

Available online at www.sciencedirect.com**ScienceDirect**

Procedia - Social and Behavioral Sciences 109 (2014) 639 – 644

Procedia
Social and Behavioral Sciences2nd World Conference On Business, Economics And Management - WCBEM 2013

Attitudes of companies in Kazakhstan towards knowledge collaboration with universities

Yelena V. Smirnova^{a*}^a*Suleyman Demirel University, Kazakhstan*

Abstract

Collaboration between universities and private sector is a key to increase innovative performance of an economy. Linkages between academia and industry may take different forms largely pending on the local context. In Kazakhstan direct partnerships between universities and business entities are rare and not very well developed. This paper studies the attitudes of telecommunications companies towards knowledge collaboration with universities and outlines the factors hindering university-industry collaboration. The discussion builds on data collected via self-administered questionnaires and face-to-face interviews with the representatives of 28 telecommunications companies. The findings reveal how these opinions depend on size and origin of businesses. This study makes a contribution by exploring this issue in the case of an emerging economy (Kazakhstan) and provides policy advice on the development of government strategies to foster such university-industry partnerships.

© 2014 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/4.0/).
Selection and peer review under responsibility of Organizing Committee of BEM 2013.

Keywords: University-industry collaboration, telecommunications sector, Kazakhstan, innovation policy;

1. Introduction

The phenomenon of collaboration between universities and business sector is not entirely new. Science historians have traced collaborations between European companies and university researchers back to the 1800s (Ślusarek *et al.*, 2010). In Kazakhstan, such collaborations can be traced back to Soviet times. In the former Soviet Union, universities had close ties with enterprises but those ties were established and controlled solely by the government. The institutional sphere and a “statist model” was studied by Henry Etzkowitz (2008:13)

After collapse of the USSR in 1991, the system, which had worked for decades, was ruined. A number of research institutes, scientific production associations and design bureaus ceased to exist. It has been 15 years since independent Kazakhstan started restoring and modernizing science and education system. Despite enormous efforts of policy makers, most higher education institutions (hereinafter – HIE) in Kazakhstan still stick to the traditional university model. According to this model, the main functions of HIE are teaching and basic research. In contrast, contemporary university model implies fulfillment of a third knowledge transfer function (Scott, 2006). This model is widely used in Western community where universities actively collaborate with industry.

In Kazakhstan, a need for closer ties between academia and industry arose in the beginning of 2000s which was

* Corresponding Author: Yelena V. Smirnova.
E-mail: elena.smirnova.sd@gmail.com

reflected in the “*Innovative Industrial Development Strategy of the Republic of Kazakhstan for 2003-2015*”. Subsequent government programs and strategies emphasized this need as well but did not offer any concrete actions to be taken. In his latest address to the nation entitled *Strategy “Kazakhstan-2050”*, the President of the Republic of Kazakhstan N. Nazarbayev (2012) raised the issue of university-industry collaboration again. The evidence that direct partnerships between universities and business entities are still rare and not very well developed in Kazakhstan backed this up. Universities cannot produce new knowledge at full capacity because of obsolete material and technical basis and lack of resources for laboratory and experimental work. Closer ties with industry would have solved this issue.

The issue of university-industry collaboration has been studied by a number of authors like Link & Tassej (1989), López-Martínez *et al.* (1994), Arundel *et al.* (2000), Hall, Link & Scott (2001), Leiponen (2001), Cohen, Nelson & Walsh (2002), Laursen & Salter (2003), Renko (2004), Veugelers & Cassiman (2005), Meredith & Burke (2008), Bruneela, D’Esteb & Saltera (2010), etc. Despite the abundant literature, this matter has not yet been widely studied in Kazakhstan. Therefore, the paper aims to explore the attitudes towards university-industry knowledge collaboration from the perspective of Kazakhstani firms. In particular, the paper focuses on telecommunications industry – one of Kazakhstan’s long-term priority sectors for development (*Strategy “Kazakhstan-2030”*). Moreover, the study examines the factors hindering the development of university-industry collaborations.

2. Literature Review

In recent years, the interest of researchers in university-industry collaboration has grown. Interactions between academia and industry are seen as one of the key elements of a country’s national innovation system. The greatest attention to this issue is being paid by developing countries. These countries have come to understand that innovative potential of a nation is directly related to university-industry interactions. Economies with weak interactions usually have weak innovation systems (Cimoli, 2000; Muchie *et al.*, 2003; Lorentzen, 2009).

Some previous studies explored the attitudes towards university-industry collaboration from the perspective of universities and firms (Link & Tassej, 1989; López-Martínez *et al.*, 1994; Meredith & Burke, 2008). In most cases, industry representatives perceive universities as “unable to effectively perform directed research”, whereas universities perceive firms as oriented to non-academic problem solving (Link & Tassej, 1989:50). A more recent study by Meredith & Burke (2008) based on the experiment of collaboration in the form of consulting teams showed quite positive attitudes of firms towards interactions with universities. In Kazakhstan, however, this issue hasn’t been deeply studied yet. To explore the attitudes of telecommunications companies in Kazakhstan towards knowledge collaboration with universities, the questionnaire developed by Meredith & Burke was adapted to be used in this study.

Previous empirical studies on university-industry interactions indicate the importance of firm size as a driver for cooperation. Adams, Chiang & Jensen (2000) and Leiponen (2001) obtained a positive size effect of R&D collaborations with universities. The importance of size is very much in line with the results from the studies on determinants of university-industry relationships (Arundel *et al.*, 2000; Mohnen & Hoareau, 2002; Cohen, Nelson & Walsh, 2002; Laursen & Salter, 2003; Veugelers & Cassiman, 2005). Nevertheless, Mohnen & Hoareau (2002) did not find firm size to be significantly related to collaboration with universities. Guena, Fontana & Matt (2003) also confirm the importance of firm size as significant driver for collaboration with universities. Their results suggest that the probability of collaboration depends on the ‘absolute size’ of the firm. Larger firms have a much higher probability of R&D collaboration than smaller firms. In addition, an empirical study by Veugelers & Cassiman (2005) found that foreign ownership has negative effect on cooperation with universities in Belgium. This is consistent with the view that the central R&D department of foreign subsidiaries is located abroad.

Quite a lot of studies have explored factors hindering university-industry relationships. For example, Kaymaz & Eryiğit (2011) studied the barriers from academicians’ perspective; Hall, Link & Scott (2001), Renko (2004) and Bruneela, D’Esteb & Saltera (2010) examined obstacles from firms’ perspective. The study by Hall *et al.* (2001) primarily focused on the barriers related to intellectual property rights. Bruneela *et al.* (2010) examined two types of barriers: i) ‘orientation-related barriers’ – those that are related to differences in the orientations of industry and universities and ii) ‘transaction-related barriers’ – barriers related to conflicts over IP and dealing with university administration. The study showed that transaction-related barriers are much more difficult to mitigate than orientation-related barriers. Renko (2004) examined the factors hindering university-industry knowledge

collaboration in Slovenia, which include the lack of university researchers' awareness of the actual needs of enterprises, establishment of cooperation on the basis of personal contacts and lack of state support to enterprises in the form of fiscal incentives for joint research and development with universities.

Despite the abundant literature on university-industry collaboration, there is lack of studies on this matter in Kazakhstan. Given that interactions between academia and industry are rare and not very well developed in Kazakhstan, there is a need to study the attitudes of firms towards knowledge collaboration and identify factors hindering the development of university-industry relationships.

3. Methodology

The study has been conducted in Almaty city, which is the largest cultural, financial and educational center of Kazakhstan. The sampling of telecommunications companies was based on the data provided by the Department of Statistics of Almaty. The number of firms operating in telecommunications sector in Almaty in 2012 totaled 172.

Telecommunications sector is very broad and can be subdivided into many subfields. Using judgmental approach I excluded from the sample some companies, which did not represent a particular interest to the study, namely, small distributors of telecommunications equipment, television and radio broadcasting companies and firms engaged solely in installation works. Thus, the sample resulted in 52 companies ranging from cellular and fixed-line operators, internet service providers and systems integrators to representatives of leading telecommunications companies and distributors of telecommunications equipment offering IT solutions. As the activities of these companies are more sophisticated and focus mostly on building networks, it is possible to expect them to engage in some kinds of collaborations with universities.

The data collection process comprised two stages. In the first stage, business representatives (directors-general or technical directors) were contacted by telephone for an appointment. In case of the appointment, semi-structured interviews were run. Interviews were held with the representatives from 16 companies. The second stage involved sending self-administered questionnaires to survey participants via e-mail. The questionnaire had been developed on the basis of the studies conducted in Mexico (Meredith & Burke, 2008) and Slovenia (Renko, 2004). Overall, 28 telecommunications companies took part in the survey, which constitutes to 54% response rate.

4. Results

The results of the interview reveal that telecommunications companies have diverse attitudes towards collaboration with universities. Some companies are indeed very open for partnerships; others are too busy to engage in any kinds of activities. As was noted by the respondents, these are mostly large companies eager to collaborate with universities as they have a fixed demand for qualified personnel. In addition, large companies have adequate resources to employ students as trainees. Still some smaller telecommunications firms have a strong desire to transfer knowledge to higher education institutions via lectures and seminars. Moreover, they are ready to assist universities in creation of research laboratories.

To measure the attitudes of telecommunications companies towards university-industry knowledge collaboration, the respondents were asked to grade six statements regarding the role university-industry collaboration plays for firms, academic staff and students. The responses to the statements were gauged on a scale from 1 to 5, where 1 is "Totally disagree", 2 is "Disagree", 3 is "Not sure", 4 is "Agree" and 5 is "Totally Agree."

The mean of all responses is 4.28 indicating that telecommunications companies have positive attitudes towards collaboration with universities. However, the opinions of the representatives from large businesses differ substantially from those of small and medium businesses. As seen from Table 1, large businesses have the highest mean and mode. This means that they perceive greater utility from university-industry linkages rather than other businesses.

Table 1. Attitudes of respondents towards university-industry collaboration pending on business category

Category	Mean	Standard Deviation	Mode
Large business	4.48	0.48	4.67
Medium business	4.15	0.54	4.00
Small business	4.14	0.48	4.00

Table 2 shows how the opinions of telecommunications companies differ pending on business origin. The means of responses do not differ much but the mode of representative offices is higher for foreign companies. The most frequently occurring value of mean for representative offices is 4.67 is indicative of more positive attitude towards collaboration with universities as compared to local companies.

Table 2. Attitudes of respondents towards university-industry collaboration pending on origin of business

Origin of business	Mean	Standard Deviation	Mode
Representative office	4.29	0.63	4.67
Kazakhstan company	4.28	0.47	4.00

The other objective of this study was to identify factors hindering university-industry collaboration. The respondents were asked to grade eight statements (see Table 3) on a scale from -2 to 2, where -2 is “Totally disagree”, -1 is “Disagree”, 0 is “Not sure”, 1 is “Agree” and 2 is “Totally agree.”

Table 3. Obstacles to university-industry collaboration

Statements	Mean	St. dev.
a) Enterprise management is often negatively disposed towards cooperation with universities	-0.33	0.94
b) New knowledge is too expensive for enterprises	0.39	0.99
c) University-industry relationships are always established on the basis of personal contacts	0.07	1.09
d) Enterprises in Kazakhstan lack market orientation	-0.32	1.05
e) There are few researchers and scientists in enterprises	0.71	1.12
f) Researchers and scientists from universities are not familiar with industry’s actual needs	0.54	1.04
g) Research conducted in Kazakhstani universities is usually of low quality	0.54	0.79
h) State should provide appropriate tax relief to enterprises engaged in research and development	1.29	0.85

The analysis of means indicated that the main factor hindering university-industry interactions is the absence of any policy in Kazakhstan stimulating companies to collaborate with universities. As evidence shows, fiscal incentives are considered one of the key drivers of collaborative research between industry and public research institutions/universities. Such incentives are prevalent in many developed countries like Japan, Italy, Norway, the United Kingdom, Canada, Denmark, and etc. For example, Italy introduced 40% tax credit to companies carrying out research with universities or public research organizations; Belgium has recently simplified the scheme of tax incentives by applying a single 75% reduction of R&D wage bill for all category of researchers. Denmark and Hungary offer tax allowances of 200% and 300% of taxable income, respectively, for donations to non-for profit R&D organizations in Denmark and for joint projects with universities or public research organizations in Hungary (OECD, 2011).

Other factors hindering university-industry knowledge collaboration revealed by this study include the following: small number of researchers and scientists involved in the work at enterprises, inadequate awareness of the industry’s actual needs, and relatively low quality of research in Kazakhstani universities (Table 3). As was noted by the interviewees, companies in Kazakhstan do not trust local education system. Low knowledge levels of graduates point out to the low quality of training at the universities. There hasn’t been any sound research conducted by university researchers, which would contribute to the development of telecommunications industry. In case companies need consultations or any research to be carried out (e.g. marketing study or economics forecasting) they prefer to recruit professional organizations.

The above-described problems of knowledge collaboration can be seen as a vicious circle. Researchers and scientists from universities are not familiar with the industry needs; this results in a low quality research having no or little practical implication. At the same time, low quality research augments mistrust of companies to science and education system leading to few researchers and scientists in the enterprises. Without having access to enterprises researchers and scientists cannot become familiar with industry needs and solve real-world problems. At this point a new cycle starts.

Although the study discovered a number of factors hindering university-industry interactions, there were also some positive aspects found. As seen from Table 3, the respondents disagree that management of companies is often negatively disposed towards cooperation with universities. The participants of the survey said: “We are open but universities do not show any interest in cooperation”. Another positive aspect is that companies perceive themselves

as market oriented enterprises studying the needs of customers and trying to satisfy them.

5. Conclusions

The study showed that telecommunications companies commonly have positive attitudes towards university-industry collaboration. Large firms have more positive perceptions rather than smaller ones indicating higher willingness to collaborate with universities. This is consistent with the results of Adams *et al.* (2000), Leiponen (2001) and Guena *et al.* (2003). In contrast to the findings of Veugelers & Cassiman (2005), local firms are less positively disposed towards university-industry interactions in comparison with foreign firms. This may be partially attributed to the lack of tradition of such relationships in Kazakhstan.

Factors hindering university-industry collaboration in Kazakhstan are similar to those in Slovenia (Renko, 2004): university researchers and scientists are not familiar with industry's actual needs; the government does not stimulate companies to collaborate with universities. In addition, as was revealed by our study, low quality research in Kazakhstani universities increases mistrust of companies leading to fewer researchers and scientists involved in the work at enterprises.

Taking into consideration the results of the study, it is essential to revise government programs and strategies to foster collaboration between industry and universities. There is a need in thorough scrutinizing successful experience of Western countries and considering the applicability of their policy to Kazakhstan given the local context. Tax allowances and/or tax credit may be considered among the possible options for stimulating university-industry collaboration in Kazakhstan.

One of the main limitations of the study is its representativeness. Even though we assume that the sample is representative because Almaty city is usually considered as representative of the whole Kazakhstan, some results may not reflect the opinions of the whole population.

Future research may focus on the development of mechanisms and tools to increase the incidence and effectiveness of university-industry interactions. Also, a similar study may be conducted to reveal the attitudes towards university-industry collaborations in other industries.

Acknowledgements

I would like to thank Professor Dr. Tatibekov B.L., the head of Department of Management at Süleyman Demirel University in Kazakhstan, for providing valuable support throughout the research process.

References

- Adams, J., Chiang, E., & Jensen, J. (2000). The influence of federal laboratory R&D on industrial research, NBER working paper 7612.
- Arundel, A., & Bordoy, C. (2002). In-house versus ex-house: the sourcing of knowledge for innovation. In J. de la Mothe, A.N. Link (eds.). *Networks, alliances and partnerships in the innovation process*. Kluwer Academic, Boston, 67-87.
- Bruneela, J., D'Esteb, P., & Saltera, A. (2010). Investigating the factors that diminish the barriers to university-industry collaboration. *Research Policy*, 39 (7), 858–868. doi:10.1016/j.respol.2010.03.006
- Cimoli, M. (Ed.). (2000). *Developing innovation systems, Mexico in the global context*. London: Pinter.
- Cohen, W.M., Nelson, R.R., & Walsh, J. (2002). Links and impacts: the influence of public research on industrial R&D. *Management Science*, 48, 1-23.
- Etzkowitz, H. (2008). *The triple helix: university-industry-government innovation in action*. New York: Routledge.
- Geuna, A., Fontana, R., & Matt, M. (2003). Firm size and openness: the driving forces of university-industry collaboration. SPRU Electronic Working Paper Series No. SEWP 103. doi: 10.2139/ssrn.479261
- Hall, B.H., Link, A.N., & Scott, J.T. (2001). Barriers inhibiting industry from partnering with universities: evidence from the Advanced Technology Program. *Journal of Technology Transfer*, 26, 87-98.
- Innovative Industrial Development Strategy of the Republic of Kazakhstan for 2003-2015, Astana
- Kaymaz, K., & Eryiğit, K.Y. (2011). Determining factors hindering university-industry collaboration: an analysis from the perspective of academicians in the context of Entrepreneurial Science Paradigm. *International Journal of Social Inquiry*, 4(1), 185-213.
- Laursen, K., & Salter, A. (2003). Searching low and high: why do firms use universities as a source of innovation? Paper presented at the 3rd European Meeting on Applied Evolutionary Economics, Augsburg, Germany 10-12 April.
- Leiponen, A. (2001). Why do firms not collaborate? Competencies, R&D collaboration, and innovation under different technological regimes. In Kleinknecht, A., & Mohnen, P. (Eds.). *Innovation and Firm Performance. Econometric Explorations of Survey Data*. London: Palgrave

- Link, A.N., & Tassej, G. (1989) *Cooperative research and development: the industry, university, government relationship*. Norwell, USA: Kluwer Academic Publishers.
- López-Martínez, R.E., Medellín, E., Scanlon, A.P., & Solleiro, J. L. (1994). Motivations and obstacles to university industry cooperation (UIC): a Mexican case. *R&D Management*, 24, 17–30. doi: 10.1111/j.1467-9310.1994.tb00844.x
- Lorentzen, J. (2009). Learning by firms: the black box of South Africa's innovation system. *Science and Public Policy*, 36(1), 33–45.
- Meredith, S., & Burkle, M. (2008). Building bridges between university and industry: theory and practice. *Education + Training*, 50(3), 199-215.
- Mohnen, P., & Hoareau, C. (2002). What type of enterprise forges close with universities and government labs? Evidence from CIS 2. MERIT-Infonomics Research Memorandum Series, August.
- Muchie, M., Gammeltoft, P., & Lundvall, B.A. (Eds.) (2003). *Putting Africa First. The Making of African Innovation Systems*. Aalborg, Denmark: Aalborg University Press.
- Nazarbayev, N.A. (2012). The Address of the President of the Republic of Kazakhstan N.Nazarbayev to the peoples of Kazakhstan. Strategy "Kazakhstan-2050", December 14, 2012.
- OECD (2011). OECD testimony to the US Congress on R&D tax incentives, September.
- Renko, P. (2004). Transfer of new knowledge from research institutes to enterprises (Master thesis). University of Ljubljana, Ljubljana.
- Scott, J. C. (2006). The mission of the university: Medieval to postmodern transformations. *The Journal of Higher Education*, 77(1), 1-39.
- Ślusarek, J., Sobota, B., & Mendec, E. (2010). Collaboration between universities and industry based on experience of the silesian university of technology. *International Conference on Engineering Education*, July 18-22, 2010, Gliwice, Poland.
- Strategy of Kazakhstan Development till 2030 – "Kazakhstan-2030". Retrieved from: http://www.akorda.kz/ru/category/gos_programmi_razvitiya
- Veugelers, R., & Cassiman, B. (2005). R&D cooperation between firms and universities. Some empirical evidence from Belgian manufacturing. *International Journal of Industrial Organization*, 23(5-6), 355-379.