Adoption of Open Innovation Strategies among SMEs: A comparative study in Portugal and Turkey

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Abstract

The aim of this paper is to outline the situation of the Portuguese and the Turkish small and medium scale enterprises (SMEs) in the field of adopting various open innovation strategies. Through the research, the reader may get a bird sight view on the conditions of the decision-making process leading to the introduction of a open innovation among SMEs within the local context. In the aspect of adoption of strategies the Portuguese enterprises adopt collaboration with universities in higher proportion, while Turkish SMEs adopt collaboration with intermediaries in higher proportion, though in both countries, collaboration with other partners remain as the best chosen strategy. It has been concluded that enterprises of the same size in the surveyed countries consider similar factors before making a decision on introducing open innovation strategies in their business. Furthermore, it is expected that within a short time, an extended survey will be carried out in both countries, including one or two additional countries.

Keywords- SMEs, open innovation, open innovation strategies, collaboration, partnership.

Introduction

Open innovation is an emerging concept that has recently attracted a lot of attention, both in practice (among industries) and in academia (among researchers). One of the main reasons could be that the concept fits very well with many trends in the broader management arena. Moreover, many studies published over the past few years provide lots of useful insights, and many more studies are currently available on various search engines and archives. Since the early works of Chesbrough (2003) almost a decade ago, this field had gained a lot on the content, context and process of open innovation. Nonetheless, it has been observed that much more research is needed to learn about the insight of practical aspects of this concept. (3) (5)

Open innovation has been evolved as a powerful framework thus encompassing the generation, capture, and employment of intellectual property at the firm level (6), and in this aspect, in-sourcing of externally developed technologies seems crucial for innovativeness of a company (12). However, competitive advantage often comes from one aspect of open innovation, such as inbound open innovation, which is the practice of leveraging the discoveries of others, where companies need not to rely exclusively on their own R&D. On the other hand, another aspect of the open innovation, namely outbound open innovation suggests that rather than relying entirely on internal paths to market, firms can look for external organizations with business models that are better suited to commercialize a given technology. (1)

Thus, open innovation has become one of the catchy topics in innovation management. A generic search in Google Scholar on open innovation provides over 2.4 million hits, while Henry Chesbrough's 2003 book has gathered more than 6,000 citations in just ten years (Google Scholar, April 2013), and subsequently a wide range of disciplines, including economics, psychology, sociology, technology, and even cultural anthropology have shown interest in it. (2) Open innovation has so far been studied mainly in high-technology based, multinational enterprises. This exploratory paper investigates about the adotion pattern of open innovation strategies among the small- and medium-sized enterprises (SMEs) in Portugal and Turkey on a pilot basis. (4)

Background

Open innovation has been suggested as a new paradigm for the management of innovation (4), and has been treated both as a set of practices for value addition from innovation, and also a cognitive model for creating, interpreting and researching those practices. (8) Open innovation is such a concept that has recently attracted a lot of attention, among researchers and practitioners. One of the main reasons is that the concept fits very well with many trends in the broader arena of business management. In this respect, many studies has been published

over the past decade that provide lots of useful insights, and many more studies are contemporarily available. Since the early works and popularization of Chesbrough (2003) almost a decade ago, this line of research has gained a lot about the content, context and process of open innovation. However, it is felt that, much more research is needed. (3)

One one hand, the basic premise of open innovation is opening up the other dimensions of the innovation process. As mentioned earlier, the first process is known as in-bound open innovation and the second out-bound open innovation. Usually, open innovation is contrasted with closed innovation, believed to be its predecessor, where companies generate their own innovation ideas, and then develop, build, market, distribute, service, finance, and support them through internal applications on their own (2). These days some researchers argue that open innovation is no longer a source of competitive advantage, but has become a competitive necessity. At the same time, academic research on the concept of innovation is also flourishing. This open innovation research is dominated by case studies and success cases on how open innovation is implemented and organized within firms and survey studies or empirical studies on the adoption and performance implications of open innovation strategies. (5)

On the other hand, though much talk is going on around the contemporary research arena, but it has been observed that open innovation is not yeat a clear cut concept to all. Open innovation comes in many forms and norms, which adds to the richness of the concept but at the same time fills like hinders theory development. Therefore, it is necessary to develop at least a generic open innovation framework. Different sets of open innovation practices can be contrasted to develop matrices distinguishing various manifestations of open innovation. A first way of doing so is by recognizing that open innovation reflects much less a dichotomy (open versus closed) than a continuum with varying degrees of openness (increamental versus radical). Open innovation also encompasses various activities, such as inbound, outbound and coupled activities and each of these activities can be seen as more or less open. In this aspect, open innovation measurement scales should be able to reflect this multi-dimensional nature and allow the dimensions to be not (fully or at most partially) correlated. (2)

Open innovation shows the capability of firms to profitably access external sources of innovations and for the firms creating those external innovations to produce a business model in capturing the value for such innovations. Contrasted to the vertically integrated top down model, open innovation includes the use by firms of external sources of innovation and the competency of the firms to monetize their innovations without having to build the complete solution themselves (13). Open innovation, henceforth, describes innovation processes, in which the boundaries of the firm are not solid. Accordingly, companies boldly and increasingly interact with their environment, and this leads to large volumes of external technology acquisition and external technology exploitation (14)

However, as mentioned, lack of firm conceptual evidence, adequate framework, and sucess cases in real case scenario, especially for the SMEs, this research feels that a ground based survey could lead to clarify the contexual aspects, establish a generic framework and find out sucess cases around the locality. This study hence, intiate this survey study.

The Study

The purpose of this paper is to contribute to a more dynamic perspective on open innovation by conducting an exploratory survey and then preparing the descriptive analysis based on the survey findings on the adoption of various selected open innovation strategies. In order to do so, we rely on several comparable surveys that are being carried out periodically among several European countries under the 'Observatory of European SMEs' project by the DG Enterprise and Industry and coordinated by the Eurobarometer Team of the European Commission[i]. Analytical and technical reports of those surveys (2002, 2003, 2007[ii]) provide valuable insight about the SME community within the EU. However, we felt that to learn about the specific natures and contexts of SMEs at the ground reality that are related to open innovation, a separate form of survey may be carried out. This is the reason; we have conducted the survey, initially in Portugal and thereafter in Turkey. Efforts are going on to conduct similar surveys in India and Israel. The selection of the geographical region is not random, but selected, as surveys in those countries are being conducted through mutual contacts and colleagues of common interest without any sort of funding.

This study compares the results of two surveys in Portugal and Turkey about SMEs on entrepreneurship and innovation. The survey was originally prepared in English to be understood by all. Thereafter, it was translated into Portuguese for the Portuguese respondents and into Turkish for the Turkish respondents.

In Portugal, after obtaining a pre-selected list of 50 companies, they were approached through individual emails to respond to the survey placed at the Survey monkey. There were 12 responses from the Portuguese version of the link and out of 50, the response rate is 24% and this response rate can be accepted as an average response rate[iii].

In turkey, the survey was administered by using Internet-based system to 39 members of Bilecik Young Entrepreneurs Board in 2012, and 11 responses were obtained with a response rate of 28%. Thereafter, the results were compared with the Portuguese and Turkish companies' surveyed data.

Questionnaire consists of 10 questions. First three questions are about general characteristics of the business, two questions are about financial characteristics, one question is about human resources, three questions are about general constraints and last question is about innovation. A total of 23 businesses, 12 Portuguese and 11 Turkish participated to the survey.

Firstly, the general characteristics of the participant companies are shown in following tables (table-1 to table-3). Table-1 shows the types of companies, table-2 shows according to the number of employees, and table-3 shows the sector of industries the participants belong.

Table-1: Company types of the participants

	Portuguese	Turkish	Total
a nonprofit company: foundations, associations, semi-government	3	0	3
a subsidiary of another company	0	0	0
an independent company	8	11	19
Missing	1	0	1
Total	12	11	23

Note: The result signifies that most of the participants belong to independent companies.

Table-2: Number of Employees

	Portuguese	Turkish	Total
1-9 persons employed	1	6	7
10-49 persons employed	2	3	5
50-249 persons employed	3	1	4
250+ persons employed	5	1	6
Missing	1	0	1
Total	12	11	23

Note: Though the preselected list comprises of SMEs in Portugal (the list was made by random selection of companies from the web sites according to their generic characteristics), but while after looking into their data, it has been observed that majority of the surveyed companies in Portugal do not belong to the group of SMEs in terms of the number of employees. It is a surprising fact that many companies though they claim as they belong to the group of SMEs, but they do not, in respect of the number of employees, but, they may fall into the class of SMEs, when we look into their investment pattern. Hence, there rises a question of categorizing companies according to the number of employees, or by their investment pattern. However, in Turkey, as the list was taken from the members of the Bilecik Young Entreporeneurs, majority of them belong to the 1-9 persons employed group.

Table-3: The industry sectors of the participants

	Portuguese	Turkish	Total
Agriculture (growing of corps; farming of poultry, animal), hunting and forestry	0	1	1
Fishing	0	0	0
Mining and quarrying of energy or non-energy producing materials	0	1	1
Manufacturing (food products, beverages & tobacco; textile & textile products; apparel, leather & wood products; paper, publishing & printing; chemical & pharmaceutical products;	0	1	1

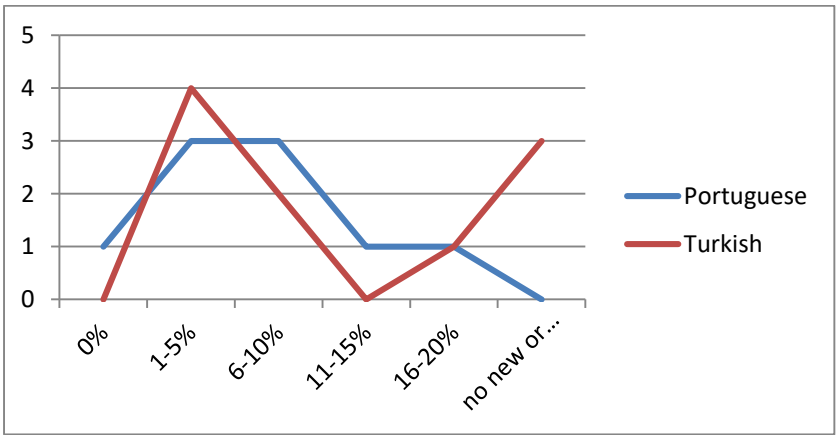
machinery & equipment)			
Electricity, gas and water supply	1	0	1
Construction	1	4	5
Wholesale and retail trade; repair of motor vehicle, motorcycles and personal and household goods	0	0	0
Hotels and restaurants	0	0	0
Transport (land, water, air, travel agencies), storage and communication (post & telecommunication)	0	0	0
Financial intermediation (banking, leasing, insurance, brokering)	0	2	2
Real estate, renting (machinery & equipment) and business activities (IT related; R&D; consultancy; Legal, accounting & auditing; other business activities)	1	0	1
Education	1	0	1
Health and social work	0	0	0
Other community, social and personal service activities	1	0	1
Other	4	2	6
Missing	3	0	3

Note: It has been observed that majority of the surveyed companies do not belong to this classification of NACE codes[iv]. Though we have used an old one, which was available during the questionnaire preparation time. The NACE code has been modified later on and it is expected that the extended survey will be carried out using the latest classification of the NACE code[v]. This is the reason that majority of the responding companies responded as they belong to the 'Other' category. While we looked into the details of the companies, we have found that they mostly belong to the sector of information technologies.

Table 4 and table 5 illustrate the investment pattern and turnover pattern respectively.

Table-4: Investment pattern of the surveyed firms

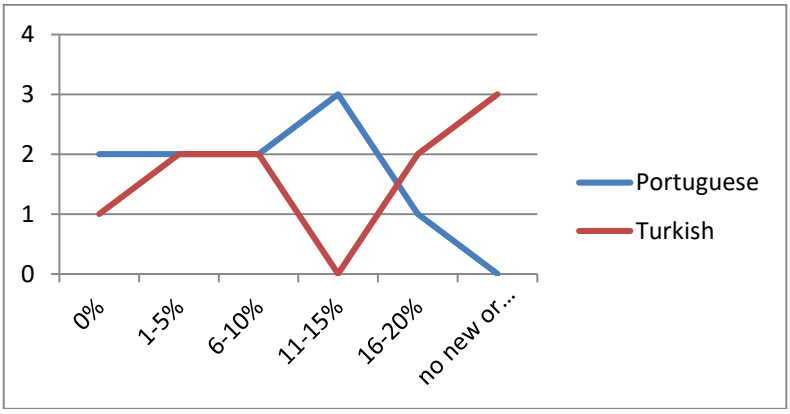
Percentage of investment	Portuguese	Turkish	Total
zero percent	1	0	1
between 1-5 percent	3	4	7
between 6-10 percent	3	2	5
between 11-15 percent	1	0	1
between 16-20 percent	1	1	2
no new or improved product	0	3	3
Missing	3	1	4



Note: In terms of investment for any new or innovative product, most of the participants invest less than 16 percent of their investment. Only one company in each country invests between 16-20 percent of their investment for any new or innovative product. Four Turkish companies and three Portuguese companies invest between 1-5 percent of their investment in terms of investment for any new or innovative product.

Table-5: Turnover pattern of the surveyed firms

Percentage of turnover (annual sales)	Portuguese	Turkish	Total
zero percent	2	1	3
between 1-5 percent	2	2	4
between 6-10 percent	2	2	4
between 11-15 percent	3	0	3
between 16-20 percent	1	2	3
no new or improved product	0	3	3
Missing	2	1	3



Note: 14 participants (9 Portuguese and 5 Turkish) reported that less than 16 percent of their annual sales coming from new or significantly improved products or services in the last two years. Three Turkish companies reported no new or improved product.

After looking into their investment and turnover patterns, we seek to find out their constraints. Human resource constraints are major factors among SMEs and table-6 shows the challenges they have found among their human resources.

Table-6: Human resources constraints in terms of recruitment

	Portuguese	Turkish	Total
Scarcity of skilled manpower	5	4	9
Scarcity of non-skilled manpower	0	0	0
Low image of the profession	2	2	4
Low image of the sector	0	2	2
Low image of the type of enterprise	0	1	1
Wage levels too expensive	4	2	6
Unpleasant work	1	1	2
Unpleasant working conditions	0	1	1
No problem with recruiting	1	4	5
Does not apply (for 1 person firms)	1	0	1
Missing	3	1	4

Note: According to the results of the current study, the main recruiting problem of the participant companies is the scarcity of skilled manpower. Even though four Portuguese companies reported "Wage levels too expensive" only two Turkish companies reported that. Wage levels are not considered as a recruiting problem for most of the Turkish participants. Four Turkish companies reported no problem with recruiting. It may be the

demographic characteristics of the countries and industry that may affect recruiting problems of companies. We understand that the Turkish population is much higher than Portuguese.

Part four of the questionnaire tried to measure the general constraints of open innovation among the SMEs using question numbers 7, 8, and 9 that are illustrated in tables 7, 8, and 9. Table-7 shows 14 types of responses about the general constraints incorporating human resources, managerial problems, administrative regulations, and other intellectual property issues; table-8 shows the main constraints in terms of open innovation activities, and table-9 illustrates a few specific parameters in relation to open innovation strategies.

Table-7: General Constraints in relation to general and intellectual property issues

General Constraints	Portuguese	Turkish	Total
Lack of market demand (Low purchasing power of customer)	3	5	8
Lack of skilled manpower	2	3	5
Too expensive manpower	1	2	3
Lack of quality management personnel	2	1	3
Problems with administrative regulations	1	4	5
Problems with infrastructure (e.g., electricity, gas, communication, etc.)	0	2	2
Problems with access to finance (other than interest rates)	3	4	7
Problems with copyright issues	0	*	0
Problems with licensing issues	0	*	0
High interest rates	1	4	5
Lack of knowledge in implementing new form of technology	0	0	0
Lack of knowledge in implementing new form of organization	0	0	0
Difficult to protect intellectual property	2	1	3
Did not have any open innovation plan	1	0	1
Other (please specify)	5	1	6
Missing			

(* - not included in the Turkish version of the survey)

Note: For Portuguese companies, general constraints of the participants are lack of market demand (3 companies) and problems with access to finance (other than interest rates). General constraints of participated Turkish companies are lack of market demand (5 companies), problems with administrative regulations, problems with access to finance (other than interest rates) and high interest rates. Lack of market demand and problems with access to finance can be considered as common constraints in both the countries. However, it seems that Turkish companies encounter more constraints than Portuguese companies in terms of general constraints.

Table-8: Policy Constraints in relation to financial and other administrative issues

Policy Constraints	Portuguese	Turkish	Total
High cost of open innovation	3	4	7
Lack of financing	3	4	7
High economic risk	1	5	6
Organizational rigidities	2	0	2
Government regulations	0	4	4
Lack of customers' responsiveness	1	1	2
Lack of knowledge to use new technology	0	0	0

Lack of information on market	1	0	1
Did not have any innovative plan	0	0	0
None of the above	1	1	2
Missing	5	1	6

Note: For participated Turkish companies, main constraints in terms of innovation activities are high cost of open innovation, lack of financing, high economic risk, and government regulations. And main constraints in terms of innovation activities for Portuguese companies are high cost of open innovation and lack of financing. The survey shows that the Turkish companies face more constraints than the Portuguese companies in terms of innovation activities. However, it also needs to be noted that 5 of the Portuguese companies did not respond to this question. This may happen due to lack of similar constraints that they are facing, or we failed to include exact constraints that they are facing in terms of policy constraints, or they do not like to share their constraints with outside world.

Table-9: Constraints in relation to competition

Factors related to competition	Portuguese	Turkish	Total
Increase quality of product/service	3	2	5
Increase product differentiation	5	3	8
Look for market niches (demand)	4	4	8
Increase marketing activity	1	6	7
Reduce costs of production	1	4	5
Forming strategic partnerships	3	3	6
Reduce prices (prices of products/services)	1	3	4
Increase working hours	0	2	2
Look for other foreign markets	3	4	7
Reduce production	0	2	2
Access to market of IP to reduce internal costs	1	*	1
Management of internal resources	1	*	1
Missing	5	1	6

(* - not included in the Turkish version of the survey)

Note: Portuguese prefer increasing product differentiation, while Turkish companies mainly prefer increasing marketing activity if competition becomes heavier and profit margin becomes lower in the market. In both countries they look for market niches, form strategic partnership, and look for other foreign markets to tackle the situation.

Table-10 shows the selected open innovation strategies that the surveyed firms have taken during the last two years, and this is extremely essential for the research. Learning about their adoption pattern, the next course of action will be taken and also the future survey will be modified, if necessitates. This table has 12 parameters.

Table-10: Open innovation strategies in terms of product, process or service or organizational innovation

Strategies	**Portuguese**	**Turkish**	**Total**
Joint Venture Capital	2	0	2
Collaboration with the University	5	1	6
Collaboration with other partners	6	6	12
Collaboration with an intermediary	2	3	5
Sale out Intellectual Property	0	2	2
Sale out Patent	0	1	1

Sale out Trademark	1	0	1
Sale out Copyright	0	0	0
Buy in Intellectual Property	0	0	0
Buy in Patent	0	0	0
Buy in Trademark	0	1	1
Buy in Copyright	1	0	1
Missing	5	1	6

Note: Common open innovation strategy among participated companies in each country is collaboration with other partners in terms of product, process or service or organizational innovation. Other main strategy among Portuguese companies is collaboration with the university, joint venture capital, and collaboration with an intermediary, while collaboration with an intermediary and sale out of intellectual property are predominant among the surveyed Turkish companies. In this question, also the skipped number of Portuguse companies is high (we need to talk with them in near future about this issue, as what could be the reason behind it.).

Future Recommendations

As a new way of conceptualizing innovation, open innovation loosen up many of the assumptions acknowledged in the Chandlerian model, both in the external supply of innovation to be incorporated into a firm's offering, as well as the potential demand that are coming outside of the firm for its internal innovation. However, this does not mean that any innovation model is viable, any more than the rise of the Internet meant that any e-strategy was profitable. Similar to the e-scenarios as many of them failed due to many reasons, open innovation models are not yet become conclusive in its current forms. Experimentation within the open innovation paradigm has the limitation or challenge in establishing a business model for creating or using an innovation, a constraint that may have been obscured by the cross-subsidies often seen with vertical integration of open innovation in a firm (8)

A future business model of open innovation is yet to be matured and may incorporate the following research (also practice) directions:

Trend of industry penetration: from pioneers or leaders to mainstream;
R&D intensity: from high-tech to low-tech;
Size: from large corporate or multinationals to SMEs;
Processes: from specific points to probe-and-learn;
Structure: from standalone to alliances, co-creation or collaboration;
Universities: from ivory towers to knowledge brokers or intermediaries;
Processes: from amateurs or individuals to professionals;
Content: from products or processes to services; and
Intellectual property: from being a protected good to a tradable good (Gassmann, Enkel and Chesbrough, 2010).

However, it has been observed that the field of open innovation is still at an early phase; it offers a wide field in which academics, practitioners and policy makers can be dynamically active. We join them with Gassmann, Enkel and Chesbrough (2010) to address these challenges and thereby fill these knowledge gaps and further develop the research field.

Conclusions

As a newly evolved concept, we found that open innovation has already attracted a lot of attention, both in the research and practice arenas. One of the main reasons could be the concept fits very easily with the diversified trends in the broader management arena. (2) The open innovation trend has developed from a small club of innovation practitioners, mostly active in the high-tech industries, to a widely discussed and implemented innovation practice area. (10) However, we feel that yet much more research is desired, especially among the SMEs in terms of adoption of open innovation strategies. Though the concept of open innovation has received a significant amount of coverage within the academic literature and outside. Much of this seems to have been without much critical investigation of the substantiation. (15) These call for initiation of this pilot survey(s) and thus an extended survey as soon as possible, at most by the mid of 2013.

So far what we have achieved can not be conclusive, however, we can deduct that there are cultural, economical and political differences exist among economies that control the broader areas of intervention in terms of adoption of open innovation strategies. At least this survey result till now points towards this deduction. Future surveyed data could result in making more specific conclusion and we are looking forward to that.

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[i] http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-observatory/
[ii] http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-observatory/#h2-3
[iii] http://www.utexas.edu/academic/ctl/assessment/iar/teaching/gather/method/survey-Response.php

Annex-1

Survey of SMEs to acquire knowledge on their current status of entrepreneurship and open innovation

Questionnaire

PART- A. General characteristics

(Nature and Sector of Business with the Company size)

1. How would you characterize your company? Is it …

a non profit company: foundations, associations, semi-government
a subsidiary of another company
an independent company

2. How many employees are being employed?

1-9 persons employed
10-49 persons employed
50-249 persons employed
250+ persons employed

3. Which sector your company belongs?

A Agriculture, hunting and forestry
B Fishing
C Mining and quarrying
D Manufacturing
E Electricity, gas and water supply
F Construction
G Wholesale and retail trade; repair of motor vehicle, motorcycles and personal and household goods
H Hotels and restaurants
I Transport, storage and communication
J Financial intermediation
K Real estate, renting and business activities
M Education
N Health and social work
O Other community, social and personal service activities
P Activities of households
Q Extra-territorial organization and bodies

PART-B. Financial Characteristics

(To learn about the investment pattern and turnover or annual sale of the surveyed companies)

4. In terms of investment for any new or innovative product (if you consider it will fall under the open innovation category), how much of your investment do you invest?

zero percent
between 1-5 percent
between 6-10 percent
between 11-15 percent
between 16-20 percent
no new or improved product

5. Could you please estimate the percent of turnover (annual sales) coming from new or significantly improved products or services (those you consider that falls under open innovation category) in the last two years?

Zero percent
Between 1-5 percent
Between 6-10 percent
Between 11-15 percent
Between 16-20 percent
No new or improved product

PART-C. Human Resources as an input to Open innovation

(Learn about the human resource problem in your company)

6. What is your main recruiting problem? (Click/select two most frequently faced difficulties)

Scarcity of skilled manpower
Scarcity of non-skilled manpower
Low image of the profession
Low image of the sector
Low image of the type of enterprise
Wage levels too expensive
Unpleasant work
Unpleasant working conditions
No problem with recruiting
Does not apply (for 1 person firms)

PART-D. General Constraints of Open innovation in an enterprise

(To learn about constraints related to managerial, policy, competition and open innovation issues)

7. Did your company encounter any of the following constraints in the last two years (General Constraints to Open Innovation)? (Select more than one)

Lack of market demand (Low purchasing power of customer)
Lack of skilled manpower
Too expensive manpower
Lack of quality management personnel
Problems with administrative regulations
Problems with infrastructure (e.g., electricity, gas, communication, etc.)
Problems with access to finance (other than interest rates)
High interest rates
Lack of knowledge in implementing new form of technology
Lack of knowledge in implementing new form of organization
Difficult to protect intellectual property
Did not have any open innovation plan
Other (please specify)

8. What was/were the main constraints you think in terms of open innovation activities in your company during last two years? (Policy Constraints to Open Innovation)(Select the two most constraints)

High cost of open innovation
Lack of financing
High economic risk
Organizational rigidities
Government regulations
Lack of customers' responsiveness
Lack of knowledge to use new technology
Lack of information on market
Did not have any innovative plan
None of the above

9. If competition becomes heavier and profit margin becomes lower in your main market, what actions do you take to compete? (Competition related to Open Innovation) (Select more than one)

Increase quality of product/service
Increase product differentiation
Look for market niches (demand)
Increase marketing activity
Reduce costs of production
Forming strategic partnerships
Reduce prices (prices of products/services)
Increase working hours
Look for other foreign markets
Reduce production

[iv] http://www.*ec.europa.eu/environment/emas/pdf/general/**nacecode**s_en.pdf*
[v] http://ec.europa.eu/competition/mergers/cases/index/nace_all.html