

Notes on *Exporting and Performance: evidence from Chilean plants (Alvarez and Lopez, 2005)*

I. PRELIMINARIES: Why are exporting firms more productive? Three reasons have been proposed, and this paper tests all of them, using data from Chilean firms.

A. Self-selection hypothesis: Firms that are more productive are better equipped to enter export markets when trade is liberalized, so only those firms that are very productive become exporters. The evidence for this hypothesis helps to answer the question, “Do good firms (and only good firms) become exporters?”

B. Conscious self-selection hypothesis: Firms are begun with a decision already made as to whether the owners want to export or only sell domestically; if the owners of the firm want to export, they produce more right away in order that they may be able to compete internationally. The evidence for this hypothesis helps to answer the question, “Are export markets an incentive to increase productivity?”

C. Learning by exporting: Information diffuses from clients abroad to exporting firms, which means that exporting itself increases productivity. The evidence for this hypothesis helps to answer the question, “Does export participation increase productivity?”

D. The questions answered by testing the theories against the empirical evidence have important policy implications, especially for developing countries—if exporting is associated (for whatever reason) with high productivity, governments in poor countries should work to boost access to world markets for their country’s firms.

II. THE DATA

A. Alvarez and Lopez used data collected by the Annual National Industrial Survey, which examines virtually all Chilean manufactories down to as few as 10 employees; the plants are individually followed from year to year, not just in the aggregated, so the data of specific plants and groups of plants can be compared over the period of the study, which used the data from 1990 and 1996. Note that the units of analysis here are plants, *not* firms, so every plant is not necessarily a firm.

The study examines levels of production, value added at production, total sales, employment, and wages. Roughly 20% of the 5,000 plants surveyed were exporters, with 13.5% of those foreign-owned.

B. Some early evidence: Exporters proved their economic value in the study in the following respects (based on 1996 values):

- 1) Accounted for 50% of total industrial employment
- 2) Share of value added stood at 63% of the total;
- 3) Share of capital stock stood at 73% of the total.

Additionally, even after some further controls for variation, the study determined that exporters had a 19% advantage in productivity in terms of total factor productivity (TFP), adding to the argument that exporters are more efficient than non-exporters. Part of this is due to the capital-intensity of their production—one of the reasons we already know makes exporters more official than non-exporters—with exporters in this data set having 60% greater capital per worker than non-exporters.

C. Testing the hypotheses: Alvarez and Lopez examined TFP with an equation that related TFP to time the plant had been exporting, sector of the industrial firm, and the year. Plants are delineated by the following categories:

- 1) Entrants-stay: plants that exported from the start of the period under examination (1990) all the way until the end (1996)
- 2) Entrants-exit: plants that exported in 1990, but had exited by 1996
- 3) Quitters: plants that exported at the beginning, but stopped before 1990.

The entrants-stay performed the best out of all the plants over the whole time period, suggesting that exporters achieve greater levels of TFP than non-exporters, and that firms staying in the market as exporters were more productive even *before* they entered the export market.

III. SELF-SELECTION

A. A. and L. investigated how initial plant performance affected the probability of beginning to export in subsequent years. They estimated an equation that gave probability of exporting in the next year as a function of non-exporting plants' TFP, size, foreign ownership, spending on foreign licenses, ratio of skilled to total labor, and plant age at time $t - 1$ (as we want to see if they export at time t). The dummy variable for spending on foreign licenses is used as a proxy for technological innovation, as one assumes that if a plant is spending on foreign assistance some technological changes must be informing the way that plant works.

B. Results: plants that are initially larger, younger, more productive, foreign-owned, have a higher share of skilled labor, and spend on foreign licenses are more likely to enter export markets. It does seem to be the case that good firms become exporters.

C. This seems to back up the self-selection hypothesis, since it is those firms that perform well initially are likely to become exporters. The fact that firms that are highly productive and competitive domestically do well internationally too doesn't really tell us anything new. However, this gets interesting given the fact that the younger plants are actually *more* likely to be exporters (rather than older, more "experienced" ones, which could be an asset were self-selection not a conscious decision), suggesting that exporters start out with competition in international markets as an explicit goal, could be good evidence for...

IV. CONSCIOUS SELF-SELECTION

A. First, a quick clarification of the difference between self-selection and conscious self-selection. Undoubtedly, firms that are better producers go on to become exporters, as we've seen above. However, part of the reason for this may be the fact that those firms *want* to export from the very start, so their owners will invest more and make them more productive to achieve this goal; these firms enter the market with the explicit desire to become exporters. A good analogy for this is the fact that students with high GPAs often go to graduate school. Obviously, graduate programs like smart students who put a lot of effort into school; that's self-selection. However, students who know they want to go to graduate school will put more effort into their undergrad classes, and consequently get higher grades, than the students for whom grad school is not necessarily a goal. That's conscious self-selection. In other words, exporters are not simply a lucky selection of the best firms; rather firms try to be competitive because they want to export.

B. Anyway, to test this, Alvarez and Lopez start with the assumption that plants planning to transition from domestic production to export production will invest more initially—for the purposes of 1) producing higher-quality goods that will be competitive internationally and/or 2) lowering production costs so that the sunk costs associated with exporting will be manageable. They estimate the equation described in part (III) again, this time including initial investment. They find that that a 1% increase in initial investment yields a 0.2% higher probability of later exportation. They also included an investment variable with a two-year lag, since exporting often requires a series of investments, not just a high start-up cost in one period. A 1% increase in this variable yields a 0.1% increase in the probability that the plant will export later.

C. Policy implications: These findings do seem to demonstrate that the international market is a good incentive for firms to be competitive, and better access to export markets may be a good source of productivity growth for firms in developing countries. However, since Alvarez and Lopez can't read the minds of all Chilean entrepreneurs, we can't absolutely prove that self-selection for exporting is a conscious decision, and it is impossible to rule out that firms that produce high-quality goods with low-cost production strategies do well domestically and are able to transfer that success to export markets.

IV. LEARNING BY EXPORTING

A. Learning by exporting, again, suggests that firms improve productivity through exporting by obtaining new knowledge and technologies through their trade. To examine the effects of trade on productivity through the study period, Alvarez and Lopez controlled for those firms that exported before the period and continued throughout, those who initially exported and stopped, those that entered at the beginning of the period of 1990-1996, those who alternated between exporting and not, and those who did not export at all. Furthermore, they controlled for plant size, capital intensity, and age of the plant as older plants use less efficient technologies. The researchers also examined the gains of those who entered early in the period, from 1990-1993, compared to those who entered in 1994-1996 to see the differences in productivity based on entry time.

B. Results: the results showed that exporters have higher levels of productivity than non-exporters in nearly all circumstances. However, once plant size, age, and capital investment are controlled for, the advantages in productivity are far lower, showing that most of the gains had to do with initial productivity advantages rather than learned ones. What the data demonstrated was thus a weak amount of gains from learning-by-exporting, and the gains that were present were concentrated in the short term, i.e., immediately after exporting began but not long thereafter. One reason for this could be that the exporting firms that do learn by exporting diffuse the knowledge and technologies throughout the industry to non-exporting firms, and in doing so diminish the advantages they would otherwise acquire.

V. CONCLUSIONS

A. Exporters are more productive than non-exporters

B. Learning by exporting seems to be a short-term and not a continuing phenomenon.

C. Self-selection certainly appears to exist evidenced by higher existing levels of productivity in exporting firms, but there also appears to be a conscious effort on the part of firms to become more productive prior to exporting.

D. Opening up markets to foreign trade makes firms more productive both through learning by exporting and self-selection (conscious or otherwise).