



# Learning by Exporting

Are we telling the correct story?

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## The problem of analyzing the LBE hypothesis?

- Observing a positive association between firm level productivity and export participation does not necessarily mean that LBE is taking place.
  - The positive correlation may be driven by self-selection of more productive firms into export markets.
  - Entry often comes at an extra cost (marketing, networking, licensing, administrative barriers etc.), which the more productive/capable firms are most likely to cope with.
  - Moreover, since export markets are more competitive than domestic markets, it may also be harder for less productive firms to enter in the first place.
- It should also be noted that LBE and self-selection are not mutually exclusive, and higher efficiency producers entering foreign markets may also improve productivity even faster than domestic firms post entry.



## How do we learn from exporting?

- Borrowing terminology from the literature on technology diffusion.
- Learning-by-exporting (LBE) effects may come from:
  - (i) knowledge flows from competitors (horizontal spillover effects)
  - (ii) knowledge flows from customers (vertical spillover effect).
- The competition effect (**horizontal spillover**) comes directly from entering international markets (observing best practice and competition).
  - Exporters must improve efficiency faster than firms only selling domestically to survive in foreign markets.
- The **vertical spillover** effect occurs as foreign buyers may wish to improve process technology by providing product specifications and technical assistance.
  - Clerides *et al.* (1998): Foreign customers may even transmit knowledge from other suppliers in order to increase competitive pressure and lower costs/improve quality.



## The learning by exporting problem

- **Learning process**
  - Decision to export complicated by sunk start-up costs (research foreign demand and competition, establish marketing channels, and adjust their product characteristics and packaging to meet foreign tastes).
- **Main LBE question in most literature:** How does the decision to export affect the productivity trajectories of exporters and plants that switch markets, relative to those of non-exporters?
  - Test whether exporting history, enters significantly in a standard cost equation. In other words, they perform a type of Granger causality test - using a "standard" GMM approach.
- But what if we observe very limited amount of switchers – That is that most exporters can be defined as **Born Globals?**



## Literature review

- The LBE hypothesis: Very different conclusions depending on region analyzed.
- Clerides et al. (QJE, 1998) main result: More efficient firms **self-select** to become exporters but do not experience any efficiency gains as a result of being exporters. (Latin America).
- In contrast several authors find evidence of **learning-by-exporting** in Africa using comparable empirical approaches.
- In an Asian context there is evidence for learning-by-exporting (Aw et al, 2008) but that efficient learning is dependent on firms in-house R&D capabilities/investments.
- Methods more or less identical: **But data quality/size seems to be correlated with main results obtained.**



## Problems identified in the Mozambican case

- Variation in export participation: Very limited in several SSA cases (ICA data)
  - Example Zimbabwe: Identification based on four switchers.
  - Mozambique (this paper): Very few exporters and only one firm changed export status between 1999 and 2006. New data from 2012 do change this conclusion dramatically.
- Reason for few switchers? Qualitative work suggests that firms in Africa are often **Born Globals** (management literature) – start-up as exporters (LLC) and if unsuccessful they close.
- BUT they are generally not owned by inexperienced entrepreneurs. Firms are just created as LLC – effect of differences in legal requirements for setting up export entities?
  - **How should we define exporter experience?**



## Mozambique paper

- Try to disentangle the Learning-By-Exporting (LBE) hypothesis in the Mozambican context and in the presence of the Born-Global phenomenon among exporters.
- We suggest to solve the endogeneity problem introduced by self-selection by combining a generalized Blinder-Oaxaca approach with results from traditional matching techniques.
- The BO method essentially identifies two components of the unconditional labor productivity gap, i.e., the difference between labor productivity of firms exporting and of firms not exporting, respectively.
  - The first component of the decomposition measures the importance of differences in observable characteristics between exporters and non-exporters (“**characteristics effect**”).
  - The second component measures the importance of differences in parameters for the two groups. This captures the variation in the returns to the characteristics between exporters and non-exporters. (“**coefficient effect**” or the unexplained component).



## Data

- Combines five different enterprise surveys (containing information for the years 1999 to 2006) with the INE enterprise census (CEMPRE), which has 2002 as the base year.
  - Using firm names and addresses, we were able to combine the data sources.
  - All firms included in the data have been observed at least twice during the period 1999 to 2006 in order to check the consistency of time-invariant characteristics over time.
  - Financial data was also checked against information obtained from the Mozambican branch of KPMG.
- Final data: 755 observations for 275 firms.
- Compared to recent the quantitative and qualitative IIM data (DNEAP, 2013) covering 761 firms.



# What type of firms export



## Empirical framework

$$(1) \quad Y_{i,t} = A_{it} K_{it}^{\beta_K} N_{it}^{\beta_N} M_{it}^{\beta_M} \Rightarrow \left( \frac{Y}{N} \right)_{i,t} = A_{it} \left( \frac{K}{N} \right)_{it}^{\beta_K} N_{it}^{\beta_K + \beta_N + \beta_M - 1} \left( \frac{M}{N} \right)_{it}^{\beta_M}$$

Formulated in logarithms and using a difference specification leads to (noting that and assuming that changes in the independent variables are uncorrelated with production output levels in all periods

$$(2) \quad \Delta y_{i,t} = \beta_n \Delta n_{i,t} + \beta_K \Delta k_{i,t} + \beta_M \Delta m_{i,t} + \Delta a_{i,t} + \Delta \eta_{i,t}$$

In the absence of sufficient variation on export status we assume that changes in TFP are dependent on export participation (thereby implicitly assuming that export participation is uncorrelated with the error when controlling for changes in inputs). We also allow for observed heterogeneity in TFP.

$$(3) \quad \Delta a_{i,t} = \delta exp_i + c_{i,t}$$

$$(4) \quad \Delta y_{i,t} = \beta_n \Delta n_{i,t} + \beta_K \Delta k_{i,t} + \beta_M \Delta m_{i,t} + \delta exp_i + c_{i,t} + \Delta \eta_{i,t}$$



## Methodological approach

- Combine the Blinder-Oaxaca (BO) approach (suggested by Aw and Hwang, 1995) with the recent literature using matching techniques (see Wagner, 2007 for a survey) to disentangle the LBE hypothesis.
  - Note that the regression based BO estimator of counterfactual means constitutes a propensity score reweighting estimator based upon a linear model for the conditional odds of being treated.
- Kline (AER, 2009): the BO estimator enjoys the status of a double robust estimator of counterfactuals, as estimation is consistent if either the propensity score assumption or the model for outcomes is correct.
  - The BO estimator may be particularly relevant for these data, as the estimator is convenient in settings where **few treated observations** are available, as estimation requires only that collinearity problems be absent among the controls.



## Results (1)

- The manufacturing sector is currently finding it difficult to keep up with the growth pace of the rest of the Mozambican economy.
- **It remains relatively small**
  - Employs fewer than 3 percent of the labor force
- **Diversification low** (even when defined at the 3-digit ISIC sector level)
  - Production is highly concentrated in a few sectors.
- **Almost no net-entry over a ten year period** (from a low base)
  - Recent estimates (comparing enterprise Census data from 2002 with local province firm records from 2012) reveal that the number of manufacturing firms has only increased modestly.
- **Very few exporters:** Very few manufacturing firms have entered foreign markets, even though exporters seem to “learn” from exporting.
  - Same (low) amount of exporters in 2012 as in 2002. And the Born Global phenomenon persistent.



## Results (2)

- Focus on labor productivity growth.
- 14 per cent unconditional exporter premium
- **20 per cent conditional exporter premium**
  - Negative "characteristics" effect (not well-determined)
- Firm size \* export status interaction significantly negative
  - However, the negative learning effects only start to kick in at a relatively high threshold level of approximately 1,000 employees.

### A: Only Differences

	Simple	OLS	NN	BO
Effect	0.139*	0.185***	0.147*	0.208***
t-stat	(1.84)	(3.30)	(1.85)	(3.21)

### B: Including Levels

	Simple	OLS	NN	BO
Effect	0.139*	0.196***	0.216***	0.216***
t-stat	(1.84)	(3.02)	(2.80)	(2.86)

Note: See Tables 5 for details on the OLS and BO. NN refers to the average treatment effect of the treated (ATT) using bias corrected nearest neighbour matching (4 matches per observation). t-values (reported in parenthesis) are heteroskedasticity robust. \*, \*\*, \*\*\* indicate significance at a 10 percent, 5 percent and 1 percent level, respectively. Estimations done using the nnmatch command in Stata (Abadie et al., 2004).



## Mozambique conclusion

- Very few manufacturing firms export, and export participation is highly persistent. (AFRICA)
- There is evidence supporting the learning-by-exporting (LBE) hypothesis. Results suggest a significant export premium of around 20 percent, controlling for differences in observable characteristics between exporters and non-exporters.
- Qualitative information on exporters suggest that firms are Born Globals, but that the owners and managers are not Born Globals
  - Can we analyze the LBE at the firm level or should it be done at the entrepreneurial level?
- Qualitative information on non-exporters seeking new markets suggests that "lack of knowledge of potential markets" is the most serious constraint for international market entry.

