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La heterogeneidad de las empresas y la exportación

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ABSTRACT:

This paper analyzes the textile firms located in Germany, France and United Kingdom from 1991 to 2015, using data from OSIRIS database.

On the one hand, we are going to analyze among others, why firms export, and which proportion represent this exports over the sector shipments.

But on the other hand, we are not just going to focus over exports, as it could be interesting to realize how this exports interact with other general factors, with the hole sector.

So, we are not going just to study the exporting behavior, and the intensity of these exports, as we will consider too, which variables will influence the total number of shipments a firm can have, and what a firm should consider if it wants to increase its profits.

Our analysis will be based over the German, English and French textile sectors, focusing on the CNAE – 2009: 13.1 (preparation and spinning of textile fibers), 13.2 (weaving of textiles), 14.1 (manufacture of wearing apparel, except fur apparel) and 14.3 (manufacture of knitted and crocheted apparel). Trying to get all the interesting information related to exports and firm heterogeneity.

1. INTRODUCTION:

I have been interested in this project because International Commerce has been increasing in importance year over year due to globalization and the creation of new markets, and exports are one of the most important issues in it.

Firm Heterogeneity has become one of the most important topics in International Commerce as data has shown that not all firms export, even being in the same sector or in the same country.

The textile industry is a really good example of heterogeneity as it has a huge number of productive activities, that is making the output of this sector being sometimes intermediate goods and sometimes final products, depending on the firm activity.

As Costa, M.T. and Duch, N. tell us in "*La renovación del sector textil-confección en España. Proceso de ajuste y contenido tecnológico*", this output can be described in a double perspective. On the one hand, as necessary goods, because everyone needs to dress up. And on the other hand, we can considerate it as luxury goods, because of the mode and fashionably firms.

Francisco Puig Blanco, Juan Manuel Berbel Pineda and Ana Debón Aucejo describe perfectly the characteristics of this sector in "*El desigual efecto de la globalización entre las empresas textiles españolas*". Some of these characteristics are for example, it has mature customers, it works in an open economy, it tends to be concentrated in a determined place, getting specialization in each different place, and every time is increasing the interest in things out of the product, like the brand or the design.

Nowadays this sector is one of the traditional sectors (OCDE, 1992) and has been affected by the entrance of China in the World Trade Organization (WTO) in the 2000 and the WTO ending commerce liberalization in 2005 (suppressing textile importing trade and barriers).

These are the main reasons why we have thought that could be interesting to focus our analysis on the textile sector.

With this analysis, we want to realize why due to export, some firms in the same sector are so different. And how this non-exporting firms can grow enough to achieve the needed skills to export.

So, the results are not just interesting for us, at the same time these firms that we will be talking about, can look to these data and try to know where to focus their efforts, increasing their profits and shipments, leading to a greater international position while trying to export.

On the other hand, we are focusing on the textile sector, but this data can be used for any firm in a lot of different sectors, as exporting is a global issue, and variables we are going to analyze can have similar effects in a lot of different sectors.

2. EMPIRICAL LITERATURE:

Empirical literature tells us that just a few firms export, and the manufacturing sector is one of the sectors where the companies export the most. And even if they are just a few firms, these are not a random sample in the economy (Helpman, 2006).

In our analysis, we will see that the most of our firms will export, the reason is not just that we are talking about a manufacturing sector as it is the textile one. The reason can be that as we have said, we have analyzed firms from three European countries. And for these countries it is easier to export, as they have advantages to export to other European members. So, we can see that we are talking about countries relatively closer to each other, with advantages to export, and at the same time we can consider these countries like rich countries. And as Bernard and Jensen (2007) say, the distance between countries decreases the probability to export between them, because of the transportation costs, value of exports and difficulties, exports are becoming more expensive with the distance. And as richer is the importer country, the probability to export will rise too.

So, we can understand that these are the main factors that are arising the average of exporters in our analysis.

One of the most important reasons in the probability to export could be differences in the productivity level among firms. Differences that are not letting firms with less productivity level lead with the huge fix costs that act as entrance barriers, and of course, as more foreign countries a firm chose to serve, higher will be the costs (Melitz, 2003 and Helpman, 2006). So only the most productive firms can face these costs and consequently, export.

Exporting companies have a lot of differences with non-exporting firms. But these productivity differences are made because of exporting? Or these differences make firms export?

Roberts and Tybout (1997) show us that productivity differences appears before the entry in export markets, as there is a need to have enough big productivity to cover the huge fix costs to export.

Once said that the differences start before entry the export markets, let's look if these differences remain the same after exporting.

The answer is NO. As Roberts, Tybout, Bernard and Jensen says, these differences start growing once some firms export and some others not. As once the exporting firms enter the market, they start growing in a faster way than the non-exporting firms. So, we have a new and bigger gap between those firms, the starting one (initial productivity differences) plus the one given by the faster growth by exporting.

Other exporting reasons can be the private ownership, the information and communication technology (ICT), trade liberalization and the firm size. That, as

Bernard and Jensen tell us, will affect positively the probability that a manufacturing firm has to export and the intensity of these exports. As for example private ownership, because foreign ownership will increase the foreign investment. The use of information and communication technology, with the example of Internet, if the firm use internet to contact with the clients, will have more chances to export as for this firm will be easier to communicate with the foreign customer. Or with trade constraints, as economy barriers, discourage innovation, hindering new business ideas emerge, leading to a less flexible market. So, with trade liberalization policies, in all industries, firm size, productivity and exporters number are rising, reallocating firms from comparative disadvantage to comparative advantage (Bru, L., Groizard, J.L. y Marques, H. ;2015).

Other national indicators like GDP or national development factors will affect positively the exports. One reason could be that an increase in exports will lead to economic and industrial growth due to the demand of products coming from the foreign markets (reasons given by Bernard and Jensen, 1999).

But at the same time, we find in the empirical literature some factors that can affect negatively the probability to export and the export intensity as are the Government ownership or the size of domestic market.

One reason is that largest markets will have enough demand to satisfy the production of the firms that are competing in it, so these firms will have no incentives to export. And the opposite is happening with the size of the foreign market. As it increases, for those firms with low productivity will be easier to cover the fix cost that we commented before, so probability to export will grow (Bernard, Jensen, Redding and Schott, 2007).

Another factor that we can see in the exporting firms is that these firms are bigger than the ones that are not exporting as Roberts and Tybout, Ottaviano and Martincus, Aitken, Bernard and Jensen or Alvarez and López tell us. This is happening because biggest firms have more probabilities to have lower marginal costs, bigger economics of scale, and as result they will grow in a faster way having enough size that make them able to export. At the same time multinationals, will have more information about the foreign markets and more relationships with foreign companies that will make them more able to export.

Something related with these last variables is the firm's age, that has a positive relationship with the probability to export as the economic theory tell us that the firms that live older are those that are more efficient, because inefficient firms will leave the competitive markets (Roberts and Tybout). But there are some studies that says that this effects are negative (Alvarez and López) or that there are not empirical evidences for this affirmation (Ottaviano and Martincus). Caused by a lack of data, we just have dropped this variable from our model, so we are not going to take in consideration firm age in our analysis.

Two variable that we are not going to analyze because of a lack of data too, are the private/public ownership and the ratio of non-production workers.

Referring to the ratio of non-production workers we can see through the empirical literature and the neo-classical trade theory (Heckscher-Ohlin) that the effect over the exports will depend on the comparative advantage of the country. If the country has a comparative advantage in the use of unskilled workers, the effect of the ratio will be negative. This is happening in the Bernard and Jensen, 2004, with the study of the exporting behavior of manufacturing firms located in the Middle East and North Africa.

And the opposite would happen in our analysis as for the developed countries as the ones that we are studying (Germany, France and United Kingdom) the comparative advantage are the skilled workers, then in our analysis the ratio would have a positive relationship with the probability to export.

So, we can see that some variables depend on the comparative advantages, Helpman, E. (2006).

The law of comparative advantage (David Ricardo, 1817) is an economic law that says that countries (or firms) identify their comparative advantages where they have lower opportunity costs, choosing to specialize, produce and trade these over other goods. Achieving better results than focusing on the absolute advantage (what they can produce better or in a higher quantity) or the comparative disadvantage (focusing on improving their skills in those activities where they are not efficient).

We can see these last affirmations in the empirical literature. In comparative advantage industries, there is a lower productivity level needed to export, so there are more export opportunities, leading to greater profits and giving incentives to new competitors to enter the market. So finally, there is going to be an increase in the level of productivity needed to remain in the market. This higher difficulty to stay in the market will exit the low productivity firms as are the non-exporting firms and will increase the number of exporting firms, so there is a bigger net creation of exporting firms and a bigger net destruction of non-exporting firms than in the comparative disadvantage industries. This fast exit and enter paths will grow the firms size and firms' productivity more than in the comparative disadvantage industries, having more net job creation in the comparative advantage industries and more job destruction in comparative disadvantage industries.

This comparative advantage law can explain why some firms export and other are not doing it, or the intensity of their exports, while being in the same country or in the same sector.

3. METHODOLOGY OF ANALYSIS:

In our analysis, we are going to implement 2 different kind of estimations, first we are going to start with a Logit model, to analyze the dichotomous variable “Exporting”. For all the other estimations, we are going to implement a MCO model.

First, introduce the database where we have extracted the necessary data, and explain all the variables.

We have extracted the data from the database called Osiris, data for 103 firms (total number of observation we will work with). This database has information of the Stock Market companies and most of the important firms that are not in the Stock Market in a worldwide scope.

To normalize the model, and avoiding non-linearity problems. we have squared and applied logarithms (ln) to the variables. At the same time, we have included 5 dummies, 3 are country dummies and 2 are year dummies.

In our project, we have 4 different estimations:

- 1- Endogenous variable: Exporting.
Exogenous variables: ln GDPC, ln Shipments Share.
- 2- Endogenous variable: ln Exporters Share.
Exogenous variables: ln Economic Freedom, ln Firm Size, ln Total Profits, France, UK, WTO1, WTO2.
- 3- Endogenous variable: ln Shipments
Exogenous variables: ln GDP, ln Economic Freedom, ln Employment Share, France, UK, WTO1, WTO2.
- 4- Endogenous variable: ln Total Profits
Exogenous variables: ln GDP, ln Economic Freedom, ln Firm Size, ln Shipments, France, UK, WTO1, WTO2.

3.1 VARIABLES

The variables we are going to work with, in our model, are:

- *Exporting*: Binary variable that is referred over the character of the firm shipments. If some of these shipments are send to other countries that are not the home country, we will give the firm a value 1, representing with this value the firms that are exporting. On the other side, if all shipments are sent to the home country, we are going to give the firm a value of 0, referring to a non-exporting firm.
- *ln GDP*: macro data for each country and each year.
- *ln GDPC* (GDP per capita): macro data for each country and each year.

- *In Economic Freedom*: macro data for each country and each year. This data has been extracted from Heritage web page. Variable that is based over property rights, freedom from corruption, fiscal freedom, government spending, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom and financial freedom.
- *In Firm Size*: total number of workers in the company.
- *In Employment Share*: ratio =
$$\frac{\text{In Firm Size } i}{\text{Total Number of Workers in our database}}$$
- *In Shipments*: total number of shipments for a firm *i*.
- *In Shipments Share*: ratio =
$$\frac{\text{In Shipments } i}{\text{Total Number of Shipments in our database}}$$
- *In Exporters Share*: ratio =
$$\frac{\text{Shipments of Exporting Firm } i}{\text{Total Number of Shipments in our database}}$$
- *In Total Profits*: for firm *i* total profits.
- *Germany*: country dummy for Germany. Reference category.
- *France*: country dummy for France.
- *UK*: country dummy for United Kingdom.
- *WTO1*: year dummy. Value 0 since 1999 and 1 from 2000. As in the 2001 China becomes part of the World Trade Organization.
- *WTO2*: year dummy. Value 0 since 2004 and 1 from 2005. Due to the World Trade Organization commerce liberalization in 2005.

In our models, basically for multicollinearity problems (**Appendix 1. Correlogram**) and a lack of data, we have not included all the variables in each estimation, and we have lost a big part of the total number of observations. So, we have selected the variables that fit the best each estimation.

3.2 EXPORTING MODEL (**Appendix 3. Exporting estimation**)

According the microeconomic theory, in a Logit model, the probability function of happening an option *i*, will depend on explanatory variables *x*. So, the probability of happening *i* is:

$$P(i) = \frac{1}{1 + e^{-\beta'x}} = \frac{e^{\beta'x}}{1 + e^{\beta'x}}$$

Where the matrix coefficient is represented by β' and the variables are represented by *x*.

As the marginal effect of a variable, is not represented by the coefficients, we are not going to analyze them, we are going to focus on the partial derivative:

$$\frac{\partial E[y_i|x_i]}{\partial x_{ki}} = P(y_i = 1|x_i)[1 - P(y_i = 1|x_i)]\beta_k = \frac{e^{\beta'x}}{(1+e^{\beta'x})^2} \beta_k$$

Where β_k will capture the sign of marginal effect of X_k .

Once explained this, introduce the ODDS-Ratio means, that will interpret the results of the logit model (**Appendix 2. Odds ratio**).

So, we can say that for the variable “Exporting” we are going to follow the model:

$$Y_i = \frac{e^{\beta'x}}{1 + e^{\beta'x}} + e_i$$

3.3 EXPORTERS SHARE MODEL (**Appendix 4. In Exporters Share estimation**)

Once specified the Exporting model, lets introduce the estimation for In Exporters Share variable.

We have made it by MCO:

$$\ln \text{Exporters Share } i = \beta_0 + \beta_1 \ln \text{Economic Freedom } i + \beta_2 \text{Firm Size } i + \beta_3 \ln \text{Total Profits } i + \beta_4 \text{France} + \beta_5 \text{UK} + \beta_6 \text{WTO1} + \beta_7 \text{WTO2} + u_i$$

3.4 SHIPMENTS MODEL (**Appendix 5. In Shipments estimation**)

Now we are going to specify the In shipments estimation, made by MCO:

$$\ln \text{shipments } i = \beta_0 + \beta_1 \ln \text{GDP } i + \beta_2 \ln \text{Economic Freedom } i + \beta_3 \ln \text{Employment Share } i + \beta_4 \text{France} + \beta_5 \text{UK} + \beta_6 \text{WTO1} + \beta_7 \text{WTO2} + u_i$$

3.5 TOTAL PROFITS MODEL (**Appendix 6. Ln Total profits estimation**)

And we are going to end, specifying the In total profits estimation, by MCO too:

$$\ln \text{shipments } i = \beta_0 + \beta_1 \ln \text{GDP } i + \beta_2 \ln \text{Economic Freedom } i + \beta_3 \ln \text{Firm Size } i + \beta_4 \ln \text{Shipments } i + \beta_5 \text{France} + \beta_6 \text{UK} + \beta_7 \text{WTO1} + \beta_8 \text{WTO2} + u_i$$

4. RESULTS:

Variables	Exporting		In Exporters Share	In Shipments	In Total Profits
	Coefficients	Odds-ratio			
InGDP				3,267**	-4,494***
InGDPC	0,461	17,87**			
InEcFreed			6,694***	-20,408***	13,274***
InFfirmSi			-0,214***		0,554***
InEmpSha				0,847***	
InShip					0,395***
InShipSha	0,462	1,623**			
InTProfits			1,245***		
France			0,901***	-2,063**	0,752
UK			-0,331***	2,342***	-2,335***
WTO1			-0,236	-0,239	0,313
WTO2			-0,402***	-1,284	2,503***
Observation	65		37	82	58

*p-value: *p=0,1 **p=0,05 ***p=0,01*

4.1 Exporting. (*Appendix 3. Exporting estimation*)

With the Logit estimation over the variable Exporting, we can see that the goodness of fit given by the McFadden R-squared, is 16,7%, value that is good enough due to the heterogeneity of the sample.

Referring the individual significance of the variables, we can see in the *Appendix 3. Exporting estimation* that both variables (GDP per capita & In Shipments Share) are significant at 5% of significance.

In this estimation, we have had the biggest problem in our project due to the individual significance level of the variables. As because of this individual significance (just 2 variables were significant at 10% of significance) we have excluded most of our variables from the estimation, ending with just 2 variables in our analysis.

Focusing in the coefficients (0,461 & 0,462), we can see that both variables will affect positively the exporting behavior of a firm. We can check it with the Odds-ratio, seeing that the one for GDPC variable (Odds-ratio: 17,871), is really bigger than 1, so we can say that an increase in one unit of this variable, will lead to a big increase in the probability that a firm has to export.

These results are consistent with the economic theory and the empirical literature we have talked about, as at the beginning of the project we have said that national indicators like GDP will affect positively the exports, and one reason could be that an increase in exports will lead to economic and industrial growth due to the demand of products coming from the foreign markets (reasons given by Bernard and Jensen, 1999).

Now let's analyze the *In Shipments Share* Odds-ratio (1,628), this value is really close to 1, if we are comparing it with the other variable Odds-ratio value, we can say that the effect of this variable over the export behavior will be positive, but really low compared with the one caused by *In GDP variable*. In conclusion, an increase in one unit over this variable, will lead to a little increase in the probability a firm has to export.

So, if a firm is increasing its shipments in a greater growth rate than its competitors, this firm will be able to export easier, than the ones with an average growth rate of shipments.

Because of these data we can say that to increase the probability to export are more important the macro variables as GDP per capita, than the micro variables as is the Shipments Share that a firm can have.

4.2 Exporters Share (*Appendix 4. In Exporters Share estimation*)

Through the MCO estimation we can observe a really huge goodness of fit, as the Mcfadden R-squared and the Adjusted R-squared are over than a 99% (R-squared: 0,999).

The individual significance of the variables, is quite good too, for most of our explanatory variables, 6 of them are significant at 1% of significance (In Economic Freedom, In Firm Size, In Total Profits, WTO2, France, UK), and just one of our 7 variables is not significant at 10% of significance (year dummy WTO1).

We are going to end the analysis of the data with the coefficients.

$\frac{3}{7}$ parts of our variables have a positive effect over the quantity of exporters shipments, compared with the non-exporters shipments (In Economic Freedom, In Total Profits & France), and 4 variables will influence the exporters to have lower shipments, compared with the non-exporters (In Firm Size, WTO1, WTO2 & UK).

See that a unitary increase in the *In Economic Freedom* will rise, by far, the quantity of exporters shipments, compared with the non-exporters shipments, more than any other variable. So, we can say again, that the macro variables are the ones with the biggest effects in our analysis. And this is consistent with the empirical literature that says that national development factors will affect positively the export.

Another positive variable, with less effect over *In Exporters Share*, are the profits a firm can achieve, so if a firm is richer, will increase its shipments more than non-exporting firms. This effect can be given because with more profits, a firm can invest more in machinery, technology and other factors that will lead the company to a greater productivity, making them able to export easier a bigger quantity.

With a negative effect over the variable *In Exporters Share* we can find the variable *In Firm Size*, so an exporting firm that is increasing its numbers of workers, will see how its shipments are increasing in a lower growth rate than non-exporting firm shipments. This may be caused, as we have said in the last variable, by the firm investment path. If a firm is investing more in Human

Resources, will have less money to invest in other important factors, making the exporting firm increase its shipments in a lower quantity than non-exporting firms.

Now we are going to talk about the year dummies, both of them are negatively related with the endogenous variable. The meaning of this is that the entrance of China in the World Trade Organization in the 2001 and the World Trade Organization commerce liberalization in 2005, have made the growth rate of shipments for exporting firms, to be lower than the growth rate of shipments for non-exporting firms.

This results are consistent with the economic theory, as increasing the competitiveness in a market, will make sector firms to lose market power, reducing its shipments, because the other new entering competitors will take a size of the market shipments. For example, the entrance of China in the textile market means an increase for China exports, that is the same that saying a reduction of shipments for the starting WTO exporting firms. And the same is happening with commerce liberalization in 2005, as a commerce liberalization means more competition in the market, the result is that the firms that where in the sector before 2005, after this year, they found new difficulties to maintain the same size of the market shipments. But once again, say that dummy WTO1 is not individually significant for a 10% of significance, so we can just take care of WTO2 analysis.

Let's talk about country dummies. We can see a positive effect for *France* dummy and a negative effect for *UK* dummy, over the endogenous variable.

So, exporting French firms will achieve a greater shipment share than German exporting firms (Germany is the reference category). And the opposite for the English exporting firms, these firms will achieve a lower shipment share than the German exporting firms.

4.3 Shipments (*Appendix 5. In Shipments estimation*)

Through the MCO estimation we can observe a really good goodness of fit again, the Mcfadden R-squared and the Adjusted R-squared are over than a 90% (R-squared: 0,925).

The individual significance of the variables, is quite good, as 3 of our explanatory variables are significant at 1% of significance (In Economic Freedom, In Employment Share, UK dummy), 2 variables are significant at 5% of significance (In GDP & France dummy) and just the 2 year dummies are not significant at 10% of significance.

Talking about the coefficients we have 3 variables with a positive relation with the shipments, as are the GDP level, the employment share of the firm and the country dummy UK. And 4 variables with negative relation with shipments, as are the Economic Freedom index, country dummy France and the 2 year dummies.

In conclusion, we can say that as the country is richer, the firm will be in a better environmental position that will let it achieve easier investments and the necessary inputs to increase its shipments (an increase in the variable In GDP will lead to an increase in the number of firm shipments). At the same time for those firms that are increasing the number of workers in a bigger way that the

other firms in the sector, will be able to increase its number of shipments too. This is happening because, as more workers you have, you will be able to produce a bigger quantity of output., and at the same time you will grow in size faster than the other firms, achieving bigger shipments (an increase in the *Ln Employment Share* will cause a growth in *Ln Shipments*).

As we have said before, more competition in the market is reducing firms market power, and as a result of the better competition environment, represented in a better Economic Freedom index, we can see how an increase of the variable *Ln Economic Freedom*, is leading to a reduction in the number of shipments for each one of the firms in the sector, as now more firms are competing in it.

Talking about the dummies, we can see that the French firm shipments are lower than the Germany firm shipments. And the opposite is happening with the United Kingdom firm shipments, that are higher than the German firm ones.

With the dummy year variables, we can see that both are negatively related to the shipments, the conclusion is that the liberal policy done by the World Trade Organization in 2005 and the entrance of China in the WTO in 2001, have caused a decrease in the number of shipments a company in the textile sector has. The explanation is the same than for the *Ln Exporters Share* estimation, *“the entrance of China in the textile market means an increase for China exports, that is the same that saying a reduction of shipments for the starting WTO firms. And the same is happening with commerce liberalization in 2005, as a commerce liberalization means more competition in the market, the result is that the firms that where in the sector before 2005, after this year, they found new difficulties to maintain the same size of the market shipments”*. And, again say that these variables are not individual significant at 10% level of significance.

4.4 Total Profits (*Appendix 6. Ln Total profits estimation*)

Through the MCO estimation we see a good goodness of fit, because the Mcfadden R-squared and the Adjusted R-squared are over than a 94% again (R-squared: 0,955).

The individual significance of the variables is good too, as 6 of our explanatory variables are significant at 1% of significance (*Ln GDP*, *Ln Economic Freedom*, *Ln Firm Size*, *Ln Shipments*, country dummy UK and the year dummy WTO2) and the 2 remaining are not significant at 10% of significance (country dummy France and year dummy WTO1).

Those things that will make a firm rise its profits are a mix of macro and micro data.

For example, a better index of Economic Freedom, this means that better property rights policies, less corruption, better government spending, and more business, labor, monetary, trade, investment, financial and fiscal freedom, labor freedom, monetary freedom, trade freedom, investment freedom and financial freedom, will make the firms affected for this environment, to increase their profits.

At the same time, we can see a surprising data, this is that an increase in the GDP level will cause a reduction in firm profits.

This may be caused because of the comparative advantage. The textile sector a lot of times can be described as a non-skilled workers sector, so the comparative advantage for this sector is to use non-skilled workers, and as we have said before in the literature review, in our analysis for developed countries, as the ones that we are studying (Germany, France and United Kingdom) the comparative advantage there, are the skilled workers.

For rich countries, it's normal to have more skilled workers, and for poorer countries is more normal to have more non-skilled workers. So, when GDP is rising, increasing country wealth, the ratio of skilled-workers is growing, while reducing the non-skilled one. And as a result, the textile sector firms of this country that is growing in wealth, will be focusing less (time over time while country continue increasing its GDP) over sector comparative advantage, the non-skilled workers, leading to a decrease in the firm profits.

Another possible reason can be, that as richer is the country, higher will be firm costs, as for example, the wages will increase, growing firm labor costs, and the inputs will become expensive too, leading to an increase in firm product prices, making this firm lose competitiveness compared with its competitors. And as a result, lowering its profits.

Focusing in the micro variables, we can see that when firms are increasing in size, hiring more workers, and increasing their number of shipments, they will achieve better profits.

This is happening because growing in the number of workers a firm has, will make this firm increase its output, output that will sell. And we can relate this with the shipments, as when a firm is increasing its shipments, this firm will increase its sales. So, a conclusion for those firms that are investing in hiring more workers and increasing the number of shipments, will be better economic results.

Focusing on the dummies, we can see that for those textile firms located in France, profits will be higher than for those located in Germany. And for those located in the United Kingdom, profits will be lower than for the German textile firms.

For the year dummies, we can see that both are positively related to the profits, the analysis is that the liberal policy done by the World Trade Organization in 2005 and the entrance of China in the WTO in 2001, have caused an increase in the profits for the textile firms. So, finally we can see how a liberalization in the commerce, making it a more competitive sector, is reducing the market power of the firms, but will lead to better economic results for them.

This is caused because as economic theory tells us, firms that live older are those that are more efficient, because inefficient firms will leave the competitive markets (Roberts and Tybout). So, it is normal that increasing in competition, lead to better profits, because inefficient firms will disappear, just remaining the efficient ones.

Once, analyzed all the variables, just highlight that as we have said at the beginning of this model estimation, dummies *France* and *WTO1* are not individually significant to at 10% of significance.

5. CONCLUSIONS:

Summarizing all the things we have been talking about, we can conclude that we have had some difficulties caused because of a lack of observations in our estimations, as we have been working with just a few of the initial observations.

This problem has happened because we have been working with a lot of uncompleted information, as for most of our firms, we didn't fill all the variables, so we finally had lost these uncompleted observations.

At the same time, we have been working with a lot of unused variables, because of problems of multicollinearity (**Appendix 1. Correlogram**) that have made us to drop a lot of variables from our estimations.

To take care of the selection effects caused because our variable of export intensity only was observable if the company was an exporting firm, meaning that export intensity determinants, conditions if we can see or not the export intensity. We should have used an instrumental variable methodology in 2 stages, where the export propensity could be estimated in the first stage and adjusted probabilities should be included as explanatory variables for the export intensity estimation in the second stage.

But to simplify the analysis we just have made 4 different estimations, trying to get enough good results that allow us to mix each estimation conclusion with the analysis of the other estimations.

The analysis of this project has been useful to see how a lot of these variables that we have been using, are finally influencing exports

We have been working with country macro data as has been GDP or GDPC, institutions actuation macro data (economic freedom index), and with micro data too, like firm's actuation (firms size, shipments) and the result of this action (Profits).

But, this are not all the variables we have wanted to work with, as we have tried to get information about, workers level of education and skills, the ownership of the firm (%Foreign & %Government Ownership), the total number of products a firm is producing and the number of exports per firm. But for all this firms we didn't get enough information to include them in our model.

And for other variables like firm age (years that the firm has been active), total costs of a firm, and the productivity of the firms (ratio: profits/costs). We get enough information, but they didn't get enough individual significance in any specification, to be included in our analysis.

As Costa, M.T. and Duch, N. tell us in *“La renovación del sector textil-confección en España. Proceso de ajuste y contenido tecnológico”* nowadays, firms that want to remain in the market, will have to adapt their organization and structures to the new international environment. As, these last years, because of the global crisis we have suffered, we are losing commerce liberalization, consequence of the new policies that the governments are implementing.

So, as we have said during our project, global variables, are really important, as in our model, macro data has been the one with the biggest effect in most of our estimations. And firms will not only have to get better in micro variables as we have been analyzing like their size, the number of shipments and their profits. At the same time they will have to mix this effort with a big effort in becoming more competitive, adapting to the global changes, countries characteristics and macro data.

To mix these results, it is not enough just to invest more money in human capital, or focusing in getting more efficient in shipments share, or trying just to focus on maximize profits. These firms will have to invest in I+D+i too, trying to reach their competitive advantage and adapt their action to the sector and country structures.

Comparing dummies results in all our estimations, we can see, how for firms located in France, results will be most of the time, better than the German firms, as French textile firms will achieve better profits, and exporters share will be higher than German Exporters Share, but French textile firms will achieve this results needing less shipments than the German ones, as for firms located in France, shipments will be lower than for textile German ones.

Totally the opposite is happening with the United Kingdom textile companies, they will have a higher number of shipments than the German ones, but they will achieve a lower Exporters Share.

And focusing on year dummies, we can see how both dummies have affected negatively most of the estimations, as since the WTO takes these decisions, textile firms in Germany, France and the UK, have been seeing how their shipments have been lowering, and a fall in the Exporters Share. But despite of that, the final result has been positive, as those firms have increased its profits. So finally, we can say that increasing in commerce liberalization and trade competition, is leading to a better situation for the textile firms.

In conclusion, if a firm want to become an exporter has to focus its effort on their comparative advantage, trying to grow in size and being more productive. By this way this firm will be able to have economics of scale, leading to a bigger production and bigger profits. And of course, making a last reference to Costa, M.T. and Duch, N., the future evolution of this sector will be very related to its changes, so firms have to try to get better in quality, in the ability to adapt to new consumption changes and in the ability to face problems that are out of the market, but that will influence sector action.

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APPENDIX:

Appendix 1. Correlogram

	WTO2	WTO1	UK	France	Germany	InTCosts	InTP	InProd	InExpSha	InShipSha	InShip	InEmpSha	SquareAge	InFfirmSi	InEcfr	InGDPC	InGDP
InGDP	0,8078	0,6008	0,0606	-0,5657	0,5665	-0,1665	-0,1922	-0,2614	-0,197	-0,197	-0,329	-0,2275	0,06	-0,2275	0,61	0,8969	1
InGDPC	0,9199	0,594	0,2898	-0,3891	0,1518	-0,1066	-0,1217	-0,1584	-0,1193	-0,1193	-0,2905	-0,1488	0,0873	-0,1488	0,5715	1	
InEcfr	0,5172	0,3886	0,7004	-0,9278	0,3529	-0,6202	-0,6112	-0,2823	-0,6032	-0,6032	-0,5982	-0,6213	-0,2011	-0,6213	1		
InFfirmSi	-0,0985	-0,1063	-0,3927	0,6149	-0,3025	0,9511	0,9496	0,5146	0,9481	0,9481	0,741	1	0,1295	1			
SquareAge	0,1151	0,0811	-0,1974	0,1951	-0,0262	0,1695	0,1729	0,1161	0,173	0,173	0,231	0,1295	1				
InEmpSha	-0,0985	-0,1063	-0,3927	0,6149	-0,3025	0,9511	0,9496	0,5146	0,9481	0,9481	0,741	1					
InShip	-0,2616	-0,1744	-0,3701	0,5377	-0,2388	0,8096	0,8412	0,6547	0,8429	0,8429	1						
InShipSha	-0,0433	-0,0458	-0,3934	0,6076	-0,2937	0,9881	0,9995	0,6201	1	1							
InExpSha	-0,0433	-0,0458	-0,3934	0,6076	-0,2937	0,9881	0,9995	0,6201	1								
InProd	-0,1478	-0,0979	-0,0151	0,3037	-0,3208	0,4937	0,604	1									
InTP	-0,0478	-0,0475	-0,4127	0,6112	-0,2792	0,9913	1										
InTCosts	-0,0277	-0,0356	-0,4478	0,6167	-0,2516	1											
Germany	0,0885	0,1754	-0,3651	-0,5888	1												
France	-0,3139	-0,2979	-0,5375	1													
UK	0,2692	0,1601	1														
WTO1	0,5948	1															
WTO2	1																

Appendix 2. Odds ratio

The odds are defined as the coefficient between two alternatives probabilities:

$$\Omega = \frac{P(y_i = 1|x)}{P(y_i = 0|x)} = \frac{P(y_i = 1|x)}{1 - P(y_i = 1|x)}$$

In the logit model, this probability coefficient is:

$$\Omega = \frac{P(y_i = 1|x)}{P(y_i = 0|x)} = e^{x_i' \beta}$$

However, the odds-ratio measure how is affected the endogenous variable when one of the explanatory variables changes its value. Assuming a logit model with k variables, the odds will be:

$$\Omega(x_{1i}, x_{2i}, \dots, x_{ki}) = \frac{P(y_i = 1|x_{1i}, x_{2i}, \dots, x_{ki})}{P(y_i = 0|x_{1i}, x_{2i}, \dots, x_{ki})} = e^{x_i' \beta} = e^{\beta_0} e^{\beta_1 x_{1i}} \dots e^{\beta_k x_{ki}}$$

Now incrementing the value of variable X_{2i} in one unit, new odds are:

$$\begin{aligned} \Omega(x_{1i}, x_{2i} + 1, \dots, x_{ki}) &= \frac{P(y_i = 1|x_{1i}, x_{2i} + 1, \dots, x_{ki})}{P(y_i = 0|x_{1i}, x_{2i}, \dots, x_{ki})} = e^{x_i' \beta} \\ &= e^{\beta_0} e^{\beta_1 x_{1i}} e^{\beta_2 (x_{2i} + 1)} \dots e^{\beta_k x_{ki}} \end{aligned}$$

In conclusion, the odd-ratio can be defined as the quotient between the two odds:

$$\frac{\Omega(x_{1i}, x_{2i} + 1, \dots, x_{ki})}{\Omega(x_{1i}, x_{2i}, \dots, x_{ki})} = \frac{e^{\beta_0} e^{\beta_1 x_{1i}} e^{\beta_2 (x_{2i} + 1)} \dots e^{\beta_k x_{ki}}}{e^{\beta_0} e^{\beta_1 x_{1i}} e^{\beta_2 x_{2i}} \dots e^{\beta_k x_{ki}}} = e^{\beta_2}$$

Appendix 3. Exporting estimation

Logistic regression	Number of obs	=	65
	LR chi2(2)	=	10.39
	Prob > chi2	=	0.0056
Log likelihood = -25.898287	Pseudo R2	=	0.1670

Exportin	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	Coef.
lnGdpc	17.8705	23.61941	2.18	0.029	1.34 238.3244	.4605038
lnShipsha	1.627832	.3439494	2.31	0.021	1.075862 2.462989	.4615533

Partial Correlogram:

	InShipSha	InGDPC
InGDPC	-0,1193	1
InShipSha	1	

Appendix 4. In Exporters Share estimation

Source	SS	df	MS			
Model	1707.10197	7	243.871709	Number of obs =	37	
Residual	1.36025643	30	.045341881	F(7, 30) =	5378.51	
Total	1708.46222	37	46.1746546	Prob > F =	0.0000	
				R-squared =	0.9992	
				Adj R-squared =	0.9990	
				Root MSE =	.21294	

lnexpsha	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnecfr	6.693736	1.189509	5.63	0.000	4.264435	9.123037
lnfirmSi	-.213758	.0541809	-3.95	0.000	-.3244101	-.1031059
lnTP	1.245144	.0475648	26.18	0.000	1.148004	1.342284
WTO1	-.2360904	.1926428	-1.23	0.230	-.6295196	.1573387
WTO2	-.4022846	.1466808	-2.74	0.010	-.7018468	-.1027223
France	.9011922	.1859081	4.85	0.000	.5215172	1.280867
UK	-.3308241	.1191817	-2.78	0.009	-.5742256	-.0874226

Partial Correlogram:

	WTO2	WTO1	UK	France	lnTP	lnExpSha	lnFirmSi	lnEcf
lnEcf	0,5172	0,3886	0,7004	-0,9278	-0,6112	-0,6032	-0,6213	1
lnFirmSi	-0,0985	-0,1063	-0,3927	0,6149	0,9496	0,9481	1	
lnExpSha	-0,0433	-0,0458	-0,3934	0,6076	0,9995	1		
lnTP	-0,0478	-0,0475	-0,4127	0,6112	1			
France	-0,3139	-0,2979	-0,5375	1				
UK	0,2692	0,1601	1					
WTO1	0,5948	1						
WTO2	1							

Appendix 5. In Shipments estimation

Source	SS	df	MS			
Model	1529.18249	7	218.454641	Number of obs =	82	
Residual	123.724688	75	1.6496625	F(7, 75) =	132.42	
Total	1652.90718	82	20.1574046	Prob > F =	0.0000	
				R-squared =	0.9251	
				Adj R-squared =	0.9182	
				Root MSE =	1.2844	

lnship	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lngdp	3.266678	1.330588	2.46	0.016	.61601	5.917345
lnecfr	-20.40807	2.771136	-7.36	0.000	-25.92845	-14.88768
lnempsha	.8474186	.0768264	11.03	0.000	.6943726	1.000465
France	-2.062484	.891562	-2.31	0.023	-3.838567	-.2864016
UK	2.342202	.3727083	6.28	0.000	1.599729	3.084675
WTO1	-.2388938	.5124455	-0.47	0.642	-1.259738	.7819501
WTO2	-1.283847	.8097375	-1.59	0.117	-2.896927	.3292326

Partial Correlogram:

	WTO2	WTO1	UK	France	lnShip	lnEmpSha	lnEcf	lnGDP
lnGDP	0,8078	0,6008	0,0606	-0,5657	-0,329	-0,2275	0,61	1
lnEcf	0,5172	0,3886	0,7004	-0,9278	-0,5982	-0,6213	1	
lnEmpSha	-0,0985	-0,1063	-0,3927	0,6149	0,741	1		
lnShip	-0,2616	-0,1744	-0,3701	0,5377	1			
France	-0,3139	-0,2979	-0,5375	1				
UK	0,2692	0,1601	1					
WTO1	0,5948	1						
WTO2	1							

Appendix 6. Ln Total profits estimation

Source	SS	df	MS			
Model	434.06862	8	54.2585775	Number of obs =	58	
Residual	20.2750308	50	.405500617	F(8, 50) =	133.81	
				Prob > F =	0.0000	
				R-squared =	0.9554	
				Adj R-squared =	0.9482	
Total	454.343651	58	7.83351123	Root MSE =	.63679	

Intp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Ingdp	-4.49416	.7777706	-5.78	0.000	-6.056359	-2.931962
Inecfr	13.27425	1.835642	7.23	0.000	9.587258	16.96125
InfirmSi	.553679	.0706634	7.84	0.000	.4117474	.6956106
Inship	.3947439	.0650163	6.07	0.000	.2641548	.525333
France	.7516345	.5431148	1.38	0.173	-.3392437	1.842513
UK	-2.335289	.2430827	-9.61	0.000	-2.823535	-1.847044
WTO1	.3132966	.3511292	0.89	0.377	-.3919672	1.01856
WTO2	2.502569	.5149935	4.86	0.000	1.468174	3.536964

Partial Correlogram:

	WTO2	WTO1	UK	France	InTP	InShip	InFfirmSi	InEcfr	InGDP
InGDP	0,8078	0,6008	0,0606	-0,5657	-0,1922	-0,329	-0,2275	0,61	1
InEcfr	0,5172	0,3886	0,7004	-0,9278	-0,6112	-0,5982	-0,6213	1	
InFfirmSi	-0,0985	-0,1063	-0,3927	0,6149	0,9496	0,741	1		
InShip	-0,2616	-0,1744	-0,3701	0,5377	0,8412	1			
InTP	-0,0478	-0,0475	-0,4127	0,6112	1				
France	-0,3139	-0,2979	-0,5375	1					
UK	0,2692	0,1601	1						
WTO1	0,5948	1							
WTO2	1								