

HOW ARE EDUCATION AND RESEARCH AFFECTED BY REGIONAL DEVELOPMENT?

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ABSTRACT

This article will discuss how education activity is combined with research in a transition period. The preliminary point of thinking is that the European Higher Education Area (EHEA) and European Research Area (ERA) are two pillars of the knowledge driven society, yet both of them are undergoing a troubled transition period. The manufacturing industry in Hungary has undergone restructuring. In consequence of this, the main sectors have begun operating by high added value activities. The relocation of industry and rapid development of international services in a low tax zone has raised demand for internationally experienced skill sources. Why is domestic education unable to feed this demand? How can national research and education be integrated more usefully? With the creation of a permeable border, both the transnational economy and the national experience were contaminated. Cross-border mobility is one element of internationalization. The author will raise some points related to the Hungarian situation on the basis of the "Salzburg Principles" for doctoral programmes. The main topic of this paper is how spatial restructuring has linked education output and technological relay. The presentation closes with some comparative recommendations on the trend experience. One such recommendation would be to integrate education and industry. This would provide more complementary skills and skilled workers who could in turn facilitate the growth of an integrated training and business strategy that would provide funds for both education and research in relevant fields. European and national funding rank the strategically and regionally operative priorities of development support from the top down, but project collaboration should be from the bottom up. There is a critical discrepancy between available funding and institutional and regional demand. The mutual benefit platform is missing.

Keywords: transition, human resources, relocation, mobility

JOINING TO MAJOR EUROPEAN R & D NETWORKS

Regions with strong knowledge base, complex research & development and innovation (RDI) capabilities enjoy comparative, and competitive position in the global competition. Due to the good accessibility, the low transport costs, the western border area of Hungary was highly impacted by *relocation of firms*. In the *local bargains* among the foreign investors, local authority and autochthon population in most cases were unbalanced. Most of them run for short profit, survival and the long-term strategy were developed a decade later.

Government has been taken more emphasis on strengthening regional capabilities in order to enhance their competitiveness and to attract the benefits of globalization and other economic processes in a broader part of the economy. As

we have learned from the *trendchart* report of innovation, the central effort is not enough. Actually this report of research & development in 2002 call the attention to new actors, a different strategy, namely the Lisbon dream - 3% of GDP for RD-should be not expected from central found, even more from the business sides (Rédei, 2007). So it based on a divided responsibility, corporate new actors, and formulates a different mutual benefit platform. This *double side pressure (central and business)* was felt also in the most advanced economies, while emerging countries were facing an even more serious challenge. This latter group of countries – Hungary among them – tried to launch policies and support programs in accordance with international good practices not only to enhance global competitiveness of certain regions but also to linkup local economies to the global environment (Inzelt, 2003). The distribution of winners and losers regions point out there is different capability. Hungary had double task; should join to global market and to go ahead on the inexperienced paths, transition from socialism to capitalism.

In the case of research was transition as well. Hungary had a centralized expenditure. Almost two-thirds of RDI expenditures and personnel are linked with the state effort; there was *slight contact by market demand*. This means that some regions of Hungary have a poor performance in this field which means.¹ At this time the key question was how to take the time on your side? First, how to reach a better position and how to keep it?

Hungary joined to the existing research framework programs, like COST, EUREKA in 1991, our OECD membership and Frascati manual was also published, Bologna process has started in 1996; which was highly contribute to development of network. Hungary, after Ireland, from 2002 was pioneer to introduce a reduced tax for SMEs in research activity usage. But there was a lack of research management experiences, network orientation.

At the end of 90's the knowledge based society was knocking on our “door”, but the driven was postponed it. The foreign production needed the eligible human resources; it was absorbed in a short period. The recruitment started directly from the universities in 1993, it was the opening of universities bourses. The two main pillars of HR development, education and research, became driving factor after 2006 by implementation of Bologna process (Rédei, 2002).

Hungary situated at geographical crossroads and at this time the economy was fairly internationalized. The knowledge driven process was opened by programs of Regional University Knowledge Centres (RUKCs), it tried not only to strengthen regional RDI activities but also to *improve university industry collaboration for better knowledge utilization*. The goals were concentrated around to polish their attraction or avoid the mass education on a decreasing level. The interactions among the universities are still on early level, no cross lecturing, the loss of capacity in

¹ In order to improve this situation Hungary has launched a number of programs in the past decade to improve the regional development process. In 1993 PECO framework project was announced and more than 12 thousand applications were sent to Brussels. The applications included several ideas and institutional description from Central Eastern European countries, by team profile. So the research networking in CEE started to be mapped.

Academy more concentrated on universities. The academic research institutes are not belonging to universities, which is a European regularity.

In the literature commonly used – categorization of networks is offered by Fischer (2002), differentiating five types of collaborations based on their horizontal or vertical character:

- buyer’s network,
- supplier’s network,
- production network,
- technology network, and
- research and development network.

To talk about the spatial networks is important to fix the working understanding of topic. The working definition is based on to create and stating their intention for a *long-lasting horizontal relationships among independent actors from the business and scientific fields with the aim to enhance the position and knowledge base of the partners through common research and development and innovation activities* (Hagedoorn, 2002; Kreis-Hoyer and Grunberg, 2002). In Hungary all kind of Fischer typology is operated. Finally, nowadays Hungary is not only formally but even more actively member of these networks.

TRANSITION AND GEOPOLITICAL ROLL

The *transition* is a time consuming process, which includes stock and flow elements. Stock like political switch, which is a declaration, building institutional background and take in force. Some other elements of transition were flow types, like economic transition, from central planning to market ones or ownership from state to private. The most time consuming process is the shift of value, the change of mind.

The *re-orientation* in economy was the main stream. Re-orientation means to lose the Russian partners in economic relations, and temporary loss of infrastructural lines towards east. Instead of that the European market became was extended. The story has begun in 1983 at the initiatives visit of World Bank in Hungary, in 1986 the big 6 was established the representative agencies in Budapest, in 1989 fall of Iron Curtain and economical and military dependence from Soviets. We are talking here about gain of process, but at that time Hungary was surrounded by several conflicted situation, collapse of Soviets, Balkan civil war, division of Checks and Slovaks, dependence of ex-Yugo countries. So meanwhile in Western Europe the *unification* was going on, in East the *disintegration*. In unification to forward the uniformities was challenging.

MOBILITY AND HUMAN CAPITAL

When in your home country there is no need for your skill, then you will *under-invest in human capital*. By permeable border it became clear the human resources make a value, started the foreign study, and early carrier development. Most of the Hungarian family made effort to send their kids in a better school, or even to study abroad. The ratio of private investment in education has reached 2% of the total

household income. From the transition period in Hungary, *optimizing individuals* became an important issue, although in Western Europe an outflow was expected.

Visible raising trend of *foreign study*, mostly on family investment, points out to the understanding of global selections. At same time, Hungary became a host country, especially for ethnics and Chinese. Both of them, a large scale institutional development were established. Systematic promotions are going on to recruit more international students; from China-natural sciences, Arab countries–technical, Nordic countries and Cyprus-medical, Germany, Austria-music, or dentist study. High proportion of low paid countries students, after finishing their study at Hungary, wants to settle down here.

As it was verified several cases touched upon the international business, the human resources and development have strong relation. The skill is a valid ticket for migration. By permeable border the highly skilled persons were the first who moved to abroad in well infrastructure centres. e.g. bio and genetic technology. At the same time the foreign development created at home an international climate for highly skilled persons, so we could temporary plug our best and brightest human resources in. In the first period, an *internal brain drain* became reality, later on for some ones global carriers were realized in abroad.

The international mobility of professionals and graduates is one of the most dynamic transnational types of movements. And this is the most effective way of the human development. The *global competition for talent, the expansion of the knowledge economy extended the need*. It is also well established that migrants move with one set of aspirations that may be altered by the experience of mobility. Nevertheless, the importance of various micro-level factors in sustaining mobility as a dynamic social process is rarely acknowledged in the literature.

There is contrast the original social interest behind mobility with the interests that emerge during the experience of professionals' and graduates' living abroad. I argue that even as they attach meaning to the experience of migration, the interests underpinning their mobility change. Their perception and continuous evaluation of their own labor market and social position at destination is the most influential factor that adds dynamism to the social process of mobility. Thus the original *drivers of change become changed drivers* of mobility, defining whether the mover settles, returns or pursues further migration in a global city (Csedo, 2007). The migration process like research activity is operating better in centres than in peripheries. There is a motivation to go to the centres of education, research or residence.

Circular mobility, many times to return to the country, is one of the main observed forms of eastern European labor migration (Illés, Kincses and Rédei, 2010). The results from different studies and surveys indicate that there is an increase in the current migration flows and those new types of migration (such as educational and seasonal) are increasingly coming to the fore. Migration surveys show that the main reason for wanting to leave is to be found in the low wage levels and standard of living in Hungary. The circular migration sum up several experience and by that contributed to make a better founded migratory decision. In the case of expatriated have a high importance, who are enrolled in step a new country?

What kinds of knowledge might migrants transfer? Is there any evidence that global talent can boost a regional knowledge economy? Is there any evidence that

policies can significantly shape skilled migration flows and what other effects might they have? Given the way that new motilities of global talent have evolved, how should policies to attract skilled transient labor be modified to be more effective in serving the interests of host regions (*Findlay and Geddes, 2007*)?

At the same time, Hungary's rapid economic development increases domestic labor demand, particularly within a handful of branches (especially construction, service, and retail). Therefore, migration is becoming a matter of increasing political concern within the country. General changes in migration policy are particularly urgent, and should be integrated within and aligned with regional policy (*Krisjane, 2007*). And that is the point to reflect in *evidence that global talent can boost a regional knowledge economy*. So the low qualified migrants loss their chance for work. Some of them moved to shadow economy.

In emerging economy, like enlargement countries join to the *free flow area*, offer good examples how the four elements of flow, capital, labor, services and goods have to be interacted. Many of habitants work abroad and, although the exact numbers are not known, various experts set the figure at 250-300 thousand. One of the best evaluator is the amount of remittances. Ireland and Great Britain have been particularly popular destinations. What was initially not expected, but which has increasingly become evident, is that the current migration story is having an impact on the domestics labor market, as well as on that of the receiving countries, for which moderate structural changes were expected, and possibly exaggerated.

Hungary is developing a new "Talentis" program - *Hungarian Silicon Valley* -, the plans is to attract young talented people from neighboring countries or far, put them in excellent circumstances to develop them in an early life period. By permeable border, we support the brain circulation like an effective form of human capital development. A framework called Project Retour – *Homecoming* -program, is dealing with how we shall manage the central and individual interest in our homecomings. The National Technological Office launched a program for those emigrated researchers who spend more than 4 years in abroad, support them to came back to be involved in research.

The foreign study has different approaches in gradual and post gradual level. The main approach is that it supports the institution's budget and also places it on a better international ranking, developing world wide contacts, while post-graduation is important to the country level concerning competitiveness.

Finally what is the *global talent*? It means, on global standards a good command of transferable skills We agree on avoiding the process of regional disparities in the world, we should take in progress the compensation of education cost from host to sending country. e.g. to pay back the cost of study, if you leave the country after the graduation.

FDI IMPACT ON SPATIAL STRUCTURE

As it is known (*Nijkamp, 1988*) the *manufacturing industries* near the main market have a meaning full spatial and branch restructuring process. It was verify in the emerging countries at the turn of millennium (*Rédei, 2002*). The volume and content of international trade shows Hungary's high level of integration. The permanent

FDI in the country, especially in the manufacturing structure, verifies the presence of global interest. In the first period of transition at the western border area was mostly in the labor-intensive textiles, and food branches, but by the mid-nineties had shifted towards the machinery and services sectors, which have more technological value added. In the first half of the last decades the food industry's presence was increasing in most regions; in the second half of the nineties the machinery sector became more important, attaining a meaningful position, especially in the western part of the country. In some branches the global chance which transnational firms will buy the market, and to move to the next one, had been played in e.g. sugar, textile, chocolate. The FDI was regionally concentrated near the western border and in the Central region. This was due to the extra profit obtainable there, as well as to the area's low competitive barriers, low local costs, comprehensive business trust, living standards, traditional working style, qualified labor and better access to the European core market. These regions have a historical background within the Austro-Hungarian Empire, and have more experience with the market economy.

FDI can be evaluating as a positive and negative effect. It is doubt about FDI is contributed to *avoid Hungary from a deepening crisis in 1992-93*. Hungary was able to avoid brain drain and put their talents to member of regional decision board. FDI is not only a capital injection for regions, but also provides international competition within many sectors of production. The regional disparities are increasing. In the west, where the big transnational companies are affiliated, their size, efficiency, *intra-firm arrangements*, outsourcing, technological expectations and global management style are creating an international standard of mass production. In the east, smaller local companies are at an earlier stage of supply chain management, with inferior living conditions and less value-added activity. Their size, ownership and competitiveness are interdependent.

From a geopolitical point of view, it is important that the neighboring countries' economies have no pulling effect. *Horizontal regional specialization* can be better verified by export values than by employment data or industrial production. Instead of the earnings level, the standard of living should be the basis for comparison. The Great Plain has an early level of specialization, with a low level of industrialization. In 1998 the greatest geographic concentration occurred for the chemical industry, the wood, paper and printing industry and for mining and quarrying.

EUROPEAN HIGHER EDUCATION AND EUROPEAN RESEARCH AREA

Our country has been a long period being the last stop of West and first stop of Balkan region. The interaction and contamination was the main motivation in Hungary. We have been joining, and advocating, have done efforts to learn the procedure to get international partners. In some cases the missing local co-finance, the contacts development was fairly rapid. It was a *beneficiary position* for Hungary, before the membership, the rules of project based on composition two members and one non-member. The research coordinators, the team workers are the main contacts.

The techno intensive branches of manufactures have a growing evidence for research, to build permanent channel from science to the everyday routine. Around the headquarters started to establish a core research team. The technological diffusion was an engine of better position. In the investments the business services and R&D has become more and more important. Several transnational companies choose this region to establish new R&D centres; the regional innovation system became reality. In the global R&D system the role of Central Eastern Europe, especially Hungary is increasing. Foreign affiliates have become very important participants in the national R&D system, accounting for nearly half of business expenditure on R&D in Hungary. In the manufacturing these rates are much bigger. These firms are very concentrated regionally and sectorally: regional clusters start to form which are enlarging owing to new investors and subcontractors who also relocate their activities to Hungary, exploiting the external effects (*Kukely, 2008*).

In the first half of 90's two counties near the European market and central location had *regional specialization* and reached the top regions. The geographical position appreciated and provided a good position. The auto assembling and the supply chain management became an issue.

Meanwhile in early 90thies the collapse of R&D was experienced the loss of researchers, the central support of research and SMEs were too weak to take consideration on it. Time to time the confidence in industry and in services was rising, some company re-engineering the former R&D, like GE. The research institution losing the central finance, turn and learn more about the market interest. Not only to take the money and run, but invest more in your mind, enterprise, learn the voice of venture.

By the fact that more and more TNCs affiliated and *relocated* or newly established firms here, they took their former global network to Hungary. The international business climate developed the domestics' environment. The interaction was highly oriented by the most experienced players. Nevertheless they trained the local actors, too. Several evidences sup up our capacity and adsorbents. The habit of Hungarians is the low internal and international mobility. Although, mass education was going on, the local labor market we can experience mismatch. The immigrants could temporary feel the gap, but for highly skilled the re-engineering is needed. It is an interesting result of our analysis on small territorial level the centres get the 80% of the better ratio of immigrant population. The young, over the average skilled people settling in the centres and the periphery is for elderly migrants from Austria, Germany and Netherlands (*Kincses and Rédei, 2010*). The silver economy is one of the economical options for next generation. 40% of Hungarian population in 2050 will be over 60 ages!

Nowadays the free flow area is fully open for Hungarian labor force. It is not expected in Western Europe any *migratory cunami* from East. There is a high probability that the illegal employment will be legalized from the shadow. What we see now? Those who were employed illegally in Austria they became legalized members of market, and a few new employee in typical sectors, like services started to work.

Why is domestic education unable to feed this demand? In the past two decades the number of universities was rising from 40 to 70! Beyond the mass education

there was not effort for *individual care of talents*. And the talents are in global business process an engine roll. Many advanced economies such as the UK have modified their skilled migration programmes to try to *attract more global talent* on the premise that they benefit economic growth through stimulating innovation and increasing the stock of human capital (OECD, 2002).

The academic literature has shifted from interpreting highly skilled international migrants as an integral part of the hierarchical ordering of international economic space to seeing them as global agents within transnational networks. The shift is a significant one since it raises the issue of how knowledge is transferred through the migration process.

HOW CAN NATIONAL RESEARCH AND EDUCATION BE INTEGRATED MORE USEFULLY?

The quality management was introduced in the education after 2000. The actors of business are be certified on somehow from the mid of 90thies. All accreditation procedure need to complete a skill, and by usage of new technology required training. In was a crucial question for those firms, which have high added value in their activity. The quality of staff members could not follow the expansion of institutional development, namely the new specialization, faculty and graduation. The usefulness of BSc was not clear on labor market, how to employ this qualification? On MSc level the interest towards the natural sciences decreased. The interaction between the labor and education is in an early level.

The international companies are the flag on this action, to support skill working a specialization, in this way they could recruit eligible workforce. The TNCs are *highly supporting vocational training*; they are donating several machinery and technical assistance. It is an aspect to find work force in 100-150 km. As it was mentioned the Hungarians are no mobile persons and the value of real estate is territorially much differentiated. It is difficult to sale own home and to buy another near the opportunities, due to the value differentiation. In Hungary the ownership of flats or houses are extremely high, near the 80-90%! And by global financial crisis this situation is not better at all. We can talk about a real estate boom near the border area; the commuters are residing on the other side of the neighborhood. So the former border area loss his cutting rolls, and became an *active contact zone*. The real estate started to flourish. The commuting is across the border speed up. And the main economical actors recruited their workforce in a new way. Probably the firms are looking for flats and houses to rent in 150 km distance from the local people for far commuters. This chain based on contracts and personal trust.

When the government launched a new major program in 2004 for the establishment of *Regional University Knowledge Centres* (RUKC) they targeted already established partnerships on which these new networks could be built. (The program was later renamed to 'Pazmany Peter' program). The main aim of this program is to *create regional knowledge centres with the collaboration of university, industry and government partners (universities as main actors) for high-level R&D and innovative activities for the benefit of their regional environment*. The program targets networks that bring together the

whole 'innovation chain' and concentrate a critical mass of financial and human resources. The program aimed to achieve the establishment of *long-lasting structures* that will exist beyond the duration of the governmental support as well. This program has a *strong regional focus* within supporting networking. The 5 chief universities were labeled as Research University in 2005. They are forced to learn how to do the fundraising, project and research management, and to run more implementation of research result. Meanwhile the chief research centres made effort to reach the label of centres of excellence or Marie Curie training centres or some other, which was an essential tool to join the European network. And the international enterprises have more confidence such institutions. In European experience the horizontal career are highly supported, which means to start on a general range, get more experience and then you can better find your ability place on working market.

In 2005, the *Salzburg Principles* were established in Bologna Process as the basis of the reforms for doctoral education. In the half decade that has passed since then, Europe's universities have carried out wide ranging reforms in this area, most notably by establishing doctoral schools. The achievements and experiences of Europe's universities affirm and enrich the original principle. The mutual benefit among the actors international investors are missing, the local economy is not partner. It looks EU sources are in wide range but it looks to put their local co-financing makes difficulties. The project monitoring shows how the individual interest overwrites the common use.

The recommendations, including a series of clues to success and obstacles to clear, have three over-arching message:

- The doctoral education has a particular place in the ERA EHEA, and makes it a fundamentally different from the first and second cycles. We experienced in Hungary after the institutional boom, there was a comprehensive interest to establish doctoral school. The several withdrawals of National Accreditation Office point out it make difficulties to fill the staff by expected lectures. This procedure is time consuming.
- Doctoral candidates must be allowed independence and flexibility to grow and develop. The doctoral education is more individual, the candidates must look for their goals and to provide the cost to take it. And at this point among the doctoral school are much differentiated as it looks in the origin of certification. More or less those who are offering support they know the activity is how helpful for them.
- The last on is, the doctoral schools must be developed by autonomous and accountable institutions taking responsibility to cultivate the research mind-set. In Hungary the schools have no time to develop an own profile, the professors have an important role to construct a workshop, using their scientific relation and reference to push their student forward.

The universities reported, if they are too successful to won more projects, they are not able to establish own research found, to keep the new result, methods in the wall of universities. If the new result is beyond the wall, the patents or some others will be independent from the universities. They had reported the most effective

stories are beyond the wall, move to an SME from the campus. The research capacity of universities is limited. The best case if the new result is able to penetrate the daily routine.

CONCLUSION

The national regional policy after 1990 had high expectation, namely the European integration process will contribute to resolve the spatial disparities. The European regional policy in 80's had remarkable results on this field. And what we have identified the traditional inequalities remain characteristics. In the two decades transition period, each regime preferred the development of local economy. The main stream was around combining the TNCs and SMEs in a network. The strategic and operational goals of National Development Plan had chosen as button up actors the SMEs to join to global economy. This policy based on demand and offer experience in the framework of catch up EU standard. In local bargain the advocating roll of domestic actors was on an early level. The lagging areas situated along the eastern border, which have not so intensified cross border activity.

What we have learned the education and research as social - human and technical innovation affected the regional disparities. More or less the regions had taken effort to develop and use effectively the human resources, by techno intensive step extend the production. Some of them attracted the FDI as a low paid area and manufacture was planted. The regions on western border have good access to the European core markets this situation is permanently implied the innovation. There are top investors, who represent the business trust for others, with sizeable companies and supply chain management or for specialization.

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