Digital Adoption, Financial Conditions, Government Support and MSME Export Likelihood

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Motivation and Context

- **COVID-19 shock to MSMEs:**
  - The pandemic severely disrupted trade and supply chains, hitting smaller firms hardest due to their limited buffers.
  - Many MSMEs struggled to fulfill export orders amid border closures and logistics hurdles.
- **Key question:**

What enabled some MSMEs to continue (or start) exporting during the COVID-19 crisis while others halted exports?

Motivation and Context

- **Digital shift:**
  - Lockdowns accelerated a shift to online commerce (Karr et al., 2020; OECD/EBRD, 2023).
  - Firms with digital channels (e-commerce, online marketing, remote delivery) could reach customers despite mobility restrictions (Haini et al., 2023).
- **Hypothesis:**

  Adopting digital sales strategies increased the likelihood of exporting during the pandemic.
- **Financial strain:**
  - COVID-19 caused steep revenue drops, draining MSMEs' cash and risking insolvency (Tarkom, 2022)
  - Exporting entails upfront costs and working capital, so we hypothesize that financially distressed firms were less likely to export (World Trade Organization, 2020)

Motivation and Context

- **Policy support:**
- Governments worldwide rolled out relief (subsidies, loans, tax deferrals) targeting MSMEs (Bruhn et al., 2024; Haini et al., 2024).
- We hypothesize that receiving government support boosted a firm's export chances, and that support may have helped offset financial constraints or complement digital adoption.

Background: MSME Exports in Selected Asian Economies

- **Focus countries:** Armenia, Azerbaijan, Georgia, Kazakhstan, and Mongolia – all CAREC members with transitional economies.
  - These five were formerly Soviet (except Mongolia) and face common structural challenges.
- **SME dominance but low exports:** MSMEs comprise 95–98% of enterprises in these economies, yet contribute only a small fraction of exports.
- Large commodity-based firms (oil, gas, minerals) generate the bulk of export revenue in Azerbaijan, Kazakhstan, Mongolia (International Energy Agency, 2023).

Background: MSME Exports in Selected Asian Economies

- **Country specifics:**
- In Azerbaijan, >90% of export value is oil/gas, leaving small scope for non-oil SMEs (Made in Azerbaijan, Asian Development Bank, 2023)
- Kazakhstan similarly has vast resource exports and single-digit SME export shares.
- Armenia and Georgia have more diversified export baskets (light manufacturing, agriculture, IT services), but still modest SME export participation (e.g. SMEs ~17–18% of Armenia's exports) (World Bank, 2024)
- Mongolia's non-mineral SME sector plays a limited export role, with only a handful of medium-sized firms exporting (often via e-commerce) pre-pandemic.

Background: MSME Exports in Selected Asian Economies

- **Pre-COVID trend:**
- Across developing Asia, SMEs account for 26% of export value on average (Shinozaki et al., 2024)
- In our focus countries, the SME export share was likely even lower (under 20%).
- The pandemic threatened to further marginalize SME exporters
- But it also spurred some firms to seek new opportunities (e.g. exporting medical supplies, leveraging digital trade) and prompted governments to intensify SME support.

Background: MSME Exports in Selected Asian Economies

- **Policy environment:** All five governments implemented emergency MSME support in 2020 (Janzen and Radulescu, 2022; Tarkom, 2022)
  - Armenia and Georgia offered grants and subsidized loans;
  - Azerbaijan and Kazakhstan provided tax relief and direct financial aid;
  - Mongolia rolled out soft loans and wage subsidy programs.
- Efforts in digital infrastructure were accelerated (e.g. online business services, e-customs) to help firms operate and export under restrictions (Groenewegen et al., 2021).
- **Regional institutions** (e.g. ADB through CAREC) encouraged measures like digital trade facilitation and “green lanes” to keep trade flowing.

Research Objective & Questions

- **Objective:**

  Analyze how digital adoption, financial conditions, and government support influenced the likelihood of MSMEs exporting during COVID-19 in the five countries, and their interaction factors

- **Key questions:**
  - Did firms that pivoted to online sales or delivery channels have higher export probability?
  - Did acute financial stress (liquidity crunch, overdue debts) reduce export participation?
  - Did receiving government relief support raise the odds of exporting?

Research Objective & Questions

- **Interactions:** We also ask whether combinations of factors mattered –
  - Does government assistance particularly help financially distressed firms export?
  - Do digital strategies work synergistically with public support?
  - The analysis tests interaction effects (digital × support, support × financial stress, etc.) to explore these nuanced relationships.
- **Contribution:** Empirical evidence on these issues is limited, especially for Central Asia/Caucasus.

This study provides systematic firm-level evidence to fill that gap, offering insights potentially generalizable to the broader Asia-Pacific context.

Data and Sample

- **Data source:** World Bank Enterprise Survey COVID-19 Follow-up surveys, conducted in 2020–2021.
  - We use firm-level data from five countries: Armenia, Azerbaijan, Georgia, Kazakhstan, and Mongolia.
- **Sample:** Cross-sectional dataset of 2,443 MSMEs (micro, small, medium firms by employee count) across the five countries.
  - Each firm was surveyed on its status during the pandemic (with some retrospective pre-pandemic comparisons).
  - We focus on firms' experience during COVID-19, capturing a snapshot of crisis impacts.

Descriptive Statistics – Summary Statistics

Variable	Description	Mean	Std. Dev.	Min.	Max.
$export_i$	1 if the firm is has exported during C19; 0 otherwise	0.09	0.286	0	1
$online_i$	1 if the firm has started or increased online sales; 0 otherwise	0.299	0.458	0	1
$delivery_i$	1 if the firm has started or increased delivery of sales; 0 otherwise	0.29	0.454	0	1
$government_i$	1 if the firm has received government support or if the firm is expected to receive government support; 0 otherwise. Government support includes cash transfers, wage subsidies deferrals of bills, debts, interest payments, and tax.	0.333	0.472	0	1
$obligation_i$	1 if the firm has overdue financial obligations; 0 otherwise	0.132	0.338	0	1
$cash_i$	1 if the firm has experienced a decrease in cashflow; 0 otherwise	0.642	0.479	0	1
$industry_i$	1 if the firm is in the manufacturing industry; 0 if the firm is in the retail or service industry	0.467	0.499	0	1
$response_i$	1 if the firm has converted production during C19; 0 otherwise	0.287	0.452	0	1
$employees_i$	Number of full-time employees	28.537	44.525	1	250

Descriptive Statistics – Export by Country

Country	Export		
	No	Yes	Total
Armenia	460	83	543
Azerbaijan	69	29	98
Georgia	628	47	675
Kazakhstan	801	46	847
Mongolia	266	14	280
Total	**2224**	**219**	**2443**

Descriptive Statistics – Initial Patterns

Export	Online		Delivery		Government Support		Financial Obligations	
	No	Yes	No	Yes	No	Yes	No	Yes
No	1578	646	1590	634	1499	725	1925	299
Yes	134	85	145	74	128	91	196	23
Total	1712	731	1735	708	1499	725	2121	322
% of Exporting Firms	**8.49%**	**13.16%**	**9.12%**	**11.67%**	**8.54%**	**12.55%**	**10.18%**	**7.69%**

Methodology

- **Estimation approach:**
- We employ a binary **logistic regression (logit)** to model the probability that a firm exports (Export=1) as a function of our independent variables.
- This is appropriate for the 0/1 export outcome.

$$Prob(export_{ij}) = \alpha + \beta_1 independent_{ijn} + \beta_n controls_{ij} + \mu_i + \mu_j + \varepsilon_{ij} \quad (1)$$

- Instead of raw logit coefficients, we report **average marginal effects**

Methodology

- **Interactions tested:** We include several interaction terms to explore conditional effects:
  - Online × GovernmentSupport
  - GovernmentSupport × FinancialStress
  - Online × Cashflow
  - ProductionConversion × Online.
  - These test whether the effect of one variable (e.g. digitalization) depends on another (e.g. having support).
- **Robustness:** We use robust standard errors and include fixed effects to account for heterogeneity.
  - Given potential endogeneity (e.g. more competitive firms both export and adopt digital tools), results are interpreted as associations rather than strict causation.
  - A probit model was also estimated as a robustness check, yielding very similar findings, which increases confidence in the results' robustness.
- **Caveat on causality**: The data are cross-sectional and largely contemporaneous to the pandemic, so we cannot definitively establish causation or timing.

Results – Main Effects

Dependent Variable: $export_i$						
Variable	(1)	(2)	(3)	(4)	(5)	(6)
$online_i$	0.023*	0.038*	0.023*	0.021**	0.023*	0.024**
	(0.014)	(0.020)	(0.014)	(0.010)	(0.010)	(0.010)
$delivery_i$	-0.010	-0.010	-0.016	-0.011	-0.010	-0.010
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
$government_i$	0.032***	0.032**	0.032**	0.021**	0.044**	0.032**
	(0.013)	(0.013)	(0.013)	(0.010)	(0.020)	(0.013)
$obligation_i$	-0.019*	-0.019*	-0.034**	-0.019*	-0.019*	-0.019*
	(0.010)	(0.010)	(0.015)	(0.010)	(0.010)	(0.016)
$cash_i$	-0.028**	-0.020**	-0.027****	-0.028****	-0.021**	-0.028****
	(0.012)	(0.010)	(0.012)	(0.012)	(0.010)	(0.012)
$industry_i$	0.049***	0.049***	0.049***	0.049***	0.049***	0.049***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
$response_i$	0.049***	0.048***	0.048***	0.048***	0.049***	0.049***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.018)
$employees_i$	0.024***	0.025***	0.025***	0.024***	0.024***	0.024***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)

Results – Main Effects

Dependent Variable: $export_i$						
Variable	(1)	(2)	(3)	(4)	(5)	(6)
$(online_i \times cash_i)$		-0.019*				
		(0.010)				
$(delivery_i \times obligation_i)$			0.064			
			(0.056)			
$(online_i \times government_i)$				0.029***		
				(0.008)		
$(cash_i \times government_i)$					0.018*	
					(0.010)	
$(response_i \times online_i)$						0.041*
						(0.024)

Discussion and Limitations

- **Mechanisms:** The findings imply that **digitalization enabled MSMEs to overcome mobility barriers** and find customers abroad even when traditional channels broke down.
- Conversely, **liquidity and solvency emerged as prerequisites** – a firm in financial peril likely cut back non-essential activities like exporting to survive.
- Government relief appears to have **bridged short-term gaps**, keeping firms engaged in export when they might have otherwise dropped out.
- Notably, **digital tools and public support complemented each other**, each enhancing the effect of the other in sustaining trade.

Discussion and Limitations

- **Causality and data limits:** Because the data are cross-sectional (single snapshot during COVID), we cannot confirm **causal direction** or dynamic effects.
- It's possible, that inherently more competitive firms both sought support and exported.
- Future research with **panel data** (tracking firms over time) or **instrumental variables** would help establish causality and see how persistent these effects are.
- We interpret our results as **associative** but policy-relevant signals.

Policy Implications – Extending to Asia-Pacific

- **Bridging the SME export gap:** Across Asia-Pacific, smaller firms' participation in exports is disproportionately low
- **Digital transformation as priority:** The pandemic accelerated digital adoption, making it clear that **e-commerce and digital platforms are essential for MSMEs** to reach broader markets
- **Access to finance and crisis support: Financial inclusion** remains a challenge for SMEs in Asia-Pacific
- **Effective government support programs:** The fact that 1 in 3 firms in the sample got support indicates broad coverage, but design and timing matter
- **Regional cooperation:** International institutions and regional partnerships can bolster national efforts. During COVID-19, bodies like **CAREC facilitated trade**

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