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Learning to Export:

Evidence from Moroccan Manufacturing

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Abstract

This paper tests two alternative models of learning to export: productivity learning, whereby firms learn to reduce production costs, and market learning, whereby firms learn to design products that appeal to foreign consumers. Using panel and cross-section data on Moroccan manufacturers, we uncover evidence of market learning but little evidence of productivity learning. These findings are consistent with the concentration of Moroccan manufacturing exports in consumer items, i.e., the garment, textile, and leather sectors. It is the young firms that export. Most do so immediately after creation. We also find that, among exporters, new products are exported very rapidly after production has begun. The share of exported output nevertheless increases for 2-3 years after a new product is introduced. Old firms are unlikely to switch to exports, even in response to changes in macro incentives. We find a positive relationship between exports and productivity and conclude that it is the result of self-selection: it is the more productive firms that move into exports. Policy implications are discussed.

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1. Introduction

For many poor countries, manufacturing exports are seen as the royal path to growth. Albeit a handful of countries – most of them in East and South-East Asia – have achieved unprecedented rates of growth through exports, many other countries have tried but failed to follow the same route (The World Bank 1993).

One often heard explanation for the contrasted experiences of manufacturing export strategies is that exporting is subject to learning-by-doing (e.g. Bernard and Jensen 1999b, Tybout 2000, Harrison and Hanson 1999, Bigsten, Collier, Dercon, Fafchamps, Gauthier, Gunning, Oduro, Oostendorp, Patillo, Soderbom, Teal and Zeufack 1999, Bigsten, Collier, Dercon, Fafchamps, Gauthier, Gunning, Oduro, Oostendorp, Patillo, Soderbom, Teal and Zeufack 2000). Countries or enterprises that lack experience find it difficult to compete in international markets. For this reason, countries and firm first need to learn how to produce before attempting to penetrate export markets. In this view, the domestic market is essential as learning ground for exports.

The purpose of this paper is to investigate this idea using survey data from Morocco. It has long been recognized that exporting is not a straightforward process. This is particularly true when poor countries seek to export manufactured products to rich nations. Products sold in developed economies are typically of higher quality. Competition tends to be fierce and consumers are sensitive to minor variations in design and style. Learning how to satisfy fussy consumers may take some time for firms accustomed to less sophisticated domestic consumers in poor countries. In some cases, consumers in rich countries learn to appreciate simple products from poor countries, but this also takes time and (marketing) effort.

While few dispute the above observations, there is considerable disagreement concerning how long learning ought to take. Some argue that learning is a protracted process that extends over years if not decades. The argument is used as a basis for the infant industry argument to justify lengthy protection (Prebisch 1963).[1] Others point to micro evidence that learning by doing takes at most a couple years (e.g. Alchian 1963, Searle 1945, Griliches and Lichtenberger 1984).

[1] See also the references cited in Tybout (2000).

It is also unclear what kind of learning is required to export manufactures. One approach focuses on the general productivity of the firm. According to this view, firms must reach a high level of productivity before they can export. As a result, exporters are expected to be found among the most productive firms (e.g. Bernard and Jensen 1999b, Bernard and Jensen 1999a, Bigsten et al. 2000). Regarding Morocco, this view was presented most clearly in Clerides, Lach and Tybout (1998). Learning to be productive is seen as a prerequisite for exporting. If this view is correct, one would expect exporters to be firms that accumulated years of experience in their domestic market before launching into exports. A protected domestic market might then be necessary to allow firms to test their products locally and learn from their mistakes.

Another approach focuses on market familiarity. To export, a firm must find a product that consumers abroad want to purchase. Low production costs are helpful but not critical because suitably designed products can fetch a high price in a differentiated market. If this view is correct, producing for the domestic market is not a prerequisite for exporting. It might even be a drawback if it leads to firm to learn 'the wrong thing' from focusing on its domestic market, e.g., that consumers are easily fooled, that quality variation is not an impediment to sales, or that health hazards go unnoticed. In this case, a protected domestic market might actually hinder exports. If foreign goods were allowed in, domestic consumers would become more demanding, that is, more like foreign consumers. This would force firms to learn how to upgrade their products which, in turn, would make their products more acceptable to foreign consumers.

Because these two views have such dramatically different policy implications, it is important to disentangle them. Our main contribution to this debate is threefold: an original test; an different methodology; and a new insight. First, by using firm-level product-specific data, we are capable of testing market learning vs. productivity learning. To our knowledge, this kind of test has never been used before. Second, our methodology differs from the existing literature in several respects – most notably the use of duration analysis and the use of fixed effect coefficients to predict pre-export productivity. This reinforces existing results by demonstrating that they obtain irrespective of methodology. We also combine 15 years of census data with a detailed firm-level survey. This enables us to gain a deeper understanding of the

issues as the two data sets are complementary to each other.

Last but not least, we show that much of the exporting behavior of firms can be understood in terms of individual products and market learning. Using detailed firm-level and product-level information, we show that much of the evidence weighs in favor of the market learning model. Manufacturers who export usually do so shortly after the firm is created; 42% export within a year of initiating production; 75% export within three years of their creation. A similar pattern is observed for individual products: new products put on the market by existing firms are either exported right away or permanently confined to the domestic market. For products that end up being exported, 80% are exported within a year of production. These effects are robust in the sense that they obtain even if we control for sector, region, year of production, and experience.

The need to familiarize oneself with export markets is a sunk cost that probably restricts entry, as suggested by Roberts and Tybout (1997). Consequently, exporting firms often specialize in exports, especially if they are small. Familiarity is not enough, however: firms also need to be more productive to break into export markets and remain an exporter. In this respect, we find little evidence that general firm experience raises exports. Export experience, however, significantly reduces the time firms take to export new products. These results are consistent with market learning. They also agree with those reported by Aw, Chung and Roberts (2000) for Taiwan and Korea. We also find that, for individual products, market learning or market adaptation is rapid: one or two years. During this learning period, the domestic market absorbs a slightly larger share of the firm's production. But this effect is temporary.[2]

As in the rest of the literature, we also find a strong relationship between exports and firm productivity. The causality seems to run from productivity to exports: firms that export were more productive before doing so. This finding is consistent with the result of Aw et al. (2000) that much of the relationship between productivity and exports is due to self-selection. Looking at Colombia, Roberts and Tybout (1997) also find that efficient firms tend to self select into the export market. They find no evidence for learning-by-exporting in explaining why exporters are more productive than non-exporting plants.

[2] Preliminary analysis also show no relationship between exporting and total factor productivity. If anything, exporters tend to display lower levels of labor productivity. This is consistent with the fact that, in Morocco, it is the least capitalistic sectors that exports. It also matches the claim made by surveyed foreign firms that they invested in Morocco because of its low labor cost. A detailed investigation of this issue is the object of future research.

Like these authors, we also find that, among exporting firms, export experience does not significantly raise productivity. Using US manufacturing data, Bernard and Jensen (1999a) also find a causality from productivity to exporting and not the reverse. While exporting plants have substantially higher productivity levels, there is no evidence that exporting increases plant productivity growth rates. Looking at African firms, Soderbom and Teal (2001) find that workers' schooling and experience – i.e., learning by workers – is not what drives exports. The underlying efficiency with which the firm operates is a stronger determinant of exports. All these results are consistent with Liu and Tybout (1996)'s claim that, in Chile and Colombia, productivity growth takes place largely through entry and exit of firms, not through (productivity) learning. Similar results are reported by Aw, Chen and Roberts (2001) for Taiwan.[3]

The paper is organized as follows. Section 2 presents a brief conceptual framework. The data sets are introduced in Section 3. Results on the relationship between firm age and the propensity to export appear in Section 4. Duration analysis is presented in Section 5. Productivity is investigated in Section 6.

2. The Conceptual Framework

There is an abundant literature on the relationship between productivity, learning, and manufacturing exports. Looking at Colombia, Roberts and Tybout (1997) for instance find that efficient firms tend to self select into the export market. They attribute their finding to the presence of sunk costs in entering the export market: only productive firms choose to incur the costs and enter foreign markets. The usefulness of the sunk cost approach is further illustrated by Das, Roberts and Tybout (2001) and Aw, Roberts and Winston (2001).

In their comparison of Moroccan, Colombian, and Mexican manufacturers, Clerides et al. (1998) find that Moroccan exporting firms do better than non-exporters. Their main hypothesis is that there are

[3] According to Bernard and Jensen (1999a), exporting in the U.S. is associated with the reallocation of resources from less efficient to more efficient plants. These reallocation make up more than 40% of total factor productivity growth in the manufacturing sector. Half of this reallocation occurs within industry and the direction of the reallocation is towards exporting plants. Bernard and Jensen (1999b) simulate the effect of globalization in the form of a 5% drop in all geographic barriers between countries and find that nearly 9% of US plants would die. However, among surviving firms, one in seven that had previously sold only to the domestic market starts exporting. Since globalization provides lager markets to survivors and since the survivors were larger to begin, the decline in manufacturing employment is less than 3%.

fixed costs associated with exporting; producers of large batches are better able to spread these costs. The authors speculate that "most of the impetus to become exporter in Morocco came from firm specific demand sides shocks. Many Moroccan exporters are young plants that were founded with the exclusive purpose of selling particular apparel and textile products abroad."

Taking these insights as starting point, this paper examines more in detail one particular type of sunk cost, market learning. To demonstrate the relationship between learning and individual products, we construct a simple export model of the firm with both productivity and market learning. Firms are assumed to have one or several product lines. Why they have multiple lines of production is not modeled explicitly, but it could be because each product line is subject to decreasing returns to scale beyond a given threshold, or because product lines benefit from economies of scope. The output of product j by firm i is denoted Q_{ij}. The total number of products is J.

Each output can either be sold domestically or exported. For simplicity, we ignore the possibility of multiple export destinations and focus on a single one. For Morocco, this is a reasonable assumption given that most manufacturing exports go to a small group of European countries. Exports are denoted X_{ij}; domestic sales are written D_{ij}. The export and domestic prices are written p_{ij}^x and p_{ij}^d, respectively. Prices are net of transport and marketing costs. Firms take prices as exogenously given.

To obtain a model in which producers need not fully specialize in either market, we assume an Armington function of the form:

$$Q_{ij} = (X_{ij}^{\frac{\sigma-1}{\sigma}} + D_{ij}^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}} \tag{2.1}$$

Parameter σ is the elasticity of substitution; it captures the ease with which producers can switch sales across the two markets. Producers allocate output Q_{ij} across the two markets so as to maximize profit subject to equation 2.1. The decision to sell on the domestic or export market depends on the relative price. When $\sigma > 1$, near corner solutions exist in the sense that, for a large enough export price, (virtually) all output is exported – $Q_{ij} = X_{ij}$ – and for a low enough export price, nothing is exported – $Q_{ij} = D_{ij}$.

The optimal allocation rule is:

$$\frac{X_{ij}}{D_{ij}} = p_{ij}^{\sigma} \tag{2.2}$$

where $p_{ij} \equiv \frac{p_{ij}^x}{p_{ij}^d}$ is the relative price between the export and domestic market. The easier it is switch from domestic to export market, the more responsive exports are to relative prices. At the optimum, the value of one unit of output Q_{ij} is:

$$q_{ij} = \left((p_{ij}^x)^{\sigma} + (p_{ij}^d)^{\sigma}\right)^{\frac{1}{\sigma}}$$

The value of the firm's exports is $V_i^x \equiv \sum_j p_{ij}^x X_{ij}$ and the share of exports in total sales is V_i^x / V_i^q where $V_i^q \equiv \sum_j q_{ij} Q_{ij}$.

Output is produced with capital K_i and labor L_i.[4] Let T_i denote the total factor productivity of firm i which, for the moment, we take as given. The production function of the firm is written in compact form as $G(Q_i, K_i, L_i, T_i) \leq 0$ with $Q_i \equiv \{Q_{i1}, ..., Q_{iJ}\}$. We assume that returns to the production of any individual good are eventually decreasing. This ensures that production and firm size are bounded.

Let the product range R_i of firm i be defined as the set of goods produced by the firm. For instance, $R_i = \{1, 0, 0, ..., 1\}$ if the firm only produces goods 1 and J. The choice of product range depends on factor costs r and w as well as on the vector of output prices $q_i \equiv \{q_{i1}, ..., q_{iJ}\}$. Define $c_{ij}(R_i, r, w, T_i)$ as the average unit cost of production associated with a particular product range. We assume that unit cost is decreasing in T_i. Good j is produced only if $c_{ij} \leq q_{ij}$.[5] For a low enough q_{ij}, good j is not produced. The features of the model are summarized in the following proposition.

Proposition 1. *(1) For each individual product, the ratio $\frac{X_{ij}}{D_{ij}}$ depends on relative prices p_{ij} not on T_i.*

(2) For the firm, V_i^x / V_i^q depends on T_i only through the range of products being produced.

The first part of the proposition implies that there are goods that are intrinsically export goods: if

[4] In practice, certain types of capital and labor may be specific to the production of particular product lines while others are not product specific. We abstract from these considerations here and assume that firms reorganize their equipment and labor force to suit their production needs.

[5] The determination of the optimal product range is a mixed-integer programming problem. Such problems are by definition difficult to solve. The difficulty can be seen by noting that c_{ij} depends on R_i. Characterizing the solution is not essential to our purpose beyond noting that the optimal product range varies with total factor productivity.

they were produced by the firm, they would primarily be exported, irrespective of the firm's total factor productivity. The reverse is also true. Of course, it is conceivable that export goods yield a lower price q_{ij} so that only highly productive firms can profitably undertake the production of export goods. This is the second part of the proposition.

We now introduce two basic types of learning-by-doing into the model: productivity learning, and market familiarity learning. We define productivity learning as any form of learning that raise T_i. Examples of productivity-learning include better organization of the labor force and of the shop floor, fine tuning of the equipment and of the methods of production, and better quality control (e.g. Searle 1945, Alchian 1963, Arthur 1990).

We assume that productivity learning depends on the length of time since production began. Following Griliches and Lichtenberger (1984) and Young (1991), we also assume that productivity learning is capped. A simple example of a production function with productivity learning for a single product firm is:

$$Q_i = aL_i^{\alpha} K_i^{\beta} T(t_i) \equiv aL_i^{\alpha} K_i^{\beta} \frac{1}{1 + \lambda_j e^{-\delta t_i}}$$

where $t_i \geq 0$ is the time since production by firm i began. As $t \to \infty$, $Q_i = aL_i^{\alpha} K_i^{\beta}$. The larger parameter δ is, the faster learning takes place. Parameter λ_j captures the learning gap for good j: the larger λ_j is, the smaller $T(0)$ is.

For multiple product firms, we assume that productivity learning has beneficial spillovers for the entire firm, even though productivity gains may be highest for a specific product. Examples of models with learning spillovers across goods are found in Stokey (1991) and Young (1991).

Market familiarity learning – market learning for short – is modeled as affecting the export price $p_{ij}^x = \bar{p}_{ij}^x \phi(t_{ij})$ where t_{ij} is the time since export of good j began. Better familiarity with export markets enables firms to catch a higher net price by reducing transaction costs and by fine tuning their products and marketing strategy to suit the preferences of consumers in export countries (Clerides et al. 1998).

Productivity and market learning have different empirical implications regarding how firms' exports evolve over time. With productivity learning, firms reduce production costs c_{ij} over time as T_i rises. As a

result, they become competitive in the production of more goods and the product range R_i changes.[6] To the extent that export goods are systematically more costly to produce for inexperienced firms, we would expect newly created firms to initially produce exclusively for the domestic market. As they learn and their total factor productivity rises, they would progressively increase the range of goods they produce to include export goods. Firms switch faster from the domestic to export markets if learning is fast – low δ – the learning gap in export goods is small – high λ_x – and learning spillovers across goods are large.

With market learning, the switch from domestic to export market takes place for individual products. Define $\bar{p}_{ij} \equiv \bar{p}^x_{ij}/p^d_{ij}$ and let $\phi(t_{ij}) = e^{\gamma t_{ij}}$. We have:

$$\frac{X_{ij}}{D_{ij}} = \bar{p}^{\sigma}_{ij}\phi(t_{ij})^{\sigma}$$

For each product, the share that is exported increases over time. If the function $\phi(t_{ij})$ is unbounded, the firm always ends up exporting all its production. If, however, the firm does not export product j, then it never does. This implies that exporters are firms that initiate the production of exported goods. If σ is large, little market learning can trigger a large shift between local and export sales. In this case, exports can increase with little measurable effect on $q_{ij} = \left((p^x_{ij})^{\sigma} + (p^d_{ij})^{\sigma}\right)^{\frac{1}{\sigma}}$ and thus on total factor productivity (measured in value).

Our findings can be summarized as follows. With productivity learning, firms do not initially export. The share of exports rises over time as productivity increases and export oriented products enter the product range. Firms need not initially be exporters for exports to rise over time. In contrast, with familiarity learning, if firms do not export a product from the onset of production, they never export it. If they export a product, the share that is exported rises over time. An increase in export need not be associated with a noticeable increase in total factor productivity (measured in value). The purpose of the rest of this paper is to ascertain which of these two models best account for the exporting experience of Moroccan manufacturers.

[6] For the product range to change with T_i, it must be that learning (eventually) benefits unproduced goods more than produced goods, otherwise the firm would simply increase the production of the same goods. If returns to learning are sufficiently strong, certain goods might be dropped from the product range. See Stokey (1988) and Young (1991) for examples of models that satisfy both requirements.

3. Local Context and Data

Morocco has implemented substantial liberalization policies since the mid-1980's but these reforms have slowed down after 1993. By industrial country standards, massive trade liberalization took place in Morocco during the 1980s. The trade reform initiated in 1984 reduced the coverage of import licenses (quotas) from 41% to only 11% of all imports by 1990. The maximum tariff fell from 165% to 45% during this period (e.g. Haddad 1992, Haddad and de Melo 1996, de Melo, Haddad and Horton 2001).

There is an extensive literature on Morocco's industrial sector, focused essentially on evaluating the impact of trade liberalization and foreign direct investment on firm performance and centering the analysis mostly on export oriented industries (e.g. Haddad and Harrison 1993, Harrison 1996). One caveat to this literature is that none of the papers, even the most recent ones (e.g. Currie and Harrison 1997, Clerides et al. 1998), account for the impact of macreconomic reforms since 1992. This is because papers written to date use the data base from Clerides et al. (1998) that covers the years 1985 to 1991. As a consequence, it is possible that papers on Morocco manufacturing have been searching for effects that were not there yet. Indeed, trade liberalization policies were still going on during the early nineties, and the supply response is generally delayed. It is therefore important to bring new data to the issue to either comfort or challenge earlier results.

The data we use in this paper comes from two related sources. The first source is a census of manufacturers conducted every year by the Moroccan Ministry of Industry. This data set covers only a small number of variables, such as employment, output, and exports, but it is available 15 years from 1985 until 1999. Coverage of medium and large firms is virtually universal.

The second data source is the Firm Analysis and Competitiveness Survey (FACS) conducted jointly by the Ministry of Industry and the World Bank from September to December 2000. To reduce costs, the FACS survey focuses on manufacturing firms located in the six regions where most of the country's manufacturers are located: Casablanca, Rabat, Tangiers, Nador, Fes, and Settat. The first four are located on the coast; Fes and Settat are inland.[7] Two thirds of the country's manufacturers are located

[7] To facilitate interpretation, we refer to regions by the name of their main city rather than using the Moroccan names for the region itself, which the reader is less likely to know.

in and around the town of Casablanca alone.

Seven sectors of activity are covered: food processing, textiles, garments, leather, electrical machinery, chemicals, and plastics. Only firms of 10 employees or more are included, as they are the most likely to export. The sample of 859 firms is drawn randomly from the census firms with more than 10 employees in the selected regions and sectors. To facilitate comparison, we confine our analysis of census data to the same regions and sectors, which contains over 30,000 observations.

The coverage of the FACS survey is extensive. The questionnaire is divided into three parts: general questions answered by upper management; accounting data collected from the accountant; and manpower data collected from personnel. Three consecutive balance sheets were collected – for 1997, 1998, and 1999 – as well as two revenues and losses accounts – for 1998 and 1999. Detailed information is available on exports, including dates at which the firm began production and exports of up to six distinct products.

The main characteristics of FACS firms are summarized in Tables 1 and 2, for all firms and broken down by exporting status. Values are translated into US dollars using the exchange rate of 10 dirhams for 1 dollar that prevailed at the time of the survey. Sixty percent of the FACS sample is in the textile and garment sectors; sixty percent are located in and around Casablanca.

Average sales amount to US$2.4 million per year. Average employment is 123 permanent and 13 temporary workers. Firms have been in existence for 16 years on average. Regarding exports, 56% of respondent firms sell all or part of their output abroad. Manufacturers export on average 43% of their output. This proportion varies with firm size, large firms exporting more (68% of output), small firms exporting less (33%). Polarization, however, is marked: 47% of all firms do not export any of their output while 34% export all their production. Only 17% of manufacturers serve both the domestic and export markets. The destination of exports largely mirrors the origin of imports: 83% of all exports go to Europe, 46% to France alone; 6% of exports go to neighboring Maghreb countries, 5% to other destinations - primarily sub-Saharan Africa. Most exports leave Morocco by road (MCI 2000); the rest leaves by sea.

Of all 7 sectors studied, the garment sector is the most oriented towards exports: on average, garment firms export 80% of their output. Textile and leather manufacturers export, on average, 37-40% of their

output. Food processors export a third. The remaining three sectors export less than 10% of their output on average. There are also strong differences across regions. Firms located in Rabat and Tangier export on average more than half of their production. Firms in the Casablanca or Nador regions export on average 40% of their output. Those located in Fes and Settat export on average 30% and 15% on average, respectively.

On average, Moroccan firms have been exporting for 10 to 12 years. Exports to particular regions do not appear to have begun before or after other regions: there is no difference in the year at which exports to particular regions began. The average time lag between producing a new product and exporting it is 2 years. However, in 76% of the cases, export begins the year production starts. Contrary to what is often claimed, manufacturers do not sell their products to domestic consumers for a few years before launching into exports. The domestic market, therefore, does not seem to serve as testing ground for new products.

The time lag between enterprise creation and exporting is equally short. The average time lag is 3.6 years but 42% of firms begin exporting in the year of their creation. Another 22% begin exporting after one year. Firms that do not export within a couple years of their inception are unlikely to ever export. Learning to export thus appears to require little or no time at all. In fact, most manufacturing operations appear to be set up from the outset to serve either the domestic or the international market. We now investigate these issues more in detail.

4. Firm Age and Exports

We begin our analysis of the propensity to export with the census panel data.[8] From data on total sales and total exports, we define the share of output that is exported $S_i \equiv V_i^x/V_i^q$. This is our dependent variable. Similar results are obtained if we use an indicator function that takes value 1 if the firm exports.

We investigate how S_i evolves as firms age. We assume that export markets are more competitive than domestic markets. This is a reasonable assumption, and one that is borne out by the FACS survey:

[8] We ignore firms with data imputed by the Ministry for national account purposes. In a number of remaining firms, the respondent did not fill in the export question, which is then coded as 'missing'. We suspect that, in the overwhelming majority of cases, this means there are no exports. Comparison with FACS data indeed indicates that dropping these missing observations overestimates the propensity of Moroccan firms that export. For this reason, we replace missing exports by zero if exports in other years are either always zero or always missing. For firms that exports in some years only, a missing value remains missing. This process yields export propensities that are close to those observed in the FACS survey.

of those exporters who complain about difficulties exporting (196 cases), 88% state that their major difficulty is either the low price or high quality of competing products.

Given this assumption, the productivity learning model predicts a monotonic increase in S_i as firms age because higher productivity allows them to better compete in export markets. The market learning model, by contrast, makes no such prediction. Whether or not firms export depends on what market they decide to target. For firms that target the export market from the outset, we expect S_i to rise over time. But for non-exporters, no increase in S_i is expected as firms age.

Our testing strategy is to regress S_i on firm age and examine the shape of the relationship. To avoid imposing any restriction, age enters the regression in a non-parametric manner – i.e., as a series of dummy variables from age 1 to age 20.[9] Since S_i is censored from below at 0 and from above at 1, we use a two-limit tobit estimator.

We suspect that productivity and market learning affect industries differently. In the garment sector, for instance, consumer taste is critical. We therefore expect market learning to be particularly important in the garment sector. In contrast, industries in electrical machinery, chemicals, and plastics sell their products primarily to intermediate buyers who have a say in product design. In their case, familiarity with the market may be less important but cost effectiveness more critical. To investigate this possibility, regressions are estimated separately for the garment sector, other light industries (food processing, textile, and leather), and what, for the purpose of this paper, we call heavy industries (electrical machinery, chemicals, and plastics). When interpreting the results, one should keep in mind that few Moroccan heavy industries export, making estimation less precise.

We estimate the relationship between exports and firm age with various controls. In the first set of regressions, we only include proximity effects and yearly dummies. Yearly dummies are included as well to control for possible time effects, such as exchange rate variations, macro shocks, and shifts in trade policy. Proximity effects arise because a firm's propensity to export may be influenced by the actions of other firms around it. Firms in a given location may also be influenced by common aggregate effects, such as proximity to roads, power, and shipping facilities. Elbadawi, Mengistae and Zeufack (2001) indeed find

[9] 79% of the observations are betwen 1 and 20 years of age. Dummies for ages above 20 are non-significant and have been dropped to streamline the presentation. Adding them does not affect our qualitative results.

that domestic and international transport costs have a strong influence on the level of exports. Location and sector-specific externalities may also be present. To control for proximity effects, we proceed as follows. Let I_{ispt} be an indicator variable equal to 1 if firm i in sector s in province p in year t exports; it is 0 otherwise. We define a proximity variable $P_{ispt} \equiv \sum_{j \neq i} \frac{I_{jspt}}{N_{spt}-1}$ where N_{spt} is the number of firms in sector s, province p, and year t. Variable P_{ispt} measures the proportion of exporting firms in the vicinity of i. There are, on average, 60 observations for each P_{ispt} value.

Coefficient estimates from this first set of regressions are summarized in Figure 1 for firm age effects, together with their 95% confidence interval. Coefficients for control variables are not reported here for lack of space. Proximity effects are strong and significant in all regressions, but their removal does not affect qualitative results regarding firm age. Yearly dummies show an upward sloping trend in export propensity.

The results presented in Figure 1 indicate that young firms are much more likely to export than old firms, a result that directly violates the productivity learning model. This is true for all sectors combined, for garments, and for light industries. In heavy industries, firm age has no significant effect on exports. Except for heavy industries, we observe an increase in exports immediately after firm creation, a result one would expect if new firms increase exports as they learn about their market. It takes a year or two for new firms to raise the share of exported output. For a short period of time, it appears that the Moroccan market serves as breeding ground for new firms breaking into export markets. Virtually identical results are obtained if the dependent variable is 1 if the firm exports and 0 otherwise.

The results from this first set of regressions are subject to omitted variable bias if old firms are qualitatively different from new firms. Until the mid 1980's, the Moroccan domestic market was protected from foreign competition. For this reason, old firms might be in industries or regions that focus on the domestic market. Trade liberalization might have brought foreign firms that are more familiar with exports and use Morocco as an export platform. New firms might also be more formal and thus more likely to export because they have better access to credit and the like.

To control for these possible effects, we reestimate the model with additional regressors: dummies for sector, region, and legal status, as well as the share of capital in the hands of foreigners and that owned

by the government. The effect of firm age is depicted in Figure 2. It is virtually indistinguishable from Figure 1. Estimated coefficients for the controls are reported in Table 3. Most are significant and have the anticipated sign. Proximity effects are again large and significant: if the proportion of exporting firms nearby rises from 0 to 50 percent, the share of exports increases by 60 percentage points. As before, heavy industries stand out as an exception: proximity effects are one order of magnitude lower.

The year 1996 marked the high tide of Moroccan manufacturing exports, with a strong effect on export propensity. This effect is strongest in the garment sector (a 51 percentage point increase in export propensity compared to 1985) and weakest in heavy industry (a 11% percentage point increase only). Recent years witness a sizeable reduction in export propensity in the garment sector – from 51% to 31%. The timing of this trend reversal (1997) coincides with the Asian crisis, the strong devaluations incurred in South East Asia, and the resulting loss of competitiveness of Moroccan garment exports. Other sectors are less affected.

We find that foreign-owned firms export significantly more, suggesting that they use Morocco as an export platform. These results are consistent with Haddad and Harrison (1993) and Harrison (1996) who show that Moroccan firms with foreign equity participation export more than their domestic counterparts. The effect of foreign ownership is large: going from 0 to 100 percent foreign ownership increases S_i by 54 percentage points. We also find that corporations export more than unincorporated firms, an effect that may be due to size differences.

Some might argue that our results are mispecified because they ignore the effect of firm size which, from the previous section, we know to be strongly related to exports. This is, for instance, suggested by the large positive coefficient of the corporation dummy. It is true that the effect of firm age on firm size is strong and significant.[10] But firm size might also be a consequence of the firm's export strategy. To investigate these issues further, we include lagged sales and lagged labor force in the regression. The use of lagged values eliminates simultaneity bias (current exports influencing current sales). But it does not eliminate endogeneity bias since firm size and export share both follow from the choice of product range.

Results are shown in Table 4. Lagged effects are in general significant and, except for heavy industries,

[10] Regressing the log of sales on the log of firm age yields a coefficient of 0.75 with a t-value of 34.

have the expected sign. In all regressions, the employment effects is largest in magnitude. It is thus the large firms that export. Similar results for sub-Saharan Africa are reported by Bigsten et al. (2000) and Soderbom (2001). Controlling for firm size changes the shape of the relationship between firm age and S_i: it now is monotonically declining with firm age after the first year (Figure 3). This suggests that the rise in S_i observed among young firms immediately follows an increase in labor and sales. It is this expansion, particularly that of labor, that makes the rise in S_i possible. This is consistent with the observation that, in Morocco, it is the labor intensive industries that export. The presence of more temporary workers in the workforce is also associated with more exports in the light manufacturing sector, further reinforcing the idea that a cheap and flexible labor force is behind Moroccan exports.

Results reported so far assume that the decision to export and the decision of how much to export are generated by the same process. This need not be true. To investigate this possibility, we estimate a Heckman selection model where the dependent variable is the share of exported output. The controls are the same as in Table 4. Results, not reported here for lack of space, are very similar to Table 4. The effect of firm age on both the propensity to export and the share of exported output is again non-linear: initially positive, then negative.

Except for an initial but short-lived rise in Figures 1 and 2, the propensity to export declines with firm age. This is true even though we include yearly dummies and control for proximity effects. This decline is inconsistent with the productivity learning model, but it is not explained by the market learning model either. One possibility is that the population of firms changes over time in a way that is not adequately captured by our regressors. Yearly dummies show an increase in propensity to export among existing firms. It is therefore likely that firms created in the late 1990's are also more likely to export than old firms.

To investigate this possibility and control fully for unobservable changes in sample composition, we reestimate the model using firm-level fixed effects.[11] We continue to control for yearly dummies and proximity effects. We have 9198 observations with firms switching from one regime to the other. Age coefficients are summarized on Figure 4. Once we control for firm-level fixed effects, we see that the

[11] Virtually identical results are obtained using a conditional logit regression on whether firms export or not.

probability to export increases rapidly for young firms, but remains constant among old firms. This effect is robust and significant and it is present for garments and light industries; these are also the sectors that export the most. Proximity effects remain significant.

These results further suggest that the observed decline in export propensity among old firms is due to a change in unobserved heterogeneity among firms: firms created in the 1990's differ from old firms in their intrinsic propensity to export in a way that is not fully captured by observable characteristics such as sector, location, or size. The response of the Moroccan manufacturing sector to trade liberalization has thus taken the form of entry by firms interested in exports, not of old firms turning to export markets.

5. Product Age and Exports

Our analysis of the census data shows that firms increase exports over a period immediately following firm creation. The time it takes for individual firm to break into export markets is quite short: 3 to 5 years. We also find that old Moroccan firms are much less likely to export than young firms, even controlling for location, sector, year, firm size, firm ownership, and proximity effects. Thus, although we find evidence of learning, it is at prima facie inconsistent with the productivity learning model.

Does this mean the market learning model better accounts for the evidence? From the census data, we cannot say because they contain no evidence on the development of new products and on the time lag between product development and exports. This is where the FACS survey comes into the picture. FACS collected data on sales and exports for the three main products of each firm, both for 1999 and 1998. Answers to these questions enables us to examine the time lag between production and exports. The market learning model predicts that exports should begin soon after production since products are designed for specific markets. As the firm learns to better fit its foreign market, the share exported might rise over time.

To investigate these ideas, we turn to product specific data. Each surveyed firm was asked to identify its main products, with a maximum of three. For each of these products, the firm was asked to give the dates at which production and exports began. All together, 1369 different products were identified, 59% of which were exported by the time of the survey. One half of the recorded products began production

before 1988. As shown in Table 5, for 80% of those products currently being exported, exports began within the first year of production; some 91% are exported within 5 years. This proportion is highest in the garment sector (96%) and lowest in heavy industry (71%), but it is high for all industries. This means that, if a product is not exported within five years of the beginning of production, the chances that it will eventually be exported are very small. These findings by themselves suggest that products are developed for specific markets.

We also have information about the time elapsed between a firm's creation and its first exports (second column of Table 4). Some 42% of surveyed firms begin exporting the year of their creation; 75% export within three years of their creation. If a firm does not export within the first years of its creation, the chances that it will export later drops dramatically. This is consistent with the idea that most firms are created around a small set of products designed for specific markets.[12]

We investigate these ideas further by estimating a duration model of the time from production to export. Our objective is to test the production and market learning models. If productivity learning is important to break into foreign markets, the time elapsed between the creation of the firm and the beginning of production should have a positive effect on the probability to export. This is because, according to the productivity learning model, gains in productivity resulting from learning-by-doing should help firms compete in export markets. In the market learning model, it is experience in exporting that matters.

To test these hypotheses, we regress the time between first production and first export on total experience and export experience, plus a number of controls. Total experience is measured as the time elapsed between firm creation and the year production of a given product begins. For example, if a firm is created in 1972 and begins producing shirts in 1984, total experience is 1984-1972=12. By the same token, export experience is the time elapsed between the year the firm first exported and the year production of the given product begins. To continue our example, if the firm began exporting t-shirts in 1977, export experience is 1984-1977=7. Both total experience and export experience are measured at the time the

[12] To confirm this interpretation, we construct a Simpson specialization index as $S_i^2 + (1 - S_i)^2$. The index is 1 if the firm either exports nothing or exports everything. We regress this index on firm size and find that small firms are more specialized; large firms, in contrast, tend to straddle both markets. This is consistent with a product range approach in which firms are organized around a limited range of products designed for specific markets.

new product was put in production. This is because, if a new product is designed for a specific market, it is experience at the design stage that matters for its export success. With productivity learning, total experience is what should matter; with market learning, only export experience matters.[13] Given that most exported products are exported in the year of first production, this test is quite conservative: the effect of export experience is identified only thanks to those firms who do not export right away. Both experience measures are entered in log form because we expect grains from experience to exhibit decreasing marginal returns.

In addition to sector and region dummies, we also include dummies for the time at which production began. The policy and market conditions prevailing at the time production began might indeed have incited firms to target either domestic or foreign markets. The calendar year of production is entered in non-parametric fashion to allow for non-linearities. In particular, we are interested in the effect of the change in trade regime that occurred in the 1980's as Morocco opened up to international trade. Dividing the data into quartiles, three dummies are created: before 1980; between 1980 and 1988; and between 1988 and 1994. The omitted dummy is for production starting in 1995 or thereafter. We expect the first two dummies to be significantly negative: production decisions made in a protected environment are more likely to target the domestic market.

Results are presented in Tables 6 and 7. Two models are estimated: a parametric hazard model with a Weibul distribution; and a Cox non-parametric hazard model. The advantage of the Cox model is that it does not impose any structure on the shape of the conditional hazard over time. Both models yield by and large similar results, the main difference being that Cox results are slightly less significant for most controls.

For both the Weibul and the Cox model, export experience is found to have a large an significant effect in three of the four regressions. The exception is garments where export experience is positive but non-significant. This is because most garment manufacturers export very soon after firm creation, so that there is not enough variation in export experience (i.e., most is zero). Total experience is negative and

[13] We also experimented calculating total and export experience up to the time the product is exported. For non-exporters, experience is measured at the time of the survey. In all regressions (except the Weibul results for the garment sector), the resulting coefficient for total experience is negative and strongly significant. These findings mirror earlier results about the effect of firm age on the propensity to export.

non-significant for all sectors except garment, where it is positive. This effect, however, is only significant in the Weibul regression.

Confirming our earlier analysis, regression results shows that the probability to export drops rapidly within a few years of production. For the Weibul model, this is apparent from the significantly negative p coefficient. This corresponds to a rapidly declining hazard with time from production. For the Cox model, this is even more apparent from the Kaplan-Meier survival estimate presented in Figure 5.

From the Cox model, we see that products introduced prior to 1980 are much less likely to be exported, but there is no difference between products introduced in the 1980's or between 1989 and 1994: it appears as if the market liberalization effects of the 1984-1990 trade reform had largely been anticipated by firms introducing new products in the 1980's. To confirm that the production date effect is not due to unobservable differences across firms, we also estimate a firm-level fixed effect regression in which the time-to-export is the dependent variable. Non-exported products are excluded. Results show that, within a firm, products introduced prior to 1988 take longer to be exported. The effect is particularly strong prior to 1980. These results suggest that trade liberalization had affected exports by changing the type of products Moroccan manufacturers decide to produce – and possibly the type of firms that are set up.

6. Exports and Productivity

We have seen that market learning provides a more convincing explanation of exporting behavior than productivity learning. Does this imply that there is no relationship between exports and productivity? In their comparison of Moroccan, Colombian, and Mexican manufacturers, Clerides et al. (1998) find that Moroccan exporting firms do better than non-exporters, but this result is less robust in Morocco than Colombia and Mexico. Firms with large capital stocks are more likely to be exporters. The main hypothesis is that there are fixed costs associated with exporting; producers of large batches are better able to spread these costs.

However, the authors find no evidence that the causal relationship is from exporting to productivity. Indeed, high productive firms appear to select themselves into the export market. Finally, there is no evidence that entering the exporting market reduced marginal costs of Moroccan firms between 1984 and

1991. In this section, we revisit these issues. We confirm that productivity and exports are strongly related in Moroccan manufacturing. But the reason for the relationship is not productivity learning.

We proceed in three steps. To ensure comparison with other studies, we first establish that exporting firms have a higher total factor productivity than non-exporting firms. We then investigate whether export causes productivity or whether productivity causes exports. We investigate the first causality link by examining whether total factor productivity among exporting firms increases with export experience. We find that it does not. To investigate the second causality link, we examine whether non-exporting firms that are more productive than other non-exporting firms are more likely to begin exporting. We find that they are. We also find that exporting firms that are less productive than other exporting firms are more likely to abandon exports.

The first step is to show that exporting firms are more productive. To this effect, we use the FACS data set to estimate a production function of the form:

$$Q_i = a(\sum_s \gamma_s L_i^s)^\alpha K_i^\beta T_i^\theta e^{\rho R_i + \eta X_i}$$

where Q_i is value added of firm i, L_i^s is labor of type s, K_i is capital, T_i is time since enterprise creation, and X_i is the share of output that is exported. Variable R_i is a measure of liquidity that is defined as (total value of long term liabilities - total value of long term assets)/capital. The numerator can be positive or negative; division by the value of capital serves as normalization. We also normalize labor coefficients such that $\gamma_s = 1$ for unskilled workers. After taking logs and using the approximation $\log(1+x) \simeq x$ for x close to 0, we obtain the estimating equation:

$$\log Q_i = \log a + \alpha L_i + \alpha \sum_s (\gamma_s - 1)\frac{L_i^s}{L_i} + \beta \log K_i + \theta \log T_i + \rho R_i + \eta X_i \qquad (6.1)$$

where L_i is total labor. When estimating the above, sector and region dummies are added to control for inherent differences in total factor productivity (TFP). To control for simultaneity bias, all labor variables, capital, liquidity, and exports are instrumented using lagged values. Equation 6.1 is estimated separately for garment, light manufacturing, and heavy manufacturing firms.

Results presented in Table 8 show a strong positive relationship between exports and total factor productivity in all sectors except heavy industry: the estimated coefficient η is positive and significant. The magnitude of the relationship is large: compared to a non-exporter, a garment or light industry manufacturers that exports all its output is 25-30% more productive on average. We also see that firm experience per se is not associated with higher TFP: the coefficient of firm age is small and non-significant. Most of the effect of exports is due to the fact of exporting: replacing the share of exported output by an export dummy yields virtually identical results.

Our second step is to investigate whether export experience is what raises TFP. We reestimate the above equation using only exporting firms and we replace X_i by the (log of the) number of years since first export. The idea is that, if export experience raises total factor productivity, the coefficient on number of years since first export should be positive and significant. The estimated coefficient, reported in the first line of Table 9, has the right sign but is never significant. There appears to be no strong relationship between export experience and TFP.[14] Other parameter estimates are largely unaffected.

The above results suggest that there is a strong relationship between productivity and exports, and that this relationship is unlikely to originate from firm or export experience. One possible explanation, suggested for instance by Clerides et al. (1998), is that exporting firms are more productive right from the start. If exporters are more efficient to start with, then firms that end up exporting should have higher productivity even before they export.

Our third step is to test this idea using data on firms that begin exporting at least one year after their creation. We go back to the manufacturing census data and identify 642 firms that initiated exports after their creation. Since the census data does not contain information about capital, we focus on labor productivity. A measure of labor productivity before exporting is obtained by regressing the log of output on firm-level fixed effects as well as a series of controls – employment, share of temporary workers, (log of) age and age squared, and dummies for sector, region, year, and legal status.[15] We only use observations on non-exporting firms and on exporting firms before they begin exporting. Firm-specific fixed effects

[14] To check for multicollinearity between firm age and time since first export, we also estimate the model without the firm age variable T_i. Results are identical.

[15] Similar results are obtained using random effects. Only fixed effects are reported here because a Hausman test rejects the hypothesis that random effects are independent from regressors.

are our measure of unobservable time-invariant labor productivity before exporting. Of course, these estimated fixed effects are subject to measurement error since they are constructed on the basis of a rather short time series. We would therefore expect their coefficient to be biased towards zero.

We construct an indicator variable that takes the value 1 if the firm subsequently began exporting; otherwise it is 0. This indicator variable is regressed on the estimated firm fixed effects from the first step regression. Firms that export in every year are ignored. Results are shown in Table 10 with additional controls for experience, sector, region, and legal status. We find that firms that had a higher than average labor productivity before exporting are significantly more likely to begin exporting.[16] This is true for all sectors except garments where the effect is not significant – largely because there are so few observations on garment exporters who did not export right from the start. These results are consistent with those obtained by Clerides et al. (1998) and by Bernard and Jensen (1999a). We again see that the effect of firm age is non-linear: controlling for inherent productivity, the probability of switching into export rises within the first year or two after inception, after which time it falls.[17] These findings are consistent with the duration analysis presented in Section 3.

We also investigate whether firms that stop exporting were less productive while they were exporting than firms that continue exporting. The approach is a mirror image of the above.[18] Results are reported in Table 11. They indicate that firms that stop exporting were less productive than other exporters before they stopped exporting. The effect is only significant for garment manufacturers, however. The probability to switch out of export increases monotonically with firm age.

Taken together, the results presented in this section suggest that a high labor productivity is a precondition for moving – and remaining – into exports. High labor productivity is thus an essential determinant of competitiveness. But the analysis presented here also demonstrates that this high productivity does not come from firm experience. Rather, firms that break into export markets are more productive from the start, as is further confirmed by the finding that they begin exporting within a few years of cre-

[16] A higher capital intensity could in principle account for both higher productivity and the switch to exports. Although we cannot rule out this explanation in the absence of data on capital stock, it is inconsistent with the fact that export industries in Morocco are less capital intensive than industries catering to the domestic market (see Table 2).

[17] We also investigated whether productivity shocks trigger exporting. To this effect, we regressed the switch into exports on lagged productivity. Results show no relationship: firms do not begin exporting because a fortunate productivity shocks in the preceding year pushes them above the competitivity threshold, but rather because they are more productive on average.

[18] If firms switch in and out of exports more than once, we only consider the first episode and ignore the subsequent ones.

ation. A corollary is that the response of the Moroccan manufacturing sector to trade liberalization has worked primarily through the creation of new, more productive firms that target export markets from their inception.

7. Conclusion

In this paper we have examined the effect of experience and learning on the exporting behavior of firms. We contrasted two types of learning. The first one, which we call productivity learning, assumes that a firm must accumulate enough experience before it can export. The second, called market learning, assumes that firms design products for specific markets. With market learning, exports do not depend on general experience but rather on familiarity with export markets, which can only be acquired by exporting. As a product is fine tuned for its market and arrangements are made in the export country, there may be a learning period between the time a product is first produced and the time it is first exported. But this adjustment period is expected to be short.

Results are by and large consistent with the market learning model. Descriptive statistics and multivariate analysis are at odds with the productivity learning model and we find little if any evidence that general experience matters in the decision to export. Firms seem to produce with either the domestic or the export market in mind. We find that firms that previously focused on the domestic market respond to changes in market conditions – as measured by time dummies. But most of the export response is due to new firms that enter and focus on foreign markets right from the start. This is particularly true for small firms which are seen to specialize either in exports or domestic sales. This situation probably results from the fact that, since firms focus on a limited range of products, they have little flexibility to respond to large shifts in market conditions whenever products developed for one market are unsuitable for the other.

We find a strong relationship between exports and total factor productivity. This relationship does not appear to be due to feedback from exporting to total factor productivity. Indeed, in line with Clerides et al. (1998), we find that, among exporting firms, total factor productivity does not rise significantly with export experience. Firms that eventually export were more productive even before exporting. It

is the more productive firms that enter export markets; most of them do so from the start. These results confirm earlier studies. Our contribution is to show that they are likely to be driven by market familiarity, as suggested for instance by the work of (e.g. Rauch and Casella 1998, Casella and Rauch 1998) on international networks. This is also in line with the fact that Morocco exports primarily to France and Spain, two countries with which it shares a long colonial history.

The work presented here leaves a number of issues unanswered. Regressions presented in Section 2 show proximity effects to be very strong: firms located near other exporters are much more likely to export, even when we control for year, firm age, and firm level fixed-effects. It is unclear why. Our proximity variable may capture infrastructure effects, industrial services, or the diffusion of ideas. Further research is needed.

We have argued here that market familiarity is important. We have also seen that certain firms appear both more productive and better suited to export markets right from the start. The next step is to find out where market familiarity and innate productivity come from. Results presented here suggest some possible diffusion mechanisms – foreign ownership and physical proximity to other exporting firms. Another possible diffusion process is suggested by the geographical concentration of Moroccan manufacture exports to France and Spain, two countries with a history of Moroccan immigration. It is conceivable that some returning migrants take advantage of their familiarity with French and Spanish tastes to invest in manufacturing exports.[19] These issues deserve further investigation.[20]

If confirmed by further analysis, our results have important policy implications. First, the argument that protection of the domestic market is essential for firms to gain enough experience to compete in international markets does not appear valid, at least for Morocco over the period studied. Second, the response of the manufacturing sector to trade liberalization primarily comes from new firms and new products. Helping new firms is essential to maximize the manufacturing export response to changes in relative prices. An immediate corollary is that obstacles to the creation of new firms (such as high

[19] McCormick and Wahba (2001) and Mesnard and Ravallion (2001) indeed show that returning migrants to Egypt and Tunisia, respectively, are more likely to invest in a business. But they do not provide information as to whether these businesses are export oriented.

[20] The FACS survey contains valuable information about prior work experience of the firm owner and manager but no information about migration or prior exporting experience. Furthermore, the information collected only relates to the current owner and manager, not to the person in charge at the time the firm began to export.

interest rates) are bound to reduce a country's response to trade liberalization. This might explain why combining financial liberalization with structural adjustment generates little response in manufacturing exports whenever it results in higher interest rates (e.g. Fafchamps, Biggs, Conning and Srivastava 1994, Fafchamps, Pender and Robinson 1995).

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Table 1. Breakdown of the FACS data by sector and region

Sector of activity	**All**	**Non-exp.**	**Exporter**
Food processing	10%	12%	7%
Textile	23%	24%	23%
Garments	37%	22%	50%
Leather	8%	5%	11%
Electrical and Electronic Equipment	4%	6%	3%
Chemicals (including pharmaceuticals)	9%	15%	3%
Plastics	9%	16%	3%
Region			
Casablanca	60%	65%	56%
Tanger-Tetouan	14%	10%	17%
Rabat-Sale (Zemmour)	6%	4%	9%
Fes-Boulemane	11%	10%	13%
Oriental (Nador, Oujda)	4%	5%	3%
Chaouia-Ouardigha (Settat)	4%	7%	2%
Total number of observations	859	401	446

Source: FACS survey data.

Table 2. Descriptive Statistics of the FACS Sample

	Mean	Median	Non-exp.	Exporter	t-test	p-value
Annual sales	2406	765	1863	2904	2.76	0.0058
Permanent workers	123	53	55	186	9.43	0.0000
Temporary workers	13	0	7	17	2.89	0.0039
Purchase value of equipment and machinery	1335	383	900	1733	3.26	0.0012
Years since creation	16	13	19	14	5.56	0.0000
Foreign ownership	21%	0%	12%	27%	-5.22	0.0000
Share of exports in total sales	43%	5%	0%	82%		

Note: All values given in '000 US$. All annual figures relate to 1999. The number of observations is 859.

Table 3. Determinants of the Share of Exports
(Estimator is two-limit tobit.)

	All sectors		Garment		Light manuf.		Heavy manuf.	
Proximity:	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**
% of exporting firms nearby	1.217	**26.15**	1.122	**10.25**	1.106	**17.20**	0.159	**1.94**
Ownership:								
Foreign ownership	0.005	**18.09**	0.001	**2.18**	0.007	**14.58**	0.005	**13.90**
Public ownershp	0.005	**13.67**	0.003	**3.66**	0.005	**8.94**	0.005	**10.86**
Sector								
Garment	omitted sector		n.a		n.a		n.a	
Food processing	-0.643	**-20.80**	n.a		omitted sector		n.a	
Textile	-0.645	**-28.71**	n.a		0.020	0.73	n.a	
Leather	-0.450	**-16.62**	n.a		0.196	**5.84**	n.a	
Electrical machinery	-1.171	**-25.43**	n.a		n.a		omitted sector	
Pharmaceutical	-1.299	**-31.86**	n.a		n.a		-0.178	**-6.19**
Plastics	-1.446	**-32.61**	n.a		n.a		-0.226	**-7.13**
Region (Casablanca is omitted region)								
Settat	-0.326	**-5.40**	-0.752	**-2.46**	-0.492	**-5.54**	-0.036	-0.67
Nador	0.288	**5.88**	0.544	0.61	0.392	**6.76**	-0.165	**-1.93**
Rabat	0.125	**3.92**	0.143	**2.43**	0.172	**3.65**	-0.028	-0.53
Fes	0.015	0.54	0.432	**6.65**	-0.195	**-5.07**	0.005	0.10
Tangiers	0.012	0.53	0.377	**8.53**	-0.152	**-4.60**	-0.206	**-4.32**
Legal status (sole proprietor is omitted category)								
SARL (limited liability company)	0.639	**21.68**	0.872	**15.70**	0.468	**11.37**	0.416	**6.16**
SA (corporation)	0.966	**39.63**	1.267	**26.17**	0.784	**24.58**	0.671	**10.71**
SNC (partnership) & other status	0.660	**11.81**	0.428	**2.82**	0.607	**9.12**	0.211	1.42
Cooperative	0.151	**2.33**	0.213	1.64	0.169	**2.05**	-2.454	.
Firm age dummies	included but not shown here (see Figure 2)							
Yearly dummies (1985 omitted category)								
1986	0.016	0.36	-0.005	-0.05	0.055	0.89	-0.049	-0.77
1987	0.051	1.17	0.110	1.21	0.086	1.41	-0.093	-1.47
1988	0.070	1.44	0.189	**1.82**	0.088	1.32	-0.060	-0.84
1989	0.104	**2.46**	0.159	**1.82**	0.125	**2.10**	0.021	0.35
1990	0.129	**3.11**	0.174	**2.04**	0.166	**2.85**	0.012	0.20
1991	0.131	**3.21**	0.166	**1.94**	0.161	**2.81**	0.024	0.41
1992	0.133	**3.21**	0.214	**2.45**	0.133	**2.30**	0.050	0.85
1993	0.170	**4.11**	0.268	**3.03**	0.165	**2.85**	0.084	1.43
1994	0.291	**6.25**	0.560	**5.43**	0.266	**4.08**	0.170	**2.66**
1995	0.296	**6.49**	0.526	**5.23**	0.296	**4.69**	0.108	**1.69**
1996	0.324	**7.24**	0.628	**6.28**	0.316	**5.11**	0.066	1.03
1997	0.295	**6.54**	0.571	**5.71**	0.294	**4.72**	0.032	0.49
1998	0.256	**5.66**	0.426	**4.36**	0.268	**4.27**	0.077	1.18
1999	0.299	**6.43**	0.459	**4.57**	0.326	**5.03**	0.115	**1.75**
Nber of observations, of which:	28702		7689		14003		7010	
zero	15457		1969		7710		5778	
non-censored	7348		1989		4223		1136	
one	5897		3731		2070		96	

Data: annual census, 1985 to 1999.

Table 4. Determinants of the Share of Exports, Controlling for Firm Size
(Estimator is two-limit tobit.)

	All sectors		Garment		Light manuf.		Heavy manuf.	
Firm size	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**
Lagged sales	0.036	**4.72**	0.191	**12.39**	0.009	0.82	-0.041	**-3.39**
Lagged employment	0.303	**30.09**	0.212	**10.56**	0.289	**20.41**	0.270	**15.85**
Lagged share of temporary workers	0.276	**6.92**	-0.040	-0.41	0.450	**8.68**	-0.078	-1.11
Proximity:								
Proportion of exporting firms nearby	0.681	**14.66**	0.302	**2.91**	0.680	**10.44**	0.091	1.06
Ownership:								
Foreign ownership	0.002	**7.40**	-0.001	**-2.22**	0.003	**7.62**	0.003	**7.60**
Public ownershp	0.002	**5.76**	0.001	0.91	0.002	**4.35**	0.003	**5.53**
Sector								
Garment	omitted sector		n.a		n.a		n.a	
Food processing	-0.622	**-18.23**	n.a		omitted sector		n.a	
Textile	-0.564	**-25.01**	n.a		0.070	**2.20**	n.a	
Leather	-0.301	**-11.39**	n.a		0.311	**8.25**	n.a	
Electrical machinery	-1.071	**-23.05**	n.a		n.a		omitted sector	
Pharmaceutical	-1.155	**-27.11**	n.a		n.a		-0.071	**-2.33**
Plastics	-1.235	**-27.68**	n.a		n.a		-0.137	**-4.27**
Region (Casablanca is omitted region)								
Settat	-0.362	**-5.74**	-0.792	**-2.47**	-0.565	**-5.79**	-0.066	-1.17
Nador	0.335	**6.83**	0.390	0.47	0.366	**6.26**	-0.035	-0.39
Rabat	-0.029	-0.92	0.070	1.26	-0.009	-0.19	-0.008	-0.15
Fes	-0.065	**-2.32**	0.377	**5.97**	-0.267	**-6.79**	0.079	1.49
Tangiers	0.026	1.14	0.428	**9.90**	-0.126	**-3.86**	-0.090	**-1.87**
Legal status (sole proprietor is omitted category)								
SARL (limited liability company)	0.280	**9.49**	0.373	**7.16**	0.211	**4.98**	0.202	**2.78**
SA (corporation)	0.330	**13.27**	0.444	**9.54**	0.272	**8.02**	0.341	**5.06**
SNC (partnership) & other status	0.210	**3.78**	0.097	0.66	0.187	**2.78**	0.031	0.18
Cooperative	0.054	0.88	0.092	0.79	0.099	1.22	-2.412	.
Firm age dummies	included but not shown here (see Figure 3)							
Yearly dummies (1986 omitted category)								
1987	0.032	0.81	0.116	1.43	0.021	0.37	-0.063	-1.06
1988	0.016	0.38	0.115	1.32	0.011	0.18	-0.046	-0.71
1989	0.069	**1.77**	0.175	**2.20**	0.060	1.10	0.033	0.59
1990	0.091	**2.47**	0.194	**2.60**	0.089	**1.69**	0.044	0.79
1991	0.110	**3.00**	0.164	**2.20**	0.112	**2.17**	0.073	1.34
1992	0.099	**2.69**	0.165	**2.19**	0.078	1.50	0.104	**1.90**
1993	0.146	**3.96**	0.224	**2.92**	0.125	**2.39**	0.124	**2.26**
1994	0.261	**6.26**	0.446	**4.99**	0.241	**4.11**	0.178	**2.96**
1995	0.263	**6.01**	0.456	**4.92**	0.217	**3.53**	0.190	**3.01**
1996	0.300	**7.14**	0.510	**5.67**	0.284	**4.84**	0.107	**1.72**
1997	0.259	**5.99**	0.393	**4.29**	0.276	**4.58**	0.050	0.76
1998	0.239	**5.48**	0.269	**3.01**	0.266	**4.36**	0.137	**2.05**
1999	0.253	**5.42**	0.311	**3.25**	0.271	**4.12**	0.180	**2.63**
Nber of observations, of which:	22387		5722		10913		5437	
zero	11953		1434		5975		4430	
non-censored	6009		1536		3423		940	
one	4425		2752		1515		67	

Data: annual census, 1985 to 1999. Year 1985 is lost because of the use of lagged regressors.

Table 5.Time between production of new product to export of that product
(Proportions reported only for products exported by the time of the FACS survey).

	All sectors		**Garment**		**Light manuf.**		**Heavy manuf.**	
Number of years before exporting	# obs.	cumul.%	# obs.	cumul.%	# obs.	cumul.%	# obs.	cumul.%
0	605	80%	388	92%	190	71%	27	43%
1	32	84%	9	94%	17	77%	6	52%
2	14	86%	2	94%	8	80%	4	59%
3	13	88%	6	96%	5	82%	2	62%
4	7	89%	0	96%	7	84%	0	62%
5	14	91%	1	96%	7	87%	6	71%
6 - 10	36	95%	13	99%	14	92%	9	86%
11 - 20	21	98%	5	100%	12	97%	4	92%
> 20	14	100%	0	100%	9	100%	5	100%
Number of observations	756		424		269		63	

Data: FACS.

Table 6. Duration analysis of time to export new product -- Weibul regressions

	All sectors		Garment		Light manuf.		Heavy manuf.	
Experience	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**
Total experience	0.991	-0.17	1.217	**2.49**	0.838	**-2.02**	0.733	-1.47
Export experience	1.533	**4.07**	1.209	1.44	1.942	**3.01**	2.150	**2.38**
Time of firm creation (creation after 1994 is omitted age category)								
Firmd created before 1980	0.136	**-13.78**	0.124	**-9.15**	0.136	**-8.97**	0.112	**-4.57**
Firm created in 1980-1988	0.563	**-5.21**	0.641	**-3.15**	0.473	**-3.83**	0.302	**-2.63**
Firm created in 1989-1994	0.615	**-4.55**	0.581	**-4.07**	0.638	**-2.24**	0.385	**-2.11**
Sector								
Garment	omitted category		n.a.		n.a.		n.a.	
Food processing	0.653	**-2.27**	n.a.		0.464	**-3.34**	n.a.	
Textile	1.847	**5.86**	n.a.		0.525	**-3.79**	n.a.	
Leather	1.821	**3.63**	n.a.		omitted category		n.a.	
Electrical machinery	0.558	**-2.41**	n.a.		n.a.		omitted category	
Pharmaceutical	0.225	**-6.31**	n.a.		n.a.		0.400	**-2.68**
Plastics	0.189	**-5.91**	n.a.		n.a.		0.367	**-2.71**
Region (Casablanca is omitted region)								
Settat	0.603	-1.53	n.a.		0.466	**-1.89**	0.710	-0.54
Nador	1.118	0.40	1.176	0.16	1.001	0.00	0.623	-0.45
Rabat	1.937	**5.08**	1.820	**3.60**	2.346	**3.47**	2.224	**1.83**
Fes	1.493	**3.66**	1.966	**5.14**	0.780	-1.03	1.473	0.52
Tangiers	1.256	**1.88**	1.504	**2.53**	1.013	0.06	1.521	0.83
ln(p)	-0.269	**-8.55**	-0.178	**-4.54**	-0.390	**-6.92**	-0.246	**-1.94**
No. of subjects	1260		535		441		284	
No. of failures	696		406		235		55	
Time at risk	11996		2359		4929		4708	

Table 7. Duration analysis of time to export new product -- Cox regressions

	All sectors		Garment		Light manuf.		Heavy manuf.	
Experience	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**
Total experience	0.974	-0.48	1.112	1.35	0.879	-1.48	0.715	-1.58
Export experience	1.293	**2.42**	1.066	0.48	1.499	**1.82**	2.223	**2.46**
Time of firm creation (creation after 1994 is omitted age category)								
Firmd created before 1980	0.389	**-6.50**	0.504	**-3.01**	0.333	**-5.01**	0.195	**-3.37**
Firm created in 1980-1988	0.902	-0.97	1.028	0.21	0.747	-1.51	0.482	-1.60
Firm created in 1989-1994	0.885	-1.17	0.905	-0.76	0.875	-0.68	0.491	-1.56
Sector								
Garment	omitted category		n.a.		n.a.		n.a.	
Food processing	0.765	-1.42	n.a.		0.546	**-2.56**	n.a.	
Textile	1.419	**3.35**	n.a.		0.614	**-2.85**	n.a.	
Leather	1.585	**2.80**	n.a.		omitted category		n.a.	
Electrical machinery	0.672	-1.64	n.a.		n.a.		omitted category	
Pharmaceutical	0.291	**-5.21**	n.a.		n.a.		0.403	**-2.66**
Plastics	0.235	**-5.12**	n.a.		n.a.		0.360	**-2.77**
Region (Casablanca is omitted region)								
Settat	0.608	-1.50	n.a.		0.501	**-1.70**	0.810	-0.33
Nador	1.036	0.13	0.803	-0.22	1.025	0.08	0.608	-0.48
Rabat	1.486	**3.06**	1.317	**1.68**	1.865	**2.53**	2.291	**1.88**
Fes	1.227	**1.87**	1.304	**2.08**	0.867	-0.58	1.446	0.49
Tangiers	1.153	1.17	1.250	1.38	0.991	-0.05	1.528	0.84
No. of subjects	1260		535		441		284	
No. of failures	696		406		235		55	
Time at risk	11996		2359		4929		4708	

Table 8. Productivity and Exports
(Dependent variable is the log of value added. Estimator is instrumental variables.)

	All sectors		Garment		Light manuf.		Heavy manuf.	
Exporting	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**
% of output exported (instrumented)	0.261	**2.69**	0.248	**2.06**	0.298	**1.95**	0.562	0.46
Firm characteristics (all instrumented except firm age)								
Log of manpower	0.787	**10.87**	0.999	**12.58**	0.804	**9.50**	1.429	0.37
Share of managers	1.468	**2.78**	1.825	**2.76**	0.893	0.92	-0.385	-0.04
Share of qualified workers	-0.076	-0.60	-0.115	-0.74	-0.097	-0.47	-0.373	-0.25
Share of clerical workers	1.844	**3.36**	4.460	**2.90**	1.806	**2.73**	4.073	0.35
Share of temporary workers	-0.508	**-1.85**	-0.687	**-1.76**	-0.935	**-2.19**	-1.752	-0.23
Log of purchase value of equipment	0.348	**5.29**	0.141	**2.28**	0.401	**6.95**	-0.224	-0.07
Liquidity ratio	0.024	0.38	0.002	0.07	0.118	**2.22**	-0.616	-0.28
Log of firm age	0.022	0.35	0.017	0.21	0.027	0.33	0.439	0.34
Sector								
Garment	omitted sector		n.a.		n.a.		n.a.	
Food processing	0.545	**3.35**	n.a.		omitted sector		n.a.	
Textile	0.062	0.63	n.a.		-0.495	**-2.73**	n.a.	
Leather	-0.098	-0.75	n.a.		-0.631	**-2.98**	n.a.	
Electrical machinery	0.485	**2.72**	n.a.		n.a.		omitted sector	
Pharmaceutical	0.792	**4.85**	n.a.		n.a.		1.128	0.33
Plastics	0.363	**2.58**	n.a.		n.a.		-0.350	-0.44
Region (Casablanca is omitted region)								
Settat	-0.274	-1.59	(dropped		0.081	0.31	-0.530	-0.53
Nador	-0.520	**-2.63**	0.711	1.01	-0.507	**-1.97**	-0.354	-0.22
Rabat	0.092	0.66	-0.110	-0.62	-0.042	-0.17	0.106	0.04
Fes	-0.079	-0.70	-0.201	-1.48	-0.073	-0.38	0.404	0.21
Tangiers	-0.141	-1.39	-0.182	-1.46	-0.221	-1.38	0.636	0.21
Intercept	1.272	**4.56**	1.850	**6.13**	1.317	**2.92**	3.128	0.39
Number of observations	710		260		285		165	
R-squared	0.716		0.795		0.735		0.538	

Export variables and firm characteristics are for 1999. Instruments are 1998 values of same variables.
Data: FACS.

Table 9. Productivity and Export Experience
(Dependent variable is the log of value added. Estimator is instrumental variables.)

	All sectors		Garment		Light manuf.		Heavy manuf.	
Exporting	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**	**Coef.**	**t-value**
Log of years since began exporting	0.085	1.15	0.181	1.41	0.070	0.67	-0.217	-0.79
Firm characteristics (all instrumented except firm age)								
Log of manpower	0.764	**13.90**	0.826	**9.40**	0.873	**11.49**	0.351	1.18
Share of managers	1.586	**2.03**	0.485	0.34	1.615	**1.67**	4.302	1.30
Share of qualified workers	-0.014	-0.11	-0.012	-0.07	-0.104	-0.52	0.674	0.86
Share of clerical workers	1.724	**2.34**	4.313	**3.00**	1.557	1.41	-2.527	-1.36
Share of temporary workers	-0.829	**-2.99**	-0.709	**-1.69**	-1.361	**-3.47**	0.825	0.79
Log of purchase value of equipment	0.339	**7.90**	0.246	**3.50**	0.295	**4.94**	0.600	**3.15**
Liquidity ratio	0.071	**2.61**	0.011	0.42	0.103	**2.33**	0.351	**2.53**
Log of firm age	-0.093	-1.12	-0.203	-1.41	-0.032	-0.28	0.393	1.08
Sector								
Garment	omitted sector		n.a.		n.a.		n.a.	
Food processing	0.313	**1.77**	n.a.		0.145	0.63	n.a.	
Textile	0.047	0.49	n.a.		-0.001	-0.01	n.a.	
Leather	0.054	0.44	n.a.		omitted sector		n.a.	
Electrical machinery	0.252	0.99	n.a.		n.a.		omitted sector	
Pharmaceutical	0.587	**2.48**	n.a.		n.a.		0.278	0.55
Plastics	0.876	**4.05**	n.a.		n.a.		-0.052	-0.12
Region (Casablanca is omitted region)								
Settat	-0.063	-0.24	n.a.		0.232	0.72	-0.412	-0.68
Nador	0.015	0.06	0.204	0.30	0.322	1.10	n.a.	
Rabat	-0.007	-0.06	-0.167	-0.93	-0.053	-0.25	1.604	**2.67**
Fes	0.009	0.08	-0.183	-1.29	0.487	**1.89**	0.434	0.61
Tangiers	-0.091	-0.90	-0.117	-0.87	-0.101	-0.61	-1.843	**-1.74**
Intercept	1.710	**6.58**	2.215	**5.95**	1.552	**4.14**	0.706	0.48
Number of observations	386		197		155		34	
R-squared	0.769		0.762		0.798		0.817	

Export variables and firm characteristics are for 1999. Instruments are 1998 values of same variables.
Data: FACS.

Table 10. Productivity and Propensity to Switch into Exporting
(dependent variable is whether firm switches into exporting. Estimator is logit.)

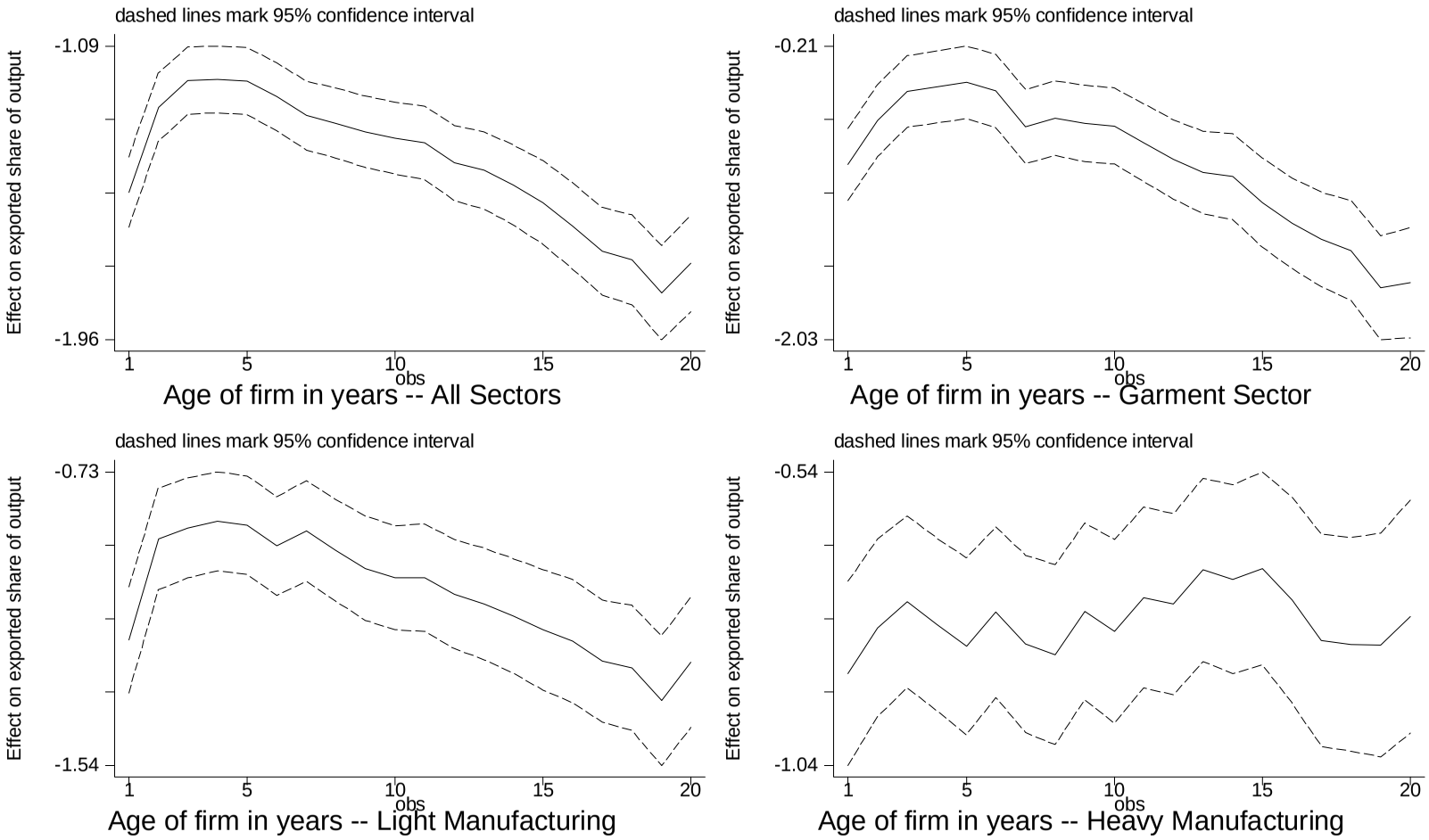
	All sectors		Garment		Light manuf.		Heavy manuf.	
	Coef.	**z-value**	**Coef.**	**z-value**	**Coef.**	**z-value**	**Coef.**	**z-value**
Productivity estimate (see text)	0.300	**6.02**	-0.193	-1.50	0.310	**4.77**	0.554	**5.15**
Firm characteristics								
Log of firm age	2.955	**5.51**	4.663	**3.47**	2.671	**3.57**	2.534	**2.15**
Log of firm age (squared)	-0.529	**-5.52**	-0.889	**-3.43**	-0.434	**-3.27**	-0.502	**-2.46**
Foreign ownership	0.010	**4.49**	0.009	1.24	0.011	**3.14**	0.006	**1.72**
Public ownership	-0.000	-0.08	0.003	0.35	-0.002	-0.66	0.002	0.46
Sector (garment is omitted sector)								
Garment	omitted sector		n.a.		n.a.		n.a.	
Food processing	-1.911	**-8.15**	n.a.		omitted sector		n.a.	
Textile	-0.250	**-1.66**	n.a.		1.444	**6.67**	n.a.	
Leather	-0.042	-0.22	n.a.		1.733	**6.60**	n.a.	
Electrical machinery	-1.941	**-7.50**	n.a.		n.a.		-0.388	-1.40
Pharmaceutical	-1.948	**-8.70**	n.a.		n.a.		-0.463	**-1.84**
Plastics	-1.647	**-8.35**	n.a.		n.a.		omitted sector	
Region (Casablanca is omitted region)								
Settat	-0.611	**-2.09**	1.415	1.08	-0.793	**-1.66**	-0.440	-1.01
Nador	-0.225	-0.66	n.a.		0.234	0.58	-0.617	-0.80
Rabat	-0.439	**-1.76**	0.103	0.21	-0.824	**-1.88**	-0.558	-1.18
Fes	-1.054	**-4.68**	-0.523	-0.89	-1.166	**-4.28**	-0.378	-0.67
Tangiers	-0.195	-1.22	-0.048	-0.14	-0.057	-0.28	-0.538	-1.30
Legal status (sole proprietor is omitted category)								
SARL (limited liability company)	0.495	**3.74**	0.847	**3.05**	0.470	**2.63**	0.160	0.49
SA (corporation)	1.274	**10.24**	1.487	**6.10**	1.021	**6.21**	1.989	**4.52**
Intercept	-4.968	**-6.53**	-7.627	**-4.26**	-6.720	**-6.22**	-6.202	**-3.55**
Number of observations	2741		467		1389		983	
Pseudo R-squared	0.177		0.163		0.159		0.217	

Data: annual census, 1985 to 1999.

Table 11. Productivity and Propensity to Switch Out of Exporting
(dependent variable is whether firm switches out of exports. Estimator is logit.)

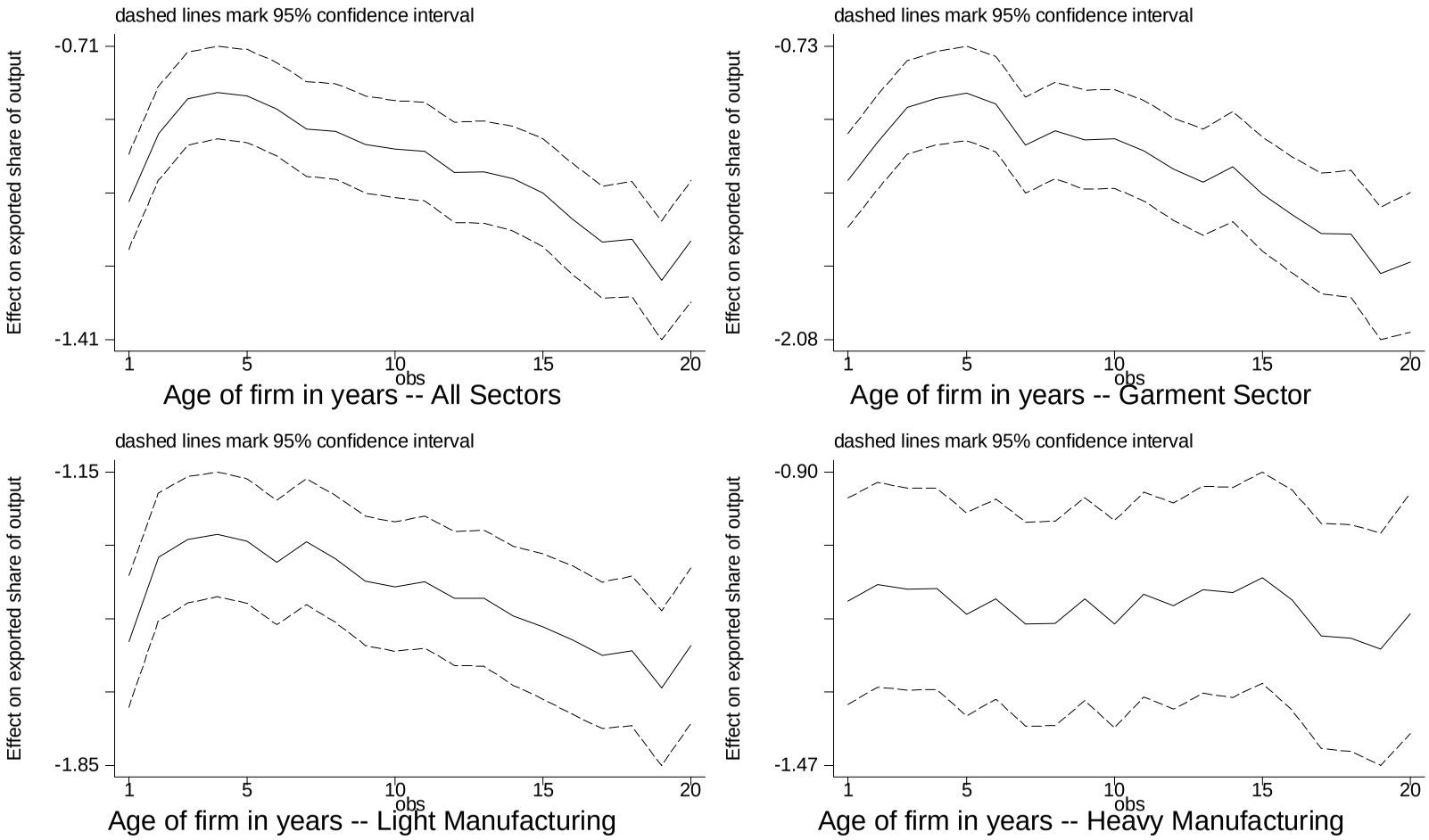
	All sectors		Garment		Light manuf.		Heavy manuf.	
	Coef.	**z-value**	**Coef.**	**z-value**	**Coef.**	**z-value**	**Coef.**	**z-value**
Productivity estimate (see text)	-0.216	**-4.00**	-0.671	**-6.17**	-0.093	-1.32	-0.051	-0.40
Firm characteristics								
Log of firm age	6.282	**7.31**	4.702	**3.33**	7.762	**5.87**	4.967	**2.16**
Log of firm age (squared)	-0.815	**-5.78**	-0.624	**-2.65**	-1.073	**-4.94**	-0.561	-1.52
Foreign ownership	0.000	0.19	-0.001	-0.32	-0.003	-1.08	0.007	1.52
Public ownership	-0.003	-1.45	0.003	0.69	0.000	0.14	-0.014	**-2.37**
Sector (garment is omitted sector)								
Garment	omitted sector		n.a.		n.a.		n.a.	
Food processing	0.309	1.43	n.a.		omitted sector		n.a.	
Textile	1.093	**8.39**	n.a.		0.695	**3.29**	n.a.	
Leather	0.304	**1.74**	n.a.		0.217	0.86	n.a.	
Electrical machinery	0.776	**2.64**	n.a.		n.a.		-0.708	**-1.89**
Pharmaceutical	1.609	**6.33**	n.a.		n.a.		omitted sector	
Plastics	1.047	**4.25**	n.a.		n.a.		-0.396	-1.10
Region (Casablanca is omitted region)								
Settat	-0.072	-0.18	-0.086	-0.08	0.284	0.53	-1.013	-1.18
Nador	0.009	0.02			0.306	0.71	0.161	0.16
Rabat	-0.445	**-1.88**	-0.863	**-2.03**	-0.251	-0.79	0.011	0.02
Fes	-0.100	-0.44	-1.011	**-2.05**	0.448	1.56	-0.139	-0.17
Tangiers	0.116	0.72	-0.544	**-1.95**	0.555	**2.57**	0.450	0.73
Legal status (sole proprietor is omitted category)								
SARL (limited liability company)	0.060	0.42	-0.205	-0.81	0.226	1.16	0.695	1.39
SA (corporation)	-0.298	**-2.07**	-0.754	**-3.12**	-0.025	-0.13	0.693	1.06
Intercept	-12.465	**-9.56**	-9.202	**-4.38**	-14.707	**-7.29**	-10.503	**-2.93**
Number of observations	2394		1127		1186		267	
Pseudo R-squared	0.161		0.164		0.124		0.153	

Data: annual census, 1985 to 1999.



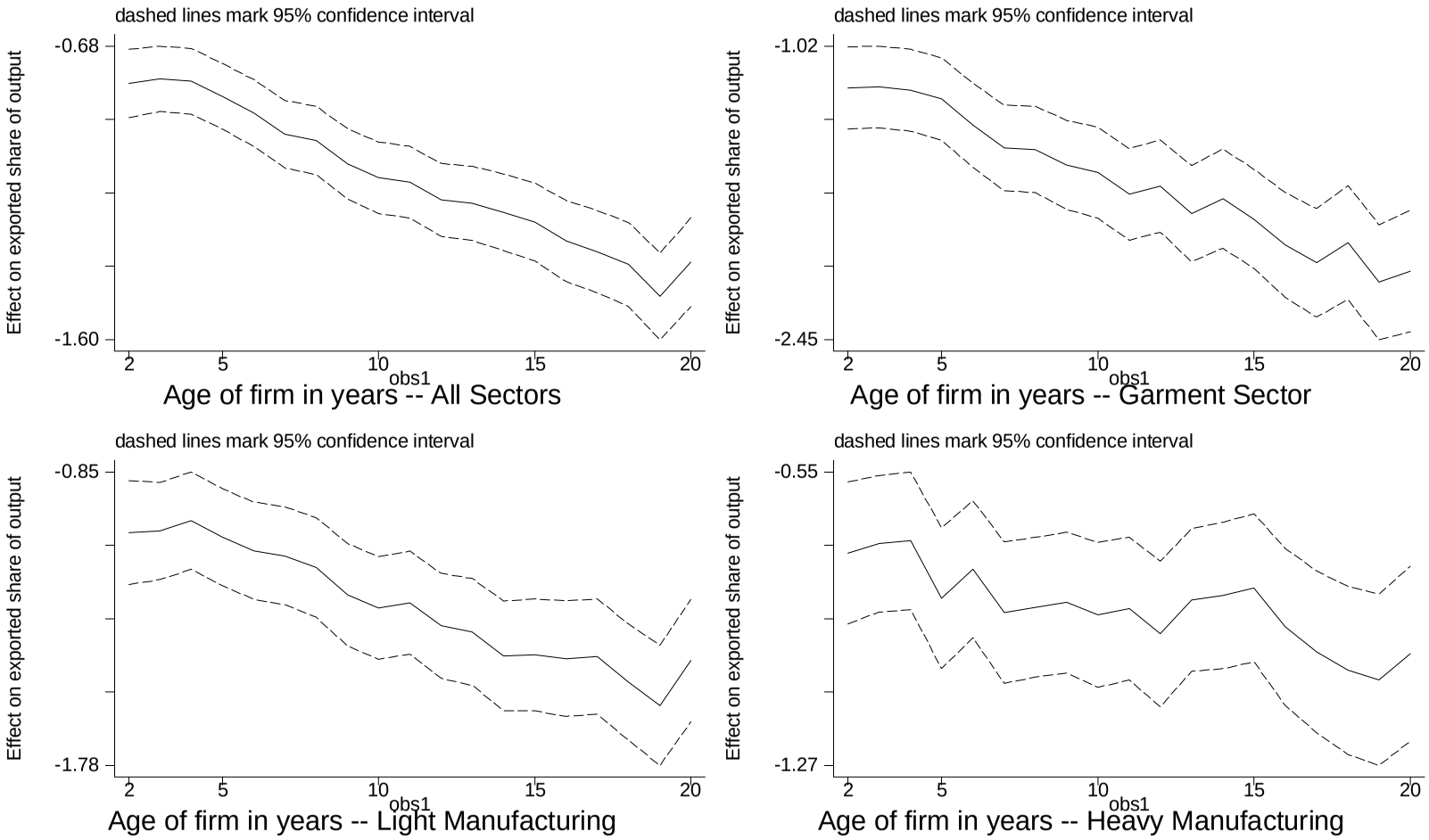
With year dummies and proximity effects

Figure 1. Firm age and exported share of output



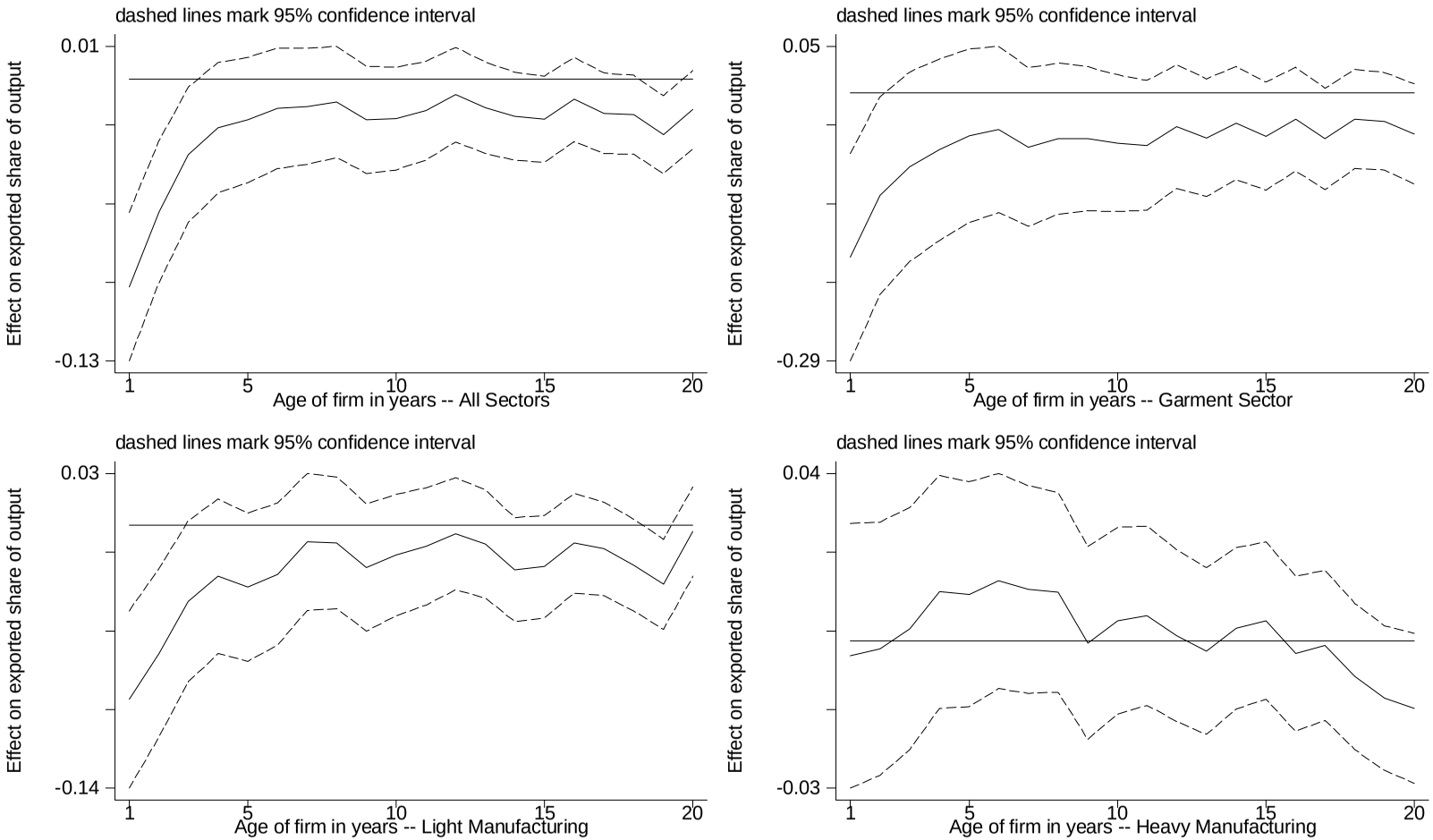
With year dummies, proximity effects, and firm characteristics

Figure 2. Firm age and exported share of output



With year, proximity effects, firm characteristics, and size

Figure 3. Firm age and exported share of output



With year dummies, proximity effects, and firm-level fixed effects

Figure 4. Firm age and exported share of output

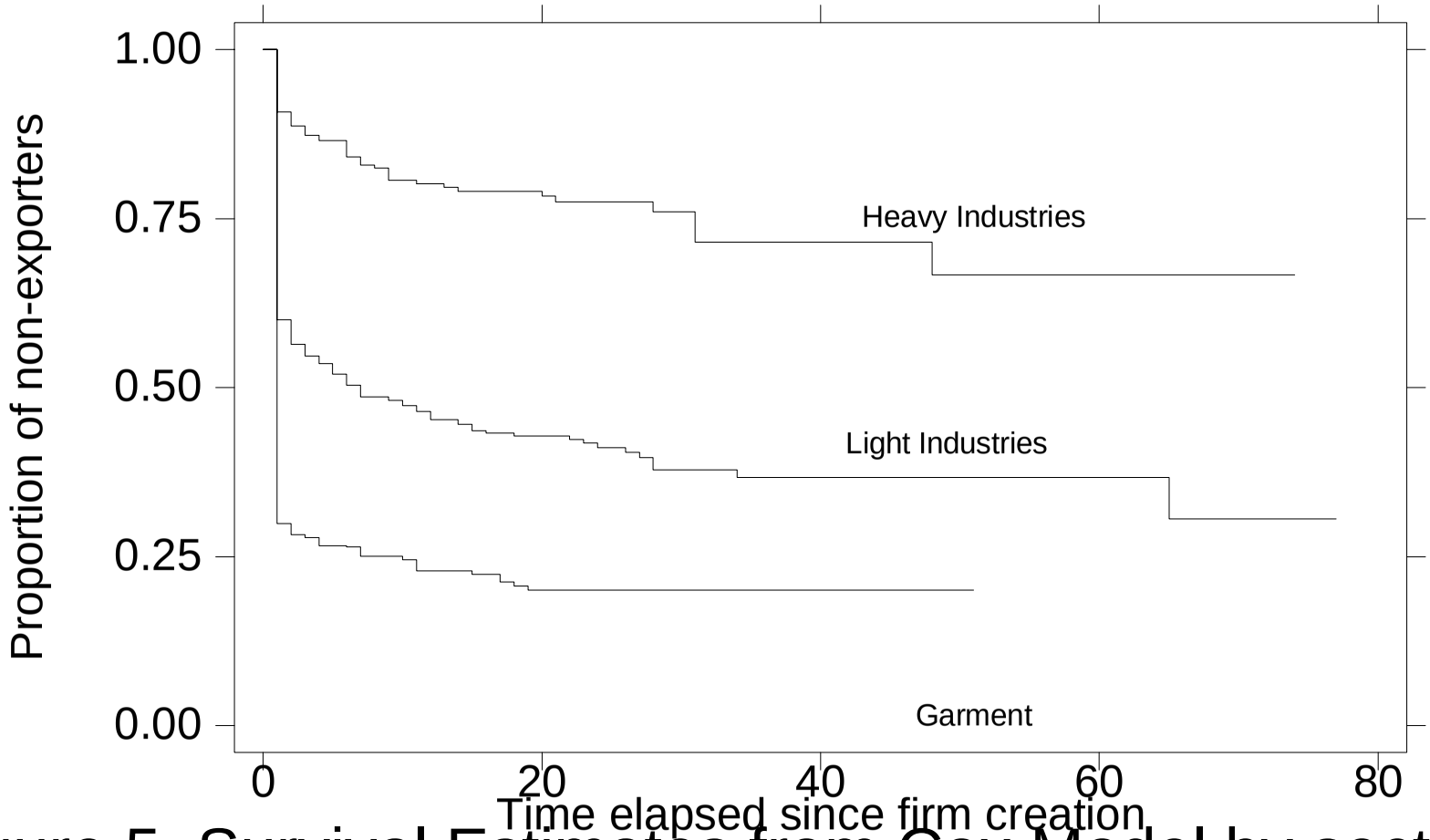


Figure 5. Survival Estimates from Cox Model by sector