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The Tunisian textile industry: local responses to internationalisation

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Abstract

The continuing internationalisation of the textile industry has reduced the labour cost advantages of Tunisian clothing firms. These firms have a precarious position in the international value chain, often as subcontractors and only rarely contributing high value inputs. To remain viable in the hyper competition wrought by internationalisation, firms must cut costs further, or adopt an entrepreneurial approach. Using entrepreneurial orientation as our conceptual framework, we examine 103 small Tunisian textile firms to find how they have responded to international competitive pressures.

Employing multiple correspondence analysis and typological analysis, we identify clusters of approaches. Our typology shows four distinctive groups: innovators, potentially innovative, passive imitators and one further ambiguous group. Our results show that different small firms have responded in different ways to the threats and opportunities of globalisation. Nonetheless, many Tunisian firms have improved their position in the international supply chain by innovative strategies, rather than simply focusing on cost reduction.

Keywords: Internationalisation, textiles; entrepreneurial orientation; innovative activity; cluster analysis; typology; multiple component analysis; Tunisia; international value chain, SME.

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1. Introduction

The aim of this paper is to examine how Tunisian textile manufacturers have responded to the pressures of globalization. In many ways the textile industry is the quintessential international industry as globalization has shaped its locations and influenced its markets (Serra, Pointon and Abdou, 2011). Historically, textiles were a foundation of the Industrial Revolution. Yet even in those early days the industry was global as raw material was sourced from the old Empires, shipped to Europe and the finished products sent out to consumers across the world. But globalization is dynamic because the relative and comparative advantages of places and people change over time (Snowdon and Stonehouse, 2006), Ironically, comparative advantage is almost always fleeting and fluid. If it works to develop the prosperity of region, the very process means that the specific advantage is lost and a new advantage is needed (Porter, 1980). Time, space and places are in dynamic relationships that shift comparative advantage and prioritise different strategies (Jack, Drakopoulou Dodd and Anderson, 2008). In recent decades the geography of the textile industry has been reshaped as manufacture has been drawn out from the core towards the periphery, driven by the lower cost of labour and the ease of transportation (Serra, Pointon and Abdou, 2011). Nonetheless, the textile and clothing industry remains important in Europe, employing over 2 million people (Taplin, 2006). However, the characteristics of the industry, the initial low barriers to entry, the labour intensity but with relatively low skill levels, and where economies of scope may be more important than economies of scale (Stroper, 1992) offer an attractive proposition for developing countries to climb the ladder of development (Gereffi and Memedovic, 2003).

This is the case in Tunisia where this industry plays a major role in the economy, especially for employment and foreign exchange earnings. Bassem (2009) explains that in the last two decades, the textile and clothing sector has experienced substantial growth, giving it a strategic place in the Tunisian economy. The sector created 30% of export added value in 2007. More than 2000 enterprises provide employment for over 200,000 individuals representing some 40% of all employment in the manufacturing industry. Yet globalization has also placed Tunisian manufactures in a somewhat precarious position in the global value chain. Generally, more complex, higher value-added tasks remain in developed countries with higher-paid skilled labour, while less skilled tasks have moved to low cost locations, mainly

in the developing world. Nonetheless, firms from high-wage developing economies are finding it increasingly difficult to retain a competitive edge in a progressively global market place (Morris, Barnes and Esselaar, 2008). Nonetheless, the viability of small businesses may depend on their ability to identify and respond to trends and opportunities (Irvine and Anderson, 2004; North and Smallbone, 1996). As Wright, Westhead and Ucbasaran (2007) comment, many SMEs lack the resources to meet the global challenge to internationalize.

Tunisia has specialised in subcontracting (APII, 2010; Bettaïeb, 2006), so that, of the 2,299 Tunisian textile enterprises, 1,752 are subcontractors and thus highly dependent on others who are likely located elsewhere (Mefford, 2010). The high value adding upstream activities of the fashion industry are largely absent. Thus internationalization makes the Tunisian industry vulnerable to shifts in the relative cost of labour and the stickiness of high value operations in core regions. Internationalization also removed the old shelter of the textile quota system in 2005 but was replaced by EU free trade agreement allowing tariff free access to EU markets.

Tunisian textile enterprises' position in the value chain may reduce the scope for innovation and result in a short term view with an emphasis on cost reduction, whilst long run survival requires innovation and the consequent risk. It is this issue that provides the focus of this study. How have textile manufacturers responded to the threats produced by internationalization? Although innovation is generally seen as a good thing (Amara et al., 2008; Wana, Ong, and Leec, 2005) but it carries costs and may have a high risk of failure (Chorev and Anderson, 2006; Oh, Cruickshank and Anderson, 2009). Morgan (2007) suggests that innovative firms face a greater degree of uncertainty and instability. Indeed, Cosh, Hughes and Wood(1996) suggest that whilst there is strong historical evidence that firm failure is linked to product innovation, they found the opposite to be the case in the UK. So at best, innovation is risky, expensive and carries no guarantees; but may even be essential to survive.

Our research problem is that whilst innovation may be a sound response to global competitive pressures, Tunisian companies may not have the capacity, capability or even a desire to be innovative. Hence they may resort to the pressure by attempting further cost containment in an attempt to remain internationally competitive. This dilemma provides the research problem for the paper. Put differently, the purpose of this article is to examine how firms have

responded to this turbulent internationalised environment. We want to know if they have simply tried to contain costs, or if they have been more proactive with an entrepreneurial response. Accordingly, we use the concept of Entrepreneurial Orientation (EO) as a theoretical lens to examine the attitude of Tunisian textile firms face to this international environment. This seems most appropriate given Zhara and George's (2002) view that international entrepreneurship is the process of creatively discovering and exploiting opportunities that lie outside a firm's domestic market in the pursuit of competitive advantage.

Using the well established conceptual framework of entrepreneurial orientation, we collected data about the practices of over 100 firms. We found that we could categorise their strategic responses into three meaningful typologies; entrepreneurial, potentially entrepreneurial and conservative. We also found a fourth, but somewhat ambiguous group. The results indicate that many small firms are grasping the mettle of opportunity, despite the risks and costs. They are attempting to shift up the value chain by adapting and improving their comparative advantage. The study contributes to our understanding of the dynamic nature of competitive strategies and practices, but especially in developing counties, and to how internationalisation can be an opportunity for smaller firms.

The paper first presents the literature on internationalisation and entrepreneurial orientation in sections 2 and 3. This conceptualises our research problem. Our methodology is reported in section 4. Section 5 discusses our findings and puts them into the broader perspective of internationalisation. Finally section 6 concludes the article.

2. Internationalisation

Globalization has brought out the opportunities of internationalization (Dimitratos et al., 2011; Perks and Hughes, 2008; Zahra and Garvis, 2000; Zhou, 2007). Since the early nineties the importance of internationalization for SME has become apparent. Stevenson and Jarillo (1990) for example, point out that entrepreneurship implies the pursuit of international opportunities, regardless of resources currently controlled. In the same vein, Alon, Fetscherin and Johnson (2011) argue that international participation is an indicator of an industry's competitiveness. Zahra and Garvis (2000) recognize that internationalization create relevant opportunities for established firms to grow and achieve profitability, since it allows them to

achieve economies of scale, develop new products, reduce production costs, expand into existing or new foreign markets. According to several authors (Javalgi and Todd, 2011; Perks and Hughes, 2008) internationalization reflects a firm's propensity to cope in global markets and to respond to the environment pressures caused by rapid globalization processes. However, there are various factors that may jeopardize a firm's capabilities to compete within the new market conditions brought about through globalization. Because of government's protectionism, domestic established firms may become accustomed to only competing in their home markets (Zahra and Garvis, 2000). Consequently, such firms have limited knowledge of foreign local conditions (Perks and Hughes, 2008) where they may face fierce rivalry among competitors (Porter, 1980), changing customers' preferences, and rapid technological changes (Javalgi and Todd, 2011; Serra, Pointon and Abdou, 2011; Zahra and Garvis, 2000).

Given such environment complexity, the entrepreneurship and international business literature (Dimitratos et al., 2011; Javalgi and Todd, 2011; Zahra and Garvis, 2000; Zhou, 2007) advocate that to be able to compete internationally, firms have to react proactively, take risks willingly and develop strategies that involve innovativeness (Miller, 1983; Zahra and Garvis, 2000; Zhou, 2007). According to Dimitratos et al. (2011), promoting a firm's international entrepreneurship culture enables the firm to understand international customers preferences, core competencies and weaknesses competitors in the international market and to increase their agility to respond to external environment change (Zahra and Garvis, 2000).

Nordas (2004) notes that the changing global environment and the buyer-driven characteristics of the international value chain means that although price is the primary determinant, it is no longer the sole determinant of competitiveness. Customers have become much more demanding in terms of lead times, quality, and reliability[1]. The ability to be flexible and accurate when responding to customers' needs, as well as having an in-depth understanding of the customer's market and culture has become critically important (Morris, Barnes and Esselaar, 2008). These factors reshape the form of international competition. Globalisation, coupled with frequent advances in technology, means that firms have to adapt quickly and constantly improve, usually by innovating (Anderson, Benavides-Espinosa and Mohedano-Suanses, 2011).

3. The challenging nature of EO and innovation

Accordingly, it seems appropriate to use the concept of Entrepreneurial Orientation (EO) as our theoretical lens to examine the activities, the intentions and the practices of Tunisian textile companies. As a firm level construct, EO extends the scope of enterprising behavior beyond business creation to consider entrepreneurial capability and implementation in existing firms. More precisely, EO focuses on measuring entrepreneurial intensity in existing firms (Miller, 1983). Lumpkin and Dess (1996) envisage the concept as entrepreneurial management (Stevenson and Jarillo, 1990). Consequently, EO refers to the processes, practices and decision-making styles that enable firms to act entrepreneurially to sustain and upgrade their competitive advantage (Atuahene-Gima and Ko, 2001; Lumpkin and Dess, 1996; Wiklund and Shepherd, 2005). Several studies (Miller and Friesen, 1982; Miles and Snow, 1978; Jambulingama, Kathuriab and Doucettec, 2005; Avlonitis and Salavou, 2007) have classified firms based upon their EO dimensions. Although there is some variation, firms are generally divided into two groups: the defenders (also labeled as conservative or reactive) and the prospectors, (also described as entrepreneurial, or pioneers or proactive entrepreneurial firms).

Innovation[2], risk-taking and proactiveness have often been considered as crucial for survival and success (Covin and Slevin, 1991; Miller and Friesen, 1982; Yang and Li, 2011). Collectively, these three dimensions have been used to define the construct of a firm's entrepreneurial orientation (Miller, 1983). Globally, entrepreneurial orientation is understood as organizational renewal and evolution (Cavalcante, Kesting and Ulhøi, 2011) and refers to the development of new business ideas and opportunities within established corporation. Thus, EO is regarded as the processes, practices and decision-making (Lumpking and Dess, 1996), the entrepreneurial behaviors (Covin, Green and Slevin, 2006; Wiklund and Shepherd, 2005) and the managerial capability (Atuahene-Gima and Ko, 2001) that leads a firm to "beat competitors to the punch" (Miller, 1983).

Moreover, scholars have developed different terminologies to describe this type of entrepreneurship within existing organizations; entrepreneurial management (Stevenson and Jarillo, 1990), strategic renewal (Crossan and Berdrow, 2003), corporate entrepreneurship (Zahra, 1993), entrepreneurial posture (Covin and Slevin, 1991). The Schumpeterian concept of "creative destruction" is also applied (Cavalcante, Kesting and Ulhøi, 2011) to corporate venturing. In terms of management, Aspara et al. (2011) describe the process as the business model of the firm's logic and ways of doing business to create value for its stakeholders (Bourne, 2011). Cavalcante, Kesting and Ulhøi (2011) emphasize dynamic change as model

revision; changing in existing working practices, dismantling the existing business model and building anew. The revised business model is a response to environment threats such as rapid product obsolescence, but embracing new opportunities (Sosna, Trevinyo-Rodriguez and Velamuri, 2010).

To identify a firm's EO, Miller (1983) posits three key dimensions. Firstly, innovativeness reflects the tendency to engage and continually promote new ideas, novelty, experimentation, and creative processes that allow the firm to put on the market new products (Lumpkin and Dess, 1996). Secondly, proactiveness reflects the company's ability to anticipate market changes to provide a better market position that creates first mover advantage over competitors (Venkatraman, 1989). Thirdly, propensity to take risks, involves a firm's willingness to engage into projects where the outcome and return on the investment are unknown. Additionally, Lumpkin and Dess (1996) suggest adding competitive aggressiveness and autonomy as additional dimensions of EO. Autonomy is defined as a willingness and ability to act independently in pursuit of market opportunities (Li, Huang and Tsai, 2009). It also refers to the extent to which individuals and teams within an organization have the freedom to take initiative and promote the new ideas that are needed for EO. Competitive aggressiveness is related to the firm willingness to take on, and a desire to dominate competitors through a combination of proactive moves and innovative efforts (Covin and Covin, 1990).

Perhaps signaling the importance of a dynamic response to globalization, the resource-based view and the capabilities-based view approaches explain heterogeneity among firms in how they resources and the different results in terms of competitive advantage (Andersén, 2011; Cáceres, Gumán and Rekowski, 2011; Cegarra-Navarro, Sánchez-Vidal and Cegarra-Leiva, 2011; Liu and Hsu, 2011). Authors using these approaches classify firms as innovators or imitators. Firms with an innovation orientation are "market pioneers" whilst firms with an imitative orientation are labeled as "followers" (Naranjo-Valencia, Jiménez-Jiménez and Sanz-Valle, 2011; Park, Lee and Hong, 2011).

Firms may of course, have different forms of EO (Avlonitis and Salavou, 2007). Nonetheless, the literature makes clear that entrepreneurial and conservative firms represent opposite ends of the spectrum. Table 1 uses the literature to summarize types of firms according to their responses to environment dynamism. It is clear that despite the different labels and descriptions, a dichotomy of being entrepreneurial or not, pervades the literature.

Table 1 Typologies of responses to environment dynamism.

Author	*Firm's Responses Typology*
Miles and Snow (1978)	• The *defender*: reflects a conservative posture by engaging in little or no product or market change; seeks to keep expertise in a narrow product market and compete on the basis of cost reduction and product quality. • The *prospector*: strives to be a pioneer; interested in developing and opening up new markets. • The *analyser*: accurately assessing risk ensures good adaptation capabilities to create organizational stability. Sometimes, the firm imitates proactively. • The *reactor*: demonstrates passive behavior, so that change in product or process is imposed; tend to failure because copies without adapting the organization
Miller and Friesen (1982)	• The *conservative model* assumes that innovation is performed mainly in response to serious challenges. • The *entrepreneurial model* proposes that innovation is always aggressively pursued.
Jambulingama, Kathuriab and Doucettec (2005)	• *Competitive Aggressors*: To improve their market position, this group shows higher competitive aggressiveness compared to most other entrepreneurial characteristics. • *Ambitious*: The top priority within this cluster is their emphasis on motivation. • *True Entrepreneurs*: Strong emphasis on all six entrepreneurial characteristics, but in particular, risk-taking, proactiveness and innovativeness. • *Low-Risk Entrepreneurs*: Lower emphasis on risk-taking compared to all other entrepreneurial characteristics within the cluster.

	• *Proactive Innovators*: An emphasis on proactiveness and innovativeness. • Anything but Entrepreneurs: This group rates significantly lower on proactiveness, innovativeness, autonomy, and motivation.
Avlonitis and Salavou (2007)	• *Passive entrepreneurs*: no action before competitors' action and avoid high risk action. • *Active entrepreneurs*: aggressive posture based on high-risk actions; exploit market opportunities aggressively, redefining how the competitive game is played.

4. Research Methodology

Earlier, we concluded that internationalization has brought both opportunity and threats to the Tunisian textile industry. The opportunity to be part of a global chain is tempered by an increased need to remain competitive, especially in the context of the hyper-competitive international clothing and textile industry (Morris, Barnes and Esselaar, 2008). Tunisia's original advantages of lower labour costs and geographic and cultural proximity to Europe (Harbi, Amamou and Anderson, 2009) were threatened by the Asian grab (Gereffi, 1999) of nearly 50% of the global textile and clothing market (Villoria, 2009) and contextualized in the less valuable role of downstream processing as a subcontractor. Furthermore, cost competitiveness is argued (Mytelka 1991) to be becoming less important because of a transformation towards becoming a 'knowledge-intensive' industry.

Our research objective was to examine if, despite the limited scope of innovation and tough competition, Tunisian apparel firms exhibit an EO. We surveyed 103 established clothing firms, then analysed our data by employing a multiple component analysis (MCA) to depict correspondences between variables and to provide coordinates for the typological classification. We conducted a second analysis, a cluster analysis to determine a typology of Tunisian apparel firms according their entrepreneurial orientation.

Our methodological approach has the apparent advantage of empirical robustness in dealing with a variety of diverse behaviours. Our sampling strategy means that our sample is

representative of our chosen sample frame. The analytical techniques we employ are the most useful for the task in hand, an exploratory analysis. Whilst this allows us to combine variables the results are, of course, only as good as the data collected. Consequently our face to face data collection gives us some confidence about the reliability of our data. However, we also have to acknowledge the diversity of means of coping with international pressures. Our variables seem to cover all those identified in the literature; hence they are well grounded in what we already know. Moreover, we have added some contextually important factors. Nonetheless, we have assumed that an entrepreneurial orientation is a solution, and this may not be the only possible way of responding to pressure. We also note that our conclusions are somewhat dependent upon our interpretations of the causality implied in the typologies.

4.1 Sample and data collection

A sample of 163 Tunisian apparel firms was selected from the national Agency for the Promotion of Industry and Innovation. The target population of this survey is small and medium-sized enterprises (SMEs) operating both in local and foreign markets, and engaged in the clothing industry. Firms only exporting and other branches of the textile industry were excluded. We define SMEs as a firm employing between 10 and 200 employees. The details of our sample are provided in Table 2.

Table 2 Demographic profile of sampled firms (N = 103)

Firm's number of employees	Number of firms	Percentage
Between 10 and 49	58	56.3
Between 50 and 99	31	30.1
Between 100 and 200	14	13.6
Total	103	100 %
Firm's age	Number of firms	Percentage
Less than 10 years	7	6.8
Between 10 et 20 years	59	57.3
More than 20 years	37	35.9
Total	103	100 %
Firm's geographic location	Number of firms	Percentage

North (Grand Tunis, Bizerte)	35	34
Center (Axis Sousse, Monastir)	37	35.9
South (Sfax)	31	20.1
Total	103	100 %

Data were collected from the year 2009-2010 through face-to-face interviews with senior managers because we thought them to be best informed about the innovative activity of the enterprise and best able to comment on the business strategies adopted. This data collection method aimed to increase the response rate and ensure that the responses collected were complete and usable for data analysis. Through various efforts including both formal and informal contact with the selected firms, a final total of 103 questionnaires were completed, a response rate of 63.2%. Such a high response rate reflects our extensive use of social network's relationships, which proved to be necessary to solicit Tunisian managers' participation in the survey of potentially sensitive issues. No significant ethical problems were raised but we promised anonymity to our respondents.

4.2 The survey instrument

Data were gathered by mean of a self-administered questionnaire. The questionnaire was adapted from the Third Community Innovation Surveys (CIS 3) which is informed by the OECD's Oslo Manual (OECD, 1992/ 1997). Based on our literature review we added further variables and items refined others. Our intention was to derive comprehensive innovation measures that take into account the specific features of Tunisian clothing industry context and to better reflect the dimensions of EO. Respondents were specifically asked about any innovative activities over the past three years, but especially about product and process innovation, novelty of innovation, innovation co-operation, innovation activity and expenditure, methods of protecting innovation, human resources practices and business strategy. Table 3 describes the definition and measurement of each variable.

Table 3 Variables about the firm's innovative activities and the measures applied

Variables	*Measures*	*Codes*
Nominal active variables		
New product/process development		
Degree of innovation novelty	New- to-market	NTM
	New to firm	NTF

Product innovation	New product (original design)	NPR
	Significantly improved products (e.g alterations to the basic material)	SIP
	Product with purely aesthetic changes	PEC
Process innovation	New production processes (e.g manufacturing automation)	NPP
	Computerization of management system	CMS
Cooperation and innovation expenditure		
Innovation framework	Cooperation with foreign firms	CFF
	Exclusive work of your firm	EWF
	Detecting and replicating existing best practices	RPM
Financing innovation activity	Self-financing	SFI
	Debt	DEB
Intellectual Property Rights		
Method of protecting innovation	Trademark registration	TMR
	Secrecy complexity of design	SCD
	First mover advantage- ahead of competitors	ATC
Human resource practices		
Staff focus on	Product design task	STDT
	Commercialization task	STCT
Staff autonomy	Highly autonomous	HAU
	Low autonomy	LAU
	Not autonomous	NAU
Business Strategy		
Market	Local/Regional (within 50kms)	LOC
	National	NAT
	Foreign (Maghrebian, European)	FOM
competitiveness factor	Low cost	LCC
	Quality produced	QPC
	Customer relationship	CRC
willingness to take risks	Take risks	TPI
	Avoid risks	ARI
Nominal illustrative variables		
ISO certification	ISO certified firm	+ISO
	ISO Non-certified firm	-ISO
Innovation activity	Acquiring other external knowledge (e.g patent licensing, software)	AEK
	Communication/advertising actions	CAA
Staff qualifications	Extremely high	EHQ
	High	HIQ
	Medium	MEQ
	Low	LOQ

5. Analysis

As discussed earlier, we are interested in identifying Tunisian firm's strategies as a local response to the competitive international conditions. To this end, we develop a typology based upon dimensions of their innovative activities. We expect this will provide a picture of their

responses to international pressures and allow us to see if there firms, who despite high risks, pursue an entrepreneurial strategy. Technically, we used two forms of analysis: MCA and cluster analysis because the combined use of these techniques is recommended for a thorough description of a complex data set. MCA permits a reduction of the number of categorical variables to be considered in the analysis, as well as the deduction of the structure of the relationships between variables. Dimensions are 'extracted' to maximise the distances between the row or column points. Successive dimensions (which are independent of, or orthogonal to, each other) will 'explain' less and less of the overall inertia. Each Eigenvalue represents a measure of how much inertia each successive factor extracts. Eigenvalue reflects the relative importance of the dimension examined.

Despite the advantages of these analytical techniques, there are also some disadvantages. As exploratory techniques, there are no statistical significance tests suitable for testing the results of MCA and HCA. Moreover, it can be difficult to identify clusters when the individual numbers increase substantially. The approach is also limited by the subjectivity involved in interpreting the obtained clusters.

5.1 Multiple Correspondence Analysis (MCA) results

The MCA generated six factors (but we retained only the first four because the other factors provide little further information) corresponding to the six first Eigenvalues (Table 4).

5.1.1 The first factorial plan

The first two dimensions accounted for 22.85% (12.18% and 10.67% respectively) of the data inertia and the first factor measures are presented in Table 5.

Interpretation of factor 1

In Figure 1 the first factor contrasts two groups of entrepreneurial activity. The staff in the first group focuses on product design task (STDT). They seem to be concerned with the development of cooperation with foreign firms (CFF) as a way to enter foreign markets. Moreover, this category of firms considers customer relationships (CRC) at the heart of firm's competitive strategy and they are willing to incur the risks, financial, commercial and organisational associated with innovative activity. In contrast, the second group is more interested in product commercialisation (STCT). Those firms exhibit a risk-averse attitude

(ARI) in terms of product innovation. They deal with potential competitors mainly by following; an imitation of innovation, rather than pioneering themselves.

Figure 1 also shows that ISO certified firms contrast with ISO non-certified firms. We note too that the two measures 'ISO certified firms (+ ISO) and 'cooperation with foreign companies' (CFF) are close together in Figure 1. Consequently, we conclude that cooperative relationships with foreign firms actually fosters Tunisian firms' international competitiveness by improving their quality management processes.

Figure 1. The first factorial distribution

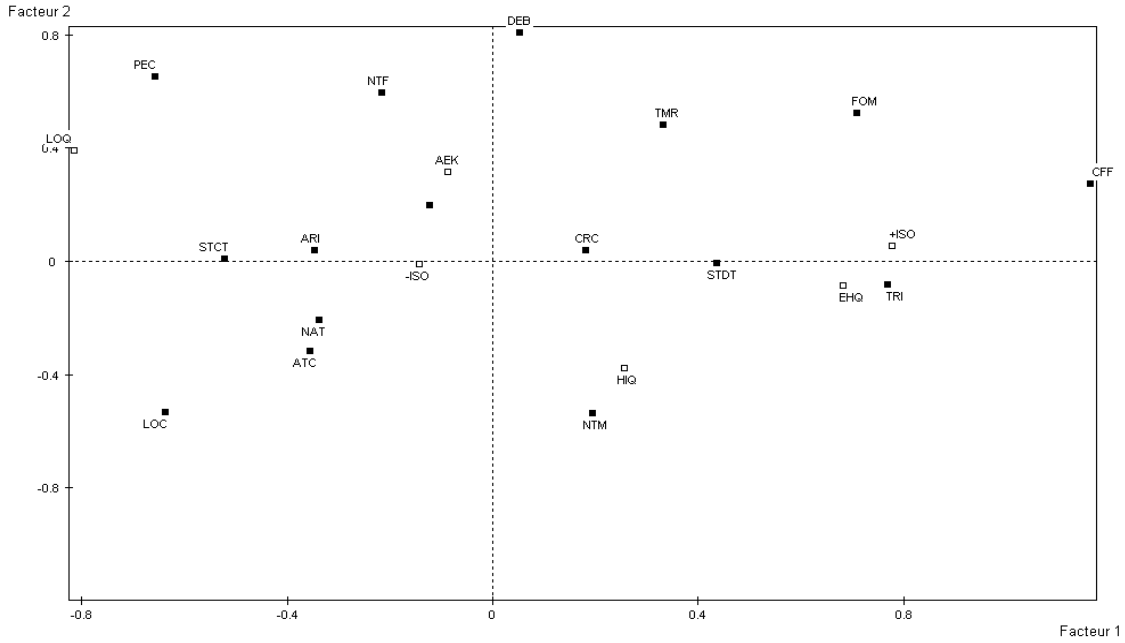


Table 4 Eigenvalues and inertia percentages

Number	*Eigenvalue*	*Percent.*	*Cumulat. Percent.*	
1	0.1882	12.18	12.18	**********
2	0.1649	10.67	22.85	**********
3	0.1372	8.87	31.73	**********
4	0.1311	8.48	40.21	**********
5	0.1117	7.23	47.44	**********
6	0.1085	7.02	54.46	**********
7	0.0958	6.20	60.65	**********
8	0.0930	6.02	66.67	**********
9	0.0815	5.27	71.94	**********
10	0.0724	4.68	76.63	**********
11	0.0703	4.55	81.18	**********
12	0.0617	3.99	85.17	**********
13	0.0561	3.63	88.80	**********
14	0.0557	3.61	92.40	**********
15	0.0413	2.67	95.08	**********
16	0.0384	2.49	97.56	**********
17	0.0377	2.44	100.00	**********

Table 5 Contributions and squared cosine of measures forming the first factor

Variables	*Measures*	*Contributions (CTR)*	*Squared cosines (CO2)*
Market	LOC: Local/Regional	4.6	0.12
	NAT: National	2.1	0.07
	FOM: Foreign (Maghrebian, European)	9.5	0.32
Innovation framework	CFF: Cooperation with foreign firms	17.2	0.48
Method of protecting innovation	ATC: Ahead of time over competitors	2.3	0.08
Willingness to take risks	TRI: Take risks	8.9	0.27
	ARI: Avoid risks	4	0.27
Staff focus on	STDT: Product design tasks	5	0.23
	STCT: Commercialisation tasks	6	0.23
Competitiveness factor	LCC : Low cost	0.8	0.04

Moreover, this first factor shows that the measures, 'Extremely high level of qualification" (EHQ) and 'Staff focus on product design task" (STDT), are proximate to each other. Also, the measures "low level of qualification" (LOQ) and "Staff focus on product commercialisation" (STCT) are close to each other. This allows us to conclude that the firms that prioritise product design are characterised by highly qualified employees. Contrastingly, the employees of firms who focused on product commercialisation are characterised by low levels of qualification.

So, it seems clear that the first axis reflects the extent of the entrepreneurial activity adopted by the Tunisian firms. Interestingly, the axis contrasts the firms which have developed relatively intensive entrepreneurial activities (a focus on product design, risk taking, developing cooperation with foreign companies) with those characterised by low entrepreneurial activities (risk-averse attitudes, focus mainly on marketing the product and limited to the local market). Thus, we call this factor "entrepreneurial orientation". Note, that the factor can be either strong or weak.

Interpretation of factor 2

The measures forming the second factor are presented in Table 6. The second factor contrasts those firms who introduce new products to the market (PNM) and fund their innovation activities by self-financing (SFI), to those whose products were not new to the market, but

new to the firm (PNF). Within this group, product innovation is limited to improving the aesthetical presentation of a competitor's product (PEC) and they fund their innovation activities by debt (DEB) and protect their trademark (TMR). As shown in Figure 1, we note that the measures "staff with high qualification levels" (HIQ) and "products new to the market" (NTM) are close to each other. So, the employees of firms that launch innovative products (original design) are characterised by a high levels of staff qualifications.

Table 6 Contributions and squared cosines of the measures forming the second factor

Variables	*Measures*	*Contributions (CTR)*	*Square cosines (CO2)*
Degree of innovation novelty	NTM: New to market	8.4	0.32
	NTF: New to firm	9.3	0.32
Product innovation	PEC: Product with purely esthetic changes	7.7	0.21
Method of protecting innovation	TMR: Trademarks registration	6.5	0.24
Financing innovation activity	SFI: Self-financing	2.8	0.22
	DEB: Debt	8.7	0.22

These result show that axis 2 relates to aspects of innovation management such as trademark registration, the contribution of purely cosmetic changes to the products already on the market and funding for innovation activities. Thus, we call this second factor "innovation management tools".

5.1.2 The second factorial plan

The percentage of inertia explained by the second plan is 17.35% (the third factor explains 8.87% and the factor explains 8.48%).

Interpretation of factor 3

The measures that form factor 3 are presented in Table 7.

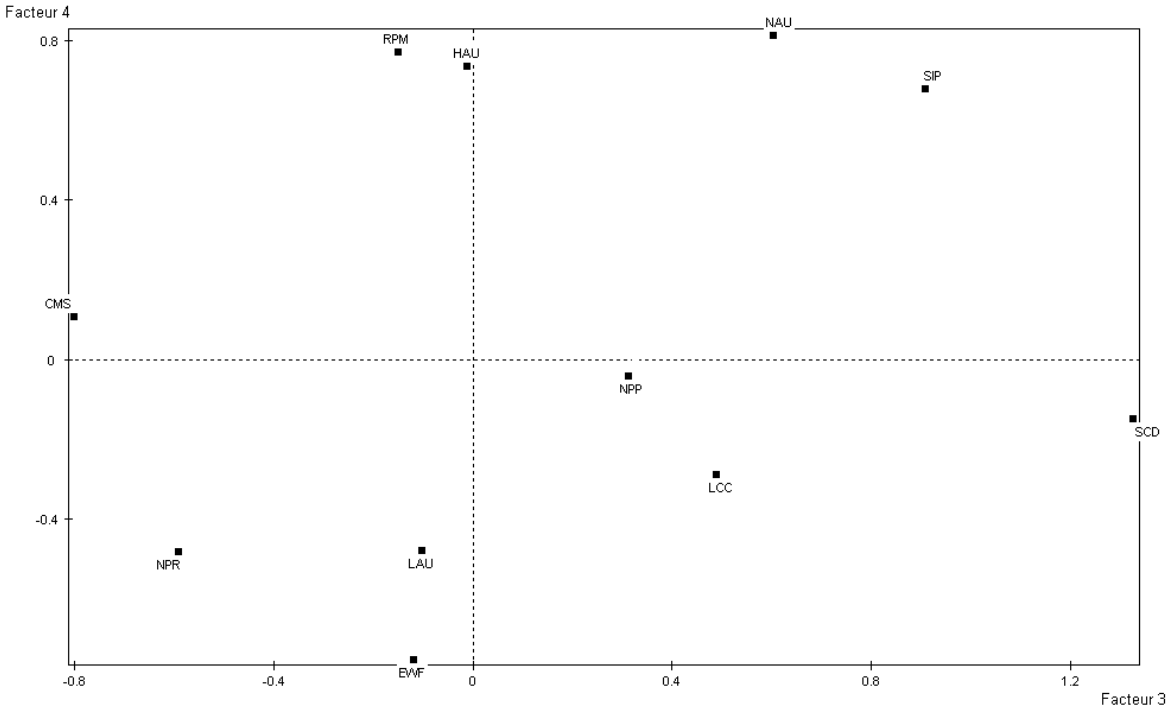
Table 7 Contributions and squared cosines of measures which form the third factor

Variables	*Measures*	*Contributions (CTR)*	*Square cosines (CO2)*
Product innovation	NPR: New product (original design)	11.8	0.31
	SIP: Significantly improved products (e.g.- altering the basic material)	16.8	0.36

Process innovation	NPP: New production processes (e.g.- manufacturing automation)	3.6	0.26
	CMS: Computerization of management system	13.1	0.26
Method of protecting innovation	SCD: Secrecy complexity of design	10.7	0.27
Competitiveness factor	QPC: Quality produced	5.5	0.09
	LCC: Low cost	4.5	0.18

According to factor 3, the measures "new manufacturing process" (NPP), "change of materials" (SIP), "low cost as a competitiveness strategy" (CCR), "secrecy and complexity of design" (SCD) are close to each other. Therefore, firms using different materials (SIP) to manufacture new products introduce significant improvements in their manufacturing processes (NPP) and opt for secrecy and complexity of the design (SCD) to protect product innovations. This group of firms employs a low-cost competitiveness strategy (LCC).

Figure 2 The second factorial distribution



We observe that in Figure 2, the measures "original product design" (NPR), "computerized management system" (CMS) and "product quality as a competitiveness strategy" (QPC) are negatively associated with axis 3. So firms that offer an original product and have a

computerised production system choose product quality as a competitiveness strategy. Thus, we call this third factor “product and/or process innovation”

Interpretation of factor 4

The measures that form the fourth factor are illustrated in Table 8. Factor 4 presents the measures "replicating best practices existing on the market "(RPM) and "high autonomy" (HAU) are close to each other. We note too, that the measures "firm’s exclusive work" (EWF) and "low autonomy" (LAU) are also close to each other. We conclude that firms generating product innovation through producing the best products involve their employees in decision making. However, firms who don’t involve employees in decision making, undertake innovations based exclusively on their own research and development.

Table 8 Contributions and squared cosines of measures which form the fourth factor

Variables	*Measures*	*Contributions (CTR)*	*Square cosines (CO2)*
Innovation framework	EWF: Exclusive work of your firm	15.4	0.36
	RPM: Detecting and replicating best practices existing on the Market	14.4	0.32
		10.6	0.21
staff autonomy	HAU: High autonomy	9.8	0.36
	LAU: Low autonomy		

Thus we note from the above, that the fourth axis distinguishes firms over two levels. Level 1 is the framework of the development of innovation activities. Level 2 is the degree of autonomy granted to employees. However, these variables also inform the entrepreneurial orientation of Tunisian firms. Accordingly, for the fourth factor we employ the same name as the first axis "entrepreneurial orientation". Nonetheless in the fourth axis, entrepreneurial orientation may be obvious or not obvious (Recall that for the first axis, entrepreneurial orientation may be high or low).

5.2 Typological analysis

In this analysis we develop our MCA analysis to identify a typology of firms. The clustering highlights the grouping of firms’ attributes and behaviours, but only those variables which contribute most to the formation of the axes are considered in the cluster analysis. As the variables are categorical, the cluster analysis is run using the factorial coordinates found in MCA. However, the complementarity of these techniques is not limited to the practical

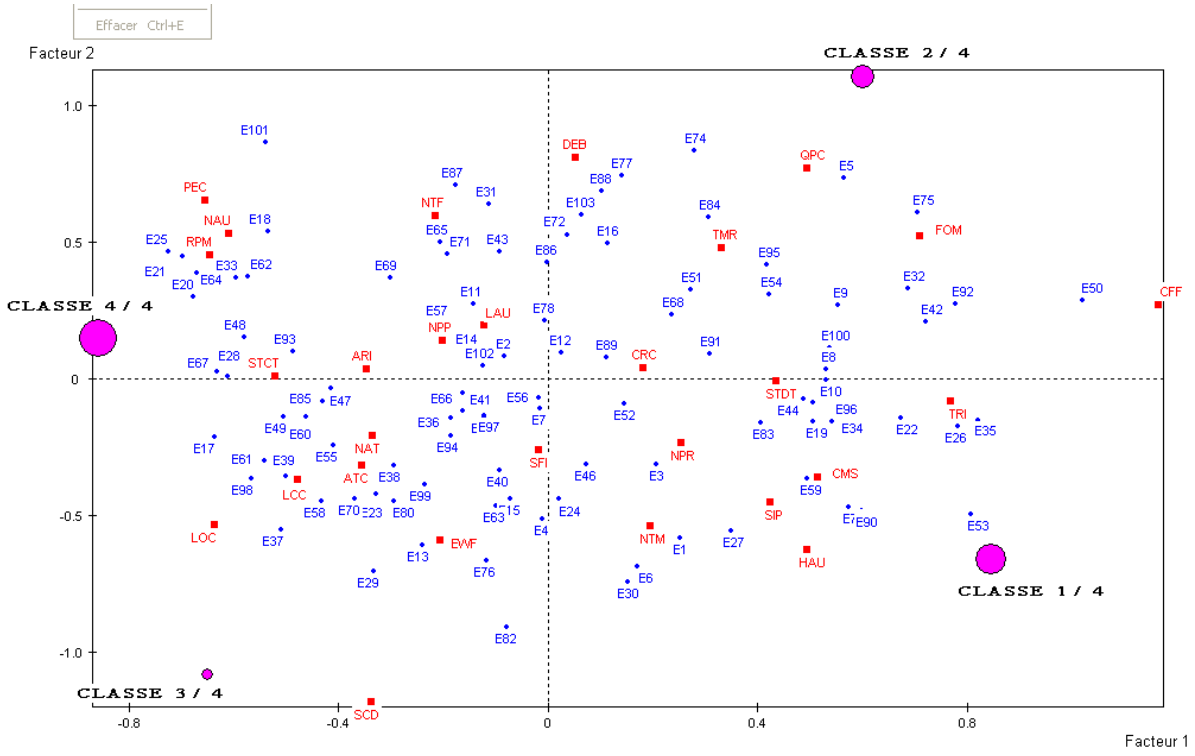
processing phase. The viewpoints of the two approaches, as well as their output, are different. Correspondence analysis describes the main features of the data as they appear in the space spanned by the first principal dimensions. This involves a substantial contraction (as a consequence of a projection onto a subspace) of the inertia. By contrast, most of the classification algorithms are locally robust in the sense that the lower parts of the produced dendrograms are largely independent of possible outliers. Thus, on the basis of the MCA results presented above, an upward hierarchical method of cluster analysis was adopted. A six cluster solution emerged. However, we retain a four cluster solution to minimize the degree of information loss.

Table 9 Inertia distribution and cluster size

	Inertia	*Size*
Inter-cluster inertia	0.3011	
Intra-cluster inertia		
Cluster 1	0.2634	31
Cluster 2	0.1613	23
Cluster 3	0.0824	10
Cluster 4	0.3761	39
Total		

The dispersion of individuals which form the five clusters is presented in Figure 3.

Figure 3 The Clusters' dispersion in the first factorial plan



5.2.1 The first cluster – The innovators

Cluster 1 includes 31 SMEs and has an intra cluster inertia equal to 0.2634. The measures which characterise this cluster are presented in Table 10. The SMEs forming this cluster are characterised by a proactive attitude and practices based on high-risk activities (NTM; TRI). A strong entrepreneurial orientation arises through product and process innovations (PNM; CMS; NPP). They seek opportunities through developing fruitful cooperation with foreign firms (CFF). Moreover the high degree of autonomy (HAU) granted to employees reflects the adoption of a management style that also encourages the development of entrepreneurial behavior from employees.

Table 10 Characteristic measures of the first cluster – *The innovators*

Variables	*Characteristic measures*	*Percentages*		
		Cla/Mod	*Mod/Cla*	*Global*
Degree of innovation and novelty	NTM: New- to-market	51.85	90.32	52.43
Willingness to take risks	TRI: Take risks	59.38	61.29	31.07
Process innovation	NPP: New production processes (e.g manufacturing automation)	55.56	48.56	26.21
	CSM: Computerization of management system	51.72	48.39	28.16
Innovation framework	CFF: Cooperation with foreign firms	21.62	51.61	71.84
Staff autonomy	HAU: Highly autonomous	51.72	48.39	28.16

5.2.2 The second cluster- The potentially innovative

Cluster 2 includes 23 SMEs and has an intra cluster inertia equal to 0.1613. The measures which characterise this cluster are presented in Table 11. This second cluster comprises SMEs with a positive attitude towards product innovation and who strive to be an innovator. They focus on product design and emphasise product quality to build competitive advantage, choosing trademark registration to protect their product innovations. Probably because of these practices, the firms are able to operate in foreign markets. Although they show a tendency to promote an entrepreneurship mindset, they are often reluctant to delegate authority to their employees.

Table 11 Characteristic measures of the second cluster- *the potentially innovative*

Variables	*Characteristic measures*	*Percentages*		
		Cla/Mod	*Mod/Cla*	*Global*
Degree of innovation novelty	NTF: New to firm	38.78	82.61	47.57
Competitiveness factor	CPC: Quality produced	71.43	43.48	13.59
Staff focus on	STDT: Product design task	37.50	91.30	54.37
Method of protecting innovation	TMR: Trademarks registration	37.74	86.96	51.46
Market	FOM: Foreign (Maghrebian, European)	40.00	96.57	38.83
Staff autonomy	LAU: Low autonomy	31.75	86.96	61.17

5.2.3 The third cluster- the ambiguous group

Cluster 3 is the smallest group, representing 10 SMEs with an intra cluster inertia equal to 0.0824. As presented below in table 12, this cluster is characterised by an only two modalities, "secrecy and complex design" (SCD and "low-cost as a competitiveness strategy" (CCR).

Table 12 Characteristic measures of the third cluster- ***the ambiguous group***

Variables	*Characteristic measures*	*Percentages*		
		Cla/Mod	*Mod/Cla*	*Global*
Method of protecting innovation	SCD: Secrecy complexity of design	81.82	90.00	10.68
Competitiveness factor	LCC: Low cost	22.86	80.00	33.98

SME members of cluster 2 opt for secrecy and complex design to protect their product innovations and compete on the basis of cost reduction. However, it is difficult to interpret this cluster because it is characterised by only two measures.

5.2.4 The fourth cluster- the conservatives

Cluster 4 is the largest group, with 39 SMEs and an intra cluster inertia equal to 0.1555. Characteristic measures of cluster 4 are presented in Table 13 below.

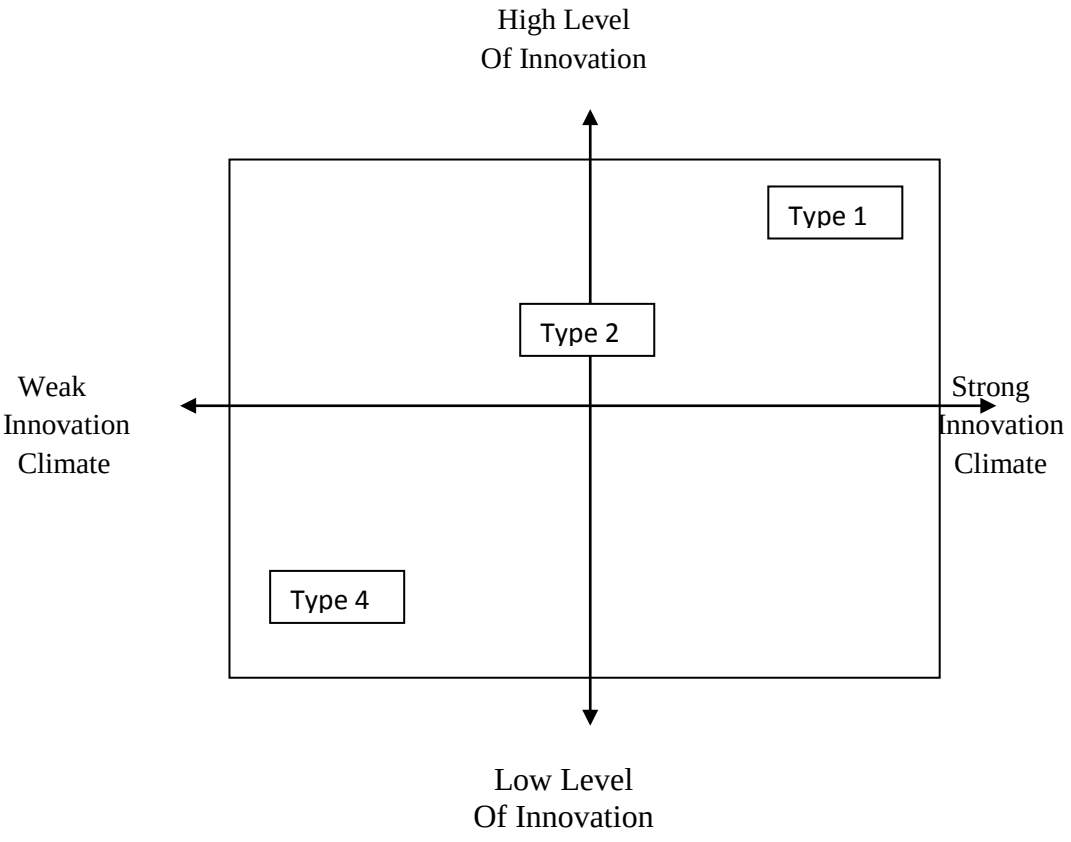
Table 13 Characteristic measures of the fourth cluster- ***the conservatives***

Variables	*Characteristic measures*	*Percentages*		
		Cla/Mod	*Mod/Cla*	*Global*
Staff focus on	STCT: Commercialization task	63.83	76.92	45.63
Innovation framework	RPM: Detecting and replicating best practices existing on the Market	63.89	58.97	34.95
Product innovation	PEC: Product with purely aesthetic changes	64.71	56.41	33.01

Willingness to take risks	ARI: Avoid risks	49.30	89.74	68.93
Market	LOC: Local/Regional (at a distance of 50 Km in neighboring countries)	66.67	41.03	23.30
	NAU: Not autonomous	81.82	23.08	10.68
Method of protecting innovation	ATC: Ahead of time over competitors	56.41	56.41	37.86
Staff qualifications	LOQ: Low	63.64	35.90	21.36

SMEs who belong to this cluster take a reactive-passive posture based on a defensive position. Indeed, they act without incurring any risk (ARI), so that their strategy is simply to avoid being first mover. They deliberately imitate innovation existing in the market (RPM). They focus on low innovative activities in that they bring purely minor or aesthetic changes to products offered by their competitors (PEC). These SMEs do not sponsor any entrepreneurial orientation such as proactivity and risk taking. Moreover, they appear to have a very centralized power structure where leaders retain decision making authority. Their employees have a low level of qualification. Their low orientations towards innovation also limits their activity to local markets. To summarize our findings, we offer the following typology of Tunisian textile SMEs.

Figure 4: Typology of Tunisian SMEs



Type 1: Innovative behaviour (EO clearly manifest: enterprises engaged in both product and process innovation, proactive (new to market) take risks, cooperation with foreign firms and high staff autonomy)

Type 2: Potential innovative behaviour (EO exists under different forms, products new to the firm, compete on basis of quality, trademark registration, foreign markets, but staff have less autonomy and focus on product design)

Type 3: non-innovative behaviour- ambiguous classification so not shown on diagram

Type 4: passive imitators (absence of any form of the EO- imitators, product aesthetic change, avoid risk, local market, staff have no autonomy and low levels of qualifications)

6. Conclusions

We set out to find how small Tunisian textile firms had responded to internationalisation. We had anticipated that a low cost strategy would continue to characterise the firms, but were concerned about the sustainability of this approach over time. Our conceptual framework of EO was intended to measure the approaches. We did find some conservative firms, some 40% of our sample, who lacked any entrepreneurial orientation in what they did. But in contrast we identified a group, some 30% of the sample, who had a strong EO and that their activities were aimed at improving their position in the supply chain. A further group, cluster 2, consisting of about 23% were moving towards a stronger EO. We identified their activities as having a high potential. The final small group, some 10%, were difficult to classify, and hence offered little useful information. Interestingly, our results indicate that a majority of the firms examined had taken a proactive approach to the problems arising from the dynamics of internationalisation. Only a minority, albeit a substantial minority, seemed content to rest on their laurels.

We see some policy implications from this study. Because it is evident that a cost containment approach will not produce the sustainable growth that governments want, policies, even incentives, should be directed towards supporting innovative enterprises. Government could stimulate investment in upgrading their operations and by encouraging a wide range of innovation-related activities. Government might consider tax deductions for those that invest in activities along the innovation value chain. Alleviating taxes on new modern equipment,

employee training, purchase of intellectual property rights and trademark registration should firms to work towards higher productivity and innovation.

This study contributes to the international literature in that our conclusions, whilst founded in the Tunisian context, may be generalized to other developing countries experiencing similar problems. Nevertheless, future research could explore our research question in other sectors such as the high-tech sector. It would also be interesting to examine the EO and performance relationship over time. .

Although our analysis offers some empirical support of the complex relationship between entrepreneurial orientation and internationalization, it is not without limitations. One of these limitations is the narrowness of our sample. This narrowness concerns not only the sample size, but also that we considered only the respondent firms. There are a substantial number of very small informal textile firms, excluded for our sample design but who face similar problems. Another limitation of our analysis is that our survey question items consisted of only self-reported measures. A major caveat is that our methodology provides only a static picture of the sector. Indeed, our results can't tell us about the fate of the 40% of the conservative firms. Also, we can't know about the evolution of the 30% who had a strong EO. Will they, in the long run, continue to be entrepreneurial? Hence, an analysis of the dynamics of the sector will be very valuable, especially if it is coupled with a case study approach to examine the perspectives of individual firms.

Standing back from the immediate issues, we saw how the changes brought about by globalisation had very immediate and important effects on the local firms. The incorporation of emerging economies into the international value chain of textile manufacturing had detrimental effects for Tunisian manufacturing. The very qualities of Tunisian advantage that attracted manufacture were lessened by increasing globalisation. Those same characteristics of lower production costs pulled newer emerging economies into the global value chain and reduced Tunisian advantage. Ironically, the original success factors of the Tunisian economy were depleted as relative wages rose and cost advantages diminished. Thus we see a merry go round, almost a game of musical chairs, as each place deploys its advantage to secure a role in the global value game. But we also saw changes in the nature of comparative advantage; that cost was only one factor. Smartness, extending capability have also become a critical factor. So in the local Tunisian context, smarter manufactures have seen this as an opportunity and

adopted an entrepreneurial orientation to secure a better position in the global value chain. Perhaps this is the very nature of developing economies in internationalisation.

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Notes

1 Trademark plays a significant role, in the context of intense global market competition which is characterized by price competition and heterogenous product (Yang and Li, 2011). Indeed, a trademark strategy may enable a firm to set higher price, differentiate their product from competitors, establish a reputation (Hormiga et al., 2011) for providing quality products and therefore appropriating innovation returns (Landes and Posner, 1987).

2 Depending on the newness and novelty of the product, it can be categorized as either an incremental product innovation or a radical product innovation (Goktan and Miles, 2011). Moreover, short product life cycles and the rapid product obsolescence have pressured firms to focus on innovation. (Hotho and Champion, 2011; Huarng and Yu, 2011; Miller and Friesen, 1983).