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Working Paper

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ADB Economics Working Paper Series, No. 837

Provided in Cooperation with:

Asian Development Bank (ADB), Manila

Suggested Citation: Shinozaki, Shigehiro (2026) : Private sector development and policy actions in Timor-Leste: Lessons from a business mapping survey, ADB Economics Working Paper Series, No. 837, Asian Development Bank (ADB), Manila, <https://doi.org/10.22617/WPS260024-2>

This Version is available at:

<https://hdl.handle.net/10419/336549>

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PRIVATE SECTOR DEVELOPMENT AND POLICY ACTIONS IN TIMOR-LESTE

LESSONS FROM A BUSINESS MAPPING SURVEY

Shigehiro Shinozaki

NO. 837

February 2026

**ADB ECONOMICS
WORKING PAPER SERIES**

ADB Economics Working Paper Series

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No. 837 | February 2026

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ISSN 2313-6537 (print), 2313-6545 (PDF)
Publication Stock No. WPS260024-2
DOI: <http://dx.doi.org/10.22617/WPS260024-2>

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ABSTRACT

This paper empirically investigates what drives the growth of private businesses in Timor-Leste and the policy actions needed to facilitate growth amid global uncertainty, especially for micro, small, and medium-sized enterprises (MSMEs). It uses the linear probability model (LPM) to identify the MSME growth structure and the Oaxaca decomposition to reveal detailed growth factors by firm type in determining which policy areas need to be strengthened. Estimation results show that four types of MSMEs—those formalized, digitalized, internationalized, and women-led—exhibit different business characteristics and performance results compared with control groups. Accordingly, policy support areas differ by firm type, with a focused approach critical in designing and delivering policy assistance to MSMEs in Timor-Leste. The study suggests policy implications to consider when designing an evidence-based MSME policy framework that can maximize the benefits from the country's recent accession to Association of Southeast Asian Nations membership.

Keywords: digitalization, heterogeneity, Oaxaca decomposition, private sector development, SME development, SME policy, Timor-Leste

JEL codes: D22, G20, L20, L50

1. INTRODUCTION

Timor-Leste gained independence in May 2002. It is a small island country with a population of 1.3 million. It is highly reliant on petroleum for revenue, making economic diversification crucial for creating a resilient, sustainable economy amid current global uncertainty. Diversification requires strong private sector growth, increasingly led by the development of growth-oriented micro, small, and medium-sized enterprises (MSMEs). Thus, strengthening dynamics of MSMEs has become a national policy priority, given their potential yet status of untapped resources to build a framework for sustaining economic growth and development.

Despite the rapidly evolving global outlook, Timor-Leste's economy has grown steadily since the coronavirus disease pandemic with strong domestic demand and improved fiscal policy. Gross domestic product (GDP) grew by 4.1% in 2024 with growth forecast to slow slightly to 3.8% in 2025 and 3.4% in 2026 (ADB 2025a). Inflation is forecast to decline from 2.1% in 2024 to 1.2% in 2025 in part due to lower food prices, but rising slightly to 1.9% in 2026. Creating a growth-base nationally through MSME development is essential for further growth of Timor-Leste.

On 26 October 2025, Timor-Leste officially became the 11th member of the Association of Southeast Asian Nations (ASEAN). It applied for membership in 2011 and held observer status since 2022. ASEAN membership offers several benefits, such as better access to regional markets, free trade agreements, and investment opportunities, all of which will help establish a more conducive environment for private sector development, particularly for MSMEs.

The lack of comprehensive MSME landscape data remains a key barrier to designing a workable MSME policy framework for the country. In response, the Asian Development Bank (ADB) conducted a nationwide business mapping survey in July 2024 to assess business conditions on the ground that could support an evidence-based national MSME policy design. Regression analyses of the data help determine what drives private sector growth and define which policy areas the government should prioritize for effective MSME development.

2. ANALYTICAL APPROACH

This study empirically examines the growth structure of MSMEs in Timor-Leste by using a linear probability model (LPM) and investigates detailed growth factors by firm type by using Oaxaca decomposition, helping identify policy actions needed to speed MSME growth process under current global conditions.

For econometric modeling with a binary dependent variable, one can use linear or non-linear regression. Considering the pros and cons of both models, this paper chose the LPM approach. Non-linear models such as probit and logit rely on several strong assumptions about error terms, which make it difficult to interpret results. By contrast, a linear model like LPM is easier to interpret, computationally less intensive, and has similar marginal effects on its non-linear counterparts (Shinozaki and Rao 2021).¹ Table A1 shows the results of probit models as a robustness test.

The Blinder–Oaxaca decomposition (Blinder 1973 and Oaxaca 1973) is a methodology that explains mean differences of the dependent variable between two groups by decomposing the gap in the effect of independent variables. It is often used to assess labor-market outcomes by

¹ Shinozaki and Rao (2021) referred to Amemiya (1977 and 1985); Hoxby and Oaxaca (2006); Hausman, Abrevaya, and Scott-Morton (1998); Angrist and Pischke (2008); and Wooldridge (2002) for its argument on the use of linear or non-linear modeling.

groups (e.g., sex and race) by counterfactually decomposing mean differences in log wages based on linear regression models (Jann 2008). The Oaxaca decomposition is used to identify what drives the mechanism behind business performance and administration by firm type.

Empirical Model

The LPM here was designed to estimate MSME growth factors compared with the previous year (July 2023–July 2024). It focuses on four areas as separate dependent variables: (i) annual sales revenue; (ii) employment conditions; (iii) wage payments; and (iv) financial conditions (Table 1). Based on Shinozaki and Rao (2021), the study assumed there were eight factors affecting MSME operations and management during July 2023–July 2024. They include (i) the industry involved, (ii) business location, (iii) operating period, (iv) business registration, (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.

$$Y_i = \alpha + \beta Ind_i + \gamma Reg_i + \delta Ops_i + \zeta Fom_i + \phi Dig_i + \psi Wom_i + \eta Int_i + \tau Siz_i + \epsilon \quad (1)$$

Y includes four dimensions (models) that measure the level of a firm’s growth during July 2023–July 2024 (Table 1). Y_i in each model is a separate binary dependent variable for each observed firm i , based on whether it increased compared with the previous year in revenue, employment, and wage, or having sufficient funds. Ind_i is the vector of categories for industry classification with “agriculture” as base; Reg_i is the vector of categories for business location with “Dili (capital city)” as base. Ops_i is the vector of categories for years of operation with “0–5 years” as base. Fom_i is a binary variable that takes the value one if the firm is legally registered and zero otherwise. Dig_i is a binary variable that takes the value one if the firm is engaged in online selling of products/services (e-commerce) and zero otherwise. Wom_i is a binary variable that takes the value one if the owner of the firm is a “woman” and zero if the owner is a “man.” Int_i is a binary variable that takes the value one if the firm is involved in a global supply chain or export/import business and zero otherwise. Siz_i is the vector of categories for business size with “self-employed” as base. ϵ is a residual. Robust standard errors, calculated as the Huber/White/sandwich estimator, are incorporated to correct the heteroscedasticity of the errors.

Table 1: Model Specification

Dimension (4)	Definition
1. Annual revenue	income/revenue increased or decreased/no change/zero compared with the previous year (July 2023–July 2024)
2. Employment	number of employees increased or not compared with the previous year (July 2023–July 2024)
3. Wage payments	wages increased or decreased/no change/zero compared with the previous year (July 2023–July 2024)
4. Financial condition	sufficient funds available to maintain business for more than 6 months or no funds/running out of funds within 6 months at the time of the survey

Source: Author.

The government law on MSME support enacted in 2023 (Decree No.30 of 2023) classifies firm size by (i) the number of employees and (ii) annual sales revenue/turnover or annual total assets excluding land (ADB 2025b). It defines a microenterprise as a firm with up to five employees and a maximum annual turnover of \$5,000 or \$25,000 in annual total assets. A small enterprise has 6–20 employees, an annual turnover not exceeding \$50,000 or annual total assets not more than \$150,000. A medium-sized firm employs 21–50 workers with an annual turnover not exceeding

\$1 million or annual total assets not exceeding \$250,000. This study uses the employment threshold in classifying firm size.

Heterogeneity Assessments

Based on the LPM results, formula (2) identifies what helps drive business performance by firm type. It assesses the heterogeneity of growth factors between two groups in four types: (i) formal (registered) or informal (unregistered) MSMEs; (ii) digitalized or non-digitalized MSMEs; (iii) internationalized or domestically focused MSMEs; and (iv) women- or men-led MSMEs.

$$Y^k = \alpha + \beta^j X^m + \gamma Z + u \quad (Y^k = \Delta R, \Delta E, \Delta W, \text{ or } \Delta F) \quad (2)$$

Y^k is the difference between mean predictions by groups in business performance indicator k (revenue, employment, wage, or financial condition) as revenue gap ΔR , employment gap ΔE , wage gap ΔW , or financial condition gap ΔF . β^j is the heterogenous coefficient depending on the firm type j (formalized, digitalized, internationalized, or women-led firms). X^m denotes binding constraints defined by the level of MSME policy assistance needs. Stronger policy needs mean areas that lack support or need further support for a firm’s growth. The assumption is that if the MSME receives the policy measure m that it strongly needs, that MSME can expand further. Policy measure m is one of 26 policy measure options MSMEs desire (Table A3). Based on the survey data, each policy measure is a category variable with 3 as strongly needed, 2 as somewhat needed, and 1 as others (including neutral, less needed, and least needed). Z denotes control variables.

Oaxaca decomposition generates four outputs. First, it estimates gaps— ΔR , ΔE , ΔW , and ΔF —between two groups in four types. Second, it estimates how each gap changed if two groups of that firm type had the same characteristics (“endowments” in the decomposition outputs). For instance, it estimates the mean increase (decrease) in women-led MSME wage payments if they had the same characteristics as men-led MSMEs. Third, it quantifies the change in the performance indicator of the group if coefficients in the control group of the firm type were applied to the treatment group’s characteristics (“coefficients” in the decomposition outputs). In this model, there are four types of treatment groups—formalized, digitalized, internationalized, and women-led MSMEs. The control groups counter the four types—informal, non-digitalized, domestically focused, and men-led MSMEs. For instance, the model quantifies the change in women-led MSME wage payments when the men-led MSME coefficients were applied to the women-led MSME characteristics. And fourth, it measures the combined effects of differences in “endowments” and “coefficients” (interaction terms).

3. DATA STRUCTURE

This study uses survey data ADB collected in all 13 municipalities of Timor-Leste during 5–21 July 2024. The survey questionnaire covered three components. The company profile section includes firm registration status, primary business, location, operating period, employment, monthly wage per employee, e-commerce use, and exposure to global business at the time the survey was conducted. The section on business environment includes changes in business circumstances (better/no change/worse), sales revenue, employment, total wage payments between July 2023–July 2024, and fiscal and funding conditions at the time of the survey. The policy intervention section identifies policy measures that MSMEs would like to receive from the government to cope with global uncertainties impacting further growth.

The survey data cover a total of 3,080 valid samples from the 13 municipalities. Respondents were randomly selected, using business directories received from the country's Ministry of Commerce and Industry and the Investment and Export Promotion Agency (*TradeInvest*), based on the quasi-sampling frame. Due to the lack of firm-level data—and given that the majority of MSMEs are self-employed—the sampling frame was developed based on a municipal labor force population aged 10 years and above using the Timor-Leste Population and Housing Census 2022 (Table 2).

Table 2: Sampling Frame and Data Collected

Municipality	City	Total population, 2022	Aged 10 years and over (labor force population)		Target samples	Data collected	
				% share			% share
Group I					1,177	1,189	
Dili	Dili	324,738	252,373	24.7%	741	}	24.9%
Atauro (part of Dili)		10,295	8,051	0.8%	24		
Aileu	Aileu	54,324	40,469	4.0%	119		
Ainaro	Ainaro	73,115	54,152	5.3%	159		
Manufahi	Sama	60,665	46,186	4.5%	136		
Group II					751	787	
Baucau	Baucau	134,878	102,684	10.0%	301	307	10.0%
Manatuto	Manatuto	50,859	38,820	3.8%	114	127	4.1%
Viqueque	Viqueque	80,176	61,464	6.0%	180	190	6.2%
Lautem	Lospalos	70,022	52,969	5.2%	155	163	5.3%
Group III					1,071	1,104	
Ermera	Gleno	137,750	103,470	10.1%	304	310	10.1%
	Liquica	83,658	62,504	6.1%	183	191	6.2%
Bobonaro	Maliana	106,639	80,835	7.9%	237	242	7.9%
Cova Lima	Suai	73,933	56,112	5.5%	165	173	5.6%
Oecusse	Pante Macassar	80,685	62,173	6.1%	182	188	6.1%
Total		1,341,737	1,022,262	100%	3,000	3,080	100%

Source: Asian Development Bank. 2025. Asia Small and Medium-Sized Enterprise Monitor 2024 Volume II: Trends and Challenges Facing Small Businesses in Timor-Leste—Key Survey Findings. p.3.

The descriptive analysis of the survey data shows that MSMEs in Timor-Leste are mostly self-employed or microenterprises, typically engaged in distributive trade within limited markets characterized by stability-oriented firms. By firm size, 50.4% of respondents were self-employed, 42.6% from microenterprises, 6.6% from small firms, and 0.5% from medium-sized firms. By sector, 44.4% were engaged in wholesale and retail trade, 21.7% in accommodation and food services, 12.0% in manufacturing, 11.3% in other services, and 2.5% in agriculture. The small number of MSMEs related to tourism (2.8%) was based on official membership in tourism organizations and associations. By type, 71.6% were registered firms with 13.0% unregistered (informal), 14.7% were individual entrepreneurs, and 0.6% cooperatives or foundations.

Timor-Leste MSMEs are relatively young with many women-owned. By firm age, 47.4% were startups operating for 0-5 years. By ownership, 43.2% were women-led with the rest (56.8%) men-led. Meanwhile, firms using digital technology and expanding business abroad remained a small fraction. Just 8.0% operated digitally using e-commerce, while 10.2% were involved in international trade.

The tables below show the mean attributes comparing the two groups for each firm type. A relatively larger portion of formal MSMEs were microenterprises and small firms (based on number of employees), more engaged in manufacturing and other services and operating longer (6–30 years) than unregistered, informal firms. Formal MSMEs had more growing numbers of female workers and gains. By contrast, more informal MSMEs were likely younger, self-employed, worked in distributive trade and agriculture, operated for 5 years or less, and experienced less change in business environment (Table 3).

More digital-capable firms were young (operating for up to 5 years), microenterprises and small firms engaged in manufacturing and other services (including information and communications) than non-digitalized firms. They were also more likely to have female employees and performed better in revenue, wage payments, and job absorption than those non-digitalized. More non-digitalized firms were self-employed and had operated longer (16 years and above), engaged in trade, accommodation, and food services. They generally performed worse than digitalized firms (Table 4).

Similarly, a larger portion of internationalized firms were microenterprises and small firms engaged in trade and manufacturing, with moderate female employment and higher gains than those domestically oriented. More domestically focused firms were self-employed, working in accommodation and food services than those with international connections (Table 5).

Women-led firms were more likely self-employed than those led by men. They worked in trade, accommodation and food services, and operated longer (11 years or more). But they more likely faced a worse business environment than men-led firms. Men-led firms were more likely to be microenterprises and small firms in manufacturing and other services with fewer female employees than women-led firms. Performance on wage payments and employment was likely better than those led by women (Table 6).

Table 3: Mean Attributes of Formalized or Informal MSMEs

Item	Formalized	Informal	Diff	t
Size (employees)				
None (self-employed)	0.407	0.747	-0.340	17.858
1-5 people	0.503	0.231	0.273	-14.246
6-20 people	0.084	0.019	0.065	-6.570
21-50 people	0.006	0.003	0.002	-0.861
Sector				
Agriculture	0.020	0.040	-0.020	3.263
Manufacturing	0.176	0.059	0.117	-8.467
Wholesale and retail trade	0.392	0.573	-0.181	9.222
Accommodation and food service	0.216	0.219	-0.003	0.167
Other services	0.195	0.108	0.087	-5.799
Age (years)				
0-5 years	0.431	0.582	-0.152	7.672
6-10 years	0.304	0.210	0.094	-5.276
11-15 years	0.149	0.111	0.038	-2.768
16-30 years	0.106	0.084	0.021	-1.776
31 years and above	0.011	0.013	-0.002	0.394
Female employees share				
0-10%	0.799	0.929	-0.130	8.916
11%-30%	0.110	0.033	0.077	-6.857
31%-50%	0.043	0.022	0.021	-2.794
51%-80%	0.019	0.005	0.014	-2.994
81% and above	0.029	0.011	0.018	-2.884
Business performance				
Revenue	0.211	0.150	0.061	-3.876
Wages	0.086	0.023	0.063	-6.334
Employment	0.066	0.021	0.046	-5.116
Business environment				
Better	0.331	0.328	0.003	-0.167
No change	0.371	0.427	-0.056	2.871
Worse	0.228	0.212	0.015	-0.928
Observations	2,204	876		

MSME = micro, small, and medium-sized enterprise.
Source: Author's calculations.

Table 4: Mean Attributes of Digitalized or Non-digitalized MSMEs

Item	Digitalized	Nondigitalized	Diff	t
Size (employees)				
None (self-employed)	0.251	0.526	-0.275	8.369
1-5 people	0.543	0.415	0.127	-3.881
6-20 people	0.178	0.056	0.122	-7.516
21-50 people	0.028	0.003	0.025	-5.298
Sector				
Agriculture	0.053	0.023	0.030	-2.851
Manufacturing	0.263	0.133	0.130	-5.640
Wholesale and retail trade	0.223	0.463	-0.240	7.356
Accommodation and food service	0.162	0.222	-0.060	2.197
Other services	0.300	0.159	0.140	-5.655
Age (years)				
0-5 years	0.543	0.468	0.075	-2.259
6-10 years	0.259	0.279	-0.020	0.665
11-15 years	0.146	0.137	0.008	-0.369
16-30 years	0.053	0.104	-0.051	2.575
31 years and above	0.000	0.012	-0.012	1.757
Female employees share				
0-10%	0.644	0.853	-0.209	8.611
11%-30%	0.138	0.084	0.054	-2.852
31%-50%	0.089	0.032	0.057	-4.580
51%-80%	0.057	0.011	0.045	-5.667
81% and above	0.073	0.020	0.053	-5.249
Business performance				
Revenue	0.308	0.183	0.124	-4.769
Wages	0.142	0.062	0.080	-4.796
Employment	0.154	0.044	0.109	-7.405
Business environment				
Better	0.356	0.328	0.029	-0.920
No change	0.389	0.387	0.002	-0.056
Worse	0.215	0.224	-0.010	0.346
Observations	247	2,833		

MSME = micro, small, and medium-sized enterprise.

Source: Author's calculations.

Table 5: Mean Attributes of Internationalized or Domestically focused MSMEs

Item	Internationalized	Domestic	Diff	t
Size (employees)				
None (self-employed)	0.302	0.527	-0.225	7.636
1-5 people	0.502	0.417	0.085	-2.880
6-20 people	0.175	0.053	0.121	-8.339
21-50 people	0.022	0.003	0.019	-4.450
Sector				
Agriculture	0.044	0.023	0.021	-2.281
Manufacturing	0.175	0.140	0.035	-1.681
Wholesale and retail trade	0.543	0.433	0.110	-3.741
Accommodation and food service	0.063	0.235	-0.171	7.037
Other services	0.175	0.170	0.005	-0.207
Age (years)				
0-5 years	0.432	0.478	-0.047	1.574
6-10 years	0.302	0.275	0.027	-1.017
11-15 years	0.143	0.137	0.005	-0.264
16-30 years	0.114	0.098	0.016	-0.913
31 years and above	0.010	0.012	-0.002	0.325
Female employees share				
0-10%	0.730	0.848	-0.118	5.380
11%-30%	0.098	0.087	0.011	-0.667
31%-50%	0.073	0.033	0.040	-3.626
51%-80%	0.035	0.013	0.022	-3.090
81% and above	0.063	0.020	0.044	-4.845
Business performance				
Revenue	0.254	0.186	0.068	-2.887
Wages	0.095	0.065	0.030	-2.011
Employment	0.130	0.044	0.086	-6.458
Business environment				
Better	0.340	0.329	0.011	-0.391
No change	0.416	0.384	0.032	-1.110
Worse	0.210	0.225	-0.015	0.623
Observations	315	2,765		

MSME = micro, small, and medium-sized enterprise.

Source: Author's calculations.

Table 6: Mean Attributes of Women-led or Men-led MSMEs

Item	Women-led	Men-led	Diff	t
Size (employees)				
None (self-employed)	0.598	0.432	0.166	-9.235
1-5 people	0.353	0.481	-0.127	7.127
6-20 people	0.045	0.081	-0.036	4.010
21-50 people	0.004	0.006	-0.003	0.966
Sector				
Agriculture	0.019	0.030	-0.011	2.011
Manufacturing	0.092	0.182	-0.089	7.058
Wholesale and retail trade	0.470	0.424	0.046	-2.543
Accommodation and food service	0.284	0.166	0.118	-7.939
Other services	0.135	0.198	-0.063	4.630
Age (years)				
0-5 years	0.465	0.481	-0.016	0.876
6-10 years	0.265	0.287	-0.022	1.363
11-15 years	0.150	0.129	0.022	-1.738
16-30 years	0.107	0.094	0.012	-1.145
31 years and above	0.014	0.010	0.004	-0.991
Female employees share				
0-10%	0.814	0.853	-0.040	2.944
11%-30%	0.091	0.086	0.005	-0.454
31%-50%	0.040	0.034	0.006	-0.813
51%-80%	0.020	0.011	0.008	-1.841
81% and above	0.036	0.015	0.021	-3.820
Business performance				
Revenue	0.183	0.201	-0.017	1.192
Wages	0.054	0.079	-0.025	2.699
Employment	0.041	0.063	-0.022	2.727
Business environment				
Better	0.324	0.334	-0.010	0.598
No change	0.381	0.391	-0.010	0.577
Worse	0.242	0.209	0.033	-2.177
Observations	1,330	1,750		

MSME = micro, small, and medium-sized enterprise.

Source: Author's calculations.

4. ESTIMATION RESULTS

4.1 Linear Probability Model

Table 7 shows the estimation results of the LPM model. Formula (1) was done using four variables—revenue, employment, wage, and finance—to identify MSME growth mechanisms in Timor-Leste. *Revenue* denotes a dummy variable taking the value one for a firm with an income/revenue increase and zero for a firm with an income/revenue decrease, zero revenue, or no change compared with the previous year (July 2023–July 2024). *Employment* is a dummy variable with the value one for a firm that increased the number of full-time employees compared with the previous year and zero for a firm with a decrease or no change in the number of regular employees or those self-employed. *Wage* denotes a dummy variable taking the value one for a firm that increased total wage/salary payments to employees and zero for a firm with a decrease, no change, or no payments in wage/salary compared with the previous year. *Finance* is a dummy variable taking the value one for a firm with sufficient savings, liquid assets, and other contingency finance to maintain business for more than 6 months and zero for a firm already out of funds or running out of funds in 6 months at the time of the survey.

MSME revenue

By sector, revenue estimates showed that information and communications and education were less likely to increase annual revenue than the agriculture base. Compared with agriculture (which includes forestry and fisheries) firms, the revenue increase was 17.2 percentage points lower in information and technology (IT)-based MSMEs (1% significance level) and 15.7 percentage points

lower in education-related MSMEs (5% significance level). The results in water supply and public administration were excluded as they each had only one sample.

By region, MSMEs in Baucau, Oecussi, Viqueque, Ermera, Cova-Lima, and Lautem were less likely to increase annual revenue than those in the capital Dili. Compared with Dili-based firms, the MSME revenue increase was 16.1 percentage points lower in Baucau, 14.5 percentage points lower in Oecussi, 12.9 percentage points lower in Viqueque, 10.3 percentage points lower in Ermera, 10.0 percentage points lower in Cova-Lima, and 9.5 percentage points lower in Lautem (all 1% significance level).

Both formalized MSMEs and digitally operated MSMEs were more likely to increase annual revenue than those informal and non-digitalized. The revenue increase of MSMEs was 6.7 percentage points higher in registered firms than unregistered firms and 9.4 percentage points higher in digitalized firms than non-digitalized firms (both 1% significance level).

MSME employment

Most industries were less likely to increase regular employees than the agriculture base. In comparison with agriculture-oriented firms, MSME job creation was 13.3 percentage points lower in professional and scientific services (1% significance level), 11.9 percentage points lower in real estate services (10% significance level), 9.4 percentage points lower in information and communications (5% significance level), and 8.4 percentage points lower in wholesale and retail trade (5% significance level).

By region, similar to the revenue analysis, MSMEs in most municipalities were less likely to increase regular employees than those in Dili. Compared with Dili-based firms, MSME job creation was 10.2 percentage points lower in Oecussi, 9.4 percentage points lower in Ermera, 8.6 percentage points lower in Viqueque, 7.9 percentage points lower in Cova-Lima, 7.8 percentage points lower in Baucau, 7.3 percentage points lower in Manatuto, 5.8 percentage points lower in Bobonaro, and 5.1 percentage points lower in Lautem (all 1% significance level).

By operating period, MSMEs operating longer were less likely to increase regular employees than younger firms. MSMEs operating for 11-15 years and those over 31 years were less likely to create new jobs than those operating at 5 years or less by 2.3 percentage points and 3.7 percentage points lower, respectively (5% and 1% significance levels). Both digitally operated MSMEs and internationalized MSMEs were more likely to increase employees than those non-digitalized or domestically focused. MSME job creation was 3.8 percentage points higher in digitalized firms than those non-digitalized (10% significance level) and 5.5 percentage points higher in internationalized firms than those domestically focused (1% significance level).

Compared with those self-employed as base, job creation was 20.7 percentage points higher in medium-sized firms (10% significance level), 14.5 percentage points higher in small firms (1% significance level), and 4.7 percentage points higher in microenterprises (1% significance level). This reconfirms that the larger the firm size, the more jobs are created and absorbed.

Table 7: Growth Factors of MSMEs in Timor-Leste—Linear Probability Model

Variables	(1) Revenue	(2) Employment	(3) Wage	(4) Finance
Industry (base—agriculture, forestry, and fisheries)				
Manufacturing	-0.01079 [0.0487]	-0.04689 [0.0364]	0.03303 [0.0247]	-0.006528 [0.0558]
Electricity, gas, steam, and air conditioning supply	0.06204 [0.1077]	-0.07392 [0.0640]	-0.08931*** [0.0287]	-0.07851 [0.1062]
Water supply	-0.1870*** [0.0608]	-0.1663*** [0.0456]	0.9140*** [0.0359]	-0.7957*** [0.0695]
Construction	-0.003191 [0.0660]	0.006426 [0.0533]	0.06153 [0.0443]	-0.1158 [0.0783]
Wholesale and retail trade	-0.006862 [0.0459]	-0.08379** [0.0342]	0.01927 [0.0214]	0.04379 [0.0526]
Transport and storage	-0.02655 [0.0941]	-0.03716 [0.0696]	0.03193 [0.0647]	-0.08376 [0.1092]
Accommodation and food service activities	-0.003078 [0.0456]	-0.0469 [0.0339]	0.02482 [0.0213]	-0.05001 [0.0540]
Information and communication	-0.1723*** [0.0573]	-0.09356** [0.0396]	-0.04579 [0.0333]	0.2248*** [0.0566]
Financial and insurance activities	0.2043 [0.1775]	0.09241 [0.1582]	0.04633 [0.1310]	0.0901 [0.1367]
Real estate activities	0.146 [0.3322]	-0.1188* [0.0718]	-0.03275 [0.0591]	-0.07185 [0.2783]
Professional, scientific and technical activities	-0.1394 [0.0852]	-0.1326*** [0.0394]	-0.06103** [0.0261]	-0.07655 [0.1240]
Administrative and support service activities	0.003149 [0.0737]	-0.01171 [0.0487]	0.01958 [0.0380]	0.02895 [0.0866]
Public administration and defense	-0.1729*** [0.0538]	-0.07597** [0.0372]	0.03061 [0.0248]	0.3461*** [0.0653]
Education	-0.1569** [0.0696]	-0.07243 [0.0542]	0.2424 [0.1685]	0.03984 [0.2214]
Human health and social work activities	-0.05076 [0.0985]	0.02436 [0.0889]	0.07758 [0.0873]	-0.06346 [0.1391]
Arts, entertainment, and recreation	-0.04354 [0.1311]	0.08223 [0.1133]	0.05949 [0.0956]	0.02199 [0.1383]
Other service activities	-0.04837 [0.0500]	-0.05559 [0.0376]	0.02066 [0.0277]	-0.03028 [0.0587]
Others	0.1592 [0.1257]	-0.03142 [0.0801]	0.04954 [0.0727]	0.09909 [0.1110]
Location (base—Dili [capital city])				
Bobonaro	0.02283 [0.0341]	-0.05842*** [0.0131]	-0.08769*** [0.0191]	0.09031** [0.0353]
Cova-Lima	-0.1004*** [0.0335]	-0.07893*** [0.0159]	-0.1221*** [0.0167]	0.1507*** [0.0366]
Liquica	0.01647 [0.0370]	-0.0217 [0.0187]	-0.08188*** [0.0207]	-0.2930*** [0.0416]
Ermera	-0.1033*** [0.0282]	-0.09439*** [0.0158]	-0.1187*** [0.0182]	0.1076*** [0.0319]
Ainaro	0.06187 [0.0413]	-0.01264 [0.0224]	-0.09237*** [0.0222]	-0.05215 [0.0442]
Aileu	0.03108 [0.0439]	-0.04019* [0.0227]	-0.1092*** [0.0224]	-0.1046** [0.0497]
Manatuto	-0.03818 [0.0407]	-0.07348*** [0.0204]	-0.09976*** [0.0231]	0.0642 [0.0468]
Baucau	-0.1610*** [0.0250]	-0.07791*** [0.0145]	-0.1342*** [0.0155]	0.1201*** [0.0326]
Viqueque	-0.1286*** [0.0296]	-0.08573*** [0.0136]	-0.1036*** [0.0196]	0.1267*** [0.0377]
Lautem	-0.09503*** [0.0338]	-0.05135*** [0.0195]	-0.1305*** [0.0181]	0.04016 [0.0418]
Manufahi	-0.04945 [0.0386]	0.004042 [0.0286]	-0.07197** [0.0292]	0.1290*** [0.0403]
Oecussi	-0.1453*** [0.0297]	-0.1018*** [0.0141]	-0.1300*** [0.0211]	0.3152*** [0.0224]

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Variables	(1)	(2)	(3)	(4)
	Revenue	Employment	Wage	Finance
Operating period (base—0–5 years)				
6–10 years	-0.01539 [0.0171]	0.004819 [0.0100]	0.006131 [0.0106]	-0.01399 [0.0193]
11–15 years	0.00515 [0.0225]	-0.02329** [0.0114]	0.01514 [0.0142]	-0.02275 [0.0248]
16–30 years	-0.03677 [0.0237]	-0.01237 [0.0118]	0.001939 [0.0139]	-0.01553 [0.0266]
31 years and above	0.01039 [0.0651]	-0.03715*** [0.0099]	0.009471 [0.0365]	-0.06987 [0.0803]
Formalization (base—unregistered [informal] firms)				
Registered firms	0.06695*** [0.0166]	0.0104 [0.0073]	0.03152*** [0.0083]	0.01574 [0.0203]
Digitalization (base—nondigitalized firms)				
Digitally operated firms ¹	0.09386*** [0.0329]	0.03845* [0.0227]	0.02234 [0.0232]	0.005669 [0.0306]
Internationalization (base—noninternationalized firms)				
Internationalized firms ²	0.02652 [0.0275]	0.05478*** [0.0189]	-0.01203 [0.0174]	0.05065* [0.0263]
Gender of owner (base—male owner)				
Female	-0.008658 [0.0145]	0.002106 [0.0077]	-0.001359 [0.0088]	0.0249 [0.0166]
Firm size (base—self-employed)				
Micro	0.005223 [0.0171]	0.04733*** [0.0084]	0.05620*** [0.0099]	0.06841*** [0.0193]
Small	0.05244 [0.0352]	0.1450*** [0.0289]	0.1173*** [0.0279]	0.1887*** [0.0328]
Medium	0.03654 [0.1148]	0.2069* [0.1172]	0.1761 [0.1073]	0.1548 [0.1100]
Constant	0.2010*** [0.0489]	0.1169*** [0.0357]	0.06832*** [0.0255]	0.5980*** [0.0566]
N	3080	3080	3080	3053
Pseudo R-square	0.04929	0.1137	0.09692	0.09512

MSME = micro, small, and medium-sized enterprise.

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

¹ Firms engaged in online selling or e-commerce.

² Firms participating in global supply chains or engaged in export/import business.

Source: Author's calculations.

MSME wage payments

By sector, estimates show that energy supply (electricity, gas, steam, and air conditioning) along with professional and scientific services were less likely to increase total wage payments to employees than the agriculture base. Compared with agriculture-oriented firms, MSME wage payment growth was 8.9 percentage points lower in energy supply (1% significance level) and 6.1 percentage points lower in professional and scientific services (5% significance level).

By region, MSMEs in all local municipalities were less likely to increase total wage payments to employees than those in Dili. Compared with Dili-based firms, MSME wage payment increases were 13.4 percentage points lower in Baucau, 13.1 percentage points lower in Lautem, 13.0 percentage points lower in Oecussi, 12.2 percentage points lower in Cova-Lima, 11.9 percentage points lower in Ermera, 10.9 percentage points lower in Aileu, 10.4 percentage points lower in Viqueque, 10.0 percentage points lower in Manatuto, 9.2 percentage points lower in Ainaro, 8.8 percentage points lower in Bobonaro, 8.2 percentage points lower in Liquica, and 7.2 percentage points lower in Manufahi (1% or 5% significance level).

Formalized (registered) MSMEs were more likely to increase total wage payments than informal firms. MSME wage payment increases were 3.2 percentage points higher in registered than unregistered firms (1% significance level).

As compared with the self-employed base, the wage payment increase was 11.7 percentage points higher in small firms and 5.6 percentage points higher in microenterprises (both 1% significance level).

MSME financial conditions

At the time the survey was conducted, information and communications was more likely to have enough funds to maintain business for more than 6 months than the agriculture base. In comparison with agriculture-oriented firms, the funds needed to survive for over a half year was 22.5 percentage points higher in IT-based MSMEs (1% significance level).

By region, MSMEs in several municipalities were less likely to have funding difficulties than those in Dili. Compared with Dili-based firms, MSME fund availability for business was 31.5 percentage points higher in Oecussi, 15.1 percentage points higher in Cova-Lima, 12.9 percentage points higher in Manufahi, 12.7 percentage points higher in Viqueque, 12.0 percentage points higher in Baucau, 10.8 percentage points higher in Ermera, and 9.0 percentage points higher in Bobonaro (1% or 5% significance level). In contrast, fund sufficiency was 29.3 percentage points lower for MSMEs located in Liquica (1% significance level) and 10.5 percentage points lower in Aileu (5% significance level).

Internationalized MSMEs were more likely to have sufficient funds than those domestically focused. Six-month fund sufficiency was 5.1 percentage points higher in internationalized MSMEs than those domestically focused (10% significance level). Compared with the self-employed base, 6-month fund sufficiency was 18.9 percentage points higher in small firms and 6.8 percentage points higher in microenterprises (both 1% significance level).

4.2 Oaxaca Decomposition

The Oaxaca decomposition estimation results identify the heterogeneity of growth factors between two groups among the four firm types—given that binding constraints on firm growth are defined by the extent to which they require policy assistance (Table 8). They suggest potentially effective policy support areas for MSME growth by firm type. The following interpretations are based on coefficients with 1% to 10% significance levels.

Formalized firms

For formalized firms, the mean prediction of increased revenue was 0.150 for informal MSMEs and 0.211 for formalized MSMEs, leaving a revenue gap of 0.061, which shows a relatively higher revenue increase for formalized (Table 8A). The mean prediction in revenue for formalized firms was 1.4 percentage points down if their revenue increase structure had the same characteristics as informal firms. This means that differences in binding constraints (the level of policy needs) account for just about one sixth of the revenue gap. In this case, less financial support for firms in bankruptcy (−0.005) will likely push down formalized firm revenue very slightly (Table A2A, endowments). But the increase in formalized firm revenue was 5.6 percentage points down if informal firms' coefficients were applied to their characteristics. In this case, less support for MSME exports and imports (through a one-stop service window) (−0.109) will likely lower formalized firm revenue (Table A2B, coefficients). Meanwhile, firms with stronger demand for

foreign investments (0.116), simplified loan procedures (0.152), and the development of dedicated MSME capital markets (0.131) will likely raise formalized firm revenue, suggesting that formalized MSMEs concerned more with funding (as a mindset) gain more comparatively. The revenue estimation results suggest that business formalization (registering businesses) increases MSME revenue. Support for MSMEs entering global markets and expanding their financing options will likely help increase formalized firm revenue.

On new jobs, the mean prediction of an increase in regular employees was 0.021 for informal MSMEs and 0.066 for formalized MSMEs, showing an employment gap of 0.046—indicating relatively higher job creation in registered firms. From different angles, the increase in formalized firms' employees was 4.6 percentage points down if informal firms' coefficients were applied to their characteristics. In this case, less support for tax relief (such as deferred tax payments, lower corporate and value-added taxes) (−0.093), less support for promoting exports and diversifying export destinations (−0.064), and the limited availability of concessional loans (−0.077) would likely push down formalized firm job creation (Table A2B). Meanwhile, firms with stronger demand for mentoring and business literacy (0.064) and special credit guarantees (0.075) will likely increase formalized firm job absorption, suggesting that registered MSMEs paying more attention to business literacy and funding (as a mindset) create more jobs. The employment condition estimation results suggest that registered MSMEs increase jobs. Tax incentives, MSME export support, and concessional MSME lending likely contribute to formalized firm job creation.

For total wage/salary payments to employees, the mean prediction of wage payment increase was 0.023 for informal MSMEs and 0.086 for formalized MSMEs, showing a wage gap of 0.063—a relatively higher wage payment increase for formalized firms. The mean prediction in formalized firm wage payments was 1.7 percentage points down if their wage payment increase structure had the same characteristics as informal firms. This means that differences in binding constraints account for only around one fourth of the wage gap. In this case, less improved public information and communications technology (ICT) infrastructure, including the internet environment (−0.005), and less financial support for bankrupt firms (−0.009) would very slightly push down formalized firm wage payments (Table A2A). But the increase in formalized firm wage payments was 6.2 percentage points down if informal firm coefficients were applied. In this case, less support for tax relief (−0.110) and limited or no debt restructuring for MSMEs (such as extending loan tenures and reducing interest rates) (−0.072) would likely lower formalized firms' ability to raise wage payments (Table A2B). Meanwhile, firms with stronger demand for participating in public procurement (0.086), teleworking (0.087), and financial support for bankrupt firms (0.155) would likely raise formalized firm wage payments, suggesting that registered MSMEs paying more attention to new business (through public procurement), digitalization, and emergency financing (as a mindset) find their wage payments rise. The interaction term (combined effect of gaps in “endowments” and “coefficients”) shows 1.5 percentage points up for formalized firm wage payment increases, where MSMEs paying more attention to emergency financing (as a mindset) (0.009) help as well (Table A2C). The wage payments estimation results suggest that registered MSMEs pay more to employees than informal MSMEs. Tax incentives, ICT infrastructure improvement, and establishing an MSME emergency financing mechanism likely contribute to increasing formalized firm wage payments.

On finance, the mean prediction of business funds sufficiency was 0.656 for informal MSMEs and 0.733 for formalized MSMEs—a financial condition gap of 0.077 that shows relatively better funding conditions for formalized than informal firms. The mean prediction in formalized firm funding sufficiency was 1.2 percentage points down if their business funding availability had the same characteristics as informal firms. This means that differences in binding constraints account for only around one sixth of the financial condition gap. In this case, less support for upgrading

worker skills (−0.006) and less development of new financing models such as digital financial services (−0.011) would very slightly push down formalized firm funding sufficiency (Table A2A). The change in formalized firm funding sufficiency was 8.3 percentage points down if informal firm coefficients were applied. In this case, less support for MSME participation in public procurement (−0.195), improving ICT infrastructure (−0.167), and in allowing foreign investment into MSMEs (−0.158) would likely reduce formalized firm funding sufficiency (Table A2B). Meanwhile, firms with stronger demand for easing tariffs and duties for imported raw materials (0.152) and simplified loan procedures (0.217) would likely help formalized firm funding sufficiency. This suggests that registered MSMEs paying more attention to reducing costs and increasing funding (as a mindset) are better funded. The interaction term shows 1.9 percentage points up for formalized firm funding sufficiency, where MSMEs paying more attention to ICT infrastructure development (0.011) and simplified loan procedures (0.011) (as a mindset) help out (Table A2C). Meanwhile, reduced access to foreign investment in MSMEs (−0.008) very slightly reduces funding sufficiency of formalized firms. The financial condition estimation results suggest that registered MSMEs enjoy greater funding access than informal MSMEs. Promoting MSME participation in public procurement and improved ICT infrastructure, facilitating foreign investments into domestic MSMEs, and setting up a mechanism for easing MSME access to finance would likely contribute to improving formalized firm financial conditions.

Digitalized firms

The mean prediction of a revenue increase was 0.183 for non-digitalized MSMEs and 0.308 for digitalized MSMEs, a revenue gap of 0.125 which shows a higher revenue increase in digitalized firms than non-digitalized firms (Table 8B). The increase in digitalized firm revenue was 11.6 percentage points down if non-digitalized firm coefficients were applied. In this case, no statistically significant result was found for binding constraints affecting digitalized firm revenue (Table A2B).

The mean prediction for a regular employee increase was 0.044 for non-digitalized MSMEs and 0.154 for digitalized MSMEs, showing an employment gap of 0.109—indicating relatively higher job creation in digitalized firms than non-digitalized firms. The increase in digitalized firm employees was 10.4 percentage points down if non-digitalized firm coefficients were applied. In this case, less support for easing tariffs and duties for imported raw materials (−0.206) would likely reduce digitalized firm job creation (Table A2B). Meanwhile, firms with stronger demand for business development and advisory services (0.207) would likely push up digitalized firm job creation, suggesting that digitalized MSMEs paying more attention to advisory services (as a mindset) create comparatively more jobs. The employment estimation results suggest that business digitalization increases MSME jobs. Relaxing trade barriers would also likely contribute to digitalized firm job creation.

For the total wage/salary payments to employees, the mean prediction of wage payment increase was 0.062 for non-digitalized MSMEs and 0.142 for digitalized MSMEs—a wage gap of 0.080 that shows a relatively higher wage payment increase for digitalized than non-digitalized firms. The increase was 6.9 percentage points down if non-digitalized firm coefficients were applied to their characteristics. But firms with stronger demand for financial support for remote work or work from home arrangements (0.225) would likely raise digitalized firms' wage payment capability, suggesting that digitalized MSMEs paying higher attention to digital work arrangements (as a mindset) comparatively increase wage payments (Table A2B). The estimation results for wage payments suggest that digitalized MSMEs provide more payments to employees than non-digitalized MSMEs. Support for digital work arrangements likely helps increase digitalized firm wage payments.

For financial conditions, the mean prediction of business funds sufficiency was 0.708 for non-digitalized MSMEs and 0.746 for digitalized MSMEs—a financial condition gap of 0.038 that shows better funding conditions for digitalized than non-digitalized firms (but this was not statistically significant). The change in digitalized firm funding sufficiency was 5.0 percentage points down if non-digitalized firm coefficients were applied. In this case, less support for tax relief (−0.234) and less foreign investment promotion into MSMEs (−0.292) would likely reduce digitalized firm funding sufficiency (Table A2B). The financial condition estimation results suggest that tax incentives and attracting foreign investment into MSMEs would likely help improve digitalized firm financial conditions.

Internationalized firms

The mean prediction of a revenue increase for internationalized firms was 0.186 for domestically focused MSMEs and 0.254 for internationalized MSMEs—a revenue gap of 0.068 that shows a relatively higher increase in internationalized firms (Table 8C). The increase in internationalized firm revenue was 5.3 percentage points down if domestically focused firm coefficients were applied. In this case, less support for improving ICT infrastructure (−0.149), less streamlining government transaction processes and shift to digital platforms (−0.142), and less support for access to new financing models such as digital financial services (−0.163) would likely reduce internationalized firm revenue (Table A2B). Meanwhile, firms with stronger demand for tax relief (0.204), deferment of utility bill payments (0.205), business development and advisory services (0.397), and foreign investments (0.246) would likely increase internationalized firm revenue, suggesting that internationalized MSMEs paying more attention to reducing costs and taking advice (as a mindset) have more to gain. The interaction term is 3.8 percentage points down for internationalized firm revenue increases, where less support for improving ICT infrastructure (−0.024) and attracting foreign investment into MSMEs (−0.015) contribute (Table A2C). These estimation results suggest that internationalized MSMEs earn more than domestically focused firms. Support for ICT/digital infrastructure development, providing new financing options like digital financial services, and promoting foreign investment likely help increase internationalized firm revenue.

The mean prediction for a regular employee increase was 0.044 for domestically focused MSMEs and 0.130 for internationalized MSMEs—an employment gap of 0.086 that indicates relatively higher job creation in internationalized firms than those domestically focused. The increase in internationalized firm employees was 8.2 percentage points down if domestically focused firm coefficients were applied. In this case, less support for improving ICT infrastructure (−0.132), less export promotion (−0.188), and less support for easing tariffs and duties for imported raw materials (−0.113) would likely reduce job creation in internationalized firms (Table A2B). Meanwhile, firms with stronger demand for business development and advisory services (0.227) would likely increase internationalized firm job creation, suggesting that internationalized MSMEs paying more attention to business advice create relatively more jobs. Support for improving ICT infrastructure, MSME exports, and easing trade barriers for MSMEs would likely contribute to internationalized firm job creation.

For total wage/salary payments to employees, the mean prediction of wage payments increase was 0.065 for domestically focused MSMEs and 0.095 for internationalized MSMEs—a wage gap of 0.030 that shows a relatively higher wage payments increase in internationalized firms. There was no statistically significant result for differences in endowments and coefficients.

As for financial conditions, the mean prediction of business funds sufficiency was 0.700 for domestically focused MSMEs and 0.811 for internationalized MSMEs—a financial condition gap

of 0.111 that shows better funding conditions for internationalized firms than those domestically focused. The mean prediction in internationalized firm funding sufficiency was 4.2 percentage points down if their business funding availability had the same characteristics as domestically focused firms. This means that differences in binding constraints account for around one third of the financial condition gap. Here, less support for deferring debt repayments (−0.022), less government transaction streamlining and shifting to digital platforms (−0.016), less financial assistance for remote work (−0.019), and less financial support for bankrupt firms (−0.010) would likely lower internationalized firm funding sufficiency (Table A2A). The change in internationalized firm funding sufficiency was 12.3 percentage points down if domestically focused firm coefficients were applied. In this case, less streamlining labor regulations for remote working arrangements (−0.150) would likely reduce internationalized firm funding sufficiency (Table A2B). Meanwhile, firms with stronger demand for business development and advisory services (0.307), streamlining government transaction processes and shifting to digital platforms (0.145), financial assistance for remote work (0.170), and financial support for bankrupt firms (0.216) would likely raise internationalized firm funding sufficiency. This suggests that internationalized MSMEs paying greater attention to business advice, digital infrastructure, and emergency financing support are more sufficiently funded. The interaction term is 5.4 percentage points up for internationalized firm funding sufficiency, where MSMEs paying greater attention to financial assistance for remote work (0.021) and financial support for bankrupt firms (0.012) contribute (Table A2C). These estimation results suggest that internationalized MSMEs enjoy more business funding access than those domestically focused. Digital infrastructure development, remote working support, and setting up an emergency financial support mechanism would likely contribute to improving internationalized firm financial conditions.

Women-owned firms

In terms of ownership, the mean prediction of a revenue increase was 0.200 for men-led MSMEs and 0.184 for women-led MSMEs—a revenue gap of 0.017, which shows a relatively higher revenue increase in men-led firms, but this was not statistically significant (Table 8D). There was no statistically significant result for differences in endowments and coefficients.

On jobs, the mean prediction of a regular employee increase was 0.063 for men-led MSMEs and 0.041 for women-led MSMEs—an employment gap of 0.022 that indicates relatively higher job creation in men-led firms. The mean prediction in women-led firm job creation was just 0.4 percentage points up if their employee increase structure had the same characteristics as men-led firms. This means that differences in binding constraints account for only around one fifth of the employment gap. In this case, firms with stronger demand for simplified loan procedures (0.003) would increase women-led firm job creation very slightly (Table A2A). The increase in women-led firm employees was 1.8 percentage points up if men-led firm coefficients were applied. In this case, firms with stronger demand for participating in public procurement (0.099) and accessing new financing options like digital financial services (0.063) would likely increase women-led firm job creation (Table A2B). This suggests that women-led MSMEs paying more attention to developing business through public procurement and accessing new financing options create more jobs comparatively. Meanwhile, less financial support through credit guarantees (−0.098) would likely reduce their job absorption. These estimation results suggest that women-led MSMEs are more disadvantaged in creating jobs than men-led MSMEs. Enhancing access to finance would likely help women-led firms create more jobs.

For the total wage/salary payments to employees, the mean prediction of wage payment increase was 0.079 for men-led MSMEs and 0.054 for women-led MSMEs—a wage gap of 0.025 that shows a relatively higher wage payment increase for men-led firms. The increase in women-led

firm wage payments was 1.8 percentage points up if men-led firm coefficients were applied to their characteristics. In this case, firms with a stronger demand for payroll subsidies for workers (0.074) would likely raise women-led firm wage payments (Table A2B). This suggests that women-led MSMEs seeking higher worker subsidies can better raise wage payments comparatively. Meanwhile, less support for utility bill payments (−0.085) and less financial support for bankrupt firms (−0.125) would likely lessen their wage payment ability. These wage payment estimation results suggest that men-led MSMEs pay wages more than women-led MSMEs. Providing payroll subsidies for workers would help increase women-led firm wage payments.

The mean prediction of business funds sufficiency was 0.711 for men-led MSMEs and 0.712 for women-led MSMEs—a negligible and not statistically significant financial condition gap of 0.001. The mean prediction in women-led firm funding sufficiency was 0.9 percentage points down if their business funding availability had the same characteristics as men-led firms. Less support for access to trade finance (−0.009) would very slightly reduce women-led firm funding sufficiency (Table A2A). These estimation results suggest that a financial condition gap is negligible between women- and men-led MSMEs. Providing greater access to trade finance may only slightly improve women-led firm financial conditions.

Table 8: Growth Factors of MSMEs in Timor-Leste by Firm Type—Oaxaca Decomposition

A. Formalized firms

	Revenue	Employment	Wage	Finance
overall				
group_1 (informal)	0.1495***	0.02055***	0.02283***	0.6564***
	[0.0122]	[0.0049]	[0.0051]	[0.0163]
group_2 (formalized)	0.2105***	0.06624***	0.08621***	0.7330***
	[0.0087]	[0.0053]	[0.0060]	[0.0095]
difference	-0.06098***	-0.04570***	-0.06338***	-0.07667***
	[0.0150]	[0.0072]	[0.0079]	[0.0189]
endowments	-0.01373**	0.0001687	-0.01702***	-0.01208*
	[0.0053]	[0.0032]	[0.0046]	[0.0065]
coefficients	-0.05568***	-0.04616***	-0.06157***	-0.08309***
	[0.0165]	[0.0073]	[0.0085]	[0.0201]
interaction	0.008422	0.0002982	0.01522***	0.01850*
	[0.0091]	[0.0036]	[0.0054]	[0.0107]
N	3080	3080	3080	3053

B. Digitalized firms

	Revenue	Employment	Wage	Finance
overall				
group_1 (non-digitalized)	0.1832***	0.04448***	0.06177***	0.7081***
	[0.0073]	[0.0039]	[0.0045]	[0.0086]
group_2 (digitalized)	0.3077***	0.1538***	0.1417***	0.7459***
	[0.0310]	[0.0242]	[0.0234]	[0.0293]
difference	-0.1245***	-0.1094***	-0.07993***	-0.03782
	[0.0318]	[0.0245]	[0.0238]	[0.0305]
endowments	0.01742	-0.01518	0.004343	0.02461
	[0.0190]	[0.0134]	[0.0152]	[0.0181]
coefficients	-0.1162***	-0.1041***	-0.06918***	-0.05040*
	[0.0322]	[0.0244]	[0.0237]	[0.0302]
interaction	-0.02568	0.009931	-0.0151	-0.01203
	[0.0197]	[0.0132]	[0.0150]	[0.0175]
N	3080	3080	3080	3053

Continued on the next page

C. Internationalized firms

	Revenue	Employment	Wage	Finance
overall				
group_1 (domestic)	0.1863*** [0.0074]	0.04448*** [0.0039]	0.06510*** [0.0047]	0.6999*** [0.0088]
group_2 (international)	0.2540*** [0.0255]	0.1302*** [0.0197]	0.09524*** [0.0172]	0.8111*** [0.0232]
difference	-0.06771** [0.0266]	-0.08567*** [0.0201]	-0.03014* [0.0178]	-0.1111*** [0.0248]
endowments	0.02335 [0.0201]	-0.004838 [0.0148]	-0.001259 [0.0141]	-0.04172** [0.0168]
coefficients	-0.05328* [0.0279]	-0.08200*** [0.0204]	-0.0125 [0.0184]	-0.1231*** [0.0259]
interaction	-0.03779* [0.0218]	0.001164 [0.0152]	-0.01638 [0.0145]	0.05371*** [0.0184]
N	3080	3080	3080	3053

D. Women-owned firms

	Revenue	Employment	Wage	Finance
overall				
group_1 (male-owned)	0.2006*** [0.0096]	0.06286*** [0.0058]	0.07886*** [0.0065]	0.7107*** [0.0110]
group_2 (female-owned)	0.1835*** [0.0107]	0.04060*** [0.0055]	0.05414*** [0.0063]	0.7117*** [0.0126]
difference	0.01711 [0.0144]	0.02226*** [0.0080]	0.02472*** [0.0090]	-0.001022 [0.0167]
endowments	0.0007792 [0.0038]	0.004446** [0.0018]	0.003111 [0.0022]	-0.008631* [0.0049]
coefficients	0.01451 [0.0145]	0.01821** [0.0079]	0.01809** [0.0089]	0.005414 [0.0164]
interaction	0.00182 [0.0045]	-0.0004027 [0.0025]	0.003522 [0.0035]	0.002196 [0.0046]
N	3080	3080	3080	3053

MSME = micro, small, and medium-sized enterprise.

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

Source: Author's calculations.

5. KEY FINDINGS FROM THE ECONOMETRIC ANALYSES

Analysis of the Timor-Leste survey data share several attributes that vary in amount and intensity depending on firm type. Formalized MSMEs are mostly microenterprises and small firms, work in manufacturing and other services, and have been operating relatively longer, with more female employees and higher gains than unregistered, informal firms. Informal MSMEs are typically young (up to 5 years in operation), self-employed, mainly involved in distributive trade and agriculture, and are less growth-oriented than formalized firms. Digitalized MSMEs are relatively young microenterprises and small firms in manufacturing and other services (including IT-based firms), with many employing women. They also perform better in terms of revenue, wage payments, and job creation than non-digitalized MSMEs. Non-digitalized MSMEs are typically self-employed and have operated for more than 5 years in trade, accommodation, and food services. Internationalized MSMEs are mostly microenterprises and small firms in trade and manufacturing, and employ a moderate number of women with higher gains compared with domestically focused firms. Domestically focused MSMEs are typically self-employed and engaged in accommodation and food services. Women-led MSMEs are mainly self-employed and

work in trade, accommodation, and food services. They have been in business for longer periods and are more likely to face a difficult business environment than men-led firms. Men-led MSMEs are mainly microenterprises and small firms in manufacturing and other services with few or no female employees.

An LPM regression was used to identify the MSME growth structure with the Oaxaca decomposition to detailed growth factors by firm type and suggesting which policy areas could be strengthened.

Timor-Leste MSME growth structure

The LPM regression results found that MSMEs in several sectors will likely see annual revenue stagnant compared with the base agriculture-oriented firms. The estimation results with 1% to 10% significance levels show that information and communications and education were less likely to increase revenue compared with the base. Most MSMEs in local municipalities also likely to face stagnant revenue growth. MSMEs in Baucau, Oecussi, Viqueque, Ermera, Cova-Lima, and Lautem were less likely to increase revenue than those in the capital, Dili. By firm type, registered and digitally operated MSMEs were more likely to increase annual revenue than informal and non-digitalized firms.

Most industries were less likely to increase regular employees. In comparison with the agriculture base, MSME job creation was lower in professional and scientific services, real estate services, information and communications, and wholesale and retail trade. Similar to the revenue analysis, MSMEs in most municipalities were less likely to increase regular employees than those in Dili. Compared with capital city firms, MSME job creation was lower in Oecussi, Ermera, Viqueque, Cova-Lima, Baucau, Manatuto, Bobonaro, and Lautem, based on 1% significance level. By operating period, MSMEs operating longer were less likely to increase regular employees than young firms. MSMEs operating for 11-15 years and over 31 years were less likely to create new jobs than those operating for up to 5 years. By firm-type, digitally operated MSMEs and internationalized MSMEs were more likely to increase employees than those either non-digitalized or domestically focused. The results of job absorption by firm size reconfirm that the larger the firm size, the more jobs are created and absorbed.

For total wages/salaries paid by MSMEs, the results differ by sector. Based on the 1% or 5% significance level, they showed that energy supply and professional and scientific services were less likely to increase total wage payments to employees than the agriculture base. MSMEs across all municipalities were less likely to increase wage payments to employees than those in Dili. By firm type, registered MSMEs were more likely to increase employee wages than informal ones. Compared with the self-employed base, the wage payment increase was higher in small firms and microenterprises.

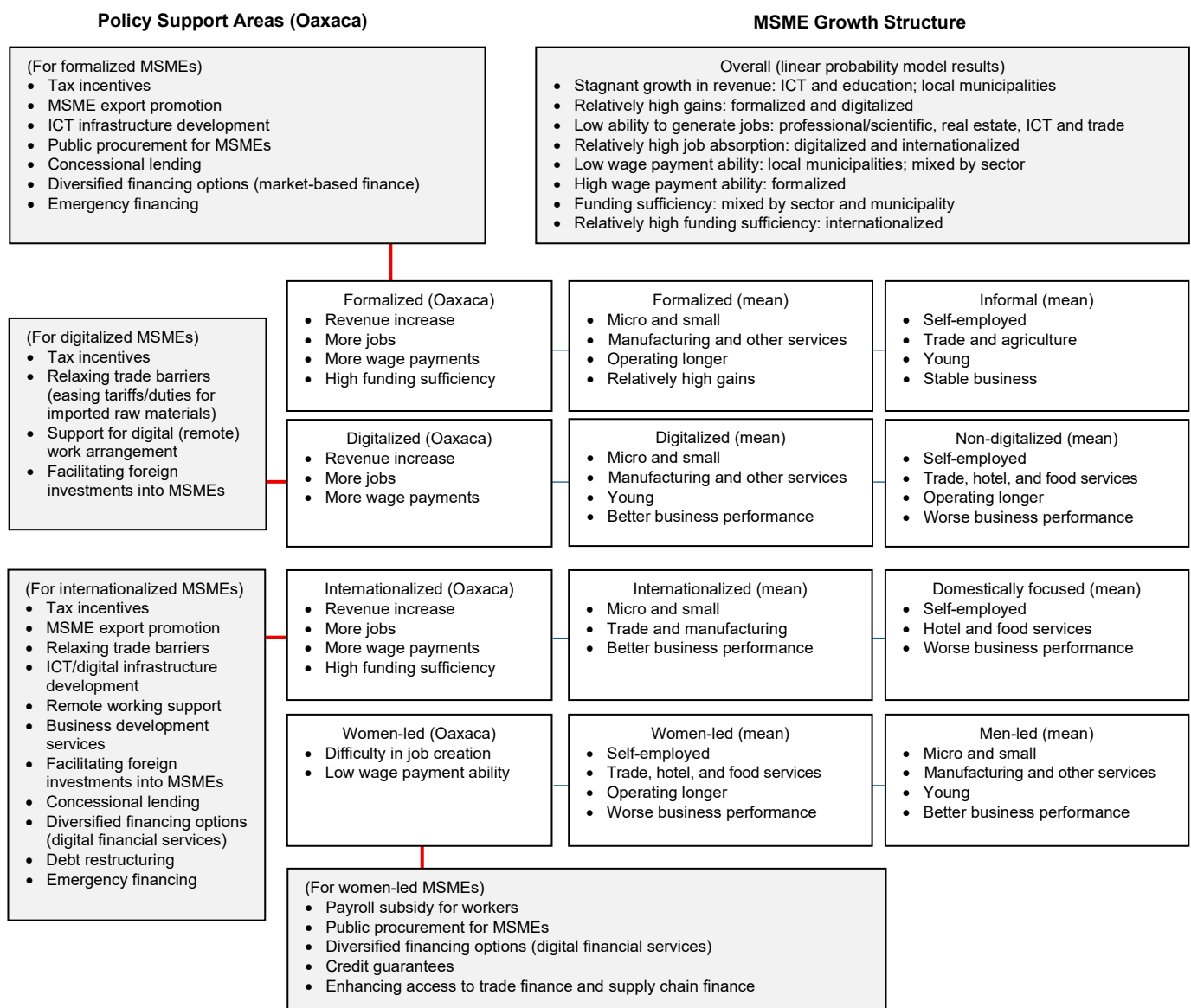
For MSME financial conditions at the time of the survey, funding sufficiency was mixed depending on sector. Information and communications (IT-based) MSMEs were more likely to hold enough funds to keep business running for more than 6 months than the agriculture base. MSMEs in several municipalities were less likely to face funding problems than those in Dili. Compared with Dili-based firms, MSME funds sufficiency was higher in Oecussi, Cova-Lima, Manufahi, Viqueque, Baucau, Ermera, and Bobonaro. Meanwhile, funds sufficiency was lower in MSMEs in Liquica and Aileu. By firm type, internationalized MSMEs were more likely to hold 6 months of funds than those domestically focused. Compared with the self-employed base, funds sufficiency for business was higher among small firms and microenterprises.

The LPM estimation results for women-led MSMEs were not statistically significant across all performance indicators—revenue, employment, wage, and finance.

Strengthening policy support for MSME growth in Timor-Leste

Oaxaca decomposition identified the heterogeneity of growth factors between two groups in four firm types—formalized (informal), digitalized (non-digitalized), internationalized (domestically focused), and women-led (men-led) MSMEs—provided that binding constraints on firm growth are defined by how much they need particular policy assistance measures (Figure below). The estimation results suggest potentially effective policy support areas for MSME growth by firm type.

MSME Growth Structure and Policy Actions to be Taken in Timor-Leste (Results from Linear Probability Model and Oaxaca Decomposition)



ICT = information and communications technology, MSME = micro, small, and medium-sized enterprise.
Source: Author.

Based on the estimation results with 1% to 10% significance levels, Oaxaca decomposition showed that business formalization leads to higher MSME revenue. Registered MSMEs bring more jobs, provide more wages, and have more funding available than informal MSMEs. From the estimation results on binding constraints defined by the level of policy needs, support for MSME entry into global marketplaces and expanding financing options likely contribute to increasing formalized firm revenue. Support for MSME exports and imports through one-stop service windows would be effective. From the perspective of MSME owners and managers, removing restrictions and barriers to foreign investments in domestic MSMEs, faster approval of bank loans or simplified loan procedures, and the development of dedicated MSME equity/bond markets would help increase registered MSMEs' ability to increase revenue. On employment, tax incentives, support for MSME exports, and concessional lending likely contribute to job creation for formalized firms. From the estimation results, tax relief such as deferred tax payments, reduced corporate and value-added taxes would help expand jobs. Further MSME export promotion and market diversification beyond Timor-Leste's neighbor Indonesia, along with providing refinancing, low interest subsidized loans, and/or MSME credit guarantees would help create more jobs for registered MSMEs. On wages, tax incentives, improved ICT infrastructure, and an emergency financing mechanism for MSMEs would help increase formalized firm wage payments. From the estimation results, tax relief and financial institutions' debt restructuring for MSMEs, such as extended loan tenures and lower interest rates would be effective in expanding wage payments for formalized MSMEs. Improved public ICT infrastructure and deregulation to increase internet speed and lower internet costs would help as well. From the perspective of MSME owners and managers, participating in public procurement (expanding into new business), remote work (digitalization), and emergency financing mechanisms such as a Business Restructuring Fund, for example, would help enhance their wage payment ability. For MSME financial conditions, promoting public procurement participation and improved ICT infrastructure, facilitating foreign investment into domestic MSMEs, and establishing a mechanism for easing MSME access to finance would likely help improve financial conditions for registered firms. MSME owners and managers find that support for reducing costs such as easing tariffs and duties for imported raw production materials, together with simplified loan procedures (faster approval of bank loans) would help increase formalized firm funding sufficiency.

Oaxaca decomposition also found that business digitalization increases MSME revenue and creates more jobs. Digitalized MSMEs (those engaged in online selling of products/services or e-commerce) pay more wages to employees than non-digitalized MSMEs. Relaxing trade barriers such as easing tariffs and duties for imported raw materials, which helps MSMEs reduce production costs, likely contributes to digitalized firms' job creation. From MSME owners and manager perspectives, business development and advisory services that support developing new business models and finding new markets would help create more jobs in digitalized MSMEs. Support for digital work arrangements such as financial support for remote work would help increase digitalized firm wage payments. Also, tax incentive schemes and facilitating foreign investment into domestic MSMEs likely contribute to improving financial conditions.

Estimates showed that internationalized MSMEs earn more than domestically focused firms, create more jobs, provide more wages, and increase available funds than domestically focused MSMEs. Support for digital infrastructure development, providing new financing options, and promoting foreign investment into MSMEs likely contribute to increased internationalized firm revenue. From the estimation results, improving ICT infrastructure, streamlining government transaction processes and shifting to digital platforms, along with support to access new financing models such as crowdfunding, peer-to-peer lending, and digital financial services would be effective. MSME owners and managers find that tax relief, deferment of utility bill payments, business development and advisory services, and facilitation of foreign investment would help

increase internationalized MSME earnings. Also, support for improving ICT infrastructure, promoting MSME exports, and easing trade barriers (tariffs and duties for imported MSME raw materials) likely contribute to internationalized firm job creation. MSME owners and managers view strengthening business advice would help internationalized MSMEs create more jobs. Digital infrastructure development, support for remote work, and setting up an emergency financial support mechanism will likely help improve internationalized firm financial conditions. The results also show that streamlining labor regulations and financial assistance for remote working arrangements, streamlining government transaction processes and use of digital platforms, deferring debt repayments, and financial support for bankrupt firms would be effective. MSME owners and managers see business advisory services, digital infrastructure, and emergency financing support as helping internationalized MSMEs improve funding sufficiency.

Estimates indicated that women-led MSMEs face more difficulties in increasing revenue (though not statistically significant), creating jobs, and increasing wages than men-led MSMEs. But better access to finance through credit guarantees and new financing options like digital financial services would likely help create women-led firm jobs. MSME owners and managers say that providing new business opportunities through participating in public procurement would also help. On wages, worker payroll subsidies likely contribute to higher women-led firm wage payments. There is little financial difference between women- and men-led MSMEs, but estimates show that easier access to trade and supply chain finance may help improve women-led MSME financial conditions.

6. POLICY IMPLICATIONS

Based on the findings from econometric analyses, eight policy implications could help MSME development in Timor-Leste.

First is to strengthen the **focused approach** on MSME support to create a base of innovative entrepreneurs and speed the growth and graduation cycle of Timor-Leste enterprises. This is crucial given that stability-oriented firms dominate the private business environment. Beyond traditional distributive trade, potentially high performing MSME segments should be promoted by focusing assistance on effectively diversifying the economy toward more resilient growth.

The LPM results and Oaxaca decomposition showed that the four types of MSMEs—formalized, digitalized, internationalized, and women-led MSMEs—have different business characteristics and performance compared with control groups (informal, non-digitalized, domestically focused, and men-led MSMEs). Accordingly, needed policy support differs by firm type, where a focused approach is critical to design and deliver feasible MSME policy assistance. The LPM results show that formalized MSMEs gain much with higher wage payment capability. Digitalized MSMEs can increase revenue and create jobs. Internationalized MSMEs create more jobs and are better funded. Business profitability, more jobs, wage payments, and financial conditions vary by sector and location. Oaxaca decomposition extracted high performing MSME segments. The estimates found that formalized, digitalized, and internationalized MSMEs are more likely to raise revenue, create jobs, provide more wages, and secure funding to maintain and grow business.

Second is to enhance financial support for formalized firms and promote **registering informal MSMEs** by improving the business registration system. Formalized firms were more likely to increase revenue, create jobs, and well manage worker income and business funding than unregistered firms, as per LPM results and Oaxaca decomposition findings. The estimation results suggest that well-combined nonfinancial support (tax incentives, MSME export promotion, ICT infrastructure development, and public procurement for MSMEs) and financial support

(concessional lending, diversified financing options including market-based finance, and emergency financing schemes) would help MSMEs choose to register.

Third is to incentivize MSME **business digitalization**, especially globalized firms. Business digitalization remains insufficient among MSMEs in Timor-Leste. According to the survey, many MSMEs are not interested in business digitalization due to a lack of digital literacy. Thus, well-designed digital literacy programs should reach out to growth-oriented MSMEs. Given the similarity of business characteristics between digitalized and internationalized MSMEs, policy support tends to be cross-cutting. It should provide tax incentives, support for MSMEs' digital shift and remote work, and relax trade barriers (easing tariffs and duties for imported raw materials) to better attract foreign investment.

Fourth is to incentivize **export business** by MSMEs and their participation in global value chains by strengthening product branding, digital shift, business development services, worker skill upgrades, and financial assistance (concessional lending, diversified financing options such as digital financial services, debt restructuring, and emergency financing such as the Business Restructuring Fund). Increased nationalism globally and regional tensions will continue to accelerate supply chain disruptions resulting in surging trade costs. Thus, strengthening supply chain networks along with digitalization is critical to make MSME exporters competitive.

Fifth is to develop national **business clustering** to vitalize local MSMEs. The LPM results found that most MSMEs in local municipalities face stagnant revenue growth, low job creation and pay rises, partly limited by funds available to maintain or grow business. Business clustering can create a base for innovative entrepreneurs outside the capital Dili by using untapped resources such as youth, women, and local MSMEs, which help vitalize local economies as MSMEs develop. Agricultural value chain development in coffee and organic oils, for example, is promising.

Sixth is to encourage **job creation**, especially for females, by providing skill upgrading. Oaxaca decomposition found that women-led MSMEs had problems creating jobs with relatively low wage payment capability compared with men-led MSMEs. But the estimation results suggest that specific policy interventions—such as payroll subsidies, support for public procurement, and broadening financing options—would help increase growth and job creation.

Seventh is to strengthen MSME **financial literacy** and develop **alternative financing options** to access more growth capital, including development of digital finance solutions. Finance is critical in each aspect of MSME growth. Oaxaca decomposition suggests that concessional lending, market-based financing, and emergency financing schemes such as rescue financing for bankrupt firms would help formalized MSMEs grow. New financing models including digital financial services would facilitate growth of internationalized and women-led MSMEs. Financing options targeting MSMEs and financial literacy programs for MSME owners and managers should be strengthened.

Finally, the eighth is to prepare a comprehensive mid- to long-term **MSME development strategy** with appropriate monitoring on MSME performance. Creating a regular, periodically updated MSME landscape database is essential to encourage evidence-based, feasible policy interventions for MSME development. A regulatory framework that ensures fair competition for private businesses should be established as well. Timor-Leste became an ASEAN member on 26 October 2025. To enjoy membership benefits, establishing a comprehensive MSME development policy framework is indispensable to create resilient, inclusive growth in Timor-Leste.

7. CONCLUSION

This study empirically investigates what drives the growth of private business—especially MSMEs—in Timor-Leste and what policy actions are needed to help them grow amid global uncertainty. It used an LPM to identify the MSME growth structure and used Oaxaca decomposition to show the detailed growth factors by firm type and extract policy areas to be strengthened. Estimation results revealed that four types of MSMEs—formalized, digitalized, internationalized, and women-led MSMEs—have different business characteristics and perform differently than control groups. Thus, needed policy support differs by firm type, with a focused approach critical to design and deliver feasible MSME policy assistance.

Deepening global economic uncertainty—whether geopolitical tensions in the Middle East, trade tensions between the United States and the People’s Republic of China, and the historically high United States tariffs imposed in 2025—more or less affect MSMEs differently by a country’s economic size and growth policies. A rapidly changing global environment is forcing governments across Asia and the Pacific to rethink their MSME development strategies and policy approaches to ensure they produce a resilient, sustainable growth ecosystem able to counter these uncertainties. The analysis here used cross-sectional survey data to suggest baseline policy implications for Timor-Leste to design an evidence-based MSME policy framework to maximize the benefits from its new ASEAN membership. Follow-up business surveys and analyses would be needed to understand the challenging private business environment to better design and implement appropriate mid- to long-term MSME policies and strategies in Timor-Leste.

APPENDIX

Table A1: Growth Factors of MSMEs in Timor-Leste—Probit Models (Robustness Test)

A. Overall

Variables	(1) Revenue	(2) Employment	(3) Wage	(4) Finance
Industry (base—agriculture, forestry, and fisheries)				
Manufacturing	-0.02055 [0.1943]	-0.4196 [0.2793]	0.5561 [0.3724]	-0.00347 [0.1797]
Electricity, gas, steam, and air conditioning supply	0.2435 [0.3431]	-0.6992 [0.4752]	0 [.]	-0.2363 [0.3318]
Water supply	0 [.]	0 [.]	0 [.]	0 [.]
Construction	-0.000818 [0.2459]	-0.1707 [0.3255]	0.6469 [0.4120]	-0.3239 [0.2283]
Wholesale and retail trade	-0.002288 [0.1842]	-0.8532*** [0.2767]	0.4627 [0.3691]	0.1659 [0.1685]
Transport and storage	-0.08055 [0.3667]	-0.3861 [0.5207]	0.5788 [0.5370]	-0.2502 [0.3252]
Accommodation and food service activities	-0.01183 [0.1871]	-0.4782* [0.2763]	0.4188 [0.3712]	-0.1481 [0.1701]
Information and communication	0 [.]	0 [.]	0 [.]	0 [.]
Financial and insurance activities	0.6909 [0.5050]	0.4265 [0.6602]	0.8767 [0.7291]	0.3597 [0.6137]
Real estate activities	0.5856 [0.9517]	0 [.]	0 [.]	-0.2108 [0.7649]
Professional, scientific and technical activities	-0.5737 [0.4301]	0 [.]	0 [.]	-0.2107 [0.3498]
Administrative and support service activities	0.0448 [0.2940]	-0.07981 [0.4029]	0.3732 [0.5380]	0.09835 [0.2710]
Public administration and defense	0 [.]	0 [.]	0 [.]	0 [.]
Education	0 [.]	0 [.]	1.6845*** [0.5650]	0.1216 [0.6910]
Human health and social work activities	-0.1672 [0.4489]	0.03547 [0.4846]	0.8619 [0.5562]	-0.1843 [0.4030]
Arts, entertainment, and recreation	-0.1753 [0.4481]	0.07671 [0.4719]	0.4854 [0.5597]	0.07757 [0.4521]
Other service activities	-0.1606 [0.1980]	-0.5448* [0.2832]	0.4325 [0.3796]	-0.06601 [0.1814]
Others	0.5072 [0.3631]	-0.3111 [0.5125]	0.6645 [0.5547]	0.3287 [0.3715]
Location (base—Dili [capital city])				
Bobonaro	0.08482 [0.1101]	-0.9609*** [0.2784]	-0.4926*** [0.1765]	0.2670** [0.1093]
Cova-Lima	-0.3719*** [0.1379]	-0.8345*** [0.3113]	-1.1932*** [0.4018]	0.5104*** [0.1253]
Liquica	0.07402 [0.1232]	0.008625 [0.2085]	-0.4446** [0.1910]	-0.7667*** [0.1136]
Ermera	-0.3956*** [0.1121]	-0.8543*** [0.1916]	-0.8376*** [0.1616]	0.3571*** [0.0997]
Ainaro	0.191 [0.1231]	0.03361 [0.1978]	-0.5542*** [0.1979]	-0.1429 [0.1191]
Aileu	0.1052 [0.1363]	-0.2559 [0.2441]	-0.7405*** [0.2173]	-0.2825** [0.1298]
Manatuto	-0.1339 [0.1394]	-0.6099** [0.2508]	-0.5681*** [0.2076]	0.1991 [0.1359]
Baucau	-0.6948*** [0.1210]	-0.8124*** [0.2079]	-1.2992*** [0.2394]	0.3715*** [0.1013]
Viqueque	-0.5156*** [0.1360]	-1.2341*** [0.4112]	-0.6223*** [0.1970]	0.3954*** [0.1173]
Lautem	-0.3482*** [0.1333]	-0.3423 [0.2156]	-1.0828*** [0.2629]	0.136 [0.1196]
Manufahi	-0.1696 [0.1376]	0.06528 [0.1784]	-0.3964** [0.1762]	0.4032*** [0.1372]
Oecussi	-0.5889*** [0.1373]	-1.3632*** [0.3693]	-0.8853*** [0.1938]	2.0896*** [0.3598]

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Variables	(1)	(2)	(3)	(4)
	Revenue	Employment	Wage	Finance
Operating period (base—0–5 years)				
6–10 years	-0.04626 [0.0649]	0.05951 [0.0997]	0.03825 [0.0910]	-0.05065 [0.0615]
11–15 years	0.03598 [0.0821]	-0.2135 [0.1570]	0.1564 [0.1178]	-0.07349 [0.0782]
16–30 years	-0.1334 [0.0959]	-0.2198 [0.1768]	-0.01893 [0.1400]	-0.04144 [0.0863]
31 years and above	0.03279 [0.2430]	0 [.]	0.07513 [0.3476]	-0.2121 [0.2266]
Formalization (base—unregistered [informal] firms)				
Registered firms	0.2649*** [0.0687]	0.1728 [0.1303]	0.3861*** [0.1186]	0.04798 [0.0614]
Digitalization (base—nondigitalized firms)				
Digitally operated firms ¹	0.3240*** [0.1000]	0.2323* [0.1353]	0.1892 [0.1313]	0.02261 [0.0994]
Internationalization (base—noninternationalized firms)				
Internationalized firms ²	0.08095 [0.0932]	0.3212** [0.1272]	-0.1767 [0.1254]	0.1890** [0.0959]
Gender of owner (base—male owner)				
Female	-0.03381 [0.0558]	-0.009067 [0.0937]	-0.001561 [0.0819]	0.07521 [0.0531]
Firm size (base—self-employed)				
Micro	0.02918 [0.0645]	0.8134*** [0.1376]	0.6398*** [0.0998]	0.2104*** [0.0601]
Small	0.1652 [0.1129]	1.2145*** [0.1758]	0.8817*** [0.1416]	0.6078*** [0.1208]
Medium	0.08847 [0.3426]	1.2804*** [0.4181]	1.0961*** [0.3864]	0.4851 [0.3994]
Constant	-0.8988*** [0.1960]	-1.5586*** [0.3209]	-2.3060*** [0.3913]	0.198 [0.1774]
N	3067	3011	3026	3044

B. Marginal Effects

Formalization

	Margin	Delta-method		P>z	[95% Conf. Interval]	
		Std. Err.	z			
Revenue						
Unregistered firms (1)	0.1353277	0.0126561	10.69	0	0.1105221	0.1601332
Registered firms (2)	0.2014055	0.0090394	22.28	0	0.1836886	0.2191224
(2)-(1)	0.0660778					

	Margin	Delta-method		P>z	[95% Conf. Interval]	
		Std. Err.	z			
Employment						
Unregistered firms (1)	0.013079	0.004178	3.13	0.002	0.0048903	0.0212676
Registered firms (2)	0.020131	0.0037259	5.4	0	0.0128284	0.0274337
(2)-(1)	0.007052					

(1) includes individual entrepreneurs/cooperatives/foundations.

Digitalization

	Margin	Delta-method		P>z	[95% Conf. Interval]	
		Std. Err.	z			
Revenue						
Nondigitally operated firms (1)	0.1741687	0.0073549	23.68	0	0.1597533	0.1885841
Digitally operated firms (2)	0.2696581	0.0314586	8.57	0	0.2080005	0.3313158
(2)-(1)	0.0954894					

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	Margin	Delta-method		P>z	[95% Conf. Interval]	
		Std. Err.	z			
Employment						
Nondigitally operated firms (1)	0.0170614	0.0030899	5.52	0	0.0110054	0.0231175
Digitally operated firms (2)	0.0296257	0.0093856	3.16	0.002	0.0112303	0.0480212
(2)-(1)	0.0125643					

	Margin	Delta-method		P>z	[95% Conf. Interval]	
		Std. Err.	z			
Revenue						
Domestically focused firms (1)	0.1787202	0.0075372	23.71	0	0.1639477	0.1934928
Internationalized firms (2)	0.2006489	0.0247138	8.12	0	0.1522107	0.2490871
(2)-(1)	0.0219287					

	Margin	Delta-method		P>z	[95% Conf. Interval]	
		Std. Err.	z			
Employment						
Domestically focused firms (1)	0.0164654	0.0029925	5.5	0	0.0106002	0.0223306
Internationalized firms (2)	0.0350133	0.0103298	3.39	0.001	0.0147672	0.0552593
(2)-(1)	0.0185479					

MSME = micro, small, and medium-sized enterprise.

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

¹ Firms engaged in online selling or e-commerce.

² Firms participating in global supply chains or engaged in export/import business.

Source: Author's calculations.

Table A2: Growth Factors of MSMEs in Timor-Leste by Firm Type—Oaxaca Decomposition

A. Endowments

	Formalized firms				Digitalized firms			
	Revenue	Employment	Wage	Finance	Revenue	Employment	Wage	Finance
endowments								
tax	-0.00001532 [0.0002]	0.0002865 [0.0006]	0.0002247 [0.0005]	-0.000287 [0.0007]	-0.002398 [0.0045]	0.001479 [0.0028]	0.000155 [0.0012]	0.001766 [0.0034]
sbd	-0.00005678 [0.0003]	0.0004262 [0.0008]	0.00003374 [0.0002]	-0.0003884 [0.0007]	-0.0002403 [0.0013]	-0.0007359 [0.0035]	-0.0002329 [0.0012]	0.0003654 [0.0019]
prs	0.0002245 [0.0008]	-0.0005874 [0.0006]	-0.000949 [0.0009]	-0.0004709 [0.0008]	0.00137 [0.0031]	0.001296 [0.0030]	0.001251 [0.0028]	0.002041 [0.0036]
util	0.001284 [0.0013]	0.0005536 [0.0007]	0.0009627 [0.0009]	-0.002601 [0.0017]	-0.00006102 [0.0008]	0.0000779 [0.0010]	0.00007685 [0.0010]	-0.0001034 [0.0018]
drm	0.00007585 [0.0007]	-0.00005922 [0.0005]	-0.00005583 [0.0005]	0.0002252 [0.0012]	0.004906 [0.0061]	-0.0009998 [0.0040]	-0.005358 [0.0052]	-0.002823 [0.0053]
dr	-0.00007051 [0.0003]	-0.00006445 [0.0003]	0.000132 [0.0006]	0.00000834 [0.0009]	0.003917 [0.0092]	-0.001325 [0.0066]	0.002278 [0.0073]	0.009962 [0.0096]
pp	0.0007164 [0.0018]	0.00005687 [0.0002]	-0.000225 [0.0006]	0.000135 [0.0004]	0.004528 [0.0055]	0.004277 [0.0049]	0.0004159 [0.0032]	0.002937 [0.0042]
bds	-0.00007085 [0.0003]	0.0001753 [0.0005]	0.0001997 [0.0006]	-0.0004676 [0.0015]	-0.003049 [0.0042]	-0.005814 [0.0057]	-0.003522 [0.0043]	0.003371 [0.0045]
us	0.002071 [0.0021]	0.0012 [0.0013]	-0.00003045 [0.0014]	-0.005524** [0.0026]	0.0004996 [0.0024]	-0.001465 [0.0026]	0.002091 [0.0031]	-0.001408 [0.0028]
ict	-0.003224 [0.0024]	-0.0008737 [0.0013]	-0.004526** [0.0019]	-0.001848 [0.0024]	-0.001446 [0.0058]	-0.003724 [0.0049]	-0.000686 [0.0053]	0.001242 [0.0059]
dp	-0.0007451 [0.0013]	0.0002355 [0.0008]	-0.0002908 [0.0009]	0.003732* [0.0021]	0.008395 [0.0089]	0.002601 [0.0076]	0.009153 [0.0094]	0.01045 [0.0084]
oss	-0.0003408 [0.0010]	-0.0002853 [0.0006]	0.0006174 [0.0008]	-0.0007645 [0.0010]	0.002313 [0.0069]	0.001748 [0.0052]	0.001885 [0.0060]	0.004002 [0.0064]
inv	-0.001575 [0.0020]	0.0003539 [0.0010]	0.00111 [0.0013]	0.002634 [0.0020]	0.001017 [0.0029]	0.0007166 [0.0020]	-0.000662 [0.0019]	-0.001169 [0.0060]
exp	-0.001491 [0.0014]	-0.000917 [0.0008]	-0.001046 [0.0010]	-0.0004335 [0.0007]	-0.005159 [0.0062]	-0.001553 [0.0029]	-0.002247 [0.0035]	-0.001216 [0.0026]
trf	0.0001509 [0.0005]	-0.00008528 [0.0003]	0.00007606 [0.0003]	0.0002668 [0.0007]	0.001061 [0.0026]	0.002416 [0.0051]	-0.00007816 [0.0012]	-0.001324 [0.0029]
bl	0.0003222 [0.0010]	-0.001401 [0.0009]	0.001166 [0.0010]	-0.0004658 [0.0011]	0.001893 [0.0041]	-0.000366 [0.0030]	0.005089 [0.0054]	0.001563 [0.0042]
tel	-0.000142 [0.0005]	0.0001225 [0.0003]	-0.00106 [0.0015]	-0.00007382 [0.0004]	-0.0004008 [0.0025]	-0.0003232 [0.0020]	-0.001324 [0.0080]	0.0001876 [0.0011]
lab	0.00001188 [0.0004]	0.00002253 [0.0007]	-0.00001436 [0.0004]	0.0001079 [0.0009]	0.000323 [0.0017]	0.000934 [0.0025]	-0.001696 [0.0044]	0.001435 [0.0048]
inf	0.00001509 [0.0002]	0.0001105 [0.0004]	0.0001667 [0.0006]	-0.0001467 [0.0005]	0.000689 [0.0023]	-0.0001921 [0.0016]	0.0004119 [0.0019]	-0.003202 [0.0045]
ref	0.001454 [0.0034]	0.003793 [0.0025]	-0.001368 [0.0028]	0.005805 [0.0039]	0.00122 [0.0057]	0.001534 [0.0045]	-0.003806 [0.0063]	0.005027 [0.0064]
cg	-0.001194 [0.0025]	-0.003321* [0.0020]	-0.002208 [0.0020]	0.002177 [0.0027]	-0.0007347 [0.0077]	-0.002362 [0.0061]	-0.000504 [0.0062]	-0.006341 [0.0088]
slp	-0.003557 [0.0027]	-0.001501 [0.0018]	-0.001494 [0.0022]	-0.00498 [0.0031]	0.004668 [0.0058]	-0.004034 [0.0048]	0.005045 [0.0053]	-0.005848 [0.0068]
af	-0.002381 [0.0025]	0.002412 [0.0017]	-0.001207 [0.0017]	-0.01130*** [0.0035]	-0.0004946 [0.0019]	-0.001339 [0.0027]	-0.00001371 [0.0013]	0.001152 [0.0030]
cap	-0.001008 [0.0015]	0.001047 [0.0011]	0.00006866 [0.0011]	-0.001458 [0.0015]	0.00005535 [0.0008]	0.0001958 [0.0029]	0.00002013 [0.0004]	0.0006032 [0.0029]
tf	0.0004962 [0.0019]	0.0000215 [0.0013]	0.001922 [0.0015]	0.004285* [0.0023]	-0.002113 [0.0040]	-0.002822 [0.0043]	0.00157 [0.0031]	0.0042 [0.0056]
bsf	-0.004612* [0.0025]	-0.001607 [0.0015]	-0.009275*** [0.0027]	-0.0002448 [0.0022]	-0.003335 [0.0049]	-0.005398 [0.0052]	-0.004969 [0.0053]	-0.00226 [0.0050]
N	3080	3080	3080	3053	3080	3080	3080	3053

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	Internationalized firms				Women-owned firms			
	Revenue	Employment	Wage	Finance	Revenue	Employment	Wage	Finance
endowments								
tax	-0.01039 [0.0065]	0.006199 [0.0046]	-0.0005349 [0.0031]	-0.002889 [0.0038]	-0.0001896 [0.0006]	0.000166 [0.0005]	-0.000003914 [0.0001]	-0.0001603 [0.0005]
sbd	-0.003761 [0.0091]	-0.004118 [0.0070]	-0.004232 [0.0062]	0.01147 [0.0079]	-0.0002631 [0.0011]	0.001404 [0.0010]	0.0001984 [0.0006]	0.0002838 [0.0011]
prs	0.007688 [0.0088]	0.004481 [0.0066]	0.009095 [0.0063]	0.003832 [0.0071]	-0.0001885 [0.0007]	-0.0000583 [0.0003]	-0.0001564 [0.0004]	-0.0006143 [0.0010]
util	-0.02046** [0.0103]	0.003138 [0.0076]	-0.001251 [0.0063]	0.002861 [0.0079]	0.00000421 [0.0001]	0.00001455 [0.0001]	0.00004945 [0.0002]	0.0001935 [0.0007]
drm	0.013 [0.0135]	-0.01324 [0.0128]	0.007059 [0.0088]	-0.02181* [0.0129]	0.0006455 [0.0018]	0.001028 [0.0011]	0.0006559 [0.0012]	0.001404 [0.0021]
dr	0.0006544 [0.0111]	0.003283 [0.0093]	0.002194 [0.0071]	0.01507 [0.0112]	-0.0005605 [0.0018]	-0.0001012 [0.0010]	-0.0003557 [0.0012]	-0.003322 [0.0025]
pp	-0.007992 [0.0063]	-0.002832 [0.0032]	-0.001145 [0.0020]	-0.003858 [0.0044]	-0.005170** [0.0026]	0.000961 [0.0010]	0.001178 [0.0011]	0.0003633 [0.0018]
bds	0.01016 [0.0070]	0.007129 [0.0053]	0.007634 [0.0051]	0.00588 [0.0053]	0.001283 [0.0013]	0.0003701 [0.0006]	0.001001 [0.0009]	-0.001278 [0.0013]
us	-0.0005173 [0.0044]	-0.002086 [0.0040]	-0.004561 [0.0035]	-0.004993 [0.0052]	-0.0001181 [0.0004]	0.00001358 [0.0001]	0.00004871 [0.0002]	0.0001621 [0.0005]
ict	0.02729** [0.0119]	0.02150** [0.0105]	0.03177*** [0.0107]	0.0102 [0.0101]	-0.00007899 [0.0003]	-0.00004946 [0.0002]	-0.0001484 [0.0006]	0.00001397 [0.0002]
dp	0.01218* [0.0072]	-0.004303 [0.0060]	-0.004467 [0.0052]	-0.01644** [0.0082]	0.0001392 [0.0005]	-0.00005332 [0.0002]	-0.00004431 [0.0002]	0.000004041 [0.0002]
oss	0.00351 [0.0046]	0.0002757 [0.0031]	-0.001453 [0.0029]	-0.00415 [0.0037]	0.0001458 [0.0005]	0.00003557 [0.0001]	0.00003408 [0.0002]	-0.00005086 [0.0003]
inv	0.01416* [0.0079]	-0.0005275 [0.0049]	-0.0008746 [0.0047]	-0.006699 [0.0061]	-0.002455 [0.0017]	-0.000457 [0.0007]	-0.000758 [0.0010]	0.001386 [0.0017]
exp	-0.008316 [0.0054]	-0.01101** [0.0055]	-0.005166 [0.0036]	0.0003744 [0.0044]	-0.0002417 [0.0007]	-0.0001837 [0.0005]	-0.0001898 [0.0005]	-0.0004532 [0.0012]
trf	-0.001106 [0.0020]	-0.002013 [0.0025]	-0.001302 [0.0018]	0.00265 [0.0029]	0.001128 [0.0012]	-0.0002054 [0.0004]	0.001125 [0.0009]	-0.00006794 [0.0010]
bl	0.004894 [0.0068]	0.008196 [0.0056]	-0.002316 [0.0049]	-0.006756 [0.0064]	0.0004503 [0.0010]	0.0007398 [0.0006]	-0.001152 [0.0010]	0.0005069 [0.0010]
tel	-0.004049 [0.0101]	-0.001478 [0.0064]	-0.01247* [0.0066]	-0.01919** [0.0088]	-0.00062 [0.0009]	0.0001858 [0.0003]	-0.0008727 [0.0011]	-0.000799 [0.0012]
lab	-0.003181 [0.0060]	-0.0001693 [0.0045]	-0.0001737 [0.0039]	0.005737 [0.0052]	0.0001945 [0.0005]	0.00002753 [0.0002]	0.0003378 [0.0008]	-0.0003529 [0.0011]
inf	0.0007944 [0.0018]	-0.000883 [0.0018]	-0.000433 [0.0011]	-0.0001141 [0.0008]	0.0001418 [0.0006]	-0.00002286 [0.0001]	-0.0000449 [0.0002]	-0.00009926 [0.0006]
ref	-0.0005029 [0.0056]	0.002595 [0.0052]	-0.002738 [0.0048]	0.003638 [0.0048]	0.0003329 [0.0024]	-0.001415 [0.0013]	0.001704 [0.0017]	-0.001094 [0.0029]
cg	-0.00145 [0.0050]	-0.006745 [0.0064]	-0.002803 [0.0047]	0.001722 [0.0037]	0.003855 [0.0033]	-0.0004134 [0.0016]	0.00004245 [0.0021]	-0.004762 [0.0038]
slp	-0.0002763 [0.0041]	-0.002875 [0.0042]	0.0004362 [0.0034]	-0.0003547 [0.0027]	-0.0007143 [0.0029]	0.002642* [0.0016]	-0.001106 [0.0023]	0.004107 [0.0037]
af	0.002052 [0.0033]	0.0008501 [0.0016]	0.0001356 [0.0009]	-0.002177 [0.0045]	-0.0002311 [0.0008]	0.00005854 [0.0004]	-0.0002233 [0.0004]	0.002887 [0.0024]
cap	0.001477 [0.0053]	-0.006414 [0.0058]	0.00009715 [0.0042]	0.00004524 [0.0062]	0.0003217 [0.0016]	-0.001272 [0.0011]	0.0005784 [0.0011]	0.0009688 [0.0018]
tf	-0.001442 [0.0035]	0.0004432 [0.0025]	-0.001979 [0.0025]	-0.005959 [0.0054]	-0.0006631 [0.0022]	0.0006033 [0.0013]	-0.0005309 [0.0014]	-0.008987** [0.0038]
bsf	-0.01106* [0.0062]	-0.00423 [0.0043]	-0.01179** [0.0059]	-0.009806* [0.0057]	0.003632* [0.0020]	0.0004282 [0.0008]	0.001745 [0.0012]	0.001129 [0.0018]
N	3080	3080	3080	3053	3080	3080	3080	3053

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B. Coefficients

coefficients	Formalized firms				Digitalized firms			
	Revenue	Employment	Wage	Finance	Revenue	Employment	Wage	Finance
tax	-0.08991 [0.0770]	-0.09324*** [0.0311]	-0.1101** [0.0447]	-0.02327 [0.0903]	0.2171 [0.1324]	-0.1084 [0.0907]	-0.001513 [0.1032]	-0.2340* [0.1200]
sbd	-0.01408 [0.0901]	0.05088 [0.0390]	0.03108 [0.0456]	-0.01202 [0.1150]	0.05926 [0.1513]	0.1361 [0.1244]	0.06203 [0.1456]	-0.05357 [0.1609]
prs	0.05727 [0.0771]	-0.008136 [0.0303]	0.002506 [0.0382]	0.1499 [0.0974]	-0.1445 [0.1247]	-0.09206 [0.1210]	-0.06653 [0.1166]	-0.08951 [0.1333]
utl	0.1007 [0.0775]	0.03565 [0.0283]	0.02617 [0.0411]	-0.05708 [0.0938]	0.02872 [0.1451]	-0.07924 [0.0904]	-0.08681 [0.1096]	0.1854 [0.1216]
drm	-0.1022 [0.0733]	0.03973 [0.0334]	0.02216 [0.0382]	0.0845 [0.0948]	-0.1208 [0.1358]	0.008706 [0.1036]	0.1175 [0.0987]	0.01038 [0.1348]
dr	0.02984 [0.0661]	0.01518 [0.0298]	-0.07204* [0.0402]	0.03263 [0.0891]	-0.07411 [0.1381]	0.01303 [0.0986]	-0.01181 [0.1094]	-0.06999 [0.1339]
pp	-0.04938 [0.0734]	0.003046 [0.0339]	0.08619** [0.0386]	-0.1949** [0.0944]	-0.06341 [0.1547]	-0.1821 [0.1265]	-0.03984 [0.1382]	-0.1694 [0.1427]
bds	-0.0275 [0.0752]	0.01436 [0.0374]	0.05289 [0.0392]	0.03498 [0.0964]	0.1326 [0.1318]	0.2069* [0.1192]	0.1157 [0.1230]	-0.006863 [0.1452]
us	-0.03836 [0.0717]	-0.00971 [0.0340]	-0.01846 [0.0356]	-0.08983 [0.0829]	-0.01556 [0.1389]	-0.1137 [0.1118]	0.1303 [0.1185]	0.003495 [0.1344]
ict	-0.03043 [0.0652]	-0.02408 [0.0284]	-0.05403 [0.0340]	-0.1669** [0.0822]	0.01438 [0.1130]	-0.07377 [0.0885]	0.04304 [0.1013]	0.02096 [0.1093]
dp	0.02625 [0.0604]	0.02705 [0.0273]	-0.02767 [0.0328]	0.1247 [0.0796]	0.1518 [0.1240]	0.04691 [0.1094]	0.1411 [0.1281]	0.0825 [0.1157]
oss	-0.1094* [0.0607]	-0.008733 [0.0293]	0.02151 [0.0337]	0.01386 [0.0740]	0.01189 [0.1324]	0.0403 [0.0987]	0.01442 [0.1144]	0.1339 [0.1201]
inv	0.1157* [0.0622]	-0.01626 [0.0311]	-0.01502 [0.0355]	-0.1582** [0.0780]	0.1326 [0.1220]	0.08147 [0.0854]	-0.0674 [0.0977]	-0.2918*** [0.1069]
exp	-0.03138 [0.0592]	-0.06415** [0.0279]	-0.02875 [0.0348]	0.002441 [0.0717]	-0.1748 [0.1282]	-0.03553 [0.1137]	-0.04878 [0.1203]	-0.003657 [0.1102]
trf	0.08002 [0.0641]	-0.03111 [0.0267]	-0.02892 [0.0378]	0.1523** [0.0734]	-0.1204 [0.1238]	-0.2062*** [0.0793]	-0.02466 [0.1003]	0.1133 [0.1129]
bl	-0.02159 [0.0672]	0.06438* [0.0341]	-0.03199 [0.0378]	-0.01404 [0.0782]	-0.05347 [0.1359]	-0.01942 [0.1026]	-0.1409 [0.1198]	-0.07953 [0.1295]
tel	-0.06024 [0.0585]	0.0116 [0.0260]	0.08699** [0.0343]	0.01834 [0.0728]	0.05405 [0.1292]	0.08991 [0.0876]	0.2247** [0.1032]	-0.04725 [0.1109]
lab	0.01519 [0.0583]	0.0366 [0.0298]	-0.006684 [0.0342]	-0.05096 [0.0762]	0.009645 [0.1329]	0.05991 [0.0875]	-0.1407 [0.1166]	0.113 [0.1244]
inf	-0.03945 [0.0670]	-0.01136 [0.0288]	-0.01834 [0.0350]	0.08212 [0.0754]	-0.04609 [0.1243]	0.04187 [0.0923]	0.02099 [0.1074]	0.1584 [0.1157]
ref	-0.05825 [0.0832]	-0.07730* [0.0397]	0.002543 [0.0462]	-0.06816 [0.1096]	-0.03012 [0.1543]	-0.02614 [0.1171]	0.08138 [0.1553]	-0.07272 [0.1411]
cg	-0.1112 [0.0899]	0.07486* [0.0387]	0.05611 [0.0427]	0.04837 [0.1128]	-0.03432 [0.1492]	0.0075 [0.1147]	-0.01564 [0.1184]	0.1798 [0.1463]
slp	0.1518* [0.0782]	0.01932 [0.0344]	0.003898 [0.0498]	0.2165** [0.1089]	-0.1538 [0.1361]	0.08262 [0.1062]	-0.1793 [0.1137]	0.0813 [0.1418]
af	0.07376 [0.0595]	-0.005255 [0.0262]	0.01079 [0.0279]	0.01405 [0.0655]	-0.05788 [0.1171]	-0.06755 [0.0944]	-0.01673 [0.0871]	-0.07982 [0.1103]
cap	0.1305* [0.0719]	-0.0256 [0.0325]	0.03003 [0.0385]	0.06892 [0.0819]	-0.02732 [0.1732]	-0.113 [0.1430]	-0.002317 [0.1443]	-0.1561 [0.1543]
tf	-0.01095 [0.0854]	-0.01769 [0.0376]	-0.05289 [0.0405]	0.1584 [0.1000]	0.1256 [0.1751]	0.1702 [0.1445]	-0.06107 [0.1387]	-0.06055 [0.1705]
bsf	-0.09551 [0.0780]	0.01666 [0.0319]	0.1552*** [0.0386]	0.02043 [0.0902]	-0.008001 [0.1196]	0.1259 [0.1090]	0.006259 [0.1160]	0.03884 [0.1196]
Constant	0.0531 [0.0849]	-0.06288 [0.0566]	-0.1848*** [0.0416]	-0.4702*** [0.1068]	0.07089 [0.1431]	-0.09834 [0.1296]	-0.1227 [0.1181]	0.2429 [0.1544]
N	3080	3080	3080	3053	3080	3080	3080	3053

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coefficients	Internationalized firms				Women-owned firms			
	Revenue	Employment	Wage	Finance	Revenue	Employment	Wage	Finance
tax	0.2038*	-0.1031	0.02987	0.003998	0.05032	-0.02746	0.02512	-0.03584
	[0.1050]	[0.0784]	[0.0640]	[0.0843]	[0.0700]	[0.0355]	[0.0438]	[0.0738]
sbd	0.05934	-0.0005802	0.05945	-0.1259	-0.02296	0.04875	0.01198	0.1006
	[0.1258]	[0.0931]	[0.0848]	[0.1151]	[0.0870]	[0.0483]	[0.0567]	[0.1011]
prs	-0.1097	-0.02075	-0.05655	-0.001104	-0.02333	0.0454	0.07440*	0.02964
	[0.1035]	[0.0757]	[0.0699]	[0.0927]	[0.0749]	[0.0391]	[0.0438]	[0.0824]
util	0.2054**	-0.04926	-0.01957	0.0717	-0.03701	-0.02969	-0.08460*	0.05509
	[0.0956]	[0.0734]	[0.0641]	[0.0873]	[0.0732]	[0.0360]	[0.0441]	[0.0808]
drm	-0.07886	0.07534	-0.07816	0.1144	0.06644	0.005154	-0.01497	-0.04671
	[0.0907]	[0.0823]	[0.0599]	[0.0928]	[0.0699]	[0.0438]	[0.0471]	[0.0818]
dr	-0.00524	-0.03845	-0.006623	-0.03222	-0.05255	-0.0291	0.01424	-0.02757
	[0.0895]	[0.0722]	[0.0581]	[0.0937]	[0.0697]	[0.0393]	[0.0473]	[0.0835]
pp	-0.1923	-0.111	-0.06047	-0.1624	-0.1178	0.09858**	0.0596	-0.02481
	[0.1212]	[0.1016]	[0.0768]	[0.1267]	[0.0727]	[0.0447]	[0.0490]	[0.0890]
bds	0.3970***	0.2267*	0.2536***	0.3066**	0.1487**	-0.03942	0.04119	0.07317
	[0.1374]	[0.1205]	[0.0958]	[0.1375]	[0.0751]	[0.0448]	[0.0504]	[0.0894]
us	-0.07662	-0.0851	-0.1089	-0.04682	-0.03364	-0.05045	-0.018	0.07451
	[0.1065]	[0.0917]	[0.0718]	[0.1179]	[0.0690]	[0.0363]	[0.0406]	[0.0757]
ict	-0.1488**	-0.1318**	-0.1690***	-0.04218	0.03176	0.001445	0.02199	0.01947
	[0.0733]	[0.0628]	[0.0601]	[0.0698]	[0.0589]	[0.0311]	[0.0381]	[0.0657]
dp	-0.1416*	0.06251	0.05771	0.1454*	-0.009463	0.02173	0.01959	-0.1256*
	[0.0797]	[0.0719]	[0.0636]	[0.0808]	[0.0555]	[0.0300]	[0.0369]	[0.0652]
oss	0.06462	0.01427	-0.04653	-0.07754	0.01689	0.0317	-0.01846	0.06901
	[0.0934]	[0.0646]	[0.0607]	[0.0807]	[0.0598]	[0.0297]	[0.0391]	[0.0638]
inv	0.2464**	-0.01323	-0.000433	-0.141	-0.1448**	-0.03601	-0.02191	0.0736
	[0.1136]	[0.0811]	[0.0787]	[0.1054]	[0.0635]	[0.0322]	[0.0411]	[0.0707]
exp	-0.0912	-0.1878***	-0.0423	0.04468	0.04533	-0.007781	0.02912	-0.08483
	[0.0893]	[0.0712]	[0.0624]	[0.0960]	[0.0584]	[0.0296]	[0.0412]	[0.0634]
trf	-0.09677	-0.1127**	-0.1108*	0.1337	0.06056	0.01629	0.04865	-0.001744
	[0.0909]	[0.0556]	[0.0606]	[0.0838]	[0.0630]	[0.0296]	[0.0410]	[0.0658]
bl	0.1096	0.1198	0.00375	-0.1679	0.06532	0.008816	-0.04131	-0.00358
	[0.1204]	[0.0888]	[0.0876]	[0.1066]	[0.0648]	[0.0341]	[0.0469]	[0.0705]
tel	0.01097	0.02795	0.0397	0.1696**	0.03507	-0.02006	-0.002315	0.09128
	[0.0818]	[0.0515]	[0.0507]	[0.0688]	[0.0566]	[0.0314]	[0.0408]	[0.0666]
lab	0.0291	-0.02643	0.02458	-0.1496**	-0.08562	-0.05552	-0.05031	0.01997
	[0.0846]	[0.0630]	[0.0568]	[0.0736]	[0.0591]	[0.0348]	[0.0422]	[0.0702]
inf	-0.07781	0.1057	0.08794	-0.004692	0.07401	0.03597	0.05134	-0.0816
	[0.0928]	[0.0777]	[0.0639]	[0.0814]	[0.0634]	[0.0335]	[0.0421]	[0.0665]
ref	0.02389	-0.0463	0.04693	-0.06511	0.01967	-0.01317	0.02515	0.04079
	[0.1517]	[0.1315]	[0.1239]	[0.1430]	[0.0811]	[0.0502]	[0.0603]	[0.1011]
cg	-0.01538	0.1675	0.05942	-0.01047	0.0307	-0.09798*	-0.06368	-0.05503
	[0.1484]	[0.1433]	[0.1307]	[0.1401]	[0.0876]	[0.0520]	[0.0592]	[0.1029]
slp	-0.02802	0.06945	-0.05491	-0.05428	-0.05288	0.05892	-0.08084	0.05311
	[0.1321]	[0.1191]	[0.1103]	[0.1238]	[0.0831]	[0.0462]	[0.0642]	[0.1036]
af	-0.1627*	-0.01694	-0.02603	0.008526	-0.04681	0.06299*	-0.05264	-0.04324
	[0.0869]	[0.0646]	[0.0602]	[0.0755]	[0.0595]	[0.0325]	[0.0338]	[0.0627]
cap	0.05026	-0.1485	0.02596	-0.03183	0.02357	-0.03541	0.05991	0.03752
	[0.1319]	[0.1219]	[0.1043]	[0.1344]	[0.0749]	[0.0455]	[0.0503]	[0.0788]
tf	-0.06495	0.01119	-0.05774	-0.1277	-0.03107	0.01604	0.04034	-0.1693*
	[0.1482]	[0.1109]	[0.0921]	[0.1315]	[0.0870]	[0.0507]	[0.0553]	[0.0934]
bsf	0.1179	0.05334	0.09079	0.2162**	0.03636	-0.02298	-0.1254**	0.03449
	[0.0934]	[0.0743]	[0.0779]	[0.0878]	[0.0716]	[0.0398]	[0.0521]	[0.0756]
Constant	-0.2815*	0.0761	0.04584	-0.0971	-0.0323	0.03145	0.06993	-0.06687
	[0.1468]	[0.1177]	[0.0919]	[0.1531]	[0.0734]	[0.0541]	[0.0505]	[0.0906]
N	3080	3080	3080	3053	3080	3080	3080	3053

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C. Interaction

interaction	Formalized firms				Digitalized firms			
	Revenue	Employment	Wage	Finance	Revenue	Employment	Wage	Finance
tax	-0.0005012 [0.0011]	-0.0005198 [0.0011]	-0.0006136 [0.0013]	-0.0001133 [0.0005]	0.002498 [0.0047]	-0.001247 [0.0024]	-0.00001741 [0.0012]	-0.002692 [0.0050]
sbd	0.00008246 [0.0005]	-0.000298 [0.0006]	-0.000182 [0.0004]	0.0000865 [0.0008]	0.0002305 [0.0012]	0.0005292 [0.0025]	0.0002412 [0.0013]	-0.0001922 [0.0011]
prs	-0.0009668 [0.0015]	0.0001374 [0.0005]	-0.00004231 [0.0006]	-0.002425 [0.0025]	-0.001533 [0.0034]	-0.0009765 [0.0024]	-0.0007057 [0.0019]	-0.001293 [0.0028]
util	-0.002517 [0.0023]	-0.0008911 [0.0008]	-0.0006541 [0.0011]	0.001485 [0.0025]	0.0000453 [0.0006]	-0.000125 [0.0017]	-0.0001369 [0.0018]	0.0002286 [0.0039]
drm	-0.00001635 [0.0014]	0.000006355 [0.0005]	0.000003544 [0.0003]	-0.000212 [0.0012]	-0.004721 [0.0062]	0.0003401 [0.0041]	0.004589 [0.0049]	0.0003957 [0.0051]
dr	0.00009728 [0.0005]	0.00004951 [0.0002]	-0.0002349 [0.0010]	0.000004155 [0.0004]	-0.004997 [0.0095]	0.0008785 [0.0067]	-0.0007962 [0.0074]	-0.00481 [0.0094]
pp	-0.0002384 [0.0007]	0.00001471 [0.0002]	0.0004162 [0.0011]	-0.0008552 [0.0024]	-0.001488 [0.0039]	-0.004272 [0.0049]	-0.0009348 [0.0034]	-0.003664 [0.0048]
bds	0.0001122 [0.0004]	-0.00005859 [0.0002]	-0.0002159 [0.0006]	-0.0001296 [0.0005]	0.003452 [0.0045]	0.005385 [0.0055]	0.003013 [0.0041]	-0.0001739 [0.0037]
us	0.001853 [0.0035]	0.0004691 [0.0016]	0.0008918 [0.0017]	0.004227 [0.0041]	0.0002723 [0.0024]	0.00199 [0.0030]	-0.002281 [0.0033]	-0.00006192 [0.0024]
ict	0.001952 [0.0042]	0.001544 [0.0019]	0.003465 [0.0023]	0.01083* [0.0059]	-0.0007672 [0.0060]	0.003935 [0.0050]	-0.002296 [0.0055]	-0.001194 [0.0062]
dp	-0.0009925 [0.0023]	-0.001023 [0.0011]	0.001046 [0.0013]	-0.004455 [0.0034]	-0.01063 [0.0094]	-0.003284 [0.0077]	-0.009878 [0.0096]	-0.005643 [0.0082]
oss	0.003019 [0.0024]	0.000241 [0.0008]	-0.0005937 [0.0010]	-0.0003701 [0.0020]	-0.0006303 [0.0070]	-0.002136 [0.0053]	-0.0007642 [0.0061]	-0.007219 [0.0072]
inv	0.005925* [0.0035]	-0.0008325 [0.0016]	-0.000769 [0.0018]	-0.007995* [0.0045]	-0.001152 [0.0032]	-0.0007082 [0.0020]	0.0005859 [0.0018]	0.001333 [0.0068]
exp	0.0005419 [0.0011]	0.001108 [0.0010]	0.0004966 [0.0007]	-0.00004257 [0.0013]	0.003704 [0.0049]	0.0007526 [0.0025]	0.001033 [0.0028]	0.00007762 [0.0023]
trf	-0.0003421 [0.0012]	0.000133 [0.0005]	0.0001237 [0.0004]	-0.0008529 [0.0022]	-0.001436 [0.0033]	-0.002458 [0.0052]	-0.000294 [0.0013]	0.001496 [0.0032]
bl	-0.000576 [0.0018]	0.001717 [0.0013]	-0.0008534 [0.0011]	-0.0003885 [0.0022]	-0.001553 [0.0041]	-0.000564 [0.0030]	-0.004092 [0.0048]	-0.002585 [0.0046]
tel	-0.0007068 [0.0012]	0.0001361 [0.0004]	0.001021 [0.0015]	0.0001912 [0.0008]	0.000257 [0.0017]	0.0004275 [0.0026]	0.001069 [0.0064]	-0.0003841 [0.0016]
lab	-0.000008392 [0.0003]	-0.00002022 [0.0006]	0.000003693 [0.0001]	0.0001027 [0.0009]	-0.0001082 [0.0015]	-0.0006721 [0.0019]	0.001578 [0.0042]	-0.0009738 [0.0034]
inf	-0.0001631 [0.0006]	-0.00004697 [0.0002]	-0.0000758 [0.0003]	0.0003592 [0.0012]	-0.0007893 [0.0024]	0.0007172 [0.0019]	0.0003595 [0.0019]	0.003352 [0.0047]
ref	-0.004222 [0.0061]	-0.005603* [0.0030]	0.0001844 [0.0033]	-0.004804 [0.0078]	-0.00115 [0.0059]	-0.0009976 [0.0045]	0.003106 [0.0062]	-0.003191 [0.0064]
cg	-0.005689 [0.0048]	0.003831* [0.0022]	0.002871 [0.0023]	0.00235 [0.0055]	-0.001852 [0.0081]	0.0004046 [0.0062]	-0.0008437 [0.0064]	0.0109 [0.0100]
slp	0.008412* [0.0047]	0.001071 [0.0019]	0.000216 [0.0028]	0.01138* [0.0063]	-0.006055 [0.0065]	0.003253 [0.0046]	-0.007059 [0.0062]	0.003714 [0.0068]
af	0.005098 [0.0043]	-0.0003632 [0.0018]	0.0007461 [0.0019]	0.0009423 [0.0044]	0.0008788 [0.0023]	0.001026 [0.0023]	0.0002539 [0.0014]	0.0008901 [0.0024]
cap	0.004169 [0.0029]	-0.0008178 [0.0011]	0.0009594 [0.0013]	0.002066 [0.0026]	-0.0000419 [0.0007]	-0.0001733 [0.0025]	-0.000003553 [0.0002]	-0.0007584 [0.0036]
tf	-0.0004001 [0.0031]	-0.0006466 [0.0014]	-0.001933 [0.0016]	0.005943 [0.0042]	0.002194 [0.0041]	0.002974 [0.0045]	-0.001067 [0.0028]	-0.001232 [0.0037]
bsf	-0.005502 [0.0046]	0.00096 [0.0018]	0.008940*** [0.0028]	0.001186 [0.0052]	-0.0003136 [0.0047]	0.004934 [0.0051]	0.0002453 [0.0045]	0.001651 [0.0052]
N	3080	3080	3080	3053	3080	3080	3080	3053

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interaction	Internationalized firms				Women-owned firms			
	Revenue	Employment	Wage	Finance	Revenue	Employment	Wage	Finance
tax	0.01068 [0.0068]	-0.005402 [0.0046]	0.001565 [0.0034]	0.0001924 [0.0041]	0.0001748 [0.0006]	-0.00009537 [0.0003]	0.00008723 [0.0003]	-0.0001516 [0.0005]
sbd	0.00453 [0.0097]	-0.00004429 [0.0071]	0.004538 [0.0066]	-0.008859 [0.0084]	0.0003721 [0.0014]	-0.0007903 [0.0009]	-0.0001942 [0.0009]	-0.001442 [0.0017]
prs	-0.00975 [0.0095]	-0.001843 [0.0067]	-0.005023 [0.0063]	-0.00009274 [0.0078]	0.0002767 [0.0009]	-0.0005385 [0.0007]	-0.0008825 [0.0010]	-0.0003642 [0.0011]
utl	0.02161* [0.0110]	-0.005183 [0.0078]	-0.002059 [0.0068]	0.007298 [0.0090]	-0.00009449 [0.0004]	-0.0000758 [0.0003]	-0.000216 [0.0009]	0.0001871 [0.0007]
drm	-0.01243 [0.0144]	0.01187 [0.0131]	-0.01231 [0.0096]	0.01664 [0.0138]	-0.002274 [0.0025]	-0.0001764 [0.0015]	0.0005125 [0.0016]	0.001549 [0.0028]
dr	-0.000697 [0.0119]	-0.005114 [0.0096]	-0.0008809 [0.0077]	-0.004075 [0.0119]	0.001805 [0.0025]	0.0009992 [0.0014]	-0.000489 [0.0016]	0.0009242 [0.0028]
pp	0.004814 [0.0045]	0.002779 [0.0032]	0.001514 [0.0022]	0.005385 [0.0050]	0.002967 [0.0022]	-0.002483 [0.0015]	-0.001501 [0.0014]	0.0006177 [0.0022]
bds	-0.01161 [0.0077]	-0.006633 [0.0052]	-0.00742 [0.0051]	-0.01088 [0.0070]	-0.002477 [0.0020]	0.0006566 [0.0008]	-0.0006862 [0.0009]	-0.001161 [0.0016]
us	0.003345 [0.0048]	0.003715 [0.0042]	0.004756 [0.0036]	0.002062 [0.0053]	-0.0001266 [0.0005]	-0.0001899 [0.0006]	-0.00006778 [0.0003]	0.0002915 [0.0009]
ict	-0.02402* [0.0125]	-0.02128** [0.0107]	-0.02728** [0.0107]	-0.006729 [0.0112]	-0.0001073 [0.0005]	-0.000004879 [0.0001]	-0.00007427 [0.0003]	-0.00005135 [0.0003]
dp	-0.01165 [0.0075]	0.005143 [0.0061]	0.004749 [0.0054]	0.01321 [0.0083]	-0.00003922 [0.0003]	0.00009007 [0.0003]	0.00008119 [0.0003]	-0.0006168 [0.0018]
oss	-0.003208 [0.0048]	-0.0007081 [0.0032]	0.002309 [0.0032]	0.003267 [0.0038]	-0.00008408 [0.0004]	-0.0001578 [0.0005]	0.00009187 [0.0003]	-0.0004822 [0.0011]
inv	-0.01525* [0.0083]	0.0008187 [0.0050]	0.00002679 [0.0049]	0.008247 [0.0067]	0.004185* [0.0025]	0.001041 [0.0010]	0.0006334 [0.0012]	-0.002196 [0.0023]
exp	0.00485 [0.0051]	0.009986* [0.0053]	0.002249 [0.0034]	-0.002197 [0.0048]	-0.0002175 [0.0007]	0.00003733 [0.0002]	-0.0001397 [0.0004]	0.0004378 [0.0012]
trf	0.001727 [0.0026]	0.002012 [0.0026]	0.001978 [0.0026]	-0.003213 [0.0034]	-0.001228 [0.0015]	-0.0003302 [0.0006]	-0.0009861 [0.0010]	0.00003462 [0.0013]
bl	-0.006284 [0.0072]	-0.006874 [0.0055]	-0.0002151 [0.0050]	0.01018 [0.0072]	-0.001227 [0.0014]	-0.0001656 [0.0006]	0.0007761 [0.0010]	0.0000643 [0.0013]
tel	0.001427 [0.0106]	0.003634 [0.0067]	0.005161 [0.0067]	0.02125** [0.0099]	0.0004452 [0.0009]	-0.0002546 [0.0005]	-0.00002939 [0.0005]	0.001074 [0.0016]
lab	0.002173 [0.0064]	-0.001973 [0.0048]	0.001835 [0.0043]	-0.01113 [0.0068]	-0.0005812 [0.0014]	-0.0003769 [0.0009]	-0.0003415 [0.0008]	0.00009994 [0.0005]
inf	-0.0009795 [0.0021]	0.001331 [0.0025]	0.001107 [0.0021]	-0.00004757 [0.0008]	-0.0002224 [0.0010]	-0.0001081 [0.0005]	-0.0001543 [0.0007]	0.0001742 [0.0011]
ref	0.0009156 [0.0058]	-0.001775 [0.0051]	0.001799 [0.0049]	-0.002016 [0.0046]	-0.0007563 [0.0031]	0.0005064 [0.0019]	-0.000967 [0.0023]	-0.001509 [0.0038]
cg	-0.0005278 [0.0051]	0.005745 [0.0061]	0.002039 [0.0047]	-0.0002719 [0.0036]	-0.001432 [0.0041]	0.004570* [0.0027]	0.00297 [0.0029]	0.002509 [0.0047]
slp	-0.0009053 [0.0043]	0.002243 [0.0041]	-0.001774 [0.0037]	-0.001298 [0.0032]	0.002352 [0.0037]	-0.002621 [0.0022]	0.003596 [0.0030]	-0.002323 [0.0046]
af	-0.002611 [0.0041]	-0.0002719 [0.0011]	-0.0004177 [0.0011]	0.0001009 [0.0009]	0.0008104 [0.0012]	-0.001091 [0.0010]	0.0009113 [0.0009]	0.0007884 [0.0013]
cap	-0.002109 [0.0056]	0.006231 [0.0058]	-0.001089 [0.0044]	0.001538 [0.0065]	-0.0006802 [0.0022]	0.001022 [0.0014]	-0.001729 [0.0016]	-0.001125 [0.0024]
tf	0.001503 [0.0036]	-0.000259 [0.0026]	0.001336 [0.0024]	0.003011 [0.0039]	0.001046 [0.0030]	-0.0005403 [0.0017]	-0.001359 [0.0019]	0.0059 [0.0038]
bsf	0.006667 [0.0058]	0.003017 [0.0043]	0.005135 [0.0048]	0.01214* [0.0066]	-0.001067 [0.0021]	0.000674 [0.0012]	0.003679* [0.0020]	-0.001034 [0.0023]
N	3080	3080	3080	3053	3080	3080	3080	3053

MSME = micro, small, and medium-sized enterprise.

Notes: Robust standard errors in brackets.

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

Source: Author's calculations.

Table A3: Abbreviations of Variables

tax	Tax relief (e.g., deferred tax payments, corporate tax reduction, value-added tax [VAT] reduction, etc.).
sbid	Subsidy for business recovery/conditional cash transfer/grants.
prs	Financial assistance to pay salary for employees (payroll subsidy for workers).
utl	Deferment of utility bill payments (e.g., electricity, gas, water supply)/utility subsidies.
drm	Deferment of debt repayments (e.g., bank loans, microfinance loans)/debt repayment moratorium.
dr	Debt restructuring by financial institutions (e.g., extension of loan tenure, interest rate reduced).
pp	Simplified procedures/eased requirements to promote MSME participation in public procurement.
bds	Business development and advisory services (e.g., help MSMEs develop new business models and find new markets).
us	Support in upgrading skills of workers to keep them competitive.
ict	Improvement of public ICT infrastructure and regulation to increase internet speed and lower internet cost.
dp	Streamlining government transaction processes and shift to digital platforms.
oss	One stop-service window to support MSME exporters/importers.
inv	Removing restrictions/barriers to foreign investments in domestic MSMEs.
exp	Apply export promotion and export destination diversification tools (e.g., export subsidies, financial support to get international certificates).
trf	Remove/reduce tariff rates and other duties for imported raw materials.
bl	Mentoring & business literacy programs for MSME owners and employees.
tel	Financial assistance on teleworking arrangement.
lab	Streamlining labor regulations for remote working arrangements.
inf	Comprehensive information platform on government assistance programs.
ref	Special refinancing facility/low interest rate loans/subsidized loans.
cg	Special credit guarantees (partial or full coverage of credit risk).
slp	Faster approval of bank loans (simplified loan procedures).
af	Facilitating access to new financing models (e.g. crowdfunding, peer-to-peer (P2P) lending, and digital financial services).
cap	Development of equity/bond market for MSMEs.
tf	Support MSMEs in accessing trade finance and supply chain finance.
bsf	Creation of Business Restructuring Fund (financial support for firms in bankruptcy).

Source: Author.

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Private Sector Development and Policy Actions in Timor-Leste

Lessons from a Business Mapping Survey

This paper empirically investigates what drives the growth of private businesses in Timor-Leste and the policy actions needed to facilitate growth amid global uncertainty, especially for micro, small, and medium-sized enterprises (MSMEs). Estimation results show that four types of MSMEs—those formalized, digitalized, internationalized, and women-led—exhibit different business characteristics and performance results compared with control groups. Accordingly, policy support areas differ by firm type, with a focused approach critical in designing and delivering policy assistance to MSMEs in Timor-Leste.

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