

The analysis on risk factors and countermeasures of Industry-University-Institute Cooperative Innovation

Ling Li^a, Peng Guo and Wei Zhang

Xi'an University of Science and Technology, 58 Yanta Rd, Xi'an, China

^a2593712043@qq.com

Abstract

Industry-University-Institute Cooperative innovation is technological innovation activities carried out by the enterprise, universities and research institutes in accordance with the principle of "benefit sharing, risk sharing, complementary advantages and common development". It is the inevitable choice of integration of science and technology economy, and also an important part of national innovation system. While recognizing its virtues, we must also be aware of its risks in order to make better use of this form of cooperation. This paper studies the risks of Industry-University-Institute cooperation based on quantitative analysis, finds out the main factors which influence the process and results of the cooperation, then puts forward the targeted prevention and control strategies..

Keywords

List Industry-University-Institute, enterprise cooperation, risks

1. Analysis on Risk Factors of Industry- University-Institute Cooperative Innovation

The development time of Industry University-Institute in China is relatively short, the development is not completed. As the parties cooperate for the specific purposes, inevitably there'll be different understandings and demands in their respective social division of labor positioning, investment interests, which will vary according to different processes in the Industry-University-Institute cooperation. Although cooperative innovation has dispersed the risks of technological innovation conducted by single company, the great uncertainty still exists in the process of Industry University Institute cooperative innovation, which may lead to more risks. In practice, in addition to the technical difficulty of the cooperative innovation project itself, the wrong choice of partners and cooperation methods and improper risk control during the process of cooperation may lead to failure of the cooperative projects. What's more, the later you end the project, the higher expense will cost. Therefore, it is necessary to understand and analyze the causes of these risks and the harm they bring, so as to avoid the deepening of the risks and to carry out the Industry University Institute cooperation more smoothly. In the process of Industry University Institute cooperation, the main causes of the risks are summarized as follows:

1.1 Technical risk is the risk caused by the uncertainty of technical assessment, technical maturity, and technology changes etc. The scientific and technological innovation activities carried out by the Industry-University-Institute Union are cooperation mainly by the universities and scientific research institutions that master the technical R & D and the enterprises which have the funds, production and markets. In the IUR cooperation and innovation, various reasons as large technology development difficulty, insufficient expectation for key technologies, limited access to technologies, lack of organizational learning, breakthrough and research methods, influence of mind-sets, may lead to the

failure. Some of the major cooperative innovation projects, due to the huge investment, long period of time, economic efficiency is difficult to foresee. From the realization of the interests of industry university research cooperation process, in the pursuit of the urgency and uniqueness of the interests of enterprises may be more direct. Universities or research institutions pay more attention to the benefits of the project from the perspective of the "social benefits of the project" and the pursuit of the enterprise is to achieve the best return on investment in the shortest possible time. Once the technology is not mature, the wrong direction, the loss will be irreparable. Some ideas and inventions were initially feasible in the laboratory. However, once implemented, many technical problems have not been solved and companies may not have the research ability in this area, leading to the cooperative innovation project had to give up halfway.

1.2 The market risks of Industry-University-Institute cooperation refer to the uncertainty of the relative competitive advantage of the products. There'll be possibilities for failure of technological innovation due to hard to confirm the time of market acceptance, the market life and the resources input intensity that development requires and so on. The market is constantly changing. Maybe the market prospect is bright at the beginning of IUR, however, when the innovative product is launched to the market, it may be expensive due to the improvement of its appearance, design, performance and quality. At the same time, due to the inertia of people's consumption, the new product is difficult to be accepted by the market. The quality performance and stability of new products often have to wait and see for some time, which hinders the rapid penetration of new products and occupation of the market. The new products rely mainly on high sales, high profits to recover the investment and benefit. If a new product is not available for sale in the market through a short period of time, the new product is likely to fail. Cooperation and innovation investment can not be recovered, enterprises do not receive any return on income, this will not only hinder the progress of cooperation, but also a serious blow to the enthusiasm of the members of the each member. If the input and output are out of proportion, the partners will not continue to waste their resources, cooperation will face the risk of failure. Second, scientific research institutions pay more attention to scientific research theory, the product replacement rate is not fast enough. When a new product is designed, there may be similar products in the market with lower performance or level.

1.3 In the Industry-University-Institute cooperation, organization management risk is an important factor restricting its development. In the Industry-University-Institute cooperation projects in our country, Because the IUR project is an inter organizational project, the nature difference and cultural difference between different organizations may bring great resistance to cooperation, the positive cooperation effect is unable to get. As a result, the speed and effect of knowledge innovation would be affected. At the same time, there are great differences in the management system, applicable policies, regulatory departments and other aspects of the cooperation system, In the level of scientific research and the improvement of the quality of personnel is difficult to enforce the unity. If the enterprise lack of adequate information collection and analysis of the customer needs and the development of science and technology, or cooperative innovation projects and strategic positioning does not match. Then companies will not be able to establish innovative projects or project is not accurate. In the innovation of the various segments of the Learning research party and enterprises because of the loss of interest between the termination of cooperation led to the failure of the final innovation. Research cooperation process , the university has over emphasized the function of the school knowledge inheritance, but neglected the cognition and interaction with the practice environment. The result is that students attach importance to theoretical study, despise scientific practice, and lead to the shortage of innovation ability and application ability. On the other hand, after the establishment of industry university research alliance, there is a lack of cooperation between schools and enterprises, and many cooperative alliances have become a paper agreement.

1.4 The information asymmetry in the Industry-University-Institute cooperation means that in the process of cooperation, the economic phenomenon of one cooperating party owns more information than other party. Under the pressure of market competition, industry university research cooperation is

organized in the form of contract, is a kind of academic industrial activities. All cooperative parties have their independent operating systems and belong to different industry sectors, so they have a great difference on the responsibility born in the cooperation and information masted in the cooperation. The two sides grasp each other's information is not the same phenomenon, so as to affect the harmony and understanding of the cooperative relationship, leading to the abnormal operation of the system, and the risk

of cooperation innovation. Secondly , In the cooperative organization, learning research party mainly responsible for R & D and the company is responsible for production and marketing, so that the difference between them is getting bigger and bigger, and the distribution of information is more and more asymmetric. The asymmetry of information make the behavior of the subject may be based on their own interests in accordance with their own information to take speculative behavior to maximize their own interests, and damage the interests of the other party, thus creating a moral hazard. With the deepening of cooperation, when one party found the other side of unethical behavior, will take the same approach to each other, then the other side will have adverse selection risk. Thirdly, businesses as a profit-making organization of the company, the main goal is to maximize the benefits. But the universities and scientific research institutions are non-profit organizations whose main task is to serve the development of human beings and to serve the society. In the market competition, the more information the transaction has, the more likely it is to get a large profit. Therefore, the smooth flow of information is the key factor of the smooth operation of the industry university research alliance, otherwise it will lead to various risks in the cooperation of industry, University and research institute.

1.5 knowledge is the main investment in the university industry cooperation, intellectual property rights will inevitably become the strategic core of cooperation between universities and enterprises to seek control. Intellectual property risk is mainly caused by the characteristics of tacit knowledge in it, which means, the object of intellectual property risk is the knowledge content in the intellectual property. In the innovation of industry university research

institute cooperation, Institutions of higher learning,

scientific research institutions and enterprises are likely to face the risk of intellectual property rights. The innovation of industry university research cooperation is a kind of relatively loose organizational relationship and there is obvious opportunism between the intellectual property right supplier and the receiving party. The asymmetric information and uncertainty in the resulting contract cannot complete. participation motivation differences, uneven distribution of interests or lack of business integrity can lead to opportunistic behavior, misappropriation of universities and scientific research institutions of intellectual property and even "poach" core talents. The invisibility of knowledge leads to the loss of tacit knowledge in the process of dominance and is not easy to be detected, the uncertainty of the use and value of intellectual property rights will lead to uneven distribution of interests . At the same time, the fuzziness of knowledge makes it difficult to evaluate and monitor the effectiveness of knowledge sharing. This potential risk will cause the parties to cooperate in order to safeguard their own interests and protection of core capacity is not lost will take extreme protection measures, the negative performance of the overall performance of the avoidance of cooperation, is not conducive to maintaining long-term cooperative relations.

Through the above analysis, we can see risk of innovation cooperation in production and research cooperation: (table 1)

Table.1 Risk Of Industry University Research Cooperation

Risk Of Industry University Research Cooperation	Technical risks	S1: technical assessment
		S2: technical maturity
		S3: technology changes
	Market risks	S4: market demands
		S5: market competition

	S6: the occurrence of replacement products
Organization management risks	S7: Organizational decision making
	S8: Lack of practical experience
	S9: Organization structure
Cooperation relationship risk	S10: Partners selection
	S11: Moral risks
	S12: Distribution of benefits
Intellectual property risks	S13: Knowledge Transfer
	S14: Opportunistic behavior
	S15: Knowledge Spillovers

2. Research Cooperation Innovation Risk Countermeasures

The rapid development of the industry-university-coordination mechanism, coordinate and solve the conflicts in the cooperation, and avoid generating additional cost. In strengthening the team's innovative awareness, it should open exchange of controversial issues, learn from each other, and jointly improve, achieve win-win cooperation and innovation.

2.1 Strengthen The Information Communication Among Cooperative Organizations

Due to the selection, filtering and other aspects will attack to the information being missing, distortion and other phenomena in the process of information transmission. It will cause the information asymmetry between the two parties. So we can set up a temporary information exchange platform, in which the information needed by the two parties be published on this platform, to reduce the level of information transfer. So that the enterprises and researches can get resources according to their own needs on the platform to reduce the possibility of asymmetric information. The information on the platform should be as comprehensive as possible. It includes not only the needs of enterprises to investigate the situation of multi market information and product feedback, but also the research and development progress of the party and the cost of research. When the two sides grasp each other's information, the occurrence of asymmetric information will be prevented to a certain extent. Secondly, we should pay attention to the timeliness of information, emphasis on information update. The information resources have the timeliness. The prompt information is valuable, but the obsolete information is useless.

2.2 Define Intellectual Property Protection Content, Balance Information Sharing and Intellectual Property Protection

Throughout the IPR protection system, it is necessary to determine the content of intellectual property protection and raise the awareness of intellectual property protection. Setting high thresholds for important intellectual property rights, strengthening protection of patents and trade secrets, and clarifying the content, standards and sharing methods of information sharing. Cooperative innovation is bound to carry out information sharing to improve the efficiency of cooperative innovation, improve the cooperative enterprises of universities, research institutions, trust. However, knowledge sharing can lead to intellectual property spillovers, once the intellectual property is theft or leakage to make up for losses are serious. Therefore, it is necessary to establish an information sharing risk early-warning system, take active risk management strategies in information sharing, and plan, actively and actively identify, evaluate, analyze and evaluate the risks existing in the cooperation

3. Conclusion

In the process of cooperation, because of different organizations in the values, positioning, demand and other aspects of the differences and confrontation, cooperation between production and research will inevitably lead to conflict. In this paper, the connotation of the conflict between the organizations of production, learning and research is analyzed and the reasons for its formation are analyzed. Based on the analysis of the motives, the strategy of conflict management is put forward: Establish a benign trust mechanism, from the environment to the industry-university-research cooperation to provide an excellent policy environment and sufficient funds to ensure and establish and improve the cooperation platform. Effective management of production and research cooperation conflict is conducive to the parties to the risk sharing, resource sharing, improve performance and enhance national capacity for independent innovation.

Acknowledgements

This paper Supported by Educational Commission of Shaanxi Province of China (Grant No. 14JK1446); Specialized Research Fund for the Doctoral Program of Higher Education (Grant No. 2015QDJ081) ;The Foundation of Shaanxi Educational Committee (Grant No. 2013JK0182);the Research Fund for soft science of Shaanxi(Grant No. 2014KRM37-02)

References

- [1] Liu Rong. Identification, transmission and evaluation of enterprise cooperative innovation risk [D]. Dalian University of Technology, 2010.
- [2] Zhang Ye, Lin Pei. The interpretation structure model of cooperative risk factors [J]. value engineering based on 2013,30:16-19.
- [3] Curtis C Study on the conflicts of interest and Countermeasures in the cooperation of industry, University and Research Institute [J]. Heilongjiang higher education research, 2001,04:9-12.
- [4] Diao Lilin, Zhu Guilong. The dimension of contract, trust and knowledge transfer in the cooperation of industry, University and research: a case study based on [J]. science, 2014, 06: 890-901.
- [5] Ann Xin in cooperative research cooperation risk analysis of [J]. enterprise, 2005,08:24-25.
- [6] Zhang Ning. Study on the comprehensive risk assessment of the cooperation of industry, University and Research Institute [D]. Shandong University, 2014.
- [7] Huang Yulan. The relationship of cooperative innovation into [D]. empirical research on the intellectual property risk of Fuzhou University, 2011
- [8] Wang Xueli. Analysis of the mechanism of cooperation between industry, University and Research Institute and restriction factors [J]. modern economic information, 2016, 14: 352-353+161.
- [9] Luo Bing, A Mu. Study on the risk and control of cooperative innovation of small and medium enterprises [J]. science and technology and economy, 2010,02:24-26.
- [10] Han Haiyong. Study on intellectual property risk control of cooperative innovation between enterprises [D]. North Central University, 2014.