EXPORTER FIRMS BEHAVIOUR, EVIDENCE FROM PORTUGUESE FIRMS USING MICRODATA

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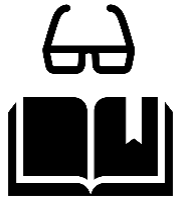
Agenda

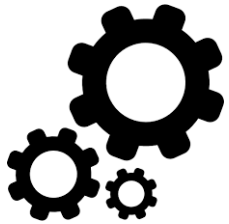
Research question

Motivation



Literature review

Data analysis



Methodology

Results

Policy recommendations

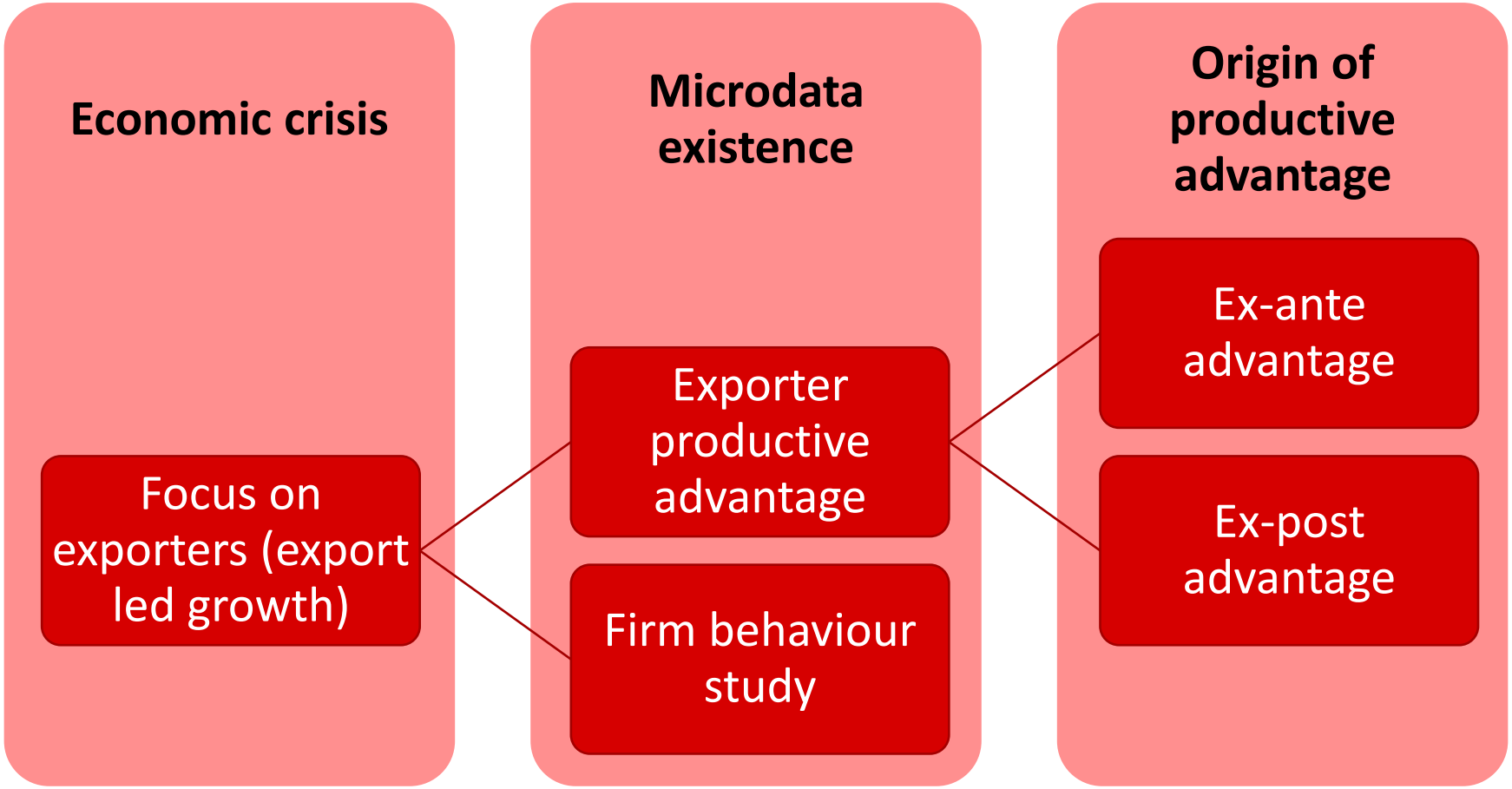
Conclusion

Research question(s)

01 Are exporters more productive that non-exporters?

02 What are relevant variables for the decision to export?

Introduction

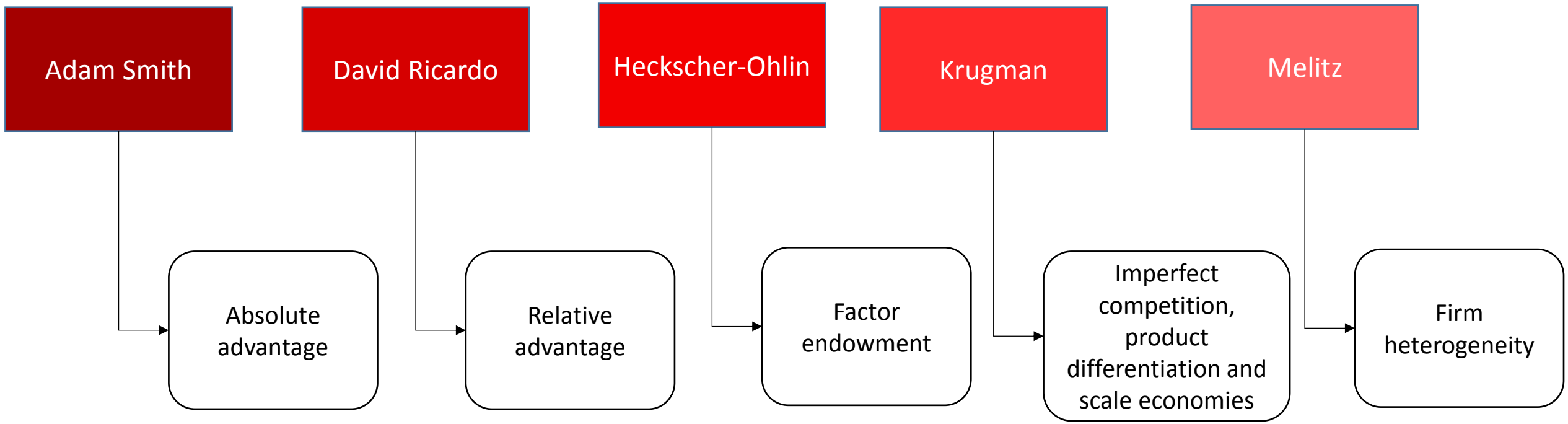


Introduction

Are future exporters more productive than future non-exporter?	Wagner (2007) does a thorough literature review on the self selection and learning by exporting theory	Given the evidence on self selection, what leads firms to enter the export market
Do exporters learn while exporting and starting increasing their productivity?	Empirical evidence on self selection and lack of evidence on learning effects	Estimation of exporting determinants for Portuguese firms using microdata

Literature review

Outline of the literature (1)



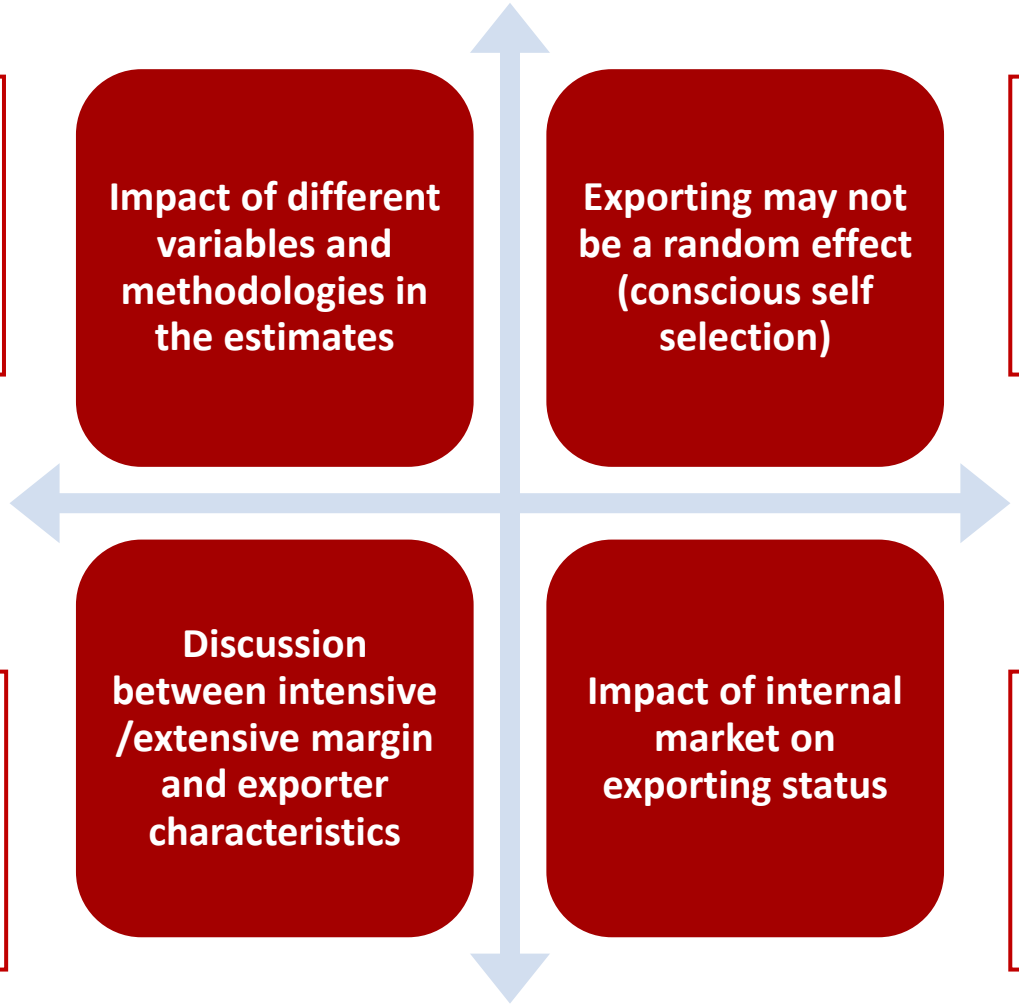
Wagner (2007)

- Not mutually exclusive phenomenon
- Empirical evidence on firm self selection to export
- Inconclusive results on learning effects

Literature review

Outline of the literature (3)

Silva et al. (2012);
Timoshenko (2015).



Hallward-Driemeir et al. (2002);
López (2009)

Mayer and Ottaviano (2008)

Muñoz-Sepúlveda (2014);
Blum, Claro and Horstmann (2013);
Lee, Veamish, Lee and Park (2009)

Data analysis

Database description

- **Database:** 2017 BPlim's Central Balance Sheet Harmonized Panel
- **Time period:** 2006 – 2015 (10 years)
- **Observations:** 3,709,683
- **Firms:** 613,107
- **Average observations per firm:** 6.05

Obs per individual	Freq	Perc.	Cum.
1	66,426	10.83%	10.83%
2	67,458	11.00%	21.84%
3	62,470	10.19%	32.03%
4	48,748	7.95%	39.98%
5	42,827	6.99%	46.96%
6	37,144	6.06%	53.02%
7	32,841	5.36%	58.38%
8	31,124	5.08%	63.45%
9	30,629	5.00%	68.45%
10	193,440	31.55%	100.00%
Total	**613,107**	**100.00%**	-

Data analysis

Observation flow

Period	Total	First	Last	Sing
2006	343,623	343,623	16,521	16,521
2007	358,499	34,074	22,317	2,886
2008	368,367	32,772	25,862	2,746
2009	368,119	26,999	25,640	2,165
2010	368,549	26,547	23,352	1,945
2011	377,014	30,458	28,039	2,500
2012	376,842	26,897	27,783	2,072
2013	380,899	31,385	27,525	2,093
2014	383,093	29,399	31,390	2,545
2015	384,678	30,953	384,678	30,953

Main patterns:

- Total number of observations by period is stable [350,000 to 390,000];
- Entrants tend to exceed Exiters;
- Low percentage of firms that operate only for one period.

Data analysis

Firm productivity (1)

Firm productivity

Main variable in the self selection and learning-by-exporting theories

Labour productivity (1)
(output per worker)

Variable volatily → Heterogeneity of wage premiums → Heterogeneity of wage growth rates

Labour productivity (2)
(output per labour cost)

Data analysis

Firm productivity (2)

Firm productivity behaviour

- Overall concentration of the distribution due to small sized firms;
- Some missing values exclude firms from the analysis due to lack of information of number of employees or lack of employees

Productivity category	Freq.	Perc.	Cum.
<10k	407,099	10.97%	10.97%
10k-100k	1,973,336	53.19%	64.17%
100k-1M	477,482	12.87%	77.04%
1M-10M	17,245	0.46%	77.50%
10M-100M	788	0.02%	77.53%
100M-1kM	84	0.00%	77.53%
>1kM	1	0.00%	77.53%
Missing	833,648	22.47%	100.00%
Total	**3,709,683**	**100.00%**	-

Data analysis

Exporter behaviour (1)

Exporter firm

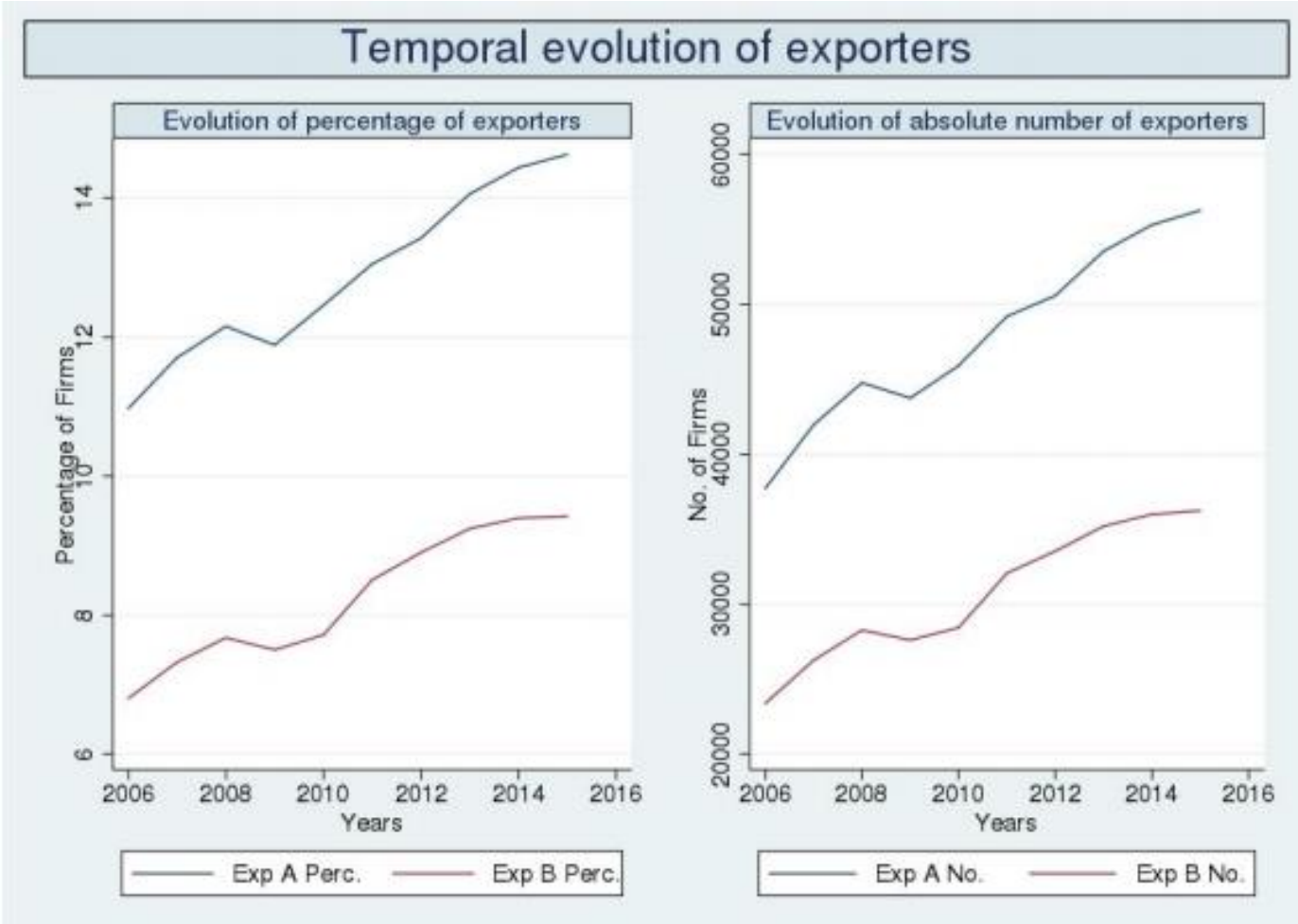
Types

Exporter A

(Firm that exports any positive value)

Exporter B

(Firm that exports at least 5% of their total output)

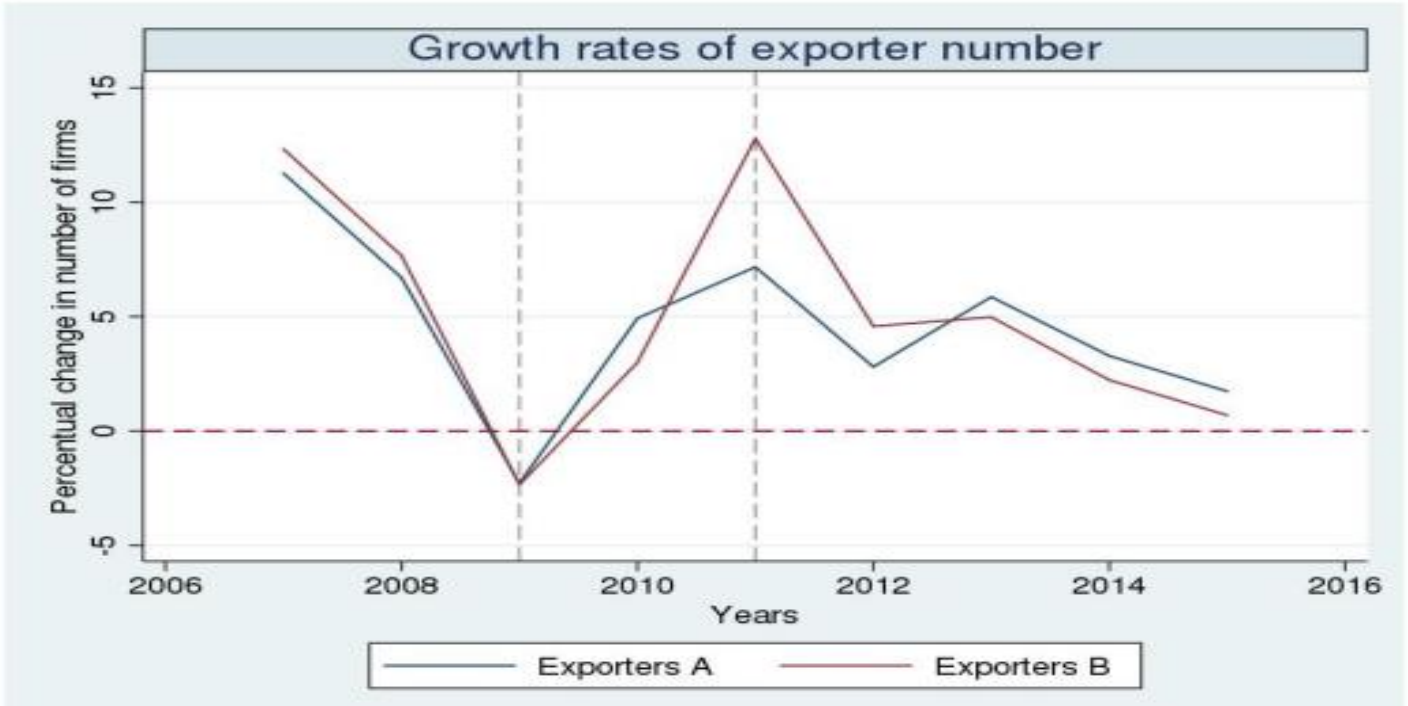


Data analysis

Exporter behaviour (2)

Exporter firm

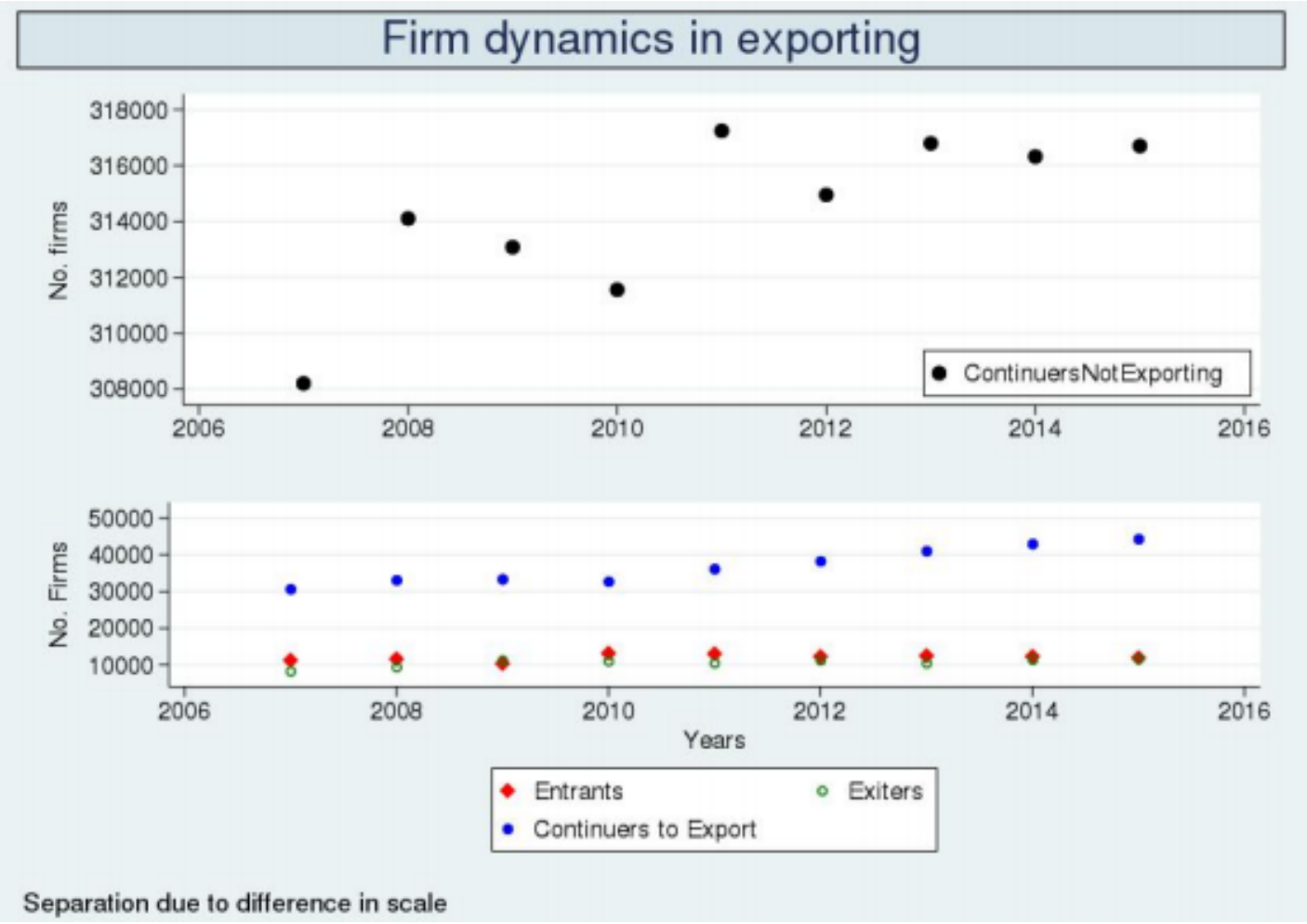
- Both exporter types present the same qualitative behavior;
- Exporter B shows more volatility in the growth rate due to fluctuations around the 5% cut-off threshold



Selection of "Exporter type A" as exporter proxy

Data analysis

Exporter behaviour (3)



- Number of exporters has been increasing;
  - Exporters remain in the market;
  - Total number of firms has seen higher volatility than number of exporter firms.

Methodology

Part I

- Identifying the existence of correlation between productivity and exporting status;
- Estimation of contemporaneous, ex-ante and ex-post export premium.

- Impact of being an exporter both in productivity levels and growth rates

Part II

- Identification of causality;
- Estimation of the impact of several variables in the export decision

- Impact of lagged determinants and isolating productivity variable on the export propensity

Methodology

Employed controls

Variable	Description
	Controls (1) vector – Part I.1 and Part I.2
Sector	2 digit activity code (CAE) dummy
Region	District of firm's headquarters
Firm size category	SME classification according to European framework
Time Dummy	Time dummy for each individual year
	Controls (2) vector – Part II
Size	Log of the absolute size of total assets
Profitability	Net income over shareholder's equity
Leverage	Total liabilities over shareholder's equity
Relative Investment	Change in non-current assets added of depreciation expenses over total assets
Relative market share	Firm's market share relative to sector leader
Market concentration	Herfindahl index for the sector
Market growth rate	Sector internal sales growth rate

Methodology

Part I.1 – Contemporanous exporter premium

Productivity level

1 $$Ln\ LP_{it} = \delta + \beta * Exporter_{it} + \gamma * Controls_{it}^{(1)} + \epsilon_{it}$$

- Impact of being an exporter at *t* on the same period productivity.

Productivity level

2 $$Ln\ LP_{it} = \hat{\alpha}_i + \hat{\alpha}_t + \hat{\gamma} * Controls_{it}^{(2)} + \epsilon_{it}$$

3 $$\alpha_i = \delta + \beta * Exporter_{it} + \epsilon_{it}$$

- Further validate results of previous estimation using FE regression;
- Afterwards, the FE estimate is run on an exporter dummy.

Productivity growth rate

4 $$(Ln\ LP_{it} - Ln\ LP_{it-1}) = \delta + \beta * Exporter_{it} + \gamma * Controls_{it}^{(1)} + \epsilon_i$$

- Impact of being an exporter at *t* on the same period productivity growth rate.

Methodology

Part I.1 – *Ex-ante* exporter premium

Productivity level

5 $$Ln\ LP_{it-z} = \delta + \beta * Exporter_{it} + \gamma * Controls_{it-z}^{(1)} + \epsilon_{it}$$

- Impact of being an exporter at *t* on the past productivity;
- Indicates if future exporter show a productivity premium compared to future non-exporters.

Productivity growth rate

6 $$(Ln\ LP_{it-z} - Ln\ LP_{it-z-1}) = \delta + \beta * Exporter_{i_t} + \gamma * Controls_{it-z}^{(1)} + \epsilon_i$$

- Impact of being an exporter at *t* on the past productivity growth rate;
- Indicates if future exporter show a different productivity growth rate compared to future non-exporters.

Methodology

Part I.2 – *Ex-post* exporter premium

Productivity level

7 $$Ln\ LP_{it+z} = \delta + \beta * Exporter_{it} + \gamma * Controls_{it+z}^{(1)} + \epsilon_{it}$$

- Impact of being an exporter at *t* on the future productivity;
- Indicates if a firm shows a productivity premium after the passage to exporter.

Productivity growth rate

8 $$(Ln\ LP_{it+z+1} - Ln\ LP_{it+z}) = \delta + \beta * Exporter_{i_t} + \gamma * Controls_{it+z}^{(1)} + \epsilon_i$$

- Impact of being an exporter at *t* on the future productivity growth rate;
- Indicates if a firm shows a productivity premium after the passage to exporter in terms of its growth rate.

Logit FE model

9

$$EXP_{it}^{*} = \alpha_i + \alpha_{t-z} + \beta * Ln\ Prod_{it-z} + \gamma * Controls_{it-z}^{(2)} + \epsilon_{it}$$

$$EXP_{it} = 1\ if\ EXp_{it}^{*} > 0;$$

- Binary dependent variable;
- Incidental parameter problem;
- Capture non-observable effects

Results

Part I.1 – Contemporaneous exporter premium

		Dependent variable	Exporter dummy coefficient	Adj. R Squared
Contemporaneous premium	Equation 1	Productivity level	0.551***	0.191
	Equation 3	Firm level FE	0.243***	0.012
	Equation 4	Productivity growth rate	0.0565***	0.0055

*** p<0.01, ** p<0.05, * p<0.1
Results for equation 2 ommited

- Evidence of productivity advantage of exporters;
- Productivity effect is significant even after controlling for a large set of controls (equation 2 and 3);
- Results corroborate literature findings (Wagner (2007)), even regarding the effects of firm size (Cabral and Mata (2003))

Results

Part I.1 – Ex-ante exporter premium

		Dependent variable	Exporter dummy coefficient					Average Adj. R Squared
Ex-ante premium		-	Z=1	Z=2	Z=3	Z=4	Z=5	-
	Equation 5	Productivity level	0.517***	0.493***	0.471***	0.448***	0.429***	Aprox. 0.2
	Equation 6	Productivity growth rate	0.0576***	0.0542***	0.0481***	0.0418***	0.0369***	Aprox. 0.003

*** p<0.01, ** p<0.05, * p<0.1

- Evidence that future exporters are more productive, and have higher productivity growth rates than future non-exporters;
- Effect felt even with large temporal distance to exporting event (maximum 5 periods lag);
- Results qualitatively corroborate literature findings, while our specification is not focused only in one period.

Results

Part I.2 – Ex-post exporter premium

		Dependent variable	Exporter dummy coefficient					Average Adj. R Squared
Ex-post premium		-	Z=1	Z=2	Z=3	Z=4	Z=5	-
	Equation 7	Productivity level	0.493***	0.460***	0.438***	0.428***	0.420***	Aprox. 0.2
	Equation 8	Productivity growth rate	-0.0296***	-0.1007***	-0.00494***	0.00211	-5.01e-05	Aprox. 0.006

*** p<0.01, ** p<0.05, * p<0.1

- Evidence that future productivity levels of exporters are higher than non-exporters;
- As several authors, we find that future productivity growth rate are lower for exporters compared to non-exporters, and as lags increase this turns insignificant.

Results

Part II – Exporter determinants (1)

Equation 9	Exporter dummy coefficient		
Variable	**Z=1**	**Z=3**	**Z=5**
Firm labour productivity	0.246***	0.0463***	0.0325*
Firm absolute size	0.453***	0.229***	0.0656***
Firm return on equity	2.16e-05	2.66e-05	2.83e-05
Debt on shareholder equity ratio	5.64e-06	-1.84e-05	6.90e-06
Relative investment	0.149***	0.0513*	0.0150
Firm relative output in sector	1.915***	1.323***	0.512
Sector concentration	0.619***	-0.0473	0.304
GR of sector internal sales	-000297	0.00190	0.00336

**** p<0.01, ** p<0.05, * p<0.1*

Policy implications

Increase extensive margin

Focus on firm productivity

Increase firm absolute and/or relative size

Improve investment conditions

Conclusions (1)

Self selection

Evidence for the impact of productivity on export propensity

Findings in line with the literature

Learning by exporting

Lack of evidence of higher productivity growth rate after exporting

Lack of effects and negative estimates are in line with the literature

Conclusions (2)

01 Are exporters more productive that non-exporters?

- Evidence of higher productivity of exporters;
- Productivity advantage felt contemporaneously, ex-ante and ex-post (in level) the passage to exporting

Conclusions (3)

02 What are relevant variables for the decision to export?

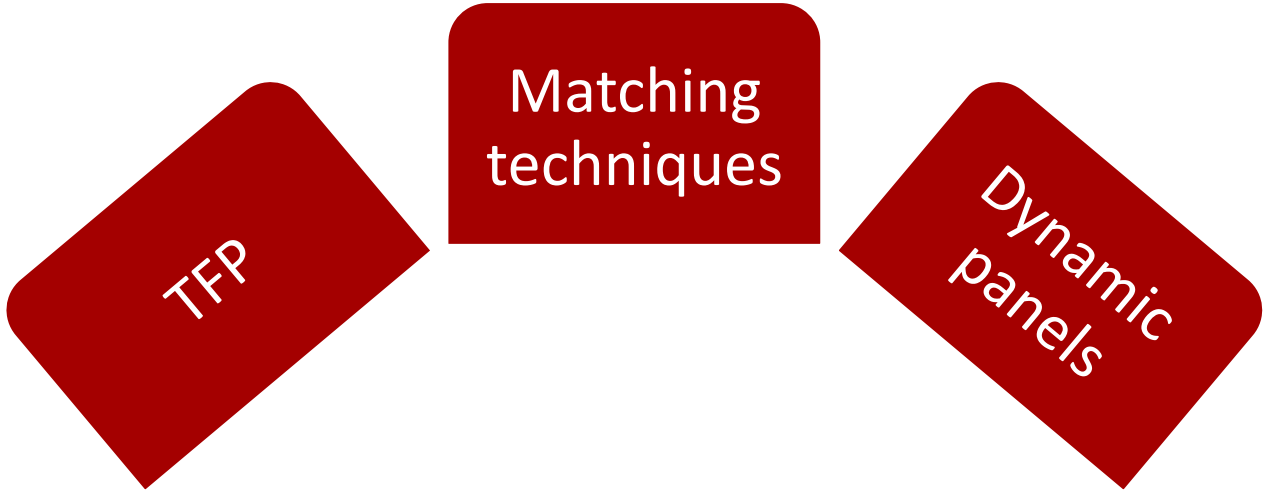
- Labour productivity and firm absolute size show positive impact even in the long term;
- Firm relative investment and relative market share show only impact for certain periods;
- Sector concentration evidences only impact on the short-term before exporting start;
- Firm leverage, profitability and sector internal sales growth rate do not show evidence of impact the export decision.

Conclusions (4)

Use of labour productivity

Use of homogeneised data – lack of detailed P&L lines

Limitations



Future avenues

Post-project conclusions

01 Different appetite for internationalization for “Born global” firms & Startups

02 Financial incentives impact on export propensity

03 Investment in fixed capital and export propensity

Thank you for your attention!

Question & Answers | Discussion period

Back-up slides

Back-up index

Back-up slides

Data analysis - Sectorial behaviour

CAE as sector proxy

Near 99% of firms derive their income from their main CAE

- Indicates that CAE is a good measure for infering the activity sector of the firm.

Concentration measure

This representability allows for the calculation of sector concentration

- Herfindahl índex (H-índex) calculate as the sum of squared market shares of firms operating in the two digit CAE

Main patterns:

- 98 total sectors (at 2 digit CAE);
- Oil&Gas extraction sector does not have observations for all time periods;
- Remaining sectors present at least eleven observations; and
- Different concentration patterns per sector.

Back-up slides

Data analysis - Firm size

Firm size

Absolute size
(total assets)

Relative size
(Market share on leader's market share)

Firm size category
(classification based on EU SME classification)

Used simultaneous – broader heterogeneity control

Used isolated – basic size control variable

Back-up slides

Data analysis - Firm investment (1)

Firm investment

Recognized as an important variable in the export decision

Proxys

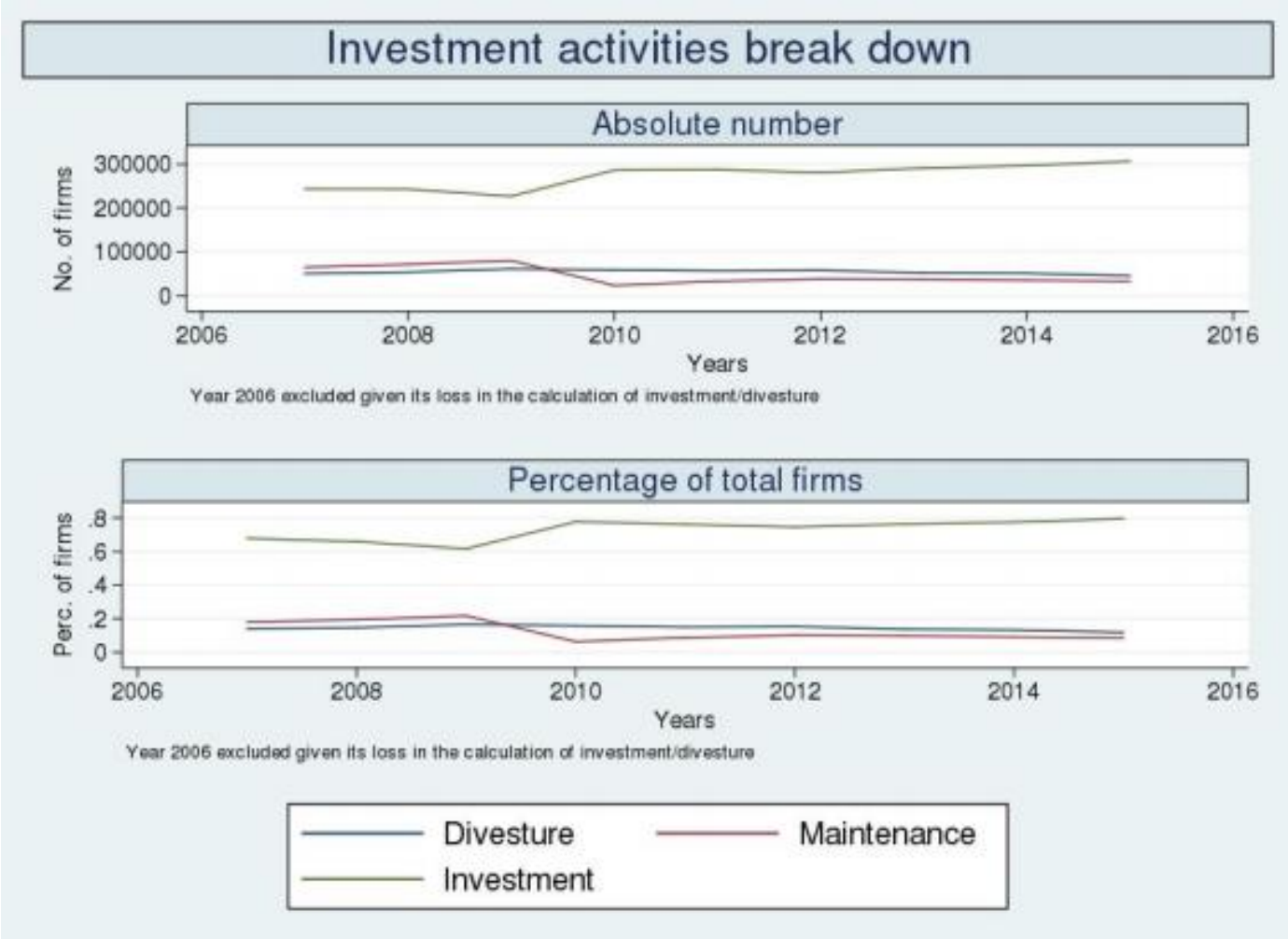
Fixed capital
(Non current assets plus depreciations and amortizations)

R&D
(R&D staff percentage in total employment)

Statistic	Fixed Capital Investment	R&D Investment
mean	85,500	0.1%
sd	17,720,922	0.0%
min	-6,531,892,736	0.0%
p25	0	0.0%
p50	325	0.0%
p75	9,361	0.0%
max	20,015,187,968	530.0%

Firm investment behaviour

- Given the truncation and concentration of R&D staff proportion, fixed capital investment was preferred;
- 2009 saw an increase in the total and relative number of firms investing in opposition to divesting firms



Controls	Author
Productivity	Melitz (2003)
Firm size	Blum et al. (2013)
Profitability	Lee et al. (2009)
Relative investment	Alvarez and López (2005)
Relative size in sector	Lee et al. (2009)
Market concentration	Lee et al. (2009)
Market internal growth rate	Blum et al. (2013)

Thank you for your attention!

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