INDUSTRY STUDIES ASSOCATION

WORKING PAPER SERIES

Not Doomed to Death: A Map of Small Firms' Business Models in the Italian Textile Apparel Industry

By

Arnaldo Camuffo
International Motor Vehicle Program
Cambridge, MA 02139
and
Bocconi University
Milan 20136, Italy
arnaldo.camuffo@unipd.it

and

Roberto Pozzana
University of Padua
Padova 35123, Italy
roberto.pozzana@unipd.it

and

Andrea Vinelli
University of Padua
Padova 35123, Italy
andrea.vinelli@unipd.it

and

Laura Benedetti
Società per gli Studi di Settore
Rome 00143, Italy
lbenedetti@sose.it

2008

Industry Studies Association

Working Papers

WP-2008-12

http://isapapers.pitt.edu/

Not doomed to death. A map of small firms' business models in the Italian Textile Apparel Industry

Arnaldo Camuffo[1], Roberto Pozzana[2], Andrea Vinelli[3] and Laura Benedetti [4]

1 - Department of Management IOSI, Bocconi University, Viale Isonzo 23, Milan, Italy, arnaldo.camuffo@unibocconi.it

2 - Department of Economics, University of Padova, Via del Santo 33, 35123 Padova, Italy, roberto.pozzana@unipd.it

3 - Department of Management and Engineering, University of Padova, Stradella S. Nicola 3, 36100 Vicenza, Italy, andrea.vinelli@unipd.it

4- Società per gli Studi di Settore, Via Mentore Maggini 48/c , 00143 Roma, Italy, lbenedetti@sose.it

Abstract

International competition has severely hit the Italian textile-apparel (TA) industry, causing reductions in the number of firms, revenues, value added, export and employment. Small firms, even those located in historical and well established districts like Prato and Biella, have suffered the most, going out of business at an unprecedented rate. This trend has prompted a crowd of scholars, practitioners and policy makers to conclude that industrial districts will disappear and that small firms are doomed to death in global mature industries like TA. But a closer and more rigorous look at the data and facts behind this general picture reveals a more articulated situation with wide variation in small firms' performance and significant differences in the strategies that they have come up with to survive, and, in some cases, to thrive.

Using data from the Italian Ministry of the Economy annual industry revenue survey (*Studi di Settore*), we apply multiple correspondence analysis and cluster analysis to a sample of almost 30,000 small Italian textile-apparel firms to map this variation of small firms' performance onto the business models they have adopted. Using the structural business variables contained in the survey, we identify 9 business models in textiles, 4 in finishing and 12 in apparel. Some of them (those characterized by internationalization, investment in technology and skills, move up scale in the market) are associated with higher productivity and innovation, while the others lead to decline.

These business models provide an interesting diagnostic and predicting tool for business practitioners and policy makers who believe small firms in mature industries can still play an important role in the economy and wish to support them as they strive to compete globally.

Introduction

The Textile and Apparel (TA) industry has almost vanished in Europe and North America. Low cost competition from Emerging Countries has hit even Countries with a strong and long tradition in the TA industry like Italy, causing significant reductions in revenues, export, value added, investments, employment and number of firms.

Small firms, even those located in historical and well established districts like Prato and Biella, have suffered the most, going out of business at an unprecedented rate. This trend has prompted a crowd of scholars, practitioners and policy makers to conclude that industrial districts will disappear and that small firms are doomed to death in a global, mature industry like TA.

But a closer and more rigorous look at the data and facts behind this general picture reveals a more articulated situation with wide variation in small firms' performance and significant differences in the strategies that they have come up with to survive and, in some cases, thrive.

Using data from the Italian Ministry of the Economy annual industry revenue survey (*Studi di Settore*), we apply multiple correspondence analysis and cluster analysis to a sample of approximately 30,000 small Italian TA firms to map the variation of small firms' performance onto the business models they have adopted.

Leveraging on our knowledge and on existing research on the industry, we initially hypothesized a typology of business models. Then, we associated each of them with a set of indicators corresponding to the structural business variables included in the survey/dataset. Finally, we ran cluster analysis on factors derived from multiple correspondence analysis to validate the above identified business models.

Our findings basically support the hypotheses that, in the Italian TA industry, firms have adopted a multiplicity of business models and that some of them lead to prosperity, while some others lead to decline. Our exploratory analysis validates 9 business models in textiles, 4 in finishing and 12 in apparel, and these business models largely correspond, number and quality wise, to those initially hypothesized. Some of them (namely those characterized by internationalization, investment in technology and skills, move up scale in the market) are associated not only with above-industry-average financial performance, but also with higher productivity and innovation, while the others include firms which are lagging behind and have not been able to innovate.

These business models provide an interesting diagnostic and predicting tool for business practitioners and policy makers who believe small firms in mature industries can still play an important role in the economy and wish to support them as they strive to compete globally.

The "successful" business models represent clusters of firms that have found their way to compete in the new global context and indicate avenues of strategic innovation within the industry.

Viceversa, the “declining” business models represent clusters of firms that either stick to an outdated strategy or are not able to frame consistently their strategic choices and configuration of activities.

The Textile Apparel Industry in Italy

Textile Apparel (TA) is still one of the most important industries in Italy, with 516.700 employees, 59.750 firms, revenues of 52.835 millions euro, and 52% of export (2006 data). It is the second largest sector (right after machinery) with a share of 9.3% of the national manufacturing industry turnover (SMI-ATI, based on ISTAT data, 2007).

Even within the European context, the Italian TA industry plays a central role. In 2006, the EU 27 TA industry counted 2.592.000 employees, 160.000 companies and revenues for approximately 207 billion Euro. Italian companies accounted for 37,3 % of the EU 27 total, and their revenues represented 25,5% of the EU 27 total.

But the role of European firms and, among them, of Italian firms in the international division of labor has changed dramatically during the last 15 years (Taplin and Wintertorn, 2004). Over time, the combined effects of the labor intensive nature of the industry, low entry and exit barriers, and changes in international trade regulations, have made TA a global industry, where competition is planetary and key players are no longer concentrated only in Europe and North America, but located in emerging countries like China, Turkey, India and Pakistan (Gereffi, Humphrey and Sturgeon, 2005).

Events such as the general maturing and weakening of demand, the expiry of the Multifiber Agreement, the EU-China trade dispute (Comino, 2007) and the rise of global retailers as key actors in the industry, have exacerbated the situation of the European and Italian TA sector, already in deep crisis for endogenous reasons in recent years. As a result, large companies have globalized their supply chains, either sourcing from around the world, or moving manufacturing to East Europe or East Asia, seeking cheap labor. Small firms have struggled to survive, often unsuccessfully, and have been progressively selected out (Dunford, 2006).

It is not an aim of this paper to analyze the nature, scope and determinants of the decline of the Italian TA industry. Table 1 summarizes the general picture and provides some crystal clear evidence of this situation, which has impacted even the industrial districts that have historically represented the backbone of the Italian TA industry. Table 2 and 3 show the continuous hemorrhage of companies in the Biella and Prato textile districts during the last decade. Apart from exogenous factors related to the volatility of financial markets, exchange rates, and lack or changes in international trade regulations, the prevalence of small firms (over 85% of the total population have

less than 5 million euro revenues), the semi-closeness of the geographical clusters in which these firms are embedded, and the lack of financial and managerial capabilities necessary to compete in a more complex world are some of the reasons why the Italian TA is in crisis.

Nonetheless, the Italian situation remains peculiar *vis-à-vis* that of the other European Countries. Though severely harmed by competitors from across the world, the Italian TA industry has maintained its share in Europe and has proven to be somewhat more resilient than those of other Countries (Berger and Locke, 2004; Dunford, 2004). As a consequence, at the moment, Italy is the only European country where TA manufacturing is performed full scale and across the whole supply chain, from yarning to weaving, finishing, knitting, and clothing.

Table 1. Evolution of the TA industry during 2001- 2006 (millions of euro, current value)

	2001	2002	2003	2004	2005	2006
Turnover	61 146	57 846	55 256	53 490	51 851	52 835
Yoy % change		*-5,4*	*-4,5*	*-3,2*	*-3,1*	*1,9*
Production	53 188	50 899	48 236	46 158	43 676	44 037
Yoy % change		*-4,3*	*-5,2*	*-4,3*	*-5,4*	*0,8*
Export	28 952	27 989	26 335	26 600	26 572	27 559
Yoy % change		*-3,3*	*-5,9*	*1,0*	*-0,1*	*3,7*
Import	14 150	14 315	14 244	14 909	15 568	17 465
Yoy % change		*1,2*	*-0,5*	*4,7*	*4,4*	*12,2*
Trade balance	14 802	13 674	12 091	11 691	11 004	10 094
Yoy % change		*-7,6*	*-11,6*	*-3,3*	*-5,9*	*-8,3*
Domestic market	38 386	37 225	36 145	34 467	32 672	33 943
Yoy % change		*-3,0*	*-2,9*	*-4,6*	*-5,2*	*3,9*
Companies (number)	73 344	71 082	68 857	64 376	61 624	59 750
Yoy % change		*-3,1*	*-3,1*	*-6,5*	*-4,3*	*-3,0*
Employees (thousands)	609,6	596,0	567,0	543,2	524,9	516,7
Yoy % change		*-2,2*	*-4,9*	*-4,2*	*-3,4*	*-1,6*
Employees/Company (number)	8,3	8,4	8,2	8,4	8,5	8,6
Structural indicators (%)						
Export/Turnover	47,3	48,4	47,7	49,7	51,2	52,2
Normalized trade balance	34,3	32,3	29,8	28,2	26,1	22,4
Attitude to import (on turnover)	30,5	32,4	33,0	35,7	38,1	40,9
Attitude to import (on production)	36,9	38,5	39,4	43,3	47,7	51,5

Source: SMI, ISTAT, Movimprese and SitaRicerca

Table 2: Active companies in Biella District from 1996 to 2004

	1996	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	2005	2006
Yarning	694	665	632	594	577	567	561	525	481	457	434
Weaving	381	365	356	328	319	304	294	282	270	248	236
Finishing	66	66	66	65	62	65	67	68	100*	97	95
Knitting	158	146	138	139	131	121	113	114	92	88	77
Other textile	53	59	63	66	62	58	44	48	52	57	58
TOTAL	1.352	1.301	1.255	1.192	1.251	1.115	1.079	1.037	995	947	900

**the rise in finishing companies is due to the 3 digit revision of ATECO, the Italian industry classification system, and database updating*

Source: Chamber of Commerce CCIAA Biella, 2007

Table 3: Active companies in Prato District from 2002 to 2007

	2002	2003	2004	2005	2006	2007
Yarning	1.465	1.382	1.314	1.228	1.126	1.030
Weaving	2.390	2.163	1.977	1.838	1.624	1.469
Finishing	433	413	653	634	645	639
Knitting	204	198	178	172	158	153
TOTAL	4.492	4.156	4.122	3.872	3.553	3.291

Source: Chamber of Commerce CCIAA Prato, 2008

Business models and firm performance in the Italian TA industry

The Italian TA industry is known worldwide for its high fragmentation, its organization around geographically coupled supply systems (industrial districts) and the prevalence of small and medium firms, vertically specialized in one or few phases of a supply chain (Sabel and Piore, 1984). In the past, Italian TA firms prospered in such "protected", semi-closed environments, embedded in well defined geographical clusters. They relied on a few, main, co-located customers, and such "quasi-captive" demand usually saturated their production capacity and shaped their capabilities. Furthermore, social embeddedness and geographical proximity facilitated the development of relational contracts, knowledge diffusion and mutual learning among buyers, suppliers and even competitors.

As afore mentioned, due to globalization and digital technologies, these characteristics have turned into structural weaknesses, which small Italian TA firms have tried to address. On the one hand, some medium firms, usually assemblers/buyers located in the downstream sections of supply chains, have changed sourcing policies, reducing their dependence from their local suppliers' bases, actively seeking for low cost sources in such emerging areas as East Europe and East Asia and establishing direct access to global markets even with autonomous distribution networks. On the other hand, also some of the small firms have tried to carve out a new role within global supply chains, diversifying their businesses, upgrading

their offer, investing in new technologies, moving from subcontracting to direct business, and reducing their level of symbiosis with few, local main customers.

The resilience of these small firms in the face of globalization is, to some extent, a theoretical puzzle. Their not being selected out, or their not growth to larger sizes is not consistent not only with standard *market theory*, which generally explains competition among firms as converging to an equilibrium drawn from the specific market structure, but also with conventional strategic management literature, which puts on growth (especially recently), a special emphasis. In both cases, the underlying assumption is that there should be a *typical firm* to which converge. However, in most industries, including TA, firms remain diverse in size and adopt different organizations models and competitive strategies (Mills, 1984; Belussi and Pozzana, 1995).

Business models are a representation of a firm's underlying core logic and strategic choices for creating and capturing value within a value network (Schafer, Smith and Linder, 2005; Chesbrough, 2006 and 2007; Malone and others, 2006). A business model is a framework to compete in a given industry. It is the set of activities which a firm performs, how it performs them, and when it performs them so as to offer its customers benefits they want and to earn a profit in a responsible and sustainable way (Afuah, 2003).

It includes the positions that a firm attains and maintains within the industry and the markets in which it competes, the activities it performs to attain and maintain these positions, the resources and capabilities that enable it to perform these activities, and the relationships among these elements (Miller, 1996; Siggelkow, 2001; Jacobides and Winter, 2006).

Although each firm is diverse, within a given industry groups of firms often share a common underlying core logic for creating and capturing value within a network, and the outcomes of this become visible in terms of performance.

Research Aim and Design

Objective of this paper is to identify, for Italian small TA firms, the business models associated with success or decline. This research objective seems particularly meaningful not only to map and understand the determinants of small firms' performance variation within the TA industry, but also for the practical implications it may have in terms of business and industrial policy.

More specifically, this study wishes to provide:

a) A grid of the choices, activities, resources and capabilities that constitute the Business Models (BMs);
b) A map of small firms' BMs in the Italian TA Industry;
c) A methodology for identifying and validating the BMs;

d) An assessment of these BMs in terms of competitive results and insights about how they may change as the industry evolves
e) A tentative agenda for industrial policy makers about where and how to direct their effort and resources to improve competitiveness.

The research was designed as follows:

1. definition, on the basis of the literature review summarized in the previous sections of the paper, of the grid of variables that capture the choices, activities, resources and capabilities that constitute the BMs in the Italian TA industry;
2. choice of the measures to be used as proxies for the variables included in the above mentioned grid;
3. identification, on the basis of existing research and of our knowledge of the TA industry, of the outstanding Business Models;
4. exploration, through multivariate statistical analysis, of industry data to find, test and validate the hypothesized BMs;
5. description and classification of the BMs and mapping of them onto performance within the industry.

Data and methods

Data

Our data source is the the *Studi di Settore* (Industry Studies) database (SdS-DB), a large, nation-wide database which contains information about all Italian small firms – all industries - with a turnover not exceeding 5,164 millions of euro. The SdS-DB is managed and updated yearly by the *Società per gli Studi di Settore* (SOSE), a service company established by the Italian Ministry for the Economy. *Banca d'Italia* (Italia Central Bank) also owns a small capital share of the company.

No other Italian database about small firms matches the scope and richness of the SdS-DB.

The information contained therein encompasses, for each firm, financial, market, production and other data, resulting from annual income tax return. The SdS-DB includes data about products, staff, properties, plant and equipment, investment, firm locations, customers' typologies, vertical relationships with suppliers and customers.

In general, the SdS-DB offers three levels of information about Italian small firms:

1. quantitative data about markets, customers, productive organization, products, and distribution channels;
2. quantitative data regarding income statements, balance sheets and other performance measures;
3. qualitative data regarding the economic outlook and the evolution of the industry.

The SdS-DB suits perfectly our research purposes because it provides an ideal empirical base to identify the BMs and map them onto performance within industries.

Potentially, this analysis could be expanded and extended to understand evolutionary patterns and make forecasts, since the SdS-DB contains longitudinal and panel data.

It's worth underlining that all the data refer only to firms with revenues not in excess of 5,164 millions Euro.

However, for our research purposes this is not a problem, given the structure of the Italian industrial system. Small firms, especially in the TA industry, account for approximately 90% of the total population.

The SdS-DB is updated annually, when companies are required, for fiscal purposes, to hand in their financial reports and to fill out the *Studi di Settore* survey.

On the whole, currently available information on the SdS-DB refer to approximately 4.3 million companies and professional activities, analyzed along a period of 5 consecutive years from 2001 to 2005.

Within the database, companies are classified according to ATECO, the Italian industry classification system, which is the Italian version of the European NACE REV 1.1 industry classification system and largely corresponds to the US NAICS.

In this study we extracted the 2005 data for Italian small TA firms. They were subdivided into three sub-sectors: textiles, finishing and clothing. In 2005 39.302 firms were surveyed: 5.948 textile firms, 896 finishing firms and 32.458 clothing firms. However, after checking the questionnaires and cleaning the data, our final data set comprised 27.087 firms, 5.493 in textiles, 818 in finishing and 20.776 in clothing. As concerns the construction of variation rates, we used panel data for the 2001-2005 period.

Variables and Measures

On the basis of our literature review on business models as well as of existing research and our knowledge of the Italian TA industry, we constructed a grid of variables which, for our research purpose, captures the most relevant dimensions of business models in the TA industry. The variables concern the positions that a firm attains and maintains within the industry and the markets in which it competes (e.g. role within the vertical contracting structure of the industry, degree of internationalization, customers' portfolio, etc.), the activities it performs to attain and maintain these positions (scale of operations, nature and scope of activities, etc.), the resources and capabilities that enable it to perform these activities (technologies, people, etc.), and the relationships (in terms of complementarities) among these elements (Miller, 1996; Siggelkow, 2001; Hedman and Kalling, 2003; Jacobides and Winter, 2006).

Each variable was then associated to a measure (an indicator), drawn from the SdS-DB and corresponding to a question/s of the industry survey questionnaire.

Table 4, 5 and 6 report, for textiles, finishing and clothing, the lists of the variables and of the corresponding measures.

After identifying and validating the BMs for the textile, finishing and clothing sub-sectors (see following sections), we mapped them onto performance. We used two performance measures: value added per employee (average 2001-2005) and the average rate of investment in fixed assets (property, plant and equipment) (2001-2005). We chose these two variables because they better allow capturing how competitive the BMs are and represent more robust and reliable performance measures than financial ones. As a check, we performed the same analysis using standard financial performance measures, with no significant difference in the outcomes of the analysis.

Table 4. Variables for business models in textiles and associated measures

Variables	Measures
Subcontract (*conto terzi)*	% revenues from sales to industrial and handicraft customers
Converter (or "ready to deliver" firm)	% revenues from sales of products purchased from third parties with no significant physical transformation activity in-house
Market dependence	% revenues from the main customer
Production outsourcing	% of Cost of outsourced production / (purchasing cost of raw materials, components and services)
Scope of production and manufacturing capabilities	Number of different production activities performed in-house
Product innovation	Number of product development activities performed in-house
Specialization of the product offer	Herfindhal Index on the % of revenues from specific products (e.g. dyed yarns, fabrics for apparel, furnishing, ties, foulard, scarf, knitted fabric, ect.)
Marketing orientation	% of revenues invested in advertising and commercials
Internationalization	% of revenues to foreign (EU and non- EU) customers
Vertical integration	Number of activities performed in-house / Number of total activities (completed within the firm + outsourced)

Table 5 . Variables for business models in finishing and associated measures

Variables	Measures
Subcontract	% revenues from sales to industrial and handicraft customers
High quality working	% revenues coming from dyeing, printing and finishing activities
Low quality working	% revenues coming from darning activities
Domestic outsourcing	Working activities entrusted to third parties in Italy (value in euro) / (Purchasing costs of raw and subsidiary materials and semicomponents + Costs of services)
Specialization and technological capability	Number of different activities carried out as for printing and finishing
Final market access	% revenues from sales to retailers and final customers

Table 6. Variables for business models in clothing and associated measures

Variables	Measures
Subcontract	% revenues from sales to industrial and handicraft customers
Converter (or “ready to deliver” firm)	% revenues from sales of products purchased from third parties with no significant physical transformation activity in-house
Quality orientation	Quality control activities: yes or no
Market dependence	% revenues from the main customer
Scope of production and manufacturing capabilities	Number of different production activities performed in-house
Product innovation	Number of product development activities performed in-house
Specialization of the product offer	Herfindhal Index on the % of revenues from different products
Brand	% of revenues from own brand products.
Production outsourcing	% of Cost of outsourcing / (Cost of purchasing raw materials and components + Cost of production of services)
Vertical integration	Number of activities performed in-house / Number of total activities (completed within the firm + outsourced)
Internationalization	% of revenues to foreign (EU and non- EU) customers
Market orientation	Salesforce (Number of agents)
Final market access	% revenues to final customers / revenues from sales to retailers and final customers
Distribution penetration	% revenues from sales to retailers and final customers
Large retail penetration	% of revenues from sales to large retailers

Methods: Multiple Correspondence Analysis

Correspondence analysis (Benzecri, 1992; Gifi, 1990; Greenacre, 1993) is a descriptive/exploratory technique initially used to analyze and describe two by two contingency tables and subsequently extended to the case of multiple-variable contingency tables. Its aim is to analyze the relationships among categories of variables. Multiple correspondence analysis (MCA) is a generalization of that on two dimensions when on each unit (firms in our case) p qualitative or quantitative variables are detected.

MCA mainly aims to represent graphically the variables on a small number of factorial plans, and see the interdependencies among them. Indeed, similarly to other factorial analysis methods (e.g. principal component analysis, Karhunen-Loeve decomposition), MCA allows to find and define a new orthogonal set of axes (the factorial axes), so as to maximize the sum of the variance explained by the new axes. This way one can order the axes according to decreasing values of variance explained, and then choose the smaller set of axes that explains the most variance.

Through the determination of these interdependencies between categories, MCA allows to formulate hypotheses on the data, remove the variables which are not significant information-wise, identify non-linear relationships among variables and identify outliers (data which ought to be removed from subsequent analysis).

The purpose is not only to determine how each unit (firm) is positioned compared to the others, but also to show the relationships between the various categories of variables.

The distinctive feature of MCA, *vis-à-vis* other classical factorial analysis methods, lies in a particular normalization method applied to the data table before the transformation. Before applying MCA, it is necessary to transform the archive's information in a complete disjunctive table.

In our case, since all the measures are quantitative, we constructed the complete disjunctive table using the following algorithm:

1. The data (values of each measure) are classified into classes of value: low, medium or high;
2. A boolean artificial variable is associated to each class of every measure, with value equal to 1 or 0 depending on whether the value of the original variable is within that class of value (value =1) or not (value = 0).

The classes of value for the variables were identified on the basis of the observation of the statistical distributions of the variables. Table 7 provides an example of this procedure showing the variable classification for the textile industry. For each variable/measure, Table 7 shows the cut (threshold values) deriving from the observation of the statistical distributions. We proceeded similarly for the finishing and clothing industries.

Table 7. Measures/values categorization for the textile industry variables

Measures	Level	Cut	Label
% revenues from sales to industrial and handicraft customers	a	till 75%	RICALC_CT_A
	b	over 75	RICALC_CT_B
% revenues from sales of products purchased from third parties with no significant physical transformation activity in-house	a	till 0	CONVERTER_A
	b	over 0	CONVERTER_B
% revenues from the main customer	a	till 10	DIP_COMM_PRINC_A
	b	from 10 to 50	DIP_COMM_PRINC_B
	c	over 50	DIP_COMM_PRINC_C
% of Cost of outsourced production / (purchasing cost of raw materials, components and services)	a	from 0 to 0,2	GRAD_OUTSOURCING_A
	b	over 0,20	GRAD_OUTSOURCING_B
Number of different production activities performed in-house	a	equal to0	SPEC_VS_DIVERS_A
	b	from 1 to 2	SPEC_VS_DIVERS_B
	c	over 2	SPEC_VS_DIVERS_C
Number of product development activities performed in-house	a	equal 0	PRODUZ_INNOV_A
	b	from 1 to 3	PRODUZ_INNOV_B
	c	from 4 to 8	PRODUZ_INNOV_C
Herfindhal Index on the % of revenues from specific products (e.g. dyed yarns, fabrics for apparel, furnishing, ties, foulard, scarf, knitted fabric, ect.)	a	from 0 to 5000	IND_SPEC_OFF_A
	b	from 5000 to 10000	IND_SPEC_OFF_B
% of revenues invested in advertising and commercials	a	equal to 0	IMMAGINE_A
	b	over 0	IMMAGINE_B
% of revenues to foreign (EU and non- EU) customers	a	equal to 0	EXPORT_A
	b	over 0	EXPORT_B
Number of activities performed in-house / Number of total activities (completed within the firm + outsourced)	a	from 0 to 0,2	INT_A
	b	from 0,2 to 0,8	INT_B
	c	over 0,8	INT_C

After transforming the data on the basis of this algorithm, we obtained a dataset with Boolean variables (a complete disjunctive table) on which we performed MCA using the SAS System 9.1.3.

Table 8 reports the MCA statistics concerning the identification of the Euclidean dimensions (factors).

Table 8. MCA statistics for the identification of the Euclidean factors in the textile industry

MCA - Inertia and Chi-Square Decomposition					
Singular Value	**Principal Inertia**	**Chi-Square**	**Percent**	**Cumulative percent**	3 6 9 12 15 ----+----+----+----+----+---
0.49303	0.24308	14519.0	16.42	16.42	**************************
0.41315	0.17069	10195.4	11.53	27.96	******************
0.36007	0.12965	7744.2	8.76	36.72	**************
0.32120	0.10317	6162.2	6.97	43.69	**********
0.31417	0.09871	5895.7	6.67	50.36	**********
0.30626	0.09379	5602.3	6.34	56.69	**********
0.30337	0.09203	5497.1	6.22	62.91	*********
0.29876	0.08926	5331.4	6.03	68.94	*********
0.28956	0.08385	5008.2	5.67	74.61	*********
0.27677	0.07660	4575.3	5.18	79.78	*********
0.27130	0.07360	4396.4	4.97	84.76	********
0.25907	0.06712	4008.9	4.53	89.29	********
0.24068	0.05793	3459.9	3.91	93.20	*******
0.23403	0.05477	3271.3	3.70	96.90	******
0.21407	0.04582	2737.1	3.10	100.00	*****
Total	1.48007	88404.5	100.00		

The decomposition of inertia shows that that the first three dimensions explain over 36% of total inertia, while each other additional dimension explains only 7% or less.

Thus, based on the principle of parsimony, we chose the first three dimensions (dim1, dim2 and dim3) to represent classes of value. Our choice is also supported by a visual analysis of the graphic of the Euclidean planes in Figure 1, 2 and 3.

Figure 1 and 2 show the Euclidean planes generated respectively by the factors dim1-dim2 and dim2-dim3. These factors can be interpreted as the macrovariables that constitute the business models (Afuah, 2003).

Figure 1 shows that dim1 discriminates firms that have a clear specialization and product focus, pursue innovation and quality-based strategies, have their own brands, and are international (positive values of dim1). Dim1 contrast them with firms that do not have their own brands, do not export and are neither specialized in a single production phase nor focused on a single product. Dim1 is a factor/axis that summarizes the firms' industry position (i.e. firms are more or less able to compete globally in terms of product positioning, innovation, internationalization).

Dim2, instead, summarizes firms' relational capabilities. It captures firms' abilities to operate as integrators, to connect and hybridate local and global resources and opportunities (i.e. firms are more or less able to act as interfaces -"converters", to identify and take advantage of market opportunities activating the appropriate production sources).

Figure 2 shows that dim3 distinguishes between firms that work on behalf of third parties (e.g. as local subcontractors) as opposed to those that run their own production. It also discriminates firms specialized in a single stage of production or in a single product from firms that operate as generalists. Dim3 summarizes firms' autonomy and business architectural capabilities (i.e. firms are more or less able to design a consistent business architecture choosing the organizational boundaries appropriately).

Figure 3 shows the Euclidean plane formed by the second and the fourth dimension (dim2 and dim4). In this case, the values of the variables are concentrated at the cross of the axes. This suggests that the inclusion of a new dimension does not add any additional information. On the other hand, the values that are distant from the cross of the axes are already well represented by the first three dimensions/factors.

After running MCA, we ended up, for the textile, finishing and clothing industry, with a new set of variables (factors) on which we ran cluster analysis. The table and figures in this section illustrates the MCA methodology for the textile industry. The same type of analysis has been conducted for finishing and apparel, with similar findings that, for the sake of brevity, we do not include.

Figure 1. Euclidean plane generated by dim1-dim2 (Textile Sector)

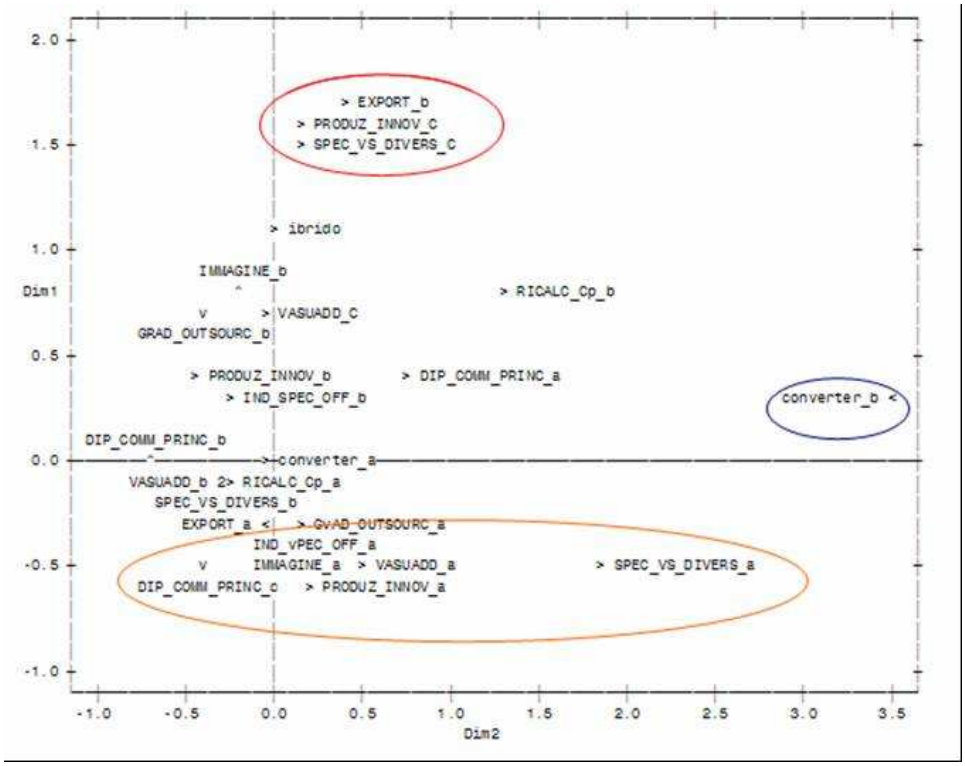


Figure 2. Euclidean plane generated by dim2-dim3 (Textile Sector)

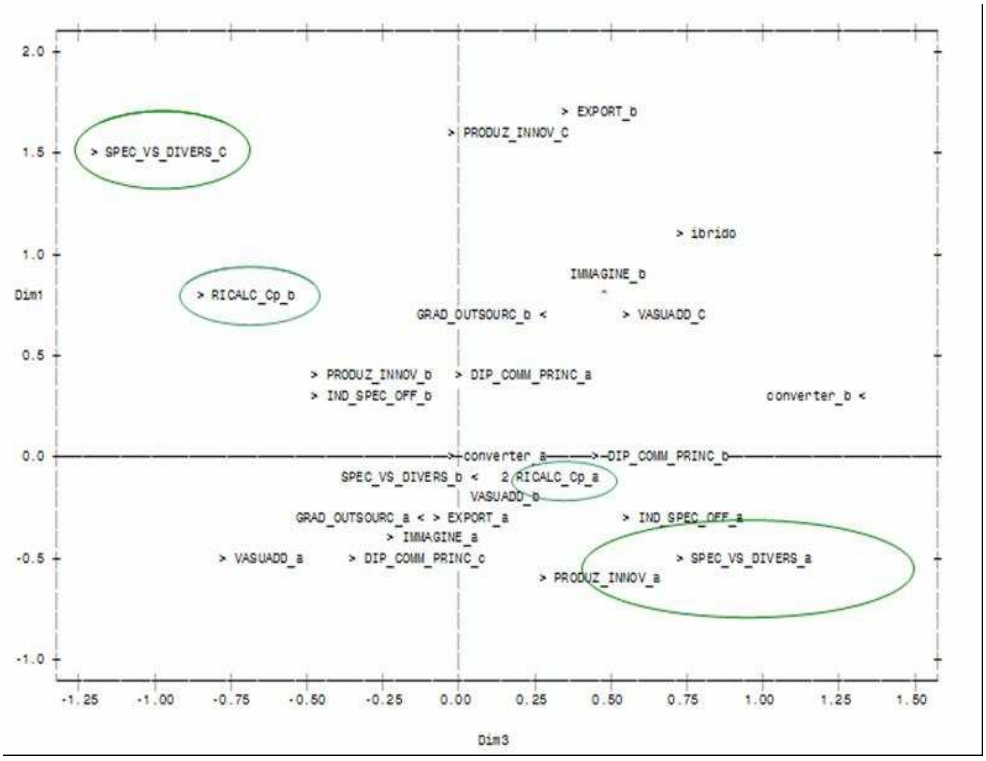
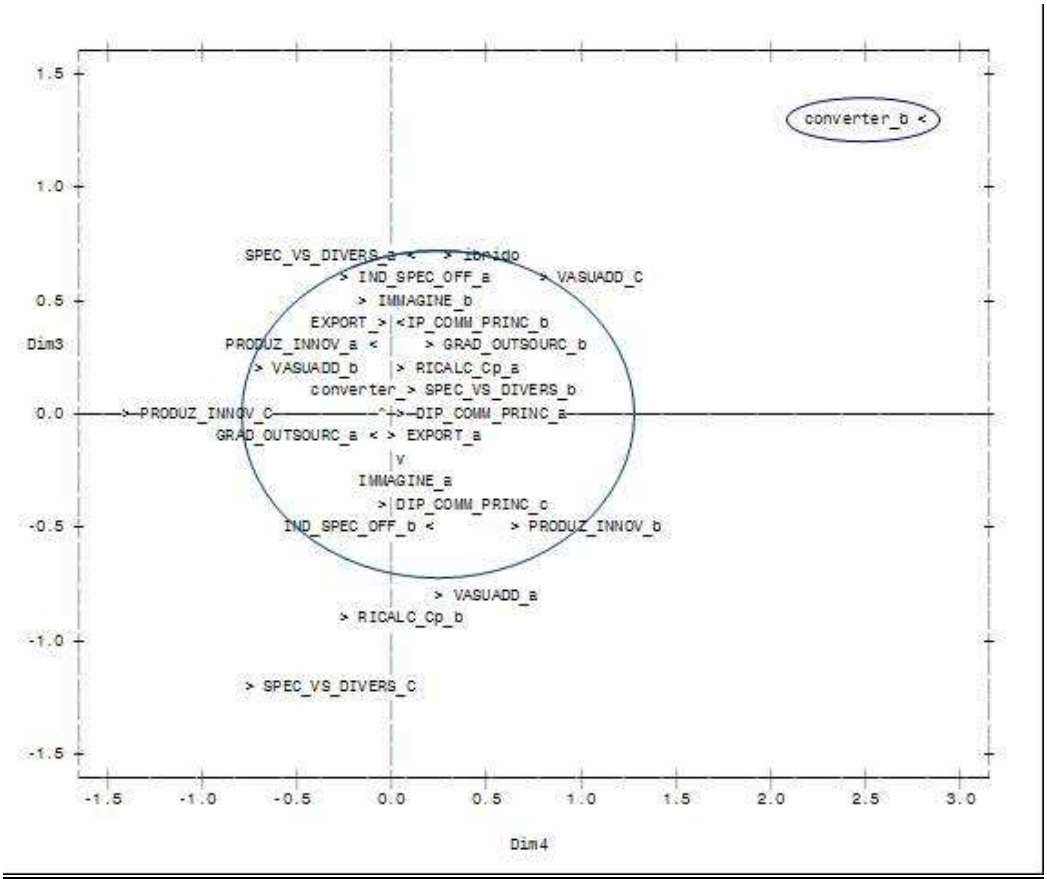


Figure 3. Euclidean plane generated by dim3-dim4 (Textile Sector)



Methods: Cluster Analysis

Cluster Analysis (Anderberg, 1973) is a multivariate explanatory statistical analysis methodology used to sort different objects (firms in our case) into groups in a way that the degree of association between objects is maximal if they belong to the same group and minimal otherwise. Given the above, cluster analysis can be applied to discover structures in data without providing an explanation/interpretation. In other words, cluster analysis simply discovers structures in data without explaining why they exist.

In this study we applied the *k-Means Method* clustering technique (Hartigan, 1975) on the factors derived form MCA. As suggested by the literature, given the sample sizes, we did not use the hierarchical method (Ketchen and Shook, 1996). This method assumes that analysts know in advance or can reasonably hypothesize the number of clusters in which to classify the objects (the firms). In general, the k-means clustering method will turn in exactly k different clusters minimizing variation within and maximizing variation between. In our case, K, i.e. the number of assumed clusters, corresponds to the number of BMs hypothesized in the preliminary analysis.

To assess the outcomes of a k-means clustering analysis, group means for each factor should be preliminarily analyzed in order to evaluate how diverse the k clusters are. The larger cross-group mean differences, the better. An additional preliminary check consists in performing ANOVA (analysis of variance) and then observing the magnitude of the F values for each factor. This is another proxy for how well the factors discriminate between clusters.

Table 9 shows the outcomes of the cluster analysis applied to our sample in textiles, using as variables the factors (dim1, dim2 and dim3) identified with MCA. 9 clusters, i.e. business models, are identified, and cross-cluster means analysis for dim1, dim2 and dim3 support business models' characterization and interpretation. As we will see in the next section, they largely correspond to the BMs we hypothesized on the basis of existing research and our knowledge of the industry.

Again, we performed the same type of analysis for the finishing and clothing sample. The findings are presented in the following sections.

Table 9. Cluster analysis outcomes, textile industry

Statistics for variables				
Factor	**Between STD**	**Within STD**	**R-square**	**RSQ/(1-RSQ)**
Dim1 – Industry position	0.49190	0.19802	0.838179	5.179662
Dim2 – Relational capabilities	0.41351	0.19966	0.767218	3.295867
Dim3 – Architectural capabilities	0.35988	0.20705	0.669492	2.025648
OVER-ALL	0.42523	0.20162	0.775538	3.455094
pseudo F				2279.59

Clusters Means			
Cluster	**Dim1**	**Dim2**	**Dim3**
1	-0.404660051	0.701639342	0.096814184
2	-0.358668503	-0.137947168	-0.267020213
3	1.164091564	0.265250943	-0.208185596
4	0.747870073	-0.124511024	0.333727720
5	0.082840356	-0.408895910	0.146285630
6	-0.111413039	1.739825378	0.512764375
7	0.227379466	0.387784566	-0.719905996
8	0.244455388	0.689366335	0.455695207
9	0.361527042	-0.123980103	-0.273724664

The map of the Italian small TA firms' Business Models

Textiles

Within the textile subsector, our analysis include yarning, weaving and knitting firms.

Following the research steps outlined before, we started defining, on the basis of the literature review summarized in the previous sections of the paper, the grid of variables that capture the choices, activities, resources and capabilities that constitute the BMs in the Italian textile industry. Then, we chose the measures to be used as proxies for the variables included in the grid (see tables 4 and 7). Finally, we hypothesized, on the basis of existing research, of interviews with key informants and of our knowledge of the industry, the set of different BMs we thought were outstanding in the industry.

As described in the previous sections, we ran a cluster analysis on the factors deriving from the MCA. Table 9 shows the 9 clusters we found and the relevant statistics. The nine clusters/ business models we found in the data largely correspond to those we hypothesized. More specifically, we found 5 successful and 4 declining BMs which are briefly described in Table 10.

Tables 11 and 12 provide additional information on why we defined and characterized the business models as per Table 10.

Table 11 reports, for each business models/cluster, the cluster's size and the values of the classes of the measures for the original variables. Table 12 reports the clusters' means and other relevant data that support the way we interpreted the outcomes of the cluster analysis.

Figure 4 maps the 9 business models derived from the cluster analysis onto performance. As already stated, we measured performance in terms of productivity (as captured by value added per employee) and innovation (as captured by the average rate of investment in fixed assets). We chose these two measures because they better represent the degree of competitiveness of firms within an industry and are not subjected to financial data distortion. Nonetheless, we obtained a similar map using standard financial measures of performance.

The origins of the axis of the map represent the overall sample means as concerns value added per employee and % investment in fixed assets. The BMs are positioned on the map according to the cluster's mean values for value added per employee and % investment in fixed assets.

Table 10. Description of the 9 BMs for the textile industry as derived from the cluster analysis

BM	Profile
Successful BMs	
Lean and Agile Firms (N=411)	Most of them sell their products to several national industrial and handicraft customers. They do not outsource activities within the production process and they show a high breadth of the production competence, since they are able to realize more than 2 production activities. Their product offer is limited.
Firms that produce high range products and export (N=300)	They are quite large (13 employees on average) and serve many final customers. Most of them offer high range products with a high specialization. Their investments in innovation and company's image are significant and they export a relevant part of their sales.
Export oriented firms specialized in high quality/end of the market products to industrial customers (N=451)	The BM represents 451 firms that serve several industrial and handicraft customers. Most of them outsource many activities, but just within one or two phases of the production process. Their product offer is in the high range. They invest in innovation, company's image and export a significant percentage of their sales.
International Converters (N=147)	147 firms follow this BM. They do not carry out any internal activities, but coordinate on behalf of industrial customers the production cycle. It is worth to point out how most of them export a relevant part of their sales.
Firms specialized in low range products offering a high variety to industrial customers (N=1215)	1215 firms are in this cluster. They serve national industrial customers with a low range products. However, they are specialized in one or two phases within the production process and able to offer a high variety.
Declining BMs	
Firms specialized in medium range products to national industrial customers (N=912)	912 firms follow this BM. Firms are just specialized in on or two phases within the production process. Most of them depend on one national industrial customer, with whom they realize most of their turnover. Their product offer is limited and medium range, and they do no export.
Traditional Converters (N=473)	These are 473 firms that do not carry out any activities within the production process, or designing, prototyping and sampling. They work on behalf of national industrial customers coordinating networks of local smes.
Firms that produce low-medium range products and do not export (N=281)	281 firms are in this cluster. They show a low specialization within the production cycle. They have many final customers, but their offer is limited, investments in company's image poor, and export negligible. Most of the firms realize low-medium range products and show low yearly investments in innovation..
Firms specialized in low range products offering a low variety to industrial customers (N=1303)	The BM represents 1.303 firms whose sales come from industrial national customers. Indeed most of their turnover is realized with just one customer. They are specialized in one or two phases within the production cycle. They offer a low variety of low range products and they do not export.

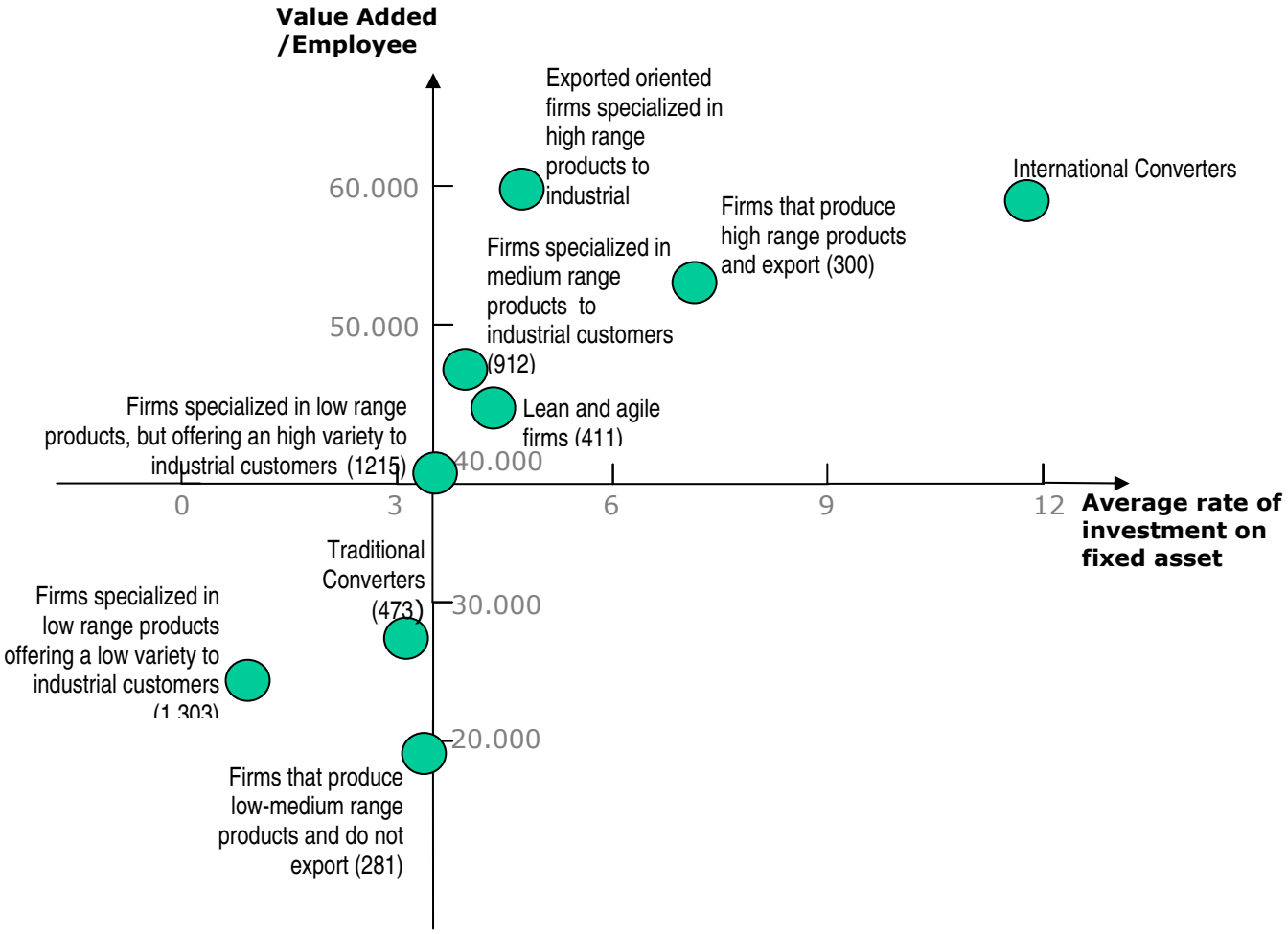
Table 11 Successful and declining BMs in the Italian textile industry (clusters' size and variables' classes of values)

Clusters		Lean and agile firms	Firms that produce high range products and export	Exported oriented firms specialized in high range products to industrial customers	International Converters	Firms specialized in low range products, but offering an high variety to industrial customers	Firms specialized in medium range products to industrial customers	Traditional Converters	Firms that produce low-medium range products and do not export	Firms specialized in low range products offering a low variety to industrial customers
		COMPETITIVE BUSINESS MODELS					DECLINING BUSINESS MODELS			
Numbers of firms		411	300	451	147	1.215	912	473	281	1.303
Variable	**Class of the measure**									
Subcontract	a	24%	79%	25%	49%	3%	4%	30%	89%	4%
Subcontract	b	76%	21%	75%	51%	97%	96%	70%	11%	96%
Converter (or "ready to deliver" firm)	a	100%	99%	100%	88%	100%	100%	94%	99%	100%
Converter (or "ready to deliver" firm	b	0%	1%	0%	12%	0%	0%	6%	1%	0%
Market Dependence	a	54%	90%	66%	91%	28%	10%	84%	80%	19%
Market Dependence	b	22%	7%	29%	6%	40%	57%	3%	3%	10%
Market Dependence	c	24%	3%	5%	3%	33%	33%	14%	17%	71%
Production outsourcing	a	58%	37%	30%	54%	88%	43%	95%	92%	85%
Production outsourcing	b	42%	63%	70%	46%	12%	57%	5%	8%	15%
Scope of production and manufacturing capabilities	a	0%	0%	1%	73%	6%	0%	77%	0%	0%
Scope of production and manufacturing capabilities	b	51%	34%	88%	26%	94%	100%	23%	55%	100%
Scope of production and manufacturing capabilities	c	49%	66%	11%	1%	0%	0%	0%	45%	0%
Product innovation	a	6%	1%	10%	86%	92%	37%	100%	23%	68%
Product innovation	b	77%	42%	44%	7%	7%	56%	0%	59%	31%
Product innovation	c	17%	57%	46%	7%	1%	7%	0%	17%	1%
Specialization of the product offer	a	16%	11%	44%	65%	85%	31%	84%	16%	24%
Specialization of the product offer	b	84%	89%	56%	35%	15%	69%	16%	84%	76%
Marketing orientation	a	66%	23%	15%	49%	78%	44%	96%	84%	98%
Marketing orientation	b	34%	77%	85%	51%	22%	56%	4%	16%	2%
Vertical integration	a	1%	1%	2%	73%	6%	0%	77%	0%	0%
Vertical integration	b	29%	64%	60%	12%	8%	31%	2%	14%	6%
Vertical integration	c	70%	35%	38%	14%	86%	69%	21%	86%	94%
Internationalization	a	87%	11%	33%	48%	99%	97%	98%	96%	100%
Internationalization	b	13%	89%	67%	52%	1%	3%	2%	4%	0%

Table 12.BMs'/clusters' means (original variables) in the Italian textile industry

Clusters	Lean and agile firms	Firms that produce high range products and export	Exported oriented firms specialized in high range products to industrial customers	International Converters	Firms specialized in low range products, but offering an high variety to industrial customers	Firms specialized in medium range products to industrial customers	Traditional Converters	Firms that produce low-medium range products and do not export	Firms specialized in low range products offering a low variety to industrial customers	Total
	COMPETITIVE BUSINESS MODELS					DECLINING BUSINESS MODELS				
Numbers of firms	411	300	451	147	1.215	912	473	281	1.303	5.493
Measures										
% revenues from sales to industrial and handicraft customers	78,27	25,97	84,72	56,9	98,11	97,53	70,06	11,48	96,57	83,17
% revenues from sales of products purchased from third parties with no significant physical transformation activity in-house	1,83	5,04	3,58	17,46	0,48	0,7	6,93	3,25	0,22	2,21
% revenues from the main customer	25,5	4,84	12,46	3,66	39,81	44,57	12,47	15,01	61,73	35,98
% of Cost of outsourced production / (purchasing cost of raw materials, components and services)	0,26	0,31	0,33	0,22	0,09	0,37	0,04	0,06	0,12	0,18
Number of different production activities performed in-house	2,45	2,65	1,8	0,33	1,05	1,58	0,25	2,31	1,33	1,43
Number of product development activities performed in-house	2,13	3,47	2,95	0,41	0,15	1,15	0	1,77	0,48	1,03
Value added per employee	44092,23	53179,51	59982,55	58740,01	39880,47	46206,41	27339,39	19226,76	24601	38366,48
Herfindhal Index on the % of revenues from specific products (e.g. dyed yarns, fabrics for apparel, furnishing, ties, foulard, scarf, knitted fabric, ect.)	7.860,83	8.480,59	5.316,56	3.373,89	1.468,19	6.466,86	1.674,62	8.067,23	7.402,89	5.289,51
% of revenues invested in advertising and commercials	0	0,01	0	0	0	0,01	0	0	0	0
Average rate of investment infixed assets (2001-2005 series)	4,25	7,08	4,88	11,79	3,5	4	3,1	3,4	0,89	3,51
Number of activities performed in-house / Number of total activities (completed within the firm + outsourced)	0,86	0,68	0,67	0,19	0,9	0,86	0,22	0,93	0,97	0,8
Internationalization	3,74	32,98	16,84	18,69	0,12	0,72	1,07	0,97	0	4,25
Number of employees	6	12,66	10,82	6,42	5,06	6,37	2,91	2,96	2,77	5,44
Turnover	550249,5	1725357	1760346	1267247	313667,3	461379,3	159271,7	158501,9	103454,1	506193,3

Figure 4. Map of the Italian textile small firms' business models



The map shows that 898 firms (16,35 % of the total) are pursuing successful BMs: International Converters, Exported oriented firms specialized in high range products to industrial customers, and Firms that produce high range products and export.

It is interesting to point out how these three successful BMs represent the international version/evolution of three typical and traditional kinds of firms in the Italian textile industry – subcontractor, autonomous full scale producer and converter. The main common characteristic of these three successful BMs seems is the ability to export.

2.057 firms (37,45% of the total) are instead stuck with a declining business model. All these three BMs are characterized by an industry position which focuses on the low end of the market and domestic customers.

Almost half of the analyzed firms (46,2 % of the sample) pursue three BMs that aren't as successful as the former, but that could be sustainable in the future. The average performance values for these clusters

are positioned around the origin of the axes (corresponding to the overall mean of the sample's performance values).

As for Lean and agile firms, their strategy seems robust: they focus on a limited offer, but they guarantee high quality, low cost and quick response to several national customers. These firms could grow improving quality to match international standards, expanding internationally and widening the product offer.

Firms specialized in medium range products to industrial customers do not seem to have bright future prospects, unless they do not move ups scale in the market improving the quality of their products, in terms of better range and variety.

As concerns Firms specialized in low range products, but still able to offer a high variety of solutions to industrial customers, they need to invest to improve their offer quality and try to open to foreign markets exporting some of their sales.

Finishing

As for the finishing subsector, we defined, on the basis of the literature review summarized in the previous sections of the paper, the grid of variables that capture the choices, activities, resources and capabilities that constitute the BMs. Then, we chose the measures to be used as proxies for the variables included in the grid. Variables and measures are reported in table 5. Finally, we hypothesized, on the basis of existing research, of interviews with key informants and of our knowledge of the industry, the set of different BMs we thought were outstanding in the industry.

Similarly to the textile industry, we performed MCA and cluster analysis for the finishing industry. Cluster analysis findings supports and validates 3 of the 4 hypothesized BMs and suggested a new one. For the sake of brevity, we do not fully report the MCA and cluster analysis statistics for finishing as we did for textiles. The data are, nonetheless, similar.

Table 13 illustrates the 4 business models derived and validated by MCA and cluster analysis for the finishing industry.

Tables 14 and 15 provide additional information on why we defined and characterized the business models as per Table 13.

Table 14 reports, for each business models/cluster, the cluster's size and the values of the classes of the measures for the original variables.

Table 15 reports the clusters' means and other relevant data that support the way we interpreted the outcomes of the cluster analysis.

Table 13. Description of the 4 BMs for the finishing industry as derived from cluster analysis

Successful BMs:	*Profile*
Firms that coordinate a network of workshops (N=185)	They operate in several fields of finishing (e.g. dyeing, printing, finishing itself) to offer high quality products and services to industrial customers. In addition to high quality and specialization they guarantee extreme flexibility thanks to the network of small workshops they coordinate
Firms specialized in high quality finishing product, process or service on behalf of a third party (N=429)	They realize high value added activities (e.g. special treatments, assistance in designing) on behalf of larger industrial customers
Declining BMs:	
Firms specialized in low quality finishing product or process on behalf of a third party (N=154)	They are specialized in low value added activities, offering low technological and design contents.
Firms specialized in some activities with direct access to final customers (N=50)	They realize most of the production internally. They are specialized in some finishing activities that offer directly to final customers.

While analysis suggests that subcontracting, in various forms, is still the prevalent operating model in the Italian finishing industry, there is a relevant group of firms that operate autonomously, on their own and for final customers.

Table 15 shows that 75 % of the analyzed firms (i.e. 614 firms out of 818) belong to the two successful BMs. This data supports the idea that, even in times of fierce competition from low labor cost countries Italian small firms can maintain their competitiveness in the finishing sub-sector, offering high value added, technological and specialized products and services.

However, the remaining 25% of firms belonging to declining BMs suffer in terms of performance as the data (value added per employee) confirms.

Table 14. Successful and declining BMs in the Italian finishing industry (clusters' size and variables' classes of values)

Clusters		Firms that coordinate a network of workshops	Firms specialized in high quality finishing product, process or service on behalf of a third party	Firms specialized in low quality finishing product or process on behalf of a third party	Firms specialized in some activities with direct access to final customers	TOTAL
		Successful business models		**Declining business models**		
Numbers of firms		185	429	154	50	818
Variables	**Class of the measure**					
Subcontract	a	14%	15%	3%	92%	17%
Subcontract	b	86%	85%	97%	8%	83%
High quality working	a	37%	19%	100%	42%	40%
High quality working	b	63%	81%	0%	58%	60%
Low quality working	a	100%	100%	40%	96%	89%
Low quality working	b	0%	0%	60%	4%	11%
Domestic outsourcing	a	45%	97%	78%	82%	81%
Domestic outsourcing	b	55%	3%	22%	18%	19%
Specialization and technological capability	a	52%	97%	100%	84%	87%
Specialization and technological capability	b	48%	3%	0%	16%	13%
Final market access	a	99%	100%	99%	0%	93%
Final market access	b	1%	0%	1%	100%	7%

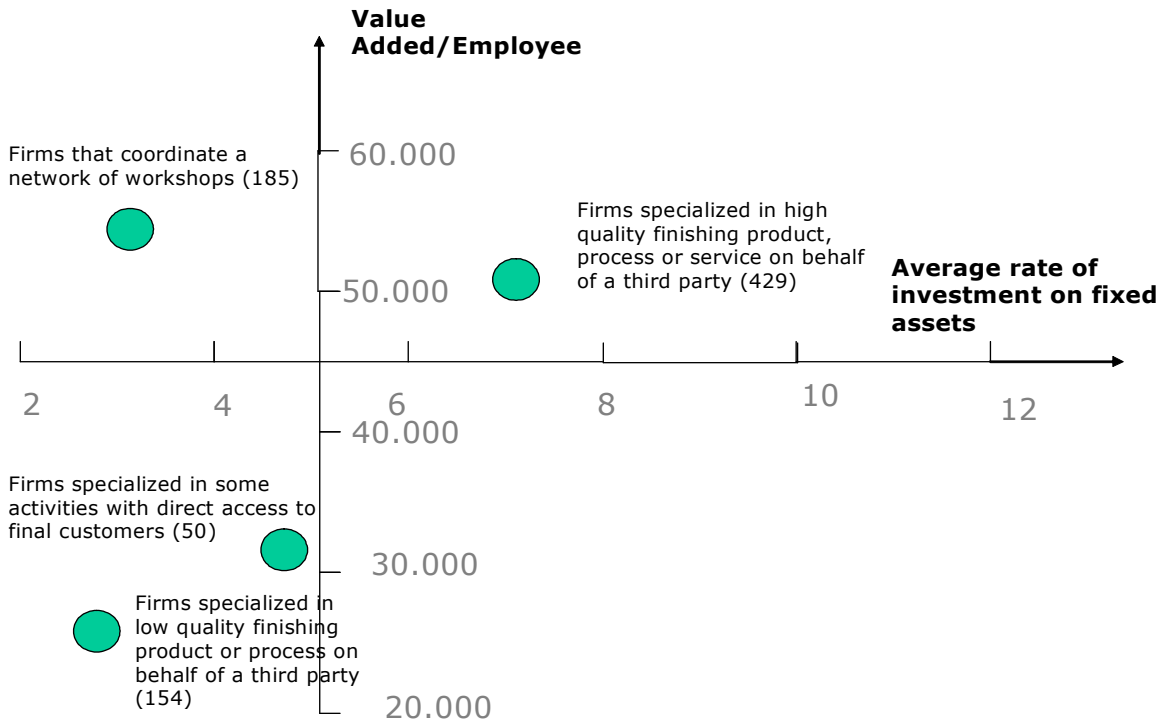
Table 15. BMs'/clusters' means (original variables) in the Italian finishing industry

Clusters	Firms that coordinate a network of workshops	Firms specialized in high quality finishing product, process or service on behalf of a third party	Firms specialized in low quality finishing product or process on behalf of a third party	Firms specialized in some activities with direct access to final customers	TOTAL
	Successful business models		**Declining business models**		
Number of firms	185	429	154	50	818
Measures					
Numbers of employees	19,42	12,61	7,95	7,41	12,96
Turnover (euro)	1.691.644,00	1.079.127,26	274.484,70	505.909,26	1.031.131,83
% revenues from sales to industrial and handicraft customers	92,71	90,41	97,77	29,9	88,62
% revenues coming from dyeing, printing and finishing activities	83,22	90,37	10,73	71,98	72,63
% revenues coming from darning activities	0,91	0,23	62,04	9,24	12,57
Value added per employee	53.874,11	50.617,19	26.010,96	31.891,08	45.576,68
Average rate of investment in fixed assets	2,89	7,24	3,13	4,98	5,35
Working activities entrusted to third parties in Italy (value in euro) / (Purchasing costs of raw and subsidiary materials and semicomponents + Costs of services)	0,32	0,04	0,19	0,11	0,13
Number of different activities carried out as for printing and finishing	2,98	1,37	0,36	1,94	1,58
% revenues from sales to retailers and final customers	0,03	0,01	0,02	42,96	2,64

Figure 5 maps the 4 business models derived from the cluster analysis onto performance. As already stated, we measured performance in terms of productivity (as captured by value added per employee) and innovation (as captured by the rate of investment in fixed assets). We chose these two measures because they better represent the degree of competitiveness of firms within an industry and are not subjected to financial data distortion. Nonetheless, we obtained a similar map using standard financial measures of performance.

The origins of the axis of the map represent the overall sample means as concerns value added per employee and % investment in fixed assets. The BMs are positioned on the map according to the cluster's mean values for value added per employee and % investment in fixed assets.

Figure 5. Map of the Italian finishing small firms' business models



The four quadrants of the map reflect different competitiveness situations, expressed as different combination of efficiency and innovation technology. Going counterclockwise, Quadrant 1 is the competitiveness area, where firms (52,44 % of the total) show a tight control of costs together with a quite strong policy in investing in new updated machinery. Quadrant 2 is still a competitive area, but firms (22,6

% of the total) are less inclined to invest in innovative technologies. Quadrant 3 is the decline area, where firms (29,94 % of the total) follow BMs unable to guarantee efficiency and necessary investments. Without any change of strategy, these firms are likely to be selected out.

Clothing

Within the clothing subsector, our analysis includes a variety of firms producing clothing items for different functional uses (men or women, underwear, formal clothing, shirts, pants, outdoor and working clothes, wedding dresses, stockings, accessories like ties, hats, etc.).

We followed the same process as for textiles and finishing. We started identifying the grid of variables that capture the choices, activities, resources and capabilities that constitute the BMs in the Italian clothing industry. Then, we chose the measures to be used as proxies for the variables included in the grid. Finally, we hypothesized, on the basis of existing research, of interviews with key informants and of our knowledge of the industry, the set of different BMs we thought were outstanding in the industry.

Table 16 reports the variables and measures (already illustrated in table 6) as well as the threshold values and the corresponding classes of values of the measures to be used in the MCA.

Similarly to what we did for the textile and finishing industries, we performed MCA and cluster analysis for the clothing industry. Cluster analysis highlighted 12 groups/business models instead of the 13 hypothesized.

This is mainly due to the difference between the hypothesized BMs and those emerging from the data as regards firms work as subcontractors (i.e. they operate “on behalf” and supply industrial customers or artisan firms). Noteworthy, the threshold value for the variable “subcontract”, measured by “% revenues to industrial and handicraft customers” was set at 80 %. This quite high threshold value is probably the reason why cluster analysis led to different outcomes.

Nonetheless, BMs based on subcontracting remain widespread and popular within the industry (68.6% of the sample, 14,252 firms), which, by the way, is unfortunate, given their poor performance.

Moreover, the incomplete support to our BMs’ assumption may be simply due to our imperfect knowledge of the industry or to the rapid changes – both structural and competitive - that small Italian apparel firms have undergone during the last 3 years.

Table 16. Variables, measures, threshold values and classes of measure for the clothing industry

Variables	Measures	Class of the measure	Threshold value
Subcontract	% revenues from sales to industrial and handicraft customers	a	< 80
		b	> 80
Converter (or “ready to deliver” firm)	% revenues from sales of products purchased from third parties with no significant physical transformation activity in-house	a	0
		b	1
Quality orientation	Quality control activities: yes or no	a	0
		b	1
Market dependence	% revenues from the main customer	a	< 75
		b	> 75
Scope of production and manufacturing capabilities	Number of different production activities performed in-house	a	0
		b	> 0; < 2
		c	> 2
Product innovation	Number of product development activities performed in-house	a	< 3
		b	> 3
Specialization of the product offer	Herfindhal Index on the % of revenues from different products	a	< 5.200
		b	>5.200
Brand	% of revenues from own brand products.	a	= 65
		b	> 65
Production outsourcing	% of Cost of outsourcing / (Cost of purchasing raw materials and components + Cost of production of services)	a	< 0
		b	> 0
Vertical integration	Number of activities performed in-house / Number of total activities (completed within the firm + outsourced)	a	< 4
		b	> 4
Internationalization	% of revenues to foreign (EU and non- EU) customers	a	< 30
		b	>30
Market orientation	Salesforce (Number of agents)	a	= 0
		b	> 0
Final market access	% revenues to final customers / revenues from sales to retailers and final customers	a	< 55
		b	> 55
Distribution penetration	% revenues from sales to retailers and final customers	a	< 0,5
		b	>0,5
Large retail chain penetration	% of revenues from sales to large retailers	a	= 0
		b	> 0

Table 17 summarizes the characteristics of the BMs for the clothing industry as derived from the cluster analysis.

Tables 18 and 19 provide additional information on why we defined and characterized the business models as per Table 17. Table 18 reports, for each business models/cluster, the cluster's size and the values of the classes of the measures for the original variables. Table 19 reports the clusters' means and other relevant data that support the way we interpreted the outcomes of the cluster analysis.

Figure 6 maps the 12 business models derived from the cluster analysis onto performance. As already stated, we measured performance in terms of productivity (as captured by value added per employee) and innovation (as captured by the rate of investment in fixed assets). We chose these two measures because they better represent the degree of competitiveness of firms within an industry and are not subjected to financial data distortion. Nonetheless, we obtained a similar map using standard financial measures of performance.

The origins of the axis of the map represent the overall sample means as concerns value added per employee and % investment in fixed assets. The BMs are positioned on the map according to the cluster's mean values for value added per employee and % investment in fixed assets.

Table 17. Description of the 12 BMs for the clothing industry as derived from the cluster analysis

BM	Profile
	SUCCESSFUL BUSINESS MODELS
LEAN AND FOCUSED FIRMS (N=540)	Firms that perform internally several activities, especially the innovative ones. They offer their customers a full service, from design to delivery of end products. Organization is well structured (average size is 10 employees), and it includes not only production workers, but also agents and commercial ones. They sell high quality own branded products with a high level of specialization. Most of their customers are national retailers, but some firms supply large scale retailers too. Some firms export their products too.
PRODUCT SPECIALISTS TO RETAILERS (N=622)	Firms with high level of specialization on a single product line. Production is high quality and integrated, since most of the production activities are distinctive. Despite firms' small size (6 employees on average) organisation includes both production and sales roles (i.e. agents). Firms show an high channel coordination, since their high level of own branded product specialization is requested by several retailers as customers. Most of their customers are national.
FIRMS WITH INDUSTRIAL CUSTOMERS THAT OUTSOURCE PRODUCTION (N=2857)	Firms that offer a specialized range of products, but they often outsource production, even if they maintain an high breadth of production competence. Average size is 8 employees and they operate as external suppliers of larger industrial companies. In this context they do not use own brands and do not need high quality production. They are located within the industrial districts, still taking advantage of proximity with national industrial customers.
EXPORT ORIENTED SPECIALIZED FIRMS THAT SELLS TO LARGE SCALE RETAILERS (N=720)	Firms focused on high quality production, perform internally the innovative activities, offer very specialized products, and serve large scale retailers. A distinctive characteristic is the significant part of turnover exported. Consistently with these characteristics, organization, altough typical of a small firm, is the largest out of the analyzed firms (12 employees on average) and encompasses design, production, sales and distribution activities.
PRODUCTION SPECIALISTS THAT SELL TO LARGE SCALE RETAILERS (N=881)	Firms characterized by high quality and specialized production, high breadth of production competence, even if some innovative activities, like technical and aesthetic finishing, style and modelling, are partially outsourced. It is interesting to point out how most of the firms do not own brand their products, but offer their specialized production to large scale national retailers. However some firms export their products, through a network of commercial agents.
SPECIALIZED FIRMS THAT SELL TO WHOLESALERS (N=1114)	Firms that manufacture high quality and specialized products, and show a high breadth of the production competence even if some innovative activities, like technical and aesthetic finishing, style and modelling, are partially outsourced. They sell their own branded products to national wholesalers. They miss a commerical network (i.e. sales agents) that could guarantee control of distribution channels.

BM	Profile
	DECLINING BUSINESS MODELS
PHASE SPECIALISTS THAT SUPPLY INDUSTRIAL CUSTOMERS (N=8212)	Firms that pursue a well established and traditional model in the industry. They serve industrial customers and are specialized in just one-two phases of the production process that are realized internally on behalf of third parties. Their phase specialization is often idiosyncratic with the industrial district where they and thier customers are located. Indeed 50% of the firms within this cluster make over 75% of their turnover with just their main and one customer. Activities are neither innovative nor high quality.
GENERALISTS THAT PRODUCE LOW MEDIUM RANGE PRODUCTS (N=1033)	Firms characterized by low medium range products, without any particular specialization in the offer. In house, they perform just few and not innovative activities. They serve national customers, most retailers and, to same extent, some private and industrial ones. To them they offer private label products, even if some firms produce own branded products too.
PLURI-PHASE FIRMS THAT SUPPLY INDUSTRIAL CUSTOMERS (N=3182)	Firms that serve many industrial customers (i.e. they do not depend on some main customers) and perform several phase of the production process. This characteristic implies an high breadth of production competence. However, activities are neither innovative nor high quality.
SMALL GENERAL FIRMS OF LOW MEDIUM RANGE PRODUCTS (N=1171)	Micro-firms (1-2 employees). The level of specialization of the offer is low, activities performed in house are not innovative ones, and quality of production and products is not controlled and guaranteed. Customers are most retailers and private ones, served with own branded products in some cases.
DOMESTIC CONVERTER (N=57)	Firms within this cluster (57) are very small (on average 1,6 employees). They try to coordinate activities on behalf of a customer. However, production is neither high quality nor innovative. The level of specialization of the offer is low. Products are sold with customer's brand. Customers are most retailers or private ones.
GENERALISTS MARKET FOCUSED (N=386)	Firms not focus on production or products, but rather on a market to which they offer a high variety of production activities / products. Most of them are artisan small firms (on average 2,8 employees) that perform internally most of the production cycle activities. They are able to coordinate distribution, selling own branded products to retailers or private customers. However they cannot count on a commercial network (i.e. sales agents) to control the distribution channel. Their products, even if not specialized, are high quality.

Table 18. Successful and declining BMs in the Italian clothing industry (clusters' size and variables' classes of values)

Clusters		Lean and focused firms	Product specialists to retailers	Firms with industrial customers that outsource production	Export oriented specialized firms that sells to large scale retailers	Product specialists that sell to large scale retailers	Specialized firms that sell to wholesalers	Phase specialists that supply industrial customers	General firms that produce low medium range products	Pluri-phase firms that supply industrial customers	Small general firms of low medium range products	National Converter	General firms market focused	**TOTAL**
		Successful BUSINESS MODELS						**Declining BUSINESS MODELS**						
Number of firms		540	622	2.857	720	881	1.114	8.212	1.033	3.183	1.171	57	386	20.776
Variables	**Class of the measure**													
Subcontract	a	99%	99%	26%	97%	82%	93%	1%	88%	39%	99%	100%	100%	40%
Subcontract	b	1%	1%	74%	3%	18%	7%	99%	12%	61%	1%	0%	0%	60%
Converter (or "ready to deliver" firm)	a	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%	100%	1%	1%
Converter	b	84%	69%	49%	87%	69%	57%	7%	30%	26%	19%	0%	63%	31%
Market dependence	a	98%	98%	69%	97%	89%	94%	50%	87%	85%	98%	98%	98%	72%
Market dependence	b	2%	2%	31%	3%	11%	6%	50%	13%	15%	2%	2%	2%	28%
Scope of production and manufacturing capabilities	a	1%	2%	0%	0%	0%	2%	0%	6%	4%	6%	96%	2%	2%
Scope of production and manufacturing capabilities	b	3%	3%	14%	2%	8%	4%	84%	17%	19%	16%	4%	1%	40%
Scope of production and manufacturing capabilities	c	96%	95%	86%	98%	91%	94%	16%	77%	77%	78%	0%	98%	58%
Product innovation	a	21%	49%	91%	29%	76%	60%	100%	94%	100%	94%	100%	22%	88%
Product innovation	b	79%	51%	9%	71%	24%	40%	0%	6%	0%	6%	0%	78%	12%
Specialization of the product offer	a	44%	46%	48%	37%	43%	37%	44%	56%	51%	55%	81%	58%	47%
Specialization of the product offer	b	56%	54%	52%	63%	57%	63%	56%	44%	49%	45%	19%	42%	53%
Brand	a	14%	12%	98%	31%	72%	37%	100%	68%	97%	57%	100%	6%	82%
Brand	b	86%	88%	2%	69%	28%	63%	0%	32%	3%	43%	0%	94%	18%
Production outsourcing	a	14%	38%	12%	8%	11%	54%	81%	74%	95%	95%	91%	63%	64%
Production outsourcing	b	86%	62%	88%	92%	89%	46%	19%	26%	5%	5%	9%	37%	36%
Vertical integration	a	8%	19%	59%	11%	33%	29%	96%	58%	80%	58%	100%	9%	69%
Vertical integration	b	92%	81%	41%	89%	67%	71%	4%	42%	20%	42%	0%	91%	31%
Internationalization	a	75%	91%	97%	38%	70%	94%	100%	100%	100%	100%	100%	97%	95%
Internationalization	b	25%	9%	3%	62%	30%	6%	0%	0%	0%	0%	0%	3%	5%

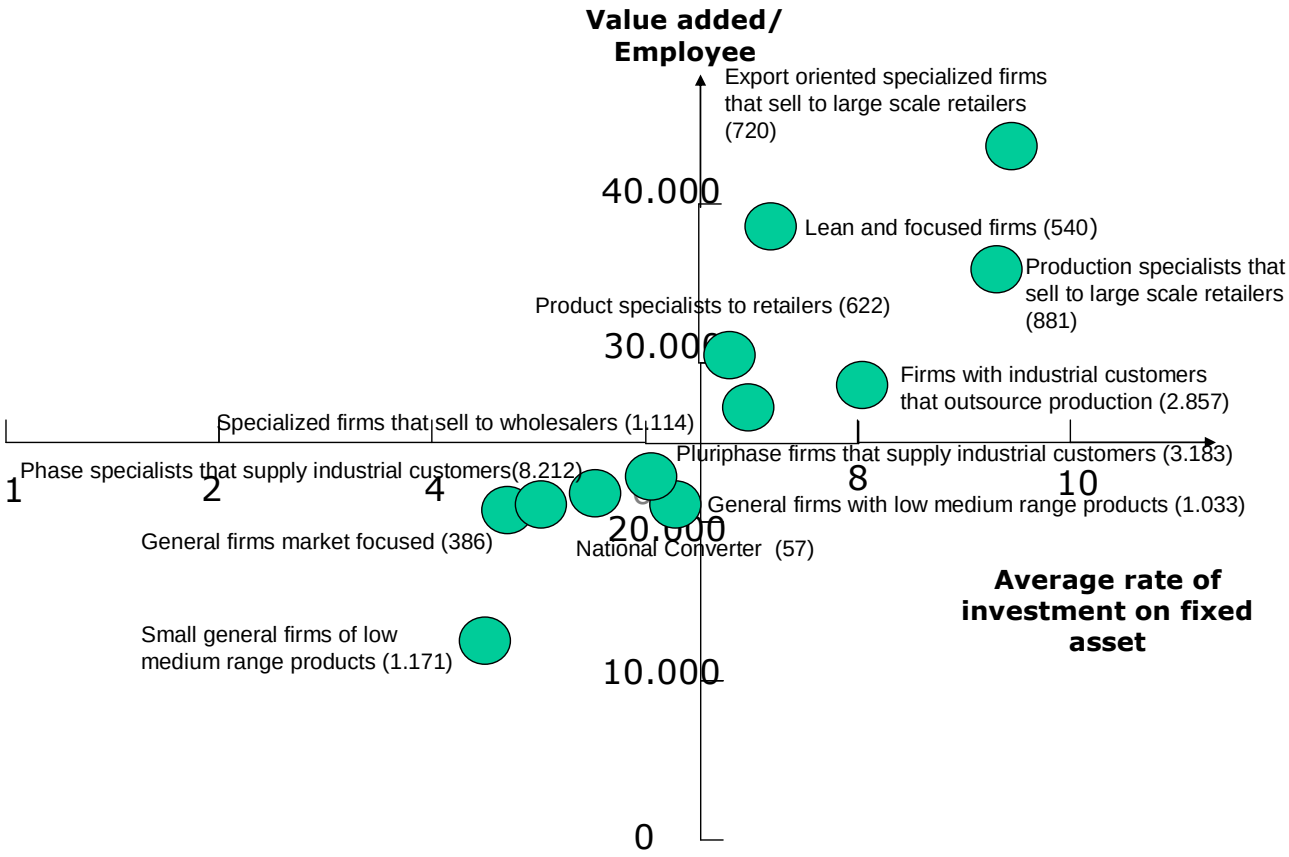
Clusters		Lean and focused firms	Product specialists to retailers	Firms with industrial customers that outsource production	Export oriented specialized firms that sells to large scale retailers	Product specialists that sell to large scale retailers	Specialized firms that sell to wholesalers	Phase specialists that supply industrial customers	General firms that produce low medium range products	Pluri-phase firms that supply industrial customers	Small general firms of low medium range products	National Converter	General firms market focused	**TOTAL**
Market orientation	a	33%	61%	98%	12%	65%	91%	100%	99%	100%	99%	100%	94%	92%
Market orientation	b	67%	39%	2%	88%	35%	9%	0%	1%	0%	1%	0%	6%	8%
Final market access	a	47%	16%	100%	78%	100%	96%	100%	52%	99%	5%	0%	1%	85%
Final market access	b	53%	84%	0%	22%	0%	4%	0%	48%	1%	95%	100%	99%	15%
Distribution penetration	a	90%	81%	100%	97%	100%	96%	100%	62%	98%	4%	11%	1%	89%
Distribution penetration	b	10%	19%	0%	3%	0%	4%	0%	38%	2%	96%	89%	99%	11%
Large retail penetration	a	67%	95%	94%	18%	45%	84%	100%	99%	100%	100%	100%	97%	92%
Large retail penetration	b	33%	5%	6%	82%	55%	16%	0%	1%	0%	0%	0%	3%	8%

Table 19. BMs'/clusters' means (original variables) in the Italian clothing industry

Clusters	Lean and focused firms	Product specialists to retailers	Firms with industrial customers that outsource production	Export oriented specialized firms that sells to large scale retailers	Product specialists that sell to large scale retailers	Specialized firms that sell to wholesalers	Phase specialists that supply industrial customers	Generalists that produce low medium range products	Pluri-phase firms that supply industrial customers	Small general firms of low medium range products	National Converter	Generalists market focused	**TOTAL**
	Successful BUSINESS MODELS						**Declining BUSINESS MODELS**						
Number of firms	540	622	2.857	720	881	1.114	8.212	1.033	3.183	1.171	57	386	20.776
Number of employee	10,27	5,93	7,99	12,23	9,53	5,5	4,06	3,94	4,82	1,62	1,64	2,88	5,35
Turnover	1.179.801	495.345	411.272	1.568.810	932.605	449.679	131.392	196.806	172.798	68.258	150.555	168.571	315.662
Value added per employee	38.358,47	30.067,31	28.254,53	42.346,9	36.683,42	28.669,79	22.212,8	21.232,23	22.824,37	14.474,13	21.383,24	20.600,58	24.932,56
Average rate of investment on fixed assets	7,26	6,74	8,33	9,69	9,48	7,03	5,45	6,35	6,15	4,57	5,12	4,91	6,43
% revenues from sales to industrial and handicraft customers	28	32,9	95,04	35,26	62,65	55,68	99,86	64,17	91,43	27,05	21	17,38	92,27
% revenues from sales of products purchased from third parties with no significant physical transformation activity in-house	0	0	0	0	0	0	0	0,01	0	0,04	1	0,01	0,01
Quality control activities: yes or no	0,84	0,69	0,49	0,87	0,69	0,57	0,07	0,3	0,26	0,19	0	0,63	0,31
% revenues from the main customer	31,94	31,33	61,98	32,9	49,99	46,92	74,1	53,88	54,85	34,14	100	32,81	64,37
Number of different production activities performed in-house	3,98	3,76	2,75	3,88	3,32	3,44	1,26	2,79	2,28	2,9	1	4,1	2,28
Number of product development activities performed in-house	2,95	2,46	1,73	2,8	2,06	2,33	1,22	1,62	1,25	1,63	1	2,94	2,01
Herfindhal Index on the % of revenues from different products	6.094,46	6.011,11	6.141,22	6.661,08	6.418,44	6.955,52	6.865,93	5.801,30	6.093,68	5.752,04	4.721,74	5.186,66	6.426,59
% of revenues from own brand products.	92,92	96,09	44,36	87,15	74,23	90,63	16,32	78,65	63,61	91,12	.	97,66	86,07
% of Cost of outsourcing / (Cost of purchasing raw materials and components + Cost of production of services)	0,36	0,39	0,37	0,39	0,4	0,35	0,5	0,51	0,91	0,6	0,91	0,29	0,42
Number of activities performed in-house / Number of total activities	10,34	8,73	4,65	9,72	6 ,81	7,61	1,56	4,95	3,31	4,83	1,5	9,86	4,03

Clusters	Lean and focused firms	Product specialists to retailers	Firms with industrial customers that outsource production	Export oriented specialized firms that sells to large scale retailers	Product specialists that sell to large scale retailers	Specialized firms that sell to wholesalers	Phase specialists that supply industrial customers	Generalists that produce low medium range products	Pluri-phase firms that supply industrial customers	Small general firms of low medium range products	National Converter	Generalists market focused	**TOTAL**
	Successful BUSINESS MODELS						**Declining BUSINESS MODELS**						
(completed within the firm + outsourced)													
% of revenues to foreign (EU and non- EU) customers	30,75	24,38	30,07	53,08	41,98	25,39	9,18	13,1	8,8	15,92	2	24,07	34,85
Salesforce (Number of agents)	5,67	4,61	4,25	5,67	2,84	4,13	.	2,88	3	3,11	.	3,13	4,84
% revenues to final customers / revenues from sales to retailers and final customers	63,69	80,51	16,88	41,61	18,98	29,23	6,96	58,96	24,32	94,46	98,11	92,79	62,56
% revenues from sales to retailers and final customers	0,39	0,5	0,31	0,28	0,25	0,52	.	0,79	0,82	0,97	0,99	0,94	0,8
% of revenues from sales to large retailers	34,66	31,23	66,91	44,19	57,68	58,38	.	68,83	.	61,75	.	16,7	50,78

Figure 6. Map of the Italian clothing small firms' business models



Business and industrial policy implications and future research

Challenged by globalization and new technologies, small Italian TA firms seem to have lost their competitive edge suffering a severe crisis, undergoing major structural and strategic changes, and partly losing their historical peculiarities.

Increasing competition from producers located in low cost Countries and ever new, more powerful information and communication technologies have reduced the importance of geographical proximity as a competitive advantage factor (Guercini, 2004).

Globalization and the related risks ask for financial structures and managerial capabilities not easily accessible and adoptable by small firms, which are mostly undercapitalized, family owned and run businesses.

Finally, while manufacturing, built on a heritage of craftsmanship and skilled labor, has historically been these firms' core competence, marketing and design capabilities, as well as knowledge of new technologies (smart textiles, nanotechnologies, etc.) have been neglected and are underdeveloped. Now

that innovation and internationalization are key success factors, competencies other than manufacturing efficiency and flexibility have become critical.

In the attempt to address at least some of these structural weaknesses, small Italian firms, also in industries other than TA are changing (Camuffo, Furlan and Grandinetti, 2007, Berger, 2006; Camuffo 2003). On the one hand, the largest firms, usually assemblers/buyers located in the downstream sections of supply chains, have changed sourcing policies, reducing their dependence from their local suppliers' base, actively seeking for low cost sources in such emerging areas as East Europe and East Asia and establishing direct access to global markets even with autonomous distribution networks. On the other hand, also some of the small and medium sized firms have tried to carve out a new role within global supply chains, diversifying their businesses, moving from subcontracting to direct business, and reducing their level of symbiosis with few, local main customers.

But only some of these firms have been able to change and adapt. This wide variation in strategies, structures and behaviors rests on the diversity of the business models these firms have adopted.

This study used the concept of business model and performed multivariate statistical analysis on a large sample of small Italian TA firms in order to understand performance variation within the industry. Our purpose was to ground, as rigorously as possible, analysis and policy making on data and facts. Conforming to the conventional view that small firms in mature industries and high wage Countries are "doomed to death", with no comprehensive empirical evidence about how things really are, may be extremely dangerous and mislead practitioners and policy makers when they decide what to do.

Our study of small Italian firms in the TA industry identifies 9 business models in textiles, 4 in finishing and 12 in apparel. Some of them (those characterized by internationalization, investment in technology and skills, move up scale in the market) are associated with higher productivity and innovation, while the others lead to decline.

Our findings show that, despite the crisis during the last decade, some firms, pursuing "*successful*" BMs, have found their way to compete in the new global context. Viceversa, some other firms, tied to "*declining*" BMs, either stack to an outdated strategy or are not able to frame consistently their strategic choices and configuration of activities (Camuffo, Furlan, Romano and Vinelli, 2008).

As for textiles, successful BMs seem to be an evolution, in terms of internationalization, innovation and focus on high end of the market, of the traditional business models (e.g subcontractors, converters, etc.).

At the same time, our findings suggest that there is not one successful BM, in term of a set of activities which a firm performs (Afuah, 2003), that fits all these different production organizations, even if three key characteristics seem to be common denominators in defining robust competitive strategies: - positioning high range products, - offering an high variety of service and products, - pursuing internationalization.

However, it is interesting to note how for a firm that adopts a successful BM, this does not necessarily imply to excel in all the three characteristics. Instead, our study reveals that it is necessary to have a strategy that consistently combines the three factors. And the successful combinations are multiple.

As for finishing, most of the surveyed firms (614 out 818, 75% of the total) pursue robust BMs, and are able to achieve good performance. Given the general crisis that has affected the Italian TA industry in the last decade, it can be useful to recall how finishing activities are still decisive in adding most of the final value within the TA supply chain. This can explain why successful BMs include the most structured and largest firms within the sample (on average 13 and 20 employees) that work as subcontractors of larger industrial customers. Being a subcontractor and having established supply relationship with international industrial customers work for small firms as a driver for continuous benchmarking and consequent improvement.

On the contrary, running one's own business, even if highly specialized in some specific activities or production phases, seems to offer only marginal growth or niche positioning in the finishing industry.

As for the clothing industry, findings of our study point out some characteristics of the successful BMs. In particular, being a specialist (i.e. offering a specialized production or a specialized range of products) is a common denominator of all the six successful BMs. However, this is a necessary, but not sufficient condition, as the declining BM "Phase specialists that supply industrial customers" exemplifies. They are specialized, but just in one/two phases of the production process, and their activities are neither innovative nor high quality. Moreover they depend on just one main national – local in most cases – customer.

Indeed, in the clothing industry, being market oriented and having a secure final market access and/or retail penetration are fundamental features that characterize supply chain strategies of all the successful BMs.

The study also offers several insights on how to conduct industry studies that are both academically rigorous and practically relevant.

From the theoretical standpoint, the joint application of MCA and cluster analysis allow to identify and validate bundles of choices, or configuration of activities (we called them, business models) that effectively summarize what strategies work in the new global environment. The "successful" business models could be used by practitioners and policy makers as a sort of benchmark against which strategies could be developed.

The concept of business model is not contingent on product types or on market niches, and captures the essence of how firms are organized and what structural choices they made. From this standpoint, we believe that the methodology we propose is more informative and robust, since it does not merely reflect market trends and tendencies.

The use of MCA, instead of principal component analysis, improves the quality of the findings and allows to eliminate potential distortions due to the data source (the data are collected for tax purposes by the Italian Ministry of Economy and we observed some. excess of variation for certain variables; PCA would have been impacted by data quality more than MCA).

There are two "natural developments of our analysis. The first would be to render the analysis dynamic using panel data for a time series and showing the dynamics that the static, cross-section analysis presented in this paper was not able to offer. The second would be to run discriminant analysis on the data fully developing the predicting value of the methodology.

From a strategic management standpoint, our findings are aligned with those of the literature about strategic innovation in mature industries and about dematuring low-tech industries. Our data suggests that finding new strategic positions is not an impossible mission for companies operating in such mature industries as TA. Small firms do not necessarily have to accept thinning margins while customers move production around the world relentlessly, seeking for ever lower cost sourcing. In the end, we believe that courageous entrepreneurs can still grow business successfully in the TA industry and that small TA firms are not doomed to death, but can carve out their own strategy to survive and thrive.

Our findings also provide some guidance to policy makers. Industrial policy tools, including incentives to investment, tax breaks and direct support should be targeted to the help firms stuck with declining business models move towards different strategies and configuration of activities. This help should be provided within a well-defined time-frame and its renewal should be contingent on results in terms of business model change, the extent of which should be monitored over time.

On the other hand, industrial policy should support the "successful" business models with innovative tools, able to foster internationalization processes, product and process innovation, and the adoption of modern management systems. A good example of this support is provided by knowledge intensive business services (KIBSs). KIBSs are developmental agencies whose aim is to support small firms providing services in such fields as technological transfer, product and process innovation, quality control, improvement and certification of products and business systems, collective marketing and branding. KIBs operate as change agents within industrial districts, to the extent in which they function as cognitive interfaces between the local context and the wider competitive environment, blending the knowledge generated in the former with the knowledge circulating outside it (Camuffo and Grandinetti, 2006).

Our study could be replicated for other industries and in other Countries, and it should be particularly helpful for those emerging regions and Countries that believe in a more "distributed" and diffused model of economic development, with small firms playing a central role.

REFERENCES

Afuah, A., (2003), "*Business Models: A Strategic Management Approach"*, McGraw-Hill, New York.

Anderberg, M. R., (1973), "*Cluster Analysis for Applications"*, New York, Academic Press, Inc.

Belussi F. and Pozzana R., (1995), "*Natalità e Mortalità delle imprese e determinanti dell'imprenditorialità"*, F.Angeli, Milano.

Benzecri, J. P., (1992) "*Correspondence Analysis Handbook*", New York, Marcel Dekker.

Berger, S., (2006), "*How We Compete"*, Random House Inc.

Berger, S., Locke R., (2004), "Il caso italiano and globalization", in Faust, M., Voskamp, U., Wittke, V., (eds.), *European Industrial Restructuring in a Global Economy: Fragmentation and Relocation of Value Chains*, Goettingen, SOFI Berichte.

Camuffo, A., (2003), "Transforming Industrial Districts: Large Firms and Small Business Networks in the Italian Eyweware industry", *Industry and Innovation*, Vol. 10, n.4, p. 377-401.

Camuffo, A. Grandinetti, R. 2007, The nature of industrial districts: a knowledge based perspective, paper presented at the British Academy of Management Conference, Belfast, September 2006;

Camuffo, A., Furlan, A. and Grandinetti, R., (2007), "Knowledge and Capabilities in Subcontactors Evolution", in Susman, G., I. (eds.), "*Small and Medium Size Enterprises and the Global Economy"*, Edward Elgar Publishing, Northhampton, USA.

Camuffo, A., Furlan, A., Romano P. and Vinelli, A., (2008), "Breathing Shoes and Complementarities: Strategic Innovation in a Mature Industry", *International Journal of Innovation Management*, Vol. 12 (2)

Chesbrough, H., (2006), "*Open Business Models: How to Thrive in the New Innovation Landscape"* Harvard Business School Press Books.

Chesbrough, H., (2007), "Business model innovation: it's not just about technology anymore", *Strategy & Leadership*, 2007, Vol. 35 Issue 6, p12-17.

Comino, A., (20007), "A Dragon in Cheap Clothing: What Lessons can be Learned from the EU–China Textile Dispute?", *European Law Journal*, Vol. 13 Issue 6, p818-838.

Dunford, M., (2004), "The changing profile and map of the EU Textile and Clothing Industry", in Faust, M., Voskamp, U., Wittke, V., (eds.), *European Industrial Restructuring in a Global Economy: Fragmentation and Relocation of Value Chains*, Goettingen, SOFI, Berichte.

Dunford, M., (2006), "Industrial Districts, Magic Circles, and the Restructuring of the Italian Textiles and Clothing Chain", *Economic Geography*, Vol. 82 Issue 1, p27-59.

Gereffi, G., Humphrey, J., Sturgeon, T., (2005),"The governance of global value chains", *Review of International Political Economy*, Vol. 12 Issue 1, p78-104.

Gifi, A. (1990), "*Nonlinear Multivariate Analysis"*, 2d ed., New York, John Wiley & Sons, Inc.

Greenacre, M. J., (1993), "*Correspondence Analysis in Practice"*, London: Academic Press, Inc.

Guercini, S., (2004), "International competitive change and strategic behaviour of Italian textile-apparel firms", *Journal of Fashion Marketing & Management*, Vol. 8 Issue 3, p320-339.

Hartigan, J. A., (1975), "*Clustering Algorithms"*, New York: John Wiley & Sons, Inc.

Hedman, J. and Kalling, T., (2003), "The business model concept: theoretical underpinnings and empirical illustrations", *European Journal of Information Systems*, v.12 n.1, p.49-59.

Jacobides, M. G. and Billinger, S., (2006), "Designing the Boundaries of the Firm: From "Make, Buy, or Ally" to the Dynamic Benefits of Vertical Architecture", *Organization Science*, Vol. 17 Issue 2, p249-261.

Jacobides, M. G., (2006), "The architecture and design of organizational capabilities", *Industrial & Corporate Change*, Vol. 15 Issue 1, p151-171.

Ketchen, D. and Shook. C.L. (1996), "The Application of Cluster Analysis in Strategic Management Research: An Analysis and Critique", *Strategic Management Journal*, Vol. 17, pp. 441-458.

Malone, T. W., Weill, P., Lai, R. K., D'Urso, V. T., Herman, G., Apel , T. G. and Woerner, S., (2006), "Do Some Business Models Perform Better than Others?", *MIT Sloan Research Paper* No. 4615-06.

Miller, D., (1996), Configurations revisited, *Strategic Management Journal*, 17: 505–512.

Mills D.E., (1984), "Demand flexibility and endogenous firm flexibility", *Journal of Industrial Economics*, 28 pp.55-71.

Piore, M. J. and Sabel, C., F., (1984), "*The Second Industrial Divide: Possibilities for Prosperity"*, Basic Books, Inc .

Shafer, Scott M., Smith, H. Jeff and Linder, Jane C., (2005), "The power of business models", *Business Horizons*, Vol. 48 Issue 3, p199-207.

Siggelkow, N., (2001), "Change in the Presence of Fit: the Rise, the Fall, and the Renaissance of Liz Calborne", *Academy of Management Journal*, 44: 838-857.

Taplin, I. M, and Winterton, J., (2004), "The European clothing industry: Meeting the competitive challenge", *Journal of Fashion Marketing & Management*, Vol. 8 Issue 3, p256-261.