Presentation 3

Advancing Inclusive MSME Development through Strategic Policy Action

Digital Divide among MSMEs in ASEAN: Evidence from a 9,000-Firm Survey

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Digital Divide among MSMEs in ASEAN: Evidence from a 9,000-Firm Survey

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Introduction

Context:

- **ASEAN Plus Three Consultation** in 2021 recognized the need to understand the **digital divide in the business sector,** especially **among MSMEs**.

Why it matters:

- **Digitalization** is essential for **inclusive and sustainable growth**.
- Yet, **evidence** on the **current digital divide among MSMEs in ASEAN** and the effects of COVID on firms digital adoption remains limited.

Contributions:

- Conducts a **large-scale questionnaire survey across all ASEAN Member States (9,000+ respondents)**.
- Measures the **digital divide before and after COVID-19**.
- Identifies **barriers by firm size** and **factors that support MSME digitalization**.
- Derives **policy implications for closing the digital divide**.

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Data – Collected Respondents

- **Web survey for 10 countries** to cover wide range of companies
- **Phone survey for 3 countries** to cover companies potentially not using internet

Web survey (N = 6,048)

Country	Micro	Small	Medium	Large
Brunei	33	73	105	27
Cambodia	16	151	318	82
Indonesia	80	153	300	360
Lao PDR	6	53	81	20
Malaysia	39	217	504	170
Myanmar	11	73	202	74
Philippines	30	141	347	177
Singapore	6	135	348	156
Thailand	50	157	317	177
Vietnam	7	256	356	240
Total	278	1,409	2,878	1,483

Phone survey (N = 3,099)

Country	Micro	Small
Brunei		
Cambodia		
Indonesia	134	884
Lao PDR		
Malaysia	110	929
Myanmar		
Philippines		
Singapore		
Thailand		
Vietnam	433	609
Total	677	2,422

Note: Micro = 1-4 workers, Small = 5-19 workers, Medium = 20-199 workers, Large = more than 200 workers.

Findings

- **Digital Divide Today**
  - ✓ By scale
  - ✓ Industry / location
- **Digitalization Dynamics During COVID**
  - ✓ What changed in adoption patters
  - ✓ Which firms advanced vs lagged
- **Barriers and Enablers of Digitalization**
  - ✓ Obstacles across phases
  - ✓ Firms' objectives
  - ✓ Key factors for adoption
- **What governments should do**
- **Evidence from Regression analyses**
  - ✓ GVC participation and digitalization
  - ✓ Digitalization and business performance under COVID

Digital Divide Today (1) by scale

- **Basic digital devices (e.g. mobile phones) and cybersecurity software are well adopted by micro and small firms**, while **they lag behind medium and large firms for other digital tools**.
- **Advanced tools widen the gaps (except RFID)**.

Intra-company

Digital tool	Large	Medium	Small	Micro
E-mail/chat applications	98.3%	89.8%	17.6%	12.0%
Mobile device	97.7%	95.3%	73.1%	79.8%
Computer	98.1%	93.1%	96.1%	100.0%
Office suite	97.4%	87.3%	25.3%	25.5%
Web meeting system	95.2%	84.3%	0.2%	0.0%
Average	**97.3%**	**89.9%**	**42.5%**	**43.4%**

Procurement

Digital tool	Large	Medium	Small	Micro
EDI	89.8%	70.5%	45.0%	44.6%
E-payment	92.2%	71.0%	50.9%	52.5%
Average	**91.0%**	**70.8%**	**47.9%**	**48.5%**

Logistics

Digital tool	Large	Medium	Small	Micro
Cargo delivery application	95.4%	82.6%	36.7%	22.6%
Inventory system	94.3%	81.2%	42.7%	49.9%
Average	**94.9%**	**81.9%**	**39.7%**	**36.3%**

Sales & marketing

Digital tool	Large	Medium	Small	Micro
EDI	92.6%	70.7%	25.1%	29.5%
SNS	93.3%	89.3%	45.2%	47.5%
E-commerce	86.0%	76.1%	39.5%	55.7%
E-payment	91.3%	81.6%	36.4%	41.5%
Sales management tool	91.9%	68.1%	26.6%	23.2%
Average	**91.0%**	**77.2%**	**34.6%**	**39.5%**

Overall company operation

Digital tool	Large	Medium	Small	Micro
ERP	90.9%	66.9%	22.7%	9.1%
Cloud storage	89.3%	70.9%	12.7%	3.6%
Cybersecurity software	88.9%	67.9%	68.5%	86.5%
Average	**89.7%**	**68.6%**	**34.7%**	**33.1%**

Advanced tools

Digital tool	Large	Medium	Small	Micro
3D printing	83.7%	63.2%	9.7%	3.6%
AI	74.1%	49.3%	1.1%	0.0%
AR	69.7%	44.6%	0.0%	0.0%
Drone	66.6%	41.8%	0.7%	0.0%
IoT device	75.7%	55.2%	5.1%	6.1%
RFID	73.2%	55.2%	49.0%	71.0%
Robotics	60.8%	35.8%	2.6%	0.0%
Average	**72.0%**	**49.3%**	**9.7%**	**11.5%**

Note: Indonesia. The results for micro and small are based on the phone survey. The results for medium and large are based on the web survey.

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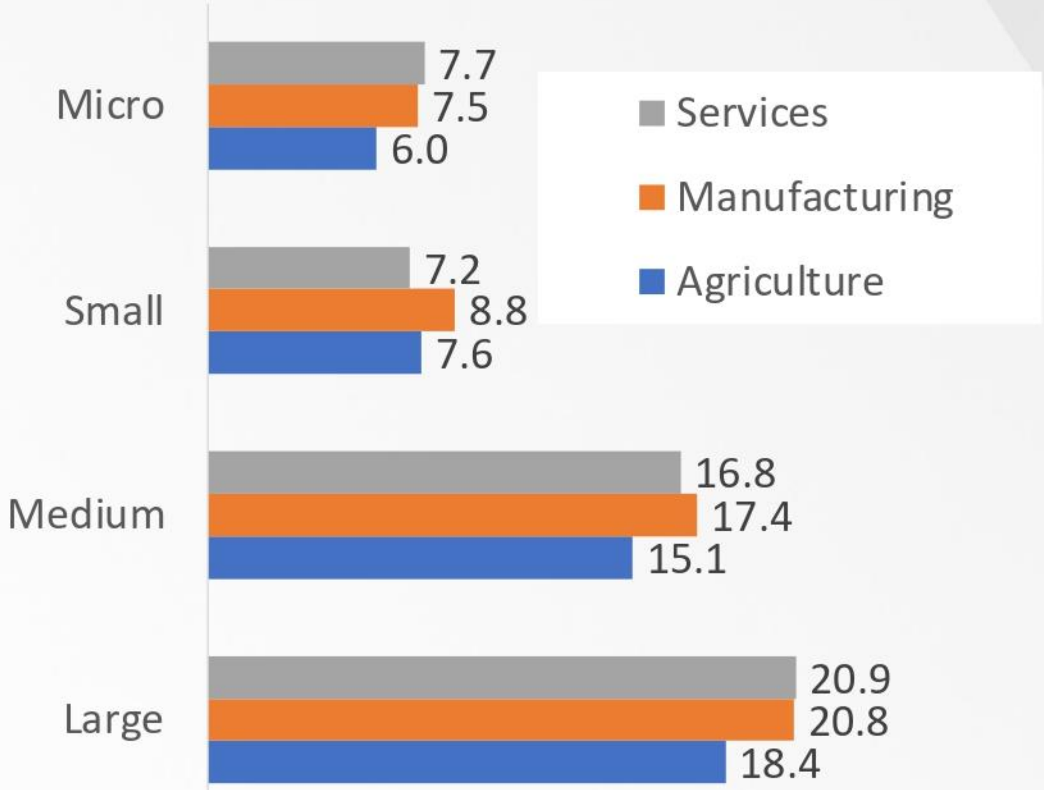
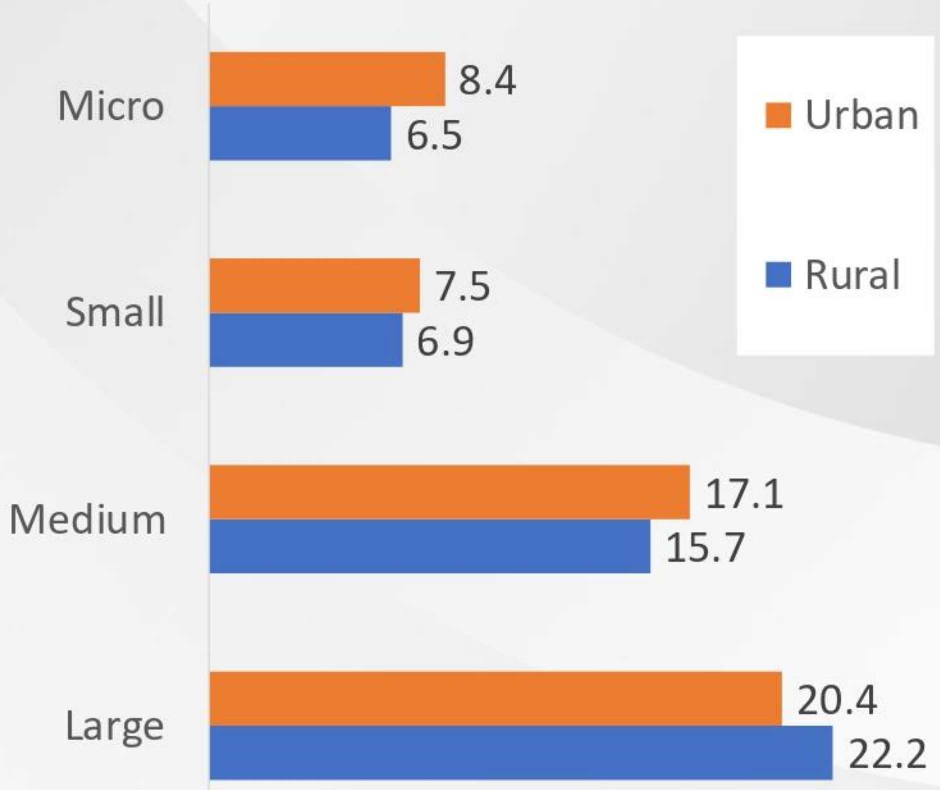
Digital Divide Today (2) by scale / location

- **No large gaps** in digital divide **across industries** and **between urban and rural areas**.

Number of implemented digital tools by Industry (Max 24 tools)



Number of implemented digital tools by area (Max 24 tools)



Note: Indonesia. The results for micro and small are based on the phone survey. The results for medium and large are based on the web survey.

COVID Impact on digital tool adoption

- **All sizes of firms advanced digital tool adoption during and after COVID,** in particular **web meeting system.**
- **Micro** firms **accelerated** digital tool adoption in **e-commerce, e-payment, and SNS**.
- **Large** firms **adopted advanced tools more extensively**, which **widen the digital gaps**.

Intra-company management

Digital tool	Large	Medium	Small	Micro
E-mail/chat applications	13.9%	10.9%	10.3%	18.0%
Mobile device	14.0%	11.6%	11.3%	16.6%
Computer	12.0%	10.8%	12.2%	17.7%
Office suite	13.8%	13.1%	13.9%	15.8%
Web meeting system	35.2%	36.8%	41.3%	42.1%
Average	**17.8%**	**16.6%**	**17.8%**	**22.0%**

Procurement

Digital tool	Large	Medium	Small	Micro
EDI	20.2%	18.1%	13.2%	12.2%
E-payment	17.8%	18.3%	15.1%	23.0%
Average	**19.0%**	**18.2%**	**14.2%**	**17.6%**

Logistics

Digital tool	Large	Medium	Small	Micro
Cargo delivery application	17.7%	17.7%	13.7%	15.5%
Inventory system	17.8%	16.2%	12.0%	16.9%
Average	**17.8%**	**17.0%**	**12.9%**	**16.2%**

Sales & marketing

Digital tool	Large	Medium	Small	Micro
EDI	19.8%	17.1%	13.1%	14.0%
SNS	16.2%	14.8%	12.9%	24.5%
E-commerce	25.8%	24.9%	19.4%	21.2%
E-payment	17.5%	17.3%	13.9%	19.8%
Sales management tool	21.4%	20.2%	14.4%	14.4%
Average	**20.1%**	**18.9%**	**14.7%**	**18.8%**

Overall company operation

Digital tool	Large	Medium	Small	Micro
ERP	21.2%	16.8%	11.5%	10.0%
Cloud storage	21.9%	16.3%	11.8%	11.9%
Cybersecurity software	21.2%	14.4%	11.4%	10.8%
Average	**21.4%**	**15.8%**	**11.6%**	**10.9%**

Advanced tools

Digital tool	Large	Medium	Small	Micro
3D printing	16.7%	11.6%	6.0%	8.6%
AI	17.3%	12.5%	6.5%	6.5%
AR	16.3%	14.3%	7.0%	5.4%
Drone	15.5%	10.0%	5.0%	3.9%
IoT device	16.6%	12.1%	8.0%	6.5%
RFID	15.3%	9.6%	6.6%	5.1%
Robotics	13.8%	7.7%	4.0%	4.4%
Average	**15.9%**	**11.1%**	**6.2%**	**5.8%**

Note: Web survey. Newly adopted digital tools during and after COVID (after January 2020). Newly established firms are included (about 5%).

Barriers (1) Information Gathering Phase

- **Micro and small Firms** experience **limited business knowledge, language barriers, and IT skills deficiency**.
- Lager firms experience **limited business knowledge, IT skills deficiency, and no consultation access.**

Obstacles	Phone	Web
Internal: Inability to diagnose the company's issue that may require digital tools	48.3%	47.9%
External: Limited information in local language	46.8%	36.4%
Internal: Limited IT knowledge due to lack of internal IT human resources to understand the information	45.9%	44.2%
Internal: Not knowing where to find the information or whom to sonsulet with	45.6%	43.9%
Internal: Language barriers to search and understand the available information	40.9%	33.4%
External: No supporting organizations nearby	35.6%	39.8%

(Phone survey = micro/small firms only; Web survey = all firm sizes with medium and large firms in the majority)
Note: The result for the following question: what are the causes of difficulties in information gathering phase?

Barriers (2) Adoption Phase

- **Micro and small firms** experience **limited relevant digital solution, lack of support organizations**, and **IT skills deficiency**.
- **Lager firms** experience **lack of IT management skills** and **limited financial resources**.

Obstacles	Phone	Web
External: Limited or no solution that can meet the business needs	56.5%	31.8%
External: No support from the solution providers available in the country or area	47.6%	40.7%
Internal: Inability to identify the tools that match with company's issues or needs	45.4%	42.6%
Internal: Lack of IT human resources who can plan and implement digital tools	38.4%	45.5%
Internal: Limited financial resources to invest in digital tools	22.9%	41.5%
External: Limited source of fund	11.0%	24.1%

(Phone survey = micro/small firms only; Web survey = all firm sizes with medium and large firms in the majority)
Note: The result for the following question: what are the causes of difficulties in adoption phase?

Barriers (3) Adoption Phase

- **Micro and small firms** experience **IT skills deficiency, less connectable with existing tools, lack of support**, and **internet instability**.
- **Larger firms** experience **relatively more difficulty in involving their employees for digitalization.**

Obstacles	Phone	Web
Internal: Employees' inability to use digital tools due to limited skills	52.4%	50.2%
Internal: Inability to integrate new digital tools with the ones already implemented	48.6%	27.7%
External: No customer support available in the country or area	43.6%	34.3%
Internal: Employees are not eager to onboard the adoption as they find digital tools confusing and they increase the work process	41.3%	43.3%
External: Internet instability that affects consistent use	41.3%	30.2%
Internal: Lack of budget to upgrade digital tools so the solutions are outdated or some features cannot be used	27.1%	27.4%

(Phone survey = micro/small firms only; Web survey = all firm sizes with medium and large firms in the majority)
Note: The result for the following question: what are the causes of difficulties in post adoption phase?

Firms' objectives for Digitalization

- **Micro and small firms' major objectives** are **sales increase**, **business continuity**, and **cost reduction**.
- The **major objectives of larger firms are similar** to those of smaller firms**,** while they place a **greater emphasis on data-driven management.**

Objectives	Phone	Web
To increase profitability through sales increase	62.8%	73.9%
To ensure business continuity	54.4%	61.3%
To increase profitability through cost reduction	43.6%	47.9%
To make management decisions in a timely manner based on the data collected	34.4%	63.9%
To respond to customer requirements	34.3%	52.9%
To address labor shortage	24.9%	23.7%
To respond to supplier requirements	11.4%	24.6%

(Phone survey = micro/small firms only; Web survey = all firm sizes with medium and large firms in the majority)
Note: The result for the following question: what are the major objectives of digital tool adoption?

Key Factors for Digitalization (Micro/Small Firms)

- **Micro and small firms** consider **reasonable subscription digital services, customization option**, and **product and service localization** as key factors for digital tool adoption.

Description	IM	PR	LG	SM	OC	AT
Price:						
If digital tools have subscription or reasonable profit-sharing models	66.6%	52.0%	53.4%	62.7%	60.3%	67.2%
If digital tools have price package options that can be customized to meet companies' needs	60.9%	60.3%	53.2%	54.0%	44.2%	57.8%
Features:						
If digital tools are available in the local language	36.4%	34.6%	34.7%	36.0%	33.7%	41.8%
If digital tools conform to the business practices of the country	30.1%	24.2%	28.0%	27.9%	38.1%	29.2%
Service:						
If digital tools have a support program or team to help diagnose the business issues and provide solution recommendation	27.7%	29.0%	28.7%	27.9%	37.5%	35.5%
If digital tools have a support program or team in-country	25.7%	21.1%	23.1%	21.7%	24.6%	27.5%
If digital tools have a support program or team provided in the local language	20.8%	29.6%	21.2%	25.4%	32.7%	19.2%

Note: Phone survey. IM = Inter-company management tools. PR = Procurement tools. LG = Logistics tools. SM = Sales & marketing tools. OC = Overall company management tools. AT = Advanced tools.

Key Factors for Digitalization (Larger Firms)

- **Larger firms** consider **customization option, tools aligning with local business practices**, and **business diagnosis assistants** as key factors for digital tool adoption.

Description	IM	PR	LG	SM	OC	AT
Price:						
If digital tools have subscription or reasonable profit-sharing models	30.9%	54.3%	40.0%	45.3%	38.1%	43.2%
If digital tools have price package options that can be customized to meet companies' needs	49.2%	48.9%	55.8%	50.5%	58.1%	70.5%
Features:						
If digital tools are available in the local language	30.7%	30.4%	29.3%	28.2%	29.5%	39.1%
If digital tools conform to the business practices of the country	55.3%	72.8%	70.3%	69.8%	69.1%	65.7%
Service:						
If digital tools have a support program or team to help diagnose the business issues and provide solution recommendation	46.0%	51.6%	55.4%	50.9%	54.6%	66.2%
If digital tools have a support program or team in-country	15.4%	20.1%	16.8%	16.4%	18.9%	35.1%
If digital tools have a support program or team provided in the local language	22.9%	32.4%	29.6%	32.7%	34.6%	37.8%

Note: Web survey. IM = Inter-company management tools. PR = Procurement tools. LG = Logistics tools. SM = Sales & marketing tools. OC = Overall company management tools. AT = Advanced tools.

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What Governments should do? (External Factors)

- **Micro and small firms** expect governments to address **business knowledge, limited fund for digital tool investment**, and **IT skills deficiency**.
- **Larger firms** expects governments more to address **deficiencies in IT management skills** (**planning, implementation,** and **digital transformation** human resources).

Objectives	Phone	Web
Limited human resources with business knowledge to diagnose and identify company's issue that may be resolved by digital tools	51.1%	53.5%
Limited fund to invest in digital tools	41.8%	51.0%
Limited human resources with IT knowledge or skills to plan and implement digital tools	40.0%	61.5%
Absence of supporting tools to connect or integrate with digital tools	39.4%	27.5%
Limited human resources to design the operation flow after digital transformation or to integrate digital tools into current operation	38.7%	56.6%
Inability to communicate the benefit and get employees onboard	37.3%	23.7%

(Phone survey = micro/small firms only; Web survey = all firm sizes with medium and large firms in the majority)

Note: The result for the following question: which should governments should emphasize for digital adoption?

What Governments should do? (Internal Factors)

- **Micro and small firms** expect governments to address **difficulties in finding affordable digital solutions, cybersecurity concerns**, and **low awareness of customers**.
- **Larger firms** expects governments more to address **limited localized solutions**.

Objectives	Phone	Web
Difficulties in finding affordable solutions	26.1%	43.8%
Cybersecurity concerns	24.7%	29.9%
Low awareness of adoption benefit due to low usage from customer side	24.6%	47.5%
Lack of opportunities to learn about support programs of private sector support providers	24.1%	34.1%
Support programs from private sector support providers do not match business needs	19.1%	25.9%
Internet connection instability that affects business continuity	18.3%	26.2%
Difficulties in finding suitable solutions due to limited options for localised solutions	16.6%	50.8%
Operational inconvenience caused by unstandardized government e-service	9.4%	31.3%

(Phone survey = micro/small firms only; Web survey = all firm sizes with medium and large firms in the majority)

Note: The result for the following question: which should governments should emphasize for digital adoption?

GVC Participation and Digitalization

- Firms tend to advance **digitalization** during COVID when they deal with **MNF customers or suppliers**.
- Two interpretations: (1) **digitalization may open the door to GVC participation**; (2) **MNF linkages may encourage and support MSMEs' digital capability development**.

Effects of firm attributes on digital tool adoption during COVID-19 (Web)

	TTL	IM	PR	LG	SM	OC	AT
MNFcd	0.563***	0.035	0	0.022	0.066*	0.084***	0.146***
	(0.119)	(0.028)	(0.019)	(0.019)	(0.036)	(0.028)	(0.046)
MNFcf	0.146	0.074**	-0.008	0.012	0.110**	-0.009	-0.101*
	(0.157)	(0.034)	(0.024)	(0.025)	(0.048)	(0.036)	(0.059)
MNFsd	0.757***	0.077**	0.067***	0.062***	0.07	0.203***	0.273***
	(0.151)	(0.033)	(0.024)	(0.024)	(0.044)	(0.035)	(0.054)
MNFsf	-0.179	-0.082**	0.015	-0.03	-0.121**	-0.029	0.125*
	(0.177)	(0.038)	(0.027)	(0.027)	(0.051)	(0.04)	(0.069)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5742	5742	5742	5742	5742	5742	5742
R-squared	0.366	0.479	0.344	0.256	0.396	0.258	0.266

Note: Web survey. MNFcd = direct multinational firm customers based in the domestic market. MNFcf = direct multinational firm customers based in a foreign market. MNFsd = direct multinational firm suppliers based in the domestic market. MNFsf = direct multinational firm suppliers based in a foreign market.

Digitalization and Performance under COVID

- Firms tend to show **robust performance** in sales after COVID compared to before COVID **when they adopted more digital tools before, during, and after COVID**.

Effects of digital tool adoption on performance post-COVID-19 compared to pre-COVID-19 (Robustness in Sales,

	Dependent variable: ROBUSTs						
	TTL	IM	PR	LG	SM	OC	AT
DSCOREb	0.009***	0.031***	0.047***	0.015**	0.035***	0.004	0.016***
	(0.001)	(0.007)	(0.009)	(0.006)	(0.005)	(0.005)	(0.003)
DSCOREd	0.010***	0.022***	0.064***	0.031***	0.042***	0.012*	0.014***
	(0.002)	(0.008)	(0.012)	(0.011)	(0.006)	(0.007)	(0.005)
DSCOREa	0.007***	0.025**	0.038***	0.007	0.029***	0.016**	0.012**
	(0.002)	(0.01)	(0.012)	(0.011)	(0.007)	(0.007)	(0.005)
Size FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5742	5742	5742	5742	5742	5742	5742
R-squared	0.11	0.103	0.104	0.099	0.112	0.098	0.106

Note: Web survey. DSCOREb/d/a = Adopted digital tool number before/during/after COVID.

Conclusion

- **Digital divide increasingly reflects a capability gap rather than a connectivity gap.**
  - ✓ Basic tools are widely adopted even among micro/small firms.
  - ✓ gaps emerge in advanced and operational tools.
- **Barriers and needs differ by firm size → policies must be size-specific.**
  - ✓ Micro/Small: business knowledge, IT skills, localized support.
  - ✓ Medium/Large: financing difficulty, IT management/DX human resources.
- **Drivers of digitalization also differ by size.**
  - ✓ Micro/Small: affordable subscription services, localization, ease of use.
  - ✓ Medium/Large: customization, fit with business practices, business diagnosis support.
- **Digitalization and GVC participation reinforce each other**.
  - ✓ Promote MSME digitalization for growth opportunities.
  - ✓ Facilitate MNF–MSME linkages for accelerating digital adoption.