
Factors Affecting the Innovation Process in the Cypriot Food and Beverage Industry

By
Efstathiades A^{‡*}, Boustras G^{†‡}, Bratskas R[†], Michaelides A[†]

Abstract:

The Food and Beverage industry, a leading sector of the Cypriot manufacturing industry is under investigation in our study. The influence of innovation as a development vehicle is considered and factors affecting it have been investigated. In order to define and introduce these factors affecting innovation in the Cypriot manufacturing sector a nationwide survey is carried out. All five prefectures (Nicosia, Ammochostos, Limasol, Larnaca and Paphos) are covered and a sample of 5% of the whole Food and Beverage sector is surveyed. A closed questionnaire, made of five sections is used in order to collect information that will be used in a second stage in order to introduce the innovation factors affecting industrial development.

The results illustrate the gradual adoption of a pro-innovation culture in the Cypriot Food and Beverage Industry. Among others it was shown, that companies that have proceeded with product innovation, process innovation and organizational innovation have experienced the impact of innovation on their organizational performance.

Keywords: Innovation, Factor analysis, Total Quality Management

JEL Classification: M11, M21, M31

1. Introduction

Innovation itself is very broad concept and, as a result, various classifications of innovation have been developed and applied in the literature. Most researchers have focused on technology-related innovations, such as the introduction of products that require radical changes in the production process. The concept of innovation however can be seen extending far beyond radical and technology-based product innovation.

The European Union's Green Paper on Innovation, suggests that there are three forms of innovation – product, process and organization. Innovation is:

- a) the renewal and enlargement of the range of products and services and the associated markets,

^{‡*}European University Cyprus, 6, Diogenes Str., Engomi, 2404 Nicosia, Cyprus

[†]RTD Talos Ltd, PO Box 21722, 1512 Nicosia, Cyprus

- b) the establishment of new methods of production, supply and distribution and
- c) the introduction of changes in management, work organization and the working conditions and skills of the workforce.

Organizational innovation deals with changes in marketing, purchases and sales, administration, management and staff policy. Organizational innovation has gained importance in all manufacturing sectors and especially in the Food and beverage sector through the implementation of ISO 9000 and other health and safety and quality standards. (Varzakas and Jukes, 1997; Boudouropoulos and Arvanitoyiannis, 2000; Hoogland et al., 1998).

Innovative organizations embrace innovation by constantly introducing change. Innovations include:

- New work structures (teams, networks, outsourcing, creating value webs new work procedures).
- Advanced technology, new manufacturing methods, information technology, quality management and process cycle time, human resource management strategies to ensure strategic fit with the business goals and inject flexibility, constant training, recruiting the best talent and rewarding employees creating a work environment to spur innovation.
- Encourage risk taking behaviours and valuing experimentation (Terziovski 2002).

Researchers and managers have tried various approaches to clarifying the relationship between organizational characteristics and the adoption of innovation in the face of multiple dimensions of innovation.

Hitt et al, (1996) combined the acquisition of process innovations with the adoption of product innovations and market innovations into a single variable termed external innovation. When using his approach they did not find significant relationship between firm size and the adoption of external innovation. Others (Rothwell, 1983) have found a significant relationship between firm size and product innovation, and others (Cohn and Turyn, 1980) between firm size and process innovation.

Terziovski (2002) presenting the results of a major study commissioned by the Australian manufacturing Council (1995) mentions on the basis of a 1,300 response data base, that continues improvement and innovation management have a positive impact on the business performance of individual firms.

Francisco et al (2003) in their study regarding the possible relationship between perceptions of quality and innovation environments at Bank branches (80 bank offices) presents the relationship between TQM approaches and Innovation.

Customer orientation is found to be a stimulus for innovation in the organization, provides a clear orientation to innovation, as it links innovation to customer needs, while continues improvement promotes change, innovation and creativity, as it reflects on how the work is organized and managed. On the other hand customer orientation may prevent organizations from undertaking radical innovations while overemphasis on efficiency of continues improvement may ultimately minimize and even remove availability of the resources required for innovation.

Empowerment makes people feel that they have a certain degree of autonomy, which make their work more innovating. Teamwork is one of the most effective communication channels, and communication is one of the main determinants for innovation within organizations. On the other hand the cultural trend to teamwork is detrimental to radical innovation and inventions.

Tucker (2001) put forward four essential principles of managing innovation in the new century as follows:

Principle 1. A company's approach to innovation must be comprehensive. It must permeate the entire company, and it must encompass new products, new services, new processes, new strategies, new business models, and the pursuit of new markets.

Principle 2. Innovation must include an organized, systematic, and continual search for new opportunities. At firms that make innovation a core competence, specific systems and practices are in place that promotes a deeper understanding of social, demographic, and technological change.

Principle 3. Organizations must involve everyone in the innovation process. Today, the vast majority of organizations don't pay their people to innovate. In fact they don't even expect them to think.

Principle 4. A company must work constantly on improving its climate for innovation. The organization with a favourable climate for innovation is one that provides the context for people to collaborate in groups, teams, divisions, and departments without boundaries or fear.

A framework proposed by Neely et al (2001) suggest that the firm's capacity to innovate and innovation itself do not depend upon a company's resources and internal environment, but also on external facilitating factors (business support agencies, public grants, active local business networks etc) which tend to be different in different contexts. In detail the proposed framework is based on the following assumptions:

1. A firm possesses an inherent capacity to innovate, which is embedded in the firm's culture, internal processes and capabilities to understand the external environment.
2. The capacity to innovate of firm affects the innovativeness of the firm in terms of product and process innovation, and also organizational innovation.
3. Even if a firm is highly innovative, it has to exploit its innovations in terms of outcomes – i.e. use them to reduce costs and/or to offer products or services to its customers. This is a condition to gain better business performance, such as market share and financial performance.

The external contextual environment can influence both the firm's capacity to innovate and the innovation itself. On the other hand the following factors are identified as factors inhibiting innovation:

- Innovation is poorly defined because customer requirements are not well understood and therefore the goals are not established properly. This is often because some organizations tend to be internally focused and innovating activity is weighted in terms of economic returns and short-term goals such as profit improvement targets.
- Culture is too inhibitive and as such does not foster innovation as an ongoing activity. Employees are not fully aware of the need to be proactive and innovate, and not necessarily encouraged and motivated to perform using their creative potential. There is lack of involvement, absence of team work, and the thinking that innovation is a management responsibility
- Organizational factors such as attitudes of doing more of the same, rewarding the status quo, poor resource allocation and utilization.

Innovation has always been at the centrepiece of competitiveness. Competitiveness comes from innovative minds. The lesson is clear. To remain on top you have to produce the consumer products people want. You have to find and convert new innovations into producible goods. You have to continually try to develop useful applications from what many would consider useless by-products.

A company embarks on innovation projects in order to improve its position in the competitive arena. The competitive success can be measured in terms of improvements in different business performance, such as R.O.I, market share and so on (Porter, 1985).

There are cases in which innovation does not lead to positive effects on business performance. It is not sufficient to introduce the innovation, but in order to gain better business performance, the innovation has to produce effective outcomes (Gunn, 1987; Womack et al., 1990).

These can be obtained by leveraging technological innovation, information and communication technology, and organizational changes. (Schomberger, 1986; Flynn et al., 1996).

According to Efstathiades et al., (2002) technology can only contribute to a competitive success if it is integrated into organizations' business strategies and practices. A model proposed by Neely et al., (2001) uses five constructs relating innovation performance and innovation practices as follows: business performance, outcomes of innovation, innovation, capacity to innovate and external contextual environment.

The dimensions of company performance that can be influenced by the outcomes of innovation are:

- Return on Investment
- Market share
- Competitive position versus direct competitors
- Value to customers (the extent to which product and services are seen by customers as value for money).

The external contextual environment includes exogenous factors, which mainly depend on public policies and infrastructure and impact on both the firm's capacity to innovate and innovation itself. The external factors that impact on the firm's capacity to innovate are: active local business networks, helping in finding R&D partners, contact with universities, business support agencies, access to tech- scientific interpreter and access to science base. On the other hand, the external contextual factors that impact on innovation are: the cost of money and its evolution, government and public loans and grants, presence of venture capitalists, funding from banks and presence of an economic environment that encourages innovation.

2. Methodology

Innovation and the ability of Cypriot SMEs to adapt to new entrepreneurial challenges is the central theme of a larger project the research team is currently running. As mentioned above the aim of this study is to identify and introduce a list of factors affecting innovation in Cyprus. The chosen method to collect information was decided to be that of a closed questionnaire and a carefully selected sample of food and beverage manufacturing companies in Cyprus was chosen for the purposes of this study.

The first section concentrates on collecting general information used to categorise the companies. The second section focuses on the degree to which companies have introduced innovation to their processes, products and internal training. The third section maps the external relation of the companies with innovation providers and trend setters by assigning values to parameters affecting their processes and personnel. The fourth section maps the factors delaying the introduction of innovation in processes, products and internal training by measuring the economic, entrepreneurial and other reasons affecting it. Finally the fifth section investigates the relation of innovation (if any) to industrial and entrepreneurial development.

As a part of a larger survey carried out in Cyprus, data collected so far is presented on this paper. The survey has taken place and results have been received and analyzed. The survey is a part of larger project dealing with innovation in the Cyprus Food and Beverage Industry and it is funded by the Cyprus Research Promotion Foundation.

3. Research Aim and Objectives

The aim of this paper is to investigate the degree of innovation in the Cyprus manufacturing industry and to examine how these expectations are formed and how their achievement is assessed. In detail the objectives of this paper are:

- To examine the extend of innovation level in the Cyprus Food and Beverage Industry
- To identify the main factors that determine the decision of companies to adopt or not innovation strategies
- To investigate the main inhibitors of the innovation process
- To examine the innovation implementation process with emphasis to the extent of the application of strategic management activities/practices leading to innovation Performance
- To identify the impact of the innovation Process at the organizational Performance
- To identify specific organisational factors (through factor analysis) that fosters the innovation process.

4. Sample Characteristics

The size of the sample includes 50 Cypriot manufacturing enterprises (~5% of the total size of manufacturing enterprises, in the Food and Beverage sector in Cyprus). The survey took place using a questionnaire which is constituted by short and explicit questions which allow the export of as much qualitative as quantitative outcomes for the level of growth of innovation in the Cypriot manufacturing enterprises.

At a next stage the survey data were coded and logged in SPSS to allow for statistical experimentation. Advanced statistical techniques such as factor analysis are used to analyze critically the questionnaire output and derive at empirical models.

The geographic representation and the employment characteristics of the sample are shown in tables 1 and 2 below. Out of 50 enterprises, 19 of them reside in the Limasol, 14 of them in Nicosia, 12 in Larnaka and 5 in Paphos (Table 1). Employment in the 50 enterprises of sample, count up about 1596 workers which are approximately 2% of total of workforce occupied in the Manufacturing Industry in Cyprus (Statistical Service of Cyprus).

In this survey sample, 15 enterprises fall under the sector of Confectioneries-bakery, 4 enterprises in the sector of Dairy Products, 5 enterprises in the sector of Ready to cook and Frozen foods, 4 enterprises in the sector of Marketing of Food Products-Import and 2 enterprises in the Beverage Sector.

The turnover of these 50 enterprises is above 80 millions Cypriot pounds.

Table 1: Geographic Representation of the Sample Companies

	LIMASOL	NICOSIA	LARNAKA	PAPHOS	Total
Nr.	19	14	12	5	50

Table 2: Employment Characteristics of Sample Companies

Employment	Number of Enterprises	Number of Workers
1-25	33	432
26-50	10	344
51-75	3	170
76-100	2	195
100>	2	455
Total	50	1596

5. Analysis of Results

5.1. The innovation process

One of the objectives of this paper is to examine the extent of the level of innovation in the Cypriot Food and Beverage Industry. This is examined by close investigation of the levels of innovation as follows:

- (a) degree of product innovation,
- (b) degree of process innovation,
- (c) degree of organizational innovation
- (d) degree of management activities – practices leading to innovation performance.

Results relevant to the degree which Cypriot companies have introduced product innovation are shown in Table 3 below.

Results reveal that product innovation is used in a considerable extent in the Cypriot Manufacturing Industry (food and beverage sector).

Table 3: Degree of Product Innovation

	N	Mean	S.D
New or drastically improved product	50	7.33	2.557
Qualitative change of product	50	7.54	2.354
Substitution of outdated products	50	6.2	2.956
Expansion of produce outside the main frame of production	50	6.53	2.501
Development of environmentally friendly products	50	6.54	2.706

The most popular activities considered for product innovation were: “New Drastically Improved Product” as well as “Product Differentiation”. Important

steps were also made in “Product Expansion” and the “Development of Environmentally Friendly products”. Companies do proceed with Product innovation reflecting changes in the existing products and services produced.

The level of innovation introduced in the production process in the Cypriot Manufacturing Industry (foods and drinks) is illustrated in Table 4.

Table 4: Degree of Process Innovation

	N	Mean	S.D
New techniques and process of production	50	7.26	2.113
Integration of advanced technology	50	7.48	1.963
Introduction of IT	50	6.75	2.422
Process quality systems	50	7.91	1.86
New material and technical support processes	50	6.55	2.556
New methods of product delivery	50	7.36	2.207
New inflow distribution methods	50	6.71	2.074

New quality systems, technological upgrading, new methods of product delivery, new techniques and new processes of production were indicated as the most important process innovation outcome.

In terms of organizational innovation and the results presented in *Table 5* one can conclude the following. The top driver for organizational innovation was the improvement of staff’s skills with the improvement of suppliers’ performance coming second and the changes on organizational structure coming third. Interesting finding is that companies they did not consider organizational innovation towards reducing the staff that is not directly related with the Production Process.

Table 5: Degree of Organizational Innovation

	N	Mean	S.D
Organizational Changes	50	6.96	2.097
Advanced Management	50	6.58	2.2
Business Process Reengineering	50	6.02	2.554
Focus on Sales and Marketing	50	6.82	2.092
Improvement of staff’s skills	50	7.28	2.029
Improvement of suppliers performance	50	7.24	2.213
Reduction of staff not directly related with the production process	50	4.62	2.733

Management activities leading to innovation performance and results are presented in Table 6. These results reveal the high level of importance given to the strategic role of Top Management in identifying the direction, the right

distribution of roles and the active involvement in planning and evaluation of innovative processes.

Emphasis is given in the focusing and planning based on customer's needs, the introduction of appropriate processes of planning and control in their production line. An interesting paradox identified was the tendency of exterior orientation of the enterprises and their effective ability of building relations with all external points of contact –suppliers, distributors which come in contrast to the fact that connection with external know-how providers is not used in great extent.

Furthermore the internal environment is enforced by focusing (i) on the staff's contribution, team work, and clear identification of operational aims, (ii) on the degree of liberty to act and risk taking freedom given to staff to define and execute their duties and (iii) on seriously emphasizing on awards and rewards which is the way successes and failures are dealt with and are rewarded constructing an autonomous and flexible organizational structure.

Table 6: Degree of Management Activities – Practices Leading to Innovation Performance

	N	Mean	S.D
Connection with external know-how providers	50	4.7	3.245
Development in the basis of customers needs	50	7.35	2.143
Implementation of planning and monitoring processes	50	7.84	2.011
Effective use of advanced technology production equipment	50	7.37	2.294
Focus on customer's needs	50	8.11	1.946
Commitment to continuous staff development	50	6.98	2.529
Liberty to act and risk taking. The degree of freedom given to staff to define and execute their duties (freedom to experiment, to challenge and question the existing situation, the perception that innovation is part of their work, freedom to try and fail, the acceptance of mistakes, etc)	50	6.96	2.366
External Orientation. The degree to which the company is sensitive to customers and the external environment (adoption of the customers view about the company, effective building of relations with all external points of contact –suppliers, distributors-)	50	7.04	2.054
Awards and rewards. The way successes and failures are dealt with and are rewarded (appreciation of new ideas, attention and support of top management, respect of initial ideas, reward of efforts)	50	6.74	2.235
Organizational Structure: Autonomy and Flexibility. The degree to which structure allows for innovative actions (responsibility for decision making in a lower level, decentralised procedures, freedom of action,	50	6.76	2.347

anticipation for action, belief that staff can influence things, delegation, flexibility in decision making, red tape reduction)			
The strategic role of Top Management in identifying the direction, the right distribution of roles and the active involvement in the planning and evaluation of innovative processes	50	9.15	13.263
Focus on the staff's contribution, team work, and clear identification of operational aims, available to all staff	50	7.17	2.274
The belief that innovation is a never ending process and the quest for bringing the enterprise to the top of its kind	50	7.46	2.465

5.2. Factors inhibiting the innovation process

The main inhibitors of the innovation process in the Cypriot Manufacturing Industry (sector of foods and drinks) are measured by examination of:

- Economic inhibitors parameters
- Organizational inhibitors parameters
- Other inhibitors parameters (other)

are shown in *Tables 7, 8, 9.*

Table 7: Economic Inhibitor Parameters

	N	Mean	S.D
Identification of high risk	50	6.2	2.4
Too costly	50	7.43	2.007
Non existence of funding sources	50	6.39	2.49
Long period of depreciation	50	6.59	2.207

As to the factors hindering the innovation process related to economic inhibitors, results coming from *Table 7* suggest that the excessively high cost and the long period of depreciation were the most important inhibiting factors, followed by the non existence and the lack of suitable funding sources and the high risk that surrounds the innovation process.

There is lack of involvement, absence of team work, and the perception that innovation is a management responsibility. In a great extent the same result came out from this study (as shown in *Table 8*), where the absence of skilled staff and the inadequate innovation capacity were the most important inhibitors. Also the absence of co-operation opportunities and team work and the insufficient information/knowledge on market reflect the inhibiting role of the internally focused factor of these enterprises. Previous research suggests that the factor of culture is a very important inhibiting factor and as such does not foster innovation as an ongoing activity. Employees are not fully aware of the need to be proactive

and innovative, and not necessarily encouraged and motivated to perform using their creative potential. Zairi.M., (1995).

Table 8: Organizational Inhibitor Parameters

	N	Mean	S.D
Inadequate innovation capacity	50	5.98	2.696
Absence of skilled staff	50	6.15	2.724
Insufficient knowledge on high tech issues	50	5.41	2.344
Insufficient knowledge of the market	50	4.98	2.427
Absence of innovation cost monitoring	50	5.47	2.519
Internal resistance to change	50	4.8	2.539
Insufficient third party services	50	5.09	2.698
Absence of co-operation opportunities	50	5.46	2.73

Other factors delaying the introduction of innovation are illustrated in Table 9. Based on the mean value of those parameters, legislation, norms, regulations, standards and taxation proved to be the most obstructing parameters, followed by the absence of opportunities for the development of new technologies and low customer response to the new products and processes.

Table 9: Inhibitor Parameters

	N	Mean	S.D
Absence of opportunities for the development of new technology	50	5.28	2.57
Absence of infrastructure	50	5.13	2.482
No need for innovation, because of previously introduced innovations	50	4.54	2.553
Deficiencies of IPR legislation	50	5.04	2.875
Legislation, norms, standards, taxation	50	5.72	1.946
Low customer response to the new products and processes	50	5.17	2.541

6. Innovation and Organizational Performance

One of the main objectives of the study is to examine the impact of innovative activities on organizational performance. The results in Table 10 reveal that delivery times, the ability of the companies to satisfy customer needs are highly impacted and are important outcome of the company’s innovative activities.

Table 10: Innovation and Organizational Performance

	N	Mean	S.D
Market share maintenance	50	7.22	2.149
Market share increase	50	7.17	2.274
Entry to new markets or new target-groups	50	6.35	2.806
Price	50	6.89	1.945
Quality consistency	50	7.78	2.299
Absolute quality	50	7.22	2.513
Production volume flexibility	50	7.63	2.122
Customer need satisfaction flexibility	50	7.83	2.204
Ability to deliver inside the promised time	50	8	2.355
Return on investment (R.O.I)	50	5.9	2.332
Decrease of labour cost per product unit	50	5.71	2.361
Decrease of material - energy cost per product unit	50	5.89	2.238
Decrease of environmental consequences or improved personnel H&S	50	6.76	2.207
Decrease of customer response time	50	6.89	2.56
Improved personnel satisfaction	50	7.36	2.024
Decreased personnel turnover	50	6.45	2.357

“Volume Flexibility” and “Quality” as the winning criteria are proven to be influenced also positively. Most of the companies managed to maintain their market share, while some of them managed to increase it.

In conclusion, it is obvious that innovation has a positive impact on “satisfaction of customer needs” and “quality consistency” closely followed by “market share increase”, “the decrease of environmental consequences or improved personnel H&S”, “the reduction employee’s turnover”, “the entry to new markets or new target-groups”.

7. Identification of Management Factors-Factor Analysis

The sample of the companies under investigation was subjected to statistical analysis, aiming to modelling the innovation indicators and the identification of specific organizational factors that foster the innovation process in Cyprus by empirical means.

The first step of this modelling process entailed the analysis of the survey data by the means of factor analysis aiming to the development of a dimensional structure. The rationale of this methodological decision is twofold. First, a

dimensional structure of innovation indicators was developed for the F&B industry of Cyprus, and secondly, the extracted dimensions were treated as independent variables at the subsequent stages of the modelling process.

By examining the factor analysis results the factors that were extracted are tabulated in tables 12,13,14,15:

1. Factor 1: Level of existence of Strategic Management Practices and Decisions
2. Factor 2: Level of Operational relations, Company strategy and capacity utilisation related to final goals
3. Factor 3: Level of Organizational reaction to exterior environment influence
4. Factor 4: Level of Organizational and Structural orientation
5. Factor 5: Level of the dynamism of internal structure and the capability of the production process.

Similar work is done by Avlonitis et al (1994) indicating the fundamental dimensions of organizational innovativeness being:

- (a) The technological innovation challenges
- (b) The manifested strategic innovation intentions
- (c) The product innovativeness
- (d) The innovativeness of core machinery and
- (e) Innovative leadership

The above five-factor solution, account for 72.69% of the total variance, with 49.50%, 9.30%, and 5.10%. 4.72% and 3.67% of the variance accounted by each factor respectively. The percentage of variance is shown in Table 11.

Table 11: Eigenvalues and Variance Explained by Survey Data

Factor	Eigenvalue	Percentage of Variance (%)	Cumulative Percentage
1	27.441	49.502	49.894
2	5.118	9.306	59.200
3	2.806	5.101	64.301
4	2.596	4.720	69.021
5	2.020	3.673	72.694

The extracted factor solution can be considered as satisfactory. As Hair et al., (1998) suggested, in social sciences that percentages around 60% of the total variance are considered as satisfactory.

As has been previously discussed the “Level of existence of Strategic Management Practices and Decisions” is considered as a major factor to the innovative effort of the companies account for 49.5% of the variance.

This Strategic Management effort is focused on planning out and implementing the enterprise’s strategy, which is a plan of implementation of innovation. Basic duties like (a) the definition of the mission of the enterprise, (b) the aim to include in the enterprise’s mission concrete innovative objectives with

effective and efficient concretisation and (c) the continuous evaluation of the implementation of the innovative process are shown to have serious prestige in Supplementary Managerial activities.

This is achieved by: (a) emphasizing on the provision of systems for effective management of the activity of innovation, (b) through an effective utilisation of all personnel's skills that is in their disposal, (c) using the most modern tools and techniques guided always by a detailed knowledge of customer's needs and finally (d) with the contribution of all departments of enterprise.

Moreover importance is given on the contribution of personnel, the provision of the requested training, so as to develop new ideas and having in place a system that recognize and remunerate the achieved goals.

This study showed also that Strategic Management of Enterprises has acquired big importance lately in Cyprus because a lot of enterprises have focused on their growth and in the invasion and take-over of new markets.

Table12: Factor 1. Level of Existence of Strategic Management Practices and Decisions

Rotated Component Matrix (a)	Component (1)
G48- The importance given to systems for the effective management of innovation: Systems are important for the correct aiming and production management.	<u>.911</u>
G46- Management of activities is not left on individuals but it is guided through the constructive involvement of all departments of the company.	<u>.899</u>
G45- The effective use of all the staff's skills available.	<u>.894</u>
G44- Management of activities driven by the thorough understanding of the customers needs the existence of good practises and the nature of the company's aims.	<u>.880</u>
G47- The use of modern innovation management tools and techniques.	<u>.878</u>
G51- The technical capacity and ability as well as the right management of innovative programmes in order to facilitate the delivery to customers.	<u>.862</u>
G54- Focus on the staff's contribution, team work, and clear identification of operational aims, available to all staff.	<u>.861</u>
G55- The belief that innovation is a never ending process and the quest for bringing the enterprise to the top of its kind.	<u>.851</u>
G49- The existence of identification mechanisms and deduction obstacles, giving the opportunity to programme leaders / teams / managers to carry on with their work.	<u>.843</u>

G39- Existence of innovation as a voluntary activity especially where there is a stable belief that innovation is important for the enterprise's competition.	<u>.841</u>
G34- Time for innovative actions and personal development. The time and space given to employees to develop new ideas and abilities and the way that new ideas are adopted and implemented (capital, budget, time, chances, tools infrastructure, personal development, etc).	<u>.838</u>
G31- Myths and Legends. The degree to which success stories are acknowledged and rewarded (symbolic action, dissemination of success stories).	<u>.831</u>
G52- The management of innovation activity for the on-time completion together with the careful choice of the types of action that companies tends to get involved.	<u>.828</u>
G38- Development of the innovation process as an integral part of corporate strategy.	<u>.827</u>

The second factor that emerged from the variables that strengthen innovation is the “Level of Operational relations, Company strategy and capacity utilisation related to final goals” that accounts for 9.3% of the variance (*Table 13*).

The company strategy and organizational capacity utilisation is focused on (a) the qualitative control practices, (b) the continuous requirement for effective and qualitative work, (c) the right administration of enterprise (Dynamic and open minded company management) and finally (d) the provision of good after – sales customer support.

Also the operational relations as part of the company's strategy are concerned with: (a) the building of right links and relations with the customers, (b) the degree of attendance of employees in the daily processes and their degree of involvement in the innovation process, (c) the degree of staff involvement in the everyday processes to the extent needed and the recruitment of the right associates. These factors are interconnected and correlated having as a result a more organised structure of enterprises concerned with the productive and innovative process and aiming at innovation as final product.

Finally, importance is given to the freedom of action and risk taking given to the staff in the determination and the execution of their duties (the freedom to experiment with new ways of production/service).

Table 13: Factor 2. Level of Operational Relations, Company Strategy and Capacity Utilisation Related to Final Goals

Rotated Component Matrix(a)	Component 2
G12- Implementation of quality control practises.	<u>.879</u>
G11- Identification and quest for quality work.	<u>.827</u>
G22- Dynamic and open minded company management.	<u>.778</u>

G8- Implementation of planning and monitoring processes.	<u>.769</u>
G18- Provision of good after – sales customer support.	<u>.755</u>
G16- Focus on building effective customer relations.	<u>.751</u>
G50- The importance of being proactive and have the ability to realise real customer needs.	<u>.719</u>
G25- Challenge and Commitment to action: the degree of staff involvement in the everyday processes to the extent needed (focus on results, attention to detail, alertness to delivery times, attention to project completion, appreciation of hard work, red-tape reduction).	<u>.630</u>
G10- Periodical and constant evaluation of all innovation processes.	<u>.630</u>
G26- Liberty to act and risk taking. The degree of freedom given to staff to define and execute their duties (freedom to experiment, to challenge and question the existing situation, the perception that innovation is part of their work, freedom to try and fail, expectance that innovation is part of their work, freedom to try and fail, the acceptance of mistakes, etc).	<u>.537</u>
G32- Leadership. The degree to which the management team illustrates its commitment to action and leads by example (commitment of top management, implementation of the company's mission statement).	<u>.528</u>
G21- Recruitment of the right associates (product champions, technological gatekeepers etc).	<u>.518</u>

The third factor selected by the total of variables connected to innovation is: “Level of Organizational reaction to exterior environment influence” accounting for 5.1% of the variance (*Table 14*).

Thus, (a) the willingness for acceptance and adoption of exterior ideas, (b) connection with external know-how providers, (c) the internal and external communication with the adoption of new communication channels and (d) involvement of all departments in the introduction of innovation from the very first stages are connected to the company's competitiveness. This in turn has to do with how the exterior environment affects the company.

Table 14: Factor 3. Level of Organizational Reaction to Exterior Environment Influence

Rotated Component Matrix(a)	Component 3
G3- Willingness for the adoption of external “ideas”.	<u>.662</u>
G1- Connection with external know-how providers.	<u>.661</u>
G5- Structural integration of innovation in the company departments.	<u>.660</u>

G2- Internal and External communication with the adoption of new communication channels.	<u>.639</u>
G4- Handling of innovation as a corporate goal.	<u>.551</u>
G6- Involvement of all departments in the introduction of innovation from the very first stages.	<u>.520</u>

Which are the management tools used by an enterprise, her policy responding to the variability of the interior and exterior environment and the means used in order to reach their goals through the innovation process, is explained by the fourth factor “Level of Organizational and Structural orientation” below (Table 15).

Organizational and Structural orientation is focused on the development of market oriented policies, the exterior orientation and the sensitiveness to the customers’ needs, provision of customer training and the effective utilisation of advanced technologically production equipment.

In their effort to become more competitive companies focus on the degree to which interaction between departments and processes is encouraged and facilitated (staff movement between different departments, team work, effective management of interaction, flexibility to work) as well as the ability in the attracting of talent managers and researchers.

Table 15: Factor 4. Level of Organizational and Structural Orientation

Rotated Component Matrix(a)	Component 4
G14- Development of market oriented policies.	<u>.785</u>
G28- External Orientation. The degree to which the company is sensitive to customers and the external environment (adoption of the customers view about the company, effective building of relations with all external points of contact –suppliers, distributors).	<u>.638</u>
G19- Provision of customer training.	<u>.535</u>
G13- Effective use of advanced technology production equipment.	<u>.496</u>
G30- Structural interaction and. The degree to which interaction between departments and processes is encouraged and facilitated (staff movement between different departments, team work, effective management of interaction, flexibility to work).	<u>.398</u>
G23- Ability to attract talented researchers and managers.	<u>.244</u>

Factor 5: “Level of the dynamism of internal structure and the capability of the production process” accounts for 3.7% of the variance and puts a label on how strong are the relations between the departments in an enterprise, the

resistance of the structure of enterprises, what way they try to maintain their market share and increase their enterprise dynamism through innovation process.

The ability in attracting talented and gifted managers and researchers is important, involvement of users / customers in the design and implementation of products and the focus in the needs of customers are given serious importance and make the fifth factor.

Finally, the commitment for the training and development of staff, the existence of an inclusive type of Management with open access to decision making, play an important role in the dynamism of the base of the structure of enterprises.

Table 16: Factor 5. Level of the Dynamism of Internal Structure and the Capability of the Production Process

Rotated Component Matrix(a)	Component 5
G23- Ability to attract talented researchers and managers.	<u>.658</u>
G17- Involvement of users / customers in the design and implementation of products.	<u>.632</u>
G15- Focus on customer's needs.	<u>.522</u>
G24- Commitment to continuous staff development.	<u>.503</u>
G42- The existence of an inclusive type of Management with open access to decision making.	<u>.311</u>

8. Conclusions

A nationwide survey was carried out and some of the important findings are presented in this paper. Results of this study reveal that innovation is introduced in a considerable extent, but still there is lot to be done in the Cypriot Food and Beverage Industry. Results indicate that companies do not innovate in a rather balanced way. The most popular activities considered for product innovation were: "New Drastically Improved Product" as well as "Product Differentiation". Important steps were also made in "Product Expansion" and the "Development of Environmentally Friendly products". Companies do proceed with Product innovation reflecting changes in the existing products and services produced.

The top driver for organizational innovation was the improvement of staff's skills with the improvement of suppliers' performance coming second and the changes on organizational structure coming third. New quality systems, technological upgrading, new methods of product delivery, new techniques and new processes of production were indicated as the most important process innovation outcome.

The strategic role of directors is reflected on focus and planning based on customer's needs and the introduction of appropriate processes of planning and control. Additionally results illustrate that internal environment is enforced by

focusing (i) on the staff's contribution, team work, and clear identification of operational aims, (ii) on the degree of liberty to act and risk taking freedom given to staff to define and execute their duties and (iii) on seriously emphasizing on awards and rewards which is the way successes and failures are dealt with and are rewarded constructing an autonomous and flexible organizational structure.

As to the causes hindering innovation, excessively high cost, lack of specialized personnel, legislation and lack of opportunities for development of technology suggest that an internal focused enterprise may be the most important inhibiting factor. As to the causes hindering innovation process in the Cypriot Manufacturing Industry (sector of foods and beverage) are measured by examination of:

- Economic inhibitors parameters
- Organizational inhibitors parameters
- Other inhibitors parameters

As to the factors hindering the innovation process related to economic inhibitors the excessively high cost and the long period of depreciation were the most important inhibiting factors, followed by the non existence of suitable funding sources and the high risk surrounding innovation process.

The results of this study show the impact of innovative activities on organizational performance and especially on delivery times and the ability of the companies to satisfy customer needs. Results from the factor analysis identify five important factors contributing to the level of innovativeness of the firms to be:

- the level of existence of Strategic Management Practices and Decisions, the level of Operational relations,
- Company strategy and capacity utilisation related to final goals,
- the level of Organizational reaction exterior environment influence,
- the level of Organizational and Structural orientation,
- the level of the dynamism of internal structure and the capability of the production process.

References

- 1) Ahmed, P.K., (1998), "*Culture and Climate for Innovation*", European Journal of Innovation Management, Volume 1, No.1, p.p. 30-43.
- 2) Australian Manufacturing Council, (1995), *Leading the Way: A Study of Best Manufacturing Practices in Australia and New Zealand*, Melbourne, p.p. 59-63.
- 3) Avlonitis, George J; Kouremenos, Athanassios; Tzokas, Nicos (1994) "*Assessing the Innovativeness of Organizations and its Antecedents: Project Innovstrat*", European Journal of Marketing, Volume 28 No. 11.
- 4) Avermaete, T., Viaene, J., Morgan, E.J., Crawford, N., (2003), "*Determinants of Innovation in Small Food Firms*", European Journal of Innovation Management, Volume 6, No 1, p.p. 8-17.
- 5) Boudouropoulos,I.D., Arvanitoyannis, I.S., (2000), "*Potential and Perspectives for applications of environmental management system (EMS) and ISO 14000 to food industries*", Food Review International, Volume 16, No.2, p.p. 117-237.
- 6) Cohn, S.F., Turyn, R.M., (1980), "*The structure of the firm and the adoption of process Innovations*", IEEE Transactions on Engineering Management, Volume 27, p.p. 98-102.

- 7) Denon, D.K., (1999), "*Gaining competitiveness through innovation*", European Journal of Innovation Management, Volume 2, No.2, p.p. 82-85.
- 8) Efstathiades, A., Tassou, S., Antoniou, A., (2002) Strategic planning, transfer and Implementation of Advanced Manufacturing Technologies (AMT) Development of an integrated process plan, Pergamon.
- 9) Flynn, B.B., Sakakibara, S., Schroeder, R.G., (1996), "*The Interrelationship between JIT and TQM: practice and performance*", Academy of Management Journal, Volume 39.
- 10) Francisco, J.L.Montes., Moreno, A.R., Molina, L.M., (2003), "*An analysis of the relationship between quality and perceived innovation: The case of financial firms*", Industrial Management and Data Systems, Volume 103, No 8, p.p. 579-590.
- 11) Guun, T.G., (1987), Manufacturing for competitive advantage: Becoming a world class manufacturer, Ballinger, Cambridge, MA.
- 12) Hair, J., Anderson, R., Tatham, R., Black, W. (1998), Multivariate data analysis, 5th ed. Upper Saddle River: Prentice Hall.
- 13) Hitt, M.A., Hoskisson, R.E., Johnson, R.A., Moesel, D.D. (1996), "*A market for corporate control and firm innovation*", The Academy of Management Journal, Volume 39, p.p. 108-119.
- 14) Hoogland, J.P., Jellema, A., Jongen, W.M.F., (1998), Quality assurance systems, in Jongen, W., Meulenberg, M. (Eds), Innovation of Food Production Systems: Product Quality and Consumer Acceptance, Wageningen Pers, Wageningen, p.p.139-158.
- 15) Nelly, A., Filippini, R., Forza, Cipriano., Hii, Jasper., (2001), "*A framework for analyzing business performance, firm innovation and related contextual factors: Perceptions of managers and policy makers in two European regions*", Integrated Manufacturing Systems, Volume 12, No.2, p.p.114-124.
- 16) Porter, M.E., (1985), Competitive Advantage: Creating and sustaining superior Performance, The Free Press, New York, NY.
- 17) Rothwell, R. (1983), "*Innovation and firm size: A case for dynamic complimentarily; or, is small really so beautiful?*" Journal of General Management, Volume 8, p.p. 6-25.
- 18) Schonberger, R.J., (1986), World Class Manufacturing, The Free Press, New York, NY.
- 19) Terziovski, M., (2002), "*Achieving performance excellence through an integrated strategy of radical innovation and continuous improvement*", Measuring Business Excellence, Volume 6, No.2, p.p. 5-14.
- 20) Tucker, R.B., (2001), "*Innovation: The new core competency*", Strategy and Leadership, Volume 29, No.1, p.p. 11-14.
- 21) Utterback, T.M., (1994), Mastering the Dynamics of Innovation, Harvard Business School Press, Boston, MA.
- 22) Varzakas, T., Jukes, D.J, (1997), The Globalisation of Food Regulation and Market Quality: A study of the Greek food market, in Loader, R.J., Henson, S.J.
- 23) Traill, W.B. (Eds), Globalisation of the Food Industry: Policy implications, The University of Reading, Reading.
- 24) Womack, J.P., Jones, D.T., Ross, D. (1990), The machine that Changed the world, Rawson Associates, New York, NY.
- 25) Zairi, M., (1995), "*Benchmarking innovation best practice*", World class design to Manufacture, Volume 2, No.3, p.p. 33-40.