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The key factors of export intensity in Tunisia: A Logistic regression with random effect model

Kahia Montassar¹

Abstract:

Given the growing international competition and globalization being characterized by the massive reduction of institutional barriers, opening new markets for consumer goods, the birth of many trade agreements and the establishment of the World Trade Organization, it is imperative for companies wishing to grow, the possibility to internationalize. Consequently, one of the first modes of internationalization of a firm is export. Indeed, the success of export can be measured by various factors that depend on company's goal against the use of export strategy. Such factors are grouped into two categories namely: external and internal factors to the company. This paper will focus on exploring and analyzing the key factors that affect the export intensity of Tunisian companies. Thus, our study was conducted at the micro-economic level. Indeed, as the available data, we will try to find out the factors of export activity for a sample of Tunisian companies and this through a Logit model with random effects applied to panel data from 1997 to 2003. Indeed, the main factors that positively affect the probability of exporting in Tunisia are: Capital intensity; the company age and size. Furthermore, among the main factors that negatively affect the probability of exporting, we state labor cost.

Keywords: Export intensity; Logit model; Panel data; Tunisian companies.

JEL classification numbers: O55; C51; C33.

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1. Introduction:

The analysis of the determinants of export intensity is a former theme and a widely investigated one. However, it is a significant revival for this theme. It is the result of the movement of opening national markets undergone by the government since the eighties, both at the multilateral agreements (GATT², WTO³) or at the level of regional agreements (European Union). This fast evolution was achieved by the implementation of strong incitements for export in favor of companies. New themes have appeared in terms of export. Schematically, we can consider that the export issue has long been integrated into the logic of the product life cycle (Vernon 1966). The company is concerned at first about its domestic market and, when this one reaches saturation point, it turns to foreign markets. However, this traditional model is increasingly called into question: the international competition is often at the beginning (due to markets interpenetration), so that the issue of exporting arises particularly in phase of maturity. It may settle from the emergence of the market. Indeed, the globalization of markets push companies, whatever their size, to increase their ability to manage information and knowledge about foreign markets. The increasing evolution of the international environment and the rising cost of introducing products are two specific factors encouraging companies to become better informed about the status of foreign markets. It is therefore not surprising that, throughout the world, investment in market research has increased steadily and substantially since the beginning of 1990's. So, competition may undermine the decentralization of exchanges which is built around the European Union (EU) in favor of a system of quantitative restrictions, including Chinese competition. In this sense, export may become a constraint in the development plan of the company even before being a choice. This is why it has become not only lawful, but even more necessary to reassess the viability of export strategies. This research is therefore at a microeconomic analysis of Tunisian firms to a major sector, which is the Tunisian textile sector to explain the determinants of export intensity. This paper is organized as follows; Section 2 presents a review of the literature on the factors that influence the export intensity. Such factors are grouped into two categories, namely external and internal factors to company. Section 3 is devoted to explain the data and methodological framework. Section 4 discusses the results. Section 5 concludes the study and presents some implications.

² The General Agreement on Tariffs and Trade (GATT) covers international trade in goods.

³ The World Trade Organization (WTO) deals with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible.

2. Literature Review :

2.1 External factors to the company:

2.1.1 Environment:

The environment or “the external uncertainty” (Khemakhem R., 2007) concerns the changes not anticipated in circumstances surrounding the exchange (Rashed, 2005). It is often described as a perception phenomenon derived from the incapacity to assign probability to the future events, a lack of information about cause and effect relationship and incapacity to predict the results of a decision (Miller and Shamise, 1999). Let us note that the international markets are characterized by a competitive pressure bigger than the national markets. Therefore, it needs competitive environment that is so much reflected on the side of demand where the consumers ask for a better quality and for low prices and on the relational side where firms face the international rivals (Jose Lopez R. and Garcia R. M., 2005). Thus, the environment practices an effect on the control degree, in the sense that it causes problems in the exchanges. Cadogan and al (2006), by referring to a database on the exporting of manufacturing industries of Hong-Kong, found that the environment is one of the important variables in determining the level of export.

2.2 Internal factors to the company:

2.2.1 Company Characteristics:

Galan and al. (1999) argue that the experience and reputation of a company promote its breaking into and success in foreign markets. Moreover, the experience of a company in exports has a significant influence on its foreign sales volume (Lado and al., 2004). Thus, Cavusgil and al. (1994), cited by Ocass and al. (2003) argue that the more a company is competent, the more it may go global. A company which is responsible for its international experience knows the differences of environmental conditions and chooses the most attractive market for it. And the company can adapt its strategies to meet the needs of the market. Moreover, Cavusgil and Nevin (1981) reported that the characteristics of the company play a role in the activity of export. In this study, it will be interesting to include the various characteristics of the company affecting export: the size of the company (Lado and al, 2004), the age of the company (Bagchi-Sen, 1999), its business sector (Orgam, 1982), capital

structure (Fernandez and al, 2005) and the level of technology (Beamish and al, on 1987). These factors are also important factors explaining the performance of the company's export (Weiner and al, 1981).

2.2.1.1 The Company size:

St-Pierre and al. (2003) point out that companies are trying to saturate the market first before adopting a regional export strategy allowing them to continue their growth. This comes to confirm the studies of Lado and al. (2004) and Moen (1999) supporting that large companies are more likely to have a higher level of export due to their experience abroad especially one that focuses on the knowledge of markets and language (Mehta, 1995) and their geographic diversification (Hitt and Bartkus, 1997). It is therefore common for large companies that have reached saturation much of their regional market as small and medium-sized enterprises (SMEs). Consequently, SMEs do not have the same needs to increase their sales abroad than large enterprises. Indeed, the literature on internationalization tends to consider the large company as the only unit of analysis in spite of the marked role that plays SMEs on the foreign markets (Coviello and McAuley, on 1999). The emphasis thus placed on the large companies is even more worrying that SMEs differ from large companies in terms of their management styles, their independence, the extent of their operations, etc. (O Farrel and al, 1998; Coviello and McAuley, 1999). Indeed, as Shuman and Seeger (1986 :8) say: “ Smaller business are not smaller versions of big business(...) Smaller business deals with unique size-related issues as well, and they behave differently in their analysis of, and their interaction with, their environment”. So, on the basis of these specificities, “It might therefore be expected that the internationalisation of SME would be different from that of larger firms due to: 1) firm characteristics or 2) behaviors used to overcome size – related challenges” (Coviello and McAuley, 1999). Indeed, for Coviello and McAuley (1999) the size seems to have a certain influence on the internationalization of the SMEs. They specify, however, that the small size has to get on in terms of weakness of resources rather than in terms of the number of employees. Also, according to Lado and al. (2004), there is a positive relation between the size of the company and the volume of export sales. These results can be explained by the fact that larger companies have the amount of resources required to perform a successful international operation while trying to take advantage of economies associated with their financial, human and managerial capacities. (Khemakhem R., 2007). Moreover, the probability of becoming an exporter increases with the size of the company (Moen, 1999). According to Julien (1997), the larger company scales, the better its profitability. In addition,

several authors have used the size of the firm as a control variable in order to analyze the effect of this mode of internationalization on firm performance (Hsu and al. 2003). In these studies, the size of the company was measured either by the number of employees or by the total assets. So there is a positive relationship between the size of the company and its performance in terms of export. Although the conventional assumption that "there must be large to compete globally" (Chandler, 1990) has been verified in many studies, a significant number of researchers found no relationship between size and export (Calof, 1993 and 1994). Indeed, Calof (1993 and 1994) found that the small size does not hold up the process of internationalization in terms of export, but limit the number of markets that company may enter. In addition, it is quite possible that beyond a certain threshold, the size does not play a significant role, data on Australia, Denmark, Italy, Japan and Spain supported this observation: the size dresses a considerable importance during the first stages of the internationalization, but it does not seem to be a significant factor afterward (OECD, on 1997). Furthermore, Cavusgil and Nevin (1981) found in their study a negative influence of the size on the propensity to be exported which is decisive in the case of very small companies. Nevertheless, some smaller companies could be important actors in their market segment, while other SMEs find that they cannot compete with their larger rivals that have a dominant position on the market (Lefebvre and Lefebvre, 2000).

2.2.1.2 Company Age:

Mature firms may have accumulated considerable knowledge stocks (Baldwin and Rafiquzzaman, 1998) and have established robust capabilities that allow them to better penetrate foreign markets. Indeed, this penetration can provide benefits that are the result of increased productivity and improved efficiency level (Deloecker J., 2007). According to the study of Bagchi-Sen (1999) conducted among 54 manufacturing SMEs in the Niagara Region in Ontario, 54.5% of firms that had a high level of exports were over the age of 20 years. Anderson and al. (2004) also support that age is significantly connected to the international activities of the small companies. Age Company therefore reflects an important aspect of the company experience and, therefore, this factor has an impact on business performance in terms of export.

2.2.1.3 Business sector:

The terms of trade are considered as one of the main problems for export (Ogram, 1982). In a study devoted to identify the success factors of the internationalization of SMEs, Fernandez and al. (2005) found that the use of the business sector as a control variable is relevant.

Considering that these conditions of exchanges differ from an industry to another one, the business sector of the company thus has an impact on its performance in terms of export. Ruigrok and al. (2003) as well as Hsu and al. (2003) used the business sector as a control variable in order to analyze the internationalization and firm performance.

2.2.1.4 Level of debt:

In their study of SMEs internationalization, Fernandez and al. (2005) have used the debt ratio as an explanatory export variable. According to Joyal (1996), under-capitalization is one of the reasons for the low export level. Ogram (1982) also supports this assertion when he states that one of the main problems in the export is the acquisition of the necessary funds for the financing of foreign sales. According to Julien (1997), a low ratio debt reflects the uncertainty of future profitability of a company. In addition, there is an inverse relationship between the debt ratio and the size of the company. According to Julien (1997), the more a company grows, the more it uses other types of financing. In a study that examines the relationship between internationalization in exporting and performance, Majocchi and al. (2003) used "Leverage", that is the capital structure of SMEs, such as a control variable. In their study, the debt ratio has shown a positive effect on company performance in terms of export.

2.2.1.5 Level of technology:

The entrance in foreign markets requires, whether industrial companies or services, an original knowledge, designing new products or an unpublished service (Leo and Philippe, 2006). In this regard, many empirical studies have emphasized the role of technology as a major factor contributing to the facilitation of entrance into international markets, at the same time as the development of export activity (Ozcelik and Taymaz, 2004; Calantone RJ and al, 2006; Leonidou, 1998). To maintain and improve the competitiveness of enterprises, it is crucial for these companies to acquire technological capabilities. Indeed, technological capabilities related to "current and future ability of a company to implement its clean technology to solve technical problems and / or to improve the technical functioning of the production process and / or finished products "(Nicholls-Nixon, 1995, p.7). While competition takes a more and more technological aspect, we have to expect that the technological capacities play an important role in a company's propensity to export. Meanwhile, Tseng and al. (2004), in a survey of U.S. SMEs, show that technological capabilities (the ability to develop new products and new processes) help SMEs to improve their international expansion.

Indeed, technology is a source of differentiation between firms by allowing them to generate sustainable competitive advantages through developing resources which are strategically uncommon. In fact, the existence of the resources strategically equivalent allows the rivals to develop similar strategies by neutralizing the advantages associated to the other resources. So, companies, possessing resources with these characteristics, have a greater competitive potential and hence a greater capacity to gain access to international markets. In addition, the adoption of advanced manufacturing technologies has long been recognized as a key factor in the competitiveness of manufacturing firms (Naik and Chakravarty, 1992), because these technologies enable greater productivity, improvements in the quality of products or reductions in the rate of release of products, all of which are essential to both domestic and foreign markets. A greater technological penetration strengthens the advantages of the automation and it improves the skills of employees (Lefebvre and Coll, on 1995). In fact, an increased level of automation is therefore considered as an asset in foreign markets and this assumption is supported by the fact that manufacturing technologies have shown a positive relationship with export (MacPherson, 1994). Similarly, modernization of machinery and equipment should also emerge as a precondition for success in export markets. According to Beamish and al. (1987), the level of technology offered is positively correlated to the level of export business as well as to the relative profitability of exports. Moreover, as shown by several studies, exporting SMEs appear more innovative than others (St-Pierre, 2003), sell products of medium and high technology (Mahone and Choudhry, 1995), have specific expertise which is oriented towards the needs of their customers (Ageron, 2001), and a motivated team (Fimbel and Gomez, 2003). In addition, Fernandez and al. (2005) argue that the ratio of R & D expenditure of the company on the sales is significantly related to the level of exporting SMEs. We note in this connection that the R & D not only generates innovations, but it allows companies to better assimilate the external technological knowledge. Furthermore, there is a causal relationship between internationalization and firm performance, the level of R & D is one of the control variables having an impact on performance (Hsu and al, 2003). According to Bagchi-Sen (1999), companies that have the highest level of exports further improve their manufacturing methods and are more opened to introduce new technologies. Moreover, a high level of technology used in the production is an indicator of the competitive advantage of the company, which is reflected in its performance. One of the main constraints faced by companies is certainly the lack of technological skills, which emerged as one of the most important determinants of technology adoption (Lefebvre and al., 1996) and this constraint can seriously slow down the innovative capabilities. However, a

rapid upgrading of the technology used by the company and innovation activities enables it to maintain its progress over potential rivals.

2.2.2 The monitoring activities and research Marketing:

Entering a foreign market is a test of the competitive capacity of the company, the level of performance of its international marketing and success of its target market (Bradley, 2002). So, as shown Julien and al. (1995), it is the strategic decision that leads managers to undertake the technology and the marketing and not the opposite. The choice of positioning on the international market led companies to practice a policy of access and dynamic circulation of information. Even if the knowledge is original, it is the manager's ability to capture information, and to control its circulation which leads to effective results (Leo, 1995) and reduces the risks associated with distance and cultural differences. According to Joyal (1996), one of the first obstacles faced by companies is the lack of information on export, hence the importance of more research on this theme. D'Ambroise (1989), in the meantime, argues that the need for good planning occupies a dominating place in the challenges which companies have to reveal. Exporting does not thus limit to sell the surplus production, but demand to be planned (Lages and al, 2004). If the knowledge of market and customers is recognized as a key factor in business performance of companies in terms of export, the necessary expertise to transform the commercial information into added value is not always available in companies and the presence of a qualified marketing manager is a catalyst for performance in exports (Williams, 2003). It has been shown that the commercial information (Czinkota, 1982) and marketing capabilities (Haar and Ortiz-Buonafina, 1995) are fundamentals to entry and expansion in the export market. Among a sample of new high-tech companies, Fontes and Coombs (1997) found that small firms seem better able to overcome the technological difficulties than commercial considerations. Given that this sample came from the technology sector information, there may be doubts about the ability to generalize this observation. In addition, Competitive advantages from an exclusive product (Cooper and Kleinschmidt, 1985) or the specificity of the products (Julien and al., 1994) have a positive relationship with performance in exports. Presence of trademarks and, more frequently exclusive products, should be an asset for companies that are present on foreign markets. Anyway, the creation of marketing channels and distribution (Julien and al., 1994) appears to contribute to strengthen the international competitiveness of firms in terms of export.

2.2.3 Partnerships:

Despite their dynamism and the fact that they are willing to have international operations, companies face serious challenges. Underfunding (Buckley, 1997), imperfect information and entry barriers set by competitors and governments (Acs and al., 1997) limit their perspectives for international expansion. In addition, the consciousness to have an original or specific expertise does not necessarily lead to an isolationist behavior among exporting firms. Whether observations made by spatial economists (Perrin , 1990) or observations made by managers (Fourcade, 1994), the call for closeness with partners is such that companies build a network of relationships with both suppliers and subcontractors, customers and donors orders, research centers and educational institutions and with public support agencies (Stevenson and Lundstrom, 2001). So, companies are turning to commercial agreements and strategic alliances with other domestic and foreign companies and rely on intermediaries (distributors and manufacturers' agents) to improve their performance in terms of export.

Indeed, collaborations or partnerships are a way to overcome the lack of resources or expertise exporting companies which might hinder their development on the international scene (Gemser and al, 2004). In addition, the intensification of the international competition, the improvement of the knowledge in all economic activities, the reduction of the product life cycle even more justify, according to Hollenstein (2005), the interest or the necessity to establish collaborations with divers partners in order, as underlines it Riddle and Gillespie (cited in Etemad and Wright, 2003), to access to strategic information required to export effectively.

2.2.4 Manager Characteristics:

Reid (1981) called back the relevance of the conclusions of Aharoni (1966) who pointed out that the knowledge of the market and the decision maker's preferences play a determining role in this decision making. Reid (1981) concluded that whatever the type of factors favoring the appearance of stimuli exports, their recognition and influence on the decision to export is a function of knowledge, attitudes and managerial motivations. Furthermore, Allali B. (2002) argues that if the SME cannot be approached as a large company in miniature, it is precisely because of the omnipotence of the manager. So, this highlights a critical role of the leader as a counselor, a consolidator, a toiler, etc.

Leonidou and al. (1998) argued that managerial characteristics influence the behavior of exporting firms. Moreover, researches in recent years are widely interested in managerial factors determining the success of export companies (Leonidou and al, 1998; Schlegelmich, 1986). According to Leonidou and al. (1998), the managerial characteristics significantly affecting firms' exports are grouped into two wide categories: objective characteristics such as the age of the manager, education, work experience, the ethnic origin, language skill and time spent abroad as well as subjective characteristics such as risk tolerance and perception of costs and benefits. The study of Weiner and al. (1981) showed that the level of leadership influences the performance of the company in terms of export. So the age of the manager, the schooling level, professional experience in international operations and foreign experience are the four characteristics which are related to the leader.

2.2.4.1 The manager age:

According to Leonidou and al. (1998), the age of the manager has a significant relationship with the fact that some firms export or do not export. This relationship indicates that younger managers tend to be more open to internationalization than older managers. Young managers play a more active role in the expansion of exporting firms (Leonidou and al, 1998). Besides, the age of the manager is inversely related to the percentage of foreign sales (Leonidou and al, 1998). Technologies that accelerate information communications and various training opportunities and possible experiences abroad are relatively recent to explain that the young managers have been more exposed to the international arena. This fact may explain the negative relationship between age of the manager and the growth of exports (Anderson and al, 2004). However, as the age of the leader is the sum of his experiences, this suggests that older leader will avoid further threats rather than a younger manager and he will improve the performance of his company.

2.2.4.2 The manager schooling level:

According to Schlegelmich (1986) cited by Leonidou and al. (1998), a high level of education is essential for managers who wish success in their export business. These authors argued that better educated policymakers are more open to international affairs. The level of education attained by the manager is suggested as a factor positively affecting business performance in terms of the exports. Moreover, as suggested by Raymond and al. (2005), a high Schooling level could help to manage information and uncertainty in the international business environment.

2.2.4.3 The manager professional experience in international activities:

The experience of the manager in international activities significantly affects export sales companies (Lado and al, 2004; Khemakhem R., 2007). According to Leonidou and al. (1998), the leader experience is also strongly correlated with the level of export business. This leader experience includes, among others, his previous trade, technical expertise and product knowledge. This relationship is even consistent if the leader experience is attached to international activities that required participation in international organizations or multinational corporations. Moreover, the experiences of international business influence, not only export, but also the profitability of foreign transactions and, thus, the global performance of the company.

2.2.4.4 Experience abroad:

According to Leonidou and al. (1998), travel and time spent abroad are strongly correlated with the level of exports. Knowing the characteristics of international markets and a foreign culture can make better decisions in order to face the business internationalization and thus to improve its performance. Moreover, Vinh and Craig, CJ (2007) indicated that the accumulation of international experience in a programmatic way extremely contributes to exploit market opportunities for export.

3. Data and Methodology:

3.1 Data:

The database implementation is derived from the National Institute of Statistics (INS) made from 254 Tunisian companies operating in the textile and clothing sector between 1997 and 2003. The database provides microeconomic data on the characteristics of the Tunisian companies over the period 1997-2003. Indeed, it contains information on the value added of every company, the capital, sales, and staff by gender, production, exports, firm age...

3.2 Selection of variables (dependent and independent):

Given that this study wants to explore the determinants of export, it is imperative to include the main explanatory variables to have a reliable estimation model and clearly identify the key factors in export activity.

3.2.1 Dependent variable:

Export (Export): the level of exports is measured by the percentage of sales for export on total sales of the company during the year ending in 2003. For our model, this variable will be defined in binary form, that is to say, a company that exports or does not export as the following:

{ If the part $\geq 10\%$, then the company is exporting ($y_{it} = 1$). .
If the part $< 10\%$, then the company is not exporting ($y_{it} = 0$).

3.2.2 Independent variables:

Firm size (Size): the company size is defined as the number of employees in the company. Indeed, the increase in size can positively influence the probability of exporting.

Qualified Women (Skilledwo): this variable represents the percentage of qualified women among the total number of employees in the company. Indeed, the improvement in labor productivity depends on the level of qualification of employees. Consequently, this variable affects positively the probability of exporting.

Qualified (Men Skilledma): this variable represents the proportion of skilled men among the total number of employees in the firm. Similarly, this variable positively affects the probability that the firm is exporting.

Firm Age (age): this variable represents the company age is defined as the absolute number of years of existence from the start. Theoretically, it is assumed that the firms that had a high level export were older. So this variable positively affects the probability of exporting.

Labor Cost (LC): The labor cost is defined as all charges for export activity. Indeed, there is an inverse relationship between exports and the labor cost. In fact, the reduction in labor cost can stimulate exports. Therefore, this variable negatively affects the probability of exporting.

Capital intensity (capintensity): According to the theory of international trade, a high level of capital intensity accordingly stimulates export activity. Consequently, this variable positively affects the probability of exporting.

To check the robustness of our estimation, Table 1 below shows the correlation matrix for all study variables. Observing the results presented for all independent variables, we note that in general, it does not seem to be a problem of multi-collinearity because the results are less than 0.5.

[Insert Table 1 about here]

3.3 Econometric Model:

Using econometric models with qualitative variables panel data allows the full use of the temporal and individual dimension of the data and take into account, at least in part, the unobserved heterogeneity of individuals. Given our objectives and the important size of our sample, the inclusion of a fixed effect deprives many degrees of freedom. Indeed, when using panel data, adding in the empirical model a fixed effect reflecting the individual effect of every company involves the dependent variable to vary across firms independently of all the explanatory variables included in the regression. In estimating the Logit model, the inclusion of a fixed effect requires the removal in our sample of all non-exporting firms. In our case this means the loss of a significant amount of information. Then, a Logit model with random effects is preferable. Indeed, to empirically analyze the determinants of export intensity, we used the Logit model with random effects applied to panel data. Assuming y_{it}^* latent binary dependent variable, we do not model the variable y_{it} itself but the probability $p(y_{it} = 1)$ that this variable takes the value 1. To model this probability, we will assume that the decision is based on the value taken by an unobservable variable y_{it}^* , called latent variable according to the following scheme:

The observed variable y_{it} is related to the latent variable with:

- $y_{it} = 1$ If the firm is exporting (share $\geq 10\%$), that is to say, if $y_{it}^* > 0$.
- $y_{it} = 0$ If the company is not exporting (share $< 10\%$), that is to say, if $y_{it}^* \leq 0$.

It is assumed that this variable y_{it}^* depends linearly on a number of explanatory variables X_{it} ;

$$Y_{it}^* = \beta'X_{it} + \varepsilon_{it} \text{ For } i = 1 \dots 254 \text{ companies and } t = 1997 \dots 2003 \quad (1)$$

With the error term ε_{it} is decomposed into an unobservable individual specific effect (v_i) and a usual error term (u_{it}). The error term (u_{it}) is assumed to be random and uncorrelated with the explanatory variables X_{it} .

u_{it} follows a normal distribution with zero mean. The individual specific effects v_i are random, zero mean and variance σ_v^2 . These specific effects are not autocorrelated or correlated with the disturbance u_{it} , then:

$$Y_{it}^* = \beta'X_{it} + v_i + u_{it} \text{ For } i = 1 \dots 254 \text{ companies and } t = 1997 \dots 2003 \quad (2)$$

$$\text{Therefore, } p(y_{it} = 1) = p(y_{it}^* \geq 0) = F(\beta'X_{it}) = \frac{\exp(\beta'X_{it})}{1 + \exp(\beta'X_{it})} \quad (3)$$

Where F is the cumulative distribution function of $\varepsilon_{it} = v_i + u_{it}$.

4. Results and Discussion:

Table 2 below presents the conclusions of the Logit estimation method with random effects applied to panel data. Wald test for the nullity of all coefficients show that our model is statistically significant (p-value < 0.05) and adapts well to the reality of our empirical data. Parameter rho is the ratio of two sigma error term specific (or random individual effect) with the total effect of two sigma of the random individual effect and the error term general.

Rho near zero means no specific individual therefore homogeneity while rho close to one means a strong heterogeneity. The Likelihood-ratio test of rho makes the test rho = 0 against rho different from 0. In our study, it is indeed a heterogeneity (p-value < 0.05).

[Insert Table 2 about here]

In addition, we remember that in a Logit model the estimated coefficients do not indicate an increased probability of the event given an increase of a one-unit of the corresponding explanatory variable. So it is for this reason we present the elasticities in table 3 shown below

[Insert Table 3 about here]

The results show that the variable *capintensity* representing capital intensity is significant with a P-value of 0.039 and positively affects the probability of exporting. Then, the elasticities for the variable capital intensity indicate that an increase of 1% level of the variable capital intensity increases by 4.58% the export probability. In fact, the increased level of capital intensity improves the productive efficiency of the Tunisian companies. Furthermore, the estimated coefficient on *Size*, representing the company size, is significant for a P-value < 0.05 and shows the expected positive sign. Then, an increase of 1% in the size of the company increases by 8.71% the firm export probability. Indeed, an increase in size, allowing Tunisian companies to be likely to have internal resources and stimulate the self-financing. Certainly, these results can be explained by the fact that Tunisian firms hold the amount of required resources to perform a successful international operation. In brief, an increase in the size allows the company to improve its financial strength and absorb any shocks which contribute to increase the probability of being exporter. The age variable representing the company age and reflects an important characteristic of its experience, is statistically significant for a P-value < 0.05 and positively correlated with the probability of exporting. In fact, an increase of 1% in age increases of 1.55% the company export probability. This could be interpreted as the consequence of the fact that older Tunisian firms have implemented strong capabilities that allow them to better penetrate foreign markets. Moreover, these companies are able to adopt rapid technological change, to reduce technical inefficiencies, to improve product quality and to accumulate considerable knowledge. The proportions of qualified women and men respectively represented by (*Skilledwo*) and (*Skilledma*) are not significant although they positively affect the exporting probability. This could be interpreted as the consequence of the fact that Tunisia's skilled labor force is scarce, mainly due to the relatively low rate of framing, particularly in terms of technical personnel and managers. Indeed, this weakness is attributable to the lack of training institutes and inadequate training content with the company needs. The labor cost approximated by the variable (*LC*) is statistically significant and negatively correlated with the probability of exporting. Indeed, the elasticities for the variable labor cost indicate that a 1% increase in the cost decreases by 0.45% the firm export probability. In fact, the decrease in cost decreases business expenses and therefore stimulates exports and this is explained by the fact that the worker in Tunisia is an abundant factor in the production.

5. Conclusion and policy implications:

In this study, we develop an econometric model which allows highlighting the main economic variables involved in explaining export intensity of the textile sector in Tunisia. We also tried to identify the key factors that have an impact on export activity. Indeed, the main factors that positively affect the exporting probability in Tunisia are: Capital intensity; the company age; and the company size. Furthermore, among the main factors that negatively affect the exporting probability, we also state the labor cost. If these results are confirmed by further analysis, they have important policy implications for businessmen and Tunisian managers. For businessmen, it is important to emphasize the need for an explicit and robust export strategy. Important points of this strategy include choosing the right location and the choice of markets with sufficient demand and strong expanding. A promising way for businesses to grow in Tunisia is to diversify the products or services in order to compete in terms of competitiveness with countries whose exports will no longer be subject to any quantitative restriction, note in this regard China. For managers, the analysis suggests several policy areas where improvements may be needed. In this respect, competition policy has a significant role to ensure a loyal competition between the competitive companies. Secondly, policies on education and professional training should be targeted to the needs of companies. It is striking in a country that where there are Thousands of graduates of colleges and universities, lack of access to skilled workers and managers is a major problem to the export activity. Then, the asymmetry between the skills offered by the working population and the skills demanded by employers must be corrected. Anyway, there is no miracle solution for companies wishing to succeed in the international scene. Even if certain conditions favor the export performance, companies must take into account the contextual factors that compose their particular environment. Under the conditions of a changing world, we proposed to cross different theoretical and empirical research in order to understand an economic aspect of Tunisia which is the export activity. We hope that this study will allow us to build a convincing explanation of certain facts concerning a key sector in Tunisia which is the textile sector. Finally, to avoid some critics sent to the Logit model as the incapability to inform about the most explanatory variables of the endogenous variable (the export intensity) and the inability to analyze the interactions between variables. Then, our attention can concern in future work on the non-

parametric methods which allow to exploit the available information in the interactions between the explanatory variables.

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Table 1: Correlation matrix

	capintensity	size	LC	skilledwo	skilledma	age
capintensity	1.0000					
size	0.4825	1.0000				
LC	0.2269	-0.0222	1.0000			
skilledwo	0.0055	-0.0375	0.1003	1.0000		
skilledma	-0.0655	-0.3751	0.4210	0.3136	1.0000	
age	-0.1528	0.1559	0.0189	0.0302	-0.0893	1.0000

Table 2: Estimation results

Variables	Statistic	P-value
constant	415.8313***	0.000
capintensity	0.7918142**	0.039
size	5.324876***	0.000
age	0.206547***	0.000
skilledwo	6.502547	0.132
skilledma	0.4993006	0.775
LC	-0.0001064**	0.036
Insig2u	2.157608	
sigma_u	2.94116	
Rho	0.7244733	

Likelihood-ratio test of rho=0: chibar2
(01) = 440.81 Prob >= chibar2 = 0.00

*** Significance at the 1% level

** Significance at the 5% level

Table 3: The Elasticities results

Variables	Elasticities	P-value
Capintensity	4.586084**	0.039
Size	8.710891***	0.000
Skilledwo	0.1840752	0.132
Skilledma	0.05153	0.775
Age	1.546482***	0.001
LC (Labor cost)	-0.4549465**	0.036

*** Significance at the 1% level

** Significance at the 5% level