Export Duration: How to Foster Always Exporters?

Prepared for

RIETI – Keio University joint workshop

「日本企業の生産性をめぐる現状と課題」

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1. Introduction & Motivation

- **How can firms be the ”always exporter”?**
  - Firm characteristics
  - Transaction partners
  - Export experiences

Precondition of Learning-by-Exporting!

Potential determinants

- **Esp., exporters to “related firms” vs. to “unrelated firms”**
  - Any difference in survivability in export markets?
  - Any difference in the determinants of the survivability?

⇒ Effective policy measures fostering always exporter firms

2. Literature

- **Theory**: Schröder and Sørensen (EER 2012).

- **Empirical**:
  - Import duration: Mostly aggregate-level data (e.g., product)

    Besedeš & Prusa (JIE 2006, CJE 2006), Nitsch (RWE 2009)
  - Export duration: Aggregate-level data

    Besedeš & Blyde (WP 2010)
  - Export duration: Micro-level data

    Obashi (JWE 2010): Machinery parts trade is longer-lived than finished products

    Esteve-Pérez al. (EI 2013): Risk of destination & information matter

Bilateral import data at the six-digit level of Harmonized System

Spanish data

- **Our paper: Using firm-level data to examine the implication of trade partners' characteristics on the survivability in export MKT**

3. Key Findings

- Semi-parametric and parametric survival analyses reveal:

I. Survivability in export markets increases when firms are…

   a. More innovative
   b. Financially less constrained
   c. Anchored more firmly to overseas markets

II. Export intensity to related firms mostly **negatively** affects the survivability in most of the case *(non-linear effect)*

III. The survivability (i.e., in export MKT) of firms exporting mostly to unrelated firms is affected by information channel

- **Policy proposal: Encouraging a specific type of exports through information channel (e.g., NEXI's recent works)**

4. Why hazard estimation?

- Many samples are censored from left

- Summary statistics of duration for completed and censored samples

	Variable	Obs (risk)	Mean	Std. Dev.	Min	Max
Completed Sample	Duration	520	4.33	3.18	1	13
Censored sample (from right)		19,306	7.09	3.84	1	15

5. Data (1)

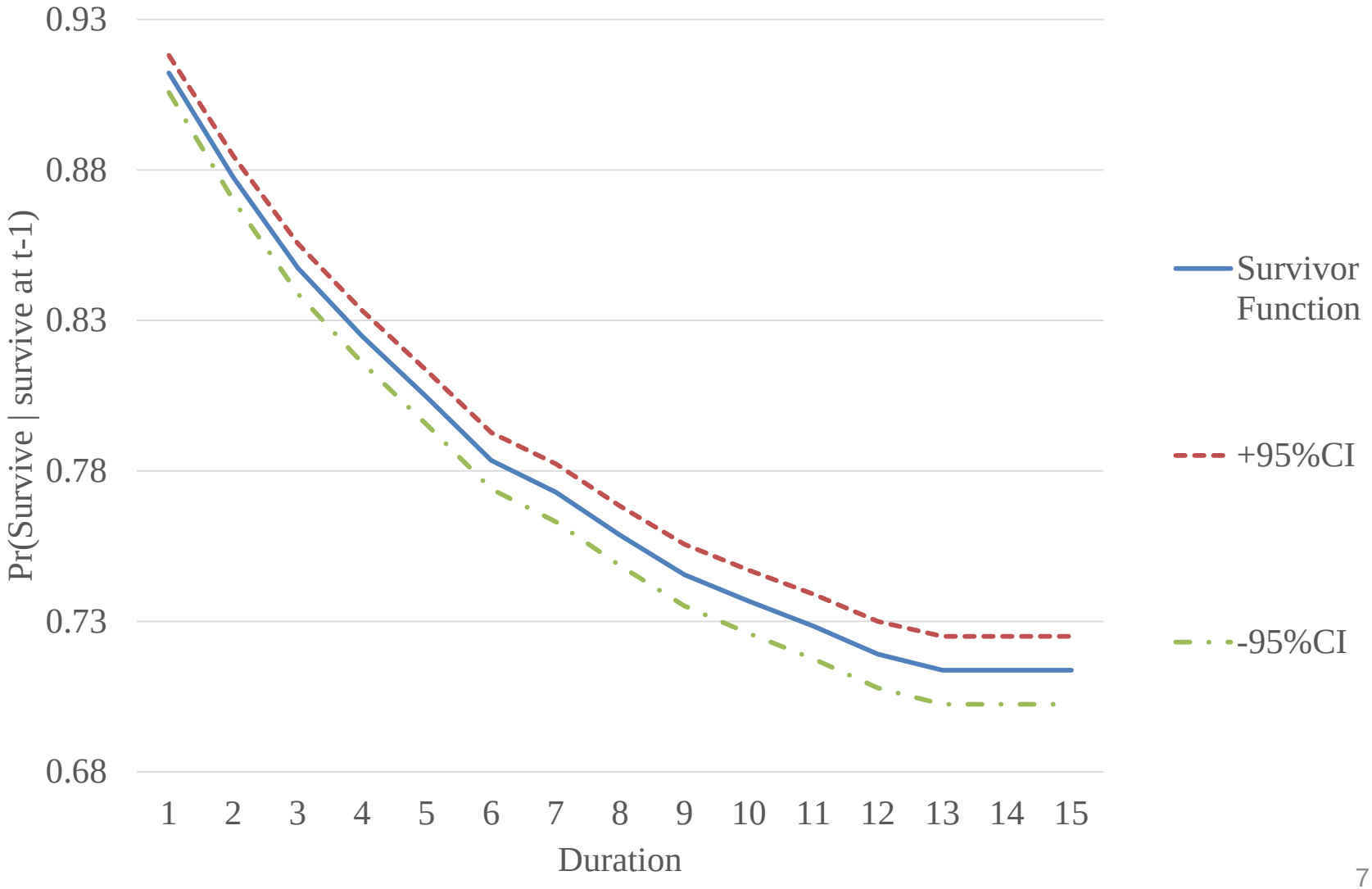
- BSBSA
  - Firms' export status
  - Firms' characteristics (esp., whether to related or unrelated client firms)
- COSMOS2
  - Transaction partners (i.e., banks)
- NEEDs FQ
  - Banks' characteristics

5. Data (2)

- How to measure export spell?
  - Need some criteria for the break of export status
    - **X-year criteria**: Need to observe X consecutive years to identify the break of export status
    - Assume X=3: Roberts & Tybout (AER 1997)
- Left-censoring
  - Use the data “as is”
- Right-censoring
  - Employ Tobit type adjustment

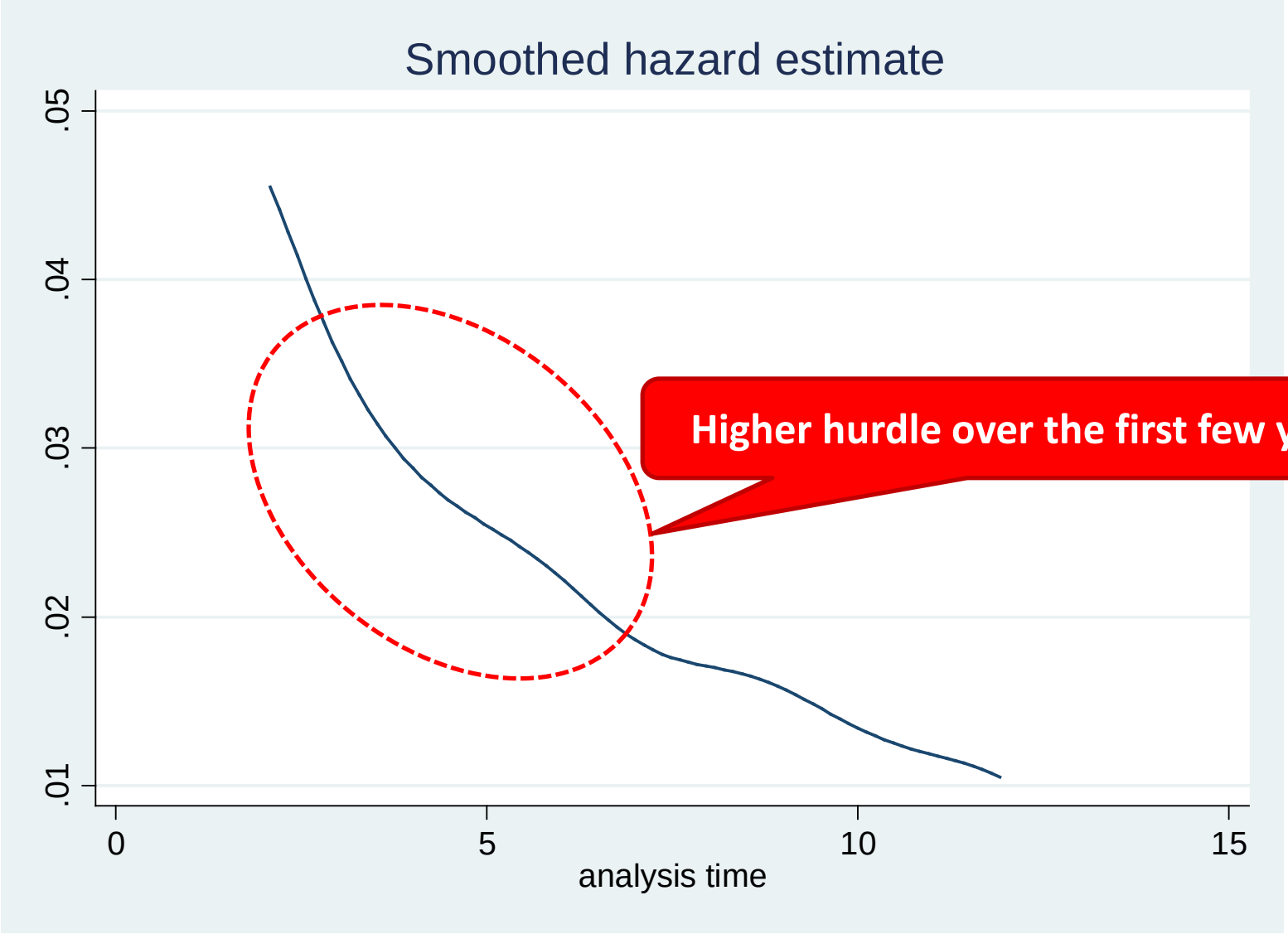
5. Data (3)

- Non-parametrically computed survivor function



5. Data (4)

- Non-parametrically computed hazard function



6. Empirical Strategy

- Non-parametric, semi-parametric, parametric hazard estimations
  - Parametric: Two distributional assumptions (identify ↑&↓)

$$S(t) \equiv \Pr(T \geq t) \tag{1}$$

$$\lambda(t) \equiv \lim_{\tau \to \infty} \frac{\Pr(t + \tau > T \geq t | T \geq t)}{\tau} = -\frac{d \ln S(t)}{dt} = \frac{f(t)}{S(t)} \tag{2}$$

$$S(t, x(t); \theta) \equiv \Pr(T \geq t, x(t); \theta) \tag{3}$$

$$\lambda(t, x(t), \theta) \equiv \lim_{\tau \to 0} \frac{\Pr(t + \tau > T \geq t | T \geq t, x(t); \theta)}{\tau} = \lambda_0(t; \alpha)\phi(x(t), \beta) \tag{4}$$

7. Empirical Analyses (1)

List of explanatory variables

Variable Name	Definition	Obs	Mean	Std. Dev.	Min	Max
Firm basic characteristics						
FIRM_TFP	TFP measured through Good et al.	19,999	0.05	0.16	-0.66	0.59
FIRM_RDRATIO	R&D investment / Sales	19,999	0.02	0.03	0.00	1.20
FIRM_SIZE	LN(firms' total asset)	19,999	8.90	1.35	5.55	15.22
FIRM_AGE	Firm age from establishment	19,948	44.50	17.31	0.00	119.00
REL_CLIENT_DUMMY	Dummy for export to relative firms / total exports is above 75percentile point	19,999	0.57	0.49	0	1
Firm financial characteristics						
FIRM_CASH	Liquidity asset / Total Asset	19,999	0.58	0.15	0.00	1.00
FIRM_LISTED	Dummy for listed status	19,999	0.07	0.26	0	1
BANK_SIZE	Main banks' LN(banks' total asset)	19,999	16.77	1.48	12.40	18.81
BANK_CAPRATIO	Main banks' equity / total asset	19,999	0.04	0.01	0.00	0.13
Firm own experiences in overseas markets						
FIRM_FORINVESTMENTRATIO	Firms' foreign lending & investment / total asset	19,999	0.03	0.06	0.00	0.93
FIRM_FOREMPLOYEES	Firms' #(overseas employees) / #(total emplotyees)	19,999	0.00	0.02	0.00	0.69
FIRM_FORESTABLISH	Firms' #(overseas establishments) / #(total establishments)	19,999	0.04	0.11	0.00	0.95
Information channel						
NUM_NEARBYFIRMS	#(firms) located in the same city	19,999	420.38	604.60	0.00	2068.00
NUM_NEARBYEXPORTFIRMS_IND	#(exporter firms in the same industry) located in the same city	19,999	4.55	7.19	0.00	254.00
FIRM_IMPORTRATIO	Import / total sales	19,014	0.04	0.09	0.00	0.94
FIRM_FOROWNERSHIP	Foreign ownership ratio	19,999	14.50	88.29	0	1000

7. Empirical Analyses (2-1)

■ Semi-Parametric estimation by all samples

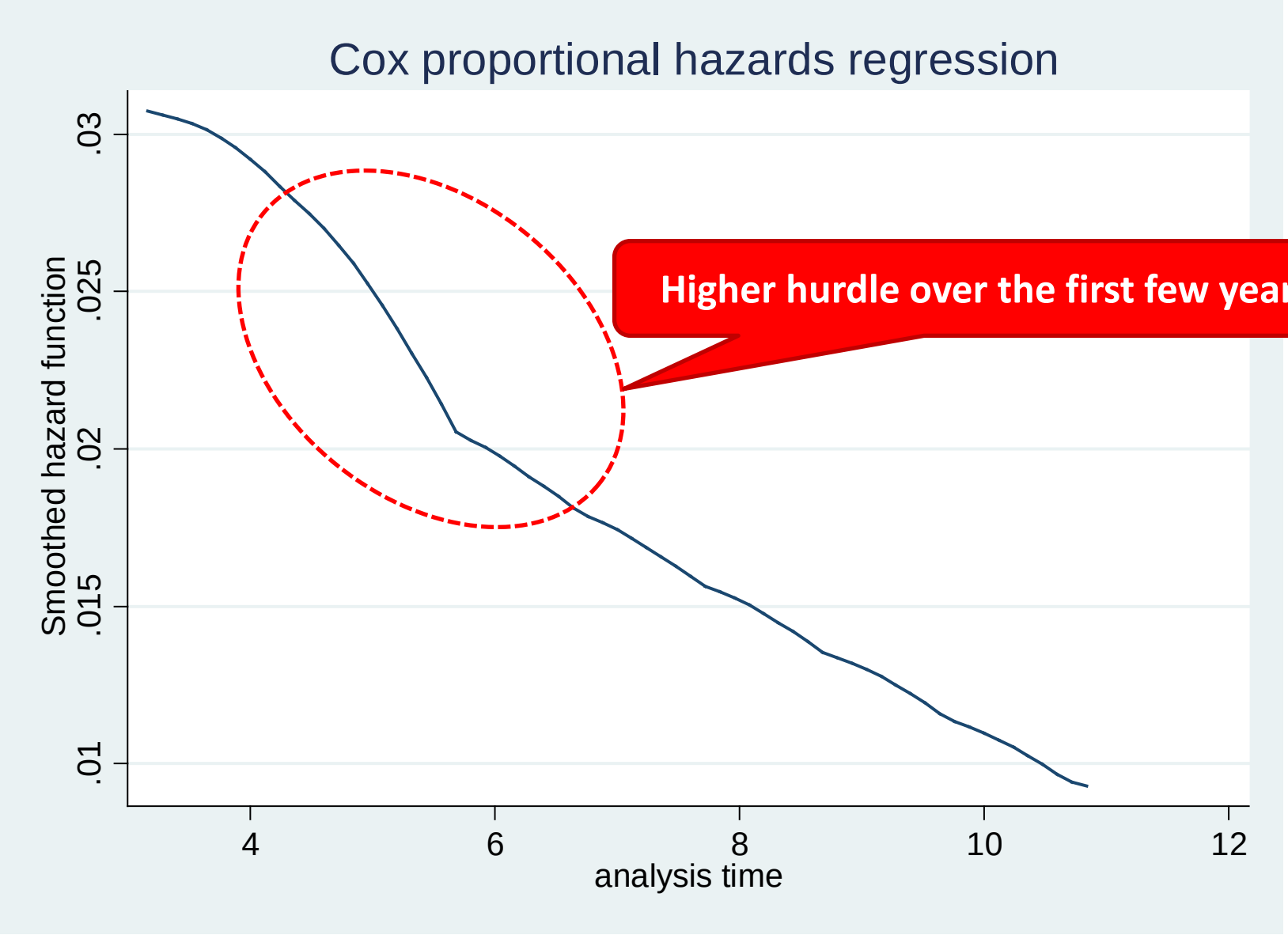
All the indep var is lagged one-period	Firm-Level Clustered Hazard Ratio	Effect on Duration
FIRM_TFP	1.1733	
FIRM_RDRATIO	0.0005	＋＋＋
FIRM_SIZE	1.0771	
FIRM_AGE	0.9981	
REL_CLIENT_DUMMY	1.6111	－－－
FIRM_CASH	0.4825	＋＋
FIRM_LISTED	0.5837	＋＋
BANK_SIZE	0.9648	
BANK_CAPRATIO	0.1042	
FIRM_FORINVESTMENTRATIO	0.0050	＋＋＋
FIRM_FOREMPLOYEES	0.0106	
FIRM_FORESTABLISH	0.2221	
NUM_NEARBYFIRMS	1.0000	
NUM_NEARBYEXPORTFIRMS_IND	0.9903	
FIRM_IMPORTRATIO	0.4322	
FIRM_FOROWNERSHIP	0.9998	
Number of Obs.	18,963	
Number of Subject	4,754	
Number of Failures	479	
Time at Risk	18,963	
Wald chi2	79.00	
Prob > chi2	0.0000	
Log pseudo likelihood	-3407.31	

Innovativeness, financial constraint, and own experiment

Exports to related firms
⇔ Shorter-lived

7. Empirical Analyses (2-1)

- Semi-Parametric estimation by all samples



7. Empirical Analyses (2-2)

- Parametric estimation by all samples confirm the results

All the indep var is lagged one-period	Weibull		Gompertz		Log-Logstic	
	Hazard Ratio	Effect on Duration	Hazard Ratio	Effect on Duration	Coef.	Effect on Duration
FIRM_TFP	0.9201		1.1517		0.0441	
FIRM_RDRATIO	0.0001	+++	0.0002	+++	12.6530	+++
FIRM_SIZE	1.0406		1.0603		-0.0399	
FIRM_AGE	0.9940	++	0.9975		0.0067	
REL_CLIENT_DUMMY	1.5254	---	1.5539	---	-0.6434	---
FIRM_CASH	0.4508	++	0.4353	+++	1.2285	++
FIRM_LISTED	0.5842	++	0.5764	++	0.7628	++
BANK_SIZE	0.9585		0.9576		0.0580	
BANK_CAPRATIO	0.0300		0.0314		3.8894	
FIRM_FORINVESTMENTRATIO	0.0021	+++	0.0025	+++	8.8199	+++
FIRM_FOREMPLOYEES	0.0072		0.0081		8.2580	
FIRM_FORESTABLISH	0.1750	+	0.1976	+	2.4181	+
NUM_NEARBYFIRMS	1.0000		1.0000		0.0000	
NUM_NEARBYEXPORTFIRMS_IND	0.9799		0.9808		0.0245	
FIRM_IMPORTRATIO	0.2781	+	0.3110		1.6952	+
FIRM_FOROWNERSHIP	0.9999		0.9998		0.0001	
cons	0.2141	++	0.1712	++	1.6865	
Shape Parameter	Negative	***	Negative	***	Negative	***
Number of Obs.			18,963			
Number of Subject			4,754			
Number of Failures			479			
Time at Risk			18,963			
Wald chi2	105.82		96.33		119.59	
Prob > chi2	0.0000		0.0000		0.0000	
Log pseudo likelihood	-1566.6		-1530.4		-1559.6	

7. Empirical Analyses (3-1)

■ Closer look through semi-Parametric estimation

All the indep var is lagged one-period	Firm-Level Clustered Hazard Ratio	Effect on Duration
FIRM_TFP	1.4310	
FIRM_RDRATIO	0.0001	++
FIRM_SIZE	1.0462	
FIRM_AGE	0.9941	
REL_EXPORTRATIO	0.0029	+++
REL_EXPORTRATIO_SQ	240.8868	−−−
FIRM_CASH	0.3754	+
FIRM_LISTED	0.6574	
BANK_SIZE	0.9792	
BANK_CAPRATIO	0.3463	
FIRM_FORINVESTMENTRATIO	0.0140	+
FIRM_FOREMPLOYEES	0.0000	
FIRM_FORESTABLISH	1.8259	
NUM_NEARBYFIRMS	1.0005	−−−
NUM_NEARBYEXPORTFIRMS_IND	0.9297	+++
FIRM_IMPORTRATIO	0.1348	
FIRM_FOROWNERSHIP	0.9997	
Number of Obs.	10,700	
Number of Subject	3,723	
Number of Failures	185	
Time at Risk	10,700	
Wald chi2	64.53	
Prob > chi2	0.0000	
Log pseudo likelihood	-1184.53	

Higher reliance on related firms contributes to long life as far as the level of the exposure is low

Higher reliance
over the high level exposure region
⇔ Shorter-lived

7. Empirical Analyses (3-2)

■ Closer look through subsample semi-Parametric estimation

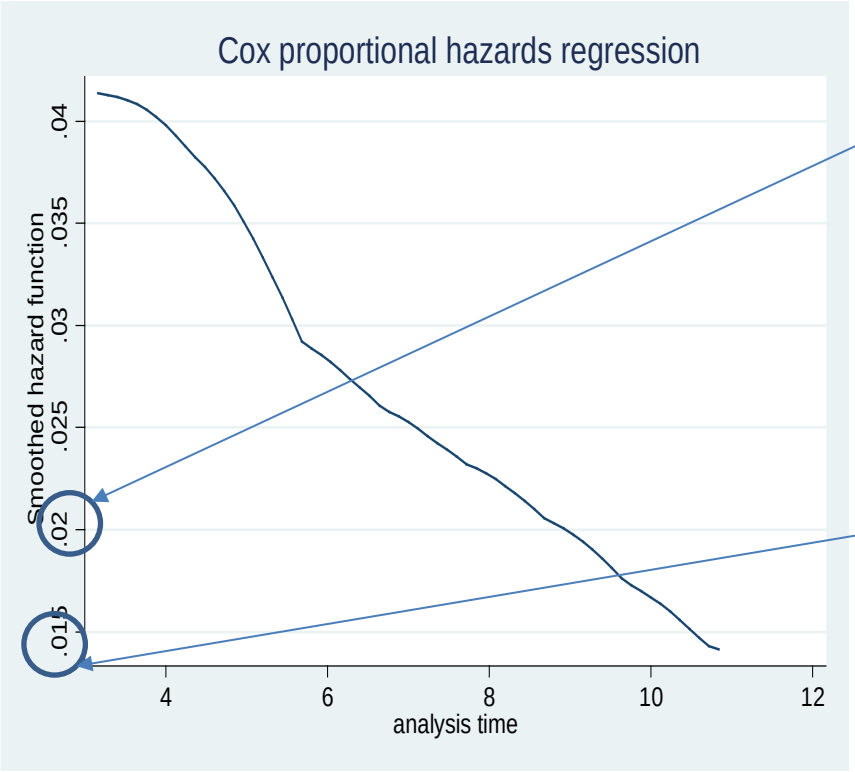
All the indep var is lagged one-period	Firm-Level Clustered			
	REL_EXPORTRATIO >=75% point		REL_EXPORTRATIO <75% point	
	Hazard Ratio	Effect on Duration	Hazard Ratio	Effect on Duration
FIRM_TFP	1.0918		1.3817	
FIRM_RDRATIO	0.0016	++	0.0005	+
FIRM_SIZE	1.1703	---	0.9224	
FIRM_AGE	0.9981		0.9997	
FIRM_CASH	0.5822		0.3618	
FIRM_LISTED	0.5924	++	0.6158	
BANK_SIZE	0.9717		0.9429	
BANK_CAPRATIO	0.0755		2.5094	
FIRM_FORINVESTMENTRATIO	0.0621	+	0.0000	++
FIRM_FOREMPLOYEES	0.7359		0.0000	
FIRM_FORESTABLISH	0.1559	++	1.2159	
NUM_NEARBYFIRMS	0.9998		1.0005	---
NUM_NEARBYEXPORTFIRMS_IND	1.0049		0.9316	++
FIRM_IMPORTRATIO	0.6781		0.0491	
FIRM_FOROWNERSHIP	0.9997		1.0002	
Number of Obs.	10,722		8,241	
Number of Subject	3,704		3,326	
Number of Failures	344		135	
Time at Risk	10,722		8,241	
Wald chi2	34.68		28.52	
Prob > chi2	0.0027		0.0185	
Log pseudo likelihood	-2277.08		-829.13	

"Information channel" matter only for this subsample

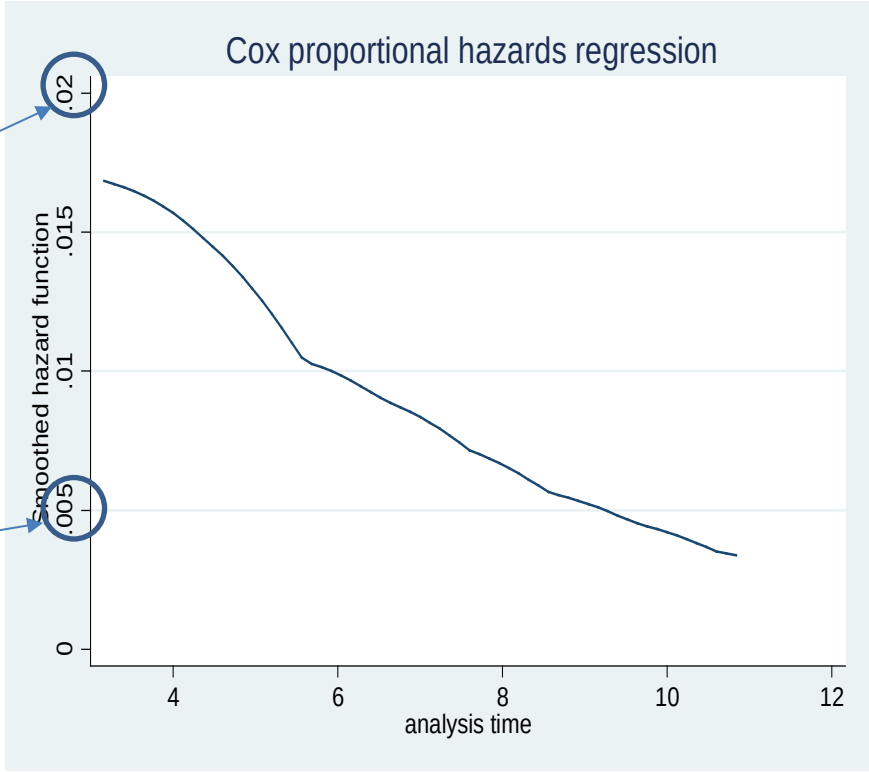
7. Empirical Analyses (3-2)

- Closer look through subsample semi-Parametric estimation

Higher reliance



Lower reliance



8. Discussion

- Exporting to related firms
  - Might work as an **entry ticket**
  - However, it is important to understand that too high reliance on the related firms does not necessarily lead to long-lived
  - In such a case, even after spending a certain length of periods in export markets, the survivability cannot improve (⇔**low LBE**?)
- There exists some **specific channel** supporting firms exporting to non-related firms (i.e., information channel)

9. Policy Implication

- Higher survivability in export market is a precondition for firms to exhibit learning-by-exporting

  - It seems that firms doing **"stand-alone" exports** show higher chance to learn from exporting (⇒Hosono et al. 2014)
  - Policy measure might need to target on such firms with higher prospect in terms of learning-by-exporting

  - **Information channel** is a key
  - E.g., encouraging such firms' export thorough the recent expansion of **NEXI's program** could be highly effective

  - Also, **surviving the first few years** seems to matter

10. Summary

- Specific firm characteristics are correlated with higher survivability in export markets

- Reliance on related firms in exports seems to have pros and cons

- Higher availability of the information about overseas markets might contribute to higher survivability (and learning-by-exports)

◆ Some ideas for future research

  - Firm × product-level analysis using customs data

  - Substitutability between exports and FDI

Thank you and comments are welcome!

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