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ADB Working Paper Series

**INFORMAL MICRO, SMALL, AND
MEDIUM-SIZED ENTERPRISES
AND DIGITALIZATION: EVIDENCE
FROM SURVEYS IN INDONESIA**

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Abstract

Most micro, small, and medium-sized enterprises (MSMEs) operate informally. While informal sectors are thought to contribute less to national economic development, MSMEs are a driving force behind national economic growth. Thus, formalizing informal MSMEs is critical to boosting national productivity, creating quality jobs, and promoting inclusive growth. This paper examines the coronavirus disease (COVID-19) impact on informal MSMEs in Indonesia by using a linear probability model regression and descriptive analysis based on evidence obtained through year-long surveys from March 2020 to May 2021. It also assessed the extent of the digital transformation and challenges brought on by the pandemic and derives policy implications. The estimates found two streams of business clusters among informal MSMEs—contracting firm groups that suffered through the pandemic and those that benefitted. The COVID-19 crisis and mobility restrictions led many informal MSMEs to accelerate digitalization. But digitally operated firms could not always operate successfully during the pandemic, splitting businesses into those profitable or less profitable.

Keywords: COVID-19, informality, shadow economy, MSMEs, digitalization, SME development, access to finance, SME policy, Indonesia

JEL Classification: D22, G20, L20, L50

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1. INTRODUCTION

The global economy clearly benefited from Asia's robust growth in recent decades, driven by the private sector, especially micro, small, and medium-sized enterprises (MSMEs). In Southeast Asia, for example, MSMEs accounted for 97.6% of all enterprises, absorbed 67.0% of the workforce, and contributed 40.5% of a country's gross domestic product (GDP) on average during 2010–2020 (ADB 2021a).¹ In Indonesia, MSME influence is much higher than the Southeast Asia average. The number of MSMEs has consistently increased for more than a decade—expanding around 2% year-on-year. As of end-2019, there were 65 million MSMEs, or 99.9% of all enterprises. MSMEs employed 120 million workers, 97% of Indonesia's workforce. They also contributed Rp9,581 trillion, or 60.5%, of GDP—20-percentage points above the Southeast Asia average. Thus, for Indonesia, MSME development is critical for growth that is both inclusive and resilient.

In developing Asia, the majority of MSMEs operate informally, many in domestic trade or low-technology services. This is true for Indonesia, where traditional wholesale and retail trade dominate (63.5% of non-agriculture MSMEs in 2016).² Most are unregistered family-run businesses or sole proprietorships. Those supplying global markets are a small fraction of total exports, accounting for 15.7% of export value (Rp339 trillion). According to the International Finance Corporation (IFC 2013), unregistered informal firms are estimated to make up 77% of all MSMEs in developing economies. Asia and the Pacific host the most worldwide, with an estimated 153 million informal MSMEs in East Asia and the Pacific and 69 million in South Asia (using World Bank regional classifications). A critical challenge to achieve inclusive growth is to formalize (register) these informal firms and non-contract-based employees. Several studies show large numbers of informal firms coincide with lower economic development (Loayza and Rigolini 2006; ILO 2011; IFC 2013). A well-designed national policy framework to formalize informal MSMEs is needed to boost productivity and create quality jobs efficiently.

The coronavirus disease (COVID-19) significantly altered people's lives and livelihoods nationally, regionally, and globally. Lockdowns and associated quarantine measures—such as travel bans, temporary business closures, and social distancing—are seriously affecting MSMEs, including informal MSMEs. Private businesses have cut back production and service delivery. An ADB study (ADB 2020), which included Indonesia, found MSME sales and revenue dropped sharply relatively soon after the pandemic was announced in March 2020. Many MSMEs laid off employees to survive and faced a lack of working capital at the early stage of the pandemic. For many, it became difficult to continue operations.

In Southeast Asia, economic growth declined from 4.5% in 2019 to a 4.0% contraction in 2020. After the first year of the pandemic, private businesses began reopening as consumption and export markets recovered, with the region recovering a forecast 3.0% in 2021 (ADB 2021b). In Indonesia, the growth projection was more robust for 2021, a 3.5% rebound after a 2.1% decline in 2020. National policies focused more on economic recovery rather than strict lockdowns.³ However, new variants from Delta to

¹ Southeast Asia includes Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam.

² Data refer to Economic Census 2016.

³ The Government of Indonesia does not use the wording "lockdown" in its quarantine measures. The government imposed a large-scale social restriction "Pembatasan Sosial Berskala Besar" (PSBB) in April–May 2020 and a second PSBB in September–November 2020, which included temporary

Omicron continue to impact economic growth. The longer it takes to contain the spread of COVID-19 increases the risk of business failure and bankruptcy, especially for informal MSMEs that cannot access formal financial services or government support.

Given the drop in personal contact as a result of the pandemic, digitalization is critical for businesses, including informal MSMEs, to survive the new or next normal. It may also help them decide to formalize operations. There are many benefits. They include access to e-commerce and administer their business digitally. It can give them better access to the information they need, strengthen their networks, offer new market opportunities globally, reduce logistics and administration costs, widen funding opportunities such as peer-to-peer lending, and allow for greater business innovation (OECD 2021). Yet, despite these potential advantages, the shift of digital transformation for MSMEs was not well promoted during the pre-COVID-19 period—as their traditional business models required physical and personal contact. However, the pandemic became an incentive for many small firms to go digital due to mobility restrictions. A global study by the Organisation for Economic Co-operation and Development (OECD 2021) says up to 70% of small firms have increased use of digital technology since the pandemic.

There are several barriers that hold informal MSMEs back from formalizing or registering their business. Some are unique to MSMEs and some are cultural. They include everything from tax compliance, high reliance on informal finance, and a lack of incentives or skills needed to expand business. Solid data analysis using granular firm-level data is critical to understand informal MSMEs, their challenges, and latent opportunities for growing their operations. It would certainly help in designing a feasible policy framework on how to better formalize and digitalize MSMEs.

This paper examines the impact of COVID-19 on informal MSMEs (sole proprietorships and family-run informal businesses), using a multivariate analytical model and descriptive analysis based on weighted data obtained from year-long ADB MSME surveys from March 2020 to May 2021 in Indonesia. It assesses the extent of their digital transformation and challenges during the pandemic and offers policy implications on how to formalize and digitalize MSMEs during the pandemic recovery. Section 2 reviews the literature analyzing the mechanics and size of shadow (informal) economies and describes the issues that keep businesses informal. Section 3 summarizes national policy responses to support MSMEs affected by COVID-19 in selected Asian economies, including support for the informal sector. Section 4 examines the study's methodology. Sections 5 and 6 discuss the profile of surveyed MSMEs and the impact 1-year into the pandemic on informal MSME revenues, employment, wages, and financial conditions, including examples of digitally operated firms, followed by associated policy implications. Section 7 concludes.

2. DEFINITIONS AND SIZE OF SHADOW ECONOMIES

Although there is no standardized definition of a shadow or informal economy, several studies tried to define it by classifying types of underground activities. Schneider (2012) summarized broad definitions of shadow economies discussed in the literature: (i) illegal activities with monetary transactions (such as trade in stolen goods or drugs, among others) and non-monetary transactions (such as smuggling); and (ii) legal

business closures and mobility restrictions. Due to the surging delta coronavirus variant, the government again imposed a partial mobility restriction “Pemberlakuan Pembatasan Kegiatan Masyarakat” (PPKM; Emergency Community Activity Restrictions) in July–August 2021. The second wave pandemic has been contained since September 2021, with limited impact on the economy.

activities evading or avoiding taxes (through unreported income from self-employment, wages, salaries, or assets from work, employee discounts, and fringe benefits, among others).⁴ As this study centers on formalizing informal MSMEs to promote inclusive growth, illegal activities are excluded from the discussion. The shadow economy—including informal MSMEs is thus defined here as “all market-based legal production of goods and services that are deliberately concealed from public authorities” to avoid payment of income, social security contributions, and compliance with legal labor market standards and certain administrative obligations (Schneider 2012).

The IFC report (2013) also summarized broader definitions of informality in three ways: (i) a dualist paradigm arguing that the informal sector is the residual component of an economy and one reflecting the inability of the formal economy to provide enough jobs; (ii) a structural paradigm arguing that the informal sector is interdependent with or part of the formal sector (providing cheap labor, inputs, and products to formal firms); and (iii) a legalist paradigm arguing that informal businesses operate to evade the exorbitant costs of complying with regulations.⁵ “Informality” comprises firms that remain “unregistered with the [business] registration office, municipality, or tax authority, or owners and employees of microenterprises that employed few paid workers” (IFC 2013; ILO 2012). Informal employment is “employment without a contract, unregistered with the relevant authority such as the social security agency or Ministry of Labor, and employment not entitled to receive social security benefits” (IFC 2013; ILO 2012). This study uses these definitions of informal firms and employment to identify informal MSMEs from ADB survey data.

As shadow economic activity is unobserved, the estimation here broadly uses two techniques: (i) structural equation modeling to estimate a latent variable, or a multiple indicator multiple cause (MIMIC) model, using identifiable illicit activities as explanatory variables (such as the tax burden and regulation intensity)⁶ and (ii) surveys using structured interviews.⁷ Schneider (2009) summarized the literature estimating the main factors behind the growth of a shadow economy and found three major determinants: (i) an increase in taxes and social security contributions (a 35%–38% impact, based on average values of 12 studies); (ii) a tax or moral psychological effect (22%–25%); and (iii) quality of public institutions such as the level of corruption (10%–12%).

Figure 1 recomposes data from Schneider’s research (2012) extracting data on Asia-Pacific countries based on five ADB subregions. It shows the size of informal economies differs by country but is sizable. For 1999–2007, the highest informal share of a country’s GDP was in Central and West Asia (averaging 46.7%), followed by the Pacific (34.2%), Southeast Asia (33.0%), South Asia (32.7%), and East Asia (15.2%). Among 10 Southeast Asian countries, Indonesia had a relatively small shadow economy (18.9% of GDP on average).

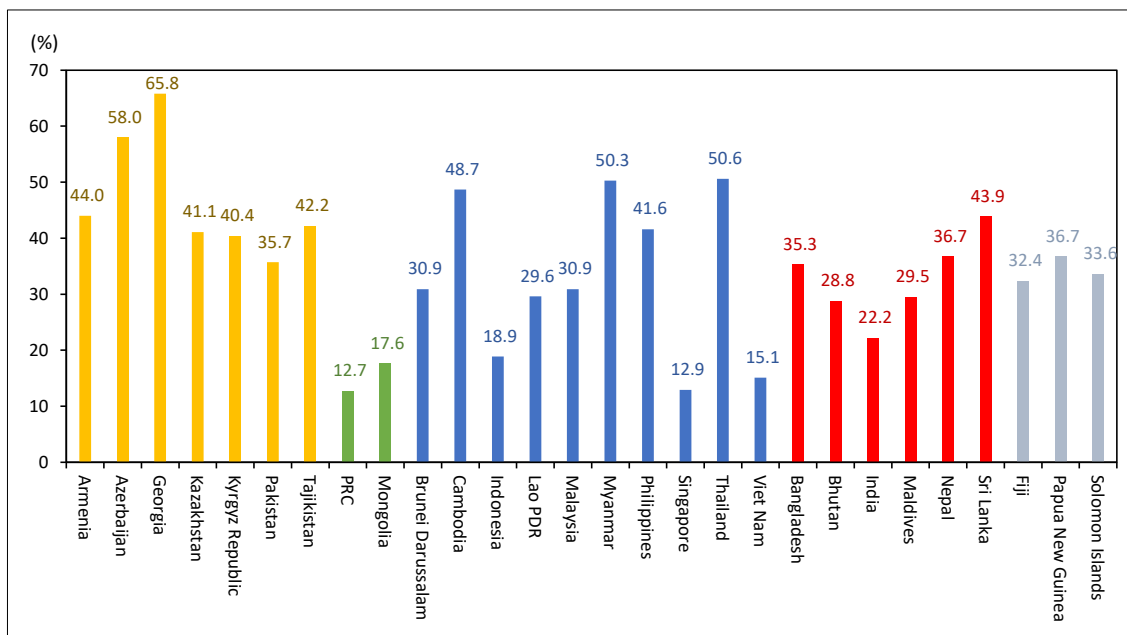
⁴ The structure of underground economic activities refer to Lippert and Walker (1997).

⁵ Item (iii) refer to Chen 2007.

⁶ Schneider, Buehn, and Montenegro (2010).

⁷ Feld and Larsen (2005, 2008, 2009).

Figure 1: Size of the Shadow Economies in ADB's Developing Member Countries
(% of country's GDP, average in 1999–2007)



PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

Source: Recomposed from Schneider, F. 2012. "The Shadow Economy and Work in the Shadow: What Do We (Not) Know?"

As to informal employment, OECD (2009) indicated that over half of all jobs in developing economies outside agriculture were informal—or more than 900 million (around 2 billion if agricultural workers are included). This study characterizes informal employment as people excluded from official jobs and voluntarily opting out of formal structures. In Asia, informal employment expanded from 55.9% in 1985–1989 to 70.2% in 2000–2007 (average share to total non-agricultural employment, Schneider 2012). In Indonesia, although the data is old, 36.7 million people were likely to be engaged in shadow economic activities in 1998, equivalent to 37.4% of the official labor force and 18.0% of the total population (Schneider and Enste 2002).

3. NATIONAL RESPONSES TO THE COVID-19 PANDEMIC

From the start of the pandemic in 2020, countries rapidly moved to contain the spread of COVID-19. Each acted quickly to respond to the health care emergency. They also adopted a wide range of policies designed to support households and businesses. These included debt financing, tax relief, and measures to help businesses retain their workers. Some came through economic stimulus packages with substantial government spending. Others did not. Informal sectors and/or self-employed workers were also covered through cash assistance, tax holidays or extensions, and subsidies for vocational training. These various measures have continued for more than a year, either nonstop or on an ad hoc basis to groups both affected and unaffected by the pandemic—including private businesses, particularly MSMEs. This section summarizes national responses to the pandemic in the Association of Southeast Asian Nations (ASEAN) plus Japan, the Republic of Korea, and the People's Republic of China,

referring to various COVID-19 policy trackers developed by ADB, International Monetary Fund (IMF), and World Bank.⁸

Debt financing is the most widely used policy instrument supporting MSMEs. At the time the pandemic started in 2020, a lack of working capital was clearly the most critical factor affecting private sector operations—due to drop in forecast sales revenues caused by mobility restrictions. Central banks responded relatively soon by providing (i) liquidity support for financial institutions (via capital injections, reduced bank reserve requirements, and liquidity financing to banks, among others), (ii) debt restructuring (such as debt moratoria, loan repayments deferrals, and eased regulatory compliance), and (iii) new lending to MSMEs (for example, refinancing facilities or special funding programs at reduced lending rates and/or credit guarantees).

Tax relief remains a key policy for providing economic stimulus in several countries. Corporate income tax reductions or exemptions and deferred payments are the main support benefiting MSMEs. Indonesia gradually reduced its corporate income tax to 22% in 2020 and 2021, lowered further to 20% in 2022—mainly targeting manufacturing. Other tax measures and reduced payments to government include (i) reduced or exempted social security contributions for affected MSMEs and industries, (ii) reduced or exempted value-added tax for businesses, and (iii) various tax holidays and/or tax breaks for businesses and specific sectors, especially small business owners and those self-employed. Indonesia temporarily suspended tax payments (6 months) for hotels and restaurants in major tourist destinations like Bali, where local government losses in tax revenues were compensated for by the central government.

Many Asian countries offered various subsidy schemes for employers to pay workers along with cash transfers for displaced workers in qualified MSMEs and priority sectors. Indonesia made cash transfers to street vendors, stalls, small shop owners, and informal sector workers (unemployment benefits). Other employment-related measures include revised terms of employment aligned to the new working environment—such as wage cuts and unpaid leave, expedited overtime work for COVID-19-related businesses, and vocational training subsidies for the self-employed and laid-off workers.

Businesses could avail of discounted or waived utility payments, rental and/or leasing fees, and government fees and charges. Other measures include deferred import tax payments for MSMEs that rely on imported goods for production, support for agricultural MSMEs selling products through e-commerce platforms, and support for digitalizing MSMEs.

Several Asian countries offered special expenditure programs for severely affected industries such as tourism (travel discount vouchers, for example), designed to stimulate consumption during the pandemic.

All of this involved massive government spending. In Indonesia, as of 15 November 2021, support packages totaled \$115.3 billion, or 11.4% of 2020 GDP (ADB COVID-19 Policy Database). The government launched several economic stimulus packages in 2020: (i) economic stimulus focusing on tourism in February (Rp10.2 trillion); (ii) fiscal stimulus for tax relief in March (Rp405.1 trillion); and (iii) the National Economic

⁸ Information refer to (i) ADB COVID-19 Policy Database (<https://covid19policy.adb.org/>); (ii) International Monetary Fund's COVID-19 Policy Tracker (<https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>); and (iii) World Bank's Map of SME-Support Measures in Response to COVID-19 (<https://www.worldbank.org/en/data/interactive/2020/04/14/map-of-sme-support-measures-in-response-to-covid-19>). Accessed 24 June 2020 and 30 November 2021.

Recovery (PEN) program, covering financial (credit guarantees) and nonfinancial (corporate income tax exemptions) for MSMEs. The uncertainty over how long it will take to contain COVID-19—given existing and potential new variant outbreaks, there is increasing risk of further bloating national budgets and deteriorating bank balance sheets over the long term. This suggests the need for ways to better control budget expenditures with support to focused groups. One important aspect is how best to encourage informal MSMEs and informal workers to formalize (or register) to ensure a smooth and stable economic recovery.

4. METHODOLOGY

Informal is normal in developing economies (OECD 2009). Informal sectors contribute less to economic development than formal sectors. While MSMEs are considered a driving force of economic growth, most of them operate informally. Thus, formalizing informal MSMEs is critical for boosting national productivity, creating quality and more secure jobs, and promoting inclusive growth. To design and implement the best policies to move this agenda forward, governments will need to better understand informal MSMEs, their challenges, and opportunities available for operating their businesses. This is particularly important, given the new normal the pandemic has generated and its evolving impact on informal sectors. It is the reason this paper examines the COVID-19 effects on informal MSMEs using evidence captured by a series of MSME surveys in Indonesia. The study compares sample groups in four data points: March–April 2020, August–September 2020, March–April 2021, and May 2021.⁹

Using the broad definitions of informal firms and employment discussed in Section 2, this study defines informal MSMEs as all micro and small enterprises (i) defined by Badan Pusat Statistik (BPS), Indonesia’s central statistics office—micro firms have 1–4 employees, while small firms have 5–19 employees;¹⁰ (ii) that deal with market-based legal production of goods and services as sole proprietorships and/or family-run businesses; and/or (iii) that are not registered with the business registration office, municipality, province, or tax authority. Informal employment is defined as those who work for informal MSMEs. From the survey data, micro and small enterprises that declared their company type as “sole proprietorship” or “others (family-run business)” are categorized as informal firms (“informal micro and small firms”), while respondents that declared “corporation or a partnership” or “cooperative or foundation” are considered formal firms.¹¹ This study focuses on informal micro and small firms as the target group for analysis.

The four surveys use a standardized questionnaire designed to assess the impact of COVID-19 on MSMEs. There were four components: (i) a company profile that identified a company’s primary business, location, operating period, employment, wage per employee, total assets, internet penetration/e-commerce, and exposure to global

⁹ The surveys were conducted during 17 April–22 May 2020 (covering March–April 2020), 17 August–30 September 2020 (covering August–September 2020), 27 March–30 April 2021 (covering March–April 2021), and 5–31 May 2021 (covering May 2021).

¹⁰ BPS defines medium-sized enterprise as firm with 20–99 employees. Firms with more than 100 employees are classified as large enterprises. In addition, Indonesia has a national MSME definition—a productive entity owned by an individual or individual business unit with maximum net assets, excluding land and buildings, of Rp10 billion, or with maximum annual sales of Rp50 billion (Law No.20/2008 on Micro, Small, and Medium-sized Enterprises).

¹¹ The survey did not identify if firms were “registered” or “unregistered”—however, a local survey partner that conducted field interviews using trained questioners indicated that sole proprietorships can be regarded as unregistered informal firms.

business; (ii) business conditions during the pandemic, including changes in the business environment, sales revenue, employment, wage payments, and fiscal and funding conditions; (iii) the business concerns MSMEs face during the pandemic and actions they would take in case the pandemic would be prolonged further; and (iv) policy interventions that MSMEs would like to receive from government to maintain or restart their business.

The surveys were conducted using two approaches: (i) online surveys through survey partners, including KADIN (the Indonesian Chamber of Commerce and Industry) and the Ministry of Finance, along with ADB's Facebook page, and (ii) field surveys conducted by a local survey firm, using trained interviewers. Due to the urgency of capturing MSME conditions to support policy design for MSMEs amid the pandemic, the first rapid survey chose an online survey approach through ADB's Facebook page. The same approach was used for the second 2020 survey. For the third and fourth surveys in 2021, the approach was modified to combine online and field surveys to increase the response ratio. The field surveys were conducted in the four main provinces of DKI Jakarta, West Java, East Java, and North Sumatra. Thus, there were largely different groups of respondents in the four surveys. Nonetheless, the study can also focus on the change in respondents within the same group of MSMEs 1 year into the pandemic.¹²

As the surveys used an online approach along with networks of survey partners, samples were not selected randomly and did not follow the existing national statistics framework. In particular, the online survey has the problem of self-selection and non-response bias.¹³ To minimize this bias, a weighting adjustment is frequently used as a correction technique.¹⁴ It uses auxiliary variables measured in both surveys and the existing sampling frame. In this study, survey data were weighted using the combination of firm size, business sector, and firm location data captured by both MSME surveys and the BPS 2016 Economic Census. For firm size, MSME surveys had data on micro, small, medium-sized, and large firms, respectively, while BPS census data had only two broad categories—(i) micro and small firms and (ii) medium-sized and large firms; the weighted data for analysis use these two classifications. For business sector, the MSME surveys also had complete responses from agriculture, while agriculture was not included in the industrial classification of BPS census data on MSMEs; the weighted data for analysis are unable to capture agricultural MSMEs.

4.1 Data Structure

The surveys received 528 completed responses from firms across Indonesia in the March–April 2020 survey, 129 in the August–September 2020 survey, 2,515 in the March–April 2021 survey, and 2,207 in the May 2021 survey.

¹² For field surveys, the local survey firm tried interviewing all respondents of the first and second surveys; however, due to surging COVID-19 infections in the country, many previous respondents were unable to answer survey questions as many had already closed their businesses, were COVID-19 positive, or passed away. As a result, there were only 1.2% repeating respondents of those in the third survey. The fourth survey tracked the same respondents as the third survey, where dates of individual interviews were scheduled 1 month after the previous interview. The gap in number or respondents between the third and fourth surveys was mainly due to the Lebaran Holiday (official Islamic holiday) 12–14 May 2021.

¹³ This happens when respondents have a choice of filling in or not filling in survey questions, which often occurs during online surveys.

¹⁴ It should be noted that the weighting adjustment may not eliminate all the biases in the estimated parameters, but it helps minimize to some extent self-selection and non-response bias.

To understand the extent of bias, the distribution of the unweighted survey samples was compared with an existing framework, the BPS 2016 Economic Census (Table 1). If the unweighted and weighted results are comparable, then self-selection and non-response bias may not be serious in the survey data.

In comparison, micro and small firms were under-represented by 1.6 percentage points for the first survey, 0.4 for the second, 0.8 for the third, and 0.4 for the fourth survey. Meanwhile, medium-sized and large firms were over-represented by 1.6, 0.4, 0.8, and 0.4 percentage points, respectively. The difference between the ADB and BPS surveys was limited.

The difference by sector share to total respondents between the ADB and BPS distribution was 4 percentage points or less (the majority had around 1% or less) for the first survey, except for manufacturing (9.7 percentage points below the BPS distribution). For the second survey, wholesale and retail trade was under-represented by 23.1 percentage points, while “accommodation and food service activities” and “other services” were over-represented by 14.2 and 12.0 percentage points, respectively. For the third and fourth surveys, the difference in each sector’s share between the ADB and BPS distribution was 6 percentage points or less (the majority had around 1% or less), except for manufacturing (12.6 and 14.0 percentage points below the BPS distribution, respectively), accommodation and food service activities (14.9 and 12.7 percentage points above, respectively), and other services (10.6 and 10.7 percentage points above).

The difference by location between the ADB and BPS distribution was 5 percentage points or less (the majority had less than 1%) for the first survey. For the second survey, the difference was less than 5% (the majority had less than 1%), except for East Java (19.6 percentage points above the BPS distribution). For the third and fourth surveys, under-representation was identified in Central Java (14.2 and 14.5 percentage points, respectively), while over-representation was in West Java (16.8 and 20.4 percentage points) and North Sumatra (17.3 and 18.5 percentage points) due to addition of field surveys.

4.2 Analytical Approach

There is an argument on the choice of econometric modeling in the presence of a binary dependent variable. It generally compares two approaches: (i) the linear probability model (LPM) and (ii) probit and logistic models. The LPM allows the fitting of data using a simple linear regression following the least squares approach. By contrast, probit and logistic regressions are drawn from the standard normal cumulative distribution function or the cumulative distribution function drawn from a logistic random variable. There are several pros and cons for both.

The literature recommending the probit and logistic regressions (Amemiya 1977; Horrace and Oaxaca 2006; Hausman, Abrevaya, and Scott-Morton 1998) argue some shortcomings of the LPM: (i) the possibility of obtaining estimated values less than zero or greater than one, which is inconsistent within the context of a limited dependent variable, which in this case falls between zero and one; and (ii) the LPM yields inconsistent estimates.¹⁵

¹⁵ The discussion summarized Shinozaki and Rao 2021. Amemiya (1985), however, showed there are some correspondences among LPM, probit, and logit estimators.

By contrast, there are several favorable discussions on the LPM. Angrist and Pischke (2008) argue that while probit and logistic regressions may fit the limited dependent variable bounds, it is the marginal effects which should be considered in non-linear settings. Through an empirical example, these marginal effects are close to the LPM's estimated coefficients irrespective of whether the conditional expectation function is linear or non-linear. They added that non-linear models are less computationally tractable, messier to interpret, and less transparent, particularly in the light of weighting, instrumental variables, and panel data.

Considering these arguments, this study chose the LPM approach. The main reasons are that (i) probit and logistic models rely on several strong assumptions with respect to error terms, which may not always hold; (ii) probit and logistic models are difficult to interpret and issues arise when justifying the results; and (iii) the LPM is convenient and easier to interpret, computationally less intensive, and reveals similar marginal effects to its non-linear counterparts.

4.3 Linear Probability Model

The LPM was designed to estimate the COVID-19 impact on MSMEs during the first year of the pandemic. It focuses on four areas: (i) monthly revenue, (ii) employment conditions, (iii) wage payments, and (iv) financial conditions (Table 2). Based on Shinozaki and Rao (2021), the study considered that factors affecting MSME operations and management during the pandemic include the (i) industrial sector they belong to, (ii) business location, (iii) operating period, (iv) business informality, (v) digital penetration in operations, (vi) business ownership (gender), (vii) global business exposure, and (viii) firm size (employment grouping). These are the independent variables for estimates. In this study, the analysis focuses on variables on informality and digital penetration in operations. The survey data were weighted in accordance with the BPS 2016 Economic Census.

$$Y_i = \alpha + \beta \text{Ind}_i + \gamma \text{Reg}_i + \delta \text{Ops}_i + \zeta \text{Inf}_i + \phi \text{Dig}_i + \psi \text{Wom}_i + \eta \text{GVC}_i + \tau \text{MSME}_i + \epsilon \quad (1)$$

In this model, Y includes four areas with six dimensions (models) that measure the level of a firm's resilience to the pandemic and associated government measures (Table 2). Y_i in each model is a separate binary dependent variable for each observed firm i ; Ind_i is the vector of categories for industry classification with "water supply (considered relatively stable sector regardless of the pandemic)" as base; Reg_i is the vector of categories for business location with "DKI Jakarta" as base; Ops_i is the vector of categories for years of operation with "0–5 years" as base; Inf_i is a binary variable that takes the value one if the establishment is a "sole proprietorship" or "others (family-run business)" and zero otherwise; Dig_i is a binary variable that takes the value one if the establishment is engaged in online selling (e-commerce) or uses the internet for business and zero otherwise; Wom_i is a binary variable that takes the value one if the owner of the establishment is a "woman" and zero if the owner is a "man"; GVC_i is a binary variable that takes the value one if the establishment is involved in a global supply chain or export/import business and zero otherwise; MSME_i is a binary variable that takes the value one if the establishment is a "micro and small enterprise" and zero if the establishment is a "medium-sized and large enterprise"; and ϵ is a residual.

Table 2: Model Specification

| Area (4) | Dimension (6) | Definition |
|-------------------------|---------------|---|
| 1. Monthly revenue | Revenue 1 | Firm's income/revenue condition 1. Totally no income/revenue or not at the time of the survey. |
| | Revenue 2 | Firm's income/revenue condition 2. An income/revenue decrease as compared to the previous month or not. |
| 2. Employment | Employment | Firm's employment condition assessed by a decrease or increase in employees (including no change) from the previous month or not. |
| 3. Wage payments | Wage 1 | Firm's wage/salary payment condition to employees 1. Totally no wage payments to employees or not at the time of the survey. |
| | Wage 2 | Firm's wage/salary payment condition to employees 2. A decrease in the total wage payments from the previous month or not. |
| 4. Financial conditions | Finance | Firm's financial condition assessed as already having no cash/savings or running out of cash/funds in 3 months at the time of the survey. |

Source: Author.

5. PROFILE OF SURVEYED MSMEs

In the March–April 2020 survey, 96.4% of respondents (509 firms) owned micro and small enterprises. 98.5% (127 firms) in the August–September 2020 survey, 97.9% (2,461 firms) in the March–April 2021 survey, and 98.2% (2,167 firms) in the May 2021 survey. The rest were from medium-sized and large enterprises for all surveys. Readers should carefully interpret the medium-sized and large enterprise statistics for the August–September 2020 survey, given the small sample size.

By sector, 79.9% of surveyed firms fell into the services category, followed by 10.8% in manufacturing and 9.3% in agriculture in the first survey. In the second survey, 79.8% were in services, followed by manufacturing (10.1%) and agriculture (10.1%). In the third survey, 92.3% were in services, followed by manufacturing (4.2%) and agriculture (3.5%). And in the fourth survey, 95.0% were in services, followed by manufacturing (2.9%) and agriculture (2.1%). Wholesale and retail trade (43.6% in the first, 20.9% in the second, 38.6% in the third, and 43.5% in the fourth survey) and accommodation and food services (18.4%, 27.9%, 30.7%, and 28.9%, respectively) were the first- and second-largest sectors among respondents in all surveys. In terms of industrial classification—as the BPS 2016 Economic Census provides only non-agricultural sector data—the descriptive and regression analyses use two broad industry classifications, manufacturing and services (Table 3).

By region, the top response rates were mostly from firms located in Java: West Java (15.3% in the first, 20.2% in the second, 34.0% in the third, and 37.8% in the fourth survey), East Java (13.6% in the first, 37.2% in the second, 21.0% in the third, and 22.6% in the fourth survey), Central Java (11.9% in the first and 10.9% in the second survey), and DKI Jakarta (11.7% in the third and 12.5% in the fourth survey). In the third and fourth surveys, North Sumatra accounted for 21.6% and 22.8% of surveyed firms, respectively.

Table 3: Industry Classification

| Industry Classification | BPS Industry Classification |
|--------------------------------|--|
| Manufacture | Manufacturing Construction |
| Services | Mining and quarrying Electricity, gas, steam, and air conditioning supply Water supply; sewerage, waste management, and remediation activities Wholesale and retail trade; repair of motor vehicles and motorcycles Transport and storage Accommodation and food service activities Information and communication Financial and insurance activities Real estate activities Professional, scientific, and technical activities Administrative and support service activities Public administration and defense; compulsory social security Education Human health and social work activities Arts, entertainment, and recreation Other service activities |

BPS = Badan Pusat Statistik (Central Statistics Office).

Note: Agriculture is excluded as it is not included in BPS statistics.

Source: Author.

Around half or more of those surveyed at the time of the survey had been operating from between 0 and 5 years (mostly young startup microenterprises in services)—50.2% in the first survey, 60.5% in the second, 47.4% in the third, and 47.6% in the fourth survey. These were followed by those operating 6–10 years (29.0%, 24.0%, 24.7%, and 23.4%, respectively), 11–15 years (12.1%, 12.4%, 12.0%, and 11.9%), 16–30 years (6.8%, 2.3%, 12.6%, and 13.3%), and over 31 years (1.9%, 0.8%, 3.3%, and 3.9%).

By type of firm surveyed, the majority were sole proprietorships or family-run businesses, which are regarded as informal firms (88.4% in the second, 95.3% in the third, and 96.8% in the fourth survey), while the remaining were “corporation or partnership” or “cooperative or foundation” (11.6% in the second, 4.7% in the third, and 3.2% in the fourth survey), seen as formal firms. In the first survey, 79.4% of surveyed firms were microenterprises with 1–4 employees or—typically family-run businesses. As there was no “type of firm” question in the first survey, this group can be regarded as informal firms, which is consistent with the definition set by ILO 2012 (see Section 2).

In terms of digital use, 71.4% of surveyed firms used the internet for daily business in the first survey, while 58.9% of surveyed firms were engaged in online selling or e-commerce in the second survey. By contrast, firms engaged in e-commerce accounted for 28.2% in the third survey and 21.8% in the fourth survey. The level of digital use differs between firms in the first and second surveys (relatively high digital use) and the third and fourth surveys (low digital use).

By ownership, more than half of surveyed firms were led by a male (70.4% in the first, 52.7% in the second, 50.3% in the third, and 51.6% in the fourth survey). Firms led by a female accounted for 29.6% of surveyed firms in the first, 47.3% in the second, 49.7% in the third, and 48.4% in the fourth survey.

Most firms reported average monthly wages per worker of not more than Rp3.2 million (\$200) (90.0% in the first, 92.3% in the second, 88.7% in the third, and 86.1% in the fourth survey).

As for a firm's internationalization, just a small portion of surveyed firms reported they were involved in a global supply chain or export/import business (5.7% in the first, 3.9% in the second, 1.7% in the third, and 1.3% in the fourth survey).

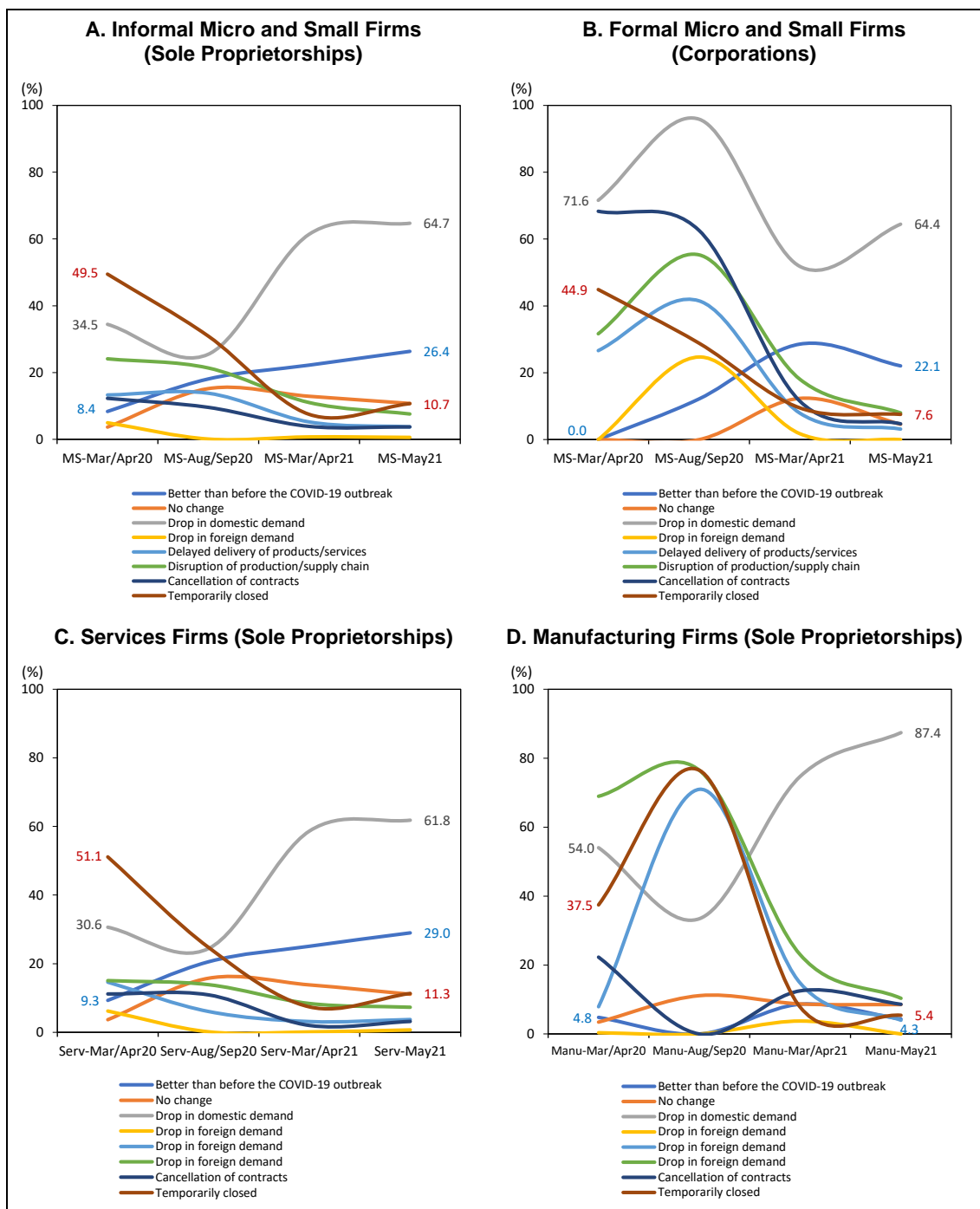
There were several common features of firms surveyed at all four points of time. Most surveyed firms were domestically operating micro and small enterprises with many engaged in services—wholesale and retail trade, accommodation, and food services—as informal sole proprietorships or family-run businesses, with many located in Java, especially West and East Java. Around half and more of those surveyed were young enterprises with 0–5 years of operations. Women-led firms accounted for less than half of the total surveyed. Monthly wages were low at around \$200 per employee. The major difference across all surveys was the level of digital use in operations: firms surveyed in 2020 had relatively high digital use (around 60% or more of surveyed firms), while those in 2021 had low digital use in commerce (one-fourth or less).

6. FINDINGS FROM THE DESCRIPTIVE STATISTICS AND ECONOMETRIC ANALYSES

The study provides a descriptive analysis based on the survey findings and uses the LPM to estimate the impact on MSME operations, employment, and fiscal conditions. It weighted the survey data based on the BPS 2016 Economic Census by firm size, sector, and location.

At the time the pandemic was formally proclaimed in March 2020, 49.5% of informal micro and small enterprises were forced to close their businesses relatively soon afterwards. The share was higher than formal micro and small enterprises (44.9%) (Figures 2A and 2B). Those continuing operations accounted for 34.5%, but they faced a drop in domestic demand—the share was lower than formal micro and small enterprises (71.6%). There was a group that reported a better business environment than before the outbreak—typically those in essential goods or services and health care for households. But these were a small fraction (8.4%). One year into the pandemic, those reporting temporary business closures decreased to 10.7% of informal micro and small enterprises (the share of formal micro and small enterprises also sharply decreased to 7.6%). However, firms that had to contend with the drop in domestic demand increased to 64.7% of informal micro and small enterprises (the share of formal micro and small enterprises also stayed high at 64.4%). By contrast, informal micro and small enterprises that reported a better business environment grew to 26.4% (formal micro and small enterprises at 22.1%), suggesting the pandemic created two streams of business clusters: those disrupted and those which benefitted from the pandemic.

Figure 2: Business Environment during the Pandemic



Manu = manufacturing, MS = micro and small enterprises, Serv = services.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculation based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

Service-related informal firms followed the same trend as informal micro and small enterprises, as most were in services (Figure 2C). For informal manufacturing firms—typically those producing and selling goods (including food products) themselves—the share of those reporting a continuous drop in domestic demand

increased from 54.0% in the first survey to 87.4% in the fourth. However, those reporting temporary business closures decreased from 37.5% in the first survey to 5.4% in the fourth (Figure 2D).

Overall, the business environment for informal micro and small enterprises (and services-related informal firms) likely improved, but many continued to face poor domestic demand 1 year into the pandemic, while some expanded their business. However, it should be noted that there were only a small portion of respondents participating across surveys (1.2% of those in the third survey); many informal micro and small enterprises may have closed.

The LPM estimates, based on the weighted data, provide detailed picture of the COVID-19 impact on MSMEs (Table 4). Formula (1) was carried out in four areas (revenue, employment, wages, and finance) with six dimensions that affect a firm's resilience to the pandemic and associated government measures.¹⁶

6.1 Impact on MSME Revenue

Impact by Sector

At the time of the initial outbreak in 2020 (see Table 4A), the regression result (*revenue1*) indicated that construction, administrative and support services, education, and arts/entertainment/recreation were more likely to have no revenue in April 2020 than water supply (as base, given relatively stable operations) due to temporary business and school closures.¹⁷ In April–May 2020, the government imposed “large-scale social restrictions” called Pembatasan Sosial Berskala Besar (PSBB), which required temporary business and school closures and restricted people's mobility and religious/social activities. It makes sense that the PSBB contributed to the zero-revenue condition of the industrial sectors mentioned above.

For firms that operated continuously after the 2020 outbreak, the estimates (*revenue2*) indicated that information and communication sector was less likely to see decreased revenues in April 2020 than water supply.¹⁸ The information and communication services were exempted from the PSBB as an essential service. The regression result was consistent with the business environment under social restrictions.

¹⁶ The six dimensions are binary dependent variables: (i) *revenue1* denotes a dummy variable taking the value one for a firm with no income/revenue at the time of the survey and zero for a firm with income/revenue; (ii) *revenue2* denotes a dummy variable taking the value one for a firm with an income/revenue decrease as compared to the previous month and zero for a firm with an income/revenue increase or no change; (iii) *employment* denotes a dummy variable taking the value one for a firm with a decrease in the number of employees as compared to the previous month and zero for a firm with an increase or no change in number of employees; (iv) *wage1* denotes a dummy variable taking the value one for a firm with no wage payments to employees at the time of the survey and zero for a firm that paid wages to employees; (v) *wage2* denotes a dummy variable taking the value one for a firm with a decrease in the total wage payments to employees as compared to the previous month and zero for a firm with an increase or no change in wage payments; and (vi) *finance* denotes a dummy variable taking the value one for a firm with no cash/savings at the time of the survey or running out of cash/funds in 3 months (in a month for the first survey) and zero for a firm that reported having enough savings, liquid assets, and other contingency finance to maintain business at the time of the survey.

¹⁷ In comparison with water supply-related firms, those in a no revenue condition was 66.4 percentage points higher in construction (the 5% significance level), 90.4 percentage points higher in administrative and support services (the 1% significance level), 75.5 percentage points higher in education (the 10% significance level), and 96.4 percentage points higher in arts/entertainment/recreation (the 1% significance level).

¹⁸ Firms' decreased revenue in information and communication services was 41.9 percentage points lower than water supply (the 10% significance level).

In August–September 2020 (see Table 4B), many industries—including manufacturing, construction, wholesale and retail trade, and accommodation and food services—were less likely to report no revenue than water supply, although estimates were not statistically significant. After the first PSBB (which ended May 2020), the economy was shifting into recovery. But due to surging COVID-19 infections later in the year, the government imposed the PSBB again (PSBB II) from September to November 2020.

In March–April 2021 (see Table 4C), “financial and insurance activities” and “human health and social work activities” were less likely to report no revenue than water supply.¹⁹ As these industries are essential services, the estimates were consistent with household needs. Meanwhile, revenue worsened in construction and transport. They were more likely to face decreased revenue even 1 year after the 2020 outbreak.²⁰

In May 2021 (see Table 4D), just 1 month from the previous survey, the business environment in each industrial sector was sensitive to changing levels of COVID-19 cases. The zero revenue firms were more likely to increase in “wholesale and retail trade” and “other service activities” (including tourism).²¹ Professional and technical business activities were also affected.²² In Indonesia, the surging delta COVID-19 variant was identified in 2021 with a second wave in mid-June 2021. The estimates indicated that small distributive trade and services were already affected 1 month before the second wave. Meanwhile, supported by the National Economic Recovery (PEN) program launched in May 2021, the revenue condition likely improved in construction.²³

Impact by Region

The LPM estimates indicated that, from the beginning stage, many provinces were negatively affected by the pandemic rather than Jakarta-based firms. At the time the first wave was identified in 2020 (see Table 4A), compared with Jakarta-based firms (as base), firms in Gorontalo, West Nusa Tenggara, West Papua, and West Sulawesi were more likely to report zero revenue in April 2020 due to business closures.²⁴ Many more firms in many provinces were also identified with decreased revenue. DI Yogyakarta, Gorontalo, West Java, West Kalimantan, South Kalimantan, Central Kalimantan, Kepulauan Riau, Lampung, West Nusa Tenggara, West Papua, West Sulawesi, South Sulawesi, and Central Sulawesi were all more likely to see firms with decreased revenue than Jakarta-based firms in April 2020.²⁵ Meanwhile, Bengkulu, Papua, and Southeast Sulawesi were less likely to report zero revenue than Jakarta-based firms.²⁶ But firms in these provinces were more likely to face decreased revenue than Jakarta-based firms, although figures were not statistically significant.

¹⁹ No revenue in financial services and health/social services was 11.7 and 10.9 percentage points lower than water supply at the 10% and 5% significance levels, respectively.

²⁰ Firms’ decreased revenue in construction and transport was 35.3 and 41.2 percentage points higher than water supply, respectively.

²¹ Their impact was 3.6 percentage points in trade (the 1% significance level) and 8.9 percentage points in other services (the 10% significance level) higher than water supply.

²² Firms’ decreased revenue in professional services was 38.8 percentage points higher than water supply at the 5% significance level.

²³ The impact on firms with decreased revenue in construction was 35.6 percentage points lower than water supply (the 10% significance level).

²⁴ 49–62 percentage points higher at the 1% significance level, except West Papua (10% significance level).

²⁵ 13–26 percentage points higher at the 1%, 5%, or 10% significance level.

²⁶ 46–47 percentage points lower at the 1%, 5%, or 10% significance level.

In August–September 2020 (see Table 4B), firms in South Sulawesi were more likely to see zero revenue than Jakarta-based firms.²⁷ Estimates in other provinces were not statistically significant.

In March–April 2021 (see Table 4C), revenues worsened in many provinces. Firms in Bali, West Java, Central Java, East Java, West Kalimantan, and West Sumatra were more likely to report zero revenue than Jakarta-based firms due to business closures.²⁸ Worsened (decreased) revenue of firms was identified in most provinces.²⁹

In May 2021 (see Table 4D), the revenue condition of firms continued to worsen in the provinces. Firms in Bali, DI Yogyakarta, East Java, Riau, and North Sulawesi were more likely to report zero revenue than Jakarta-based firms due to business closures.³⁰ The estimates found that a large number of local firms were more seriously affected by the pandemic than Jakarta-based firms a year into the pandemic.

Impact by Operating Period

The COVID-19 impact on business also differed by operating period. At the time of the 2020 outbreak (see Table 4A), longer-established firms had more serious drops in revenue than young enterprises.³¹ The PSBB with forced business closures in April–May 2020 likely contributed. But as the pandemic continued, the revenue loss condition shifted more to young enterprises. In August–September 2020 (see Figure 4B), the no revenue condition was less likely to be seen in longer-established firms than young enterprises, but the figures were not statistically significant. In March–May 2021 (see Tables 4C and 4D), the zero-revenue condition was more likely to be serious in young enterprises.³²

Impact on Informal Firms

Informal firms were more likely to be affected by the pandemic than formal firms. In August–September 2020 when COVID-19 cases surged, firms' no revenue condition was 57.5 percentage points higher in informal firms than formal ones at the 1% significance level. In March–April 2021, when the economy had begun a recovery, firms with no revenue were 24.5 percentage points lower in informal firms than formal firms at the 1% significance level. In May 2021, during delta variant surge, firms with no revenue were again 5.8 percentage points higher in informal firms than formal ones at the 5% significance level.

²⁷ 72.8 percentage points higher at the 5% significance level.

²⁸ 3–94 percentage points higher at the 1%, 5%, or 10% significance level.

²⁹ Firms in Aceh, Bali, Bengkulu, Jambi, Central Java, West Kalimantan, South Kalimantan, Lampung, West Nusa Tenggara, East Nusa Tenggara, Riau, South Sulawesi, Southeast Sulawesi, North Sulawesi, and West Sumatra were all more likely to see decreased revenue than Jakarta (13–36 percentage points higher at the 1% significance level except South Kalimantan [10%]).

³⁰ 3–94 percentage points higher at the 1%, 5%, or 10% significance level. Firms in Bali, DI Yogyakarta, South Kalimantan, West Nusa Tenggara, South Sulawesi, and North Sulawesi were more likely to report decreased revenue than Jakarta-based firms (20–51 percentage points higher at the 1% significance level).

³¹ Compared with firms operating for up to 5 years, firms operating for 6–15 years were more likely to decrease revenue in April 2020 (8–12 percentage points higher at the 5% or 10% significance level).

³² In March–April 2021, no revenue was 5.6 percentage points lower in 11–15 year old firms (the 5% significance level), 5.8 lower in 16–30 year old firms (the 10% significance level), and 7.5 lower in over 31 year old firms (the 5% significance level) than 0 to 5 year old firms. In May 2021, no revenue was 6.3 percentage points lower in 16–30 year old firms (the 1% significance level), and the impact on decreased revenue was 14.5 percentage points lower in 11–15 year old firms (the 10% significance level) and 16.0 lower in over 31 year old firms (the 5% significance level).

Table 4: Pandemic Impact on MSMEs—Linear Probability Model

A. March–April 2020

| Variables | (1) revenue1 | (2) revenue2 | (3) employment | (4) wage1 | (5) wage2 | (6) finance |
|--|------------------------|-----------------------|------------------------|-----------------------|------------------------|------------------------|
| Industry (base—water supply) | | | | | | |
| Manufacturing | 0.2584 [0.3309] | -0.03508 [0.0772] | -0.193 [0.3068] | 0.1766 [0.3398] | 0.1662 [0.2323] | -0.07843 [0.1826] |
| Electricity, gas, steam, and air conditioning supply | -0.06249 [0.3782] | -0.1285 [0.1157] | -1.0410*** [0.3342] | -0.3876 [0.3736] | 0.3518 [0.2627] | -0.1775 [0.2136] |
| Construction | 0.6640** [0.3368] | 0.03577 [0.0819] | 0.08171 [0.3146] | 0.3043 [0.3415] | 0.345 [0.2357] | 0.006198 [0.1921] |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | 0.2476 [0.3203] | -0.1033 [0.0734] | -0.1792 [0.2908] | 0.2517 [0.3256] | 0.2241 [0.2175] | -0.1627 [0.1801] |
| Transport and storage | 0.5162 [0.3419] | -0.003399 [0.0635] | 0.05363 [0.3165] | 0.1815 [0.3523] | 0.3720* [0.2182] | -0.0007579 [0.1753] |
| Accommodation and food service activities | 0.4544 [0.3249] | 0.03049 [0.0769] | -0.0887 [0.2946] | 0.3083 [0.3300] | 0.2313 [0.2273] | -0.01188 [0.1887] |
| Information and communication | -0.009183 [0.3500] | -0.4193* [0.2454] | -0.471 [0.3586] | 0.0006072 [0.3733] | -0.119 [0.3388] | 0.1462 [0.2316] |
| Financial and insurance activities | 0.2358 [0.3987] | -0.01003 [0.0794] | -0.6215** [0.3123] | 0.3321 [0.3980] | -0.2719 [0.3574] | -0.4653 [0.3597] |
| Professional, scientific, and technical activities | 0.5076 [0.3620] | -0.1207 [0.1082] | -0.4776 [0.3423] | 0.5233 [0.3594] | 0.2128 [0.2762] | -0.2996 [0.2642] |
| Administrative and support service activities | 0.9044*** [0.3283] | -0.07904 [0.1131] | -0.03457 [0.3113] | 0.386 [0.3597] | 0.4704** [0.2306] | -0.03855 [0.2071] |
| Education | 0.7547* [0.4198] | 0.1086 [0.1448] | -0.233 [0.3867] | 0.8528** [0.3624] | 0.4194* [0.2492] | -0.4322 [0.3259] |
| Human health and social work activities | 0.5638 [0.3868] | -0.2197 [0.1977] | -0.8293*** [0.3185] | 0.2909 [0.3857] | 0.4581* [0.2432] | 0.02938 [0.2112] |
| Arts, entertainment, and recreation | 0.9637*** [0.3359] | -0.03576 [0.0758] | 0.1448 [0.3587] | 0.6908* [0.3900] | 0.16 [0.2656] | -0.02548 [0.1831] |
| Other service activities | 0.1871 [0.3368] | -0.08888 [0.0781] | 0.006148 [0.3033] | 0.2214 [0.3408] | 0.2447 [0.2292] | -0.08264 [0.1841] |
| Location (base—DKI Jakarta) | | | | | | |
| Aceh | -0.1258 [0.2585] | 0.02403 [0.1229] | 0.003734 [0.2494] | -0.2306 [0.2752] | 0.09917 [0.0836] | -0.1609 [0.1202] |
| Bali | -0.1194 [0.1757] | 0.0116 [0.1066] | 0.0148 [0.1793] | -0.09326 [0.1907] | 0.007967 [0.1026] | -0.2633** [0.1246] |
| Banten | 0.2042 [0.2018] | 0.0768 [0.1155] | -0.3429* [0.2075] | 0.2412 [0.1933] | 0.01843 [0.1155] | -0.07078 [0.1021] |
| Bengkulu | -0.4657*** [0.1542] | 0.06765 [0.0811] | -0.3006 [0.4908] | -0.1288 [0.3811] | 0.01792 [0.1321] | -0.2152** [0.0950] |
| DI Yogyakarta | 0.04249 [0.1902] | 0.1313* [0.0737] | -0.02025 [0.1807] | 0.03048 [0.1819] | -0.0848 [0.1421] | -0.2967** [0.1339] |
| Gorontalo | 0.6191*** [0.1758] | 0.1554* [0.0875] | 0.4436*** [0.1672] | 0.4543*** [0.1736] | 0.2044* [0.1124] | -0.08985 [0.0776] |
| Jambi | -0.2897 [0.2660] | -0.276 [0.2987] | -0.243 [0.3434] | -0.1709 [0.2655] | 0.1268 [0.0863] | -0.1328 [0.0811] |
| Jawa Barat | 0.1712 [0.1710] | 0.1261* [0.0699] | 0.0247 [0.1609] | 0.03293 [0.1596] | 0.0633 [0.0904] | -0.06214 [0.0741] |
| Jawa Tengah | 0.01559 [0.1803] | 0.1203 [0.0741] | -0.04227 [0.1688] | -0.005636 [0.1889] | -0.09937 [0.1403] | -0.1400** [0.0707] |
| Jawa Timur | -0.1537 [0.1585] | 0.01588 [0.0871] | -0.02942 [0.1555] | -0.2044 [0.1553] | -0.1242 [0.1051] | -0.1317** [0.0662] |
| Kalimantan Barat | -0.156 [0.2149] | 0.1839*** [0.0700] | -0.2411 [0.2313] | -0.2128 [0.1850] | -0.5360*** [0.2071] | 0.02607 [0.1592] |
| Kalimantan Selatan | 0.03464 [0.3205] | 0.1901** [0.0759] | -0.4431** [0.1903] | 0.0519 [0.3258] | 0.1172 [0.0901] | -0.02418 [0.0731] |
| Kalimantan Tengah | -0.171 [0.3410] | 0.1260* [0.0756] | -0.4990* [0.2895] | 0.4182** [0.1643] | 0.01863 [0.0854] | -0.09573* [0.0571] |
| Kalimantan Timur | -0.2539 [0.1727] | 0.1409 [0.1057] | -0.5014*** [0.1815] | -0.1263 [0.1956] | -0.3617 [0.2826] | -0.6730*** [0.2190] |
| Kep. Bangka Belitung | 0.1748 [0.5054] | 0.02875 [0.1119] | 0.1124 [0.1814] | 0.4118** [0.1924] | -0.06176 [0.1348] | -0.6608 [0.4674] |

continued on next page

Table 4 *continued*

| Variables | (1) revenue1 | (2) revenue2 | (3) employment | (4) wage1 | (5) wage2 | (6) finance |
|---|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|
| Kepulauan Riau | 0.1669 [0.2713] | 0.2633** [0.1206] | 0.2895 [0.2628] | -0.04065 [0.4024] | 0.2327* [0.1334] | 0.07125 [0.1326] |
| Lampung | 0.1317 [0.2788] | 0.1822* [0.0969] | 0.3733** [0.1773] | 0.2967 [0.2513] | 0.169 [0.1162] | -0.0164 [0.1007] |
| Nusa Tenggara Barat | 0.5044*** [0.1920] | 0.1475* [0.0851] | 0.4617*** [0.1760] | 0.3679** [0.1730] | 0.1103 [0.1384] | 0.09489 [0.1400] |
| Nusa Tenggara Timur | -0.06771 [0.2024] | 0.1061 [0.1309] | -0.423 [0.2863] | -0.06057 [0.2255] | 0.1422 [0.1041] | -0.1091 [0.1713] |
| Papua | -0.4618* [0.2630] | 0.07771 [0.0984] | -0.3402 [0.2939] | -0.09624 [0.2355] | 0.05507 [0.0986] | -0.1799 [0.1128] |
| Papua Barat | 0.4888* [0.2625] | 0.1607** [0.0758] | 0.4975*** [0.1648] | 0.5355** [0.2538] | 0.1589 [0.0981] | 0.1479 [0.0981] |
| Riau | -0.3823 [0.2866] | -0.4926** [0.2404] | 0.1004 [0.2198] | -0.2954 [0.2797] | -0.07933 [0.1398] | -0.1118 [0.1551] |
| Sulawesi Barat | 0.5492*** [0.1595] | 0.2494*** [0.0857] | 0.4430*** [0.1510] | 0.5147*** [0.1700] | 0.2109** [0.0976] | 0.08366 [0.0932] |
| Sulawesi Selatan | 0.01194 [0.2442] | 0.2269** [0.0906] | 0.2406 [0.2686] | -0.07007 [0.2177] | -0.002784 [0.2363] | -0.2932 [0.2475] |
| Sulawesi Tengah | 0.179 [0.4046] | 0.2373*** [0.0799] | 0.4635*** [0.1429] | -0.07403 [0.4048] | 0.1601* [0.0897] | 0.01508 [0.0702] |
| Sulawesi Tenggara | -0.4664** [0.1808] | 0.09464 [0.0692] | -0.5509*** [0.1670] | -0.6136*** [0.1601] | -0.01641 [0.1021] | -0.06731 [0.0762] |
| Sulawesi Utara | 0.2711 [0.2185] | 0.02332 [0.1380] | 0.2611 [0.1637] | -0.06094 [0.1897] | 0.1856** [0.0869] | -0.14 [0.1285] |
| Sumatera Barat | 0.01633 [0.2224] | 0.08168 [0.0847] | 0.0344 [0.2142] | 0.2684* [0.1480] | 0.08047 [0.0822] | -0.1862* [0.0953] |
| Sumatera Selatan | -0.2945 [0.2194] | 0.1053 [0.0763] | 0.2175 [0.1989] | -0.1813 [0.2004] | -0.4139* [0.2493] | -0.1153 [0.1419] |
| Sumatera Utara | -0.07445 [0.1828] | 0.04999 [0.0986] | 0.1166 [0.1667] | 0.001381 [0.1980] | 0.09243 [0.1066] | -0.1885 [0.1189] |
| Operating period (base—0–5 years) | | | | | | |
| 6–10 years | 0.02814 [0.0875] | 0.08409* [0.0467] | 0.03391 [0.0859] | -0.00848 [0.0871] | 0.04913 [0.0628] | -0.04677 [0.0697] |
| 11–15 years | -0.1361 [0.1167] | 0.1224** [0.0600] | 0.2622*** [0.0914] | -0.08861 [0.1182] | 0.1123* [0.0622] | 0.1077 [0.0814] |
| 16–30 years | -0.07968 [0.1460] | 0.053 [0.0469] | 0.107 [0.1429] | -0.1429 [0.1218] | -0.002599 [0.1150] | -0.01087 [0.1140] |
| 31 years and above | 0.1769 [0.2443] | 0.06017 [0.0876] | 0.1552 [0.1948] | -0.3238** [0.1409] | 0.01059 [0.0935] | 0.0511 [0.1269] |
| Informality (base—business with more than 5 employees) | | | | | | |
| Sole proprietorships ¹ | -0.02021 [0.0876] | 0.03188 [0.0347] | 0.0849 [0.0794] | 0.2483*** [0.0877] | 0.07029 [0.0545] | 0.1308** [0.0591] |
| Digitalization (base—personal contact-based business) | | | | | | |
| Digitally operated firms ² | -0.1174 [0.0969] | -0.05861* [0.0301] | 0.01906 [0.0816] | -0.04848 [0.0948] | -0.1275*** [0.0478] | -0.1292*** [0.0485] |
| Gender of Owner (base—male owner) | | | | | | |
| Woman | 0.1096 [0.0808] | 0.01977 [0.0449] | 0.1054 [0.0762] | 0.1596** [0.0790] | 0.01947 [0.0664] | 0.0622 [0.0647] |
| Involvement in GVC (base—non-GVC firms) | | | | | | |
| GVC firms | 0.118 [0.1450] | -0.1998 [0.1383] | -0.2817* [0.1606] | 0.05872 [0.1697] | -0.2493 [0.1559] | -0.1671 [0.1497] |
| Enterprise Classification (base—medium and large enterprise) | | | | | | |
| Micro and small | -0.02413 [0.2083] | -0.1704** [0.0786] | 0.0624 [0.2052] | -0.07885 [0.2100] | 0.0202 [0.1885] | 0.0393 [0.1824] |
| Constant | 0.2352 [0.4048] | 1.0631*** [0.1166] | 0.5493 [0.3752] | 0.2014 [0.4077] | 0.6528** [0.2920] | 1.1067*** [0.2554] |
| N | 479 | 479 | 479 | 479 | 479 | 448 |
| Pseudo R-square | 0.2016 | 0.2826 | 0.2175 | 0.231 | 0.2295 | 0.2588 |

Note: Robust standard errors in brackets.

*** p<0.01, ** p<0.05, * p<0.10.

¹ includes family-run and/or business with up to 4 employees.

² firms that use the internet for daily business.

Table 4 *continued*

B. August–September 2020

| Variables | (1) revenue1 | (2) revenue2 | (3) employment | (4) wage1 | (5) wage2 | (6) finance |
|--|----------------------|----------------------|------------------------|-----------------------|------------------------|------------------------|
| Industry (base—water supply) | | | | | | |
| Manufacturing | −0.01736 [0.4043] | 0.09664 [0.1016] | 0.1586 [0.1174] | 0.08016 [0.3761] | −0.006712 [0.1347] | −0.007344 [0.0304] |
| Construction | −0.7182 [0.4315] | 0.3137 [0.2219] | 1.1047*** [0.1049] | −0.6407 [0.4734] | 0.2607 [0.2493] | |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | −0.5258 [0.4054] | −0.06377 [0.0925] | 0.0177 [0.0675] | −0.04636 [0.3601] | −0.1749 [0.1132] | −0.07688 [0.0560] |
| Transport and storage | 0.4793 [0.4103] | −0.01621 [0.1099] | −0.1031 [0.1122] | 0.4938 [0.3790] | 0.1288 [0.1356] | −0.08218 [0.0566] |
| Accommodation and food service activities | −0.4233 [0.4058] | −0.02002 [0.1297] | 0.06749 [0.1108] | −0.09641 [0.3661] | −0.1951 [0.1455] | −0.1871 [0.1237] |
| Information and communication | 0.2728 [0.4007] | 0.3113 [0.2174] | 0.01543 [0.0813] | 0.4087 [0.3969] | 0.2744 [0.2196] | −0.02793 [0.0622] |
| Financial and insurance activities | 0.1539 [0.5268] | 0.174 [0.4035] | −1.6923*** [0.4603] | 0.9805* [0.5680] | −1.0932*** [0.3653] | −1.5132*** [0.2525] |
| Professional, scientific, and technical activities | −0.6119 [0.4017] | −0.06992 [0.1633] | 0.5293* [0.2812] | −0.5068 [0.3652] | −0.07071 [0.1713] | −0.4114* [0.2281] |
| Human health and social work activities | −0.2187 [0.5699] | 0.2095 [0.2253] | 0.2676 [0.6585] | −0.1094 [0.4644] | −0.2533 [0.4347] | −0.1494 [0.0973] |
| Other service activities | −0.2436 [0.4349] | −0.0809 [0.1422] | 0.05634 [0.0844] | −0.1066 [0.3834] | −0.2023 [0.1369] | −0.07218 [0.0589] |
| Location (base—DKI Jakarta) | | | | | | |
| Banten | −0.1195 [0.3508] | −0.2712 [0.3571] | 0.3797 [0.3351] | 0.7710** [0.3584] | 0.1202 [0.1169] | 0.00479 [0.0622] |
| Bengkulu | −0.08593 [0.2642] | −0.03396 [0.1587] | −0.6063** [0.3023] | 1.1526*** [0.3502] | −0.1519 [0.1902] | 0.2781 [0.2236] |
| DI Yogyakarta | −0.0349 [0.3077] | −0.2418 [0.2387] | 0.324 [0.2038] | 0.06486 [0.3671] | −0.37 [0.2733] | 0.1597 [0.1806] |
| Jambi | −0.2745 [0.2893] | −0.08386 [0.1203] | −0.1445 [0.1746] | 0.7422** [0.3456] | −0.02753 [0.1455] | 0.05381 [0.0739] |
| Jawa Barat | −0.02342 [0.3241] | 0.05362 [0.0813] | 0.1275 [0.1783] | 0.2583 [0.3608] | −0.153 [0.1690] | −0.01274 [0.0650] |
| Jawa Tengah | 0.203 [0.3732] | −0.1856 [0.1323] | 0.000143 [0.1777] | 0.4378 [0.3667] | −0.1822 [0.1775] | −0.1232 [0.1343] |
| Jawa Timur | 0.1747 [0.3272] | −0.02445 [0.0891] | 0.1055 [0.1972] | 0.5461* [0.3241] | −0.01689 [0.1207] | −0.08997 [0.0754] |
| Kalimantan Barat | −0.3997 [0.4966] | 0.2139 [0.3858] | −0.2081 [0.4394] | 0.2344 [0.5423] | −0.0767 [0.3820] | 0.008703 [0.1406] |
| Kalimantan Selatan | −0.4542 [0.3022] | −0.02298 [0.1293] | −0.1333 [0.1633] | 0.7524** [0.3413] | −0.0203 [0.1531] | −0.06111 [0.0637] |
| Kalimantan Timur | 0.217 [0.3768] | 0.2788 [0.2291] | −0.01161 [0.2295] | 0.9431** [0.4177] | 0.3585 [0.2638] | |
| Kep. Bangka Belitung | −0.5862 [0.4921] | −0.09356 [0.1214] | 0.1076 [0.1968] | 0.5988 [0.4788] | −0.196 [0.1786] | −0.1155 [0.1113] |
| Kepulauan Riau | −0.1354 [0.3182] | 0.1203 [0.1182] | 0.03973 [0.1688] | 0.6878 [0.4644] | 0.2273 [0.1936] | −0.01629 [0.0733] |
| Maluku Utara | −0.2899 [0.3401] | −0.06701 [0.1470] | 0.8511*** [0.1755] | −0.3012 [0.3859] | −0.08699 [0.2009] | −0.06976 [0.0893] |
| Nusa Tenggara Timur | 0.06778 [0.3758] | 0.1073 [0.1758] | 0.4951 [0.3350] | 0.2588 [0.4041] | 0.04649 [0.2246] | 0.3165 [0.2274] |

continued on next page

Table 4 *continued*

| Variables | (1) revenue1 | (2) revenue2 | (3) employment | (4) wage1 | (5) wage2 | (6) finance |
|---|-----------------------|----------------------|-----------------------|------------------------|----------------------|-----------------------|
| Sulawesi Selatan | 0.7283** [0.3572] | 0.209 [0.1576] | 0.04846 [0.2281] | 0.9037** [0.3723] | 0.2808 [0.2287] | -0.1256 [0.1267] |
| Sulawesi Tengah | 0.5806 [0.3805] | 0.1234 [0.3749] | -0.409 [0.3751] | 1.1472*** [0.4241] | -0.1672 [0.2785] | -0.04424 [0.1035] |
| Sulawesi Utara | -0.01455 [0.2529] | -0.07559 [0.1153] | -0.1068 [0.1440] | -0.3525 [0.3601] | -0.1561 [0.2096] | -0.06325 [0.0920] |
| Sumatera Selatan | 0.1959 [0.4239] | -0.2909 [0.3498] | 0.003966 [0.1815] | 0.4142 [0.5108] | -0.2311 [0.3653] | 0.009759 [0.0623] |
| Sumatera Utara | 1.0498*** [0.3643] | 0.09481 [0.1440] | -0.01454 [0.2088] | 0.8028** [0.3765] | 0.1294 [0.1910] | -0.03117 [0.0927] |
| Operating period (base—0–5 years) | | | | | | |
| 6–10 years | -0.07095 [0.1542] | -0.2217 [0.1506] | 0.002832 [0.0649] | -0.1984 [0.1920] | -0.2745 [0.1824] | 0.08226 [0.0678] |
| 11–15 years | -0.05275 [0.2989] | 0.05435 [0.0854] | 0.2001 [0.2352] | 0.006591 [0.2411] | 0.09334 [0.1109] | 0.02647 [0.0401] |
| 16–30 years | -0.3971 [0.2435] | 0.02987 [0.1090] | 0.9813*** [0.0998] | -0.8383*** [0.1897] | 0.05058 [0.1317] | 0.05842 [0.0449] |
| 31 years and above | -0.2745 [0.2373] | -0.08057 [0.1295] | 0.12 [0.1036] | -0.104 [0.2033] | -0.08378 [0.1580] | 0.001221 [0.0614] |
| Informality (base—corporation/cooperative) | | | | | | |
| Sole proprietorships | 0.5752*** [0.1901] | 0.3607 [0.3491] | -0.3391 [0.3463] | 0.7485*** [0.2354] | 0.1331 [0.2359] | -0.03151 [0.0526] |
| Digitalization (base—personal contact-based business) | | | | | | |
| Digitally operated firms ¹ | -0.2065 [0.1307] | -0.08694 [0.1041] | 0.09872 [0.0861] | -0.0996 [0.1654] | -0.1051 [0.1247] | -0.0119 [0.0242] |
| Gender of Owner (base—male owner) | | | | | | |
| Woman | -0.1643 [0.1204] | 0.04403 [0.0837] | 0.01552 [0.0585] | 0.05361 [0.1814] | 0.06669 [0.1483] | 0.008654 [0.0502] |
| Involvement in GVC (base—non-GVC firms) | | | | | | |
| GVC firms | 0.5207* [0.3057] | 0.1238 [0.1383] | -0.2643 [0.1693] | 0.2665 [0.2606] | 0.1895 [0.2194] | -0.1013 [0.1257] |
| Enterprise Classification (base—medium and large enterprise) | | | | | | |
| Micro and small | -0.205 [0.3207] | 0.6511 [0.4371] | 1.0235 [0.7227] | -0.6794 [0.4332] | 0.5913 [0.4892] | 0.137 [0.1009] |
| Constant | 0.3803 [0.5895] | 0.03773 [0.3548] | -0.8076 [0.6905] | 0.2785 [0.6362] | 0.4048 [0.4935] | 1.0013*** [0.0881] |
| N | 116 | 116 | 116 | 116 | 116 | 109 |
| Pseudo R-square | 0.5348 | 0.2971 | 0.3423 | 0.3093 | 0.2516 | 0.1997 |

Note: Robust standard errors in brackets.

*** p<0.01, ** p<0.05, * p<0.10.

¹ firms engaged in online selling or e-commerce.

Table 4 *continued*
C. March–April 2021

| Variables | (1) revenue1 | (2) revenue2 | (3) employment | (4) wage1 | (5) wage2 | (6) finance |
|--|-----------------|-----------------|-------------------|--------------|--------------|----------------|
| Industry (base—water supply) | | | | | | |
| Mining and quarrying | -0.09356* | -0.5808*** | -0.09012* | -0.1954** | -0.2502** | 0.3896*** |
| | [0.0516] | [0.1132] | [0.0540] | [0.0918] | [0.1008] | [0.1239] |
| Manufacturing | 0.006639 | 0.1027 | 0.05045 | -0.03034 | 0.1751 | 0.06954 |
| | [0.0581] | [0.1221] | [0.0654] | [0.0979] | [0.1128] | [0.1307] |
| Electricity, gas, steam, and air conditioning supply | -0.01847 | -0.01583 | -0.01686 | 0.4551* | 0.6875*** | 0.1225 |
| | [0.0569] | [0.2538] | [0.0652] | [0.2612] | [0.1520] | [0.2481] |
| Construction | -0.02456 | 0.3528** | 0.01078 | -0.1037 | -0.1811 | -0.1678 |
| | [0.0525] | [0.1612] | [0.1408] | [0.1187] | [0.1130] | [0.2379] |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | -0.01309 | 0.08733 | -0.0306 | 0.02484 | 0.1613* | 0.08481 |
| | [0.0483] | [0.1111] | [0.0496] | [0.0889] | [0.0977] | [0.1204] |
| Transport and storage | 0.02799 | 0.4118*** | 0.1842 | -0.07819 | 0.07717 | -0.003575 |
| | [0.1028] | [0.1176] | [0.1312] | [0.1004] | [0.1790] | [0.1933] |
| Accommodation and food service activities | -0.006727 | 0.1066 | 0.004759 | 0.08006 | 0.2193** | 0.1826 |
| | [0.0494] | [0.1126] | [0.0542] | [0.0939] | [0.1024] | [0.1209] |
| Information and communication | -0.05231 | -0.05448 | -0.003413 | -0.07225 | 0.05764 | 0.0896 |
| | [0.0520] | [0.1473] | [0.0665] | [0.0957] | [0.1295] | [0.1553] |
| Financial and insurance activities | -0.1166* | 0.09249 | 0.02833 | -0.2143** | -0.1123 | -0.5252*** |
| | [0.0655] | [0.3125] | [0.0874] | [0.1035] | [0.1765] | [0.1497] |
| Real estate activities | 0.3044 | 0.2891 | -0.05863 | 0.3648 | 0.8216*** | -0.1903 |
| | [0.2401] | [0.1955] | [0.0754] | [0.2887] | [0.1118] | [0.3409] |
| Professional, scientific, and technical activities | -0.0801 | 0.1444 | 0.1219 | -0.02319 | 0.2912** | 0.1083 |
| | [0.0576] | [0.1498] | [0.1231] | [0.1184] | [0.1484] | [0.1464] |
| Public administration and defense; compulsory social security | -0.04356 | 0.1416 | -0.279 | 0.7265*** | 0.7462*** | 0.2707 |
| | [0.0674] | [0.1236] | [0.1730] | [0.1734] | [0.2124] | [0.1984] |
| Education | -0.06203 | 0.0676 | 0.06104 | 0.08274 | 0.2373 | -0.04889 |
| | [0.0839] | [0.1560] | [0.0817] | [0.1355] | [0.1559] | [0.1553] |
| Human health and social work activities | -0.1093** | 0.08274 | 0.3166* | 0.08273 | 0.3109 | -0.03422 |
| | [0.0556] | [0.1876] | [0.1758] | [0.1708] | [0.1925] | [0.1928] |
| Other service activities | 0.01786 | 0.08583 | 0.01396 | 0.02787 | 0.2459** | 0.1019 |
| | [0.0638] | [0.1163] | [0.0641] | [0.1012] | [0.1068] | [0.1264] |
| Location (base—DKI Jakarta) | | | | | | |
| Aceh | -0.01475 | 0.3014*** | 0.2507 | 0.2796 | 0.2088 | -0.6078*** |
| | [0.0222] | [0.0418] | [0.2267] | [0.2176] | [0.2086] | [0.1846] |
| Bali | 0.3366* | 0.3116*** | 0.2747 | 0.5377*** | 0.3368** | 0.1136** |
| | [0.1829] | [0.0464] | [0.1923] | [0.1891] | [0.1553] | [0.0504] |
| Banten | 0.002007 | -0.3603*** | -0.01381 | 0.05916 | -0.3674*** | -0.4169*** |
| | [0.0187] | [0.0884] | [0.0329] | [0.0559] | [0.0763] | [0.0944] |
| Bengkulu | 0.01907 | 0.2938*** | -0.05997 | 0.9145*** | 0.4633*** | 0.04811 |
| | [0.0482] | [0.0448] | [0.0496] | [0.0596] | [0.0661] | [0.0486] |
| DI Yogyakarta | 0.3781 | -0.0603 | 0.05336 | 0.4393 | 0.07139 | 0.09727** |
| | [0.2434] | [0.2693] | [0.0555] | [0.2678] | [0.2665] | [0.0383] |
| Jambi | -0.01281 | 0.3153*** | 0.01688 | -0.03412 | -0.5047*** | 0.1581*** |
| | [0.0362] | [0.0389] | [0.0373] | [0.0454] | [0.0596] | [0.0434] |
| Jawa Barat | 0.03369** | -0.02722 | 0.05418** | 0.1313*** | -0.1466*** | -0.1796*** |
| | [0.0167] | [0.0371] | [0.0270] | [0.0250] | [0.0507] | [0.0409] |
| Jawa Tengah | 0.1550** | 0.2525*** | 0.2497*** | 0.4217*** | 0.2330** | 0.1034** |
| | [0.0767] | [0.0567] | [0.0850] | [0.0934] | [0.0910] | [0.0411] |
| Jawa Timur | 0.02920* | -0.09759** | 0.03276 | 0.03278 | -0.1776*** | -0.2399*** |
| | [0.0163] | [0.0416] | [0.0249] | [0.0240] | [0.0528] | [0.0450] |
| Kalimantan Barat | 0.9346*** | 0.2529*** | -0.03328 | 0.8731*** | 0.3793*** | 0.02625 |
| | [0.0608] | [0.0707] | [0.0405] | [0.0624] | [0.0866] | [0.0658] |
| Kalimantan Selatan | 0.1047 | 0.1386* | 0.07739 | 0.4816*** | 0.3265*** | -0.08299 |
| | [0.0757] | [0.0816] | [0.0733] | [0.1075] | [0.0875] | [0.0891] |
| Kalimantan Tengah | -0.1447 | -0.5382*** | 0.04101 | -0.1885 | 0.1486 | -0.3125 |
| | [0.1071] | [0.1659] | [0.0721] | [0.1224] | [0.2847] | [0.2620] |

continued on next page

Table 4 *continued*

| Variables | (1) revenue1 | (2) revenue2 | (3) employment | (4) wage1 | (5) wage2 | (6) finance |
|---|------------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|
| Kalimantan Utara | 0.0381 [0.0339] | 0.03751 [0.1497] | 0.2742* [0.1486] | 0.1592 [0.1170] | -0.01393 [0.1591] | -0.1125 [0.1448] |
| Lampung | -0.02763 [0.0239] | 0.3103*** [0.0373] | 1.0291*** [0.0500] | -0.1483*** [0.0383] | 0.4421*** [0.0597] | -0.0003647 [0.0389] |
| Nusa Tenggara Barat | 0.2176 [0.1686] | 0.2887*** [0.0476] | 0.5307*** [0.1898] | 0.4385** [0.1957] | 0.4124*** [0.0770] | -0.04908 [0.1224] |
| Nusa Tenggara Timur | 0.1308 [0.0829] | 0.3607*** [0.1218] | 0.7614*** [0.1152] | -0.03658 [0.1254] | 0.4446*** [0.1474] | 0.2852** [0.1115] |
| Riau | -0.01594 [0.0581] | 0.2941*** [0.0443] | 0.08538 [0.1555] | 0.7860*** [0.1461] | 0.4432*** [0.0672] | -0.01621 [0.1038] |
| Sulawesi Selatan | 0.0363 [0.0555] | 0.3101*** [0.0378] | 0.00824 [0.0433] | 0.6393** [0.2556] | 0.1682 [0.2607] | 0.1185** [0.0521] |
| Sulawesi Tenggara | 1.0057*** [0.0580] | 0.2976*** [0.0703] | -0.1057 [0.0659] | 1.0249*** [0.0723] | 0.5075*** [0.0871] | 0.1612** [0.0647] |
| Sulawesi Utara | 0.03925 [0.0383] | 0.2784*** [0.0496] | 0.2905* [0.1656] | 0.2036 [0.1462] | -0.04842 [0.1905] | -0.1037 [0.1639] |
| Sumatera Barat | 0.04845* [0.0284] | 0.3442*** [0.0484] | -0.05716 [0.1114] | 0.0145 [0.0444] | -0.4525*** [0.0966] | 0.1705*** [0.0514] |
| Sumatera Utara | -0.007558 [0.0157] | -0.04786 [0.0514] | 0.06610** [0.0296] | 0.2175*** [0.0400] | -0.03918 [0.0641] | -0.06201 [0.0446] |
| Operating period (base—0–5 years) | | | | | | |
| 6–10 years | 0.03397 [0.0455] | 0.01062 [0.0278] | 0.02222 [0.0378] | 0.05479 [0.0518] | 0.05338 [0.0479] | 0.03297 [0.0324] |
| 11–15 years | -0.05640** [0.0259] | -0.02798 [0.0385] | 0.1223 [0.0885] | -0.05163 [0.0407] | 0.0006843 [0.0484] | -0.00562 [0.0390] |
| 16–30 years | -0.05830* [0.0306] | -0.05828 [0.0412] | 0.04148 [0.0995] | -0.1174** [0.0523] | -0.07858 [0.0690] | -0.04255 [0.0398] |
| 31 years and above | -0.07518** [0.0329] | 0.004953 [0.0827] | -0.01273 [0.0339] | -0.06005 [0.0538] | 0.01679 [0.1096] | -0.2456*** [0.0811] |
| Informality (base—corporation/cooperative) | | | | | | |
| Sole proprietorships | -0.2445*** [0.0853] | 0.01404 [0.0535] | 0.1298** [0.0622] | -0.1425* [0.0755] | 0.02587 [0.0668] | 0.00581 [0.0544] |
| Digitalization (base—personal contact-based business) | | | | | | |
| Digitally operated firms ¹ | -0.03825 [0.0387] | 0.002242 [0.0371] | 0.04148 [0.0435] | -0.003805 [0.0523] | -0.02593 [0.0556] | 0.0122 [0.0283] |
| Gender of Owner (base—male owner) | | | | | | |
| Woman | 0.01666 [0.0323] | -0.01964 [0.0297] | -0.06671* [0.0359] | 0.06448 [0.0421] | -0.01522 [0.0426] | 0.06374** [0.0270] |
| Involvement in GVC (base—non-GVC firms) | | | | | | |
| GVC firms | -0.1142* [0.0609] | 0.09009 [0.0821] | 0.1081 [0.2226] | -0.3395*** [0.0898] | 0.2437** [0.1083] | -0.02285 [0.0673] |
| Enterprise Classification (base—medium and large enterprise) | | | | | | |
| Micro and small | 0.04504 [0.0501] | 0.03809 [0.1063] | 0.01098 [0.0709] | 0.01234 [0.0660] | -0.04709 [0.1301] | 0.3047*** [0.0863] |
| Constant | 0.2253** [0.0899] | 0.5453*** [0.1562] | -0.127 [0.1127] | 0.1394 [0.1214] | 0.3646** [0.1654] | 0.4466*** [0.1561] |
| N | 2,428 | 2,428 | 2,428 | 2,428 | 2,428 | 2,290 |
| Pseudo R-square | 0.2504 | 0.1967 | 0.234 | 0.2892 | 0.2395 | 0.2113 |

Note: Robust standard errors in brackets.

*** p<0.01, ** p<0.05, * p<0.10.

¹ firms engaged in online selling or e-commerce.

Table 4 *continued*
D. May 2021

| Variables | (1) revenue1 | (2) revenue2 | (3) employment | (4) wage1 | (5) wage2 | (6) finance |
|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Industry (base—water supply) | | | | | | |
| Mining and quarrying | 0.00822 [0.0152] | -0.2143 [0.2793] | 0.01708 [0.0362] | -0.2434*** [0.0701] | -0.04423 [0.2786] | 0.1115 [0.1278] |
| Manufacturing | 0.009071 [0.0239] | 0.009912 [0.1644] | 0.01531 [0.0310] | -0.1230* [0.0708] | -0.0664 [0.0787] | -0.1159 [0.1251] |
| Electricity, gas, steam, and air conditioning supply | -0.0164 [0.0207] | -0.03359 [0.2318] | 0.1523 [0.1176] | -0.09347 [0.0818] | 0.04654 [0.1840] | -0.2916 [0.2462] |
| Construction | -0.01581 [0.0247] | -0.3563* [0.1990] | 0.05671 [0.0802] | -0.1848** [0.0740] | -0.3017*** [0.1043] | -0.2462 [0.2344] |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | 0.03586*** [0.0137] | -0.02004 [0.1482] | 0.05643* [0.0322] | -0.05062 [0.0684] | 0.04826 [0.0720] | -0.1179 [0.1074] |
| Transport and storage | 0.07395 [0.1019] | 0.02021 [0.2357] | 0.2589 [0.1834] | -0.08427 [0.1176] | 0.07254 [0.1897] | -0.1614 [0.2343] |
| Accommodation and food service activities | 0.03432 [0.0316] | 0.09235 [0.1504] | 0.007893 [0.0387] | -0.004749 [0.0759] | 0.0766 [0.0775] | -0.07901 [0.1091] |
| Information and communication | -0.01925 [0.0187] | -0.09711 [0.1878] | -0.01652 [0.0280] | -0.08345 [0.0816] | -0.06333 [0.1079] | -0.08479 [0.1458] |
| Financial and insurance activities | 0.02019 [0.0236] | -0.2051 [0.2730] | 0.01344 [0.0528] | -0.1346 [0.0957] | -0.3444*** [0.1027] | -0.3537* [0.2109] |
| Real estate activities | -0.06178 [0.0413] | -0.02228 [0.4200] | -0.05921 [0.0594] | -0.2231** [0.0890] | 0.6955*** [0.1044] | -0.8054*** [0.1115] |
| Professional, scientific, and technical activities | 0.1155 [0.1391] | 0.3879** [0.1764] | 0.2527 [0.2107] | 0.1569 [0.1435] | 0.5092*** [0.1271] | -0.1366 [0.1579] |
| Education | 0.07724 [0.0492] | 0.1152 [0.1871] | 0.06192 [0.0543] | 0.04599 [0.1296] | 0.2188 [0.1382] | -0.3339** [0.1605] |
| Human health and social work activities | -0.02532 [0.0338] | 0.1049 [0.1990] | 0.1332 [0.1631] | 0.05257 [0.1867] | 0.1094 [0.1338] | -0.2779 [0.1958] |
| Other service activities | 0.08903* [0.0466] | -0.05613 [0.1580] | 0.08615 [0.0541] | 0.06859 [0.0905] | 0.1366 [0.0874] | -0.1497 [0.1177] |
| Location (base—DKI Jakarta) | | | | | | |
| Aceh | -0.1055 [0.1418] | 0.003246 [0.1095] | 0.8153*** [0.2132] | -0.1991 [0.1306] | 0.05966 [0.1179] | 0.1134 [0.1276] |
| Bali | 0.6627** [0.2714] | 0.4016*** [0.0662] | -0.05559** [0.0283] | 0.9446*** [0.0688] | 0.4703*** [0.0922] | 0.2103*** [0.0482] |
| Banten | -0.02511* [0.0137] | -0.5635*** [0.0458] | -0.03666 [0.0225] | -0.027 [0.0237] | -0.4884*** [0.0518] | -0.4439*** [0.0930] |
| DI Yogyakarta | 0.3564* [0.2066] | 0.3473*** [0.0489] | -0.006013 [0.0396] | 0.7655*** [0.1502] | 0.2727* [0.1454] | -0.07187 [0.1937] |
| Jawa Barat | 0.02386 [0.0202] | -0.1054** [0.0471] | 0.02026 [0.0217] | 0.1229*** [0.0239] | -0.1999*** [0.0476] | -0.09855** [0.0440] |
| Jawa Tengah | 0.05916 [0.0598] | -0.02369 [0.1246] | 0.2678** [0.1076] | 0.2225** [0.0929] | 0.01901 [0.1142] | 0.1141** [0.0527] |
| Jawa Timur | 0.03174** [0.0151] | -0.3282*** [0.0485] | 0.006423 [0.0152] | 0.04572** [0.0192] | -0.3529*** [0.0458] | -0.2117*** [0.0479] |
| Kalimantan Selatan | -0.06036** [0.0302] | 0.2049*** [0.0687] | -0.02076 [0.0565] | 0.8521*** [0.0403] | 0.3087*** [0.0696] | 0.08123 [0.0516] |
| Nusa Tenggara Barat | 0.0665 [0.0773] | 0.5122*** [0.0597] | -0.05799* [0.0337] | 1.0347*** [0.0351] | 0.5975*** [0.0548] | 0.3014*** [0.0724] |
| Riau | 0.7686*** [0.1538] | 0.02183 [0.1272] | -0.3538 [0.2189] | -0.1678 [0.1294] | 0.1486 [0.1275] | 0.4947*** [0.1580] |
| Sulawesi Selatan | -0.05528 [0.0375] | 0.3973*** [0.0861] | -0.05646 [0.0390] | 0.04914 [0.0767] | -0.4145*** [0.0883] | 0.2094*** [0.0485] |
| Sulawesi Utara | 0.9396*** [0.0302] | 0.2049*** [0.0687] | -0.02076 [0.0565] | 0.8521*** [0.0403] | 0.3087*** [0.0696] | 0.08123 [0.0516] |
| Sumatera Utara | -0.006849 [0.0145] | -0.06888 [0.0652] | 0.01855 [0.0241] | 0.2137*** [0.0337] | -0.1560*** [0.0561] | 0.0577 [0.0464] |

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Table 4 *continued*

| Variables | (1) revenue1 | (2) revenue2 | (3) employment | (4) wage1 | (5) wage2 | (6) finance |
|---|-------------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|
| Operating period (base—0–5 years) | | | | | | |
| 6–10 years | –0.0492 [0.0375] | –0.04262 [0.0739] | –0.02537 [0.0451] | 0.0716 [0.0640] | 0.08066 [0.0528] | 0.008181 [0.0305] |
| 11–15 years | –0.04058 [0.0258] | –0.1451* [0.0768] | 0.05062 [0.0876] | –0.0237 [0.0405] | –0.08087 [0.0686] | –0.0222 [0.0451] |
| 16–30 years | –0.06329*** [0.0225] | –0.07811 [0.0569] | 0.002199 [0.0283] | –0.0385 [0.0384] | –0.06784 [0.0436] | –0.1394*** [0.0537] |
| 31 years and above | –0.02362 [0.0299] | –0.1603** [0.0696] | –0.04373* [0.0265] | –0.01502 [0.0413] | –0.07073 [0.0550] | –0.04517 [0.0713] |
| Informality (base—corporation/cooperative) | | | | | | |
| Sole proprietorships | 0.05821** [0.0277] | 0.06302 [0.0880] | –0.05654 [0.0637] | 0.1334*** [0.0482] | 0.09597 [0.0621] | –0.1492* [0.0778] |
| Digitalization (base—personal contact-based business) | | | | | | |
| Digitally operated firms ¹ | 0.03603 [0.0458] | 0.09382 [0.0667] | 0.08086 [0.0555] | 0.1104** [0.0539] | 0.1836*** [0.0561] | –0.02533 [0.0352] |
| Gender of Owner (base—male owner) | | | | | | |
| Woman | –0.02989 [0.0370] | 0.02809 [0.0509] | –0.06651 [0.0449] | –0.0028 [0.0427] | 0.01856 [0.0426] | 0.1065*** [0.0308] |
| Involvement in GVC (base—non-GVC firms) | | | | | | |
| GVC firms | 0.05993 [0.0773] | –0.08431 [0.0822] | 0.02175 [0.0745] | –0.1446*** [0.0446] | –0.2539*** [0.0687] | –0.2494** [0.1010] |
| Enterprise Classification (base—medium and large enterprise) | | | | | | |
| Micro and small | 0.003293 [0.0177] | –0.1841** [0.0933] | 0.0379 [0.0721] | –0.02395 [0.0343] | –0.04342 [0.0812] | 0.4967*** [0.0844] |
| Constant | –0.04159 [0.0427] | 0.7019*** [0.1965] | 0.01715 [0.0949] | –0.06446 [0.0940] | 0.3601*** [0.1270] | 0.5690*** [0.1551] |
| N | 2,160 | 2,160 | 2,160 | 2,160 | 2,160 | 2,039 |
| Pseudo R-square | 0.2278 | 0.2587 | 0.2098 | 0.3518 | 0.3377 | 0.2021 |

Note: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.10.

¹ firms engaged in online selling or e-commerce.

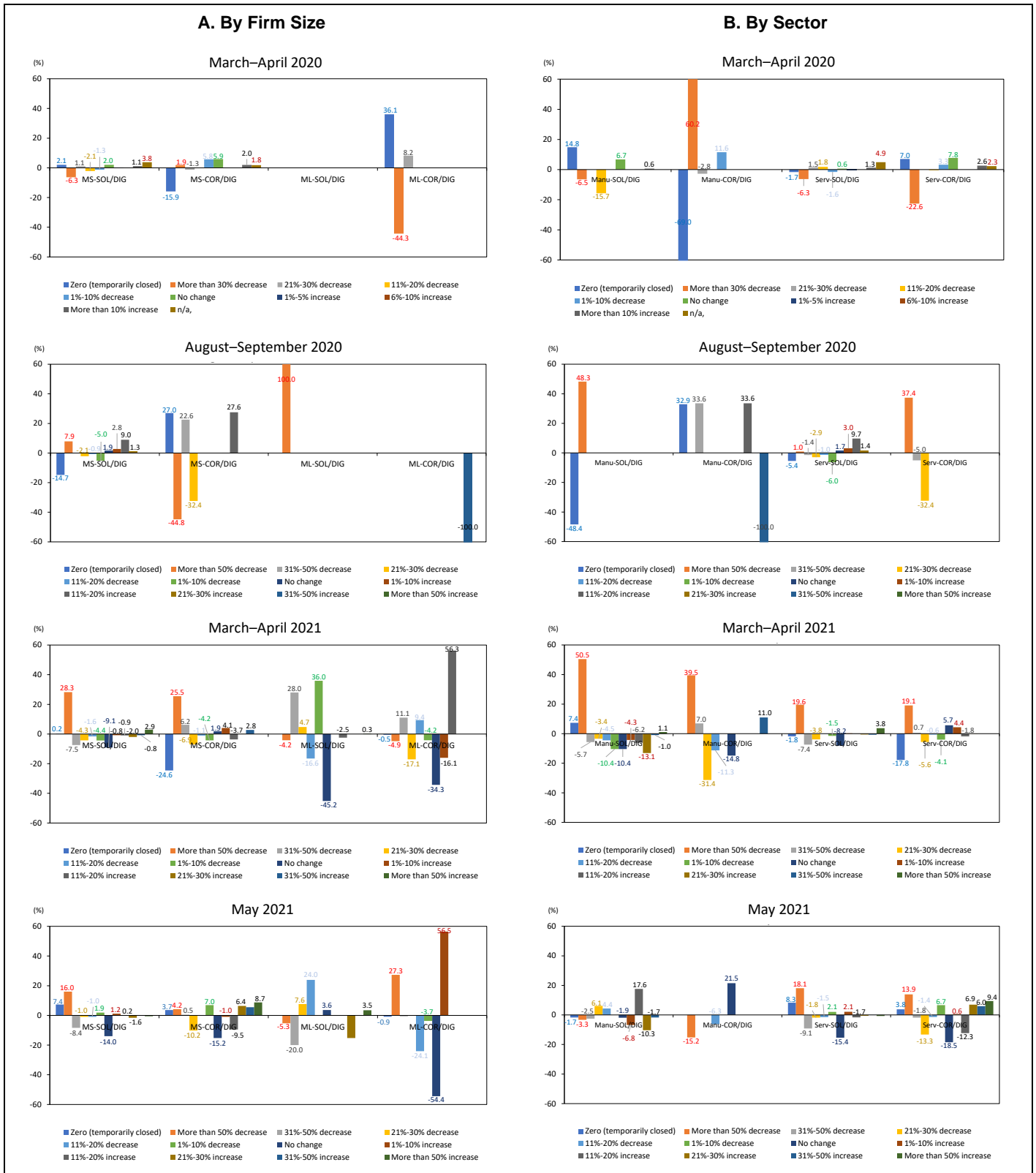
Impact on Digitally Operated Firms

The LPM result showed that, at the beginning of the pandemic in 2020, digitally operated firms were less likely to be affected.³³ Firms' limited revenue loss condition was likely to continue in digitally operated firms in August–September 2020 and March–April 2021, but this condition seemed to reverse in May 2021, although figures were not statistically significant. The descriptive analysis based on weighted survey data provides a more detailed picture.

Figure 3 shows the gap of survey response ratio in revenue between digitally operated firms (informal and formal micro and small enterprises and medium-sized and large enterprises that use e-commerce or the internet for daily business) and non-digitally operated firms (those that do not use e-commerce or the internet for business, and thus rely on physical-contact-based operations). The gap is calculated as the share of digitally operated firms minus that of non-digitally operated firms to their respective populations, where a positive value indicates a higher impact (a higher percentage share) in digital firms, while a negative value indicates a lower impact (a lower percentage share) than non-digital firms.

³³ Firms' decreased revenue condition was 5.9 percentage points lower than non-digitally operated firms in April 2020 at the 10% significance level.

Figure 3: Revenue—Digitally Operated Enterprises



COR = corporations, DIG = digitally operated firms, Manu = manufacturing, ML = medium-sized and large enterprises, MS = micro and small enterprises, Serv = services, SOL = sole proprietorships.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

Similar to other firms, digitally operated micro and small enterprises (those using the internet for business) had operations seriously damaged at the beginning of the pandemic, but the impact on revenue was relatively limited as compared with non-digital micro and small enterprises in April 2020 (−6.3 for informal micro and small enterprises with income drops of over 30%, and −15.9 for formal micro and small enterprises with no revenue). The share of those reporting monthly income increases (over 10%) was slightly higher than non-digital micro and small enterprises (+1.1 for informal and +2.0 for formal micro and small enterprises in April 2020) (Figure 3A). By May 2021, however, two different groups emerged for digitally operated micro and small enterprises using e-commerce. One was for nonprofitable firms and the other for profitable firms.³⁴ For digitally operated medium-sized and large enterprises, formal firms with high revenue were likely in March to May 2021.³⁵

For digitally operated firms in services (Figure 3B), the impact on revenue was also relatively limited compared with non-digital services in April 2020 (−8.0 for informal firms with no revenue or an over 30% decrease in income, and −22.6 for formal firms with an over 30% decrease). Meanwhile, the share of those reporting increased monthly income (over 10%) was slightly higher than non-digital firms in services (+1.3 for informal and +2.6 for formal firms in April 2020). Similar to digitally operated micro and small enterprises, however, both highly nonprofitable and profitable services firms emerged in May 2021 and created two streams of business clusters.³⁶

For digitally operated manufacturing firms, the impact on revenue continued to be severe at the end of April 2021.³⁷ But it likely improved in informal manufacturing firms operating digitally, with an increased share of those with high revenue in May 2021.³⁸

Other Impacts

Firms involved in the global supply chain or export/import businesses were more likely to be affected by the social restrictions (PSBB II) that began in September 2020. Those with no revenue were 52.1 percentage points higher in internationalized firms than domestically focused firms in August–September 2020 (the 10% significance level). As the economy began to recover, revenue losses for internationalized firms likely decreased. Those with no revenue were 11.4 percentage points lower in internationalized firms than domestically focused firms in March–April 2021 (the 10% significance level).

The LPM estimates did not show statistically significant results for revenue of women-led firms. But their revenue losses were more likely to be serious than firms led by men at the time of the first PSBB in April and PSBB II in September 2020.

³⁴ For nonprofitable firms, +23.4 for informal and +7.9 for formal micro and small enterprises with no revenue, or an over 50% decrease in May 2021. For profitable firms, +1.4 for informal micro and small enterprises with up to a 20% increase and +20.6 for formal micro and small enterprises with a 21% increase or more in May 2021.

³⁵ +56.3 for formal medium-sized and large enterprises with an 11%–20% increase in March–April 2021 and +56.5 for formal medium-sized and large enterprises with up to a 10% increase in May 2021.

³⁶ For nonprofitable firms, +18.1 for informal and +13.9 for formal firms with an over 50% decrease in May 2021. For profitable firms, +2.1 for informal firms with up to a 10% increase and +22.9 for formal firms with increased income (of which +9.4 for those with increased income of over 50%) in May 2021.

³⁷ +57.9 for informal firms with no revenue or an over 50% decrease and +46.5 for formal firms with an over 30% decrease (of which +39.5 for those with a decrease of over 50%) in March–April 2021.

³⁸ +17.6 for informal firms with 11%–20% increase.

By firm size, revenues of micro and small enterprises were also affected by the pandemic and social restrictions. But the decrease seemed somewhat limited in April 2020 as compared to medium-sized and large enterprises (17.0 percentage points lower at the 5% significance level). The same appeared in May 2021 (1 month before the second wave of infections) (18.4 percentage points lower at 5% significance level). This suggests that the revenue losses were more likely to be serious in medium-sized and large enterprises.

6.2 Employment

As mentioned, informal micro and small enterprises are sole proprietorships and family-run businesses. They also have a few full-time workers and/or part-time/contractual workers. During the first wave of the pandemic and under PSBB social restrictions in 2020, 51.1% of informal micro and small enterprises temporarily laid off staff, the top measure taken (Figure 4A). Other measures included (i) reducing working hours (21.7%), (ii) work-from-home arrangements (12.7%), and (iii) granting sick leave (0.2%)—these were not popularly used at the time of first outbreak. Formal micro and small enterprises took the same actions: (i) with 53.0% laying off workers; (ii) 31.5% reducing working hours, and (iii) 11.6% applying work-from-home arrangements (Figure 4B).

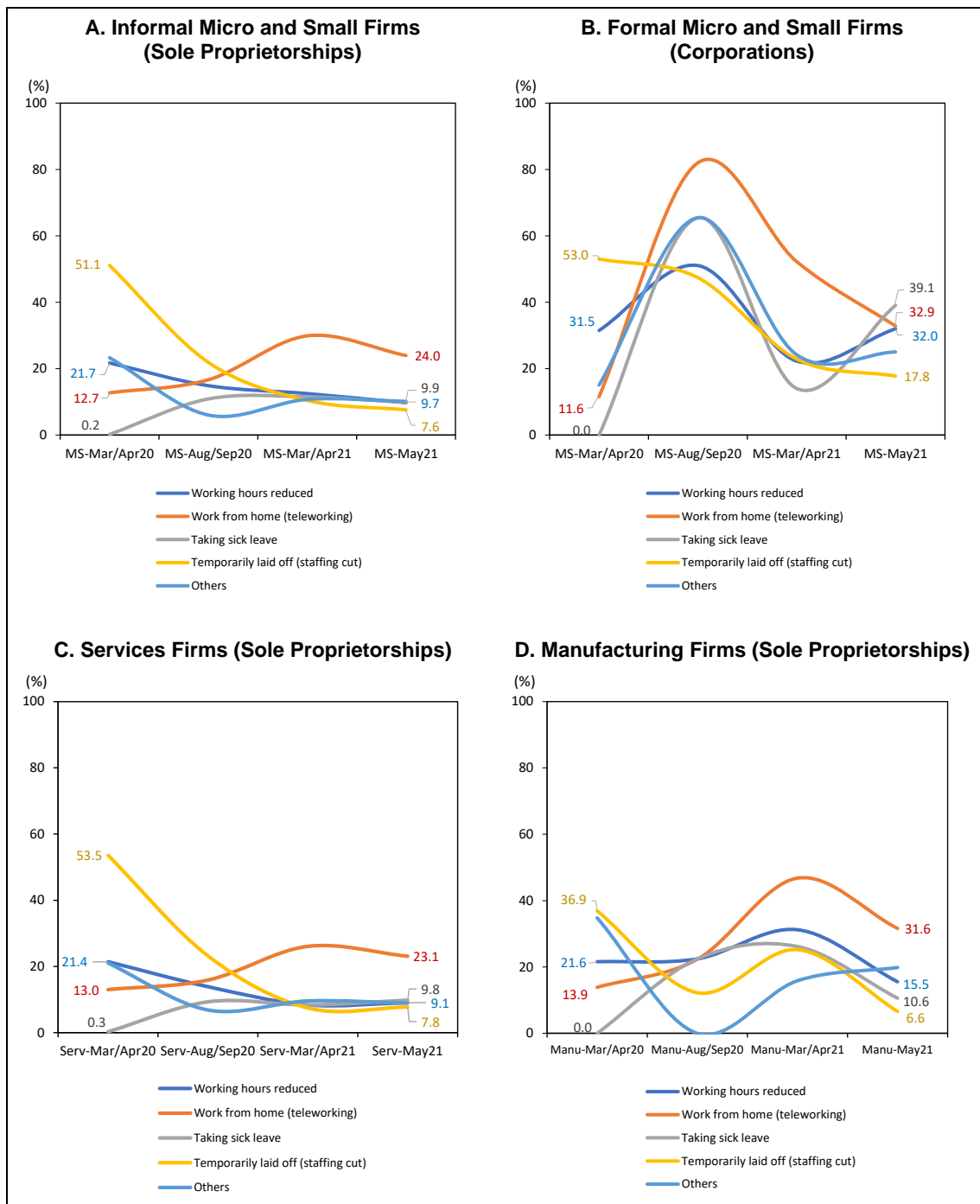
One year after the first outbreak, lifestyles and business operations adapted to the “new normal” of living with the pandemic. Layoffs sharply decreased (7.6% for informal micro and small enterprises and 17.8% for formal ones by May 2021), while work-from-home gradually spread (24.0% for informal and 32.9% for formal micro and small enterprises). Paid leave had also gradually increased by May 2021 (9.9% for informal and 39.1% for formal micro and small enterprises). As the economy began to recover, reduced working hours fell, especially for informal firms (9.7% for informal and 32.0% for formal micro and small enterprises).

By sector, informal firms in services followed the same trend: (i) temporarily laid off fell from 53.5% in March–April 2020 to 7.8% in May 2021; (ii) work-from-home arrangements increased from 13.0% to 23.1%; (iii) sick leaves increased slightly from 0.3% to 9.8%; and (iv) reduced working hours dropped from 21.4% to 9.1% (Figure 4C). For informal manufacturing firms, the trend was similar: (i) temporary layoffs fell from 36.9% in March–April 2020 to 6.6% in May 2021; (ii) work-from-home arrangements grew from 13.9% to 31.6%; (iii) sick leaves granted increased slightly from zero to 10.6%; and (iv) reduced working hours dropped from 21.6% to 15.5% (Figure 4D).

The LPM estimates (*employment*) showed staffing cuts were more likely in firms in construction, transport, arts/entertainment/recreation, and other services (including tourism) than in water supply firms in March–April 2020 with the PSBB, but figures were not statistically significant. Meanwhile, financial services and health/social services—essential services in a pandemic—were less likely to report staffing cuts than water supply in the same period³⁹. In August–September 2020, under PSBB II, layoffs were 52.9 percentage points higher in professional, scientific, and technical activities (the 10% significance level) than water supply. In March–April 2021, as economic recovery began, layoffs were 31.7 percentage points higher in health/social services (the 10% significance level) than water supply. In May 2021 as the second wave of the pandemic struck, layoffs were 5.6 percentage points higher in wholesale and retail trade (the 10% significance level) than water supply.

³⁹ 62.2 and 82.9 percentage points lower at 5% and 1% significance levels, respectively.

Figure 4: Working Environment during the Pandemic



Manu = manufacturing, MS = micro and small enterprises, Serv = services.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

By region, LPM results were mixed. In March–April 2020, firms in Gorontalo, Lampung, West Nusa Tenggara, West Papua, West Sulawesi, and Central Sulawesi were more likely to report staffing cuts than Jakarta (at the 1% or 5% significance level), while Banten, South Kalimantan, Central Kalimantan, East Kalimantan, and Southeast

Sulawesi had opposite results (the 1%, 5%, or 10% significance levels). The mixed impact continued with different combinations of provinces in August–September 2020. In March–April 2021, although the economy was beginning to recover, a large number of provinces were more likely to report layoffs than Jakarta.⁴⁰ In May 2021, the mixed impact appeared again.

By operating period, layoffs were likely to be higher in longer established firms than young enterprises with up to 5 years of operations in 2020.⁴¹ In May 2021, this likely improved in over 31 year old firms.⁴²

The estimates on informal firms did not show any statistically significant results in 2020. In March–April 2021, while temporary layoffs fell sharply among informal firms, staffing cuts were 13.0 percentage points higher than formal firms (the 5% significance level).

The estimates on digitally operated firms also did not show any statistically significant results across the surveys, but the gap of survey response ratio between digitally and non-digitally operated firms gave a detailed picture of employment 1 year into the pandemic (Figure 5).

Informal micro and small enterprises gradually shifted to digital operations throughout the first year of the pandemic, while those using the internet for business or adopting e-commerce led to personnel cuts to rationalize operations. This trend was more pronounced among informal micro and small enterprises than formal ones (except in the May 2021 survey). At the time of the first outbreak with social restrictions, staffing cuts were more likely in digitally operated informal micro and small enterprises than non-digitally operated informal firms (+6.3 for informal micro and small enterprises in March–April 2020, and +3.7 for informal ones in August–September 2020) (Figure 5A). This expanded further in 2021.⁴³ The size of the staffing cuts was higher in digitally operated informal micro and small enterprises than the formal digitally operated firms until March–April 2021, but this reversed in May 2021.

For informal firms in services, layoffs were more evident in digitally operated firms during the first year of the pandemic (Figure 5B).⁴⁴ For informal manufacturing firms, the gap likely narrowed between digitally and non-digitally operated firms.⁴⁵

The LPM results indicated that internationalized firms were less likely to reduce employment in 2020 (layoffs were 28.2 percentage points lower than domestically focused firms in March–April 2020), but they were more likely to do so in 2021, although the results were not statistically significant. By contrast, women-led firms were more likely to reduce employment in 2020 (although results were not statistically significant) but less likely to do so in 2021 (layoffs were 6.7 percentage points lower than firms led by men in March–April 2021).

⁴⁰ West Java, Central Java, North Kalimantan, West Nusa Tenggara, East Nusa Tenggara, North Sulawesi, and North Sumatra (at the 1%, 5%, or 10% significance levels).

⁴¹ 26.2 percentage points higher in 11–15 year old firms in March–April 2020 and 98.1 higher in 16–30 year old firms in August–September 2020, both at the 1% significance level.

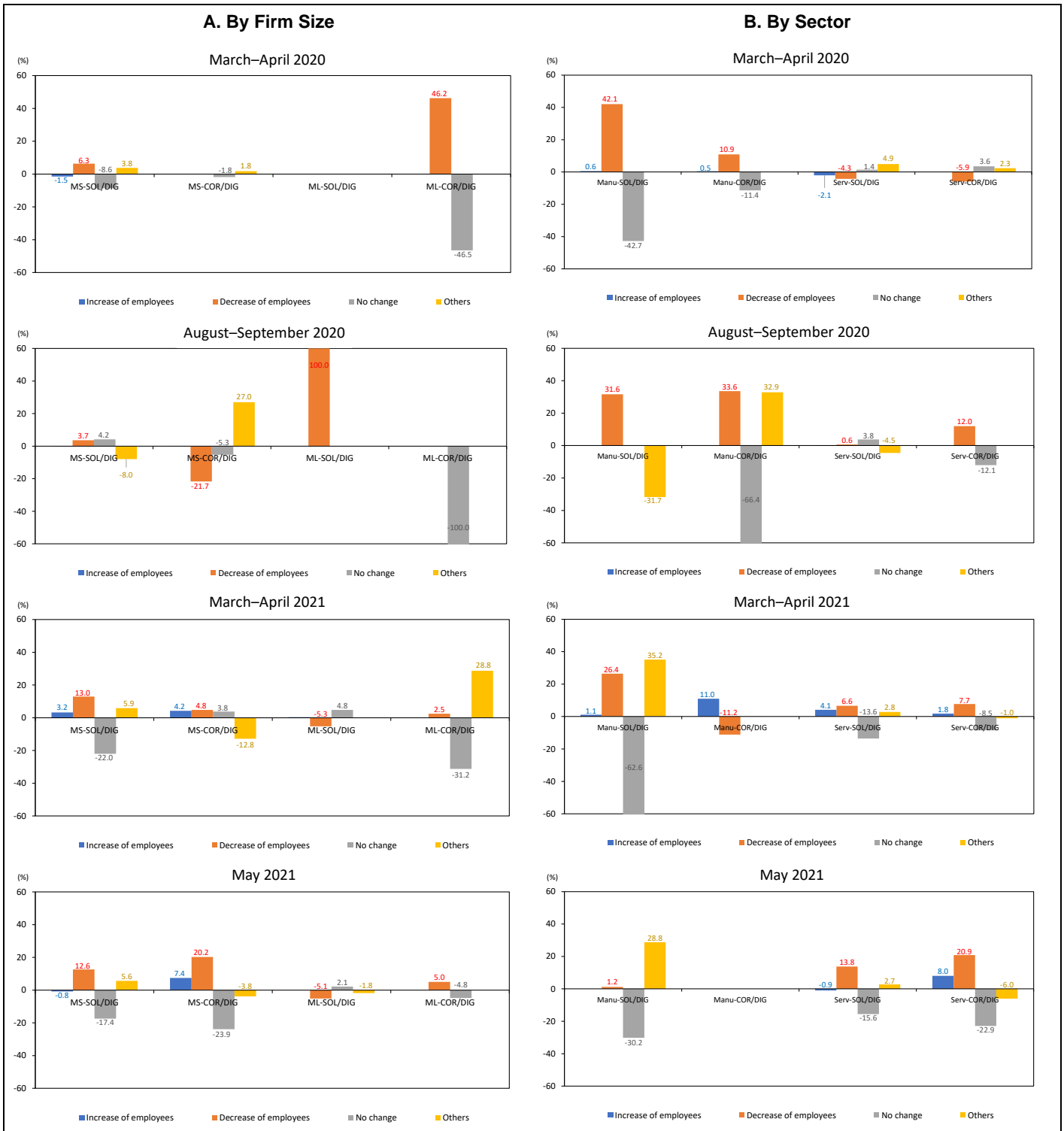
⁴² 4.4 percentage points lower than 0–5 year old firms (the 10% significance level).

⁴³ +13.0 and +12.6 for informal micro and small enterprises in March–April 2021 and May 2021, respectively.

⁴⁴ –4.3 in March–April 2020, +0.6 in August–September 2020, +6.6 in March–April 2021, and +13.8 in May 2021.

⁴⁵ +42.1 in March–April 2020, +31.6 in August–September 2020, +26.4 in March–April 2021, and +1.2 in May 2021.

Figure 5: Employment—Digitally Operated Enterprises



COR = corporations, DIG = digitally operated firms, Manu = manufacturing, ML = medium-sized and large enterprises, MS = micro and small enterprises, Serv = services, SOL = sole proprietorships.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

6.3 Wage Payments

Based on weighted survey data, the majority of informal micro and small enterprises (58.7% in March–April 2020 and 65.2% in August–September 2020) suspended wage payments to employees relatively soon after the pandemic started in 2020. The magnitude of their suspended wage payments was larger than formal micro and small enterprises (32.0% and 30.1% over the same period, respectively). This likely improved for informal micro and small enterprises in 2021 with an increased share of “no change” in wage payments.⁴⁶ By sector, informal firms both in services and manufacturing followed the same trend as informal micro and small enterprises. A large portion of informal firms in services suspended wages at the start of the pandemic, slowing toward May 2021 with more in “no change” status.⁴⁷ Informal manufacturing firms followed the same trend.

The LPM results showed that most industrial sectors suspended or decreased wage payments at the time of the 2020 outbreak. No wage payment condition (*wage1*) was 85.3 percentage points higher in education (the 5% significance level) and 69.1 percentage points higher in arts/entertainment/recreation (the 10% significance level) than water supply in March–April 2020. Reduced wage payment condition (*wage2*) was 37.2, 47.0, 41.9, and 45.8 percentage points higher in transport, administrative/support services, education, and health/social services than water supply, respectively, over the same period (the 5% or 10% significance level). In March to May 2021, wage suspensions decreased in several industries.⁴⁸ But the decreased wage condition remained high across many sectors, although some sectors improved.⁴⁹

Wage payment conditions differed by province, but many provinces reported more serious suspensions or reductions than Jakarta. Gorontalo, Central Kalimantan, Bangka Belitung, Kepulauan Riau, West Nusa Tenggara, West Papua, West Sulawesi, Central Sulawesi, North Sulawesi, and West Sumatra were more likely to report zero or reduced wage payments than Jakarta in March–April 2020 (the 1%, 5%, or 10% significance level). One year later, more provinces followed: Bali, Bengkulu, West Java, Central Java, West Kalimantan, South Kalimantan, Lampung, East Nusa Tenggara, Riau, South Sulawesi, Southeast Sulawesi, and North Sumatra in March–April 2021 (the 1% or 5% significance level). This continued in May 2021 with different province combinations.

By operating period, longer established firms were less likely to suspend wages than young firms a year into the pandemic.⁵⁰

⁴⁶ 23.8% for zero payment and 46.6% for no change in March–April 2021; 19.5% and 56.9% in May 2021, respectively.

⁴⁷ 59.6% for zero payment and 10.8% for no change in March–April 2020; 62.2% and 19.4% in August–September 2020; 26.3% and 48.9% in March–April 2021; 21.7% and 55.6% in May 2021, respectively.

⁴⁸ 21.4 percentage points lower in financial services than water supply in March–April 2021 (the 5% significance level); 12.3, 18.5, and 22.3 percentage points lower in manufacturing, construction, and real estate than water supply, respectively, in May 2021 (the 5% or 10% significance level).

⁴⁹ 16–82 percentage points higher in electricity, wholesale and retail trade, accommodation and food services, real estate, professional/scientific services, public administration, and other services than water supply in March–April 2021 (the 1%, 5%, or 10% significance level).

⁵⁰ Wage suspensions were 32.4 percentage points lower in firms older than 31 years than young firms of 0–5 years old in March–April 2020 (the 5% significance level); 83.8 and 11.7 percentage points lower in 16–30 year old firms in August–September 2020 (the 1% significance level) and in March–April 2021 (the 5% significance level).

Under the pandemic and social restrictions (PSBB I and II) in 2020, informal firms were more likely to suspend wages than formal firms: the no wage payment condition was 24.8 and 74.8 percentage points higher than formal firms in March–April 2020 and August–September 2020 at the 1% significance level, respectively. In March–April 2021 as economic recovery began, informal firms' wage suspension likely improved as compared with formal firms.⁵¹ But as the delta variant surged, informal firms were likely to suspend wages again to save costs as domestic demand fell once more.⁵²

For digitally operated firms, decreased wage payments were 12.7 percentage points lower than non-digital firms in March–April 2020 (the 1% significance level). But in May 2021, their wage suspension and reduction were 11.0 and 18.4 percentage points higher than non-digital firms at the 5% and 1% significance level, respectively. Digitally operated firms were likely trying to manage their operational costs.

For digitally operated informal micro and small enterprises, the wage payment condition changed a year into the pandemic. The extent of informal micro and small enterprises wage suspension was similar between digitally and non-digitally operated firms in 2020, but it was likely higher in digital firms than non-digital firms in 2021 (Figure 6A).⁵³ It was also likely higher than digitally operated formal micro and small enterprises.

Digitally operated informal firms in services followed the same trend in digitally operated informal micro and small enterprises (Figure 6B).⁵⁴ For digitally operated informal manufacturing firms, the extent of wage reduction was relatively higher than non-digital informal manufacturing firms. Overall, digitally operated informal micro and small enterprises and services firms were more likely to suspend wages to better manage operational costs.

The LPM result indicated that internationalized firms were less likely to suspend wages in 2021, suggesting they were beginning to recover as exports resumed.⁵⁵ Meanwhile, women-led firms were more likely to suspend wage payments at the time of the 2020 outbreak.⁵⁶

⁵¹ 14.3 percentage points lower than formal firms at the 10% significance level.

⁵² 13.3 percentage points higher than formal firms at the 1% significance level.

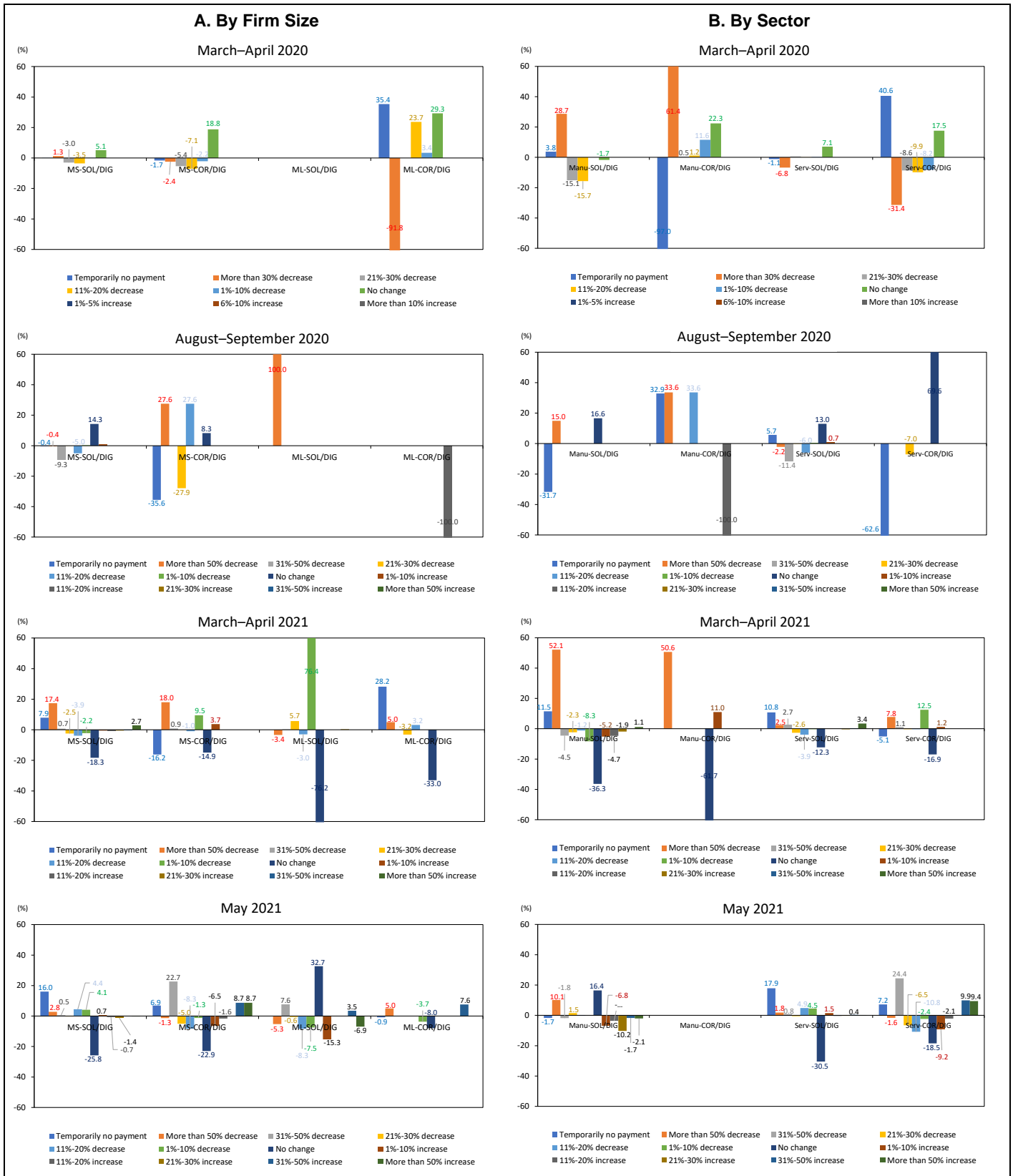
⁵³ +7.9 and +16.0 for informal micro and small enterprises with wage suspension in March–April 2021 and May 2021, respectively.

⁵⁴ -1.1, +5.7, +10.8, and +17.9 for informal services firms with wage suspension in March–April 2020, August–September 2020, March–April 2021, and May 2021, respectively.

⁵⁵ The extent of wage suspension was 33.9 and 14.5 percentage points lower than domestically focused firms in March–April 2021 and May 2021, respectively.

⁵⁶ The extent of their wage suspension was 15.9 percentage points higher than firms led by men in March–April 2020 at the 5% significance level.

Figure 6: Total Wage Payments—Digitally Operated Enterprises



COR = corporations, DIG = digitally operated firms, Manu = manufacturing, ML = medium-sized and large enterprises, MS = micro and small enterprises, Serv = services, SOL = sole proprietorships.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

6.4 Financial Conditions

Working Capital Condition

Mobility restrictions to contain the COVID-19 in the start of the pandemic immediately affected MSME business operations and their financial conditions. Working capital shortages were more serious in informal MSMEs as they normally cannot access formal financial services. As a result, many were forced to close. Based on the weighted survey data, 55.8% of informal micro and small enterprises had neither cash nor savings, while 31.7% reported they would run out of cash/funds within a month of the survey (March–April 2020). Their financial condition was worse than formal micro and small enterprises.⁵⁷ It was similar in August–September 2020.⁵⁸ However, those reporting sufficient cash/savings to maintain their business increased for both informal and formal micro and small enterprises in 2021, supported by the start of economic recovery. There was enough cash and savings to operate for 21.2% of informal micro and small enterprises and 24.6% for formal ones in March–April 2021. This increased to 24.1% for informal and 28.0% for formal micro and small enterprises in May 2021, while those out of cash fell to 26.1% of informal and 11.4% of formal micro and small enterprises, though the levels remained high.

Informal micro and small enterprises in services followed a similar trend as informal ones: 55.9% reported no cash with 32.2% to run out of cash in a month of the survey (March–April 2020). This was worse than formal firms in services. Similarly, in 2021, those with sufficient cash were in the informal services sector: 21.0% and 22.6% in March–April 2021 and May 2021, respectively; although improving, those out of cash remained high at 33.2% and 27.5% during the same period, respectively. Manufacturing firms followed the same trend as services.⁵⁹

The LPM estimates (*finance*) for the most part did not show statistically significant results in industrial sectors in 2020. In 2021, with economic recovery beginning, several industries were less likely to report they were in a “no or little cash” condition than water supply: 52.5 and 35.4 percentage points lower in financial services in March–April 2021 (the 1% significance level) and May 2021 (the 10% significance level); 80.5 lower in real estate (the 1% significance level) and 33.4 lower in education (the 5% significance level) in May 2021.

By region, at the beginning of the 2020 outbreak, many provinces were less likely to report firms with no or little cash than Jakarta: Bali, Bengkulu, DI Yogyakarta, Central Java, East Java, Central Kalimantan, East Kalimantan, and West Sumatra (the 1%, 5%, or 10% significance level). In other words, the magnitude of those lacking cash would be higher in Jakarta. In 2021, financial conditions were more serious in the provinces, though at different magnitudes. A lack of working capital was more pronounced in Bali, DI Yogyakarta, Jambi, Central Java, East Nusa Tenggara, South Sulawesi, Southeast Sulawesi, and West Sulawesi than Jakarta in March–April 2021

⁵⁷ 35.8% with no cash in hand and 39.2% to soon run out for informal micro and small enterprises.

⁵⁸ 64.6% with no cash and 15.0% to run out within 1–3 months for informal micro and small enterprises; while 17.5% with no cash, 24.7% to run out of cash in 1–3 months, and 57.3% to run out of cash in 3–6 months for formal micro and small enterprises.

⁵⁹ 55.6% out of cash for informal manufacturing firms in March–April 2020, dropping to 22.5% in March–April 2021 and 14.1% in May 2021. Those with enough cash increased to 22.2% in March–April 2021 and 38.3% in May 2021.

(the 1% or 5% significance level). This expanded with different combinations of provinces in May 2021.⁶⁰

By operating period, estimates in 2020 were not statistically significant. In 2021, longer established firms were less likely to face working capital shortages than young firms operating from 0 to 5 years.⁶¹

Informal firms were more likely to face working capital shortages than formal firms when the outbreak began in 2020 (March–April 2020): 13.1 percentage points higher than formal firms (the 5% significance level). In May 2021, this improved, with informal firms' cash shortages 14.9 percentage points lower than formal firms (the 10% significance level).

Digitally operated firms were less likely to be short on working capital than non-digitalized firms in March–April 2020 (12.9 percentage points lower at the 1% significance level).

As to the survey response gap between digital and non-digital firms, the share of those without cash was 4.6 percentage points lower in digital firms than non-digital firms, but the extent of firms that would run out in a month was 6.3 higher for informal micro and small enterprises in March–April 2020 (Figure 7A). Formal digital micro and small enterprises had a higher share of those with sufficient cash than informal ones. In August–September 2020, there were relatively few digital firms with no cash than non-digital informal micro and small enterprises, but those running out of cash in 6 months increased. During March to May 2021, those running out of cash improved but those already out of cash increased among informal micro and small enterprises, while the share of digital firms with enough cash was lower than non-digital informal firms. By contrast, among formal micro and small enterprises, digital firms with sufficient cash increased compared with non-digital firms (+26.3 higher in May 2021).

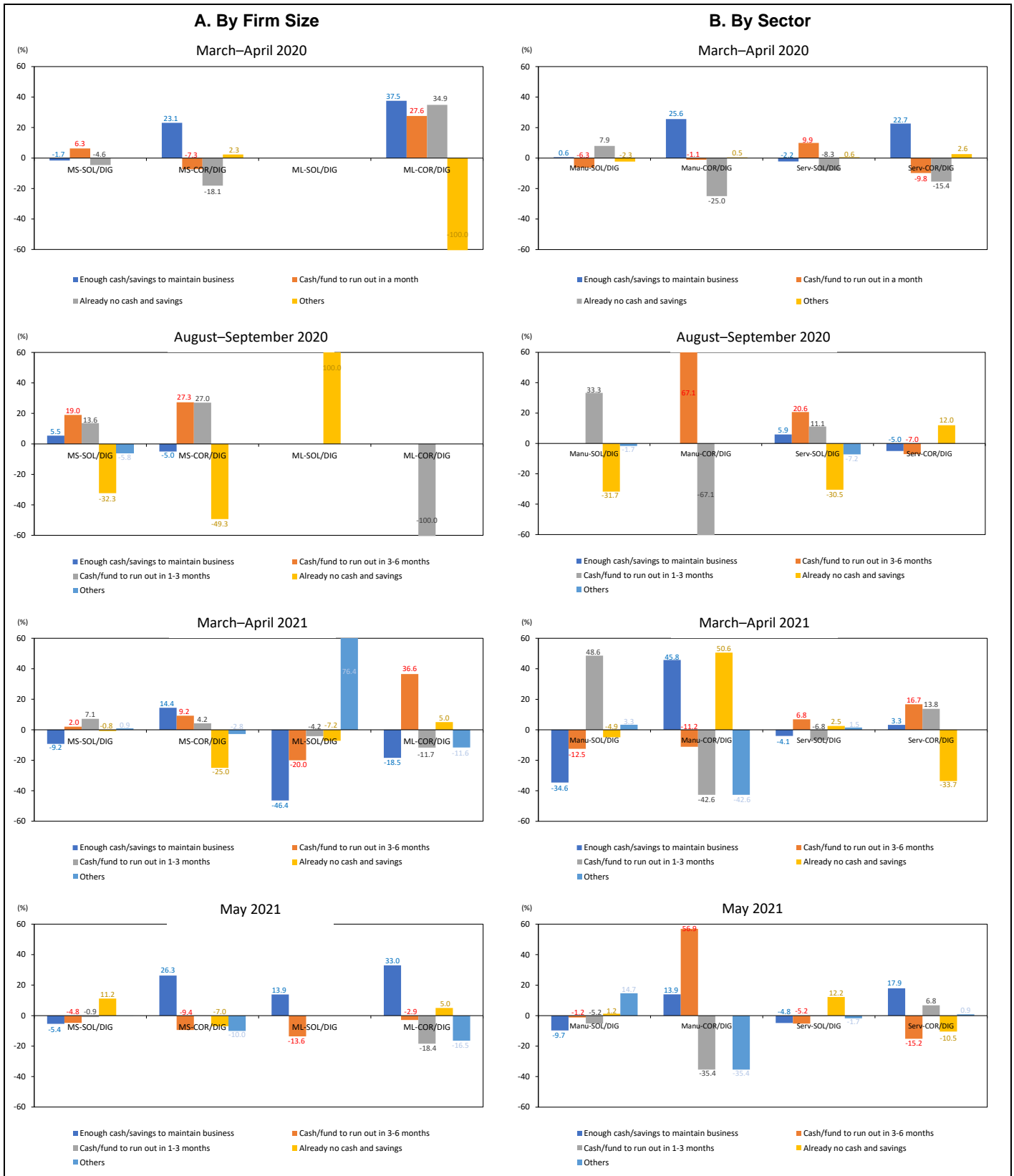
Informal firms in services followed a similar trend as informal micro and small enterprises (Figure 7B): digital firms had a limited impact on working capital shortages at the beginning of the pandemic, but moving to 2021, those out of cash grew while those with enough cash were more trivial than non-digital informal firms and digital formal firms in services. For informal manufacturing firms, the share of digital firms out of cash was higher than non-digital firms in March–April 2020; 1 year later, the no cash condition improved but those running out in 3 months expanded. Those with sufficient cash had a smaller share in digital firms than non-digital firms and formal digital firms in manufacturing.

The LPM did not show any statistically significant results in 2020, but women-led firms and micro and small enterprises were more likely to report cash shortages than firms led by men or medium-sized and large firms in 2021 (March to May) (the 1% or 5% significance level). In May 2021, internationalized firms were less likely to face cash shortages than domestically focused firms (24.9 percentage points lower at the 5% significance level).

⁶⁰ West Nusa Tenggara and Riau were added, while Banten, West Java, and East Java were less likely to report working capital shortages than Jakarta at the 1% or 5% significance level.

⁶¹ The extent of cash shortages was 24.6 percentage points lower in firms over 31 years old in March–April 2021 and 13.9 lower in 16–30 year old firms in May 2021 at the 1% significance level.

Figure 7: Financial Conditions—Digitally Operated Enterprises



COR = corporations, DIG = digitally operated firms, Manu = manufacturing, ML = medium-sized and large enterprises, MS = micro and small enterprises, Serv = services, SOL = sole proprietorships.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

Funding Condition

The pandemic along with social restrictions hit informal micro and small enterprises operations hard. In 2020, the majority already either had no cash or would run out soon. This improved in 2021 but working capital shortages remained high. There were more with sufficient cash, but less than formal micro and small enterprises. Those without cash were likely lower in digital firms than non-digital firms, but those running out of cash tended to increase in 2021. The question became how could informal firms manage operational costs and raise working capital to survive a lengthening pandemic?

Figure 8 illustrates the funding conditions of informal and formal firms during the pandemic thus far. Overall, firms mostly relied on their own funds and retained profits or borrowed from family, relatives, and friends. One year after the 2020 outbreak, they relied even more on their own funds, while they reduced borrowing from close relatives, as they availed of government financial support to businesses, which included informal sectors. At the same time, their access to bank credit increased moderately, again due to increased government lending assistance.

For informal micro and small enterprises, the share using their own funds increased from 29.4% in March–April 2020 to 75.4% in May 2021, although different survey groups (Figure 8A). Those borrowing from close relatives decreased from 32.2% to 21.0% over the same period. Those that successfully borrowed from banks increased from 2.3% to 15.6% during the same period, but only 8.6% of informal micro and small enterprises used government support to access bank credit (May 2021) through new lending facilities or credit guarantees. As formal micro and small enterprises were more likely to receive government support (12.1% as of May 2021), they could reduce informal borrowing more than informal firms (Figure 8B).

Informal services firms followed the same pattern as informal micro and small enterprises (Figure 8C). A high reliance on using their own funds (99.2% as of May 2021) was more pronounced among informal manufacturing firms (Figure 8D).

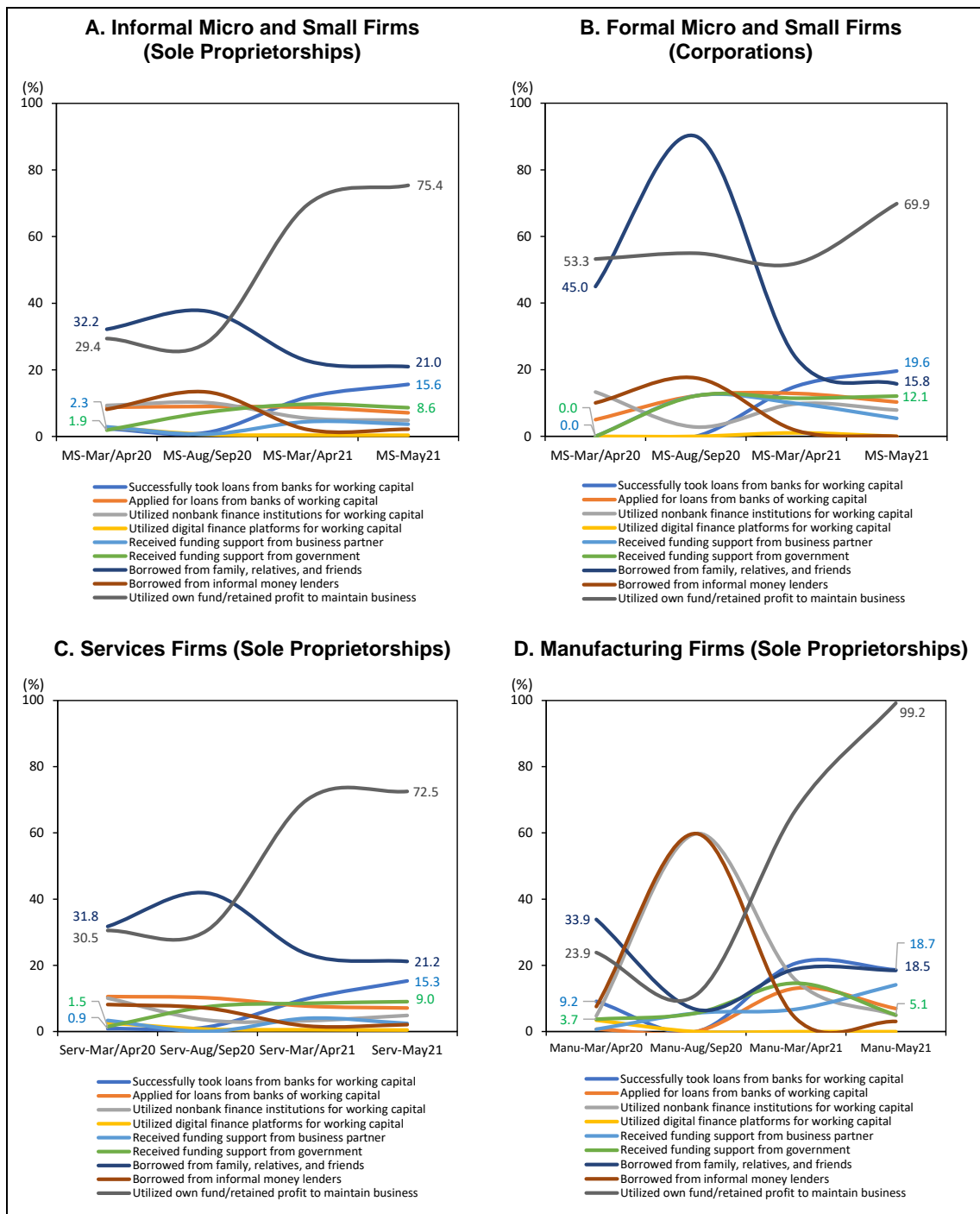
6.5 MSME Perceptions of the Pandemic Impact

Concerns Raised by Informal MSMEs

The surveys also monitored the main concerns of MSMEs and problems expected should the pandemic continue after the survey. In March–April 2020, the top-ranked concern of informal micro and small enterprises was a lack of working capital (76.2% of informal micro and small enterprises), followed by a decline in domestic demand (36.8%), loan repayments (33.3%), supply chain disruptions (25.7%), tax payments (10.8%), and a decline in foreign demand (8.3%) (Figure 9A). One year after the outbreak, domestic demand became their top concern (65.4% in May 2021) with a lack of working capital second (56.7%). Concern on supply disruptions, tax payments, and foreign demand fell to 16.9%, 4.3%, and 1.7%, respectively, in May 2021.

The length of the pandemic and frequent social restrictions created a serious concern over future demand for the products and services provided by informal micro and small enterprises. Government debt finance support eased concerns over working capital shortages and loan repayments by May 2021, but the share remained high. Less concern over taxes and foreign demand make sense as informal firms typically operate without paying taxes and operate domestically with little contact with global supply chains. As they generally have their own supply networks to serve limited domestic markets, broad supply chain disruptions would not be a major concern.

Figure 8: Funding during the Pandemic



Manu = manufacturing, MS = micro and small enterprises, Serv = services.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

Figure 9: Concerns and Obstacles Faced by MSMEs



Manu = manufacturing; MS = micro and small enterprises; MSME = micro, small, and medium-sized enterprise; Serv = services.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

Formal micro and small enterprises had similar concerns as informal firms, but by different magnitudes. There was greater concern over “domestic demand decline” (72.4% in May 2021) and less on working capital shortages (43.6%) due to government financial assistance. But concerns on loan repayments (29.0%) increased (Figure 9B). Those over supply disruptions and tax payments decreased. There was a small fraction which was worried over a decline in foreign demand (3.9% in May 2021). Informal firms in services and manufacturing had similar concerns as informal micro and small enterprises (Figures 9C and 9D)—with a decline in domestic demand topping the list among informal manufacturers (78.4% in May 2021).

Actions Considered by Informal MSMEs

Should the pandemic continue beyond the time of the survey, half (50.3%) of the informal micro and small enterprises in the March–April 2020 survey wanted loan repayments to financial institutions delayed. This was followed by reducing employee wages (35.6%), deferred tax payments (23.4%), applying for bankruptcy (20.1%), layoffs (18.6%), and contract cancellations (12.1%) (Figure 10A). One year after the outbreak, all these fell to 16% and below in the May 2021 survey—reducing wages moved to the top at 15.9%, followed by layoffs (15.1%).

Formal micro and small enterprises also wanted financial institutions to delay loan repayments (68.3%), followed by deferred tax payments (53.2%), wage reductions (45.0%), layoffs (26.6%), and contract cancellations (13.3%) (Figure 10B). One year after the outbreak, as financial concerns eased due to government support, they considered further staff layoffs (44.1% in May 2021) as the top action followed by wage cuts (31.5%) as concerns continued over reduced domestic demand. Given the length of the pandemic, applying for bankruptcy gradually increased (7.9% in May 2021).

Informal firms in services agreed that delaying loan repayments was needed, although its share fell from 49.5% in March–April 2020 to 14.5% in May 2021 (Figure 10B). Wage cuts (13.9%) and layoffs (13.8%) were second and third in the May 2021 survey. For informal manufacturing firms, wage cuts (32.4%) and layoffs (26.4%) were the top and second ranked actions in the May 2021 survey (Figure 10D).

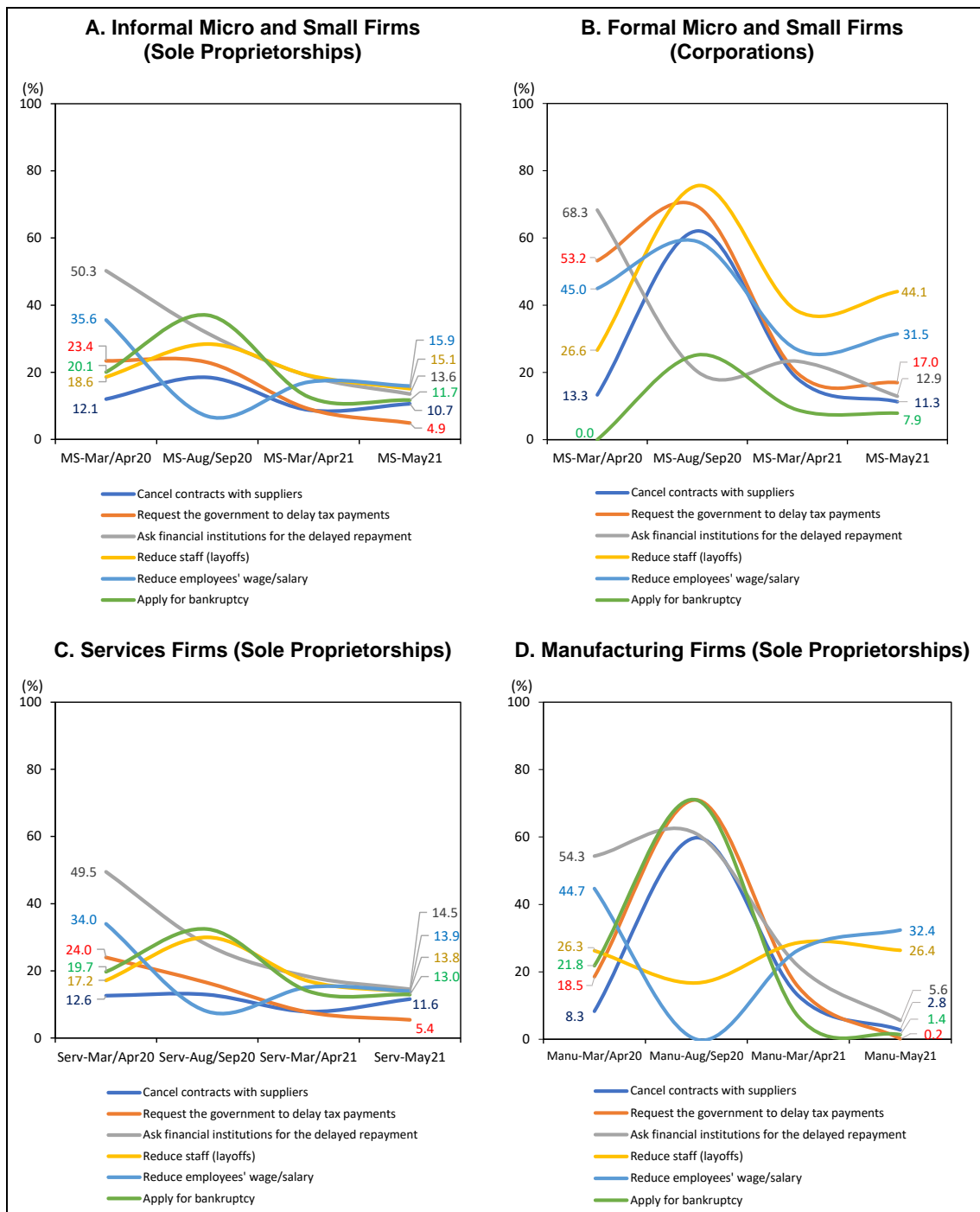
Policy Measures Desired by Informal MSMEs

The surveys also sought out the policy measures MSMEs wanted to see. Figure 11 shows nonfinancial and financial measures informal firms were looking for in March–April 2020 and March–April 2021.

In March–April 2020, subsidies to help businesses recover and cash transfers was the top policy measure desired (93.2%), followed by a comprehensive information platform on government assistance programs (86.7%) and assistance to pay salaries (85.2%). Assistance in paying wages, training and business literacy programs, and sector-specific support in areas such as tourism were more important to informal firms than formal firms.⁶²

⁶² The informal firm response ratio was 12.1, 17.6, and 13.4 percentage points higher than formal firms for wage assistance, training, and sector-specific support, respectively.

Figure 10: Actions Considered by MSMEs

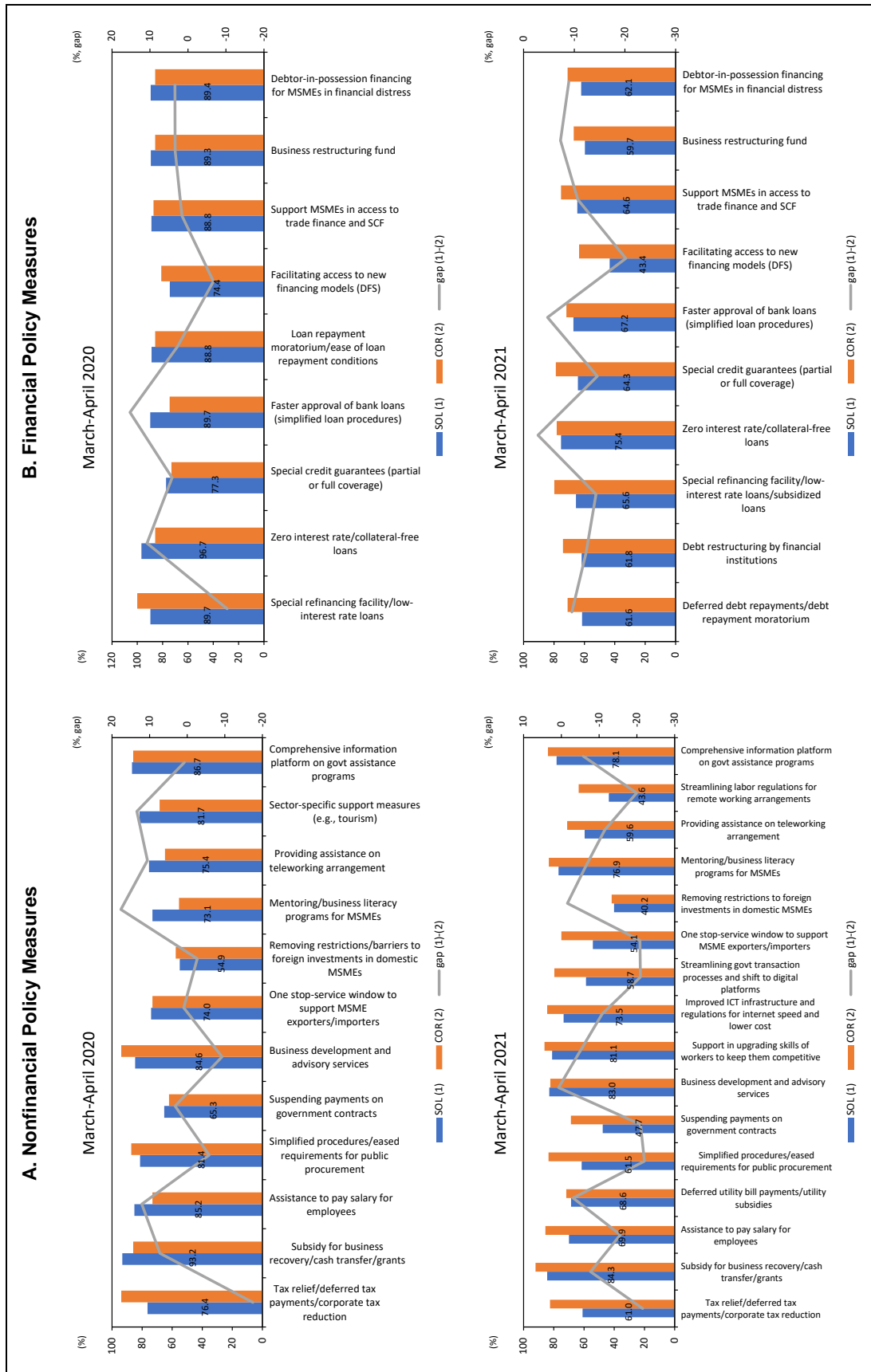


Manu = manufacturing; MS = micro and small enterprises; MSME = micro, small, and medium-sized enterprise; Serv = services.

Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.

Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

Figure 11: Policy Measures Desired by MSMEs



COR = corporations; MSME = micro, small, and medium-sized enterprise; SOL = sole proprietorships.
 Note: 528 valid samples in Indonesia for March–April 2020, 129 for August–September 2020, 2,515 for March–April 2021, and 2,207 for May 2021.
 Source: Calculations based on weighted data from MSME surveys in Indonesia for March–April 2020, August–September 2020, March–April 2021, and May 2021.

Zero interest/collateral-free loan was the top financial measure informal firms wanted (96.7%), followed by special refinancing facilities with low interest (89.7%) and simplified loan procedures for faster bank approvals (89.7%). Zero interest/collateral-free loans, simplified loan procedures, and special credit guarantees were desired more by informal than formal firms.⁶³ Access to new financing models or digital financial services was cited by 74.4% of informal firms, but their response ratio was 6.7 percentage points lower than formal firms.

One year into the pandemic, the policy measures informal firms sought changed slightly. In March–April 2021, subsidies for business recovery remained the top nonfinancial policy desired by informal firms (84.3%), but the second and third changed to business development advisory services (83.0%) and support in skills upgrading of workers (81.1%). Only business development advice was higher for informal firms than formal firms (0.7 percentage points higher); all others were below the shares of formal firms. Zero interest/collateral-free loans remained the top financial measure for informal firms (75.4%), followed by faster bank loan approvals (67.2%) and special low interest refinancing facilities (65.6%). But all these measures were less likely desired by informal than formal firms. “Facilitating access to new financing models (digital financial services)” was the lowest desired measure by informal firms (43.4%).

6.6 Policy Implications

Understanding Informal MSMEs to Design a Feasible Policy Framework

Informal MSMEs were hit hardest by COVID-19, more seriously than formal MSMEs. Many businesses were forced to close, and domestic demand for their products and services dropped sharply. One year into the pandemic, the situation improved, but domestic demand had yet to recover. Meanwhile, two types of business clusters formed and grew: (i) contracting firms hurt badly by the pandemic and (ii) groups of firms that benefitted from the pandemic. This was most prominent among firms in services.

The LPM estimates found that construction, administrative services, education, and entertainment services were the hardest hit initially in revenue, given the PSBB social restrictions. Information and communication, financial services, and health and social services had limited impact as they remained essential services. Local firms felt the impact on revenue more than Jakarta-based firms a year after the first outbreak. As the pandemic wore on, the impact became more serious for young firms aged up to 5 years. Women-led firms also faced serious impacts on revenue, employment, and finance. Internationalized firms had a mixed impact in terms of revenue and employment, affected by social restrictions and balanced by global market openness. Private businesses began reopening as the economy started to recovery in 2021. But small distributive trade and services—typically in informal sectors—reacted quickly to the surging delta variant 1 month before the second wave struck in mid-June 2021. They temporarily shut down or faced revenue losses again. Informal firms were more sensitive to the pandemic’s impact than formal firms. And business remained highly fragile given the uncertainty of COVID-19 infection rates.

The pandemic drove private businesses to go digital. Informal MSMEs joined this accelerating process. Digitally operated informal firms—those using the internet for business or using e-commerce—felt less impact from the pandemic in revenues than

⁶³ The informal firm response ratio was 10.8, 15.2, and 4.2 percentage points higher than formal firms for concessional loans, simplified loan procedures, and credit guarantees, respectively.

non-digital informal firms, falling into profitable or non-profitable clusters, especially for those in services.

The informal MSMEs surveyed had a few regular staff or paid part-time workers. At the start of the pandemic, they largely laid off staff and suspended wages. As the pandemic continued, they gradually adapted to the new normal, where work-from-home (teleworking) arrangements increased. However, employment remained unstable. When under high alert levels, they quickly returned to layoffs and wage suspensions, more than formal firms. Digitalization of informal MSMEs also led staffing cuts and reduced or suspended wages to rationalize operations and reduce costs, especially for those in services. The employment situation for local firms differed by province. But many provinces such as Bali, Java, Sulawesi, Kalimantan, and Sumatra had more layoffs and reduced or suspended wages than Jakarta.

The pandemic and social restrictions also hurt the finances of informal MSMEs. Working capital shortages were more serious than formal firms, and more evident among Jakarta-based firms. As the pandemic continued, however, two groups emerged: those with sufficient cash or savings and those facing serious working capital shortages. These were closely associated with two business clusters—those who were severely hit by the pandemic and those who benefited by supplying essential goods or services. Young firms had more cash/savings problems than longer established firms. Digitally operated firms had less financial issues than non-digital firms. But even digitally operated informal MSMEs had to contend with volatile working capital conditions. Formal MSMEs with digital operations were more likely to have sufficient cash available.

Informal MSMEs relied heavily on their own funds and borrowings from close relatives at the start of the pandemic. One year later, they borrowed less from close relatives while access to formal financial services increased—largely due to available government financial assistance. However, the number of informal MSMEs that could obtain credit from banks was still limited, so they relied more on internal to keep their business operating, suggesting many remained outside those qualified for government financial assistance. The use of digital financial services was out of their options.

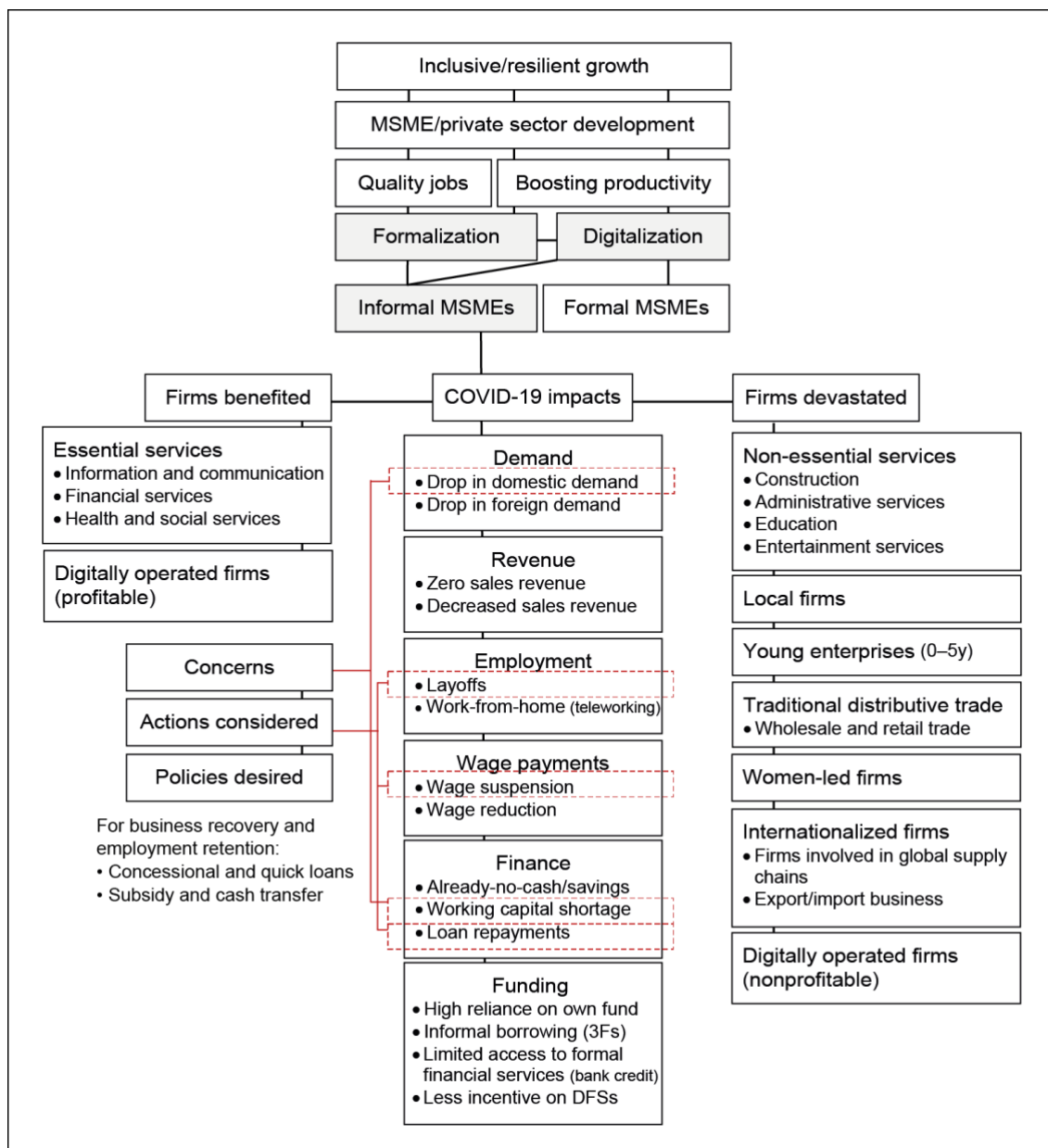
The top concern of most informal MSMEs at the start of the pandemic was the lack of working capital. One year later, their top concern shifted to the decline in domestic demand, as the pandemic continued with emerging new variants. But working capital shortages remained high as the second-ranked. Concerns over tax payments and a decline in foreign demand were ranked lowest, as these firms operate informally with many evading tax payments and focus on limited domestic markets.

Informal MSMEs also indicated actions they considered should the pandemic prolongs further. At the time of the 2020 outbreak, they indicated negotiating with financial institutions to delay loan repayments as a top-ranked action. Behind this, they were likely to take or expect bank credit assisted by the government in response to the COVID-19. But toward 2021, it was unclear what their top priorities were, given the limited number of responses. Still, wage cuts and layoffs became more prominent in May 2021, suggesting a shift from financial concerns to those involving employment.

This surfaced in their choice of desired policy measures. Concessional and quick loans, along with subsidies and cash transfers for business recovery and worker retention, were the top policy measures desired a year into the pandemic. For more real-time assistance from government, they initially asked the government to set up a comprehensive information platform on available support programs. In parallel, they wanted support for training and business literacy programs. As the pandemic continued, they increasingly looked to the government more in terms of business

development and skills upgrading for workers aside from a desire for continuous working capital support. Figure 12 summarizes key issues raised in this study to design a feasible policy framework for informal MSMEs.

Figure 12: COVID-19 Impact on Informal MSMEs—Evidence from Surveys and a Linear Probability Model



Source: Author.

Policy Actions for Informal MSMEs

Formalizing informal MSMEs and their employment is a critical step to promote MSME development, create a quality labor market, and accelerate inclusive growth. To this end, it is crucial that business owners are convinced they should look beyond maintaining the status quo—to shift from being stability-oriented to become more growth-oriented. Informal MSMEs typically serve low technology domestic markets with

a limited customer base. Their mindset is less innovative, and they normally are satisfied with keeping their business as is. The COVID-19 pandemic led to a new normal that offers an opportunity to change this informal business owners' mindset to one where owners see the advantages of formalizing their business. Government restrictions on mobility and social distancing in response to the outbreak encouraged a shift from a personal contact-based business model to one that includes digitalizing operations—from simple use of the internet for daily business to selling goods and services online or e-commerce. As revealed in the LPM results and survey findings, informal firms that went digital tried to rationalize their business operations and manage costs through staff and wage cuts. This made owners increasingly think about value creation and critical thinking for business growth. With a mindset attuned more toward growth, it would be relatively easy to see the advantage of formalizing their business. However, this has yet to happen among most informal MSMEs. As mentioned, there is a defining difference a year into the pandemic among informal MSMEs—those who struggled with the pandemic and those who benefitted (Figure 12). Digitally operated firms were among those who benefitted, although they were not always successful.

A policy framework on formalizing informal MSMEs should be designed proportionately, focusing on firms' different coping abilities to the pandemic and providing incentives to informal business owners for growth under the new normal. Based on the study findings, there are several policy implications that help formalize and increasingly digitalize MSMEs in Indonesia:

- Provide timely information on government support programs for informal business:

Informal MSMEs had a difficult time accessing up-to-date information on government assistance programs. The March–April 2021 survey also found that the use of government assistance programs was limited among MSMEs primarily due to the fact that they did not know how to access available assistance.⁶⁴ Building an SNS-based comprehensive information platform on government assistance programs would be worth considering.

- Elaborate focused group assistance with proportionate measures:

The LPM identified firms that suffered from the pandemic in terms of revenue, employment, and fiscal conditions: (i) non-essential services including construction, administrative services, education, and entertainment; (ii) firms located in specific provinces outside the capital; (iii) young enterprises operating from 0 to 5 years; (iv) traditional distributive trade and services (including tourism); (v) women-led firms; (vi) internationalized firms; and (iv) digitally operated firms (nonprofitable firms having problems with operational and financial management). The assistance would target those more adversely affected with measures proportionate to each impact level.

- Use a phased approach for assistance with well-scheduled budget allocations:

Given the uncertainty over controlling the pandemic, there is the increasing risk of bloating national budgets to continue government support programs over the

⁶⁴ The March–April 2021 survey in Indonesia assessed respondents' awareness of the following government programs: (i) subsidized loan program (*subsidi bunga*), (ii) credit restructuring fund (*penempatan dana*), (iii) credit guarantees (*penjaminan kredit UMKM*), (iv) income tax break facility (*PPH final UMKM*), (v) investment financing for cooperatives and MSMEs (*pembiayaan investasi LPDP*), and (vi) productive assistance for MSMEs (*bantuan presiden usaha mikro*). Only 5.4%–22.1% of MSME respondents (2,509) used these programs. 60.5% of the respondents answered that they did not know the procedure to apply for the income tax break facility, for instance.

long term. A phased approach for government assistance should be elaborated within a well-controlled budget framework.

- Provide business development services, mentoring support, and skills development training for workers:

A drop in domestic demand is the top concern among informal MSMEs. Strengthening business competitiveness is critical for creating demand, to survive and grow during a post-pandemic recovery. Business development and advisory services, mentoring and business literacy programs, tax education/incentives, and training to upgrade worker skills are critical. These also help create a base of quality jobs across the country.

- Strengthen business registration services:

There remains a need to create, expand, or strengthen one-stop service windows for new business registration nationwide, addressing informal MSMEs, startups, and entrepreneurs.

- Promote the digital transformation and increased use of technology in operations:

The digital transformation offers several benefits to informal MSMEs, startups, and entrepreneurs; it enhances access to business information, strengthens business networks, creates new business opportunities including access to global marketplaces and global supply chains, and reduces administrative costs. The assistance would include guidance on e-commerce development, teleworking arrangements, technology transfer and adoption, and research and development (R&D) for new business.

- Expand the base of incubators and accelerators for entrepreneurship development:

Business incubator and accelerator programs can be developed under the business development and advisory services. These would support strengthening business competitiveness and entrepreneurship development.

- Diversify alternative financing options and provide growth capital for business:

Finance is critical for business development. Working capital shortages were a major concern for informal MSMEs to survive the pandemic. Supported by government financial assistance, access to bank credit has gradually improved for informal MSMEs while more diversified financing options should be developed to fulfill their unmet financing needs. This would include further development and dissemination of digital financial services (such as peer-to-peer lending and equity crowdfunding platforms) and a dedicated MSME equity market (an Acceleration Board under the Indonesia Stock Exchange).

- Use more private sector resources for policy implementation:

As an informal MSME is a small business with a few staff, it is important to attract private sector support to implement government policy goals on formalizing informal firms, for example, outsourcing financial and business administration of informal firms using advisory professionals such as certified public accountants.

- Regulations that do not restrict new businesses but rather facilitate them.

7. CONCLUSION

This paper examined the COVID-19 impact on informal MSMEs in Indonesia by using an LPM regression and descriptive analysis based on evidence obtained through year-long surveys from March 2020 to May 2021. It also assessed the extent of the digital transformation and challenges brought on by the pandemic and provided policy implications on formalizing and digitalizing MSMEs in the country. Due to the urgency of capturing the MSME conditions to support the country's policy design for MSMEs amid the pandemic, the rapid surveys used a hybrid approach that combined online and field surveys. As survey samples were not selected randomly to extract a national representation, each sample group of four data points in time was different. But the study could focus on the change in respondents within the same group of MSMEs 1 year into the pandemic.

The LPM found two streams of business clusters among informal MSMEs—contracting firm groups that suffered through the pandemic and national social restrictions (PSBB) and those that benefitted. It identified different ways firms dealt with and responded to the effects of the pandemic among various groups of informal MSMEs. The COVID-19 crisis and mobility restrictions led many private businesses—including informal MSMEs—to accelerate digitalization. But digitally operated firms could not always operate successfully during the pandemic, again splitting businesses into those who suffered or benefited from the pandemic and the social restrictions imposed.

Most MSMEs operate informally. While informal sectors are thought to contribute less to national economic development, MSMEs are a driving force behind national economic growth. Formalizing informal MSMEs is critical to boosting national productivity, creating quality jobs, and promoting inclusive growth. This requires a well-designed policy framework. The study suggests a policy framework on formalizing informal MSMEs is designed proportionately, focusing on firms' different coping abilities to the pandemic and providing incentives for informal business owners to concentrate on growth under the new normal. The policy implications cover strengthening business competitiveness and entrepreneurship development for firms to survive and grow during the recovery period, with the digital transformation a part of the strategy. Changing informal business owners' mindset from being stability-oriented to growth-oriented is key.

In Indonesia, the growth projection was for a robust 2021, a 3.5% rebound from a 2.1% contraction in 2020. However, new variants such as Omicron increase the uncertainty over economic growth and raise the risk of business failures and bankruptcies, especially for MSMEs that account for a large number of informal firms and employment. Formalizing informal MSMEs is now more critical to a policy agenda that aims to build a resilient economic recovery and sustainable, inclusive growth.

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