Determinants of export behaviour in Argentina during the 1990s: an empirical approach based on firm data

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Abstract

This paper examines firms' export decisions in Argentina during the nineties. Using a sample of about 1600 Argentinean industrial firms for four years (1992, 1996, 1998 and 2001), we test on the one hand which factors impact on the probability of entry foreign markets and, on the other hand, which factors explain that a firm is able to export in many periods, in some periods or never. We thus estimate two types of non-linear discrete regression models, a Probit and a Dynamic Multinomial models, in order to explore those two issues respectively. We find evidence suggesting that export experience is a key explicative variable for export decision (in line with the sunk costs model). Likewise, firm-specific characteristics and technological strategies are significant to explain not only export decision but also export behaviour along the decade. In particular, we find that size and access to financial markets, as well as R&D investments and product differentiation, play a key role on firms' export capacity.

Keywords: Firm's Export Status, Probit and Multinomial Models, Argentina.
JEL Classification: C35, F14, O54

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1 Introduction

During the nineties, Argentina implemented major macro-economic reforms. Some of them –the trade and current account liberalization and the establishment of a currency board– had a significant impact on the country's specialization pattern. Actually, they intensify market competition and modify relative prices what, through a real exchange appreciation, had a negative impact on profitability of firms belonging to tradable sectors. In this macroeconomic context, this paper investigates the determinants of export performance of those tradable sectors. We focus on the key elements that allow firms to enter foreign markets and to *keep on* exporting once they have entered them.

To begin with, we will study the factors that increase the probability of entry into exporting. We will particularly test the role of prior experience in present firm's export capacity. The underlying assumption is that firms have to pay an entry cost to enter foreign markets, like the creation of a widespread distribution network or the improvement of product quality, among others. These intuitions are in line with the theoretical model put forward by Baldwin & Krugman (1989), Dixit (1989) and Krugman (1989). They define *sunk* costs as the expenditures that nonexporters must incur in to enter foreign markets, and which salient feature is their irreversibility. As the authors point out, this assumption implies that transitory policies or situations (for instance, a currency appreciation) can have permanent consequences on the economy, a phenomenon known as hysteresis. Furthermore, in an uncertainty context, this impact can be even larger since a firm will follow a "wait and see" strategy, rather than undertake those costs to entry foreign markets without having a clue about the exchange rate in the following periods (Krugman 1989, page 47). As a corollary, the presence of sunk costs in a volatile environment –particularly characterized by a large currency appreciation, like Argentina during the nineties– it is more likely to find a rather conservative firm behaviour (i.e."wait and see") than an aggressive foreign market penetration.[1]

The sunk cost model has been empirically tested by, among others, Roberts & Tybout (1997), Bernard & Wagner (1998) and Bernard & Jensen (2004) for Colombian, German and American firms, respectively. Those authors aim at quantifying the impact of entry-exit costs on the probability of entry into exporting.[2] The empirical findings emphasize the relevance of both, the export experience and a set of firm specific features, to explain firm ability to export, verifying the relevance of the sunk cost model to explain firms' export status. Interestingly as well, Roberts & Tybout (1997, page 549) find some

[1] As Roberts & Tybout (1997, page 560) summarize "the combination of sunk cost and uncertainty about future market conditions can create an option value to waiting".

[2] For instance, Bernard & Jensen (2004) find for German firms that being a current exporter increase by 50 % the probability of exporting in the next period.

evidence of an *asymmetric* impact of exchange rate on the quantity of firms exporting: the response is stronger during the phase of currency appreciation than during depreciation. A similar outcome is presented in a theoretical model by Amable, Henry, Lordon & Topol (1995), where firms' heterogeneity provoke a strong exchange-rate hysteresis phenomenon.

Concerning firms' characteristics that explained export status, Bernard & Jensen (2004) find size, age, capital ownership structure and productivity among the most significant. They conclude that the "key unanswered question is how firms obtain the characteristics that allow them to easily enter to the export market" (Bernard & Jensen 2004, page 569). We thus argue that one of those key element to be taken into account is the firms' access to the financial system in order to invest, to innovate and to be able to incur in sunk costs to entry into exporting. We will then explicitly include in a sunk-costs export decision model some variables that represent firms' access to financing.[3]

Actually, a vast literature linking finance with economic growth and international trade has been developed in the last ten years. Seminal works can be found in King & Levine (1993), who explicitly follow old Schumpeterian ideas, as well as in Rajan & Zingales (1998)'s article. As suggested by Rajan & Zingales (1998), and empirically revisited by Beck (2003) later on , the access to financial markets can be thought as a comparative advantage in industries that rely more on external finance. As we discuss below, exporters must incur in important costs to entry foreign markets, and therefore countries with a well developed financial system will enjoy from some comparative advantage for export activities. They find that widespread financial services have a significant effect on the *quantity* of exporting firms, more than on the size of existing exporters (Rajan & Zingales 1998, page 579). Therefore, financial development would have a rather extensive effect : on the quantity of new firms on the one side, and on their capacity of boosting new products, new processes and/or new markets, somewhat in a Schumpeterian vane.[4]

In the same line, Fanelli & Keifman (2002, pages:39-40) underline that for countries with a weak financial system one could expect export activity being highly concentrated in big and well established companies. As it is the case in Argentina, they point out that the access to financial markets, besides firms' size and age, is a relevant factor determining firms' export ability and thus they conclude that having a well developed financial system

[3]This intuition reachs some general results from Wilson & Otsuki (2004)'s report about the factors that encourage business activities in developing countries. In a set of descriptive statistics, they find for Argentinean firms that market and other distribution costs are very important reason preventing exports, as well as the difficulty faced by firms to obtain credits.

[4]In Schumpeter's words: "Emphasis upon the significance of credit is to be found in every textbook. That the structure of modern industry could not have been erected without it [...] even the most conservative orthodoxy of the theorists cannot well deny. Nor the connection established here between credit and the carrying out of innovations [...] For it is as clear *a priori* as it is established historically that credit is primarly necessary to new combinations" (Schumpeter 1961, page 70).

can be thought as a key element of a country non-price competitiveness.

Likewise, Becker & Greenberg (2005) propose a particular channel to link access to financial system with international trade, through the role that some particular type of investments has on firms' export capacity – expenditures that can be viewed as sunk cost. Export performance relies on a particular type of investment, usually intangible and with long-time gestation. This makes them by nature more difficult to be financed by external sources in a weak financial system. Among those investments enumerated by the authors, we will pay particular attention to R&D expenditures, product differentiation and innovation on patents. On the other hand, Beck (2002) develop a theoretical model that underlines the role of increasing returns to explain why finance matters for export capacity and can determine countries' trade balance. His main conclusion is that financial development will enhance capital investment in sectors with higher scale economies, commonly assumed to be manufactured production, and thus "economies with a better-developed financial sector therefore have a comparative advantage in sectors with high scale economies [manufactured goods] and, all else equal, are net exporters of them" (Beck 2002, page 129).

Finally, we consider the role of technological and innovation strategies. Argentinean firms' responded differently to the recent liberalised environment of the nineties, and Katz & Kosacoff (1998) and Kosacoff (2000) identified two kinds of reaction: "offensive restructuration" and "defensive strategies" depending on which was firm's response to cope with this new environment. Productivity gains from the former group are triggered not only by higher quality of imported capital goods but also (and mainly) by an active technological and innovative behaviour, training of the labour force, higher R&D investment, etc. By contrast, productivity gains from "defensive" firms are mainly based on import of inputs and capital goods (sometimes even on imports of final goods to be directly sold in the domestic market), as well as on capital-labour substitution[5] (Katz 2000, Kosacoff 2000). Besides this group remains far away from the international state of art technological frontier. We use those definitions, which implies different technological strategies, to evaluate the role of firms' technological behaviour on their export performance.

In sum, our purpose is to asses the impact of prior export experience, access to financial markets and technological strategies (among other plant-specific characteristics) on industrial firms' export behaviour in Argentina during the 1990s. We estimate an export equation using non-linear discrete regression models. Our empirical work uses a firm database of about 1600 Argentinean industrial firms for the years 1992, 1996, 1998 and 2001, extracted from the National Survey of the Technological Behaviour of

[5]Mostly in favor of capital, which became the cheapest choice thanks to the real currency appreciation.

Argentine Industrial Firms (*ECT: Encuesta Nacional sobre la Conducta Tecnológica de las Empresas Industriales Argentinas*). We argue that although traditional factors like size and age can be relevant to explain export decision, firms' access to financial markets is a key element that is likely to constrain or allow the persistence of exports activity through different channels we will address further in this paper. To our knowledge, this is the first time that finance related variables are linked with international trade in an empirical work at a firm-level, since all the literature enumerated here deals empirically with this issue at macro-economic or industrial level.[6]

As we pointed out at the beginning, we are also interested in extending the analysis in order to test which factors explain that a firm is able to export in many periods, in some periods or never exports. A CEP (2003)'s report put in evidence that firms in Argentina during the nineties can hardly remain into foreign markets and that they rather show an erratic export behaviour. Actually, over all of the firms that exported for the first time between 1995-97, only 10 % of firms kept on selling to foreign markets, while about 40 % have exported in a discontinued way and 50 % did not exporte again. In this paper we actually define five categories of export statusin order to describe those different export behaviour and to go further in the analysis, detecting the variables that enable firms not only to enter but to stay in foreign markets, as well as the variables that keep them away from this possibility. We use then a dynamic multinomial logit model to tackle this topic, since it allows us to explain the complex set of firms' reaction related to trade strategies with one estimation method.

The remainder of the paper is organized as follows. Section 2 describes the database and provides some descriptive statistics. Section 3 discusses the econometric models and their relative methodological issues, while in the following section we examine estimations' outcomes. Finally we conclude in section 5.

2 Database and descriptive statistics

2.1 The Data

We use a firm database of about 1600 Argentinean industrial firms for the years 1992, 1996, 1998 and 2001, extracted from the two National Surveys of the Technological Behaviour of Argentine Industrial Firms.[7] The sample is relatively high representative of

[6]Besides, as we present in the following paragraphe, using a multinomial logit model allow us to consider the factors that impact not only on export decision at each period but also on firms' export behaviour (which is a quite innovative approach in this topic).

[7]This survey has been carried out by the National Bureau of Statistics (INDEC), the Secretary for Science and Technology, the Institute for Social Studies of Science (IEC) of Quilmes University, and the Institute of Industry of the General Sarmiento National University.

aggregate Argentinean manufacturers firms: it concentrates approximately 30% of the manufacture gross product value (GPV), as well as 40% of aggregate manufacturer exports and 30% of industrial labour force. It is worth noting that the survey is naturally biased towards the better performance firms since only survival are interviewed. Furthermore, as we work with firms that are in operation along the whole period, we restrict even more our sample in this same sense. We acknowledge that this can reduce the representativeness of the argentinean population firms, though its macro-economic weight is high enough to teach valuable lessons about firms export behaviour in Argentina.

The first survey contains data from 1639 firms for the years 1992 and 1996, while the second survey provides information of 1668 firms for 1998 and 2001. In order to be able to follow firms' behaviour all over the period 1992-2001, we just keep those firms that are present with positive sales on both surveys. The sample is then reduced to 790 firms for the four years, from which around one third have never exported and each year we observe between 40% and 56% of firms that do not export (see table 2).

Finally, the data are expressed in real terms, deflated depending the case by the argentinean wholesale price index (IPP), by the imported price index (differenciated by imported capital goods and imported inputs) and by a sectorial price index built up from the evolution of the producer price index (IPIM). All those index are published by the National Bureau of Statistics (INDEC-Ministry of Finance).

2.2 Descriptive statistics

First of all, we split up the sample into sub-samples according to the export status, the size and the age. We will use two definitions of the export status in the estimations.[8] For the probit model, we divide the firms between exporters and non-exporters, while for the multinomial logit, we define five categories of export status: *never* for the firms that do not export along the decade (none of years in the survey); *always* for those firms that exported during the whole period (every year in the survey); *new* exporting are firms that started to export in 1996 or 1998 and keep on exporting during the remaining years[9]; *nomore* define those that already exported before the nineties but that stopped exporting; and finally *erratic* are firms present in the four periods, which show an inconstant exporting pattern and that are basically those do not belong to any of the previous categories.

[8]See table 1 in the appendix for further details on all variables' definition.

[9]New exporting firms increased their weight over the decade: they just represented 3-5% of total exports in 1996 and 1998, while they concentrate 13% in 2001. Though, their total sales remain quite stable, representing about 12% of aggregate total sales in the sample. Actually, total sales of all categories do not change much over the whole period.

The sample is also divided by size (*big, median* and *small*[10]) and age (*old, med* and *young*). The first sub-division is based on firms' total sales, following the criteria used by the Ministry of Finance for the *Censo Económico* de 1993 : sales of *small* firms are inferior to $7.5 millions, *big* firms have a turnover higher than $18 millions, and *median* firms are between those two limits. The age criteria is defined according to the number of years elapsed after the firm setting up: *old* firms are those that started to produce before 1960, *med* define firms founded between 1960 and 1980 and *young* firms were created between 1980 and 1992 (cf. table 3).

Table 4 reports information about the distribution of sales and exports. Taking sales distribution as a benchmark, we observe that not only export are more concentrated than sales on the top centiles, but also the level of concentration increases over the time. In fact, the first centile explains 35-40 % of total exports in the first half of the decade and 52-54 % in the second half (comparing with 23-25 % and 27-28 % respectively for sales distribution). Besides, 3 % of firms represents 58-60 % of sales abroad between 1992-1996 and more than 73% in 2001.

Table 5 displays the relation between the size and export status. As expected, over the group of firms that never exported (*never*), 76 % are *small* firms and over those that stopped exporting during the nineties (*nomore*) *small* firms' proportion diminishes to 44 %; instead, more than 50 % of firms that were always present in foreign markets (*always*) are *big*. We also find some unexpected high presence of *big* firms (33 %) in the *nomore* group. And, in the new exporters category (*new*), we observe similar ratios for *big* and *small* firms (37 %), both higher than *median* size firms.

Some interesting features are reported in table 6 concerning the link between age and export status. As one could expect, *old* and *med* firms represent the hugest part of the long-run exporters (always) –around 80 %– while both *old* and *med* concentrate just 14 % of those firms that cease to export during the nineties (*nomore*). On the other hand, 48 % of new exporting firms (*new*) are *young*.

In respect to productivity performance, as expected, firms that *never* exported have the lowest productivity level and those that *always* exported the highest. Looking more in detail, we could broadly divide export status into two groups: lower productivity for *never*, *erratic* and *nomore* firms, while *always* and *new* clearly show a higher productivity level (cf. table 7). Similarly, this table reports higher productivity for *big* firms and lower for *small* ones. It is worth noting that for *small* firms the level is markedly lower than for those ones which *never* exported, and for *big* productivity is by far higher than confirmed exporters (*always*).

[10]We originally defined a sub-category of micro-firms, but given that they represent just 1 to 2 % of total sample, we decided to collapse them with small firms.

Finally, we have a look to a set of financial variables related to export status, size status and technological behaviour. Firstly, table 8 displays the weighted share of firms that face up to financial problems (to innovate) among different categories. Firms belonging to *always* and *new* groups seem to find more easily external sources of finance: each category show less than 10 % of positive answer for financial restriction and both categories together explain almost 50 % of firms that enjoy from a high access to bank system. By contrast, the rest of the firms faces deeper financial problems represented by a higher ratio of positive answer for the first question (between 20-30 % depending on the group) and a lower share for banking source of finance.

Secondly, the same shares computed for firm size reveal that, as expected, smaller firms face out higher financial limitations (representing 56 %). Surprisingly, the share of high bank access is similar for all three size categories. One could take into account that a portion of *small* firms belongs to *new* exporting category, which in a way represents those firms that managed to export and innovate and thus have an easier access to financial market. Lastly, we aim at analysing the relation between innovative and technological activities and finance. Over the totality of firms that have high R&D expenditures only 3.2 % face extremely financial problems to innovate and their access to financial system seems to be quite limited since only 9.4 % of those firms has a high access to banking source of finance.

3 Empirical Model and Econometric Issues

3.1 Probit Model

We study the factors which are commonly considered as the main determinants of firms' export capacity. We will estimate the following equation using a non-linear binary-variable model[11]:

$$Y_{i,t} = \begin{cases} 1 & \text{if } \beta\ Z_{it} \text{ - } (1 - Y_{t-1})\ C^{X}_{i,t-1} + \mu_t + \epsilon_{it} > 0 \\ 0 & \text{otherwise} \end{cases} \tag{1}$$

where $i = 1...790$ are the firms, $t = 1998$ and 2001are the years and Y_{t-1} is a dummy variable equal to 1 if the firm exported in the previous period (1996 and 1998, respec-

[11]The main drawback of estimating dichotomic dependent variables using OLS technique is that it would provide an inefficient estimation with not normal disturbances generating heteroscedasticity problems. Therefore, non linear models must be used (i.e. probit and logit models (Maddala 1983, page 14-5).

tively).[12] The vector Z_{it} represents observable differences in plant-specific characteristics, μ_t incorporates macroeconomic level shocks in export conditions and ϵ_{it} is a noise.

The purpose of the empirical work is to identify those firm-specific factors that have an impact on the probability of exporting. The vector thus include: size, age, capital ownership origin, productivity level, firm's access to financial markets[13], technological behaviour and three-digit ISIC code industry-dummies.[14] In order to deal with potential simultaneity problems, plant specific variables are lagged one period.

There are unobservable plant characteristics that can have an impact on export capacity and they are in general quite permanent along the time (at least for relatively short periods as in our case). Besides, another drawback arises from the assumption that initial export status conditions are exogenous. The characteristics of our sample complicates matters and could give rise to an overestimation of entry cost. Since we do not have the appropriate instruments and we assume that initial conditions are exogenous as Bernard & Wagner (1998, page 10) do. In respect to the overestimation of the sunk cost, as Bernard & Wagner (1998) and Bernard & Jensen (2004) point out, we can can calculate the linear probability regression which work as an upper bound of the sunk cost coefficient.

The model is estimated with Maximum-likelihood methodology. Basically, it finds the parameters that make the observed value most likely to be predicted by the model, what means that it maximises the probability of obtaining the sample we originally work with. Depending whether ϵ_{it} cumulative function follows a normal or a logistic distribution, we should use a probit or a logit model respectively. Although this function distribution must be assumed because it is not observable, Maddala (1983, page 24) points out that the cumulative normal and logistic distributions are quite similar and thus results from both models are likely to be very close.

We check whether the error term ϵ_{it} follows a normal law N (0, σ^2) or we have to deal with heteroscedasticity and influential cases problems. We use a set of test to assess

[12]We exclude from the estimations the first survey (1992 and 1996) since the variable representing financial restrictions only appears in the second questionnaire. Nevertheless, we include information of the first survey when we take the set of lag variables. Although we miss a considerable part of observations, we decided to work just with 1998 and 2001 in order to have a Y_{it} variable which length periods inbetween are more similar –i.e. 2 and 3 years, instead of 4 if we would have included 1996 on the estimations. Indeed, since we include export experience –i.e. export status lagged from one period– we would not include 1992 anyway. In an additional specification of the estimated equation we also include the second lag of the variables, leaving aside 1996 as well.

[13]Actually, as we describe in the appendix, it represents firms' financial restrictions *to innovate*. Given that we do not have a direct question about financial constraint to invest in a broadly sense, we use this answer as a proxy for financial problems.

[14]We collapse industry sector in five groups (food and tabacco; textile and leather; paper, wood and furniture; chemicals, metals and minerals; and machinery, capital goods and transport equipment) to avoid a too long list of independent variables.

the model's goodness of fit: we verify the joint significance of the variables, as well as whether all variables are orthogonal to each other (i.e. no correlated among them).

3.2 Multinomial Logit Model

Since we aim at studying not just firms export capacity in one period but their ability to remain in this market, we will also estimate a dynamic multinomial logit model (MNL). *Dynamic*, since we split firms in five categories related to their export status explained by their export behaviour along all the decade (in the four years of our sample); *multinomial*, because the dependent variable can take more than two values (five in our case: never, always, new, nomore and erratic).

The model we estimate is then:

$$xtatus_{ij} = \alpha_j + \beta_j Z_{ij,t} + \mu_t + \epsilon_{ij,t} \tag{2}$$

where i= 1....790, j= 1,2,3,4,5 correspond to the export status categories t= 1998 and 2001, $Z_{ij,t}$ is a vector of plant specific characteristics, μ_t incorporates macroeconomic level shocks in export status and $\epsilon_{ij,t}$ is a noise.

One category is chosen as the reference and then we will estimate the probability of belonging to each group normalized by the probability of belonging to the reference category (in our case category 2: always). Thus, the coefficients resulting from the estimations will represent the effect of independent variables on the probability of belonging to the estimated category in relation with the reference category.

More precisely:

$$ln\Omega_{j|2} = \alpha_j + \beta_{j|2} Z_{ij,t} + \mu_t + \epsilon_{ij,t} \tag{3}$$

where j= 1,3,4 and 5 correspond to the export status categories (excluding the base category 2), $\Omega_{j|2}$=[proba($xstatus_j$)/ proba($xstatus_2$)], $\beta_{j|2}$ are the odds ratios. We will then estimate four equations –and not five– since export category 2 (*always*) is used to normalize the others.

Like in the previous case, maximum-likelihood methods are required to estimate the model. We carry out robust estimations. A set of tests are run in order to verify the goodness of fit measures of our model. Two Wald tests allow us first to evaluate the regressors' significant across categories (i.e. the significance of each regressors in all of four estimations) and second to test whether the regressors are different across categories (i.e. or some categories can be collapsed). Finally, the independence of irrelevant alternatives (IIA) assumption must be satisfied, which postulates that odds are unaltered with the addition or deletion of a particular category.

4 Econometric Results

4.1 Probit Model Estimations[15]

According to the log likelihood test, the following equation provides the most accurate specification of equation 1:

$$\begin{aligned} \text{proba}[Y_{i,t} = 1] = {} & \beta_1 Y_{i,t-1} + \beta_2 Size_{i,t-1} + \beta_3 ForeignK_{i,t} + \beta_5 Prody_{i,t-1} \\ & + \beta_6 FinPb_{it} + \beta_8 HighRnD_{i,t} + \beta_8 InnPatents_{i,t} \\ & + \beta_9 DuSect_{i,t} + \beta_{10} DuYear + \epsilon_{it} \end{aligned} \tag{4}$$

Table 9 summarizes the outcome of the probit model estimations.[16] The first and the second column display coefficients of the probit estimation and its marginal effect, respectively. Analyzing the results in terms of the odds ratios is not straightforward, thus we estimate the marginal effects of regressors, which compute the impact on the probability to exports of a one percentage increase in the independent variable evaluated at the means of the rest of the variables (or in the case of dummy variables, the change from 0 to 1). First of all, we confirm the existence of sunk cost to entry foreign markets since firms having exported in the previous period are almost 70 % more likely to export in the current year. Then, the size and the fact of having foreign capital participation both increase the probability of exporting[17]. Likewise, one main result of the estimation is the negative and significant impact of the variable that represents financial problems (marginal effect: 11.0 %). Firm's previous productivity performance has a positive and significant (at 1 %) impact on exports ability, though the coefficient seems to be low (because of the variable units: thousand of pesos per worker). Finally, our results confirm somewhat the hypothesis that link technological and innovative behaviour with export performance: those firms that invest the most in R&D and in intangibles –like patents– are more likely to export (i.e. both have positive and significant coefficients).

The fact that size is a continuous variable allows us to calculate the predicted probability of being exporter based on the parameters issued from model estimations. As we can see in figure 1, there is a positive relation between firms' size and their ability of being an exporter, all the rest of the variables computed at their mean values (dash lines represent

[15]It is worth noting that probit and logit models, as expected, furnish quite similars results: the predicted probabilities provided by both models are highly correlated (0.99 at 1 % of significance).

[16]We controlled using sectoral dummies, but we do not include the result on tables to make them easily readable.

[17]More precisely, a size increase of 1 % rises the probability of exporting by 6.2 % and having foreign capital participation rises this probability by 17 %.

the upper and lower limits of the confidence interval of the predicted probabilities).

We control for heterocesdacticity, but there is no sign of large residuals (see figure 2). In order to verify that there are not influential observations (that could biased our results), we run robust estimations as well, and again coefficients remain unchanged. Finally we run the collinearity diagnosis to check wether all the variables are orthogonal to each other and we have confirmation of non collinearity, what exclude one source of estimation's unsoundness. Likewise, the Wald test for joint significant for all the variables is rejected at 1%, thus all the variables all simultaneously significant.

In order to test the relevance of certain firm characteristics we compute the predicted probability of exporting whether the firm belongs to one of the two types of *ideal* firms we define (see table 10). On the one side, those firms that exported in the previous period, have foreign capital participation and do not face financial problems are 93 % likely to export in the current year (at 95 % confident), while for those firms that show the opposite characteristic the probability diminishes to 15 %. Clearly, if we add variables that have a positive impact on firms' export capacity, this shares will reach furthest values. For instance, if we add to the definition the level of R&D expenditures, the probability of exporting become 96 % and 10 % respectively. The same probability for an average firm is 65 %. In order to check whether export decision is mainly explained by export experience, we exclude the dummy variable for having exported in the previous period from the ideal types just defined. The first group of firms show a large predicted probability of exporting (82 %), while for the other this probability is reduced by 48 %. These latter percentages suggest that although having exported in the last period do not monopolize the explicative power of predicted probabilities, not exporting is a highly important factor to explain the absence in foreign markets in the present period.

Although our basic estimations so far follow equation 4, we include some other independent variables which results are displayed in table 11. Following Rajan & Zingales (1998) and Fanelli & Keifman (2002), one could expect that older firms are more likely to export, therefore we include firms' age as explanatory variable (results are given in column 1). Nevertheless, it is not the case and one explanation could be the potential collinearity between size and age variables. Besides, financial problems became non significant in this estimation.

Secondly, and following previous empirical work in this field, we add a second lag of export experience, in order to test wether there is an export persistence phenomenon. We verify that, although the coefficient is positive and significant, it declines over time. It is worth noting that in our sample the second lag of exports represents five or six years what means that the depreciation of the sunk cost over time is not as high as expected, and six years later export experience still matters to enter foreign markets. Actually the

marginal effect of having exported for the last time two periods ago is 11.4 %. The rest of the results remain unchanged. We check as well the impact of having exported in the first year of the sample (1992), independently whether the firm exported later on. This coefficient is not only positive and significant, but also relatively important, increasing the probability of being exporter by 16 %.

The last two columns of the table display the probit estimation results including the evolution of total labour force. As we mentioned in the introduction, a firms' response to the new liberalised macroeconomic context in Argentina was a "defensive" strategy, which main characteristic was that their productivity gains rely more on the contraction of the labour force than on a proactive technological and innovative strategy. We actually observe in this table that those firms that diminish the most the number of total employees in the first period are less likely to being exporter, and that total labour growth between 1992 and 1996 would have a positive impact on the probability to sell abroad (the coefficient is positive althoug not significant). We acknowledge that this is just a beginning and that those ideas deserve a deeper analysis.

The last set of probit estimations investigates the link between finance and technological expenditures. Actually, as we just verified, active innovative behaviour has a positive impact on export behaviour, though those investments are usually more financially constrained and then they are rather financed by internal funds.[18] We test this proposition and table 12 displays the preliminary results. We include in the estimations the size and two financial variables: facing financial restrictions and using mainly retained earnings to finance innovations. The size is positive and highly significant in all cases , while financial variables are less straightforward readable. On the one side, facing financial limitations has a negative and significant coefficient for R&D expenditures and product differentiation. Likewise, those firms who highly use retained earnings to innovate are more likely to invest in R&D and patents, while this variable do not seem to impact on product differentiation. However, the fact of carrying out product differentiation in the previous period has a positive impact in both R&D expenditures and patents' innovation (though significant just for the first dependent variable).

The overall picture of export decision tells us that former export experience matters to export (and, as expected, its impact decreases along the time); and that big firms, owned by foreign investors and without financial restrictions are more likely to enter foreign markets. Likewise, productivity level is always significant and positive. Technological and innovative behaviour (represented by R&D expenditures and patent innovations) is likely to increase firms' probability of exporting. Finally, reducing labour force does not

[18]Becker & Greenberg (2005) particularly signal the relevance of R&D expenditures, intangtibles investment (like patents) and product differentiation to encourage exports.

seem to be a positive strategy to enhance export performance.

4.2 Multinomial Logit Model Estimations

After studying the role of export experience on firms' actual ability to export, we investigate which factors determine whether a firm is able to succesfully keep on selling abroad. We are particularly interested on potential effect that the access to financial markets can have. We estimate then the following equation:

$$\begin{aligned}\Omega_{j|2} = \beta_{1j|2}\, Y_{i,t-1} + \beta_{2j|2}\, Size_{i,t-1} + \beta_{3j|2}\, ForeignK_{i,t} + \beta_{4j|2}\, Age_{i,t-1} + \beta_{5j|2}\, Prody_{i,t-1} \\ + \beta_{6j|2}\, FinPb_{it} + \beta_{7j|2} FinBk_{i,t-1} + \beta_{8j|2}\, DiffProd_{i,t} + \beta_{9j|2}\, DuSect_{i,j} \\ + \beta_{10j|2}\, DuYear + \epsilon_{ij,t}\end{aligned} \tag{5}$$

where j= 1,3,4,5 export status categories, i=1...790, t=1998 and 2001, $\beta_{j|2}$ are the odds ratios and $\Omega_{j|2}$=[proba($xstatus_j$)/ proba($xstatus_2$)] .

We estimate equation 5 using a multinomial logit model, which results are summarised in table 13. The first four columns display the odds ratios for each category (*never, new, nomore* and *erratic* respectively), while the second part of the table reports the marginal effects (i.e. the effect of a one percentage increase in the independent variable evaluated at the means of the rest of the variables –or in the case of dummy variables, the change from 0 to 1– on the probability of belonging to each category).

First of all, we confirm that size is a relevant variable to explain firms' export behaviour. The coefficient is negative and significant for all export categories (unless for *nomore*), with a higher impact for those firms that *never* exported. More precisely marginal effect can be read in the following way: having 1 % more of total labour force in the last period decreases the probability of being in the category *never* by 0.14 %. Indeed, age plays a similar role on export: all odds ratios are negative comparing with those firms that *always* exported. It is worth noting that in this case, the most significant coefficients are those for *never* and *new*, something one could expected given that *nomore* firms have already exported and thus at a certain moment the firm was able to enter foreign markets. Again, the ownership structure is a relevant factor and has a negative relationship with the probability of belonging to all categories comparing with *always*, particular remarkable for *never*: the fact of having foreing capital participation decreases the probability of belonging to the first category by 26 %. The last plant-characteristic we test is the productivity level that is significant and negative for the first *never* and the last category *erratic*.

The last three variables explore on the one side financial factors, and on the other side the fact of having implemented a product differentiation. The latter is particularly significant for the first and the last categories and it can be read as follows: firms that differentiated their products have 73% less chance of belonging to *never* exporting firm category. It is interesting to note that although non significant, this variable has a positive coefficient for *new* exporting firms. Finally, we can see that the fact of having access to financial services has a positive impact on export ability: facing financial limitations to innovate increases the probability of exit from foreign markets (*nomore*), while none of the categories in the table enjoy from high levels of banking finance. The fact that the coefficient of financial problems is negative (non significant though) for *new* could be interpreted as a sign that this group actually succeeded in selling abroad and thus are those firms that overcome several barriers, among them financial restrictions.

The results presented so far define *always* as a base category. However, it is interesting to test whether results hold with alternative base categories as well. Therefore, in order to gain in robustness, we estimate the same multinomial logit model using categories *never* and *new* as the reference respectively. The coefficients are reported in table 17. As expected, plant characteristics as size, age and foreign ownership have positive and significant coefficients comparing with *never* (first half of the table), while comparing with *new* exporters those characteristics have a positive and significant effect for *always*, negative and significant for *never* and non significant for the remaining categories (second half of the table). Productivity variable remains significant and negative comparing with *never* (unless for *erratic*), while significant and negative in the second part of table for *never* and *erratic*. Product differentiation shows a very interesting outcome: comparing with *never*, we observe a positive and significant coefficient for *always* and *new*, while when the base category is *new*, this coefficient is negative for all categories (although non significant for *always*, what actually is expected). Regarding financial factors, we obtained interesting results as well. In the first half of the table *never* are evidently those firms with the higher financial restriction unless for the case of *nomore*, what we interpreted as a signal that those firms who exported and were forced to quit this activity are subject to stronger financial constraints to innovate than those who actually never get into foreign market. Indeed, in the second half of the table we confirm that financial restrictions are more significant and important for *nomore* than for *never*. Lastly, only for *always* high access to bank finance is significant though less than in the other estimations.

A rather low pseudo-R^2 does not mean that the model is mispecificated to predict observed responses (Maddala 1983, page 38)[19]. We run then a set of tests to assess

[19]Basically, the problem is that the correlation between a predicted probability and a binary response that takes the values 1 or 0 might provide a relatively low R^2.

the overall fit of the predicted probabilities of our estimated model with the observed firms' export behaviour. First of all, we test the joint significance of the variables and we observe that all the regressors are significant at 1 % unless for high banking access that is at 5 % (see table 14). Secondly, we test whether the coefficients are different across categories in order to be sure that categories are well defined and thus they can not be collapsed between them. We reject the null hypothesis that two categories can be combine in all cases at 1 %, unless for categories 4 and 5 where the rejection is at 5 % (see table 15). We finally need to test the independence of irrelevant alternatives (IIA) assumption since all the estimation is built up on it. This hypothesis postulates that results are not altered when we add or delete one particular category. Basically the test will compare the outcome of table 13 with those obtained excluding successively one category. The rejection of H_0 implies that the IIA assumption is satisfied and then the estimated model is appropriate. This is actually the case as can be seen in table 16.

Based on the estimations of equation 5, figure 3 reports some interesting plots that link firms' size and export status, divided between firms that face financial problems (solid line) and firms do not (dash line). While for *never* and *always* categories, the fact of facing financial problems does not make any difference in their negative and positive relation respectively, for *new* and *nomore* this relation is likely to show a gap whether the firm is subject to financial restrictions or not. One could think that for those firms that *never* exported, having financial constraints to innovate is rather a secondary problem among others and, actually, this coefficient is non significant in the regression displayed in table 17. Likewise, firms that export since a long time (*always*) are likely to be those with easier access to financial system, and then it would not be an element to make a distinction among them (again, we observe in table 17 that this coefficient is not significant for this category). By contrast, having financial problems increases the probability of belonging to *nomore* category (comparing to those firms without this financial constraints) and after a certain threshold the relation is stable. And for *new* exporters the relation is in the other way around: firms with financial problems have less probability of entering in foreign markets. Although the probability of being new exporters increases with the size until a certain threshold and start to diminish later on.

In order to gain in robustness we estimate equation 5 collapsing categories 4 and 5, since as table 15 displays, their coefficients are different among them at 5 and not 1 % of significance. As we can see in table 18 most of the results hold with this new categorization, with the only exception of financial problems variable that although with the expected signs become non significant. We test again wether the new categories are differentiated among them as well as the IIA assumption. Results validate the new model estimation, though in the sake of simplicity we do not include the table.

Finally, following the preliminary results from the previous subsection, we study the impact of "defensive" strategy on export status (as before, represented by total labour contraction in 1992-1996 period). In the first part of table 19 we run the basic model adding a variable that stands for total labour growth. Its coefficient is actually positive and significant for *new* exporting while negative and significant for *nomore*, what could at a first glance suggests that productivity gains which only rely on labour contraction are not likely to enhance export activity. Remaining coefficients are virtually unchanged (compared with the first estimation). In the second part of the table, we add a dummy for those firms that diminish the most total labour force and we observe a negative coefficient (significant at 10 %) for *new* firms, although non significant for the rest of the categories. Again, further research would shed more light on this debate.

To sum up, some plant-specific characteristics explain export status along the decade, in particular size, age, foreign capital participation and the access to financial markets. Once more, productivity is relevant to explain failure on entering and remaining in foreign markets, as well as product differentiation. Again, defensive strategies are not likely to enhance export behaviour.

5 Conclusion

This paper investigates the export behaviour of Argentinean firms during the 1990s. Using a four-period sample of 790 firms, we assess two issues: i- the factors determining firms' capacity to enter foreign markets; and ii- whether this faculty is persistent over period. Our empirical work is based on two types of binary variable models and it pays particular attention to the role of sunk costs, financial factors and innovation strategies on export status. On the one side, we estimate a probit model to explore which are the factors allowing firms to sell in foreign markets, and for this we split up the sample between exporters an non-exporters at each period. On the other side, we use a dynamic multinomial logit model to test which elements explain why a firm is able not only to enter foreign markets but also to stay (as well as those factors inhibiting firms from exporting). To estimate this model, the firms' export status is defined by five different categories (*always*, *never*, *new*, *nomore* and *erratic*) depending on whether firms have exported during each of the four periods, in none of them or just in some of them –that is taken into account firms' export behaviour along the whole decade.

The overall picture of probit models is that prior export experience plays a key role in firm's present export capacity, confirming the presence of sunk cost to enter foreign markets. In addition, some particular plant-specific characteristics (like size, capital ownership, productivity level, or the absence of financial problems to innovate) as well as

some technological strategies are likely to increase the probability of exporting. It is worth noting that our results are robust and hold using alternative econometric techniques and tests. We also find some results suggesting that financial variables can have an indirect impact on exporting decision through technological and innovative behaviour, since those types of investment rely more on retained earning funds.

The dynamic multinomial logit model allows us to confirm that size, age, productivity performance and financial factors contribute to explain firms capacity to enter, stay and exit from foreign markets. Differentiated products, that can be read as a non-price competitiveness element, is also a significant factor that explains firms' export status. Some preliminary results casts doubts about the efficacy of a labour force-contraction as a strategy to trigger gains in productivity and then an increase in export capacity.

Although some results deserve further research, we want to underline some interesting findings about the role that financial development have on firms' success in exporting. Our empirical work suggests that firms' access to financial markets can have not only a direct impact on export decisions but also an indirect one, through its effects on innovation and technological investment. Those investments often need large amount of resources, hence they can be boosted by a wider firms' access to finance. Likewise, we prove that size is a relevant characteristic to explain export capacity. Since financial access can facilitate firms' growth (not just in a marginal but in a significant discrete way), this can be an additional indirect channel by which financial development can affect firms' export status.[20] In short, we address several channels by which availability of finance impacts directly and indirectly firms' export behaviour. This confirms the idea, already mentioned in the introduction, that a weak financial system should be understood as a deteriorated non-price competitiveness determinant of a country.

Some of the microeconomic mechanisms emphasized so far become even more relevant if we consider their macroeconomic scope. For instance, in the presence of export sunk costs, a currency appreciation can have negative and long lasting effects on a country's productive structure and trade pattern. As a consequence, export supply will remain permanently damaged because the following phase do not allow to completely recover export capacity lost during the appreciation phase. In other words, the outcome of this empirical work suggest the necessity of a micro-macro analysis, which evaluates on the one hand firms' responses to a new macroeconomic context, and on the other, the macroeconomic consequences of a particular microeconomic behaviour. Argentinean history of chronic balance of payments crises (associated to trade deficits and large external debt) boosts up the relevance of this fields.

[20]In addition, there is a vast literature that proves the negative link existing between size and access to financial system for a firm –i.e. small and medium firms are more financially constraints than bigger ones. This reinforce the impact that weak financial systems can have on firms' export performance.

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6 Appendix: Tables and Figures[21]

Table 1: Variables

Name	Definition
Y_i	Dummy=1 if exports>0 in t
Y_i in t-1	Dummy=1 if exports>0 in t-1
Y_i in t-2	Dummy=1 if exports=0 in t-1 and exports>0 in t-2
Y_i 1992	Dummy=1 if exports>0 in 1992
Size	Logarithme of Total Labour
Age	Years elapsed after firm creation
ForeignK	Dummy variable=1 if the firm has foreign capital participation
Independent	Dummy variable=1 if the firm does not belong to a conglomerate
Prody	Output per worker
FinPb	Dummy=1 if the firm does not invest because of financial restrictions
HighRnD	Dummy=1 for those firms in the top three deciles of R&D expenditures
InnPatents	Dummy=1 if the firm undergoes innovation in patents
gTotLab	Growth rate of total labour force between 1992 and 1996
LowTotLab	Dummy=1 for those firms in the bottom three deciles of gTotLab
DiffProd	Dummy=1 if the firm sells a product differentiated and new for local of foreign markets
HighOwnFinance	Dummy=1 for those firms in the top three deciles of firms that finance innovations with retained earnings
HighBankFinance	Dummy=1 for those firms in the top three deciles of firms that finance innovations with bank funds
Export Status	
1: *never*	If exports in 1992, 1996, 1998 and 2001=0
2: *always*	If exports in 1992, 1996, 1998 and 2001> 0
3: *new*	If exports in 1992=0, 1996=0, 1998> and 2001>0 or If exports in 1992=0 , 1996>0, 1998>0 and 2001>0
4: *nomore*	If exports in 1992>0, 1996=0 1998=0 and 2001=0 or If exports in 1992>0 , 1996>0, 1998=0 and 2001=0
5: *other*	If Exports status $\neq$ 1, 2, 3, 4

Table 2: Export Status 1992-2001(%)

xstatus					
Never	Always	New	Nomore	Erratic	
31.77	35.32	14.3	5.32	13.29	100
No Export			Export		
46.9			53.1		100

Table 3: Share of Firms by Size and by Age 1992-2001(%)

size			
Big	Median	Small	
30.6	21.8	47.7	100
age			
Old	Med	Young	
37.88	40.41	21.71	100

Table 4: Export and Sales Distribution (% of exports or sales over total)

Centiles	Exports			
	1992	1996	1998	2001
100	39.3	34.6	51.9	54.1
99-100	52.2	49.9	63.6	67.1
98-100	60.6	57.8	68.6	73.5
91-100	80.8	79.6	85.6	87.3
76-100	94.1	93.9	95.0	95.9
51-100	99.0	98.9	98.9	99.2
Centiles	Sales			
	1992	1996	1998	2001
100	24.9	23.0	27.4	28.4
99-100	36.0	35.0	41.2	42.2
98-100	43.6	42.8	49.1	50.2
91-100	67.3	68.3	70.7	72.9
76-100	84.4	84.4	84.4	84.4
51-100	95.0	95.6	96.0	96.9

Table 5: Export Status by Size (%)

Size	Export Status				
	never	*always*	*new*	*nomore*	*erratic*
Big	9.1	51.2	37.2	32.7	19.3
Median	15.0	26.1	25.4	23.2	21.4
Small	75.9	22.8	37.4	44.0	58.8
Total	100	100	100	100	100

Table 6: Export Status by Age (%)

Age	Statut exportateur					
	never	*always*	*new*	*nomore*	*erratic*	Total
Old	21.8	47.3	12.1	5.0	13.8	100
Med	35.7	31.8	13.3	5.9	13.3	100
Young	45.3	18.2	19.7	4.4	12.4	100

Table 7: Productivity Performance by Export Status 1992-2001 (thousand of $/worker)

xstatus	mean	median	Sd Deviation
Never	77,072	48,648	90,032
Always	143,744	94,840	238,690
New	138,153	84,867	230,568
Nomore	108,898	60,141	121,594
Erratic	91,983	68,508	83,373

Size	mean	median	Sd Deviation
Big	201,337	132,423	289,659
Median	106,716	79,767	101,606
Small	59,828	45,214	55,209
Total	113,038	72,150	181,293

Table 8: Financial Problems by Export Status and by Size 1992-2001(%)

xstatus	Financial Problems	High Bank Finance
Never	29.4	15.5
Always	9.5	26.9
New	9.6	20.6
Nomore	31.5	12.3
Erratic	20.0	24.7
Total	100	100

Size	Financial Problems	High Bank Finance
Big	17.1	33.1
Median	27.2	35.6
Small	55.7	21.2
Total	100	100

Table 9: Sunk Costs Model Estimations

	Probit	Marginal Effect	Linear Probability
Y t-1	2.054	0.691	0.659
	(0.102)***	(0.025)***	(0.025)***
Size t-1	0.166	0.062	0.034
	(0.041)***	(0.015)***	(0.008)***
ForeignK	0.469	0.161	0.069
	(0.158)***	(0.051)***	(0.022)***
Prody t-1	9.79E-07	3.64E-07	3.81E-08
	(0.000)***	(0.000)***	(0.000)
FinPb	-0.286	-0.11	-0.069
	(0.143)**	(0.057)*	(0.031)**
HighRnD	0.206	0.077	0.040
	(0.098)**	(0.036)**	(0.020)*
InnPatents	0.600	0.195	0.083
	(0.223)***	(0.058)***	(0.030)***
Observations	1304		1304
Pseudo R-squared	0.480		0.560
Joint Significance	554.57		
	0.000		

Note: Standard errors appear in parentheses. ***: Significant at 1%. **: Significant at 5%. *: Significant at 10%

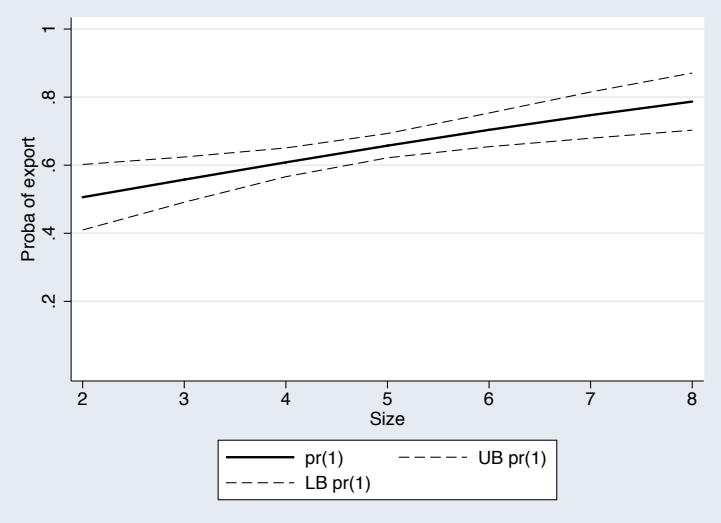

Figure 1: Predicted Probability of Exporting by Size

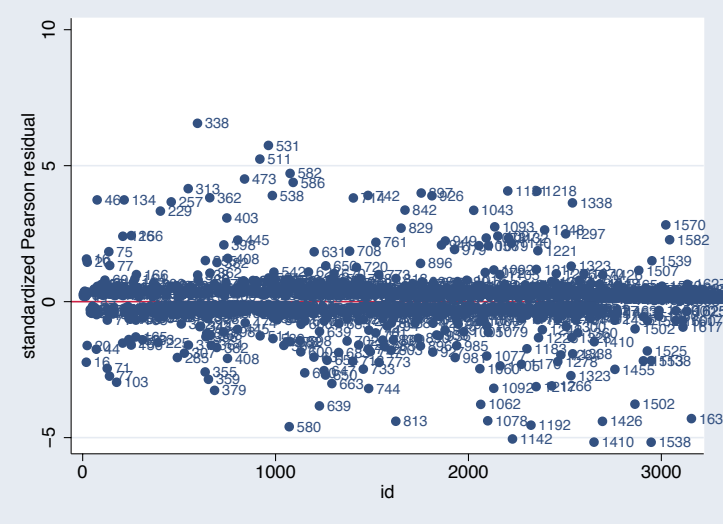

Figure 2: Pearson Residuals by firms, based on the Sunk Costs Model Estimation

Table 10: Predicted Probabilities for *Ideal* Types of Firms

Types of firms	Predicted Probability of Exporting (95% CI)
Export in t-1, Foreign, No Financial Problem to innovate	0.93 [0.88, 0.97]
No Export in t-1, No Foreign, Financial Problem to innovate	0.15 [0.08, 0.22]
Export in t-1, Foreign, High R& D No Financial Problem to innovate	0.96 [0.93, 0.98]
No Export in t-1, No Foreign, No High R& D Financial Problem to innovate	0.10 [0.05, 0.14]
Foreign, High R& D No Financial Problem to innovate	0.82 [0.74, 0.90]
No Foreign, No High R& D Financial Problem to innovate	0.48 [0.38, 0.58]
Average firm	0.65 [0.61, 0.68]

Table 11: Probit Estimations : Sunk Costs Model with Additional Variables

	Age	Independent	Y t-2	Y 1992	LowTotLab	gTotLab
Y t-1	2.041	2.045	2.126	1.86	2.057	2.06
	(0.114)***	(0.103)***	(0.111)***	(0.112)***	(0.101)***	(0.102)***
Size t-1	0.147	0.158	0.155	0.141	0.171	0.166
	(0.044)***	(0.042)***	(0.041)***	(0.042)***	(0.040)***	(0.041)***
ForeignK	0.486	0.41	0.458	0.374	0.474	0.472
	(0.160)***	(0.162)**	(0.157)***	(0.163)**	(0.165)***	(0.167)***
Prody t-1	1.37E-06	9.25E-07	9.66E-07	8.90E-07	9.28E-07	9.65E-07
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)**	(0.000)**
FinPb	-0.242	-0.295	-0.291	-0.287	-0.262	-0.288
	(0.154)	(0.144)**	(0.143)**	(0.142)**	(0.145)*	(0.146)**
HighRnD	0.189	0.206	0.215	0.228	0.209	0.199
	(0.111)*	(0.100)**	(0.098)**	(0.099)**	(0.099)**	(0.099)**
InnPatents	0.641	0.614	0.608	0.569	0.586	0.603
	(0.254)**	(0.223)***	(0.225)***	(0.224)**	(0.219)***	(0.220)***
ln_age	0.13					
	(0.081)					
Independent		-0.122				
		(0.114)				
Y t-2			0.326			
			(0.184)*			
Y 1992				0.444		
				(0.110)***		
LowTotLab					-0.182	
					(0.105)*	
gTotLab						0.072
						(0.101)
Observations	1046	1246	1304	1304	1304	1292
Pseudo R-squared	0.48	0.48	0.49	0.49	0.49	0.48
Joint Significance	464.01	547.28	572.79	571.81	567.45	562.86
	0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*

Note: Standard errors appear in parentheses. ***: Significant at 1%. **: Significant at 5%. *: Significant at 10%

Table 12: Probit Estimation : Effect of Finance on R&D and Patent Investments

	HighRnD	InnPatents	DiffProd	HighRnD	InnPatents
Size t-1	0.138	0.116	0.185	0.115	0.099
	(0.026)***	(0.045)***	(0.028)***	(0.027)***	(0.046)**
HighOwnFinance	0.227	0.329	-0.019	0.191	0.307
	(0.072)***	(0.112)***	(0.074)	(0.073)***	(0.114)***
FinPb	-1.727		-1.336	-1.733	
	(0.122)***		(0.127)***	(0.122)***	
DiffProd t-1				0.259	0.145
				(0.075)***	(0.117)
Observations	1578	1124	1578	1578	1124
Pseudo R-squared	0.19	0.09	0.14	0.20	0.09
Joint Sifnificance	420.04	58.05	272	432.15	59.58
Pseudo R-squared	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*

Note: Standard errors appear in parentheses. ***: Significant at 1%. **: Significant at 5%. *: Significant at 10%

Table 13: MNL Model and Marginal Effects: Base Category 2

	never	Marginal Effect	**new**	Marginal Effect	**nomore**	Marginal Effect	**erratic**	Marginal Effect
Size t-1	-0.916	-0.142	-0.256	0.014	-0.161	0.011	-0.342	-0.001
	(0.084)***		(0.088)***		(0.133)		(0.092)***	
ForeignK	-2.675	-0.262	-0.839	-0.007	-1.127	-0.017	-1.422	-0.077
	(0.449)***		(0.258)***		(0.471)**		(0.333)***	
Age	-0.566	-0.058	-0.607	-0.050	-0.464	-0.008	-0.327	0.000
	(0.149)***		(0.160)***		(0.237)*		(0.174)*	
Prody	-2.86E-06	-4.04E-07	1.08E-07	2.37E-07	-3.85E-07	5.05E-08	-3.18E-06	-3.14E-07
	(0.000)***		0.000		0.000		(0.000)***	
FinPb	0.273	0.039	-0.179	-0.050	1.12	0.081	-0.075	-0.029
	(0.212)		(0.275)		(0.317)***		(0.254)	
HighBkFinance	-0.898	-0.096	-0.33	0.016	-1.526	-0.044	-0.794	-0.051
	(0.320)***		(0.328)		(0.752)**		(0.381)**	
DiffProd in t	-0.73	-0.114	0.207	0.081	-0.514	-0.017	-0.394	-0.028
	(0.207)***		(0.203)		(0.350)		(0.219)*	
Observations	1276		1276		1276		1276	
Pseudo R-squared	0.170							

Note: Standard errors appear in parentheses. ***: Significant at 1%. **: Significant at 5%. *: Significant at 10%

Table 14: Wald Test for Joint Significance of Variables

	chi2	df	P>chi2
Size t-1	127.85	4	0.000
Foreign K	52.672	4	0.000
Age	19.784	4	0.001
Productivity t-1	17.094	4	0.002
Fin Pb	17.826	4	0.001
High Bk Access t-1	11.564	4	0.021
Diff Prod	21.114	4	0.000

Table 15: Wald Test for Combining Alternatives Categories

Categories tested	chi2	df	P>chi2
1-3	131.217	12	0.000
1-4	55.749	12	0.000
1-5	89.481	12	0.000
1-2	265.089	12	0.000
3-4	32.681	12	0.001
3-5	37.282	12	0.000
3-2	74.199	12	0.000
4-5	24.256	12	0.019
4-2	61.669	12	0.000
5-2	79.084	12	0.000

Table 16: Test for IIA Assumption

Omitted	lnL(full)	lnL(omit)	chi2	df	P>chi2	evidence
1	-462.749	-446.825	31.849	13	0.003	against Ho
3	-561.201	-543.259	35.883	13	0.001	against Ho
4	-661.241	-638.577	45.329	13	0.000	against Ho
5	-545.101	-518.242	53.719	13	0.000	against Ho

Table 17: MNL Model: Base Category 1 and 3 Respectively

	base category 1				base category 3			
	always	new	nomore	erratic	never	always	nomore	erratic
Size t-1	0.916	0.66	0.755	0.574	-0.66	0.256	0.096	-0.086
	(0.084)***	(0.093)***	(0.134)***	(0.093)***	(0.093)***	(0.088)***	(0.142)	(0.105)
ForeignK	2.675	1.836	1.549	1.254	-1.836	0.839	-0.288	-0.583
	(0.449)***	(0.477)***	(0.621)**	(0.520)**	(0.477)***	(0.258)***	(0.508)	(0.386)
Age	0.566	-0.041	0.102	0.239	0.041	0.607	0.143	0.28
	(0.149)***	(0.157)	(0.233)	(0.169)	(0.157)	(0.160)***	(0.247)	(0.188)
Prody	2.86E-06	2.97E-06	2.48E-06	-3.19E-07	-2.97E-06	-1.08E-07	-4.93E-07	-3.29E-06
	(0.000)***	(0.000)***	(0.000)**	0.000	(0.000)***	0.000	0.000	(0.000)***
FinPb	-0.273	-0.452	0.847	-0.348	0.452	0.179	1.299	0.104
	(0.212)	(0.256)*	(0.304)***	(0.231)	(0.256)*	(0.275)	(0.354)***	(0.298)
HighBkFinance	0.898	0.568	-0.627	0.104	-0.568	0.33	-1.195	-0.464
	(0.320)***	(0.362)	(0.759)	(0.407)	(0.362)	(0.328)	(0.776)	(0.430)
DiffProd in t	0.73	0.937	0.216	0.335	-0.937	-0.207	-0.721	-0.601
	(0.207)***	(0.227)***	(0.364)	(0.239)	(0.227)***	(0.203)	(0.368)*	(0.247)**
Observations	1276	1276	1276	1276	1276	1276	1276	1276
Pseudo R-square	0.170				0.170			

Note: Standard errors appear in parentheses. ***: Significant at 1%. **: Significant at 5%. *: Significant at 10%

Table 18: MNL Model: Base Category 2, Categories 4 and 5 Collapsed

	never	new	nomore & erratic
Size t-1	-0.917	-0.257	-0.298
	(0.084)***	(0.088)***	(0.084)***
ForeignK	-2.678	-0.841	-1.337
	(0.449)***	(0.258)***	(0.283)***
Age	-0.565	-0.607	-0.361
	(0.149)***	(0.160)***	(0.156)**
Prody	-2.84E-06	1.07E-07	-2.09E-06
	(0.000)***	0.000	(0.000)**
FinPb	0.28	-0.181	0.311
	(0.212)	(0.275)	(0.223)
HighBkFinance	-0.89	-0.327	-0.952
	(0.320)***	(0.328)	(0.355)***
DiffProd in t	-0.728	0.208	-0.421
	(0.207)***	(0.203)	(0.200)**
Observations	1276	1276	1276
Pseudo R-squared	0.180		

Note: Standard errors appear in parentheses. ***: Significant at 1%. **: Significant at 5%. *: Significant at 10%

Table 19: MNL Model : Base Category 2 with Additional Variables

	never	new	nomore	erratic	never	new	nomore	erratic
Size t-1	-0.942	-0.294	-0.186	-0.368	-0.915	-0.251	-0.168	-0.341
	(0.086)***	(0.090)***	(0.134)	(0.094)***	(0.084)***	(0.089)***	(0.133)	(0.093)***
ForeignK	-2.633	-0.879	-1.119	-1.399	-2.673	-0.834	-1.129	-1.424
	(0.450)***	(0.265)***	(0.472)**	(0.335)***	(0.448)***	(0.258)***	(0.473)**	(0.333)***
Age	-0.552	-0.509	-0.565	-0.269	-0.559	-0.575	-0.499	-0.32
	(0.154)***	(0.165)***	(0.243)**	(0.180)	(0.150)***	(0.161)***	(0.240)**	(0.175)*
Prody	-2.68E-06	8.57E-08	-2.48E-07	-3.08E-06	-2.87E-06	9.55E-08	-3.25E-07	-3.19E-06
	(0.000)***	(0.000)	(0.000)	(0.000)***	(0.000)***	(0.000)	(0.000)	(0.000)***
FinPb	0.311	-0.136	1.112	-0.007	0.278	-0.149	1.096	-0.071
	(0.214)	(0.276)	(0.322)***	(0.256)	(0.212)	(0.275)	(0.320)***	(0.255)
HighBkFinance	-0.900	-0.376	-1.427	-0.807	-0.900	-0.361	-1.463	-0.797
	(0.322)***	(0.331)	(0.753)*	(0.382)**	(0.320)***	(0.330)	(0.752)*	(0.381)**
DiffProd in t	-0.716	0.182	-0.446	-0.37	-0.733	0.182	-0.474	-0.398
	(0.208)***	(0.205)	(0.353)	(0.220)*	(0.207)***	(0.203)	(0.353)	(0.219)*
gTotLab	-0.087	0.352	-1.013	0.225				
	(0.200)	(0.164)**	(0.434)**	(0.210)				
LowTotLab					-0.049	-0.400	0.362	-0.059
					(0.191)	(0.224)*	(0.288)	(0.212)
Observations	1266	1266	1266	1266	1276	1276	1276	1276
Pseudo R-squared	0.170				0.170			

Note: Standard errors appear in parentheses. ***: Significant at 1%. **: Significant at 5%. *: Significant at 10%

Figure 3: Predicted Probability of Belonging at Each Export Status divideb by Financial Restrictions