to businesses  
2. Financial support to the health-care sector  
3. Provision of cheap and easy-to-get loans to consumers  
4. Loan deferrals and guarantees to businesses and consumers  
5. Business licensing facilitation |
| Pillar 2: supporting enterprises, employment, and incomes | 1. Price controls of necessities, including food items  
2. Support to the higher education sector  
3. Support to workers with disabilities  
4. Support to the care of the aged  
5. Childcare support  
6. Rent and mortgage support—deferrals  
7. Public job creation  
8. Support for the self-employed  
9. Support for the retired and pensioners  
10. Enhanced unemployed benefit  
11. Employment retention policies  
12. Policies toward the informal sector  
13. Social protection packages  
14. Reduction and deferrals in social security payments and fees  
15. Induced change in production lines  
16. Prohibition of worker dismissal  
17. Tax cuts and exemptions  
18. Child support  
19. Basic food support  
20. Other direct support for different sectors, including agriculture  
21. New health-care employment  
22. Support for utilities  
23. Direct salary subsidy |
| Pillar 3: protecting workers in the workplace | 1. Support for communication  
2. New work arrangements, including remote work practices  
3. Enhanced sick day leave  
4. Enhanced paid and unpaid leave policies  
5. Penalties for employers not complying with measures  
6. Prevention of discrimination and exclusion  
7. Enhanced access to health-care system  
8. Personal protective equipment provision to workers |

(Continues)
Measure 6 deals with monetary or regulatory support and deferrals of rent and mortgage payments. Measure 7 includes various measures that led to the government to create jobs on itself. Measures 8 and 9 quantify support for the self-employed and retired and pensioners. Measure 10 includes policies that implement enhanced unemployment benefits, mostly in the form of reducing the requirements and extending the benefits. Measure 11 entails introducing various forms of employment retention policies. Measure 12 consists of policies primarily aimed toward mitigating the adverse impact of the pandemic on the informal sector and informal employment. Measures 13 and 14 include different social protection packages and policies toward the reduction and deferrals in social security payments and fees, respectively. Measure 15 involves changing the production lines in the form of prioritizing the production of some specific goods. Measure 16 focuses on prohibiting termination of employment and worker dismissal. Measure 17 introduces permanent or temporary tax cuts, deferrals, and exemptions. Child support (measure 18) provides monetary or in-kind support to families with children, and basic food support (measure 19) provides in-kind or coupons/money-based support to needy families for basic food consumption. Measure 20 aims to quantify various other support types directly aiming for specific sectors, including the agricultural sector. Measure 21 is used by governments to create additional public or private health-care employment. Support for utilities in measure 22 includes various types of support by central or local governments to subsidize/deferring payments for utilities.

Finally, measure 23 focuses on governments directly subsidizing a fraction of salaries of workers.

Pillar 3 is about protecting workers in the workplace. ILO Policy Tracker lists strengthening occupational safety and health measures, adapting different work arrangements, preventing discrimination and exclusion, and enhancing access to health care and paid leave under this category. These are part of 10 measures. Measure 1 is the provision of support for communication in the form of subsidizing mobile or land lines, in some countries for only essential workers. Measure 2 introduces new work arrangements, including remote and telework practices. Measures 3 and 4 introduce enhanced sick and paid/unpaid leave policies. Measure 5 introduces penalties for employers not complying with the public and occupational health measures. Measure 6 includes various measures aiming for the prevention of discrimination and exclusion in the labor market. Measure 7 quantifies the efforts of enhancing access to the health-care system for the workers. Measure 8 provides personal protective equipment to workers by employers and/or the government. Measure 9 includes policies for the enhancement of other health and safety measures, and measure 10 provides more monetary and nonmonetary incentives to health-care workers. Finally, the fourth and the last pillar focuses on having a social dialogue and tripartite consultation between the government, employer associations, and labor unions.

This paper has analyzed the ILO Policy Tracker to identify in each country whether each of these 39 policy measures (Table 1) has been adopted. Based on this, the ILO Labor Market
Intervention Index has been constructed. This index is reported on a country-by-country basis in Table A1. For instance, in pillar 2, to create a variable entitled employment retention, “1” is used if the country introduced an employment retention policy and “0” if such a policy was not introduced. As another example, within the category of protecting workers in the workplace, we coded “1” if the country had introduced a paid leave policy and “0” if such policy was not introduced. The outcome is that 39 distinct variables have been generated (5 variables for stimulating the economy and jobs; 23 variables for supporting enterprises, employment, and incomes; 10 variables for protecting workers in the workplace; and 1 variable for social dialogue). To gather information on whether a specific measure is reported to be applied by the ILO in a specific country, two researchers (one author of this paper and one research assistant) studied the ILO Policy Tracker website and coded the textual information into distinct variables separately and independent of each other. Then the two data coders compared their findings and resolved any potential conflicts of data coding, which was less than 4% of the overall data.

After the policy measures taken in each country were collated, the next step was to use other publicly available data sets (ILO, OECD, ourworldindata.org) to first enable a comparison of how the adoption of these responses to COVID-19 differs, according to the level of infection and particular country-level characteristics, namely GDP per capita (World Development Indicators, 2020), the size of the informal sector (Elgin 2020), unemployment rate (World Development Indicators, 2020), and stringency index (Hale et al, 2021). Second, a comparison

| Variable | Definition | Source |
|----------|------------|--------|
| ILO index | An index of measures toward COVID-19 | Authors’ own calculations using ILO data |
| Pillar 1 | Stimulating the economy and jobs | Authors’ own calculations using ILO data |
| Pillar 2 | Supporting enterprises, employment, and incomes | Authors’ own calculations using ILO data |
| Pillar 3 | Protecting workers in the workplace | Authors’ own calculations using ILO data |
| Pillar 4 | Using social dialogue between government, workers, and employers to find solutions | Authors’ own calculations using ILO data |
| Infection rate | Infection rate (% population) | John Hopkins University |
| GDP per-capita | Real GDP per capita (000 USD) in 2019 | WDI |
| Informal sector | Informal sector size (% GDP) in 2019 | Elgin et al. (2020) |
| Unemployment | Unemployment rate in 2019, total (% of total labor force) | WDI |
| Stringency index | COVID-19 Government Response Tracker | Hale et al. (2021) |
| Growth | Annual GDP growth in 2020 | Haver Analytics |
| LFPR Diff | The difference between 2020 and 2019 labor force participation rate | ILO |
| WHL | Working hours lost due to the COVID-19 (%) | ILO |
| Growth in 2019 | Annual GDP growth in 2019 | Heritage Foundation |
| LFPR in 2019 | Labor force participation rate (2019) | ILO |

Note: GDP = gross domestic product; ILO = International Labor Organization; LFPR = labor force participation rate; WHL = working hours lost; WDI = World development indicators.
was made between the adoption of these responses to COVID-19 and the level of economic growth, working hours, and employment to observe which measures reduced the impact of the pandemic on growth, working hours, and employment. Table 2 provides the definition of all the variables as well as their sources.

**TABLE 3 Descriptive summary statistics**

| Variable                  | Mean   | Median | Std. Dev. | Minimum | Maximum | Observations |
|---------------------------|--------|--------|-----------|---------|---------|--------------|
| ILO index                 | 10.77  | 11.00  | 5.42      | 0.00    | 23.00   | 165          |
| Pillar 1                  | 1.95   | 2.00   | 1.14      | 0.00    | 5.00    | 165          |
| Pillar 2                  | 5.49   | 5.00   | 3.32      | 0.00    | 15.00   | 165          |
| Pillar 3                  | 2.88   | 3.00   | 1.73      | 0.00    | 7.00    | 165          |
| Pillar 4                  | 0.46   | 0.00   | 0.50      | 0.00    | 1.00    | 165          |
| Infection rate (%)        | 2.54   | 1.49   | 2.85      | 0.001   | 12.66   | 156          |
| GDP per capita (000 USD)  | 14.82  | 6.04   | 20.19     | 0.21    | 110.74  | 160          |
| Informal sector (% GDP)   | 26.51  | 26.00  | 11.72     | 5.02    | 58.01   | 163          |
| Unemployment (%)          | 6.77   | 5.00   | 5.08      | 1.00    | 28.00   | 163          |
| Stringency index (0–100)  | 83.62  | 87.04  | 14.20     | 16.67   | 100     | 156          |
| Growth in 2020 (%)        | -4.69  | -3.90  | 7.78      | -59.70  | 43.40   | 165          |
| Difference in LFPR (%)    | -2.00  | -2.00  | 1.87      | -13.00  | 1.00    | 163          |
| WHL in 2020 (%)           | 9.09   | 9.00   | 5.02      | 0.00    | 28.00   | 163          |
| Growth in 2019 (%)        | 3.37   | 3.20   | 2.66      | -5.70   | 17.90   | 163          |
| LFPR in 2019 (%)          | 62.54  | 62.00  | 10.23     | 38.00   | 87.00   | 163          |

*Note: GDP = gross domestic product; ILO = International Labor Organization; LFPR = labor force participation rate.*

**FIGURE 1** ILO measures index across the world [Colour figure can be viewed at wileyonlinelibrary.com]
Next, Table 3 presents a descriptive summary statistics of all variables used in the analyses. In both tables, the top five rows include the ILO index and then its four pillars. These are followed by several explanatory variables that are used in the regressions of these policy measures. These are the COVID-19 infection rate (total COVID-19 infections as % of population), real GDP per capita (pre-pandemic level at the end of 2019), informal sector size as percentage of GDP, unemployment rate, and government stringency index as a measure of stringency measures taken by governments. We hypothesize that these variables are comprehensive to account for the variation in the labor market policy measures governments have taken during the pandemic.

Finally, we also present the data series that will be used in subsequent system estimations, which will help us evaluate the impacts of these policy measures on three outcome variables. These outcome variables are the percentage growth rate of GDP in 2020, the difference between the labor force participation rate in 2020 and that in 2019, and a measure of working hours lost.
in 2020. We believe that the growth rate and the two labor market variables are good indicators of economic performance during the pandemic year.

Figure 1 provides a global heat map of the index we created, and Figure 2 presents its correlation with real GDP per capita in a scatter plot diagram. Here, Figure 1 shows that there is a

### Table 4: Regression results

| Variables    | 1       | 2       | 3       | 4       | 5       |
|--------------|---------|---------|---------|---------|---------|
|              | ILO index | ILO index | ILO index | ILO index | ILO index |
| Infection rate | 0.2048*** | 0.1339** | 0.1264** | 0.1465** | 0.1381** |
| (0.0543)      | (0.0537) | (0.0524) | (0.0638) | (0.0638) |
| GDP per capita | 0.0298*** | 0.0323*** | 0.0238** | 0.0278** |         |
| (0.0077)      | (0.0080) | (0.0107) | (0.0118) |
| Informal sector | -1.8829 |          |         | -1.7516 |         |
|               | (2.0633) |          |         | (2.0914) |         |
| Unemployment  | 0.0376   | 0.0419   | 0.0382   |         |         |
| (0.0235)      | (0.0257) |          | (0.0269) |
| Stringency index | 0.0240** |          |         |         |         |
|               | (0.0115) |          |         |         |         |
| Observations  | 156      | 153      | 152      | 137      | 135      |
| Pseudo-$R^2$  | 0.05     | 0.04     | 0.05     | 0.05     | 0.05     |
| Wald $\chi^2$ test (p-value) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

*Note: All regressions include a constant. Robust standard errors are in parentheses. GDP = gross domestic product; ***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$."

### Table 5: Regressions of pillars 1 and 2

| Variables    | 1 Pillar 1 | 2 Pillar 1 | 3 Pillar 1 | 4 Pillar 2 | 5 Pillar 2 | 6 Pillar 2 |
|--------------|------------|------------|------------|------------|------------|------------|
|              | ILO index  | ILO index  | ILO index  | ILO index  | ILO index  | ILO index  |
| Infection rate | 0.1492**   | 0.1316**   | 0.1340**   | 0.1701***  | 0.1588***  | 0.1544***  |
| (0.0602)      | (0.0617)   | (0.0632)   | (0.0527)   | (0.0527)   | (0.0511)   |
| GDP per capita | 0.0223***  | 0.0267***  | 0.0261***  | 0.0245***  | 0.0277***  | 0.0302***  |
| (0.0081)      | (0.0091)   | (0.0091)   | (0.0072)   | (0.0079)   | (0.0080)   |
| Stringency index | 0.0230**   | 0.0231**   |            |            | 0.0199     | 0.0178     |
| (0.0096)      | (0.0097)   | (0.0097)   | (0.0124)   | (0.0124)   | (0.0123)   |
| Unemployment  | -0.0149    |            |            |            | 0.0536*    |            |
|               | (0.0288)   | (0.0000)   | (0.0288)   | (0.0277)   | (0.0000)   |
| Observations  | 153        | 151        | 150        | 153        | 151        | 150        |
| Pseudo-$R^2$  | 0.05       | 0.06       | 0.06       | 0.04       | 0.05       | 0.05       |
| Wald $\chi^2$ test (p-value) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

*Note: All regressions include a constant. Robust standard errors are in parentheses. GDP = gross domestic product; ***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$."
significant variation in the global distribution of the extent of the overall measures. Moreover, Figure 2 shows that there is a significant correlation (0.4118) between GDP per capita and the index of adopted measures.

Finally, Figure 3 shows the histogram of our labor market measures index as well as the normal distribution fitted on top of it. This figure provides further support for the wide variation of the extent of the global labor market measures.

Our empirical method involves two steps. In the first step we regress the index of measures (and the pillars) on several explanatory variables. The primary explanatory variable of interest is GDP per capita. That is, we basically estimate the following equation:

$$\text{Measure}_i = \beta_0 + \beta_1 \text{GDPcap}_i + \sum_{k=2}^{n} \beta_k X_{ki} + u_i$$

In this specification, for country $i$, we regress the policy measure (ILO index and the four pillars) on GDP per capita and some control variables (denoted by $X$). $u$ Denotes the error term of the regression. Since the ILO index (as well as the submeasures of the four pillars) is an ordinal variable and exhibits an ordered structure, we use the ordered logistic regressions as the estimation method here with robust standard errors.

In the second step of our analysis, in addition to the regressions of the policy measures, we provide additional estimation results to observe the potential impacts of these measures. Therefore, we regress the following system using a systems estimation approach, where we use the three-stage least squares estimator:

| Variables          | 1 Pillar 3 | 2 Pillar 3 | 3 Pillar 3 | 4 Pillar 4 | 5 Pillar 4 | 6 Pillar 4 |
|--------------------|------------|------------|------------|------------|------------|------------|
| Infection rate     | 0.0461     | 0.0247     | 0.0236     | −0.1462*** | −0.1405**  | −0.1485*** |
|                    | (0.0552)   | (0.0550)   | (0.0555)   | (0.0695)   | (0.0707)   | (0.0716)   |
| GDP per capita     | 0.0181***  | 0.0213***  | 0.0214***  | 0.0400***  | 0.0401***  | 0.0424***  |
|                    | (0.0066)   | (0.0067)   | (0.0069)   | (0.0106)   | (0.0112)   | (0.0112)   |
| Stringency index   | 0.0207**   | 0.0201**   | 0.0020     | 0.0008     | 0.0047     |
|                    | (0.0090)   | (0.0093)   | (0.0126)   | (0.0127)   | (0.0347)   |
| Unemployment       |            |            | −0.0041    |            | 0.0467     |
|                    |            |            | (0.0296)   |            | (0.0127)   |
| Observations       | 153        | 151        | 150        | 153        | 151        | 150        |
| Pseudo-R$^2$       | 0.02       | 0.02       | 0.02       | 0.07       | 0.07       | 0.08       |
| Wald $\chi^2$ test (p-value) | 0.00   | 0.00       | 0.00       | 0.00       | 0.00       | 0.00       |

Note: All regressions include a constant. Robust standard errors are in parentheses. GDP = gross domestic product; ***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$. 

TABLE 6  Regressions of pillars 3 and 4
Outcome\(_i\) = \beta_0 + \beta_1 Measure\(_i\) + \sum_{k=2}^{n} \beta_k X_{ki} + u_i

Measure\(_i\) = a_0 + a_1 GDPcap\(_i\) + v_i

In this specification, for country \(i\), we regress the policy outcome measure on the policy measure index and some control variables (denoted by \(X\)). Simultaneously, we also regress the policy measure on GDP per capita. Here, \(u\) and \(v\) denote the error terms of the regression equations.

## 4 | RESULTS

This section presents our estimation results.

Table 4 presents five regression results, where the dependent variable is the overall ILO index, we have constructed in the previous section. Here, we regress the ILO index on a number of variables,\(^4\) including the COVID-19 infection rate, pre-pandemic level of GDP per capita, informal sector size (as % GDP), unemployment (%), and index of government stringency measures.

The table basically suggests three main results. First, given the significantly positive coefficient of GDP per capita, we conclude that richer countries adopted a larger set of measures toward the labor market. Second, given the significantly positive coefficient of the infection rate, countries with a higher infection rate adopted a larger set of labor market measures.

### Table 7  Correlation between economic growth and range of mitigating policy measures used

| Variables                | 1 Growth in 2020 | 2 ILO index |
|--------------------------|------------------|-------------|
| ILO index                | 0.3730***        |             |
|                          | (0.1375)         |             |
| Infection rate           | −0.5847**        |             |
|                          | (0.2928)         |             |
| Growth in 2019           | −0.3163          |             |
|                          | (0.2494)         |             |
| Maximum stringency       | −0.0662          | 0.1049***   |
|                          | (0.0457)         |             |
| GDP per capita           | 0.1049***        |             |
|                          | (0.0187)         |             |
| Observations             | 151              | 151         |
| \(R^2\)                  | 0.10             | 0.17        |
| Regional dummies         | Yes              | No          |

Note: All regressions include a constant. Standard errors are in parentheses. GDP = gross domestic product; ***\(p < 0.01\), **\(p < 0.05\), and *\(p < 0.1\).
**TABLE 8** Systems estimations of growth

| Variables                        | 1 Growth (2020) | 2 Pillar 1 | 3 Growth (2020) | 4 Pillar 2 | 5 Growth (2020) | 6 Pillar 3 | 7 Growth (2020) | 8 Pillar 4 |
|----------------------------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|
| Pillar 1                          | 2.7530*         | (0.5791)   |                 |            |                 |            |                 |            |
| Infection rate                    | −0.6506**       | (0.2883)   | −0.5724**       | (0.2935)   | −0.5701**       | (0.2917)   | −0.5285*        | (0.2912)   |
| Growth in 2019                    | −0.3745         | (0.2425)   | −0.3379         | (0.2495)   | −0.3184         | (0.2486)   | −0.3919         | (0.2488)   |
| Maximum stringency                | −0.0766*        | (0.0444)   | −0.0593         | (0.0455)   | −0.0657         | (0.0454)   | −0.0628         | (0.0490)   |
| GDP per capita                    | 0.0178*         | (0.0041)   | 0.0610***       | (0.0117)   | 0.0199***       | (0.0064)   | 0.0062***       | (0.0019)   |
| Pillar 2                          | 0.5526**        | (0.2205)   |                 |            |                 |            |                 |            |
| Pillar 3                          |                 |            | 1.7321***       |             |                 |            |                 |            |
| Pillar 4                          |                 |            |                 |            | −1.3529         | (1.2390)   |                 |            |
| Observations                      | 151             | 151        | 151             | 151        | 151             | 151        | 151             | 151        |
| $R^2$                             | 0.13            | 0.11       | 0.08            | 0.15       | 0.03            | 0.06       | 0.14            | 0.06       |
| Regional dummies                  | Yes             | No         | Yes             | No         | Yes             | No         | Yes             | No         |

**Note:** All regressions include a constant. Standard errors are in parentheses. GDP = gross domestic product; **$p<0.01$, ***$p<0.05$, and *$p<0.1$.**
Finally, we also observe that countries, where the government stringency index was taking a larger value (implying more stringent public health restrictions), adopted a significantly (at 10% though) larger set of measures toward the labor market. Contrary to these significant variables, the pre-pandemic unemployment rate and the informal sector size are not significantly associated with our index. We do not interpret these significant statistical associations as causal relationships here. Nevertheless, these results overall indicate that the exposure to the pandemic as measured by the infection rate, the stringency of the public health restriction, and the pre-pandemic GDP per capita, which might serve as a proxy for the overall fiscal and regulatory capacity of the government, are all associated with a larger variety of adopted labor market measures.

Next, in Tables 5 and 6 we repeat the same analysis using the four subcategories of the ILO index that are denoted as pillars 1, 2, 3, and 4, respectively. For the first three pillars we again use the ordered logistic estimator, whereas for the final pillar we simply use the logistic regression because the pillar 4 takes the values of 0 and 1 only. Regressions of the first two pillars are presented in Table 5, and regressions of the third and the fourth pillars are presented in Table 6.

Table 5 shows that the infection rate, GDP per capita, and government stringency are all associated with a larger value of pillar 1. For pillar 2, the estimated coefficient of the

| Variables     | 1 LFPR Diff | 2 Pillar 4 | 3 WHL | 4 Pillar 2 |
|---------------|-------------|------------|-------|------------|
| Pillar 4      | 0.5648**    |            |       |            |
|               | (0.2771)    |            |       |            |
| Pillar 2      |             |            |       | −0.1873*   |
|               |             |            |       | (0.1035)   |
| Infection rate| 0.0666      |            | −0.0813|            |
|               | (0.0506)    |            | (0.2480)|            |
| Stringency index| −0.0561*** |            | 0.1696***|            |
|               | (0.0103)    |            | (0.0201)|            |
| LFPR in 2019  | −0.0442***  |            | 0.0602* |            |
|               | (0.0154)    |            | (0.0349)|            |
| Unemployment  | −0.0138     |            | −0.1364***|            |
|               | (0.0319)    |            | (0.0650)|            |
| Growth in 2019| 0.0745      |            |       |            |
|               | (0.0579)    |            |       |            |
| GDP per capita|            | 0.0064***  |       | 0.0060***  |
|               |            | (0.0019)   |       | (0.0014)   |
| Observations  | 150         | 150        | 142   | 141        |
| R²            | 0.2035      | 0.0644     | 0.64  | 0.17       |

Note: All regressions include a constant. Standard errors are in parentheses. LFPR = labor force participation rate; ***p < 0.01, **p < 0.05, and *p < 0.1.
government stringency is not significant, whereas the unemployment rate is significant at 10%. The results in Table 6 show that only GDP per capita and the stringency index are significantly correlated with pillar 3. Regarding the regression of pillar 4, the significant variables are infection rate and GDP per capita. In these two tables we observe that the estimated coefficient of GDP per capita is significant in all regressions. This suggests that richer countries adopted a larger set of measures across all four pillars. Moreover, infection rate is significant in regressions of pillars 1, 2, and 4 but not in that of pillar 3. This means that countries that are more exposed to the pandemic adopted a larger set of measures to stimulate the economy and jobs to support enterprises, employment, and incomes and used social dialogue between government, workers, and employers to find solutions. We also observe that the strictness of the stringency measure is a significant predictor of pillar 1 (stimulating the economy and jobs). Moreover, countries that had a higher pre-pandemic level of unemployment rate in 2019 also adopted a larger set of measures indexed by pillar 2 (i.e., those that support enterprises, employment, and incomes).

5 | IMPACTS OF THE POLICY MEASURES AND POLICY IMPLICATIONS

This section evaluates whether the policy measures taken have reduced the impact of the pandemic on (1) economic growth, (2) working hours, and (3) employment participation rates. Tables 7–9 present the results, that is, two-system estimations. As described earlier, the first estimation regresses an outcome variable (e.g., economic growth) to the ILO index or one of the pillars of the index. The second estimation regresses the ILO index or one of the pillars on GDP per capita using a three-stage least squares technique.

Table 7 examines the correlation between economic growth and the level of adoption of these policy measures. The first column shows that there is a significant correlation between the level of GDP economic growth in 2020 and the ILO index; the wider the range of policy measures adopted, the greater has been the level of economic growth in 2020. The control variables used are infection rate, GDP growth rate in 2019, maximum level of government stringency measures taken during the pandemic, and regional dummies for the following regions: Organization for Economic Cooperation and Development-European Union (OECD-EU), Austral-Asia, Latin America, Middle East and North Africa (MENA), and post-socialist transition economies. The second column shows that richer countries with a higher GDP per capita adopted a significantly wider range of measures to mitigate the impacts of the pandemic. Interestingly, there is no significant correlation between the growth rate in 2020 and 2019. However, there is a significant correlation between the growth rate in 2020 and infection rate; countries with a higher infection rate had a significantly lower growth rate.

Overall, therefore, a wider range of policy measures mitigated the impacts of the pandemic on economic growth. Is it the case, however, that all these types of policy measures did so? To answer this, Table 8 examines whether there is a significant association between each of the four types of policy measures and the GDP growth rate in 2020. The result is that of the four pillars, pillars 1, 2, and 4 were significantly positively associated with the GDP growth rate in 2020. On the contrary, the coefficient of pillar 3 (i.e., measures to protect workers in the workplace) was not significantly associated with the GDP growth rate in 2020. Moreover, in line with Table 6, richer countries with a higher GDP per capita adopted a significantly wider range of measures to mitigate the impacts of the pandemic across all these pillars, which were then relevant for the growth performance in 2020.
Table 9 examines whether the adoption of these policy measures mitigated the impacts of the pandemic on employment participation rates and working hours. This table presents only the statistically significant correlations. The first two columns of Table 9 correspond to the system, where we use the difference between the labor force participation rates of 2020 and 2019 as the outcome variable of the first regression, and the last two columns use working hours lost instead.

The first two columns indicate that pillar 4 is relevant for differences in the labor force participation rate. That is, countries where governments used social dialogue more extensively experienced a larger difference between the labor force participation rates in 2020 and 2019, in favor of that in 2020. In addition to pillar 4, the labor force participation rate in 2019 and the stringency index are significant predictors of this difference. As for the working hours lost, the significant pillar is pillar 2. In countries where the governments have undertaken a larger set of measures supporting enterprises, employment, and incomes, fewer working hours were lost during 2020. Other significant predictors of the working hours lost were the stringency index and the unemployment rate in 2019. Moreover, in the second regressions of both systems, where we regress pillars 4 and 2 on GDP per capita, the estimated coefficients of GDP per capita are significantly positive. This indicates that richer countries adopted larger sets of measures as proxied by pillars 4 and 2, which were then relevant for the two outcome measures of labor force participation differences and working hours lost.

The results reported in this section are particularly relevant for economic policy, in general, and labor market policy, in particular, and we can draw a number of policy recommendations based on them. First, our results indicate that the extent and the variety of the policy measures (as measured by the ILO index) were useful for different outcome variables during the pandemic.

Second, given our results presented in Table 7, we understand that the overall index was associated with a larger GDP growth rate in 2020. This result was further supplemented by results in Table 8, where we showed that of the four pillars, those that were associated with growth 1, 2, and 3 but not 4. This suggests that except the social dialogue measures, all labor market measures mattered for GDP growth during the pandemic. This might be due to the fact that trade and employer unions show some understanding toward the government and to each other during extraordinary times such as pandemics. Third and finally, for other outcome variables such as the change in the labor force participation rate and working hours lost, pillar 4 (social dialogue) and pillar 2 (support measures for enterprises, employment, and incomes) mattered, respectively. These two results identify the set of measures governments should emphasize if they are targeting for a specific outcome variable.

6 | CONCLUSION

This study analyzed whether the different labor market policy interventions taken in response to the COVID-19 pandemic have been effective in reducing its impacts on annual GDP growth, working hours, and employment participation rates. To achieve this, we assessed cross-national variations in the impacts of the COVID-19 pandemic on economic growth, working hours, and employment across 165 countries based on whether they adopted several identified labor market interventions grouped into four pillars: stimulating the economy and jobs (pillar 1); supporting enterprises, employment, and incomes (pillar 2); protecting workers (pillar 3); and social dialogue (pillar 4). The results show that measures taken under pillars 1, 2, and 3 have reduced the impacts of the pandemic on economic growth, pillar 4 measures were significantly associated with reducing its impacts on employment, and pillar 2 measures were associated with reducing its impacts on working hours.
Our study is critical for at least three reasons. First, we introduced a quantitative data set where we coded the labor market policy responses of 165 countries into 39 distinct variables. Second, we studied the labor market policies of countries against COVID-19 with regard to supporting employment and worker protection. This is not only helpful in listing and describing these responses but also in providing an analytical categorization of these measures. Third, we examined whether several pandemic-related characteristics and GDP per capita are associated with the extent of the measures and showed whether the adopted measures have an effect over different outcome variables. Our findings confirm the importance of strong labor market institutions in dealing with public health crises, indicating the immediate need for building and strengthening strong industrial relations policies and institutions. According to various public health experts, pandemics and epidemics will be a part of the so-called new normal, and it is very likely that these future public health crises will have adverse impact on the labor market. We believe that our paper may shed light on the design and adaptation of the right mix of labor market measures in these economic downturns.

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CONFLICT OF INTEREST
The authors report no conflicts of interest.

DATA AVAILABILITY STATEMENT
We make the constructed data series (the index) available in the appendix. All other data series are available in publicly available data sources.

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ENDNOTES
1 See https://www.ilo.org/global/topics/coronavirus/regional-country/country-responses/lang-en/index.htm.
2 For example, category 3 under pillar 3 that mentions enhanced sick day leave does not refer to potentially already-existing sick day leave in a country but instead that a new form of sick day leave was introduced particularly for Covid-19.
3 We also used an alternative method of creating this index using principal component analysis. Our results do not change qualitatively when this alternative method is used. This alternative index is also presented in Table A1 and has a correlation of 0.85 with the benchmark index we use in the subsequent analysis.
4 Here, we also experimented using some interaction terms, particularly with GDP per capita. However, we did not obtain any significant estimates of these terms when they are included in the regression.

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**APPENDIX**

**TABLE A1** Country-level ILO index and pillar values

| Country name | ILO index value | PCA index | Pillar 1 | Pillar 2 | Pillar 3 | Pillar 4 |
|--------------|----------------|-----------|----------|----------|----------|----------|
| Afghanistan  | 11             | −0.639    | 0        | 7        | 3        | 1        |
| Albania      | 8              | 0.142     | 2        | 1        | 4        | 1        |
| Algeria      | 3              | −1.454    | 0        | 2        | 1        | 0        |
| Angola       | 8              | −0.791    | 1        | 5        | 2        | 0        |
| Argentina    | 13             | −0.066    | 1        | 8        | 3        | 1        |
| Armenia      | 8              | −0.310    | 2        | 4        | 2        | 0        |
| Australia    | 20             | 1.078     | 3        | 10       | 6        | 1        |
| Country name                      | ILO index value | PCA index | Pillar 1 | Pillar 2 | Pillar 3 | Pillar 4 |
|----------------------------------|-----------------|-----------|----------|----------|----------|----------|
| Austria                          | 18              | 1.078     | 3        | 10       | 4        | 1        |
| Azerbaijan                       | 14              | 0.506     | 2        | 9        | 2        | 1        |
| Bahamas                          | 20              | 1.650     | 4        | 11       | 4        | 1        |
| Bahrain                          | 12              | 0.353     | 3        | 7        | 2        | 0        |
| Bangladesh                       | 9               | 0.324     | 2        | 5        | 1        | 1        |
| Barbados                         | 18              | 1.033     | 3        | 9        | 5        | 1        |
| Belarus                          | 5               | −0.927    | 1        | 2        | 2        | 0        |
| Belgium                          | 21              | 1.078     | 3        | 10       | 7        | 1        |
| Belize                           | 19              | 1.078     | 3        | 10       | 5        | 1        |
| Benin                            | 4               | −0.973    | 1        | 1        | 2        | 0        |
| Bolivia                          | 4               | −0.882    | 1        | 3        | 0        | 0        |
| Bosnia and Herzegovina           | 16              | 0.987     | 3        | 8        | 4        | 1        |
| Botswana                         | 9               | −0.203    | 1        | 5        | 2        | 1        |
| Brazil                           | 16              | 0.535     | 3        | 11       | 2        | 0        |
| Brunei                           | 6               | −0.836    | 1        | 4        | 1        | 0        |
| Bulgaria                         | 10              | 0.278     | 2        | 4        | 3        | 1        |
| Burkina Faso                     | 4               | −1.363    | 0        | 4        | 0        | 0        |
| Burundi                          | 1               | −1.545    | 0        | 0        | 1        | 0        |
| Cabo Verde                       | 11              | 0.415     | 2        | 7        | 1        | 1        |
| Cambodia                         | 9               | −0.264    | 2        | 5        | 2        | 0        |
| Cameroon                         | 3               | −0.973    | 1        | 1        | 1        | 0        |
| Canada                           | 12              | 0.896     | 3        | 6        | 2        | 1        |
| Central African Republic         | 2               | −1.545    | 0        | 0        | 2        | 0        |
| Chad                             | 2               | −1.500    | 0        | 1        | 1        | 0        |
| Chile                            | 23              | 1.260     | 3        | 14       | 5        | 1        |
| China                            | 13              | −0.173    | 2        | 7        | 4        | 0        |
| Colombia                         | 14              | 0.353     | 3        | 7        | 4        | 0        |
| Costa Rica                       | 6               | −0.355    | 2        | 3        | 1        | 0        |
| Croatia                          | 6               | 0.187     | 2        | 2        | 1        | 1        |
| Cyprus                           | 13              | 0.399     | 3        | 8        | 2        | 0        |
| Czech                            | 11              | −0.173    | 2        | 7        | 2        | 0        |
| Democratic Republic of Congo     | 10              | 0.263     | 3        | 5        | 2        | 0        |
| Denmark                          | 16              | 0.987     | 3        | 8        | 4        | 1        |
| Djibouti                         | 4               | −0.973    | 1        | 1        | 2        | 0        |
| Dominican Republic               | 12              | −0.700    | 1        | 7        | 4        | 0        |
| Ecuador                          | 9               | 0.233     | 2        | 3        | 3        | 1        |
| Egypt                            | 12              | 0.308     | 3        | 6        | 3        | 0        |

(Continues)
| Country name         | ILO index value | PCA index | Pillar 1 | Pillar 2 | Pillar 3 | Pillar 4 |
|---------------------|-----------------|-----------|----------|----------|----------|----------|
| El Salvador         | 12              | -0.745    | 1        | 6        | 5        | 0        |
| Equatorial Guinea   | 4               | -1.409    | 0        | 3        | 1        | 0        |
| Eritrea             | 2               | -1.454    | 0        | 2        | 0        | 0        |
| Estonia             | 11              | 0.369     | 2        | 6        | 2        | 1        |
| Eswatini            | 11              | 0.233     | 2        | 3        | 5        | 1        |
| Ethiopia            | 5               | -0.911    | 0        | 1        | 3        | 1        |
| Fiji                | 7               | -0.730    | 0        | 5        | 1        | 1        |
| Finland             | 15              | 0.415     | 2        | 7        | 5        | 1        |
| France              | 16              | 0.025     | 1        | 10       | 4        | 1        |
| Gabon               | 8               | -0.248    | 1        | 4        | 2        | 1        |
| Gambia              | 0               | -1.545    | 0        | 0        | 0        | 0        |
| Georgia             | 14              | -0.082    | 2        | 9        | 3        | 0        |
| Germany             | 19              | 1.169     | 3        | 12       | 3        | 1        |
| Ghana               | 7               | -0.401    | 2        | 2        | 3        | 0        |
| Greece              | 17              | 0.535     | 3        | 11       | 3        | 0        |
| Guatemala           | 5               | -0.401    | 2        | 2        | 1        | 0        |
| Guinea              | 4               | -0.927    | 1        | 2        | 1        | 0        |
| Guinea-Bissau       | 1               | -1.018    | 1        | 0        | 0        | 0        |
| Guyana              | 15              | 0.835     | 4        | 6        | 5        | 0        |
| Haiti               | 2               | -1.454    | 0        | 2        | 0        | 0        |
| Honduras            | 15              | 0.263     | 3        | 5        | 7        | 0        |
| Hungary             | 15              | 0.835     | 4        | 6        | 5        | 0        |
| Iceland             | 15              | 1.033     | 3        | 9        | 2        | 1        |
| India               | 12              | 0.172     | 3        | 3        | 6        | 0        |
| Indonesia           | 13              | 0.942     | 3        | 7        | 2        | 1        |
| Iran                | 15              | 0.987     | 3        | 8        | 3        | 1        |
| Iraq                | 5               | -0.927    | 1        | 2        | 2        | 0        |
| Ireland             | 13              | 0.896     | 3        | 6        | 3        | 1        |
| Israel              | 12              | 1.362     | 5        | 6        | 1        | 0        |
| Italy               | 16              | 0.460     | 2        | 8        | 5        | 1        |
| Ivory Coast         | 10              | 0.369     | 2        | 6        | 1        | 1        |
| Jamaica             | 14              | 0.506     | 2        | 9        | 2        | 1        |
| Japan               | 19              | 1.123     | 3        | 11       | 4        | 1        |
| Jordan              | 10              | 0.369     | 2        | 6        | 1        | 1        |
| Kazakhstan          | 19              | 0.054     | 2        | 12       | 5        | 0        |
| Kenya               | 9               | -0.775    | 0        | 4        | 4        | 1        |
| Kuwait              | 11              | 0.263     | 3        | 5        | 3        | 0        |
## Table A1 (Continued)

| Country name       | ILO index value | PCA index | Pillar 1 | Pillar 2 | Pillar 3 | Pillar 4 |
|--------------------|-----------------|-----------|----------|----------|----------|----------|
| Kyrgyzstan         | 6               | -0.836    | 1        | 4        | 1        | 0        |
| Lao                | 9               | -0.264    | 2        | 5        | 2        | 0        |
| Latvia             | 10              | -0.310    | 2        | 4        | 4        | 0        |
| Lebanon            | 6               | -1.318    | 0        | 5        | 1        | 0        |
| Lesotho            | 11              | -0.173    | 2        | 7        | 2        | 0        |
| Liberia            | 5               | -0.385    | 1        | 1        | 2        | 1        |
| Libya              | 1               | -1.018    | 1        | 0        | 0        | 0        |
| Lithuania          | 12              | -0.112    | 1        | 7        | 3        | 1        |
| Luxembourg         | 15              | 0.460     | 2        | 8        | 4        | 1        |
| Madagascar         | 5               | -0.339    | 1        | 2        | 1        | 1        |
| Malawi             | 18              | 0.460     | 2        | 8        | 7        | 1        |
| Malaysia           | 13              | 0.896     | 3        | 6        | 3        | 1        |
| Maldives           | 8               | -0.264    | 2        | 5        | 1        | 0        |
| Mali               | 4               | -0.973    | 1        | 1        | 2        | 0        |
| Malta              | 15              | 0.399     | 3        | 8        | 4        | 0        |
| Mauritania         | 7               | -0.836    | 1        | 4        | 2        | 0        |
| Mauritius          | 3               | -1.018    | 1        | 0        | 2        | 0        |
| Mexico             | 10              | -0.219    | 2        | 6        | 2        | 0        |
| Moldova            | 14              | 0.353     | 3        | 7        | 4        | 0        |
| Mongolia           | 17              | 1.123     | 3        | 11       | 2        | 1        |
| Montenegro         | 19              | 1.017     | 4        | 10       | 5        | 0        |
| Morocco            | 11              | -0.264    | 2        | 5        | 4        | 0        |
| Mozambique         | 15              | 0.369     | 2        | 6        | 6        | 1        |
| Myanmar            | 7               | -0.294    | 1        | 3        | 2        | 1        |
| Namibia            | 16              | 1.514     | 4        | 8        | 3        | 1        |
| Nepal              | 11              | -0.355    | 2        | 3        | 6        | 0        |
| Netherlands        | 12              | 0.896     | 3        | 6        | 2        | 1        |
| New Zealand        | 12              | -0.310    | 2        | 4        | 6        | 0        |
| Nicaragua          | 2               | -0.957    | 0        | 0        | 1        | 1        |
| Niger              | 9               | -0.310    | 2        | 4        | 3        | 0        |
| Nigeria            | 4               | 0.035     | 3        | 0        | 1        | 0        |
| North Macedonia    | 14              | 0.460     | 2        | 8        | 3        | 1        |
| Norway             | 16              | 0.506     | 2        | 9        | 4        | 1        |
| Oman               | 11              | 0.698     | 4        | 3        | 4        | 0        |
| Pakistan           | 9               | 0.278     | 2        | 4        | 2        | 1        |
| Panama             | 10              | -0.836    | 1        | 4        | 5        | 0        |
| Papua New Guinea   | 5               | 0.126     | 3        | 2        | 0        | 0        |

(Continues)
| Country name            | ILO index value | PCA index | Pillar 1 | Pillar 2 | Pillar 3 | Pillar 4 |
|------------------------|-----------------|-----------|----------|----------|----------|----------|
| Paraguay               | 17              | 1.033     | 3        | 9        | 4        | 1        |
| Peru                   | 18              | −0.037    | 2        | 10       | 6        | 0        |
| Philippines            | 11              | 0.760     | 3        | 3        | 4        | 1        |
| Poland                 | 12              | 0.308     | 3        | 6        | 3        | 0        |
| Portugal               | 22              | 1.305     | 3        | 15       | 3        | 1        |
| Qatar                  | 9               | −0.310    | 2        | 4        | 3        | 0        |
| Republic of Congo      | 4               | −1.500    | 0        | 1        | 3        | 0        |
| Republic of Korea      | 13              | 0.324     | 2        | 5        | 5        | 1        |
| Romania                | 10              | −0.219    | 2        | 6        | 2        | 0        |
| Russia                 | 17              | 1.514     | 4        | 8        | 4        | 1        |
| Rwanda                  | 6               | 0.187     | 2        | 2        | 1        | 1        |
| San Marino             | 7               | −0.927    | 1        | 2        | 4        | 0        |
| Saudi Arabia           | 15              | 0.399     | 3        | 8        | 4        | 0        |
| Senegal                | 4               | −0.927    | 1        | 2        | 1        | 0        |
| Serbia                 | 11              | −0.219    | 2        | 6        | 3        | 0        |
| Seychelles             | 18              | 0.444     | 3        | 9        | 6        | 0        |
| Sierra Leone           | 6               | −0.294    | 1        | 3        | 1        | 1        |
| Singapore              | 14              | 0.369     | 2        | 6        | 5        | 1        |
| Slovakia               | 14              | −0.219    | 2        | 6        | 6        | 0        |
| Slovenia               | 17              | 0.490     | 3        | 10       | 4        | 0        |
| South Africa           | 12              | 0.460     | 2        | 8        | 1        | 1        |
| Spain                  | 18              | 1.078     | 3        | 10       | 4        | 1        |
| Sri Lanka              | 12              | 0.369     | 2        | 6        | 3        | 1        |
| Sudan                  | 6               | −1.409    | 0        | 3        | 3        | 0        |
| Suriname               | 19              | 0.597     | 2        | 11       | 5        | 1        |
| Sweden                 | 19              | 0.597     | 2        | 11       | 5        | 1        |
| Switzerland            | 14              | 0.987     | 3        | 8        | 2        | 1        |
| Tajikistan             | 8               | −0.791    | 1        | 5        | 2        | 0        |
| Tanzania               | 0               | −1.545    | 0        | 0        | 0        | 0        |
| Thailand               | 16              | −0.082    | 2        | 9        | 5        | 0        |
| Togo                   | 8               | −0.730    | 0        | 5        | 2        | 1        |
| Tonga                  | 2               | −0.492    | 2        | 0        | 0        | 0        |
| Trinidad and Tobago    | 21              | 1.169     | 3        | 12       | 5        | 1        |
| Tunisia                | 7               | −0.294    | 1        | 3        | 2        | 1        |
| Turkey                 | 18              | 0.926     | 4        | 8        | 6        | 0        |
| Turkmenistan           | 0               | −1.545    | 0        | 0        | 0        | 0        |
| United Arab Emirates   | 10              | −0.310    | 2        | 4        | 4        | 0        |
| Country name   | ILO index value | PCA index | Pillar 1 | Pillar 2 | Pillar 3 | Pillar 4 |
|---------------|-----------------|-----------|----------|----------|----------|----------|
| United Kingdom| 12              | 0.369     | 2        | 6        | 3        | 1        |
| United States | 9               | 0.217     | 3        | 4        | 2        | 0        |
| Uganda        | 5               | -0.294    | 1        | 3        | 0        | 1        |
| Ukraine       | 9               | -1.272    | 0        | 6        | 3        | 0        |
| Uruguay       | 13              | 0.851     | 3        | 5        | 4        | 1        |
| Uzbekistan    | 23              | 2.177     | 5        | 11       | 6        | 1        |
| Vietnam       | 11              | 0.263     | 3        | 5        | 3        | 0        |
| Yemen         | 3               | -1.018    | 1        | 0        | 2        | 0        |
| Zambia        | 10              | -0.203    | 1        | 5        | 3        | 1        |
| Zimbabwe      | 12              | 0.278     | 2        | 4        | 5        | 1        |

Abbreviations: ILO = International Labor Organization; PCA = principal component analysis.