THE USV ANNALS OF ECONOMICS AND PUBLIC ADMINISTRATION | VOLUME 14, ISSUE 1(19), 2014

OPEN INNOVATION – THE GOOD, THE BAD, THE UNCERTAINTIES

PhD Student **Eliza Laura CORAS**
Bucharest University of Economic Studies, Romania
eliza.paicu@yahoo.com

Professor PhD **Adrian Dumitru TANTAU**
Bucharest University of Economic Studies, Romania
ad_tantau@yahoo.com

Abstract:

Given the limited amount of research written about the open innovation practices of companies located in Romania, we consider of high weight the need to stress on the benefits, the barriers and the drawbacks entailed by open innovation projects..

What allures firms to embrace open innovation is their resource deficiency, insufficient abilities to explore and exploit technology, knowledge gaps and financial constraints. The extensive literature written on open innovation subjects highlights the motives, the benefits and the barriers these but the studies focusing on the risks of open partnerships are scarce.

This paper draws on theoretical literature and contemporary media accounts, building the argument for a significant impact of open innovation to the current economic background. This paper both explores the motives of firms embarking in collaborative relationships, but also the diversity of risks entailed, raising awareness of this framework of uncertainties. Within the study, our work highlights that open innovation in is impeded by risks related to technology, market place, collaboration among partners, financial sources availability, clients needs, workforce, knowledge and intellectual property rights.

By undertaking this study we aim to contribute to the scarce literature on open innovation risks and to shed light on the factors that a firm needs to approach in order to foster a culture for open innovation and, in the same time, to reduce the drawbacks of open innovation.

Key words: open innovation, risk management, innovation performance, collaboration, resource availability.

JEL classification: O310

INTRODUCTION AND PURPOSE OF THE RESEARCH

We are now in the hype of the knowledge society where information and knowledge is accessible and being a part of the competitiveness of organizations and also individuals (EU, 2012). As innovation is now widely acknowledged as one of the main drivers of the knowledge society, there has been an increasing interest in studying the innovation process (Mention, 2011). Over the past decade, an increasing number of firms have started actively to involve customers, suppliers, and other parties in product and process innovation; this phenomenon is commonly referred to as ‘‘open innovation’’ (Wallin and Von Krogh, 2010).

Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively (Chesbrough, 2003). As technology investor Bill Joy of Sun Microsystems explains, a fundamental premise of open innovation is “not all the smart people work for you”, hence triggering the need to incorporate external knowledge into internal processes.

Chesbrough (2003) model of open innovation puts a strong focus on “connect and develop”, which assumes that external sources of ideas may often be more valuable than internal ones (Sakkab, 2002), the reason being that not all smart people in the field work for a single company, so it shifts from the “not invented here syndrome” (Katz&Allen, 1982) to “proudly found elsewhere” (PFE) (Chesbrough, 2003). “Proudly found elsewhere” has its origin in Procter & Gamble, which back in 2002 decided that it needed to move the company’s attitude from resistance to innovations “not invented here” to enthusiasm for those “proudly found elsewhere” (Sakkab, 2002). Hence

forward, the value creation process has included the network of external sources of new ideas, putting the customer's input in the centre.

Practical examples of open innovation in industries are vast: the mobile phone industry, the digital amplifier industry, the open source software industry, the mobile operating system Android, the bio-pharmaceutical industry, Procter&Gamble, Italcementi, Deutsche Telekom, Innocentive, Roche or the Dutch special materials company DSM (Schroll, and Mild, 2011).

Trends such as outsourcing, agility, and flexibility had already forced companies to reconsider their strategies and processes in other areas, and to become network organizations. The 'do-it-yourself' mentality in innovation management just became outdated (Gassman, 2006).

Although the phenomenon of open innovation has increasingly captured the attention of many researchers, we found few studies addressing open innovation from the risk management perspective, especially in Central and Eastern Europe.

According to the Innovation Union Scoreboard 2011, Romania is a modest innovator with a below average performance and one of its majors weaknesses are companies introducing product or process innovations and firms collaborating with each other, scoring half on EU27 average. While in Belgium, Cyprus, Estonia or UK more than 1 out 5 SMEs collaborate, in Romania this is less than 1 out of 20. This low innovation performance of Romanian firms is also correlated with the scarce literature written on the impact of external cooperation on the innovation of Romanian firms and especially on their potential of efficiently managing the risks this cooperation involves. To our knowledge, there is a limited amount of empirical research on the risk management of open innovation processes. This paper aims to address these research gaps.

This article focuses on open innovation projects, first seeking to elaborate on the benefits and motives of firms involving in external partnerships, secondly to approach the barriers and drawbacks that such partnerships entail and thirdly to define a comprehensive structure of risks residing in open innovation, by raising awareness on the factors that help mitigate the risks met by companies in their innovation process. The research results support the importance of risk management in the open innovation environment.

Given the overall sparse attention given to the dark side of open innovation form the risk management perspective, we consider worth addressing this deficiency through the challenge of defining a theoretical framework of risks encountered in external partnerships. In order to build this, we used the extensive support literature written on open innovation, since Chesbrough (2003) until today and the relatively scant literature affiliated to open innovation risks. Additional research sources were case studies and media accounts focused on motives, barriers and barriers to such partnerships, which were used to found our framework on.

We intend our study to make the path for future researches in the risk management area of open innovation, analyzed on the background of the developing countries.

THEORETICAL BACKGROUND

MOTIVES TO PURSUE OPEN INNOVATION

The literature on open innovation indicates that in the last decade a tremendous shift in business occurred: a growth in the use of external partnerships and increased interactions among different actors. Chesbrough (2003) stresses that the most important factor for the development of open innovation is the dramatic rise in the number and mobility of knowledge workers, making it increasingly difficult for companies to control their proprietary ideas and expertise. In addition to that, when employees change jobs, they take their knowledge with them, resulting in knowledge flows between firms (Chesbrough, 2003). Another important factor was the growing availability of private venture capital, which has helped to finance new firms and their efforts to commercialize ideas that have spilled outside the silos of corporate research labs (Chesbrough, 2003).

As a result, the companies have sought outside their boundaries for new sources of external knowledge in order to boost their internal capabilities. The new paradigm focuses on the significant

value of external R&D and on building a business model so effective and innovative that it won't matter whether you are the first on the market.

The drastic shortening of product life cycles, the globalization of competition with the accompanying growth in the number of possible innovators, the interacting influence of products, technologies on international markets, and the increasing difficulty of protecting and monitoring intellectual property and expertise act as motives for open innovation development.

The main driver of open innovation is inherently communication between stakeholders. In IBM's recent CEO study, more than three quarters of the 765 CEOs queried cited collaboration and partnering as very important to their innovation efforts. The technology has had the greatest contribution to facilitating the new communication and collaboration techniques, especially by the growth of the Internet, through social networking, Web conferencing and instant messaging.

Collins (2006) proposes the key to successful innovation lies as much in the ability to collaborate as it does the ability to perform applied science and engineering. A second factor cited is globalization. An increasingly international division of labour and knowledge has increased the number, and geographical diversity, of relevant knowledge sites, forcing firms to access external knowledge to support their value chain activities (Rothaermel and Hess, 2007) and, thus, to create and manage connections with other organizations (Hess and Rothaermel, 2011). Improved market institutions are a third cited factor.

The key to developing thriving innovations is to open the mindset to collaboration as a driver for competitive advantage.

BENEFITS OF OPEN INNOVATION

Open innovation can help firms by reducing the cost of product development and process improvement, accelerating time to market for new products, improving product quality, accessing customer and supplier expertise outside the organization, sharing risk in product and service development, and enhancing company image and reputation (Wallin and Von Krogh, 2010). By opening their doors and integrating external knowledge bearers companies can cope with shorter innovation cycles, rising R&D costs, and a lack of resources (Gassmann & Enkel, 2004) turning open innovation into a "frequently dominant competitive factor" (Piller & Hilgers, 2008).

Several studies and research have shown that an intensive exchange of information by all the actors involved in the innovation process helps to reduce the time-to-market period, the cost to market, and the risk involved with the development of new products and services (Chesbrough 2003; Reichwald and Piller 2009).

The benefits are clear: an enormous universe of innovators working on technologies, products, and services of relevance to the company; reduced costs associated with moving a larger portfolio of innovations down the pipeline; reduced risk as others put their human capital to work on risky propositions; and accelerated time-to-market as innovation is freed from the shackles of the cumbersome large-company financial, planning, and pipeline process (Le Merle, Campbell, 2011).

As previously stated, open innovation can do (at least) two things that closed innovation cannot: to effectively exploit diversity and to share risk. Innovation collaboration allows organization to gain needed skills, technologies, assets, and other resources from partners' side. The sharing of resources enhances firm's capability and flexibility of conducting its innovative projects. In the mean time, it implies that project costs and risks will be reduced by shared partnership.

ACTORS ON THE OPEN INNOVATION STAGE

In the new models of innovation, different actors are collaborating together to turn a new idea into a potentially successful product or service (Mention, 2011). Companies increasingly innovate with the aid of customers, suppliers, universities, competitors (Kruse, 2012), public research centres, competitors, groups of product users (Duarte and Sarkar, 2011), development partners, both public and partially privatized research institutions and the company itself.

The diversity of actors that form the open innovation framework is noticeable. The external knowledge is generated by the employees, business partner, customers, consultants, competitors, business associations, internet sales and service units, internal research and development units and academia. The literature is rich in providing evidence on customer and employees driven knowledge but proof of enhancing knowledge raised by universities and research laboratories in the innovation process of business actors is relatively scarce,

As reported by EUROSTAT (2008), 26% of innovative firms were engaged in co-operation with other enterprises, universities, public research institutes, suppliers, customers and competitors in the EU-27. In the Member States, the most common co-operation partners were suppliers followed by customers (respectively, 17% and 14% of innovative firms), while the least common co-operation occurred with universities and research institutions (9%) (Mention, 2011).

The most important source of external knowledge comes from the customer, who takes a more and more active role in innovation process. Johannessen and Olsen (2010) discuss about the so-called "connected customer," who increasingly expects tailor-made products and services based on individualized and immediate feedback. The early involvement of the customer reduces time-to-market by eliminating time-consuming iteration cycles and test phases (Lilien et al. 2002), transforming clients into 'co-inventors'.

BARRIERS TO OPEN INNOVATION

The scarce literature written about risk management dimension in open innovation projects is more focused on highlighting the barriers for a firm to approach open innovation rather than on depicting the risks which accompany such collaborative arrangements. In our review of literature, we show what impedes a company to perform while involved in external collaborations.

The openness raises several questions concerning property rights and how this interaction can be managed within established organizations. Such particular organizational demands are placed on the management of innovation by the Open Innovation paradigm itself (Arnold, 2008).

The potential gains from collaborations involve "organizational" costs (Williamson, 1985). Opportunistic behaviour from the collaboration partners (Jarillo, 1993), insufficient expertise of one partner (Flowers, 2007), or precaution measures for the possibility of information leaks regarding valuable technologies, especially in collaborations with competitors (Oxley and Sampson, 2004) may increase coordination costs and make external partnerships less attractive. Collaboration can also increase costs if there is "too much" diversity amongst partners. Exceptionally valuable outcomes often come from cross-collaboration from different fields of science. However, the chances of achieving a positive outcome and, indeed, the average gain from collaborations increase if both partners' knowledge is within the scope of the same specific domain (Fleming, 2001). There may be a trade-off between the likelihood of achieving a breakthrough and the probability of project failure (Mata and Woerter, 2012).

Shifting the focus towards exploiting resources outside the company's own market may dilute the firm's focus at the expense of its customers. Increased attention to outbound open innovation may then have a positive effect on short term profits and a negative effect on long term profits (Huizingh, 2011).

A firm's Innovation outsourcing project needs to seek domestic and/or foreign partners to establish a collaborative network. In order to select optimal vendors for partnership, firms must collect and analyze global resource accessibility in the market. An ideal marketplace should exhibit transparent global supply chain, labour and technology supply, information flows, customer needs and expectation, and cost structures. Lacking of these market information throw in enormous risky concerns into outsourcing project.

Work force is a major anxiety for innovation outsourcing practice. The primary goal of outsourcing R&D project is to seek skilled and talented external researchers to work for the firm. Since the geographical and cultural differences in the global market, the supply of quality labour may be inadequate for the firm. Later on, a firm must carefully maintain its employee relation and

conduct reasonable workforce management in order to cut down the turnover rate among work force (Brunold and Durst, 2012).

Lichtenthaler (2011) argues that external knowledge sharing has the potential to expose organization's core competencies to its rival organizations. Therefore, knowledge sharing is a potential risk because the organization may lose its competitive edge over its competitors. Additionally, this knowledge exposure could provide the rival organizations with added advantages if the competitor adapts this knowledge and gains significant market share (Lichtenthaler, 2011).

The study of Enkel et al. (2009) shows that risks such as loss of knowledge, higher coordination costs, as well as loss of control and higher complexity are mentioned as frequent risks connected to open innovation activities. In addition, there are significant internal barriers, such as the difficulty in finding the right partner, imbalance between open innovation activities and daily business, and insufficient financial resources for open innovation activities (Kutvonen, 2011).

Subsequently, firms feel a profound cost pressure, resources constraints and people adversity to change, which impedes them to involve in big collaboration projects. Their size acts as a limitation and, the bigger the cost pressure the higher their dependability on internal sources of knowledge.

OPEN INNOVATION – THE GOOD

Based on our extensive research, we have broken down the various motives for embarking in open innovation project to four key objectives: cost reduction, knowledge gain, sharing risks and diversification of resources. We found that knowledge acquisition is perceived both as the highest reason for external partnerships but also as the main advantage of open innovation, as foundation for organizational learning.

Figure no. 1 summarizes the main four drivers for companies to start open partnerships: cost reduction, knowledge gain, risk sharing and resources accessibility.

Figure 1. Motives to pursue open innovation
Source: *the authors*

Opening the boundaries of a company by incorporating knowledge generated by customers, suppliers, education institutions, consulting agencies leads to intellectual capital development through knowledge sharing. By developing joint collaborations in the market, firms can access a higher volume and a more diverse structure of resources, otherwise insufficiently developed inside. Open innovation enlarges the knowledge pool of a company and contributes to boosting the potential to reach a better position on the market. Competitiveness being a key driver, firms become more flexible in involving external partners in the innovation process, expanding their investment in external R&D in order to stay alert to new ideas brought to the market instead of investing only in internal resources. Knowledge acquisition can also accelerate the organizational learning of a firm, as part of their strategic processes to develop internal capabilities and integrate external know-how. Therefore, the innovation pace is increased in external partnerships since open innovation reduces the time-to-market for new products and services, through shorter development time.

Partnering in the purpose of innovation is sought also for cost alleviation, during the ever increasingly pressure the financial crisis has posed on firms competitiveness. The rising costs of

technology development, correlated with the shortening product lives on the market drive companies to focus on a better management of expenses, targeting efficient collaborations.

Since innovation is closely related to higher risks, the choice of involvement in external partnerships is a means of sharing the risks of the firm's projects. However, as later detailed, this open innovation projects may also entails a wide range of risks which need to raise awareness of.

Internal resources are often limited, insufficient and unavailable for large innovation projects. Open innovation allows internal resources to be freed for other purposes and grants access to a range of resources otherwise unavailable inside. Financial constraints being a tough burden to bare in the current economic environment, open innovation helps building up the capital positions of firms and making cash infusion easier. In addition to increased flexibility and speed generated by external partnerships, joint projects also create incentives for partners to free ride.

OPEN INNOVATION – THE BAD

While an open innovation strategy targets to decrease the risk related to the innovation process, it may also entail an increase of risk related to collaboration among different partners. However, there is a scarcity of research regarding the costs and barriers of open innovation.

A number of both internal factors (within individual companies or single industries) and external factors (related mainly to marketplace and the quality of partnerships) account for poor open innovation or act as barriers to such project. The next section highlights some of these factors.

The open innovation literature shows that the paramount benefit for firms entering collaboration projects with innovative purposes is risk sharing. At the same time, collaboration inherently brings along risks and costs. Our research distinctly points out to a paradox: even if the major motive for firms to embark in open innovation projects is risk sharing, in these collaborations may also reside threats that distort the initial objective of pursuing innovations and competitive advantage. An open innovation strategy aims at decreasing the risk inherent to the innovation process but at the same time it may increase the risk inherent to collaboration with different partners (Tantau and Coras, 2013).

Our study reflects that open innovation is commonly hampered by constraints related to technology, market place, collaboration among partners, financial sources availability, clients needs, workforce, knowledge and intellectual property rights, as graphically reflected in Figure 2.

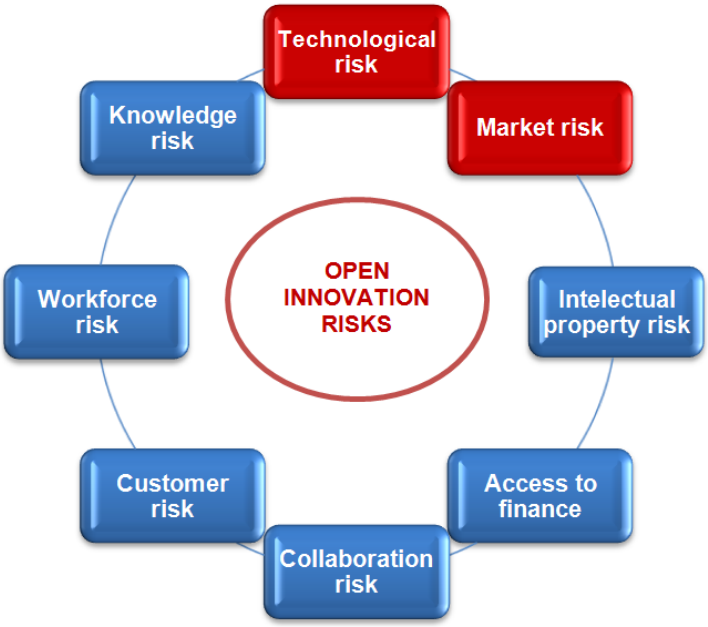

Figure 2. Open innovation risks
Source: *the authors*

Figure 3 depicts in further detail the major risk drivers (internal and external) for a company collaborating.

Since collaborating in joint projects is considered the most economical way to access knowledge form outside the boundaries of one's firm, knowledge may be the most important asset that is traded in open innovation. However, insufficient expertise of partners in such collaborations may entail costs and barriers to the desired outcome. Moreover, external knowledge sharing has the potential to expose a company's internal distinctive competencies to its rival organizations which may lead to losing competitive edge over the competitors who, in exchange, gain significant market share or market visibility. Loss of knowledge or involuntary knowledge spillover is also strictly related to open partnerships, since leaking critical internal resources and disclosure of core competencies to cooperation partners may alter the aim and ethic of the open innovation process. If a company owns special technical knowledge in a field, not using it but relying on others for the knowledge will lead to decay of value of your own. Knowledge sharing risks are strictly correlated with the lack of trust in the partner and poor communication among collaborators about common goals and strategies, which finally impedes the innovation process and the performance of the alliance. Opportunism is regarded as high threat.

In open partnerships, firms seek skilled and talented external collaborators to work for the firm. However, due to geographical, cultural or merely strategic differences in the global market, the supply of quality labour may be inadequate for the firm. Retention risk acts as a major constrain since turnover among work force can alter the quality of the partnerships and lead to major knowledge loss. People related risks are regarded as highest threats, since they are the major actors and assets in collaboration projects. The workforce safety mentality, reluctant to change and innovation, acts as a major risk and its impact is even greater when it is a translation of the top management's attitude, which shows little support for innovation and low awareness of risks. Under-trained workforce is a threat for a small firm since it builds up a knowledge barrier from the firms it collaborates with.

Formally, open innovation bring into light the intellectual property rights protection. Due to potential attempts of knowledge spillover or knowledge theft, precaution measures are needed for the possibility of information leaks regarding valuable technologies, especially in collaborations with competitors. It basically protects internal knowledge from spilling over to the partner.

Risk driver	Type	Description
Workforce	internal	Employees resistance to innovation and change, poor understanding of their role, safety mentality
	external	Insufficient technical expertise or training of employees, insufficient knowledge about partners
	internal	High staff turnover, difficulty in finding quality employees, low support of top management for innovation
Knowledge sharing	external	Insufficient expertise of partners
	external	Ethical barriers due to leaking critical internal resources and disclosure of core competencies
Collaboration	internal	Higher complexity of managing open innovation, difficulty in balancing innovation with daily tasks
	internal	Low control of external resources compared to internal ones
	external	Conflicting interests of partners, developing dependency on partners, relational risk
	external	Lack of trust and communication among partners, collaboration suddenly disolved due to partner leaving
	external	Collaboration objectives may not be met due to poor quality of partners or poor management of partnership
Market	external	Volatile and ambiguous industry regulations
		Unethical behaviour of the partners of related to state administration bodies
		Large volume of paperwork, administrative burdens
		Lack of market information and transparency
Clients	external	Constantly changing needs of the clients, requiring customized products
Finance	external	Lack of financial capital to support open innovation, high commercialization costs
		higher management, coordination and control costs
Techonology	external	Technology leakage to rivals, risk from technological uncertainty, inability to adapt to techonology advances
Intellectual property	external	knowledge spillover / core knowledge flow towards the competitors; inexistence of formal contracts

Figure 3. Details of open innovation risks

Source: *the authors*

The constant changing needs of the customers pose a significant challenge on firm in their rush to adapt and customize their offer. However, this search for short term competitive advantage, by shifting the focus towards exploiting resources outside the company's own market may dilute the firm's focus at the expense of its customers. Increased attention to outbound open innovation may then have a positive effect on short term profits and a negative effect on long term profits. Outbound open innovation seeks to meet the goal, instead of customer satisfaction.

Collaboration among partners, the core process of open innovation, entails a variety of risks that alter the purpose. Firms may lose control over their internal processes, not being able to have a tight control of external resources as internal ones. Open innovation partnerships needs distributive attention and competences of managing complex projects, due to the constant need to consider external relationship management, intellectual property, confidentiality. Collaboration risks are highly connected with knowledge loss and opportunistic behaviour, if partners allow each other to build skills in area important to their business and then sell their expertise to the competitors. Partner with differences incentives or expectations may also dilute the scope of the collaboration. The size of the open innovation project is a variable the quantitatively affect the quality of the outcome: the larger the project, the more combined resources are needed (financial, labour, knowledge), since a higher complexity requires solid management and control skills and abilities to mitigate the uncertainties that arise. Opportunity risk is another facet of collaboration barriers, since difficulty in finding the right partner to innovate is high and, even if once that partner found, we also need to professionally balance open innovation activities with daily, routinely, business.

The current rapidly developing economic background is based on sky-rocketing technology advances. The risk of technology leakage to rivals and a loss of control over the innovative process is an ever growing concern.

Availability of a greater pool of resources is one of the main drivers for firms to enter open innovation projects. However, gaining access to such a diversity of new resources or using too many resources simultaneously generates an attention and a maintenance problem. On the other side, time and finance are a perpetual concern for open partnerships, access to finance being one of the most prominent barriers of such projects. Coordination costs may increase and make access to external resources less attractive, since learning about the other partner's competitive advantages does entail additional costs. Too much diversity among partners, protecting internal knowledge from spilling over to the partner, using external knowledge sources all involve higher costs of partnering putting a great deal of pressure of financial resources. Overall, openness requires higher management, coordination and control abilities, which translate into high costs.

The market landscape influences the success potential of open innovation projects. Globalization has led companies to focus on short term results, thereby cutting expenses for long-term research towards radical innovation. Apart from that, the market lacks transparency regarding information flows, customer needs and expectations and cost structures, which impacts on the firm collaborating. Inadequate marketplace information or knowledge may generate high risk to the firm. The global economic climate and its instability require firms to study well before adopting outsourcing partners in order to avoid possible outsourcing risks. Highly specific to emergent countries, unethical behaviour is common and acts a major business risk. Open innovation is also impeded by a high level of bureaucracy and firms find it harder to cover the administrative costs entailed in the external partnerships.

In a nutshell, while the foundation of open innovation is knowledge exchange, such partnership holds significant risks residing not only in the failure of collaborations but also in potential loss of competitive advantage should the critical internal competencies and knowledge is spilled over on the market place to competing firms.

CONCLUSIONS AND FURTHER RESEARCH

The use of external relationships is increasingly interpreted as a key factor in enhancing the innovation performance of modern enterprises (Lasagni, 2012). Therefore, it can be argued that the ability to access external knowledge resources efficiently and overcoming the risks encountered in the process can become a huge competitive factor for companies.

This paper has empirically explored the risk agenda companies encounter in the process of open innovation. Within the research, our work highlights that companies are allured to enter external partnerships to enrich their knowledge base, to reduce transactions costs, to access a larger pool of resources otherwise insufficient, to share risks that go along with their businesses.

While collaborating, we conclude that firms are impeded by risks related to workforce, knowledge sharing, complexity of collaboration, market tensions, client pressures, access to finance, technology advances and demands related to intellectual property rights protection.

Further streams of research may seek to study whether open innovation is more suitable for larger companies than smaller ones, and how these projects differ according to the size of the partners involved. While generally scholars have focused their research of risks in open innovation on large companies rather than SMEs, there is little knowledge on how the magnitude and impact of open innovation threats are distinct for smaller firms than for larger companies. We also consider critical the study of extent of cultural factors that affect open innovation, on the background the current globalized economy. While awareness on the barriers and drawbacks of open collaboration projects is decisive, we consider critical for further research the development of risk mitigation models for open innovation risk.

REFERENCES

1. Arnold, R. (2008). Microeconomics. 9th ed. Mason: South-Western Cengage Learning.
2. Brunold, J. and Durst, S. (2012) "Intellectual capital risks and job rotation", Journal of Intellectual Capital, Vol. 13 (2), pp.178 – 195
3. Chesbrough, H. (2003) “Open Innovation”, Harvard Business School Press, Boston, pp. 43-62
4. Collins, L. (2006) “Opening up the innovation process”, Engineering Management Journal, 16(1), pp. 14-17.
5. Duarte, V. and Sarkar, S. (2011) "Separating the wheat from the chaff – a taxonomy of open innovation", European Journal of Innovation Management, Vol. 14 Iss: 4, pp.435 – 459
6. Enkel, E., Gassmann, O., & Chesbrough, H. W. (2009) „Open R&D and open innovation: Exploring the phenomenon” R & D Management, 39(4), pp. 311–316.
7. European Commission (2012) „SBA Fact Sheet 2012 - Romania”, Retreived from: http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/files/countries-sheets/2012/romania_en.pdf
8. Fleming, L. (2001) “Recombinant uncertainty in technological search”, Management Science 47 (1), pp. 117-132.
9. Flowers, S. 2007, “Organizational capabilities and technology acquisition: why firms know less than they buy”, Industrial and Corporate Change, 16 (3) pp. 317-346
10. Gassmann, O., Enkel, E., and Chesbrough, H. (2010) ‘The Future of Open Innovation’, R&D Management, Vol. 40 No. 3, pp. 213-221.
11. Gassmann, O. (2006), “Opening up the innovation process: towards an agenda”,R&D Management, Vol. 36 No. 3, pp. 223-6.
12. Gassmann, O. and Enkel, E. (2004), “Towards a theory of open innovation: three core process archetypes”, Proceedings of the R&D Management Conference (RADMA), Lisbon.
13. Hess, A. M., Rothaermel, F. T. (2011). When are assets complementary? Star scientists, strategic alliances and innovation in the pharmaceutical industry. Strategic Management Journal, 32 (8): 895-909.

14. Huizingh, E.K.R.E (2011) 'Open innovation: state of the art and future perspectives', Technovation, 31, pp. 2-9
15. Innovation Union Scoreboard 2011 (2012), European Commision, http://ec.europa.eu/enterprise/policies/innovation/files/ius-2011_en.pdf
16. Jarillo, J.C. (1993), „Strategic Networks: Creating the Borderless Organization". Butterworth-Heinemann: Oxford.
17. Johannessen, J.A.; Olsen, B. (2010) "The future of value creation and innovations: Aspects of a theory of value creation and innovation in a global knowledge economy. ", *International Journal of Information Management,* vol. 30 issue, p. 502-511
18. Katz, R., Allen, T, (1982) "Investigating the Not Invented Here (NIH) Syndrome: a look at the performance, tenure and communication patterns of 50 R&D project groups", R&D Management, Vol.12, No. 1, pp.7-19
19. Kruse, P. (2012) "The Role of External Knowledge in Open Innovation – A Systematic Review of Literature", 592-601. In *Proceedings of the 13th European Conference on* Knowledge Management.
20. Kutvonen, A. (2011) "Strategic application of outbound open innovation", Emerald 14
21. Lasagni, A. (2012), How Can External Relationships Enhance Innovation in SMEs? New Evidence for Europe. Journal of Small Business Management, 50: 310–339
22. Le Merle, M. and Campbell, J. (2011), "Building an external innovation capability", Booz & Company, http://fifthera.com/perspectives/
23. Lichtenthaler, U. (2011) "Open innovation: Past research, current debates, and future directions," Academy Of Management Perspectives, vol. 25, no. 1, pp. 75-93
24. Lilien, G. L., Morrison, P. D., Searls, K., Sonnack, M., and von Hippel, E. (2002) Performance assessment of the lead user idea-generation process for New Product Development, Management Science, 48 (8), pp. 1042-1060
25. Mata, J. and Woerter, M. (2012) "Risky innovation: the impact of internal and external R&D strategies upon the distribution of returns", Paper to be presented at the DRUID 2012 at CBS, Copenhagen, Denmark
26. Mention, A.-L. (2011). Co-operation and co-opetition as open innovation practices in the service sector: Which influence on innovation novelty? Technovation, Vol. 31. No. 1, 44-53.
27. Oxley, J.E. and Sampson R.C. (2004) "The scope and governance of international R&D alliances", Strategic Management Journal 25 (89) pp. 723–49.
28. Piller, F. and Hilgers, D. (2008). Open Innovation: Externes Wissen fu.r erfolgreiche Innovationsprozesse. RKW Magazin, Vol. 3, 12-13.
29. Reichwald, R. and Piller, F. (2006). Interaktive Wertschopfung: Open Innovation, Individualisierung und neue Formen der Arbeitsteilung, Wiesbaden: Gabler Verlag.
30. Rothaermel, F.T., Hess, A. (2007). Building dynamic capabilities: Innovation driven by individual, firm, and network-level effects. Organization Science, 18 (6): 898-921.
31. Schroll, A., Mild, A. (2011) "Open innovation modes and the role of internal R&D: An empirical study on open innovation adoption in Europe", European Journal of Innovation Management, Vol. 14 Iss: 4, pp.475 – 495
32. Sakkab, N. (2002) "Connect & Develop Complements Research & Develop at P&G", Research Technology Management, 45 (2), pp. 38 – 45
33. Tantau, A. And Coras, E. (2013) "A risk mitigation model in sme's open innovation projects", Management & Marketing, Vol. 8, No 2(30), p. 303-328
34. Wallin, M.W. and von Krogh, G. (2010) "Organizing for open innovation: Focus on the integration of knowledge" Organizational Dynamics 39(2): 145-154
35. Williamson, O.E. 1985, The economic institutions of capitalism, firms, markets, relational contracting. The Free Press, New York.