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**Working Paper**

## Digital divide decoded: Can e-commerce and remote workforces enhance enterprise resilience in the COVID-19 era?

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## **ONLINE APPENDIX**

ADB Economics Working Paper No. 667

### **DIGITAL DIVIDE DECODED: CAN E-COMMERCE AND REMOTE WORKFORCES ENHANCE ENTERPRISE RESILIENCE IN THE COVID-19 ERA?**

Long Hai Vo, Thai-Ha Le, and Donghyun Park  
August 2022

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**APPENDIX**

*A1. Additional summary statistics on firm performance*

[Insert Table A1 here]

[Insert Figure A1 here]

*A2. Further results*

[Insert Tables A2 – A9 here]

*A3. Country- and industry marginal effects of website ownership*

[Insert Figures A2 – A3 here]

**Table A1: Firm Performance Indicators during COVID-19, By Industries**

Industry	Survey module →		Sales					Production		Labor			
	Obs.	Mean Sales Change (%)	SALE1	SALE2	SALE3	SALE4	SALE5	PROD1	PROD2	WORK1	WORK2	WORK3	WORK4
(1)	(2)	(3)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. Hotel and restaurants	789	-64.5	33.5	44.7	80.1	24.5	57.3	61.7	0.1	36.2	9.8	8.6	20.0
2. Other services	3	-59.7	0.0	33.3	66.7	0.0	66.7	33.3	0.0	0.0	0.0	0.0	0.0
3. Leather	97	-53.8	26.8	47.4	70.1	13.4	38.1	51.5	39.2	25.8	9.3	5.2	26.8
4. Textiles	228	-51.6	13.6	45.6	72.8	9.6	45.6	57.5	38.2	20.2	7.5	6.1	13.2
5. Transport machines	91	-50.0	9.9	47.3	73.6	7.7	36.3	65.9	35.2	30.8	8.8	2.2	20.9
6. Publishing, printing, and media	246	-49.7	14.2	40.2	78.5	13.8	44.7	63.8	51.2	30.9	7.3	5.7	19.9
7. Construction	1,108	-46.2	13.2	38.1	64.2	15.8	33.4	47.1	0.4	22.7	6.4	4.0	13.1
8. Services of motor vehicles	477	-46.1	13.4	35.6	71.7	6.5	38.4	49.9	0.2	21.2	7.1	4.0	17.4
9. Furniture	365	-45.3	16.7	40.0	64.9	13.2	31.5	49.3	38.6	25.2	7.1	5.5	19.5
10. Transport, storage, and communication	537	-45.1	10.4	28.7	71.3	11.0	36.7	53.8	0.7	24.0	5.2	4.8	16.8
11. Refined petroleum product	11	-43.9	0.0	63.6	81.8	9.1	36.4	63.6	63.6	36.4	9.1	0.0	0.0
12. Garments	727	-43.0	17.6	50.2	75.0	13.8	38.7	52.1	39.2	26.1	8.0	4.7	16.1
13. Basic metals	107	-41.9	12.1	39.3	71.0	6.5	27.1	43.0	36.4	17.8	4.7	1.9	14.0
14. Tobacco	13	-41.7	7.7	53.8	61.5	7.7	30.8	46.2	30.8	7.7	0.0	0.0	7.7
15. Information technology	240	-41.0	14.2	28.3	63.7	7.9	29.6	41.2	1.7	19.2	6.7	4.6	11.2
16. Nonmetallic minerals	340	-37.9	6.8	52.6	67.1	5.6	22.6	52.4	30.3	31.8	3.8	3.2	8.2
17. Wholesale	1,031	-35.5	10.7	34.7	64.8	8.4	25.9	42.9	0.4	24.1	5.9	4.0	13.5
18. Wood	201	-35.2	11.4	35.3	60.2	6.5	22.4	40.8	39.3	23.4	9.0	8.0	16.4
19. Retail	2,278	-34.5	10.9	37.3	61.8	8.0	29.0	42.7	0.5	18.2	5.6	4.0	13.8
20. Fabricated metal products	825	-34.2	8.2	30.1	64.4	3.8	20.6	42.9	27.2	15.2	4.1	2.2	13.2
21. Machinery and equipment	695	-31.8	5.9	29.8	61.6	2.0	16.8	44.6	22.6	16.8	4.0	1.9	7.9
22. Food	1,735	-31.5	7.8	23.4	58.4	5.2	22.2	41.6	29.0	18.6	4.3	3.7	9.5
23. Precision instruments	57	-30.6	3.5	26.3	56.1	3.5	24.6	35.1	26.3	17.5	1.8	1.8	10.5
24. Recycling	47	-30.4	8.5	38.3	53.2	6.4	14.9	31.9	19.1	31.9	4.3	2.1	6.4
25. Electronics	132	-29.9	8.3	34.1	62.9	6.8	18.9	43.9	28.8	27.3	6.8	3.0	10.6
26. Paper	91	-27.4	6.6	26.4	58.2	7.7	14.3	42.9	28.6	16.5	4.4	2.2	18.7
27. Plastics and rubber	311	-23.6	6.4	30.5	55.0	3.5	14.1	36.0	23.5	15.4	6.1	2.3	11.3
28. Chemicals	208	-18.1	2.9	36.5	53.4	3.4	18.8	32.7	26.0	17.8	3.4	1.0	6.7

Industry	Survey module →		Sales					Production		Labor			
	Obs.	Mean Sales Change (%)	SALE1	SALE2	SALE3	SALE4	SALE5	PROD1	PROD2	WORK1	WORK2	WORK3	WORK4
(1)	(2)	(3)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Mean	464	-40.1	10.8	38.3	65.9	8.3	30.6	46.8	24.2	22.1	5.7	3.5	13.0
S.D	533	10.5	7.0	9.4	7.7	4.9	12.5	9.4	17.2	7.9	2.5	2.2	6.0

Notes: Table A1 presents measures of industry-specific firm performance during the coronavirus disease (COVID-19) pandemic in our sample along three dimensions as captured by the three survey modules described in Table 1. Industries [column (1)] are defined based on the International Standard Industrial Classification. These are ranked by average percentage sales changes [column (3)]. Sale outcomes: Columns (3)–(7) report the shares of firms that, in this order, reported temporary or permanent closures, indicated a closure because of COVID-19, experienced sale decrease, were out of business for more than half the time since 2020 began, and experienced at least 50% sale reduction. Production outcomes: Columns (8)–(9) document the shares of firms that experienced decreasing weekly work hours and had production capacity fell below 50%. Labor outcomes: Columns (10)–(13) document the shares of firms that experienced a reduction in the number of temporary workers, and as a result of the pandemic, had at least 25% of their workforce either (i) quit/leave or (ii) laid-off or (iii) furloughed.

Source: Authors' calculations based on the data from World Bank Enterprise Surveys, <http://www.enterprisesurveys.org>.

Table A2: Effect of Website Ownership on Sale Outcomes, IV Regression Results

Dependent Variable Code →	SALE1			SALE2	SALE3			SALE4	SALE5
Model type →	Ordered probit			Probit	Ordered probit			Linear regression	
Dependent variable →	Probability of ...			If currently opened or temporarily closed ...					
	Permanent closure (1)	Temporary closure (2)	Remaining open (3)	Probability of temp. closure (4)	Probability that sales ... Decreased (5)    Unchanged (6)    Increased (7)			#weeks of temp. closure (8)	% change in sales (9)
Baseline categories: Domestic-private firms in service sectors, own no website, are small-sized, and compete locally									
Have website	-2.88*** (0.65)	-3.69*** (0.79)	6.57*** (1.40)	-7.08*** (2.20)	-3.11 (1.97)	1.70 (1.09)	1.42 (0.89)	-0.92*** (0.34)	7.70*** (1.70)
Physical capital	-0.00 (0.01)	-0.00 (0.01)	0.01 (0.01)	-0.04 (0.02)	0.02 (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.00)	0.01 (0.02)
Human capital	-0.02* (0.01)	-0.02* (0.01)	0.03* (0.02)	-0.11*** (0.03)	-0.06** (0.03)	0.03** (0.02)	0.03** (0.01)	0.00 (0.01)	0.03 (0.03)
Medium-sized firm	-1.59*** (0.50)	-1.99*** (0.64)	3.58*** (1.12)	-4.12** (1.86)	-2.44 (1.66)	1.39 (0.95)	1.05 (0.71)	-0.79** (0.31)	5.93*** (1.40)
Large-sized firm	-2.68*** (0.51)	-3.64*** (0.75)	6.32*** (1.21)	-2.90 (2.17)	-9.78*** (2.02)	5.18*** (1.08)	4.60*** (0.97)	-2.08*** (0.38)	12.59*** (1.68)
Growth rate	-0.02** (0.01)	-0.02** (0.01)	0.04** (0.01)	-0.05* (0.03)	-0.06** (0.02)	0.03** (0.01)	0.03** (0.01)	0.00 (0.00)	0.08*** (0.02)
Age	-0.03** (0.01)	-0.04** (0.02)	0.07** (0.03)	-0.14*** (0.05)	0.06 (0.04)	-0.03 (0.02)	-0.03 (0.02)	0.00 (0.01)	-0.01 (0.04)
Nationally competed firm	-0.67 (0.45)	-0.84 (0.56)	1.51 (1.01)	-2.46 (1.88)	-3.92** (1.67)	2.15** (0.93)	1.77** (0.74)	0.27 (0.30)	2.28 (1.39)

Dependent Variable Code →	SALE1			SALE2	SALE3			SALE4	SALE5
Model type →	Ordered probit			Probit	Ordered probit			Linear regression	
Dependent variable →	Probability of ...			If currently opened or temporarily closed ...					
	Permanent closure (1)	Temporary closure (2)	Remaining open (3)	Probability of temp. closure (4)	Probability that sales ... Decreased    Unchanged    Increased			#weeks of temp. closure (8)	% change in sales (9)
Baseline categories: Domestic-private firms in service sectors, own no website, are small-sized, and compete locally									
Internationally competed firm	-0.80 (0.59)	-1.03 (0.76)	1.83 (1.34)	-8.14*** (2.35)	-3.55* (2.15)	1.95* (1.18)	1.60 (0.97)	0.65 (0.43)	0.53 (1.82)
Foreign private firm	1.35 (0.93)	1.60 (1.03)	-2.95 (1.95)	-0.46 (2.79)	-4.56* (2.52)	2.37* (1.27)	2.18* (1.26)	0.78 (0.53)	-0.26 (2.18)
Public and other firms	0.23 (1.08)	0.29 (1.35)	-0.51 (2.42)	9.80** (4.20)	-3.03 (3.80)	1.60 (1.96)	1.42 (1.85)	0.71 (0.66)	-0.14 (3.01)
Manufacturing firm	-12.25 (12.15)	-9.41 (5.76)	21.65 (17.88)	15.55 (17.95)	23.79 (26.95)	-9.24 (5.83)	-14.55 (21.13)	-0.72 (3.61)	-2.59 (14.11)
Economic support index	0.03*** (0.01)	0.04*** (0.01)	-0.08*** (0.02)	0.25*** (0.03)	0.09*** (0.03)	-0.05*** (0.02)	-0.04*** (0.01)	0.01 (0.01)	-0.05** (0.03)
New cases per million	-0.04*** (0.01)	-0.05*** (0.01)	0.08*** (0.02)	-0.09*** (0.02)	-0.09*** (0.01)	0.05*** (0.01)	0.04*** (0.01)	-0.02*** (0.00)	0.12*** (0.01)
Observations	1,576	1,576	1,576	1,576	1,576	1,576	1,576	2,565	3,409

Notes: The instrumental variable is the number of power outages a firm experienced in a typical month during the last fiscal year. The figures in columns (1)–(7) capture marginal effects and are multiplied by 100. Columns (8) and (9) report the second-stage results of two-stage least square estimations. Heteroskedasticity-robust standard errors are in parentheses. Statistical significance levels: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ .

Source: Authors' calculations.

**Table A3: Effect of Website Ownership on Production and Labor Outcomes, IV Regression Results**

Dependent Variable Code →	PROD1			PROD2	WORK1			WORK2	WORK3	WORK4
Model type →	Ordered probit			Linear regression	Ordered probit			Linear regression		
Dependent variable →	Probability of total number of weekly work hours ...			% of full capacity	Probability of total number of temporary workers ...			Because of COVID-19, the share of workers that ...		
	Decreased	No	Increased		Decreased	No	Increased	Leave/quit	Are laid-off	Are furloughed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Baseline categories: Domestic-private firms in services sectors, own no website, are small-sized, and compete locally										
Have website	-6.10*** (2.07)	4.76*** (1.64)	1.34*** (0.44)	2.45* (1.27)	-4.88*** (1.67)	3.81*** (1.34)	1.06*** (0.34)	1.12 (3.50)	-2.06 (1.44)	-3.18* (1.83)
Physical capital	-0.02 (0.02)	0.01 (0.02)	0.00 (0.01)	0.02* (0.01)	-0.00 (0.02)	0.00 (0.02)	0.00 (0.00)	-0.03 (0.03)	0.01 (0.02)	-0.04** (0.02)
Human capital	-0.08** (0.03)	0.06** (0.02)	0.02** (0.01)	0.06*** (0.02)	-0.12*** (0.03)	0.09*** (0.02)	0.03*** (0.01)	-0.03 (0.04)	-0.00 (0.02)	0.06** (0.03)
Medium-sized firm	-3.11* (1.77)	2.43* (1.39)	0.68* (0.39)	5.93*** (1.07)	2.00 (1.35)	-1.43 (0.96)	-0.57 (0.39)	-7.56*** (2.31)	-4.41*** (1.23)	-5.00*** (1.48)
Large-sized firm	-5.85*** (2.06)	4.49*** (1.58)	1.37*** (0.49)	11.33*** (1.26)	7.96*** (1.85)	-6.16*** (1.48)	-1.80*** (0.41)	-8.74*** (2.85)	-4.04*** (1.50)	-7.55*** (1.83)
Growth rate	-0.08*** (0.03)	0.06*** (0.02)	0.02*** (0.01)	0.08*** (0.02)	-0.11*** (0.02)	0.08*** (0.02)	0.03*** (0.01)	-0.01 (0.03)	0.01 (0.02)	-0.02 (0.02)
Age	0.09* (0.05)	-0.07* (0.04)	-0.02* (0.01)	-0.08*** (0.03)	-0.10** (0.04)	0.07** (0.03)	0.02** (0.01)	0.09* (0.05)	-0.06* (0.03)	-0.05 (0.04)
Nationally competed firm	-5.16*** (1.81)	4.02*** (1.43)	1.14*** (0.38)	1.40 (1.07)	-3.03* (1.57)	2.44* (1.28)	0.59** (0.29)	-0.76 (2.32)	-0.28 (1.23)	1.27 (1.54)



Dependent Variable Code →	PROD1			PROD2	WORK1			WORK2	WORK3	WORK4
Model type →	Ordered probit			Linear regression	Ordered probit			Linear regression		
Dependent variable →	Probability of total number of weekly work hours ...			% of full capacity	Probability of total number of temporary workers ...			Because of COVID-19, the share of workers that ...		
	Decreased	No change	Increased		Decreased	No change	Increased	Leave/quit	Are laid-off	Are furloughed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Baseline categories: Domestic-private firms in services sectors, own no website, are small-sized, and compete locally										
Internationally competed firm	-5.40** (2.30)	4.20** (1.79)	1.20** (0.51)	1.87 (1.37)	-8.90*** (1.85)	6.60*** (1.39)	2.30*** (0.52)	1.51 (2.95)	-0.14 (1.58)	0.23 (1.88)
Foreign private firm	0.63 (2.70)	-0.48 (2.08)	-0.14 (0.62)	-3.27** (1.60)	0.83 (2.25)	-0.64 (1.74)	-0.19 (0.51)	2.45 (3.13)	0.62 (1.68)	-4.36** (2.14)
Public and other firm	-4.78 (3.92)	3.53 (2.80)	1.24 (1.12)	-0.48 (2.32)	1.08 (3.26)	-0.83 (2.54)	-0.25 (0.72)	16.85*** (4.24)	-4.70** (2.27)	0.28 (3.39)
Manufacturing firm	5.19 (17.89)	-3.83 (12.63)	-1.37 (5.25)	-0.01 (0.02)	20.99*** (2.79)	7.93 (21.71)	-28.93 (24.42)	10.56 (32.34)	4.03 (17.38)	8.64 (21.24)
Economic support index	0.02 (0.03)	-0.02 (0.02)	-0.01 (0.01)	0.08*** (0.01)	0.02 (0.03)	-0.01 (0.02)	-0.00 (0.01)	-0.03 (0.04)	-0.07*** (0.02)	0.23*** (0.02)
New cases per million	-0.10*** (0.01)	0.07*** (0.01)	0.02*** (0.00)	51.81*** (2.04)	-0.04*** (0.01)	0.03*** (0.01)	0.01*** (0.00)	-0.00 (0.02)	-0.01 (0.01)	-0.08*** (0.01)
Observations	1,576	1,576	1,576	3,986	1,576	1,576	1,576	2,200	2,206	3,054

Notes: The instrumental variable is the number of power outages a firm experienced in a typical month during the last fiscal year. The figures in columns (1)–(3) and (5)–(7) capture marginal effects and are multiplied by 100. Columns (4) and (8)–(10) report the second-stage results of two-stage least square estimations. Heteroskedasticity-robust standard errors are in parentheses. Statistical significance levels: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ .

Source: Authors' calculations.

**Table A4: Impact of Owning a Website on Sale Outcomes, Regression without Instrumental Variable**

Dependent Variable Code →	SALE1			SALE2	SALE3			SALE4	SALE5
Model type →	Ordered probit			Probit	Ordered probit			Linear regression	
Dependent variable →	Probability of ...			If currently opened or temporarily closed ...					
	Permanent closure (1)	Temporary closure (2)	Remaining open (3)	Probability of temp. closure (4)	Probability of sales ... Decreased (5)    Unchanged (6)    Increased (7)			#weeks of temp. closure (8)	% change in sales (9)
Baseline categories: Domestic-private firms in services sectors, own no website, are small-sized, and compete locally									
Have website	-2.70*** (0.48)	-3.50*** (0.59)	6.20*** (1.03)	-8.02*** (1.80)	-4.68*** (1.59)	2.59*** (0.90)	2.10*** (0.69)	-0.53* (0.28)	7.28*** (1.32)
Physical capital	-0.00 (0.01)	-0.00 (0.01)	0.01 (0.01)	-0.04 (0.02)	0.02 (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.00)	0.01 (0.02)
Human capital	-0.01* (0.01)	-0.02* (0.01)	0.03* (0.02)	-0.11*** (0.03)	-0.06** (0.03)	0.03** (0.02)	0.03** (0.01)	0.00 (0.01)	0.03 (0.03)
Medium-sized firm	-1.54*** (0.48)	-1.97*** (0.61)	3.51*** (1.08)	-4.13** (1.85)	-2.48 (1.68)	1.42 (0.96)	1.06 (0.72)	-0.85*** (0.31)	5.99*** (1.39)
Large-sized firm	-2.59*** (0.50)	-3.59*** (0.71)	6.19*** (1.17)	-2.91 (2.17)	-9.83*** (2.01)	5.22*** (1.07)	4.62*** (0.97)	-2.16*** (0.38)	12.67*** (1.67)
Growth rate	-0.02*** (0.01)	-0.02*** (0.01)	0.04*** (0.01)	-0.05** (0.03)	-0.06** (0.02)	0.03** (0.01)	0.03** (0.01)	0.00 (0.00)	0.08*** (0.02)
Age	-0.03** (0.01)	-0.04** (0.02)	0.07** (0.03)	-0.14*** (0.05)	0.06 (0.04)	-0.03 (0.02)	-0.03 (0.02)	0.00 (0.01)	-0.00 (0.04)
Nationally competed firm	-0.65 (0.44)	-0.83 (0.56)	1.48 (1.00)	-2.47 (1.88)	-3.94** (1.68)	2.17** (0.94)	1.78** (0.75)	0.20 (0.30)	2.34* (1.39)
Internationally competed firm	-0.79 (0.58)	-1.03 (0.77)	1.82 (1.35)	-8.12*** (2.36)	-3.56* (2.15)	1.96* (1.19)	1.60 (0.97)	0.60 (0.43)	0.58 (1.82)

Dependent Variable Code →	SALE1			SALE2	SALE3			SALE4	SALE5
Model type →	Ordered probit			Probit	Ordered probit			Linear regression	
Dependent variable →	Probability of ...			If currently opened or temporarily closed ...					
	Permanent closure (1)	Temporary closure (2)	Remaining open (3)	Probability of temp. closure (4)	Probability of sales ... Decreased (5)    Unchanged (6)    Increased (7)			#weeks of temp. closure (8)	% change in sales (9)
Baseline categories: Domestic-private firms in services sectors, own no website, are small-sized, and compete locally									
Foreign private firm	1.33 (0.91)	1.60 (1.01)	-2.94 (1.91)	-0.47 (2.80)	-4.64* (2.52)	2.41* (1.27)	2.22* (1.26)	0.78 (0.54)	-0.28 (2.19)
Public and other firm	0.24 (1.07)	0.31 (1.35)	-0.55 (2.42)	9.71** (4.19)	-3.11 (3.70)	1.65 (1.90)	1.47 (1.80)	0.73 (0.67)	-0.14 (3.02)
Manufacturing firm	-12.29 (10.97)	-9.55* (5.26)	21.85 (16.18)	15.61 (18.34)	24.23 (20.39)	-9.37** (4.31)	-14.86 (16.10)	-0.78 (3.63)	-2.64 (14.14)
Economic support index	0.03*** (0.01)	0.04*** (0.01)	-0.08*** (0.02)	0.25*** (0.03)	0.09*** (0.03)	-0.05*** (0.02)	-0.04*** (0.01)	0.01 (0.01)	-0.05** (0.03)
New cases per million	-0.04*** (0.01)	-0.05*** (0.01)	0.08*** (0.01)	-0.09*** (0.02)	-0.09*** (0.01)	0.05*** (0.01)	0.04*** (0.01)	-0.02*** (0.00)	0.12*** (0.01)
Observations	4,215	4,215	4,215	3,839	4,032	4,032	4,032	1,576	3,028

Notes: The figures in columns (1)–(7) capture marginal effects and are multiplied by 100. Heteroskedasticity-robust standard errors are in parentheses. Statistical significance levels: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ .

Source: Authors' calculations.

**Table A5: Impact of Having a Website on Production and Labor Outcomes, Regression Without Instrumental Variable**

<b>Dependent Variable Code →</b>	<b>PROD1</b>			<b>PROD2</b>	<b>WORK1</b>			<b>WORK2</b>	<b>WORK3</b>	<b>WORK4</b>
Model type →	Ordered probit			Linear regression	Ordered probit			Linear regression		
Dependent variable →	Probability of total number of weekly work hours ...			% of full capacity	Probability of total number of temporary workers ...			Because of COVID-19, the share of workers that ...		
	Decreased	No change	Increased		Decreased	No change	Increased	Leave/quit	Are laid-off	Are furloughed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Baseline categories: Domestic-private firms in services sectors, own no website, are small-sized, and compete locally										
Have website	-6.65*** (1.70)	5.19*** (1.36)	1.46*** (0.36)	0.08*** (0.02)	-5.10*** (1.45)	3.99*** (1.17)	1.11*** (0.30)	-1.51 (2.07)	-2.63** (1.11)	-0.46 (1.42)
Physical capital	-0.02 (0.02)	0.01 (0.02)	0.00 (0.01)	0.00 (0.00)	-0.00 (0.02)	0.00 (0.01)	0.00 (0.00)	-0.03 (0.03)	0.01 (0.02)	-0.04* (0.02)
Human capital	-0.08** (0.03)	0.06** (0.02)	0.02** (0.01)	0.00** (0.00)	-0.12*** (0.03)	0.09*** (0.02)	0.03*** (0.01)	-0.03 (0.04)	-0.00 (0.02)	0.06** (0.03)
Medium-sized firm	-3.13* (1.80)	2.44* (1.41)	0.69* (0.40)	0.04* (0.02)	1.99 (1.39)	-1.42 (0.99)	-0.57 (0.41)	-7.27*** (2.30)	-4.34*** (1.24)	-5.24*** (1.48)
Large-sized firm	-5.88*** (2.09)	4.50*** (1.60)	1.38*** (0.50)	0.07*** (0.03)	7.95*** (1.78)	-6.15*** (1.40)	-1.79*** (0.42)	-8.20*** (2.80)	-3.93*** (1.50)	-8.05*** (1.82)
Growth rate	-0.08*** (0.03)	0.06*** (0.02)	0.02*** (0.01)	0.00*** (0.00)	-0.11*** (0.02)	0.08*** (0.02)	0.03*** (0.01)	-0.01 (0.03)	0.01 (0.02)	-0.02 (0.02)
Age	0.09* (0.05)	-0.07* (0.04)	-0.02* (0.01)	-0.00* (0.00)	-0.10*** (0.04)	0.07*** (0.03)	0.02** (0.01)	0.10* (0.05)	-0.06* (0.03)	-0.05 (0.04)
Nationally competed firm	-5.18*** (1.80)	4.03*** (1.41)	1.15*** (0.39)	0.06*** (0.02)	-3.01* (1.54)	2.41* (1.25)	0.60** (0.30)	-0.41 (2.30)	-0.21 (1.23)	0.93 (1.53)

Dependent Variable Code →	PROD1			PROD2	WORK1			WORK2	WORK3	WORK4
Model type →	Ordered probit			Linear regression	Ordered probit			Linear regression		
Dependent variable →	Probability of total number of weekly work hours ... Decreased      No      Increased change (1)      (2)      (3)			% of full capacity (4)	Probability of total number of temporary workers ... Decreased      No      Increased change (5)      (6)      (7)			Because of COVID-19, the share of workers that ... Leave/quit      Are laid-      Are off      furloughed (8)      (9)      (10)		
Baseline categories: Domestic-private firms in services sectors, own no website, are small-sized, and compete locally										
Internationally competed firm	-5.41** (2.30)	4.20** (1.78)	1.21** (0.52)	0.07** (0.03)	-8.83*** (1.81)	6.49*** (1.33)	2.34*** (0.54)	1.77 (2.96)	-0.09 (1.59)	-0.01 (1.89)
Foreign private firm	0.60 (2.65)	-0.46 (2.04)	-0.14 (0.61)	-0.01 (0.03)	0.82 (2.25)	-0.63 (1.73)	-0.19 (0.51)	2.36 (3.15)	0.61 (1.69)	-4.35** (2.15)
Public and other firm	-4.82 (3.81)	3.56 (2.72)	1.26 (1.09)	0.06 (0.05)	1.06 (3.18)	-0.81 (2.47)	-0.25 (0.71)	16.96*** (4.26)	-4.68** (2.28)	0.24 (3.40)
Manufacturing firm	5.34 (20.04)	-3.93 (14.09)	-1.42 (5.96)		20.77*** (2.76)	8.47 (22.37)	-29.24 (25.06)	10.03 (32.52)	3.91 (17.49)	9.35 (21.28)
Economic support index	0.02 (0.03)	-0.02 (0.02)	-0.00 (0.01)	-0.00 (0.00)	0.02 (0.03)	-0.01 (0.02)	-0.00 (0.01)	-0.04 (0.04)	-0.07*** (0.02)	0.23*** (0.02)
New cases per million	-0.10*** (0.01)	0.07*** (0.01)	0.02*** (0.00)	0.00*** (0.00)	-0.04*** (0.01)	0.03*** (0.01)	0.01*** (0.00)	-0.00 (0.02)	-0.01 (0.01)	-0.09*** (0.01)
Observations	4,043	4,043	4,043	4,043	3,840	3,840	3,840	1,224	1,232	2,466

Notes: The figures in columns (1)–(3) and (5)–(7) capture marginal effects and are multiplied by 100. Heteroskedasticity-robust standard errors are in parentheses. Statistical significance levels: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ .

Source: Authors' calculations.

**Table A6: Channels via Which Website Ownership Facilitates Firm Resilience**

<b>Dependent Variable Code</b> →	<b>MECH1</b>	<b>MECH2</b>	<b>MECH3</b>	<b>MECH4</b>	<b>MECH5</b>
Model type →	Probit			Linear regression	
Dependent variable/Channels →	Probability of started or increased ...			Share of ...	
	Online business (1)	Delivery (2)	Remote work (3)	Online sales (4)	Remote workforce (5)
Baseline categories: Domestic-private firms in services sectors, own no website, are small-sized, and compete locally					
Have website	5.33*** (1.43)	0.58 (1.42)	8.76*** (1.62)	1.57** (0.62)	1.30** (0.56)
Physical capital	0.01 (0.02)	-0.02 (0.02)	-0.08*** (0.02)	-0.01 (0.01)	-0.02*** (0.01)
Human capital	-0.10*** (0.03)	-0.08*** (0.03)	-0.12*** (0.03)	-0.03** (0.01)	-0.04*** (0.01)
Medium-sized firm	2.80* (1.50)	3.00** (1.45)	9.55*** (1.70)	-0.10 (0.66)	0.32 (0.60)
Large-sized firm	8.62*** (1.89)	7.43*** (1.83)	24.30*** (2.11)	0.70 (0.78)	3.47*** (0.71)
Growth rate	0.02 (0.02)	0.02 (0.02)	0.03 (0.03)	-0.00 (0.01)	-0.01 (0.01)
Age	-0.13*** (0.04)	-0.11*** (0.04)	0.05 (0.04)	-0.05*** (0.02)	0.01 (0.02)
Nationally competed firm	-4.19** (1.67)	-6.75*** (1.67)	-0.08 (1.76)	-0.67 (0.66)	-0.33 (0.60)
Internationally competed firm	-12.24*** (1.92)	-18.71*** (1.80)	-0.06 (2.23)	-2.38*** (0.85)	-1.42* (0.77)
Foreign private firm	-1.14 (2.35)	-0.23 (2.41)	10.91*** (2.75)	2.27** (0.99)	2.34*** (0.90)

<b>Dependent Variable Code</b> →	<b>MECH1</b>	<b>MECH2</b>	<b>MECH3</b>	<b>MECH4</b>	<b>MECH5</b>
Model type →	Probit			Linear regression	
Dependent variable/Channels →	Probability of started or increased ...			Share of ...	
	Online business (1)	Delivery (2)	Remote work (3)	Online sales (4)	Remote workforce (5)
Baseline categories: Domestic-private firms in services sectors, own no website, are small-sized, and compete locally					
Public and other firm	3.67 (3.62)	1.78 (3.42)	-4.52 (3.56)	-1.07 (1.44)	-1.07 (1.30)
Manufacturing firm	5.41 (15.47)	5.36 (14.36)	-4.41 (22.43)	-10.74 (9.63)	-3.06 (7.75)
Economic support index	0.02 (0.03)	0.04 (0.03)	0.08** (0.03)	0.01 (0.01)	0.01 (0.01)
New cases per million	0.02 (0.01)	-0.03** (0.01)	0.02 (0.01)	0.01 (0.01)	-0.00 (0.00)
Observations	4,050	4,077	4,082	3,854	4,004

Notes: The instrumental variable is the number of power outages a firm experienced in a typical month during the last fiscal year. The figures in columns (1)–(3) capture marginal effects and are multiplied by 100. Columns (4) and (5) report the second-stage results of two-stage least square estimations Heteroskedasticity-robust standard errors are in parentheses. Statistical significance levels: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ .

Source: Authors' calculations.

**Table A7: Effect of Online Business on Sale Outcomes, IV Regression Results**

<b>Dependent Variable Code →</b>	<b>SALE2</b>	<b>SALE3</b>			<b>SALE4</b>	<b>SALE5</b>
Model type →	Probit	Ordered probit			Linear regression	
Dependent variable →	If currently opened or temporarily closed ...					
	Probability of temp. closure because of coronavirus disease (COVID-19)  (1)	Probability that sales ... Decreased    Unchanged    Increased  (2)            (3)            (4)			#weeks of temporary closure  (5)	% change in sales  (6)
Baseline categories: Domestic-private firms in services sectors, have not started online business, are small-sized, and compete locally						
Online business	-21.31*** (2.28)	-10.36*** (2.02)	5.84*** (1.21)	4.53*** (0.84)	-1.14*** (0.33)	-0.39 (1.69)
Physical capital	-0.03 (0.02)	0.02 (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.00)	0.00 (0.02)
Human capital	-0.08** (0.03)	-0.05* (0.03)	0.03* (0.02)	0.02* (0.01)	0.00 (0.01)	0.03 (0.03)
Medium-sized firm	-5.48*** (1.81)	-3.39** (1.65)	1.91** (0.94)	1.47** (0.71)	-0.82*** (0.31)	6.79*** (1.39)
Large-sized firm	-5.66*** (2.10)	-11.59*** (2.01)	6.02*** (1.05)	5.57*** (1.00)	-2.08*** (0.38)	14.07*** (1.67)
Growth rate	-0.05* (0.03)	-0.06** (0.02)	0.03** (0.01)	0.03** (0.01)	0.00 (0.00)	0.09*** (0.02)
Age	-0.15*** (0.05)	0.06 (0.04)	-0.03 (0.02)	-0.03 (0.02)	-0.00 (0.01)	0.01 (0.04)
Nationally competed firm	-3.03* (1.79)	-4.37*** (1.66)	2.35*** (0.91)	2.03*** (0.76)	0.03 (0.30)	3.33** (1.38)
Internationally competed firm	-6.55*** (2.31)	-3.07 (2.17)	1.67 (1.18)	1.40 (0.99)	0.38 (0.43)	1.47 (1.83)



Dependent Variable Code →	SALE2	SALE3			SALE4	SALE5
Model type →	Probit	Ordered probit			Linear regression	
Dependent variable →	If currently opened or temporarily closed ...					
	Probability of temp. closure because of coronavirus disease (COVID-19)  (1)	Probability that sales ... Decreased    Unchanged    Increased  (2)            (3)            (4)			#weeks of temporary closure  (5)	% change in sales  (6)
Baseline categories: Domestic-private firms in services sectors, have not started online business, are small-sized, and compete locally						
Foreign private firm	1.14 (2.80)	-4.12 (2.51)	2.11* (1.24)	2.01 (1.27)	0.83 (0.54)	-0.63 (2.20)
Public and other firms	8.88** (4.02)	-3.09 (3.79)	1.60 (1.90)	1.49 (1.89)	0.77 (0.67)	0.02 (3.03)
Manufacturing firm	14.17 (18.64)	23.33 (27.09)	-8.86 (5.71)	-14.47 (21.40)	-0.46 (3.61)	-3.81 (14.19)
Economic support index	0.27*** (0.03)	0.09*** (0.03)	-0.05*** (0.02)	-0.04*** (0.01)	0.01** (0.01)	-0.05** (0.03)
New cases per million	-0.14*** (0.02)	-0.09*** (0.01)	0.05*** (0.01)	0.04*** (0.01)	-0.02*** (0.00)	0.13*** (0.01)
Observations	1,538	1,538	1,538	1,538	2,507	3,367

Notes: The instrumental variable is the number of power outages a firm experienced in a typical month during the last fiscal year. The figures in columns (1)–(4) capture marginal effects and are multiplied by 100. Columns (5) and (6) report the second-stage results of two-stage least square estimations. Heteroskedasticity-robust standard errors are in parentheses. Statistical significance levels: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ .

Source: Authors' calculations.

**Table A8: Effect of Remote Working on Labor Outcomes, IV Regression Results**

<b>Dependent Variable Code</b> →	<b>WORK1</b>			<b>WORK2</b>	<b>WORK3</b>	<b>WORK4</b>
Model type →	Ordered probit			Linear regression		
Dependent variable →	Probability of total number of temporary workers ...			Because of coronavirus disease (COVID-19), the share of workers that ...		
	Decreased	No change	Increased	Leave/quit	Are laid-off	Are furloughed
	(1)	(2)	(3)	(4)	(5)	(6)
Baseline categories: Domestic-private firms in services sectors, have not started online business, are small-sized, and compete locally						
Remote working	-0.52 (1.51)	0.40 (1.15)	0.12 (0.36)	-0.30 (3.73)	-1.34 (1.44)	-3.44* (1.83)
Physical capital	0.00 (0.02)	-0.00 (0.02)	-0.00 (0.00)	-0.03 (0.03)	0.01 (0.02)	-0.04** (0.02)
Human capital	-0.12*** (0.03)	0.09*** (0.02)	0.03*** (0.01)	-0.03 (0.04)	-0.00 (0.02)	0.06** (0.03)
Medium-sized firm	1.52 (1.36)	-1.09 (0.98)	-0.43 (0.39)	-7.33*** (2.32)	-4.51*** (1.24)	-4.94*** (1.48)
Large-sized firm	7.09*** (1.85)	-5.49*** (1.47)	-1.60*** (0.41)	-8.48*** (2.91)	-4.19*** (1.52)	-7.27*** (1.86)
Growth rate	-0.11*** (0.02)	0.09*** (0.02)	0.03*** (0.01)	-0.01 (0.03)	0.01 (0.02)	-0.02 (0.02)
Age	-0.11** (0.04)	0.08** (0.03)	0.03** (0.01)	0.10* (0.05)	-0.06** (0.03)	-0.05 (0.04)
Nationally competed firm	-3.72** (1.56)	3.00** (1.28)	0.72** (0.29)	-0.64 (2.27)	-0.48 (1.22)	1.03 (1.51)
Internationally competed firm	-9.63*** (1.84)	7.15*** (1.39)	2.48*** (0.52)	1.94 (2.94)	-0.27 (1.58)	0.07 (1.87)
Foreign private firm	1.05 (2.25)	-0.81 (1.74)	-0.24 (0.51)	2.54 (3.15)	0.85 (1.68)	-3.83* (2.15)

Dependent Variable Code →	WORK1			WORK2	WORK3	WORK4
Model type →	Ordered probit			Linear regression		
Dependent variable →	Probability of total number of temporary workers ...			Because of coronavirus disease (COVID-19), the share of workers that ...		
	Decreased	No change	Increased	Leave/quit	Are laid-off	Are furloughed
	(1)	(2)	(3)	(4)	(5)	(6)

Baseline categories: Domestic-private firms in services sectors, have not started online business, are small-sized, and compete locally

Public and other firms	1.15 (3.26)	-0.88 (2.54)	-0.27 (0.72)	16.87*** (4.23)	-4.75** (2.28)	-0.10 (3.39)
Manufacturing firm	21.22*** (2.37)	10.62 (23.07)	-31.84 (25.35)	10.25 (32.37)	3.82 (17.42)	7.63 (21.25)
Economic support index	0.02 (0.03)	-0.01 (0.02)	-0.00 (0.01)	-0.04 (0.04)	-0.07*** (0.02)	0.23*** (0.02)
New cases per million	-0.05*** (0.01)	0.04*** (0.01)	0.01*** (0.00)	-0.00 (0.02)	-0.01 (0.01)	-0.09*** (0.01)
Observations	1,542	1,542	1,542	2,165	2,171	3,019

Notes: The instrumental variable is the number of power outages a firm experienced in a typical month during the last fiscal year. The figures in columns (1)–(3) capture marginal effects and are multiplied by 100. Columns (4)–(6) report the second-stage results of two-stage least square estimations. Heteroskedasticity-robust standard errors are in parentheses. Statistical significance levels: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ .

Source: Authors' calculations.

Table A9: Effects of Online Business and Remote Working, By Income Groups

Dependent Variable Code →	SALE2	SALE3			SALE4	SALE5
<b>A. Impact of Online Business on Sales Outcomes</b>						
Model type →	Probit	Ordered probit			Linear regression	
Dependent variable →	If currently opened or temporarily closed ...					
	Probability of temp. closure	Probability that sales ...			#weeks of temp. closure	% change in sales
	(1)	Decreased (2)	No change (3)	Increased (4)	(5)	(6)
Low-income sample	-6.34 (6.47)	-1.01 (4.69)	0.53 (2.44)	0.49 (2.25)	-0.80 (1.13)	2.15 (4.16)
Medium-income sample	-17.37*** (3.55)	-14.07*** (2.89)	8.88*** (2.00)	5.20*** (1.01)	-0.53 (0.33)	0.51 (2.35)
High-income sample	-8.78** (3.77)	-3.21 (3.62)	1.59 (1.84)	1.62 (1.78)	0.42 (0.47)	-5.31* (2.95)
Full sample	-21.31*** (2.28)	-10.36*** (2.02)	5.84*** (1.21)	4.53*** (0.84)	-1.14*** (0.33)	-0.39 (1.69)

**B. Impact of Remote Work on Labor Outcomes**

Model type →	Ordered probit			Linear regression		
Dependent variable →	Probability of total number of temporary workers ...			Because of coronavirus disease (COVID-19), the share of workers that ...		
	Decreased	No change	Decreased	Leave/quit	Are laid-off	Are furloughed
	(1)	(2)	(3)	(4)	(5)	(6)
Low income sample	-5.34 (4.98)	4.29 (4.05)	1.04 (0.95)	-61.04*** (9.82)	-2.14 (3.44)	-5.44 (5.13)
Medium income sample	-3.34 (2.80)	2.81 (2.38)	0.53 (0.43)	-0.29 (3.74)	1.28 (3.61)	-6.72* (3.71)
High income sample	2.04 (1.53)	-1.12 (0.81)	-0.92 (0.74)	0.87 (2.86)	-2.01 (1.43)	-2.45 (2.29)
Full sample	-0.52 (1.51)	0.40 (1.15)	0.12 (0.36)	-0.30 (3.73)	-1.34 (1.44)	-3.44* (1.83)

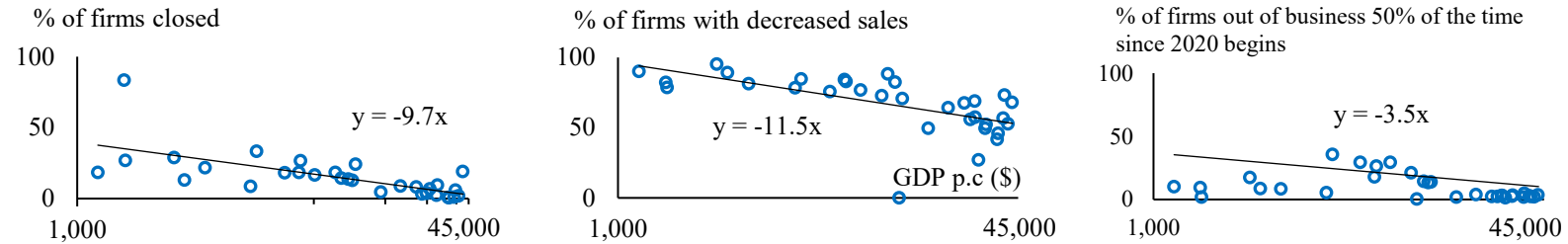
Notes: Table A9 presents IV regression results corresponding to the effects of online business and remote workforce on various sale and labor outcomes, in three income-level subsamples. The instrumental variable is the number of power outages a firm experienced in a typical month during the last fiscal year.

1. Panel A: The figures in columns (1)–(4) capture marginal effects and are multiplied by 100. Columns (5)–(6) report the second-stage results of two-stage least square estimations.
2. Panel B: The figures in columns (1)–(3) capture marginal effects and are multiplied by 100. Columns (4)–(6) report the second-stage results of two-stage least square estimations. Heteroskedasticity-robust standard errors are in parentheses.
3. Statistical significance levels: \*\*\*:  $p < 0.01$ , \*\*:  $p < 0.05$ , \*:  $p < 0.1$ . For presentation purpose, the coefficients of control variables are omitted. For comparison purpose, the last two rows in each panel are reproduced from the first two rows in Tables A6 and A7.

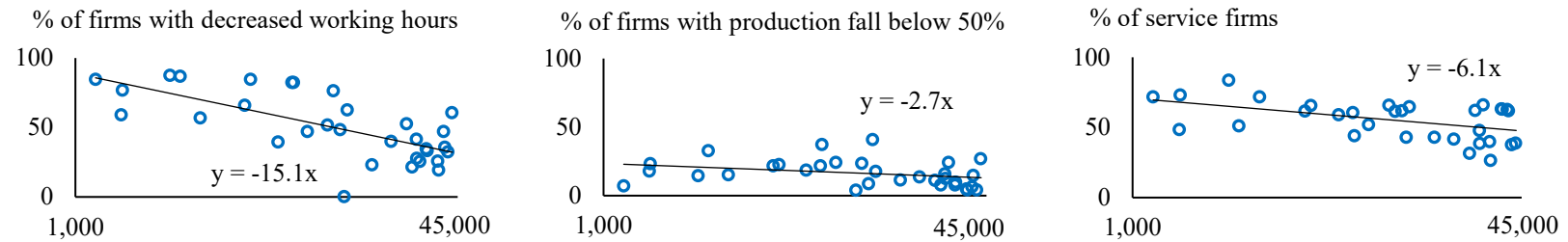
Source: Authors' calculations.

**Figure A1: Country-Level Correlations of Selected Outcomes and Income per Capita**

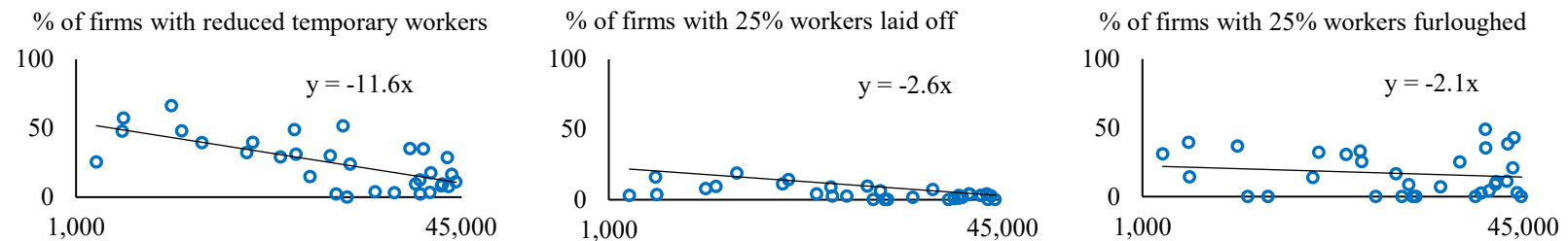
**A. Sales Outcome**



**B. Production Outcomes and Shares of Service Firms**



**C. Labor Outcome**

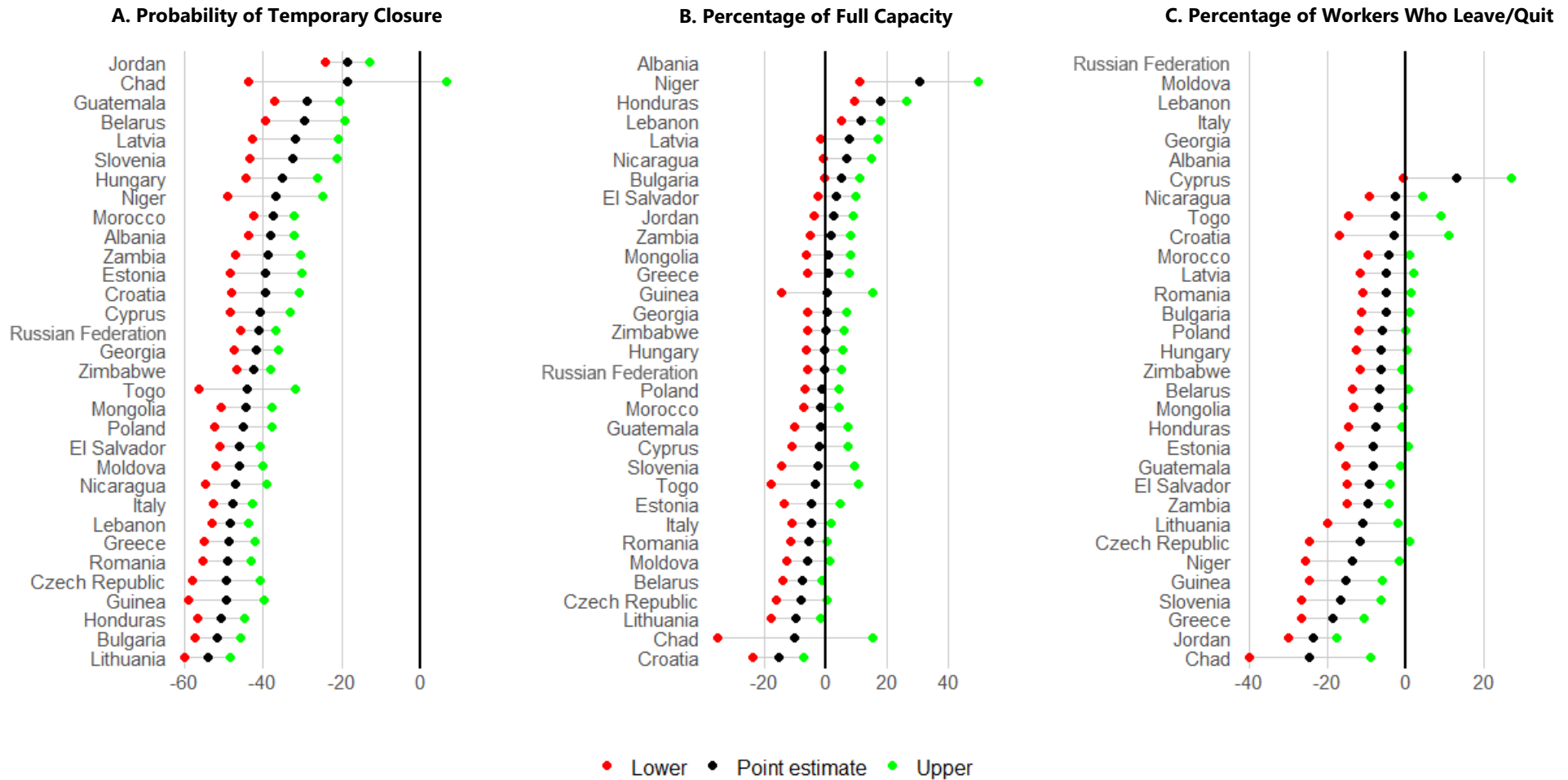


GDP = gross domestic product.

Notes: All data are at country level, viz. there are 32 observations/countries in each plot. The dependent variables' definition are in Table 2 of the main text. The horizontal axis is the logarithmic income per capita, in units of constant 2017 international dollar at purchasing power parity rate (measured in 2019). For presentation purpose, the intercept terms are included but are not shown. The slope coefficient in each plot measures the percentage-point change of the dependent variable induced by 1% rise in income.

Source: Authors' calculations.

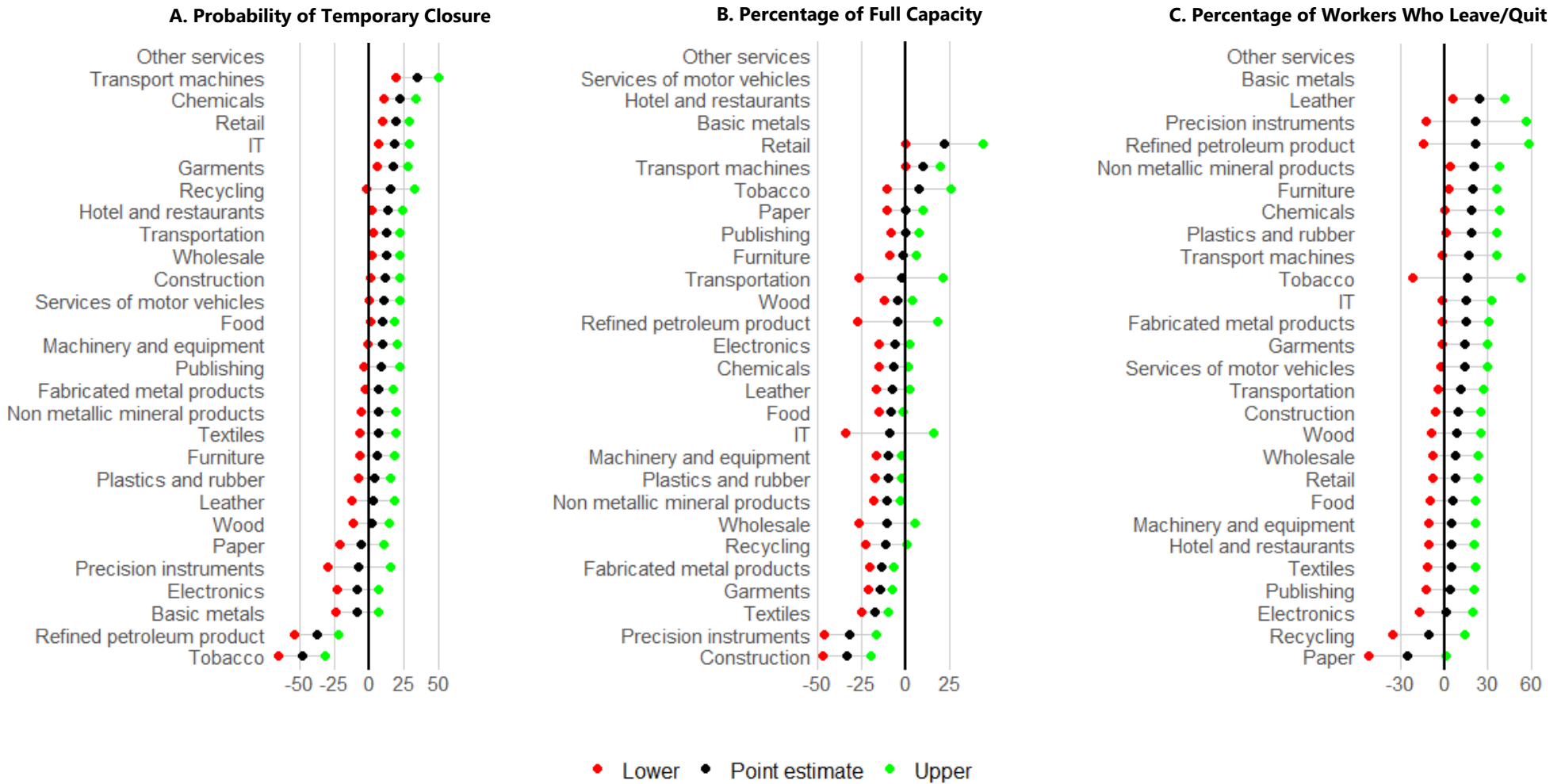
Figure A2: Country-Specific Effects of Website Ownership on Selected Outcomes during COVID-19



Notes: Figure A2 presents the country-specific marginal effects measured for the interaction between country dummies and website-ownership dummy [refer to Equation (9) of the main text]. The black, red, and green dots represent the point estimates and the lower and upper one-standard-error confidence band. These values are interpreted as the change in the outcome variable (which are specified in the panels' titles) when a firm in a specific country changes from not owing a website. In panel A, all values are multiplied by 100. In all panels, the countries are ordered by the point estimates (black dots). Cases when country-level data are insufficient to make reliable estimates are left blank.

Source: Authors' calculations.

Figure A3: Industry-Specific Effects of Website Ownership on Selected Outcomes during COVID-19



Notes: Figure A3 presents the industry-specific marginal effects measured for the interaction between country dummies and website-ownership dummy [refer to Equation (9) of the main text]. The black, red, and green dots represent the point estimates and the lower and upper one-standard-error confidence band. These values are interpreted as the change in the outcome variable (which are specified in the panels' titles) when a firm in a specific industry changes from not owing to owning a website. In panel A, all values are multiplied by 100. In all panels, the industries are ordered by the point estimates (black dots). Cases when industry-level data are insufficient to make reliable estimates are left blank.

Source: Authors' calculations.