

SPNA Review

Volume 3 | Issue 1

Article 2

4-1-2007

Economic Development Potential Of The Krakow Region

Alicja Boryczko
Grand Valley State University

Follow this and additional works at: <http://scholarworks.gvsu.edu/spnareview>

Recommended Citation

Boryczko, Alicja (2007) "Economic Development Potential Of The Krakow Region," *SPNA Review*: Vol. 3: Iss. 1, Article 2.
Available at: <http://scholarworks.gvsu.edu/spnareview/vol3/iss1/2>

Copyright ©2007 by the authors. SPNA Review is reproduced electronically by ScholarWorks@GVSU. http://scholarworks.gvsu.edu/spnareview?utm_source=scholarworks.gvsu.edu%2Fspnareview%2Fvol3%2Fiss1%2F2&utm_medium=PDF&utm_campaign=PDFCoverPages

**ECONOMIC DEVELOPMENT POTENTIAL
OF THE KRAKOW REGION**

ALICJA BORYCZKO
Grand Valley State University

Analyzing economic development potential and activities in a region requires identifying factors essential for a successful strategy and analyzing the locale in terms of its resources and relative position within a broader economic environment. In order to examine Krakow's opportunities and steps already taken, it is necessary to analyze the region's strengths and weaknesses and relate the findings to academic theories on high technology's role in economic development and then evaluate the results in the context of Poland. The Krakow Region, located in southern Poland, prides itself as a dynamically developing center of advanced technologies and unmatched business climate. High technology, or high-tech economic development, has been incorporated into regional plans and strategies as most promising component of the region's development. Hence, this paper's intention is to look at the process of economic development based on high technology and compare the theoretic findings with the reality and practice of the Region of Krakow. The analysis presented in this paper identifies the region's strengths and weaknesses. It is found that despite the academic potential and multiple efforts to stimulate economic development based on advanced technologies, Krakow faces considerable challenges. These are the leadership of Warsaw, weak relationships between business and science and, consequently, insufficient application of research outcomes to economic practice. Recommendations to overcome these threats and weaknesses are presented in the final section.

REGIONAL ECONOMIC DEVELOPMENT COMPONENTS

High technology as an economic development component

Regional economic development is the process of increasing region's wealth understood as creating jobs, increasing incomes and the overall life quality. This kind of development occurs on the basis of internal assets and a region's capacity to use those resources (Fitzgerad 2002).

The world today, and especially the economy, is characterized by acceleration of all processes, which leads to shortening distances between any points on the globe. This means that small geographic units, such as regions, gain significance and may participate in the global competition without the intermediation or with only minor impact of national states. This emphasis put on regions is possible due to technological progress, which constantly involves new areas of human activity, new locations and new groups of people. Hence, advanced technology is what shapes the world and regional economy today.

The significance of high technology in the today's world is undisputable. As Carly Fiorina, the HP executive put it, "Now we are going into an era in which technology will transform every aspect of business, of government, of society, of life" (Friedman 2006). Several theories talk about high technology as a component of regional economic development. In the light of increasing speed of the world economic, social and scientific changes, embracing of the recent technological achievements is seen as a key to a region's success. According to regional growth theory, the areas with more advanced technology can generate higher product from the same input; thus, they attract more investment and display higher growth rates (Goldstein 1993)

In addition, different theories identify different factors determining economic development of a region or a community. The comparative advantage concept emphasizes the importance of internal assets of the region, which are crucial to initiate high-tech growth. The resources that should be in possession of the area are universities, academic traditions, technical higher education establishments, institutes and advanced information network (Goldstein 1993). The existence of these assets in the region of Krakow will be examined in this paper.

High-technology development is a process of enhancing employment and income situation in a region by means of "knowledge-intensive" activities. Those activities involve innovation in products and processes based on corporate research and development activity or cooperation between businesses and research institutions. Organizations contributing to this kind of development may belong to public, private as well as to nonprofit sector and are recruited among universities, private companies, nonprofit institutes and government agencies. The process involves attracting, creating or expanding investments by these organizations.

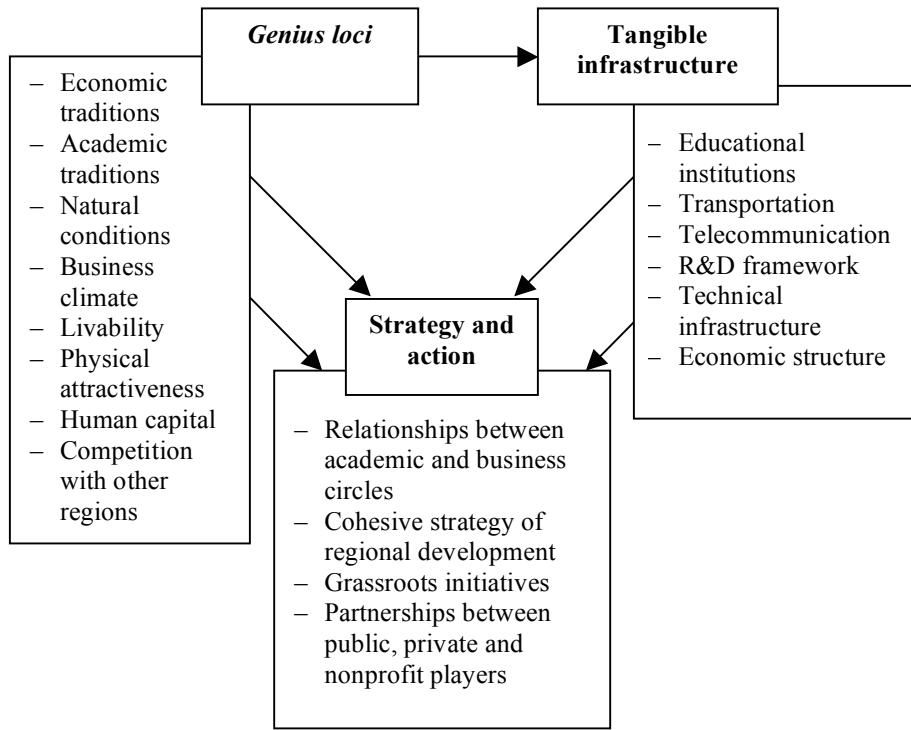
The evaluation of the high-tech developing activities may be based on several variables. Among others, Goldstein lists the following indicators: gross value of the investment, technological improvements and the change in the regional employment and industry structures. Some of these variables will be measured for the region of Krakow in a further section of this paper.

Factors and resources enabling high-tech development

Taking into consideration the theory describing economic development process and high technologies' impact it may be concluded that three components are necessary to achieve successful regional development. These inextricable elements are *genius loci* or spirit of the place, created framework and action. The first element refers to inherent qualities of the locale. The second describes the tangible assets established by people in terms of technical, educational, social infrastructure as well as economic base. The final component is a robust and consistently pursued regional strategy and all the efforts taken to enhance the development.

The following model displays the relations between those components.

Figure 1: Components of economic development



There are some qualities of the place which are difficult to measure and to create. They are often described as a locale's atmosphere or spirit. Local traditions, culture and natural conditions have a substantial impact on the region's image. Krakow's human capital and competition with other regions will be examined as the inherent qualities of the place. Locale's "atmosphere" has a significant role in attracting or discouraging people to live and conduct economic activity in the region. This activity leads to the creation of the second set of assets, i.e. infrastructure. In the following section of this paper Krakow's educational and research framework, transportation infrastructure and economic based will be discussed.

Given the inherent qualities and created infrastructure the current leaders and residents of the region undertake efforts and develop plans to pursue economic development. This stage is reflected in the creation of the Krakow Technology Park.

Potential flaws and threats

Despite the widespread enthusiasm for the high-tech strategies, Blakely lists potential threats and flaws resulting from inconsiderate pursuit of these strategies without taking into account local resources and potential.

Consequently, it may be said that the potential threats result usually from either neglecting one or from discrepancy between the components. The following threats may be identified.

- a. Creating infrastructure, which does not match the places "spirit"
- b. Developing strategies without internal regional resources to support them
- c. Lack of partnerships between the participants of regional development, such as scientists, businesses, government and local residents
- d. Lack of framework to transfer the research results to the business sector
- e. Lack of the overall coordination of development initiatives

This list will be used to look critically at the Krakow's region and identify potential threats to its economic development.

HIGH-TECH DEVELOPMENT IN KRAKOW

Characteristics of the Krakow Region

Krakow with its 750,000 residents is the third biggest and one of the most important Polish cities. It is the capital of one of the sixteen self-government provinces, Malopolska in the southern Poland. This region will be further referred to as the Krakow Region. As one of the European eldest and most famous cultural and educational centers, Krakow has well-established academic and tourist traditions. It is home to the renowned fourteen-century Jagiellonian University and several other institutions of higher education, which creates the potential for high-tech economic development.

Figure 1: Basic information about the Krakow Region

	Krakow Region	Poland
Capital (residents)	Krakow (750,000)	Warsaw (1,690,000)
Population	3,240,000	38,220,000
Urban population	50.2%	61.7%
Population density (per sq. mi)	545	314
Area (sq. mi)	5,900	121,900

Source: 1) Polish Public Statistics. 2) Wrota Malopolski 3) Polish Agency of Information and Foreign Investment

Economic structure

The regional economy is undergoing a gradual shift from traditional low-skilled to more competitive sectors. This shift is enhanced by the Regional Development Strategy emphasizing high technologies and services replacing heavy industry and agriculture. The creation of Krakow Technology Park is a factor that may have a significant impact on the transition process.

At present the most dynamically developing sectors of the Krakow economy are information technology connected with the Krakow Special Economic Zone and banking. The recent study conducted by McKinsey consulting company examines the most important centers of business supporting services in Poland. Krakow, along with Warsaw, Wroclaw and Gdansk, offers substantial base of research services available for businesses (Maciejewicz 2006). Among advanced-technology companies investing in Krakow, McKinsey mentions ABB, Delphi, Motorola, Pliva and Sabre.

Other important sectors are food processing with substantial share of tobacco industry, chemical and petrochemical industries and, traditionally, steel industry.

Figure 2: Main economic data

	Krakow Region	Poland
GDP per capita (\$)	5,788	6,676
Unemployment	14%	18%
Average monthly wage in		
a) industry	\$736	\$772
b) construction	\$606	\$712
Employment in		
a) agriculture	18.3%	17,4%
b) industry and construction	26.9%	28.3%
c) services	54.8%	54.3%

Source: 1) Polish Public Statistics. 2) Polish Agency of Information and Foreign Investment. Calculations based on exchange rate USD 1 = PLN 3.23 (National Bank of Poland, purchase rate on December 31, 2005).

Although the gross regional product per capita equals only 87% of GDP per capita, unemployment rate in the Region of Krakow of 14% is substantially lower than the national average, which at times reaches the dramatic value of 20%. The relatively low level of wages may be seen as an advantage for investors who may expect lower costs than in other regions and, consequently, higher productivity.

Human capital

The Krakow Region is home to 3.2 million residents out of whom 1,300,000 constitute the region's workforce. High population density makes the region's economy more concentrated and lively than in most of the other locales in Poland. The region, which was traditionally dominated by agriculture, is still more rural in character than the rest of Poland. As Table 2 indicates, almost one fifth of the working population occupy themselves with agriculture.

However, the region's dense network of academic institutions and Krakow's fame and achievements as a well-established university center attracts young, able people to the region contributing to constant enhancement of the workforce. Krakow's region thus struggles with substantive disparities between traditional manufacturing and agricultural class of workers and young

professionals with state-of-the-art educational attainments. This latter group is growing and foreign investors rate the Krakow's labor force as considerably competitive and with excellent skills (Maciejewicz, 2006). An example may be the last week's gold medal for Krakow's computer science students at the International Collegiate Programming Contest in San Antonio, Texas. The students from Jagiellonian University ranked second following Russians and were awarded gold as one of the four winning teams (Slagle 2006).

Education and research framework

The region is well known for its strong educational and research potential. With regards to the economic development model presented in Graph 1, Krakow certainly possesses an appealing image of academic city with atmosphere that stimulates the creation and exchange of ideas and scientific achievements.

The region is home to 32 higher education establishments, which account for 10% of Polish students and 13% of academic teachers. Students' population of 191,000 creates a potential of highly skilled workers, who are likely to remain in the region. Beside the famous Jagiellonian University with its 41,000 students, there are two major technical universities teaching 47,000 students. Other institutions include eight schools of economics and business with 47,000 students, a university of agriculture and multiple others.

Transportation accessibility

The Region of Krakow has a considerably advantageous location in terms of being placed at the southern border of the country and in the middle of the A4 road connecting border crossings with Germany and with Ukraine. The region may be accessed through state roads from Slovakia and Warsaw.

However, the transportation infrastructure is very poor in Poland and the improvement process is slow and ill managed. The A4 freeway is only completed in its western part, which ends in Krakow. There are no expressways and the current network consists of state and local roads. The railway system is notorious for its bad quality and administration. The government's Roads and Freeway Construction Plan issued in January 2006 foresees the extension of the A4 freeway from Krakow to the border crossing with Ukraine in 2013.

Competition with other regions

Krakow's province is one of a few regions in possession of distinguishing resources and achievements in economic development. It is also not the only centre of high-tech in Poland. The other important competitors are the regions of Warsaw and Wroclaw.

The province of Warsaw is developing at the highest speed among Polish regions. As the country's capital, Warsaw attracts the most investors, tourists and residents; thus, the transition of economy is the quickest and the most diverse. Warsaw Stock Exchange is the major institution of this kind in the Central and Eastern Europe. The city is a financial, convention and business

center. With its outstanding number of students and highly qualified workers as well as with the highest spending and employment in the field of R&D the region is clearly the national leader. Moreover, Warsaw may be accessed through a better than Krakow's transportation network and the region is home to the nation's biggest international airport. In addition, Warsaw is Krakow's most important competitor in terms of software production. The region accounts for over 50% of the national market, compared to Krakow's estimated 9% (Krzysztofciak 2006).

Wroclaw's region is competing with Krakow in terms of academic and R&D potential. It is one of the nation's most important university and research centers with 33 higher education institutions and only slightly less students than in Krakow. Wroclaw's province ranks second after Warsaw in terms of computer software manufacturing. It possesses a 10% market share and slightly surpasses Krakow (Krzysztofciak 2006).

The region is home to three special economic zones, none of which however is a technology park. Over 70% of the region's population live in cities, which is a great advantage in terms of human capital availability and qualifications.

Another advantage of Wroclaw is good transportation accessibility. The region is located at the German and Czech borders and possesses road and railway connections with Berlin, Prague and Warsaw.

Figure 3: Development indicators in the leading Polish regions in 2004

Indicator	Krakow	Warsaw	Wroclaw
Students	191,000	349,000	167,000
R&D expenditures (\$m)	210	707	90.6
R&D employees	17,000	34,700	9,600
Average wage in industry	736	949	827
Unemployment	14%	14.4%	21.1%

Source: 1) Polish Public Statistics 2) Polish Agency of Information and Foreign Investment. Calculations based on exchange rate USD 1 = PLN 3.23 (National Bank of Poland, purchase rate on December 31, 2005).

As the findings above indicate, Krakow faces a significant competition on the part of two other Polish regions. It seems that Krakow's academic potential is surpassed only by that of Warsaw, although Wroclaw is also an important educational center. Notwithstanding, Krakow is disadvantaged in terms of transportation accessibility and economic structure. On the other hand, the region displays the lowest unemployment rate and very high R&D employment and expenditure. Krakow's academic traditions, favorable research milieu and

the existence of Krakow Technology Park are other unmatched assets of the region.

Krakow Technology Park

One of the most significant Krakow's assets in terms of promoting regional economy based advanced technologies is the city's technology park. Established in 1998, the park possesses the status of the special economic zone granted by the government for the period of 20 years, i.e. to December 31, 2017.

The 650-acre zone is called Krakow Technology Park, which is also the name of the company administering the zone. The main reason for creating the zone was the intention to support the restructuring of the region's economy, which used to rely predominantly on manufacturing and metal industry. The Technology Park was developed in order to facilitate the shift to high-technology-based production of goods and services. Close cooperation of business and science belongs to the main objectives of the Technology Park, which aims at facilitating the application of academic achievements in the economy.

The investors are entitled to public support in the form of income tax exemptions on the activity in line with the zone development plan. Moreover, the region's resources of highly qualified specialists and research and developments achievements are available to the businesses.

The goals and objectives of the Park exhibit a greatly competitive approach reflecting theories presented in the first section. The strategy emphasizes the application of research and science outcomes and extensive partnerships to facilitate the dissemination of technologies. It is however important to examine the enforcement of those intentions in the economic practice of the Krakow Region. The basic indicators of the performance refer to the creation of work places and gross investment induced.

The economic activity within the boundaries of the Krakow Technology Park has led to the creation of 3,500 additional work places. The companies active in the zone give jobs to the total number of 4,500 employees. Nonetheless, it should be noted that these are only the work places created in the most technologically advanced enterprises active in the economic zone. However, the effects of the Technology Park are reflected in the overall shift of the economic structure with the diminishing share of agriculture and increase in services and high technologies.

The total amount of investment in the park from 1998 has amounted to \$141 million. These expenses were incurred by 21 investors, out of whom 11 represent high-technology sector. Among them there is a Polish IT company Comarch employing 400 people, Business and Innovation Center "Copernicus", the biggest investor, RR Donnelley with 1,000 jobs and electronic giant, Motorola employing 300 people.

On the negative side, the president of the Krakow Technology Park administering company complains about the unavailability of good investment sites and impeding bureaucratic procedures (Krzysztofia 2006).

Krakow's regional development from 1997 to 2005

The goal of this section is to estimate the economic development in Krakow during the time since the creation of the Krakow Technology Park in 1997. It cannot be claimed, however, that the change of economic situation is a result of this particular program. It is rather a combined effort of numerous initiatives and an effect of a network of relationships and factors shaping the region's economy in late 1990s and at the beginning of the 21st century. Based on the measures suggested by Goldstein, Blakely and Fitzgerald, it was decided to use the following indicators to determine Krakow's achievements in high-tech development: change in higher education scope, change in the use of R&D and change in the economic structure.

Change in higher education scope

Figure 4: Higher education in the Region of Krakow 1999 and 2004

	1999 (share in nation's total)	2004 (share in nation's total)
Students	127,000 (9%)	191,000 (10%)
Students of technical majors	37,000 (13%)	47,000 (9%)
Higher education institutions	21 (8%)	32 (8%)
Academic teachers	9,600 (13%)	11,000 (12%)

Source: 1) Polish Public Statistics 2) Polish Agency of Information and Foreign Investment. Calculations based on exchange rate USD 1 = PLN 3.23 (National Bank of Poland, purchase rate on December 31, 2005).

As the evidence in Table 4 shows, the scope of higher education establishments increased in terms of all the variables measured. Substantial increases were observed in the number of institutions, students and technical majors' students. However, Krakow's share in the nation's number of technical majors' students decreased significantly.

Change in the research and development activity

Despite the outstanding academic traditions and resources, the R&D potential is still underused. The region exhibits low application of research and weak connections between universities and market so that only minor proportion of academic works is actually purchased and implemented in the economy. However, the activity of the special economic zone in Krakow aims at enhancing the framework of those connections, which could be the cause of the substantive increase in R&D expenditures over the period from 1999 to 2004 (Polish Public Statistics).

The total research and development expenditures in the region amounted to \$202 million in 2004. Although this level is constantly increasing, it equals only 1.1% of the regional GDP, which is however almost twice as high as the national ratio of 0.6% GDP. It is interesting to note that the comparative values for developed countries, such as Sweden and the US are as high as respectively 3.5% and 2.5% GDP (Krzysztofciak 2006).

Figure 5: High technology indicators in the Krakow Region in 1999 and 2004.

	1999	2004	Change
R&D expenditure			
a) total (\$ million)	135	202	-
b) per capita (\$)	42.1	62.3	48%
c) per capita national (\$)	37	42.1	14%
d) regional to national	1.14	1.48	-
R&D employment			
a) total	15,000	17,000	-
b) per 10,000 residents	46.7	52.5	12%
c) per 10,000 residents national	32.6	33.2	2%
d) regional to national	1.43	1.58	-
Purchases of R&D achievements (\$ m)			
a) total	5.6	15.3	-
b) per capita (\$)	1.74	4.72	171%
c) per capita national (\$)	2.04	2.84	39%
d) regional to national	0.85	1.66	-

Source: Polish Public Statistics. Calculations based on exchange rate USD 1 = PLN 3.23 (National Bank of Poland, purchase rate on December 31, 2005).

Table 5 presents the information on research and development activity in the Krakow Region in 1999 and 2004 compared to respective numbers referring to Poland.

R&D employment increased by 12% in the Krakow region, whereas in Poland it grew only by 2%. Consequently the number of R&D employees per 10,000 residents was by 59% higher in the Krakow region than in the whole country in 2004.

R&D expenditures were higher in the Krakow Region than in the whole nation by 13% in 1999 and by 48% in 2004. The expenditures devoted to the purchase of academic works and other R&D results increased almost threefold over the six years so that the region surpassed the nation average. Hence, the purchases of R&D works per capita were by two thirds higher in the Krakow Region than in Poland. Moreover, the percentage of academic work purchases from higher-education institutions increased at much higher rate in the Region of Krakow than nationwide.

The facts presented above may be considered as the evidence for Krakow's excellent performance in terms of the research and development activity. However, it may be feared that the connection between science and economy tends to be overlooked. Based on the data and information mentioned above, it is probably safe to conclude that the application of R&D is underused but it is growing at higher speed than elsewhere in Poland. Krakow, although still in the beginning stage of high-tech development exhibits the characteristics of technological and research center. Furthermore, the positive trends described above allow expecting that the region will become a Polish leader in high-technology-based development.

c. Change in the structure of economy

One of the indicators of economic development as mentioned by Goldstein is the structure of regional product mix. Hence, in order to evaluate the potential of the Region of Krakow, it was decided to analyze the shares of economic sectors in the regional and national product and their changes over the period in which the Krakow's special economic zone was active.

Figure 6: Regional and national product structure in 1999 and 2003.

	1999		2003	
	Krakow Region	Poland	Krakow Region	Poland
Agriculture	4%	5%	3%	5%
Industry	35%	31%	28%	33%
Services	61%	64%	69%	62%

Source: Polish Public Statistics. Calculations based on exchange rate USD 1 = PLN 3.23 (National Bank of Poland, purchase rate on December 31, 2005).

The structure of the regional economy changed over the period of the Krakow Technology Park activity in comparison to Poland. The share of agriculture, which is the most obsolete and inefficient sector decreased to 3% in the Krakow Region, whereas it remained stable nationwide. Industry and construction, which accounted for 35% of regional product and by 4% more than in the whole country in 1999, reduced its share to only 28%, compared to 31% in Poland in 2003. In the classification of economic activity applied in Poland, services represent the most competitive sector, with higher wages and relying on high technologies more than two other sectors, agriculture and industry. The share of services in the Polish economy decreased from by 2% reaching 62% in 2003, whereas the Krakow Region surpassed the nation increasing the share of services from 61% to as much as 69% in 2003.

The findings above show that the regional economy in Krakow shifts more dynamically to the modern model based on services. It is important to note that only a part of services is high-technology-based and this classification includes traditional services, like gastronomy or tourist accommodation as well. The data on the share of high technology in the regional product are not available; however, it may be assumed that this share has also been increasing.

Nonetheless, the fact that the regional economy is shifting towards more technologically advanced production cannot be assigned solely to the impact of well-designed regional strategy. The dynamics of the Krakow's economy are part of transition processes taking place in Poland and Eastern Europe. After being exposed to market economy in 1989, these countries started to make up the fifty-year delay and to embrace even more quickly the recent achievements of technology and science. What Thomas L. Friedman writes about Asian people changing the world in the 21st century, applies also, on a smaller scale, to Eastern Europeans: "These new players are stepping onto the playing field legacy free, meaning that they can leap right into the new technologies without having to worry about all the sunken costs of old systems" (Friedman 2006).

ASSESSMENT OF DEVELOPMENT POTENTIAL IN THE REGION OF KRAKOW

The following list of strong and weak points of the Krakow Region summarizes the characteristics of Krakow presented in this paper. The purpose of this part is also to combine the theoretical model of economic development with the actual resources of the Krakow Region.

Advantages

- a. Strong academic and research capacity
- b. Strong and renowned center of software creation
- c. Young and well-skilled workforce
- d. Krakow Technology Park
- e. Well-developed financial framework
- f. Favorable business climate

Disadvantages

- a. Low spending on research and development
- b. Too weak connections between business and universities
- c. Strong leadership of the Warsaw Region
- d. Shortage of investment locations
- e. Long and complicated bureaucratic procedures

Conclusion

Referring to the model presented in Section I and combining it with Krakow's situation discussed in Section II, the regional components of economic development may be identified. As far as internal resources are concerned, Krakow's region possesses magnificent educational traditions and an excellent research and business climate. The regional workforce, although in the process of transition, may be qualified as highly educated and skilled.

With regards to the second component, the region offers very high potential of science and research as well as good telecommunication infrastructure and well-developed business supporting services. In contrast, the transportation network requires significant improvement. Furthermore, the business locations offered by the region are insufficient to achieve the intended level of investment. Notwithstanding, the existence of Krakow Technology Park constitutes a great advantage of the region guaranteeing high quality of services and public aid to the investors. Competition with other regions stimulates economic development and enhances the region's image. However, the position of Warsaw is unmatched and Krakow has chances to become the national leader are close to none.

The third component of economic development is the least pursued. The research is not sufficiently transferred to the business practice due to weak connections between business and academic spheres. In addition, the network of relationships between universities, business and the government is still underdeveloped. On the positive side, the strategy of regional development and Development Plan of the Krakow Technology Park create framework for enhancing those relationships and promote Krakow's significance as high-technology center. Moreover, there are plans to create a biomedical cluster in the Krakow's province. The region thus becomes one of the most specialized in the nation and thus may successfully compete with Warsaw and Wroclaw for the investment in the fields of information technology and biotechnology.

In the light of the conclusions above several recommendations may be developed. First, the region should improve the connections between individual components of economic development. One of the most desirable changes is strengthening the relationships between academic and business sectors and thus enhancing the transfer of technologies from R&D activity to the economic practice. More generally, the education system should be reformed to ensure matching the graduates' skills with the market demand and to create incentives

for applicable research. The development of technical and computer science major needs to be much more dynamic than at present.

In order to increase the impact of the technology park, it is recommended to change the zoning ordinance so that more investment sites would be available. Moreover, the procedures of granting permits should be simplified. In addition, transportation and telecommunication infrastructures require much higher level of funding to accelerate their progress.

Finally, the regional development strategy should be more focused on shifting employment and production from traditional branches to high-technology based economy.

The analysis of the Region of Krakow in terms of its resources and in the light of economic development theory allows the evaluation of regional development potential. It may be concluded that the region possesses unmatched internal assets and valuable framework of education and business. Those resources create the opportunity for Krakow's dynamic development as one of the nation's most important high-technology centers. However, the regional strategy should be modified in order to achieve better connections between the resources and enhance the network of relationships between the participants of economic development.

Alicja Boryczko is a graduate of Krakow of Economics in Poland and received her Masters in Public Administration from GVSU in August 2006. She completed an internship with the city of Phoenix, Arizona in the summer of 2006 and now works for the regional government in Krakow, Poland.

REFERENCES

Literature

- Bezols, Bryan. "Technology Clusters in St. Louis," *Economic Development Journal* 3 (2004): 2, 50-54
- Blakely, Edward J., and Ted K. Bradshaw. *Planning Local Economic Development. Theory and Practice*. Thousand Oaks: Sage Publications, Inc., 2002.
- Fitzgerald, Joan, Nancey G. Leigh. *Economic Revitalization. Cases and Strategies for City and Suburb*. Thousand Oaks: Sage Publications, 2002
- Friedman, Thomas, L. "It's a Flat World, After All." *The New York Times* (April 3, 2006)
- Goldstein, Harvey, A., Michael I. Luger. "Theory and Practice in High-Tech Economic Development." In *Theories of Local Economic Development. Perspectives From Across the Disciplines*, edited by Richard, D. Bingham and Robert Mier, 147-171. Thousand Oaks: Sage Publications, 1993
- Krzysztof, Krzysztof, President of the Krakow Technology Park. "Jaki Kraków?," Interview, *Gazeta Wyborcza* (March 11, 2005)
- Macierewicz, Patrycja. "Polskie mózgi przyciągają globalne koncerny," *Gazeta Wyborcza* (April 14, 2006).
- Slagle, Matt. "Russian Students Win the Programming Contest," *ABC News* (April 13, 2006).
<http://abcnews.go.com/Technology/wireStory?id=1837578>. Accessed on April 19, 2006.

Other sources

- Krakow Technology Park Special Economic Zone. <http://www.sse.krakow.pl/>. Accessed on March 27, 2006.
- Polish Information and Foreign Investment Agency. <http://paiz.gov.pl/index/>. Accessed on April 1, 2006.
- Polish Public Statistics Main Statistical Office. <http://www.stat.gov.pl/>. Accessed on April 1, 2006.