

# Foreign Investment of Hi-Tech Enterprises as the Source of Knowledge Transfer to the Region—Opolskie Voivodship Case Study

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## Abstract

*Article's aim is the critical analysis of the literature and case study of the knowledge transfer issue into Opolskie Voivodship by foreign investment of the hi-tech sector. To illustrate such undertaken problem the role and a place of knowledge transfer and high technologies sector as the factor having an impact on development of the region was discussed. Enterprises—foreign investors—are the source of the knowledge for human capital of the region, and because of that for enterprises of the region. There also will be pointed the practical example from Opolskie Voivodship, at the base of knowledge transfer by hi-tech enterprise into Opolskie Voivodship. After such stated analysis it is possible to state that foreign investment of hi-tech sector and knowledge transfer to region being their consequence, constitute actual field of scientific interests. As the pro-innovative action it is simultaneously the field of the mutual co-operation of hi-tech sector and regional economy. Interactions of these subjects are important not only from the point of view of mutual benefits, such as knowledge transfer by the side of regional economy and economic benefits, including those connected to regional human capital, by the side of hi-tech sector. Thus foreign investment of that sector can be pointed as the source of innovation, know-how and knowledge transfer, but also as the engines of social and economic changes in the region.*

**Keywords:** foreign investment, knowledge transfer, high technology sector, regional economy

**JEL:** O31, F63, L26

## Introduction

Foreign investment are seen as a catalyst for economic growth in the future and consider as a key driver of international economic integration. There exist two ways of classification of foreign investment, direct and indirect (Kourtit and Nijkamp 2013, 763). Foreign direct investment (FDI) are physical investment and purchases made by a company or individual in a foreign country in business interests, in the form of establishing entrepreneurial operations, opening plants, buying buildings, machines and other equipment. Indirect investments are when enterprises purchase positions or stakes in companies on a foreign stock exchange. Direct investments are usually a longer-term investment because of longer term needed for selling them.

Article's aim is the study of the issue of the foreign investment of the hi-tech sector in region as the specific form of knowledge transfer into the region. Foreign direct investment can provide financial stability for region, promote its economic development and enhance the wellbeing of societies with the right policy framework (Jasińska-Biliczak 2012, 68). The influence of foreign direct investment in many cases reflects the health of the host economy and the sustainability of their

fundamentals. Foreign direct investments are indicator of external economic confidence in the domestic business environment (Bernat 2016, 25). The reasons for the location of foreign direct investment vary and often change over the time (Bauer, Lang, and Schneider 2012, 288). Which is due to the development of the business environment and its conditions.

Foreign direct investment is a key element in this rapidly evolving international economic integration, also referred to as globalization. FDI provides a means for creating direct, stable and long-lasting links between economies. Under the right policy environment, it can serve as an important vehicle for local enterprise development, and it may also help improve the competitive position of both the recipient (“host”) and the investing (“home”) economy. In particular, foreign direct investment encourages the transfer of technology and know-how between economies. It also provides an opportunity for the host economy to promote its products more widely in international markets. Foreign direct investment, in addition to its positive effect on the development of international trade, is an important source of capital for a range of host and home economies.<sup>1</sup>

Although there is often discussion about the positively phenomena associated with foreign direct investments, progression and changes in the lifecycle, foreign direct investment are also reflected their negative effects. The host economy can benefit from foreign direct investment through debt financing of investment activities,<sup>2</sup> increased export performance, increased job creation, increased labor productivity which may be achieved by transfer of knowledge.

## 1 Knowledge transfer: the instrument of regional development

Knowledge sharing is one of mankind’ development pillars. As a scientific problem knowledge transfer has been discussed since the time of the philosophical debates lead by Aristotle and Plato. Nowadays it is still present in scientific discussion. It is worth to point at influence Harvard Business Review article where we can find thesis that “Explicit knowledge is formal and systematic. For this reason, it can be easily communicated and shared. . . . This helps create a “common cognitive ground” among employees and thus facilitates the transfer of tacit knowledge.” (Nonaka 1991, 52). Literature of the subject is pointing lots of presentations comprehending the transfer of knowledge. It is defined as the knowledge transfer process—it is regarding the knowledge transfer as itself as well as making knowledge available to other persons in addition the transfer includes two natures of the actions—transmission and the absorption, where transmission is sending or introducing the knowledge the potential user, whereas the absorption consists in accepting knowledge to the purpose of its subsequent use (Dalkir 2005, 81). So the transfer of knowledge is possible to identify as planned combination of knowledge and this knowledge management for obtaining the economic profit (Tangaraja et al. 2016, 569). It is also necessary the closeness such values as knowledge to enterprises. Scientific discourse, research and economic development directed may be the base of research oriented introduction or improving product for the company (Jasińska-Biliczak 2014b, 146). Research allows to state, in accordance to Liyanage (2009, 37), that knowledge transfer is the conveyance of knowledge from one place, person or ownership to another person, enterprise or region.

## 2 Methodology

For achievement of aim of present article there will be used the literature review from the scope of knowledge transfer, foreign investment and high technology enterprises. There also will be used review of European Union documents from that scope (desk research). There was undertaken the case study from the high technology sector in Opolskie Voivodship as the example of the knowledge transfer from that sector into the region (case study).

1. See: OECD Benchmark Definition of Foreign Direct Investment. Fourth Edition, 2008, page 4, [©:] <https://www.oecd.org/daf/inv/investmentstatisticsandanalysis/40193734.pdf>.

2. See: Horizon 2020 Work Programmes published at <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/promoting-gender-equality-research-and-innovation>.

### 3 High technology enterprises as regional investors and source of knowledge for regional companies

High technology is understood as technology that is at the cutting edge: the most advanced technology available. The first occurrence of the phrase is in a 1958 The New York Times story advocating “atomic energy” for Europe (“Atomic Power for Europe” 1958, 12). The sector of high technology is the sector using or involving advanced methods and the most modern equipment (Wolf and Terrell 2016, 5). The hi-tech sector of the economy develops or uses the most advanced technology known, it is often seen as having the most potential for future growth. This perception has led to high investment in hi-tech sectors of the economy. Hi-tech startup enterprises receive a large portion of venture capital. However, if investment exceeds actual potential, as has happened in the past, then investors can lose all or most of their investment. Hi-tech is often viewed as high risk, but offering the opportunity for high profits. OECD has two different approaches to high technology: as the sector and as the product (industry) (Rokita-Poskart 2015, 28). It is believed that high-growth enterprises, by their extraordinary growth, make the largest contribution to net job creation in the region. They are characterized by exceptionally favorable economic characteristics (Szewczyk 2014, 238).

“European Union had almost 46 000 enterprises in hi-tech manufacturing in 2014. Four countries — Germany, the United Kingdom (UK), Italy and Poland — together account for around 53% of the high-tech sector in the EU-28. The UK has the most enterprises in the high-tech knowledge-intensive services sector (180 257 enterprises), followed by France (141 647) and Germany (112 570). . . . Turnover in the high-tech knowledge-intensive services sector was higher than for high-tech manufacturing in all countries for which data are available, except the Czech Republic, Estonia, Hungary and Slovakia. Knowledge-intensive services generated a production value at least three times higher than high-tech manufacturing in the UK, Portugal, Lithuania, Greece, Spain and Romania”<sup>3</sup> (see also: Stverkova, Kribikova, and Humlova 2012, 516).

Hi-tech industries are expanding most strongly in international trade and their dynamism helps to improve performance in other sectors. Their influence at regional development is base at the “Europe’s growth strategy,” which sets out a vision of Europe’s social market economy for the 21st century underpinned by three mutually reinforcing priorities:

- smart growth — developing an economy based on knowledge and innovation,
- sustainable growth — promoting a more resource-efficient, “greener” and more competitive economy, and
- inclusive growth — fostering a high-employment economy, delivering social and geographical cohesion (*Europe 2020: Europe’s Growth...* 2014).

Not only main tasks but also the structure of analyzed sector have got the influence at its role in the investments’ region. The structure of high technology sector for region being the example of practical path of knowledge transfer from foreign investment to the region is presented at figure 1.

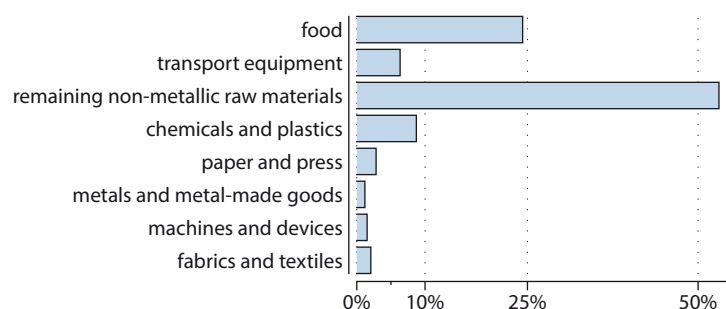


Fig. 1. Structure of hi-tech sector for Opolskie Voivodship

Data source: Bernat and Kania (2005, 37)

3. High-tech statistics — economic data, [a:] [http://ec.europa.eu/eurostat/statistics-explained/index.php/High-tech\\_statistics\\_-\\_economic\\_data](http://ec.europa.eu/eurostat/statistics-explained/index.php/High-tech_statistics_-_economic_data).

Because of so pointed and realized by hi-tech sector aims, enterprises, by their investment in regions in which they settled their branches, realize knowledge transfer to regions (Jasińska-Biliczak 2014a, 327). One of the example of so understanding knowledge transfer is the example of know-how included into the processes occurring in the enterprises towards other co-operating regional enterprises.

#### **4 The example of regional B2B knowledge transfer — Opolskie Voivodship case study**

Presented case study was undertaken in the company x,<sup>4</sup> which is the foreign investor in Opolskie Voivodship. It has got its branches in Germany, Czech Republic, Poland, USA. The enterprise is representing the hi-tech sector in analyzed region. The case study is provided by authors as the illustration of the research issue for needs of the present article. Internal audit is presented as the example of innovation at the level of the enterprise (by using it as the process) and as the knowledge transfer (management system, standardization system) from foreign, hi-tech industry, to the region.

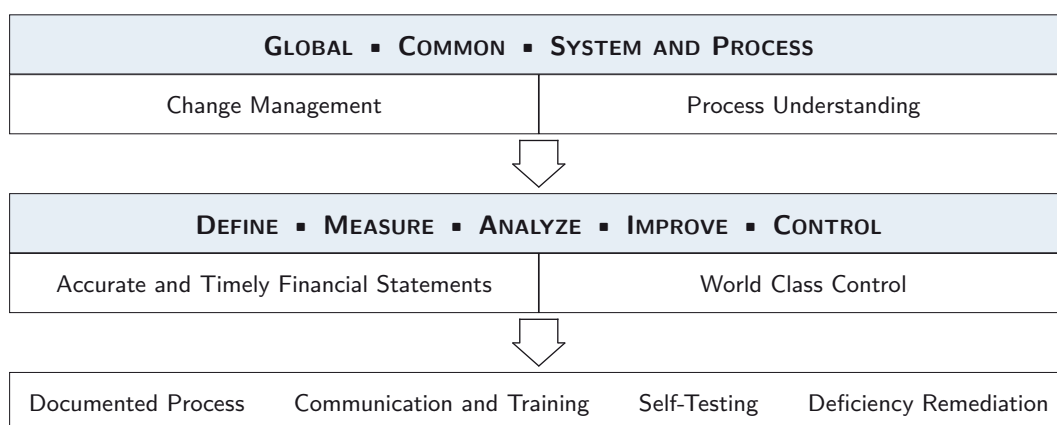
Principle of knowledge overflow from foreign investor towards regional entrepreneur is applied in all entrepreneurial units. In case of external audit of any plant, the results are always forwarded to other entities. This practice allows continuously learn about international demands of internal control which changes and develops all the time. Compliance with procedures is not requirement of external auditors and stockholders only. It is demand of customers as well. The example of this kind of procedure is tooling process. General definition of tooling is working or manufacturing aids such as cutting tools, dies, fixtures, gauges, jigs, molds, and patterns of a specialized nature which are limited in use to a specific production line or the performance of a specific contract. Tooling procedure describes process used for projects granted to production unit by customer for the costs of tools which are refundable. It includes three main areas:

- grant of the program,
- financial monitoring of the program, and
- return of program expenses.

Point regarding financial monitoring includes rules of program review way. Depends of individual agreement with customer, expenses for purchased tools used to parts production for customer are in ownership of customer and they needs to be returned. Costs qualified for return by customer are assigned by specified account number and individual project number. Project number is created in Enterprise Resource Planning (ERP) and Enterprise Asset Management (EAM) systems. In EAM there are created budget by financial controller and specified approval path for requisitions in which is included additionally Program Manager and Financial Controller. In case of costs which are not agreed in EAM (for example internal costs), Program Manager needs to approve them (by mail of on document). Each received invoice is posted in ERP system, approved by Program Manager and released for payment. Financial Controller monitors expenses and correctness of records in general ledger in monthly basis. Status of tool programs in compare with budged and defined customer terms are controlled as well. Gains and losses of program are calculated after realization of all costs and started production.

Return of program expenses describes formal point of program. Signed and approved order is required. Key Account Manager / Program Manager approves the order to have documented authorization of tool program by production unit. After receiving customer approval of parts, customer authorizes it by appropriate document. Each customer has indicated type of this document in the agreement. After finished production process and verification of tools by customer, Program Manager and Financial Controller prepare documentation which are the base of invoice issue for customer by production plant. Figure 2 presents the procedure, which was implemented from foreign investor to its regional branch. During preparation of technical aspect in production plant, very often the flow of know-how takes place. Such knowledge transfer's example adaption of the machine is done by cooperation with engineers from Asia who participate in launch of production

4. The enterprise did not agree for presenting its name in the article.



**Fig. 2.** Internal control process in chosen hi-tech enterprise in Opolskie Voivodship

line. This kind of activities allow to extend knowledge and flow of innovations. Standardized procedures are necessary to have clear activities path. It is in line with capital group standards and requirement of customer. Could be possible that customer will perform independent audit which will be confirmation that process takes places according to procedures.

Presented example of knowledge transfer should be treated as the knowledge transfer in both dimensions: knowledge transfer inside the enterprises and knowledge transfer into the foreign investment's region. From economic point of view it is worth to point that it took place from advanced branch settled in high developed region to its new open branch in emerging economy region. Knowledge transfer was made by enterprise by setting the procedure and proceeding standards to its new branch in Opolskie Voivodship what was made as the long term process involving new branch's human capital. The first, direct beneficiary of foreign investment in region, was wide understood human capital—new branch's workers involved into it, as the second—the new branch as the independent part in whole company by itself, and as the final and long term beneficiary—the region. Besides FDI, which are economic value for region, knowledge transfer is larger understanding value for it—brings knowledge, which stays connected to the region by human capital. Workers carrying the knowledge are the value as educated and experienced personnel but also they can spread and share the knowledge inside the region. In that meaning knowledge transfer has influence on development of the region.

## Conclusions

After such conducted analysis it is possible to state that foreign investment of hi-tech sector and knowledge transfer to the region, being their consequence, as the pro-innovative action, constitute not only the area of scientific interests at present, but simultaneously are the field of the mutual cooperation of hi-tech sector and regional economy. Thus, foreign investment can be also pointed as the determinant of innovations made by these enterprises in analyzed region with using processes being components of established and moved from foreign countries to the investment region processes competent for enterprise data. Their permeation oneself and connections are also affecting the innovation of enterprises as well as at the regional development and the innovation of domestic economies (Jasińska-Biliczak 2014a, 52), because the enterprise may purchase specific technology, products. The reason may also be an access to additional customers.

Mutual interactions of these subjects are important not only from the point of view of mutual benefits, to which to rank belongs knowledge transfer by the side of regional economy and economic benefits, including those connected to regional human capital, by the side of hi-tech sector. The same foreign investment of that sector can be pointed as the source of innovation, know-how and knowledge transfer but also as the engines of social and economic changes in region. As more foreign investment comes into a region, it can lead to even greater investments because other foreign enterprises see this region as economically attractive and developing.



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