The Growth and Volatility of French Exporters

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Motivations

Importance of firms' heterogeneity in international trade

- Cross-sectional distribution of exporters' size :
  - Sales and exports are extremely concentrated among a limited number of very large firms
  - Large number of small exporters ship one or few goods to a neighboring destination (EKK, 2004)

- Dynamics : entry/exit
  - New exporters are small and have low rate of survival (Eaton et al. 2007 ; Freund and Pierola, 2010)
  - Surviving exporters grow faster (Eaton et al., 2007), especially on their first market (Albornoz et al, 2012)

Motivations

Experience (or "age") and size are central variables in the modeling of firm dynamics in domestic and foreign markets (Arkolakis, 2011 ; Luttmer, 2007)

- With Markov process, current size is a good prediction of future size (Hopenhayn, 1992)
- Learning emphasizes the role of age (Jovanovic, 1982)

Knowing whether age / size (or both) matter w.r.t. firms growth is a theoretical question that requires empirical investigation

Objective of the paper

- Provide new empirical evidence regarding the determinants of firms dynamics in the export market
- Combined effect of age and size on exports growth
- Address several important statistical issues
- Focus on (1) survival (2) net growth conditional on survival (3) gross contributions of the intensive and extensive margins (volatility/churning)

How do we address this question ?

- Methodology borrows from IO literature (Dunne et al. 1989 ; Davis and Haltiwanger 1992 among others)
- Detailed trade data at firm/product/destination
- Non-parametric estimations using export experience (age) and total exports value (size) as explanatory variables

Statistical issues :

- Bias in measurement of growth rate in years of entry/exit
- Average size vs initial size $\Rightarrow$ regression to the mean effects

Preview of the main results

- **The net growth of exports for surv. firms is decreasing with firm experience in foreign markets**
  $\Rightarrow$ Confirms previous findings but high growth rate in first year is considerably reduced once growth rate in 2nd year is properly measured
- **No relationship between net growth of surv. firms and average size when controlling for export experience**
  $\Rightarrow$ Gibrat's law holds for export activity
- **Churning (gross contributions of entry and exit) decreases with both average size and export experience**
  $\Rightarrow$ Young and small exporters have more volatile trade relationships

Road Map

- Methodology to compute growth rate of firm-level exports
- Presentation of the French data (firm-destination-product)
- Econometric strategy taking into account age and size of exporters
- Presentation of the main results for age/size of exporters in relation with net exports growth
- Additional results using gross export margins as dependent variable
- Concluding remarks

I. Methodology and data

Firm-level exports data

Monthly individual French exports 1994-2008 (French Customs).

- About 100,000 individual firms export in a given year
- of which 20,000 new exporters each year
- Monthly exports value by firm-destination-product(HS6)

Experience of exporters :

- Define 7 age-class of exporters (experience), 1-6 years for new exporters, 7+ for mature ones
- Firm considered as 'new' exporter if it did not export in the past 7 years (data start in 1994, and the first cohort is 2001)
- Re-entry is not allowed : one spell per firm
- Mature exporters have more than 6 consecutive years of experience

Methodology : growth rate

Net growth of exports at firm level from individual export flows (x_{ijkt}) : firm i, country j, product k, year t

$$G_{it} = \sum_{jk} \omega_{ijkt} \times g_{ijkt}$$

$$g_{ijkt} = \frac{x_{ijkt} - x_{ijkt-1}}{\frac{1}{2}\left(x_{ijkt} + x_{ijkt-1}\right)}$$

$$\omega_{ijkt} = \frac{x_{ijkt} + x_{ijkt-1}}{\sum_{jk} x_{ijkt} + \sum_{jk} x_{ijkt-1}}$$

$\Rightarrow$ Accounts for possibility of entry and exit ;
$\Rightarrow$ Good approximation of the log first difference around zero ;
$\Rightarrow$ bounded between the values of entry and exit, 2 and -2.

Methodology : growth rate

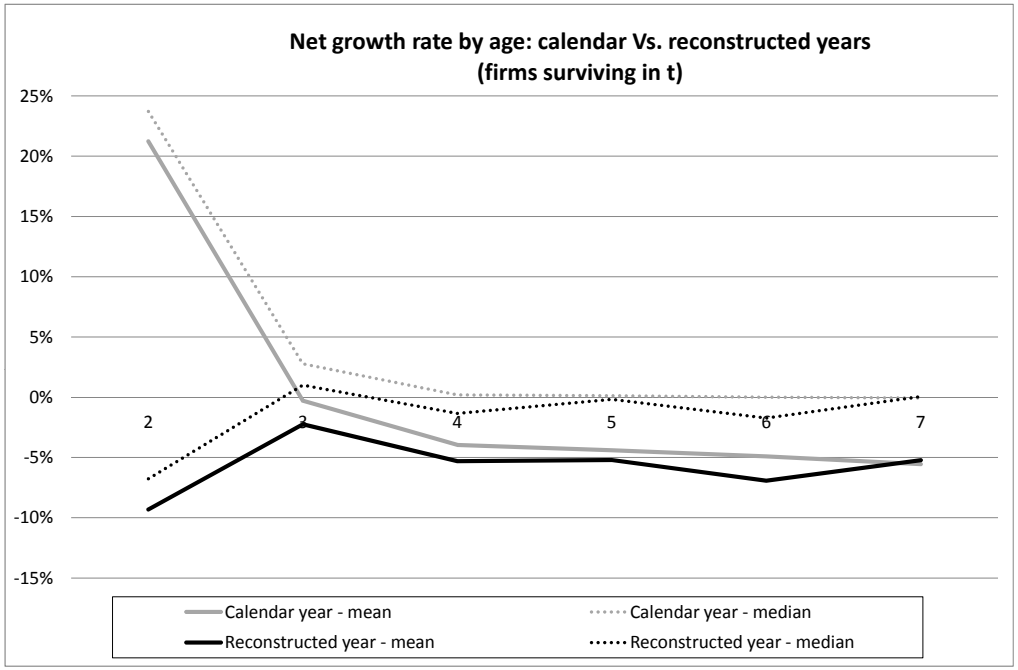
- Contributions of intensive/extensive margins :

$$G_{it} = G_t^I + G_{it}^{E+} + G_{it}^{E-} \text{ where } \begin{cases} G_{it}^{E+} = \sum_{jk} \omega_{ijkt}^s \times g_{ijkt} & \text{if } g_{ijkt} = 2 \\ G_{it}^{E-} = \sum_{jk} \omega_{ijkt}^s \times g_{ijkt} & \text{if } g_{ijkt} = -2 \\ G_{it}^{I} = \sum_{jk} \omega_{ijkt}^s \times g_{ijkt} & \text{otherwise,} \end{cases} \quad (1)$$

- Can be refined with respective contributions of products, destinations, or both (in paper)

Methodology : growth rate in 1st year

Important bias due to the 1st year of entry using calendar years



Methodology : firm size

Size of exporters :

- Estimations subject to regression to the mean effects when using base year in t-1 to measure exporter's size
- Total exports averaged over $t-1$ and t to mitigate this bias
  - Correction similar to more sophisticated dynamic methodology developed by the US Bureau of Labor Statistics (Davies et al., 1996 ; Haltiwanger et al., 2010).
- Compare results based on alternative definitions (initial vs average size).

II. Econometric analysis

Econometric strategy

Estimation methodology

Non parametric methodology :

$$G_{it} = \sum_{m=1}^{6} \beta_m age_{mit} + \sum_{n=1}^{9} \beta_n size_{nit} + \gamma_k + \gamma_t + \epsilon_{ijkt}$$

- firm size classes n : deciles of firm size
- age classes m : 1-6 and 7+
- Reference categories :
  - age $\Rightarrow$ mature exporters (age = 7+)
  - size $\Rightarrow$ large exporters (10th decile)
- industry (HS2) fixed effects
- year fixed effects.

Reporting of estimation results

Predicted growth of firms' exports computed using the estimated coefficient for each category (n or m) and the average growth of the reference category (age >= 7 or size = 10)

$$\widehat{G}_{it}(Size = n) = \overline{G}_{it}(Size = 10) + \hat{\beta}_n$$

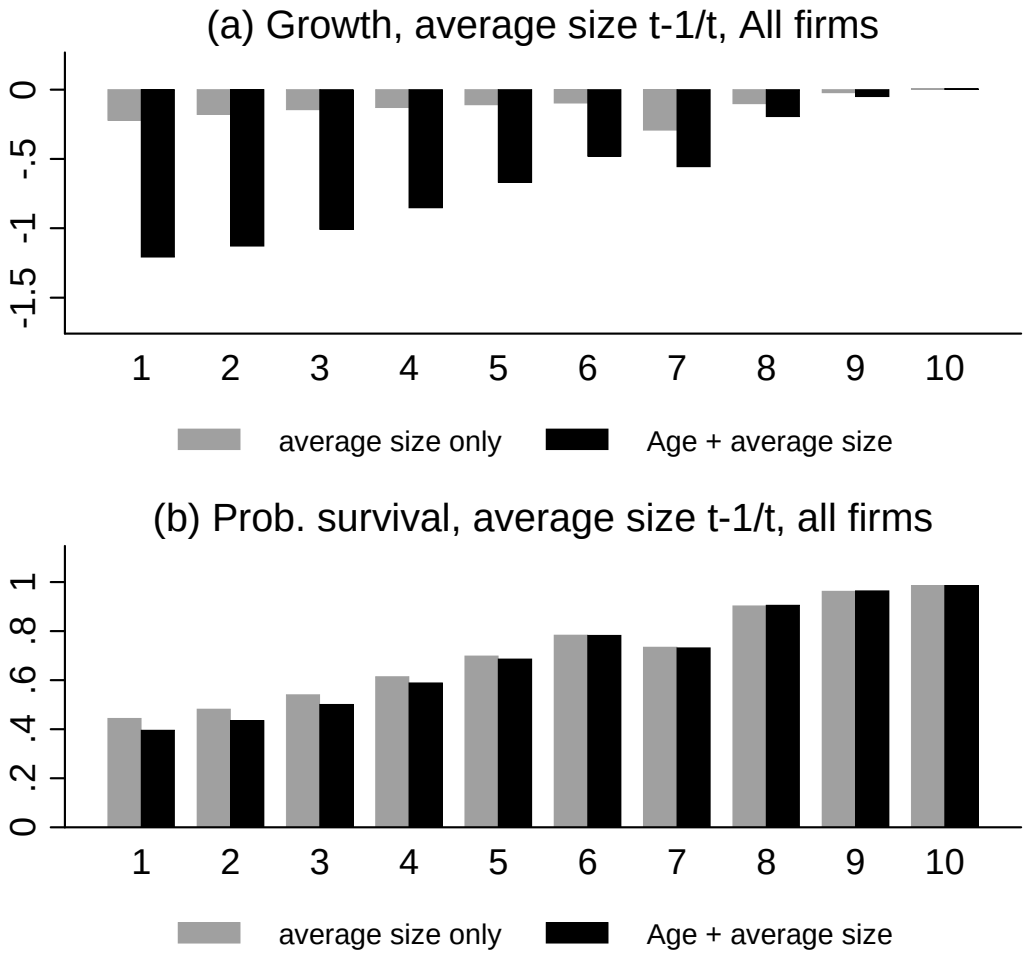
$$\widehat{G}_{it}(Age = m) = \overline{G}_{it}(Age >= 7) + \hat{\alpha}_m$$

$\Rightarrow$ Results are summarized in graphs

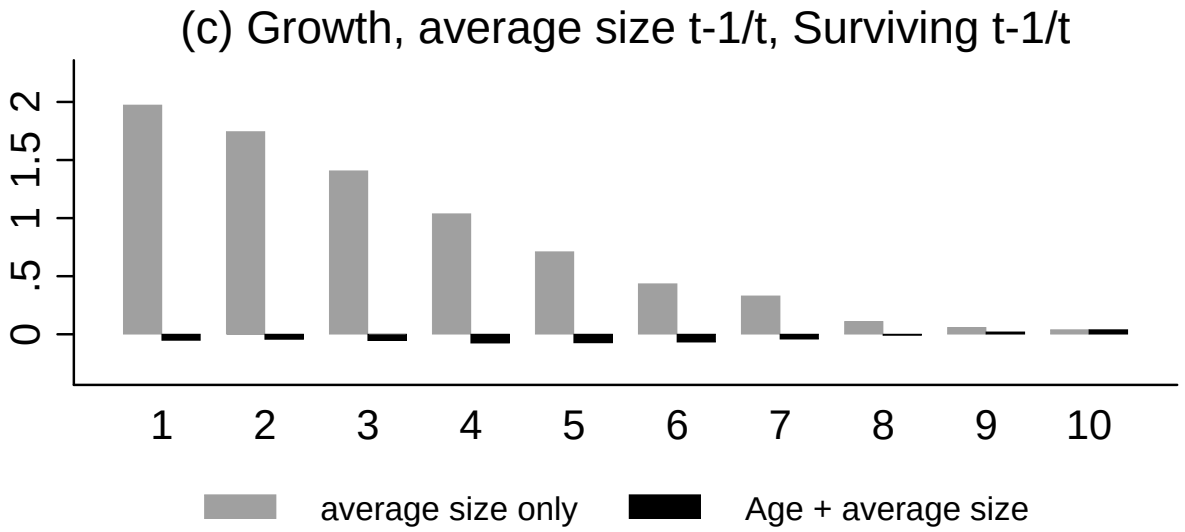
II. Econometric analysis

Net growth of exports

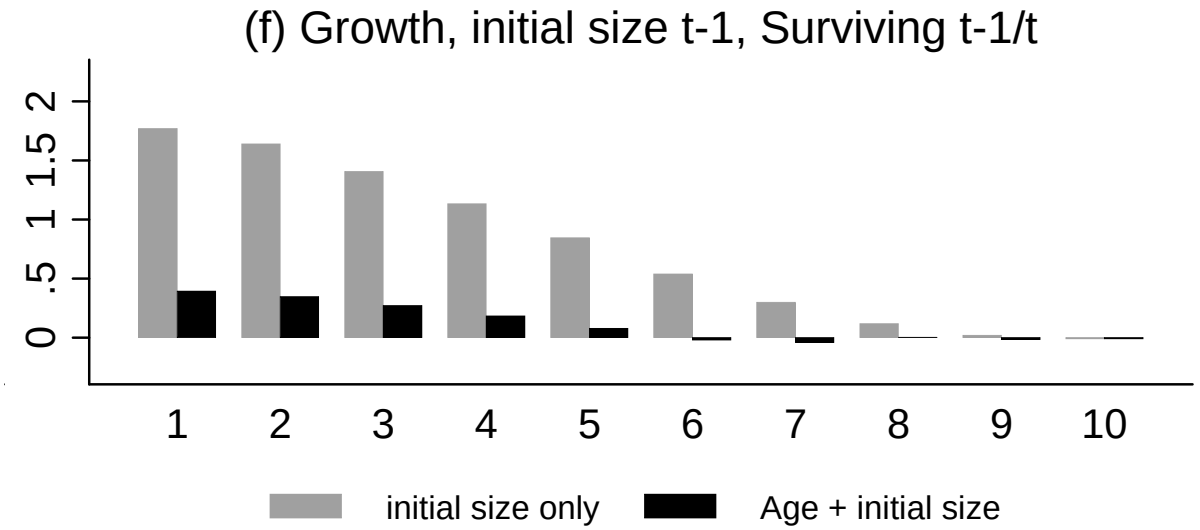
Average size and net growth of exports



Average size and net growth of exports



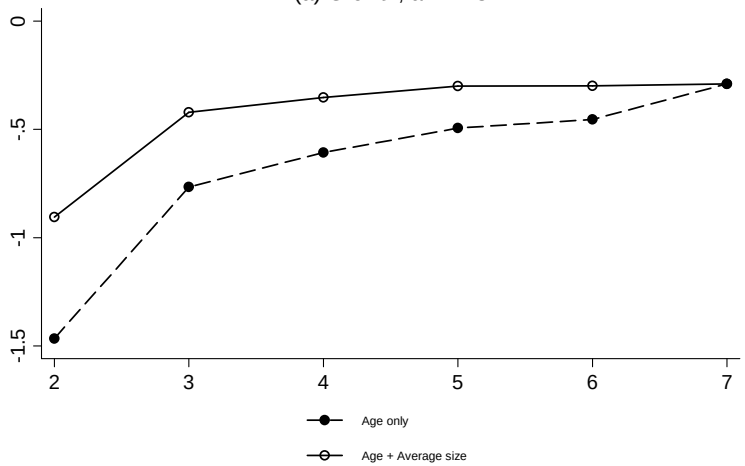
initial size and net growth of exports



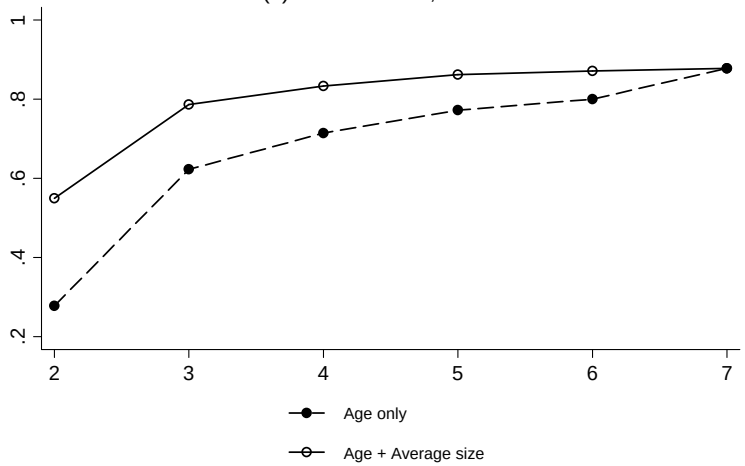
$\Rightarrow$ Growth decreases with initial size due to regression to the mean effects

Export experience and net growth of exports

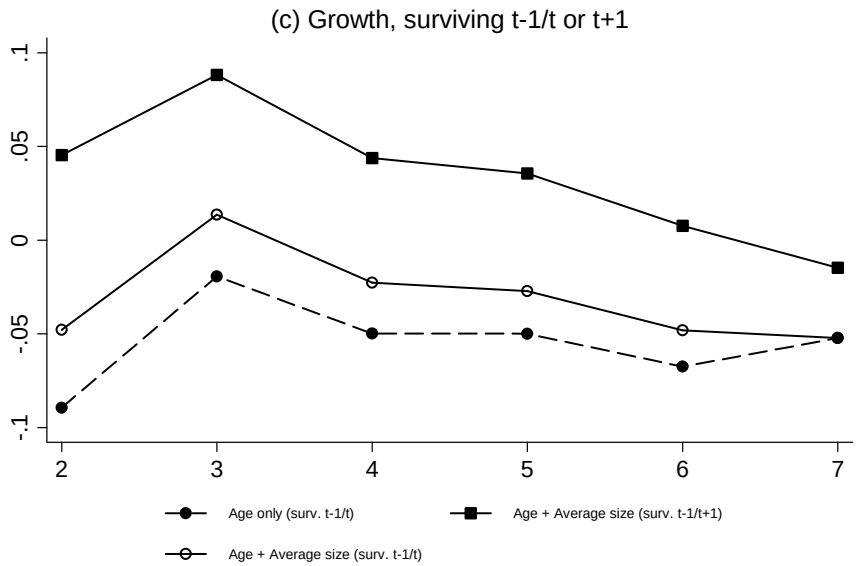
(a) Growth, all firms



(b) Prob. survival, all firms



Export experience and net growth of exports



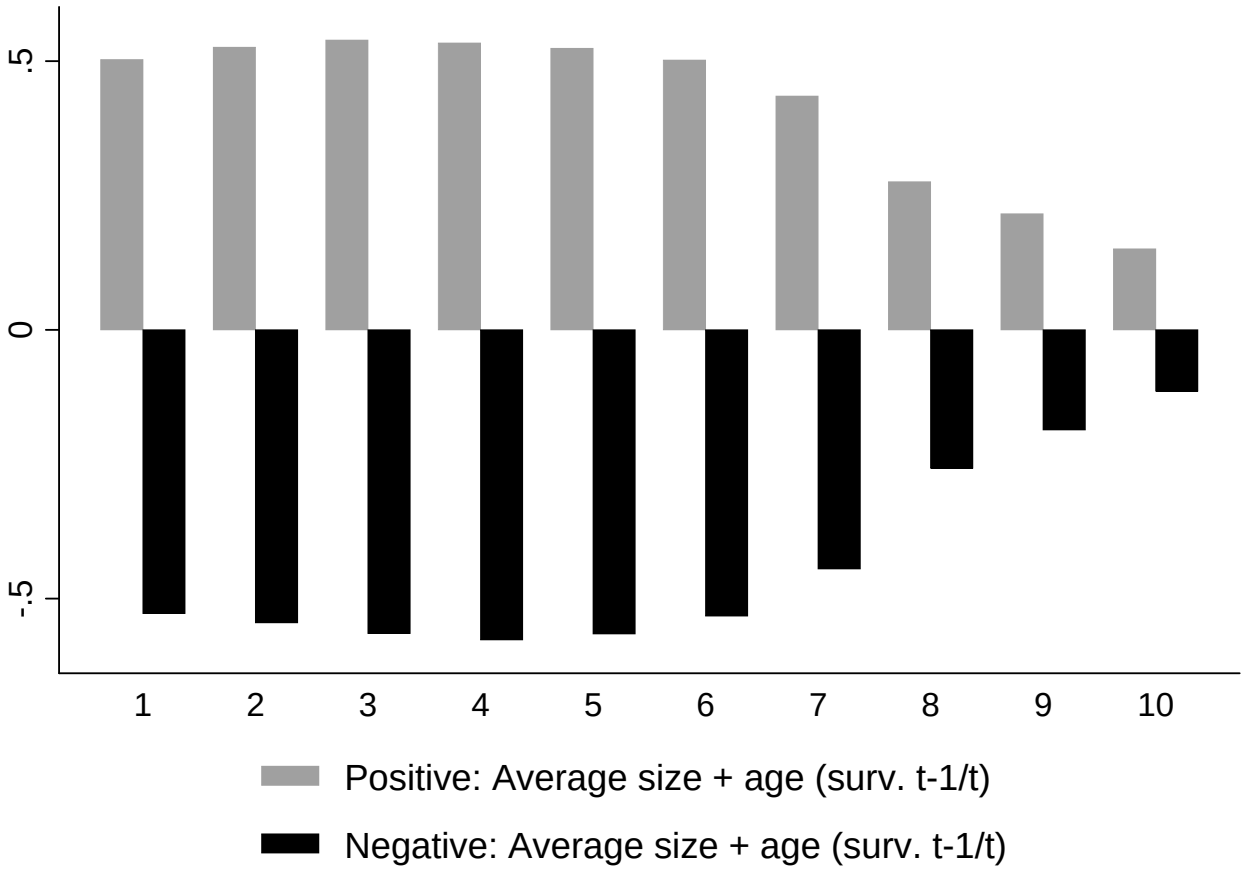
Summary of findings

- Rate of survival is increasing with experience in foreign market and exporter size
- No relation between exporter size and net growth of surviving firms if the estimation controls for the age
  $\Rightarrow$ Gibrat's law holds in the export market
- Net growth of surviving exporters decreasing with export experience

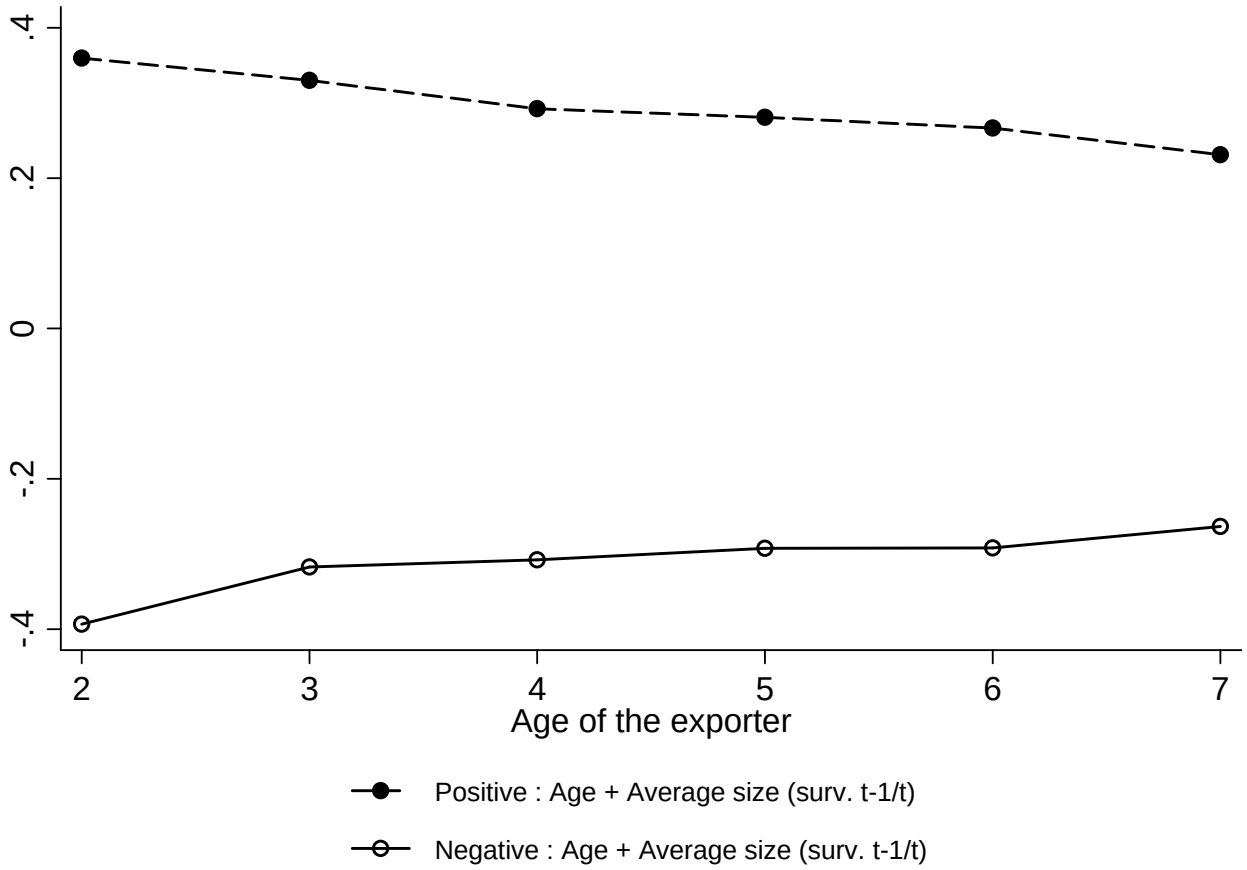
II. Econometric analysis

Gross exports margins (churning) conditional on survival

Average size and the **gross margins** of firm-level exports



Experience and the **gross margins** of firm-level exports



III. Summary of findings and concluding remarks

Summary and conclusions

Empirical evidence that experience matters for exporters' net growth, controlling for their size :

- survival rate increases with age, although less when controlling for average size
- Net growth conditional on survival is negatively related to experience
- Consistent with the existence of learning in export activity

Gibrat's law verified in the export market when considering net growth of surviving exporters

Summary and conclusions

Volatility in foreign markets is decreasing with size (and to a lower extent with age)

- Large exporters have more stable trade relationships, conditional on survival
- To a lower extent, mature exporters have also more stable trade relationships
  $\Rightarrow$ also consistent with learning/matching stories