How the transaction cost theory can help us understand the regional technological changes in the post-socialist economies?

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Abstract:

This paper focuses on the development of the conceptual framework for the analysis of the regional technological changes in the post socialist economies based on the transaction cost theory. Despite the relatively strong economic growth, these economies are characterised by low innovative performance and fragmented innovation systems. According to the literature, innovations are considered to be collective process, which requires the mobilisation of number of knowledge agents. Technological development of the regions is determined by the capacity of the agents to organise in such systems in which the knowledge transaction costs are low. These costs include all costs associated with searching, interacting or contracting the important agents which are needed in order to produce new bits of knowledge. Turbulent and uncertain technical, commercial and regulatory environment in transition economies sharply increases the knowledge transaction costs. As a result firms tend to buy ready to use technology solutions or to innovate internally. High levels of uncertainty also caused that even if economic agents have the same degree of risk aversion as the agents in the western economies, the research, technology development and innovation business expenditures were much lower, because the risk of failure was much higher.

Key words: regional technology development, transaction costs, post socialist economies, collective knowledge

JEL Classification: D23, O33, P25, P31

1 Introduction

Transaction cost economics is built on the idea that all economic exchanges are characterized by some degree of costs associated with them. The exchanges in the economy are organized in a way that minimizes these costs. The COASE [1] and WILLIAMSON [2] approaches show that the transactions are in principle to be carried out through the market or within the firm, depending which mechanism is characterized by lower transaction costs. This approach is based on two basic behavioural economic principles and the principle of bounded rationality [3] and the principle of opportunism. Low level of information (and knowledge) in the system increases the problem of bounded rationality. Decision-makers lack the ability and resources to arrive at the optimal solution; they instead apply their rationality only after having greatly simplified the choices available.

Opportunism of agents indicates a problem that they can prioritize own interests, may lie, cheat or steal. If the market exchanges among firms are risky they will require high levels of investment to secure them, transaction costs will be high. In that case, such exchanges take place outside the market in other non-market structures, in principle as hierarchical (e.g. in a firm) or as hybrid contracts (e.g. long-term contracts). In order to reduce transaction costs institutions are established within the economy. NORTH [4] defines institutions as the rules of the game, which may be both formally legal anchored, as it can also be an informal social norms. These institutions regulate individual behaviour and structuring social relationships. NORTH distinguishes between institutions and organizations, the latter are considered as such groups, which are designed for coordinated action against other teams. Organizations include companies and various associations, clubs, universities, trade unions and so on. Institutions are the rules of the game and organizations are the players. Once the institutions are created they remain relatively stable because the change brings a variety of costs. The institutional path dependency therefore comes out from positive network externalities and economies of scale arising from existing institutional arrangements. Our contribution seeks to explain the technological changes in transition countries from the transaction cost theory. This theory allows us to better understand the lower levels of endogenous technological development.

Central and East European countries passed dramatic economic development in recent years; this process was accompanied by the degradation of systemic relations between economic actors and with the creation of new systemic relations [5], [6], [7], [8]. Such regions are characterized by complex of problems such as low research activity, lack of specialization in research, lack of excellent laboratories, limited commercialization of research activities, the brain drain, lack of demand for research from the commercial sector, lack of financial and politic support from the government, lack of intermediaries, and so on. In these economies that have undergone an economic transformation from a planned economy towards market based, regions are often characterized by fragmented innovation systems [9], [10]. Despite available regional research capacities the knowledge diffusion in the business sector is limited. Regions lack significant knowledge-based clusters and are rather characterised by isolated innovative firms [11].

2 Innovations systems in transition. A transaction costs perspective.

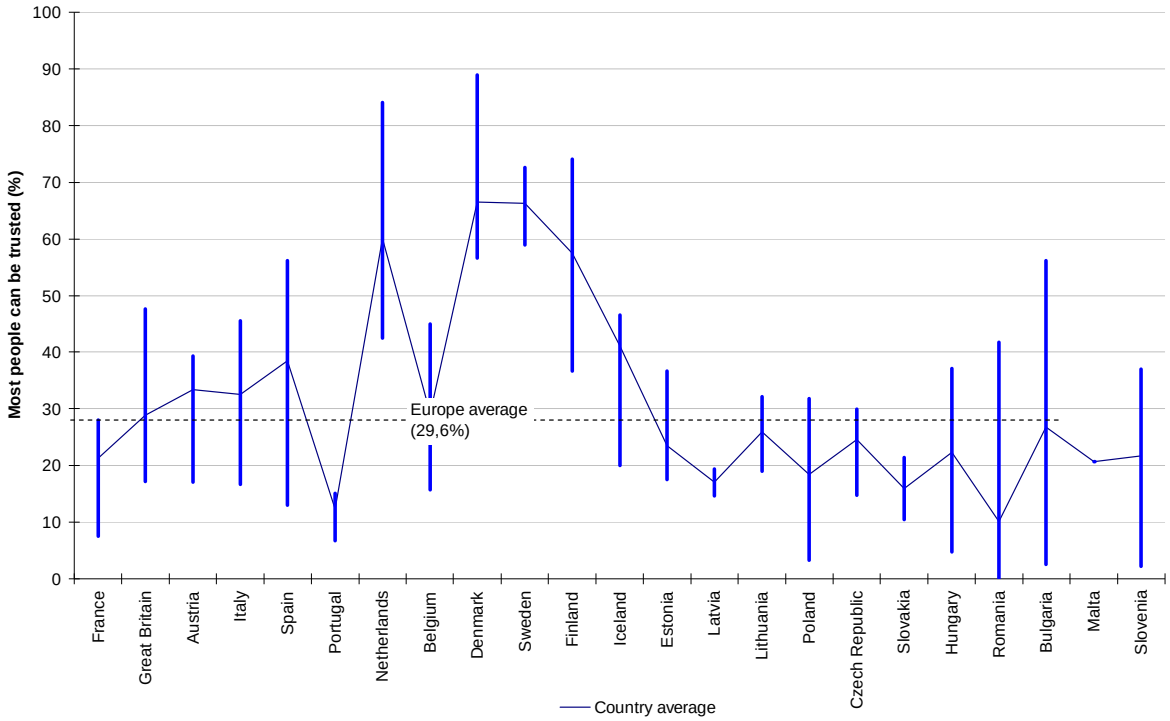
Economic mechanisms of centrally planned economies had a significant impact on the future development. All economic transactions, business organization, existing institutions and

market management products have been centrally planned economy. Companies at the beginning of the transformation period were facing an institutional earthquake [13]. Since the change of institutions has been a slowly developing process the companies find themselves in a very chaotic environment. Institutional changes were driven by the need of organizations to reduce transaction costs. However the development of institutions is influenced by existing institutional arrangements, this process is incremental and path dependent. Institutions tend to persist and their reform is problematic. Formal institutions can change very quickly however informal institutions are developing rather evolutionary.

Companies at the beginning of the transformation process have built long term relationships with its customers and clients that were part of the planning system. After the change of economic system, these relationships have changed, companies have changed their entire network of business relationships on the basis of cost requirements. As stated by EARL, ESTRIN and LESHCHENKO in [12] " *A principal task of transition is therefore the reorganization of the groups of productive units which comprised the enterprise sector in the formerly socialist economies through vertical and horizontal disintegration and reintegration to form an industrial structure in which the boundaries of the firm are set to ensure the costs within the new structures are at a minimum.* " Transactions between companies in the command economy have been created, managed, and enforced centrally. In the new system, however, enforcement of trade relations between the companies was problematic. There were, therefore, the high costs associated with searching for new business partners, the costs of negotiations and contractual arrangements. In this respect, the importance of confidence in interfirm relations increased, firms therefore build on previous collaboration or contacts. For example, research in Romania [12] showed that 55% of production of semifinished products was a result of contracts based on bilateral relations resulting from previous contacts or personal relationships. On the other hand, relations on the basis of the legal system comprised 22%.

Trust, norms and social networks are key components of social capital; these play a significant role in transactions between people. The trust between people among post-socialist countries evidently falls behind the level in the rest of the Europe, especially comparing to the Nordic countries. Based on the European Value Survey in 1990 the ratio of trust was approximately 10 percent points lower than the European average, which reached 36.5 % at that time. After ten years the level of trust between people in Europe decreased in

total to 29.6 %. Regional data show that regions with the highest level of trust in the EU as Bornholms Amt (DK), Utrecht (NL), Ringkøbing Amt (DK) reach values around 75%. On the other hand, a total of 15 regions in Greece, Romania and Croatia, the value is zero trust between people, hence there is absolute lack of trust. Above average of trust in the regions of post-socialist countries can be find in several regions of Bulgaria, where Razgrad region has reached a highest level (56.2%). Above average values are in several regions of Latvia, Poland, Hungary, Romania, Czech Republic, and Slovenia. Among the Slovak regions, the highest value of trust is in the Nitra region (21.4%), the lowest ranked Zilina region with 10.4%.



Graph: Most people can be trusted – regional extremes

Source: own elaboration based data from the European Values Study (2000)

Newly created institutions establish formal and informal rules that reduce uncertainty and create a stable structure for the organizations of transactions. The institutional reform in transition economies, therefore, seeks to reduce transaction costs in the market. Foreign investors, who began their activities in transition economies, have also had to face high transaction costs that resulted from efforts to adapt to the existing institutional environment [13]. They sailed from low cost awareness of local partners, the unclear legal framework, underdeveloped judiciary and corruption. According MEYER [13] in transition economies, the diffusion of knowledge is of particular concern because the institutional framework does

not provide for the efficient protection of intellectual property rights. Hence foreign investors prefer to internalise their transactions in high-tech goods and services. This includes the transfer of production know-how, assessment of market opportunities for innovative products, as well as the training of sales and service personnel.

Economic reforms accompanied with the shortage of financial resources during the transformation process resulted in the collapse of former innovation system. Innovation system has been subject to ideological planning and development of new technologies was organized in large firms. According HOGSELIUS [14], this system lacked the existence of small firms acting as specialist suppliers. These are usually considered to be a critical link in the innovation activities and participate in the further development and dissemination of new technologies.

Changes of the national innovation system have been associated with rapid destruction of the former system (interference with research institutes, breaking the original links between research and industry, and reducing research and development capacities in the industry). According DYKER and RADOSEVIC [15] it was mostly a passive restructuring process based on sudden shock combined with gradual reform but without fair "therapy" of the system. The scientific system has faced an external brain drain and also a significant internal leakage (within the economy), which was considered even more significant (see [16]). According several Slovak authors are analysing the changing position of universitie in the regional economies [17]. [18], [19], [20], [21]. Based on these results we can conclude that despite the low research quality, universities are gradually becomming a important agents in the regional networks. Our previous studies [22] showed that while in Slovakia the formal institutional relationships are rather irregular and infrequent, networking based on a personal reputation is relatively common. Since the company is a high degree of confidence and weak institutional support, personal relationships allow the transfer of scientific knowledge.

From the perspective of institutional economics such changes of institutions are characterized by high starting costs. The long-term existence of the system reduces transaction costs, on contrary the radical changes such cost increases. In addition, other major costs are also costs internal learning associated with the development organization and coordination costs incurred in the process of mutual adaptation of formal and informal rules [23]. These reasons suggest that regional economies which have passed through

transformation face barriers in establishing innovation systems. Another possible explanation is the network externalities. To reach positive network externalities in the new system is crucially dependent of the involvement of critical mass of regional players in the system. At the same time the individuals and organizations that have strong bargaining power in the old system will persist on running the system. There is therefore institutional path dependence.

Economic agents in the transition economies in order to increase their competitiveness implemented technological changes [24]. Since there was an economically uncertain environment, these changes were mostly based on the purchase of technologies from abroad instead of endogenous development of new ones. This resulted in the erosion and degradation of the original stock of knowledge and established networks from the past. High levels of uncertainty also caused that even if economic agents had the same degree of risk aversion as the agents were in western economies, they invest on the innovation related research much lower, because the risk of failure was much higher. The following table shows the evolution of the share of RTDI business expenditures in GDP in CEE countries compared to EU15. While in the EU15 we observe a slight increase in spending, we see that the RDTI business expenditures in CEE countries are much lower (except for CR and SI).

Table: The share of BERD / GDP in CEE countries

geo/time	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
BG	0,12	0,11	0,12	0,11	0,10	0,09	0,10	0,12	0,10	0,12	0,15
CZ	0,68	0,74	0,71	0,73	0,72	0,73	0,76	0,79	0,91	1,03	0,98
EE		0,11	0,16	0,14	0,24	0,22	0,26	0,33	0,42	0,51	0,54
HR						0,45	0,41	0,47	0,41	0,32	0,35
HU	0,30	0,26	0,28	0,35	0,37	0,35	0,34	0,36	0,41	0,48	0,49
LT	0,03	0,01	0,02	0,13	0,20	0,11	0,14	0,16	0,15	0,22	0,23
LV	0,09	0,08	0,06	0,18	0,15	0,17	0,13	0,19	0,23	0,35	0,21
PL	0,26	0,28	0,29	0,23	0,22	0,11	0,15	0,16	0,18	0,18	
RO		0,38	0,30	0,26	0,24	0,23	0,22	0,21	0,20	0,22	0,22
SI	0,68	0,70	0,75	0,78	0,87	0,88	0,81	0,94	0,85	0,94	0,94
SK	0,81	0,51	0,41	0,43	0,43	0,37	0,32	0,25	0,25	0,21	0,18
EU15	**1,16**	**1,17**	**1,23**	**1,24**	**1,25**	**1,25**	**1,23**	**1,21**	**1,20**	**1,23**	**1,23**

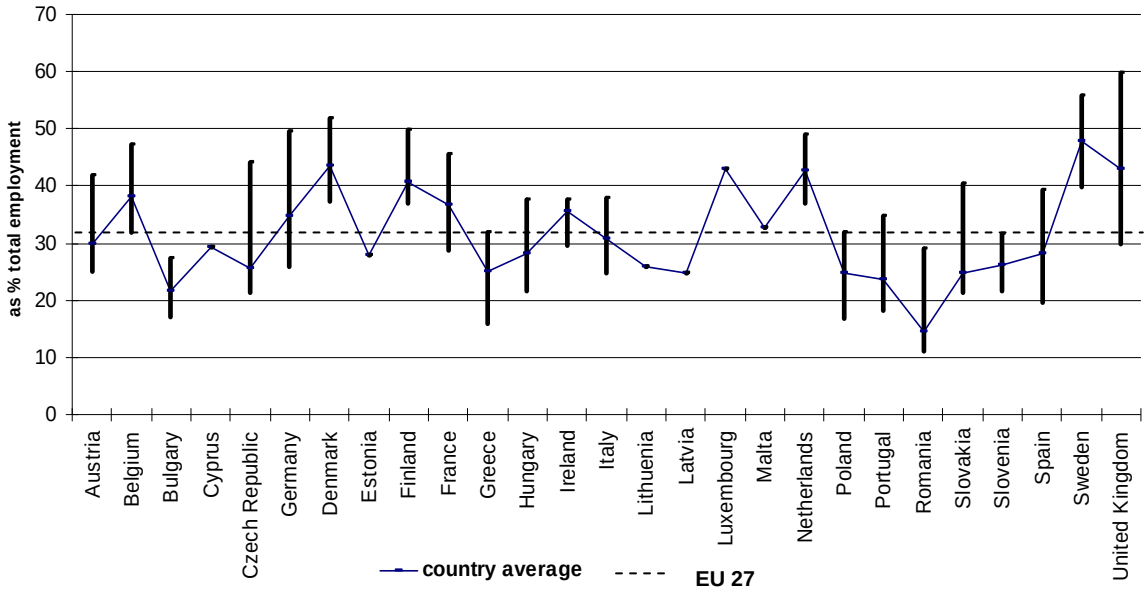
Source: Eurostat

Endogenous production of new knowledge in the post socialist countries, as the data show was not high. The economies however, were have imported the existing technologies. This in combination with lower labour costs and reduced production costs were the basis of price competition in the markets.

New knowledge markets – the emergence of KIBS.

Local knowledge interactions are despite the spatial proximity of actors in post socialist countries limited. Fragmented innovation systems are characterized by high costs associated with searching for economically useful knowledge in the region. Obtaining new knowledge outside their own activities is expensive due to high transaction costs and interaction costs. The existence of these costs allows the creation of knowledge brokering markets in which they KIBS operate [25]. The emergence of KIBS markets is therefore also response to turbulent and uncertain technical, commercial and regulatory environment [26]. The employment growth was almost twice that rapid in the KIBS than in the less knowledge-intensive services. In the EU27 the share of total employment in KIBS reached 32.94% (2007). In most developed countries of Europe it was even more, their share of employment has reached more than 40%. The leaders are Sweden with 47.83%, Norway and Luxembourg (45.98% and 43.02%). Post socialist countries are reaching an average value of 8 percentage points lower.

Figure: Employment in KIS-EU 27–regional extremes (% of total employment in 2007)



Source: own elaboration and calculation based on the Eurostat database

Absolute regional differences (between the regions with the highest concentration of employment and the regions with the lowest concentration of employment) are in EU

countries alike. We can observe the dominance of certain regions, particularly in new Member States. Among the regional leaders of the EU 27 are Inner London (UK 59.73%), Stockholm (SE 55.76%), Hovedstaden (DK 51.71%) and Åland (FI 49.92%). From the regions of new Member States above average concentration of KIS employment is in Prague (CZ 44.19%), the region of Bratislava (SK 40.53%) and the region Kozep-Magyarorszag (HU 37.44%).

Although we are aware of the possible statistical distortions due to different delimitation of NUTS II regions, the situation nevertheless shows us that there is a strong concentration of employment in knowledge intensive services in metropolitan regions. The spatial concentration of KIBS can be explained by the advantages of proximity of clients (KEEBLE and NACHUM, 2002 in MILLER), localized collective learning processes and high level of spin-off (p. 17). This situation shows us the analysis of employment concentration in knowledge-intensive high-tech services in the EU-15 regions and regions of new Member States in the period 2005 - 2007. The European leaders at the national level are traditionally appointed to Scandinavian countries as Sweden (5.08%), Finland (4.55%), Iceland (4.44%), Denmark (4.30%) and also the United Kingdom (4.28%). Average high-tech KIS employment in EU 27 countries together with Iceland, Liechtenstein and Norway is 3.30%. New Member countries are below this, the national leader is Hungary (3.28%), followed by Czech Republic (3.03%), Slovakia (2.71%), Croatia (2.17%), and Romania (1.51%). Despite the relatively low levels of employment in high-tech KIS in post-socialist countries, the regional leaders (usually the capital cities regions) reach almost the level of developed countries. In 2007 the Prague region ranked as the fourth and the Bratislava region ranked eighth in this order.

3 Conclusions

Innovation is considered as a result of intensive interactions among the different actors in the company and outside, and is therefore dependent on the environment in which business is located. The post-socialist countries are typical for fragmented innovation systems which results in the hierarchical modes of knowledge governance and lack of networks. Lack of demand for local knowledge indicates that firms prefer to purchase ready-to-use technologies or innovate alone. Local knowledge interactions are therefore limited despite the spatial proximity of actors. Joint bilateral, especially long-term R&D activities, are still lacking. Innovation systems are characterized by high costs associated with searching for economically useful knowledge in the region. Acquiring new knowledge from the regional

innovation system is expensive due to high transaction costs and interaction costs. Collective generation of new technological knowledge based on larger network interactions in post-socialist countries is a risky business from this perspective. The lack of trust among people hampers the cooperation activities and indicates potential costs emerging with opportunistic behaviour. According the main principles of transaction cost theory hierarchical organisation will dominate in the governance of the knowledge processes as they are more effective to solve potential conflicts. At the same time closed communities with a certain level of trust engaged in collective knowledge processes may be expected as well. The existence of high level of transaction costs allows the creation of demand for the advisory services, thus knowledge brokering markets in which KIBS operate can emerge.

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