



**The Asia Foundation**

# Survival Analysis of Thai Micro and Small-sized Enterprises: Does the Covid-19 Pandemic Matter?

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# Introduction:

- MSEs contribute a significant impact to Thai economy in several dimensions.
  - In 2019, the MSEs contributed THB 5,963,156 million, accounting for 35.3% of GDP.
  - MSEs generate 69.48% of the total employment.
- However, after its presence in December 2019, COVID-19 has triggered a severe spike to businesses in many countries including Thailand, especially tourism and business sector.
- Many MSEs have closed permanently as they could not survive the economic contractions brought on by the COVID-19 lockdowns and travel restrictions
- According to the Asian Development Bank (2020), domestic demand for MSEs products fell by 40%, and 41% of MSEs suspended their operations after the national lockdown.

## Research objective:

- To analyze the survival probability of Thai MSEs (business vulnerability) during the COVID-19 crisis.
- To examine the risk factors of business failure of Thai MSEs during this COVID-19 crisis.

# Research Methodology:

- How to model the survivability?

-> This study used the Cox proportional hazards model of Cox (1972).

-> This model can predict the survival probability of MSEs and the survival duration (how long they can survive).

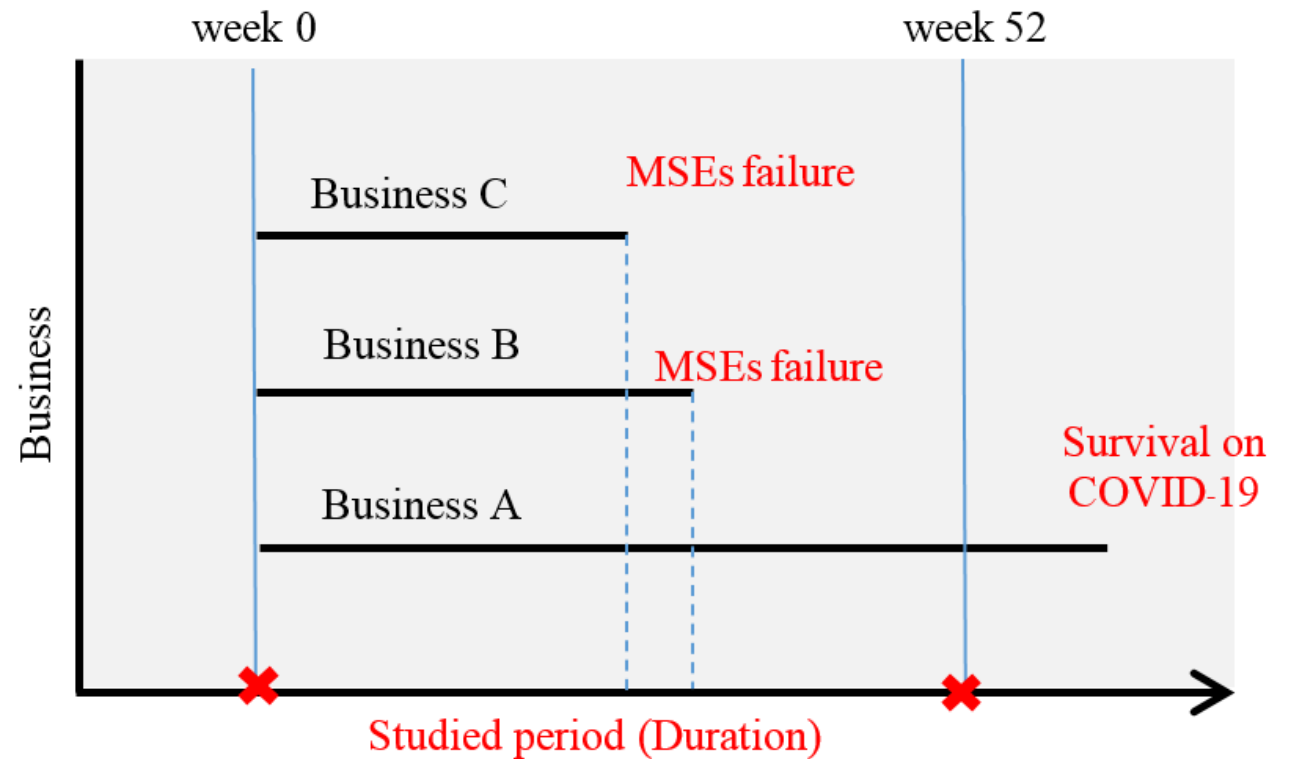


Figure 1 The illustration of survival data

# Research Methodology:

- Key factors affecting the survival probability of MSEs (independent variables):
  - Owner-specific characteristics (Gender, Age of owner)
  - Business-specific characteristics (Location of business, Area, Size, Total Asset, Annual sales, Type of business, Revenue, Rent/lease business premises, Business Import or Export)
  - Business strategies against COVID-19 (Business reduces working hours to minimize layoff, Receiving soft loan, Business model changing)
  - Employees of the business (Number of employees, N. female employees, N. informal employees, N. laid-off employee, N. laid-off female employees, N. laid-off informal employee, N. employees expects to leave within two months)

## Data:

- The survey is a pool-data survey (same businesses are tracked), collected three rounds in June (Round 1), September (Round 2), and December (Round 3) of 2020.
- From Bangkok and all four major regions in Thailand: North, Northeast, Central, and South.
- The first round of survey has the sample size of 982 MSEs (60% from the tourism sector and 40% from the manufacturing sectors)
- However, there were some sample drop of at the rate of 16% and 13% in the second and third rounds of survey, respectively.
- This study only includes the MSEs that appears in all three rounds with the sample size of 720 MSEs.

## Results: Descriptive statistics

Variable	Description	Round 1	Round 2	Round 3
<b>Dependent variable: Survival data</b>				
<b>MSEs failure</b>	1 = business failure within 52 weeks, 0 = survive more than 52 weeks	49.72%	46.25%	46.81%
<b>Economic survival duration</b>	Number of weeks that business can operate (If the individual can survive longer than a year, the variable takes the value of 52)	46.711 (17.864)	47.397 (17.364)	45.033 (19.871)
<b>Independent variable: Owner-specific characteristics</b>				
<b>Gender of owner</b>	1 = female, 0 = male	52.92%	52.92%	52.92%
<b>Age of owner</b>	Age 15-24 years old		0.97%	
	Age 25-34 years old	20.28%	20.28%	20.28%
	Age 35-44 years old	33.33%	33.33%	33.33%
	Age 45-59 years old	36.39%	36.39%	36.39%
	Age 60 years old and above	9.03%	9.03%	9.03%

Independent variable: Business-specific characteristics				
<b>Location of business</b>	Bangkok metropolitan area	19.86%	19.86%	19.86%
	Central region	21.67%	21.67%	21.67%
	Northeastern region	19.44%	19.44%	19.44%
	Northern region	19.86%	19.86%	19.86%
	Southern region	19.17%	19.17%	19.17%
<b>Area of business</b>	1 = urban, 0 = rural	45.97%	45.97%	45.97%
<b>Size of business</b>	1 = small enterprise, 0 = micro enterprise	59.44%	59.44%	59.44%
<b>Total assets</b>	Total assets less than THB3 millions	50.27%	50.27%	50.27%
	Total assets THB3-60 millions	46.94%	46.94%	46.94%
	Total assets THB61-100 millions	2.79%	2.79%	2.79%
<b>Annual sales</b>	Annual sales less than THB3 millions	61.39%	61.39%	61.39%
	Annual sales THB 3-60 million	37.92%	37.92%	37.92%
	Annual sales THB 61-100 million	0.69%	0.69%	0.69%
<b>Types of business related to service sector</b>	Small & micro (non-tourism)	39.45%	39.45%	39.45%
	Gastronomy (i.e., food/beverage /bakery/snack-tourism related)	18.19%	18.19%	18.19%
	Hotel / accommodations	18.19%	18.19%	18.19%
	Travel agent/ tour guide/ transportation	10.98%	10.98%	10.98%
	Other business in tourism sector	13.19%	13.19%	13.19%
<b>Revenue</b>	No change in sale/revenue from the COVID-19 pandemic	2.36%	2.36%	2.36%
	Sale/revenue has increased from the COVID-19 pandemic	1.81%	1.81%	1.81%
	Sale/revenue has decreased from the COVID-19 pandemic	95.83%	95.83%	95.83%
<b>Rent/lease business premises</b>	1 = rent/lease business premises, 0 = own business premises	38.19%	38.19%	38.19%
<b>Business import</b>	1 = import, 0 = not import	10.28%	10.28%	10.28%
<b>Business export</b>	1 = export, 0 = not export	8.33%	8.33%	8.33%



- Descriptive statistics

Independent variable: Business strategies against COVID-19				
<b>Business reduces working hours to minimize layoff</b>	Business reduces the working hours to minimize layoff	25.28%	12.64%	12.08%
	No change/ working as usual (not reduce the working hours to minimize layoff	27.22%	60.42%	51.67%
	Not reduce the number of hours, but already layoff some/all staff	45.69%	22.78%	26.39%
	Not reducing number of hours because business is (temporarily) closed	1.81%	4.16%	9.86%
<b>Receiving soft loan</b>	1 = receiving soft loan, 0 = not receiving soft loan	15.69%	23.06%	25.28%
<b>Business model change from COVID-19 pandemic</b>	Not yet try anything /No change /No adjustment on the business model	52.64%	43.47%	39.17%
	Operate while adapting to social distancing	5.69%	5.97%	5.56%
	Move into new products and services that have high demand during COVID	4.03%	6.67%	9.44%
	Operate through online markets or social media	22.22%	30.28%	34.03%
	Discussed with employees to reduce their salary to keep all employees	15.42%	13.61%	11.80%

- Descriptive statistics

Independent variable: employees				
<b>Number of employees</b>	Number of employees before COVID-19	9.951 (11.755)	9.951 (11.755)	9.951 (11.755)
<b>Number of female employees</b>	Number of female employees before COVID-19	5.284 (6.131)	5.284 (6.131)	5.284 (6.131)
<b>Number of informal employees</b>	Number of informal employees before COVID-19	3.966 (9.726)	3.966 (9.726)	3.966 (9.726)
<b>Number of laid-off employee</b>	Number of laid-off employees due to COVID-19	4.730 (10.252)	2.800 (5.759)	3.254 (5.946)
<b>Number of laid-off female employees</b>	Number of laid-off female employees due to COVID-19	2.618 (4.987)	1.555 (3.458)	1.972 (4.338)
<b>Number of laid-off informal employee</b>	Number of laid-off informal employees due to COVID-19	2.508 (8.825)	1.480 (4.793)	1.929 (4.995)
<b>The number of employees expects to leave within two months.</b>	Number of employees that expect to leave within two months due to the COVID-19 pandemic.	0.123 (1.024)	0.108 (0.899)	0.159 (0.847)

# Estimation results of the Cox model

- These are the estimated coefficients corresponding to their hazard ratios.
- If their value is above 1, it implies that this variable is the inhibiting factor of MSEs survival

Variable	Parameter estimate			Hazard ratio		
	Round 1	Round 2	Round 3	Round 1	Round 2	Round 3
Owner-specific characteristics						
gender	.	.	.	.	.	.
age 25to34	.	.	.	.	.	.
age 35to44	.	.	0.058	.	.	1.060
age_45to59	.	.	.	.	.	.
age 60up	.	.	.	.	.	.

## Estimation results of the Cox model

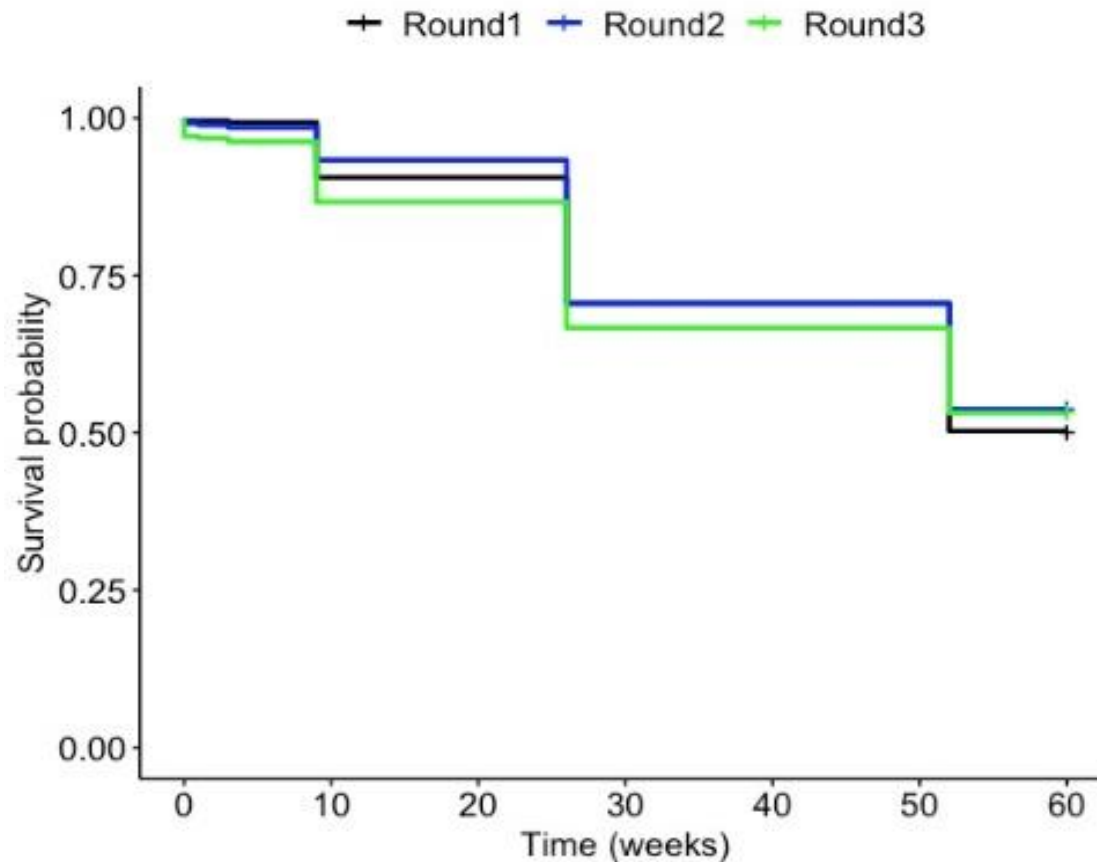
Variable	Parameter estimate			Hazard ratio		
	Round 1	Round 2	Round 3	Round 1	Round 2	Round 3
<b>Business-specific characteristics</b>						
reg_central	-0.195	-0.132	-0.717	0.823	0.876	0.488
reg_northeast	.	.	-0.074	.	.	0.929
reg_north	.	.	0.080	.	.	1.083
reg_south	.	-0.124	-0.389	.	0.883	0.678
area	.	.	-0.017	.	.	0.983
size_business	.	.	.	.	.	.
total_asset_business_d2	.	.	.	.	.	.
total_asset_business_d3	.	-0.028	.	.	0.972	.
annual_sale_business_d2	.	.	.	.	.	.
annual_sale_business_d3	.	.	.	.	.	.
business_tour_d2	.	-0.074	-0.348	.	0.929	0.706
business_tour_d3	0.029	.	0.063	1.029	.	1.065
business_tour_d4	0.116	.	0.164	1.123	.	1.178
business_tour_d5	.	.	.	.	.	.
rev_change_d2	-0.307	.	-0.419	0.736	.	0.658
rev_change_d3	.	0.003	0.123	.	1.003	1.131
rent_premises	0.280	0.260	0.142	1.323	1.297	1.153
business_import	.	.	0.079	.	.	1.082
business_export	.	.	.	.	.	.

## Estimation results of the Cox model

Variable	Parameter estimate			Hazard ratio		
	Round 1	Round 2	Round 3	Round 1	Round 2	Round 3
<b>Business strategies against COVID-19</b>						
reduce_hour_d2	-0.403	-0.391	-0.426	0.668	0.676	0.653
reduce hour d3	.	.	-0.421	.	.	0.656
reduce hour d4	.	0.094	0.002	.	1.099	1.002
softloan_d2	-0.025	.	-0.043	0.975	.	0.958
business change d2	.	.	-0.182	.	.	0.834
business change d3	.	.	0.080	.	.	1.083
business_change_d4	-0.020	.	-0.113	0.980	.	0.893
business_change_d5	.	0.095	0.048	.	1.099	1.060
<b>Employees</b>						
employees	.	.	-0.010	.	.	0.990
employees female	.	-0.001	.	.	0.999	.
employees_informal	.	.	.	.	.	.
employees lay off	0.004	0.013	0.026	1.004	1.013	1.026
employees female lay off	.	.	.	.	.	.
employees_informal_lay_off	.	.	.	.	.	.
employees_expect to leave	0.005	0.005	0.022	1.005	1.005	1.022

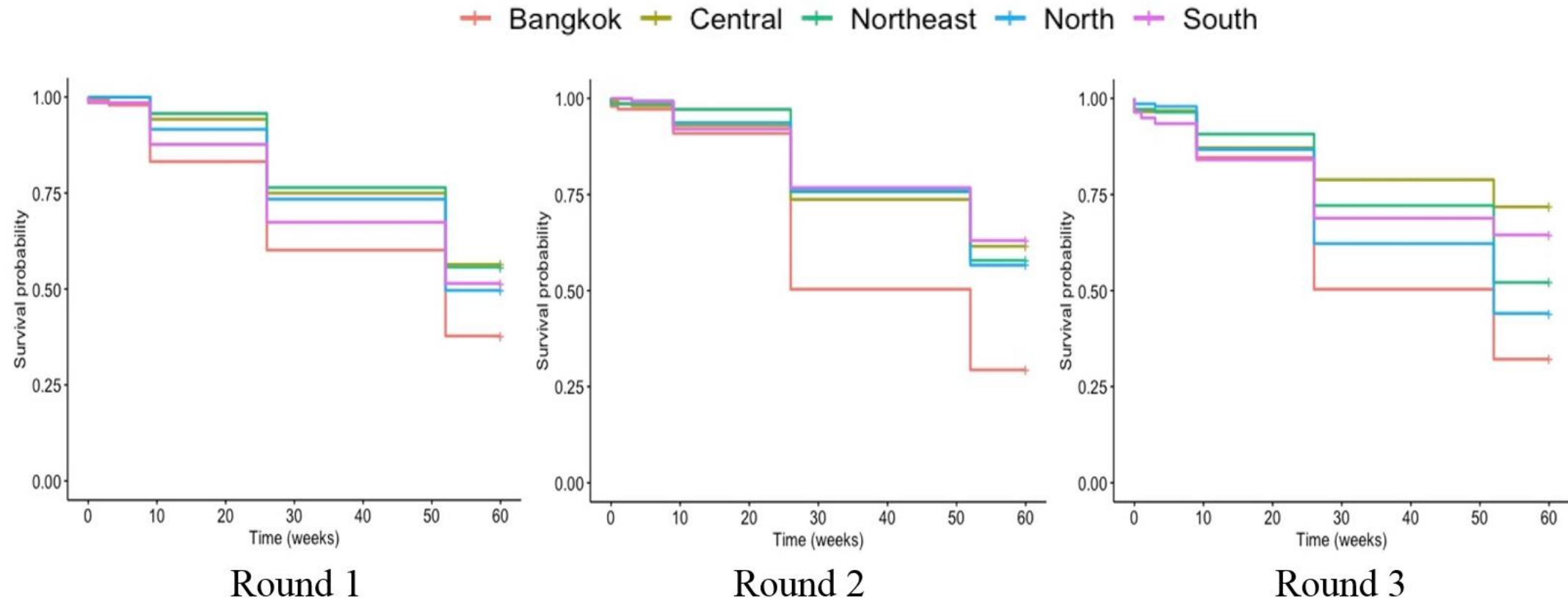
# Results: Survival path analysis

- The overall economic survival probability of Thai MSEs in June (round 1), September (round 2), and December (round 3) of 2020



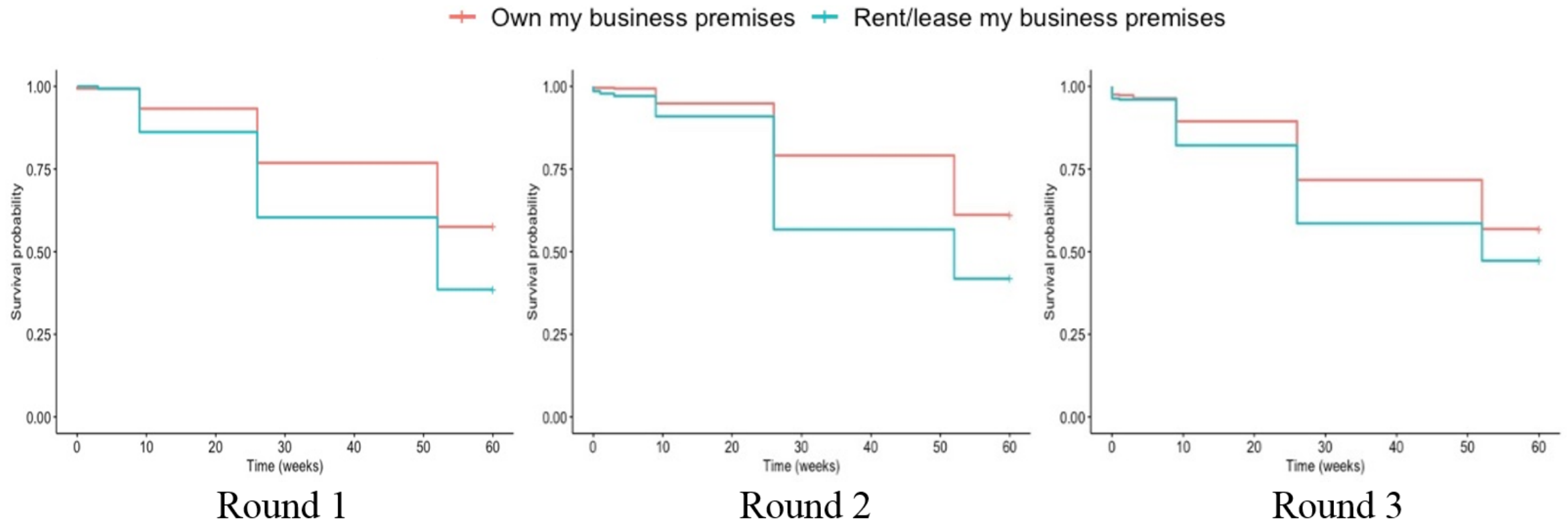
# Results: Survival path analysis

- Survival probability of MSEs in different regions over the three survey periods



# Results: Survival path analysis

- Survival probability concerning different types of business premises over the three-survey period.

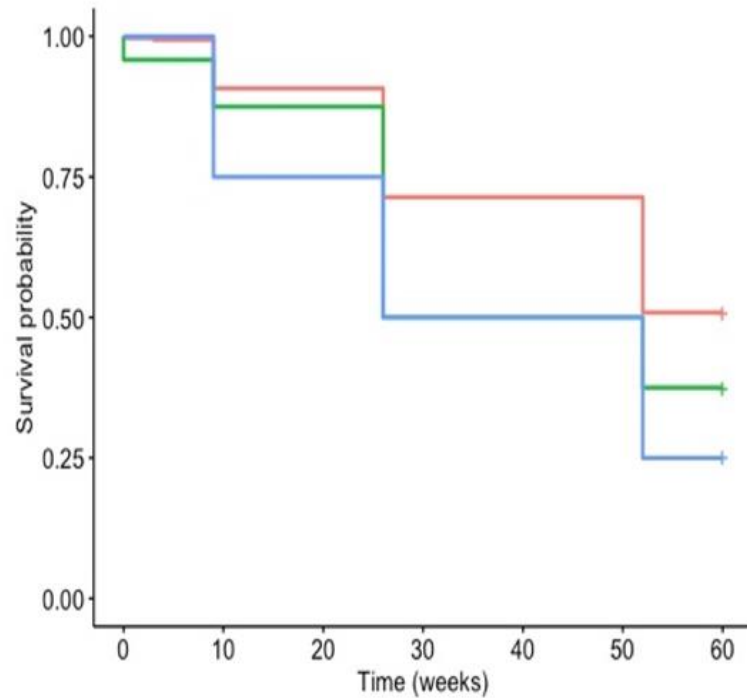




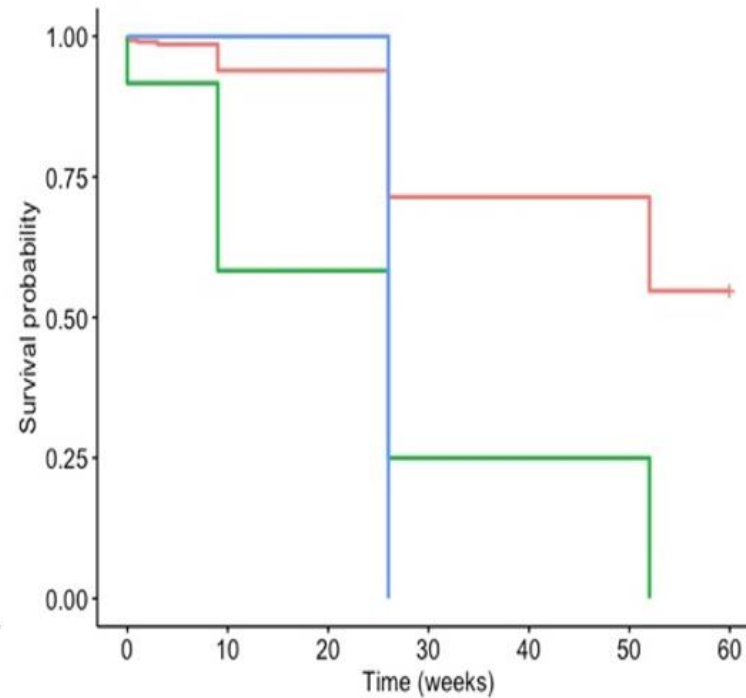
# Results: Survival path analysis

- Survival probability of MSEs that lays-off employees over the three survey periods.

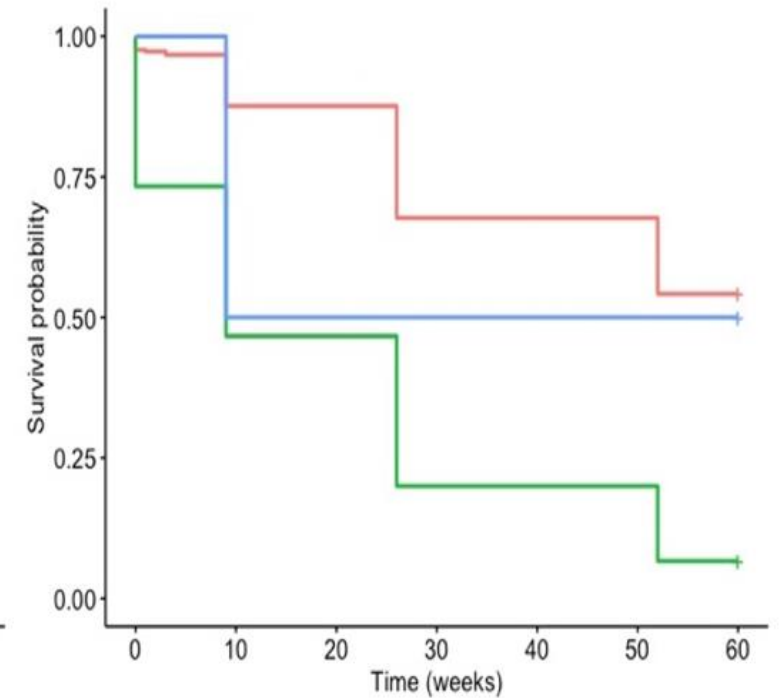
Lay-off + 1-20 persons + 21-40 persons + 41 persons or above



Round 1



Round 2

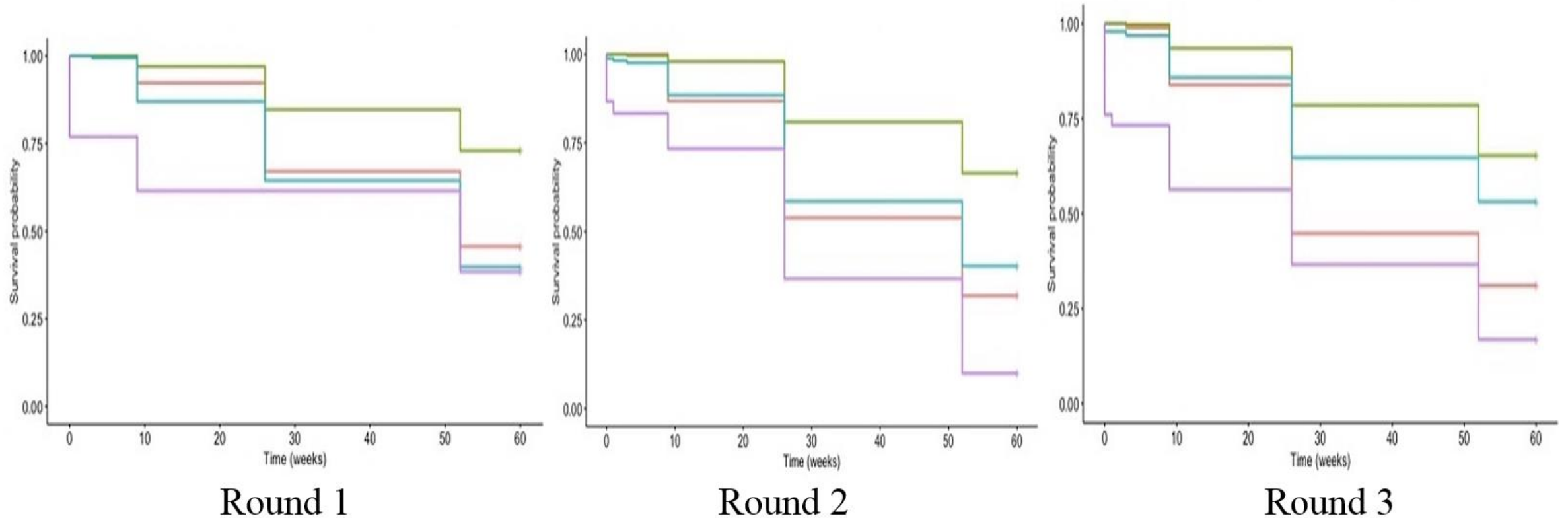


Round 3

# Results: Survival path analysis

- Survival probability of MSEs in different business adjustments over the three-survey period.

—+ Reduce working hours —+ Not reduce/ Working as usual —+ Already layoff some/all staffs —+ Temporarily closed



## Concluding remarks:

1. According to the survival probability paths, it is reported that approximately 50% of MSEs could not survive longer than 52 weeks during the COVID-19 pandemic.
2. MSEs tried to cut costs by reducing working hours or laying off workers during the crisis. However, this is not enough for them to survive and may lead to long-term unemployment.
3. Liquidity is vital. MSEs who own their business premises and have access to a soft loan is more likely to survive. Hence, it emphasizes the importance of accessibility to credit for all.
4. Business model adjustment (e.g., online marketing) are likely to have a pronounced effect on the survival probability of MSEs, especially in round 3.

A top-down view of a desk with a white wooden surface. In the center is a spiral-bound notebook with the text "THANK YOU FOR YOUR ATTENTION" written in bold, black, hand-drawn letters. To the right of the notebook are a pair of black-rimmed glasses and a silver pen with gold accents. In the top left corner, there are green leaves from a plant.

**THANK YOU  
FOR YOUR  
ATTENTION**