2008

Microeconomics of Competition
Wirtschaftsuniversität Wien

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[THE ICT CLUSTER IN POMERANIA, POLAND]

EMERGING CLUSTER OR WISHFUL THINKING?

Contents

Introduction

Geographical Facts

Source: The Economist

Poland is located in the north central of the European continent, extends 649 kilometres from north to south and 689 kilometres from east to west with the total area of 312,683 square kilometres, including inland waters. The population is 38,518,241. Poland's neighbouring nations are Germany (in the western side), Ukraine, Belarus (in the eastern side), Czech Republic and Slovakia (in the southern region), Lithuania, and Russia (in the north). Poland also borders the Baltic Sea in the northern side. Denmark and Sweden also lie in the borderline of Poland. The land of Poland is mainly flat. Mountain ranges, highlands and plateaus cover mainly the southern region of the country. The weather remains moderate throughout the year in Poland. The winter months are characterized with cold, weather and cloudy sky. Some amount of rainfall also occurs in this period. The summer months on the other hand are mild. The environment issues are severe air pollution because of sulphur dioxide emissions from coal-fired power plants, and the resulting acid rain has caused forest damage. Water pollution from industrial and municipal sources is also a problem.

Poland's population is relatively homogenous; minorities constitute only about 3.26% of the population, coming mostly from Germany, Byelorussia and Ukraine (Chancellery of the Prime Minister 2007). Most of the population lives in urban areas while about 38% of people live in rural areas.

Historical Overview

Government type: Parliamentary republic
President: Lech Kaczyński
Prime Minister: Jarosław Kaczyński
Administrative divisions: 16 provinces (województwa)
Independence: 11 November 1918 (republic proclaimed)
National holiday: Constitution Day, 3 May (1791)

In 1795, Russia, Prussia, and Austria divided Poland-Lithuania among themselves. From that moment, the name Poland disappeared from the maps of Europe for over a century. The wound remains livid in Poles' minds.

The Treaty of Versailles, which ended the Great War, sanctioned Poland's independence in 1918. The Second Republic of Poland was interrupted by the invasion of Germany and the Soviet Union in 1939. Poland then remained under the absolute rule of the PZPR Communist Party for around 8 years during the Stalinist era.

Poland enjoyed a short time of prosperity during the 1970s; however, due to the high inefficiency of communist economy, depression appeared persuasively. Repressions directed against the 1976 rioters led to the creation of an illegal workers' defence committee (KOR) and other illegal opposition groups. The 'success propaganda' period ended in 1980. Solidarity emerged after the signing of August Agreements in the same year. One year later, Martial law was introduced to relieve economic crisis and increasing influence of solidarity. But it did not solve Poland's problem. With the support from the Church, solidarity campaigners were able to reduce opposition activities and repressions step by step. In the early months of 1989, as a result of the Round Table talks, an agreement was signed calling for partially free elections to the Parliament. On 29 July 1989 the Parliament changed the country’s name and constitution. The People’s Republic of Poland became a thing of the past. The events in Poland precipitated the fall of the entire Communist block. The Yalta arrangement finally collapsed.

In the early 1990s, Poland made great progress towards the transformation from planned economy to market economy and achieving a fully democratic government. The Economic Transformation Program was adopted to reduce the large budget deficit, to abolish all trade monopolies, and to sell many state-owned enterprises to private interests. A moderate recovery during 1992-94 was followed by robust growth (the fastest in Central Europe) during 1995-99 that was driven by a rapid expansion of the new private sector. Poland's GDP was 20 percent larger in 1999 than in 1989. The privatization slowed down in 1995, as 512 smaller state enterprises were transferred to private National Investment Funds under the Mass Privatization Program, but large-scale industry remained largely in state hands. However, the government subsequently made an attempt to privatize such large-scale sectors of the economy as banks and oil, arms, and telecommunications. Faced with overly rapid domestic demand growth, monetary policy was increasingly tightened during 1997, with two increases in required reserve ratios and one in the central bank's benchmark rates. Poland in the early 2000s focused on bringing its economic policies compatible with EU standards. These policies promise even further liberalization and foreign investment into the Polish economy. Poland was officially invited to join the EU in December 2002, with accession planned for May 2004. In 2002, the government announced a new set of economic reforms, including improving the investment climate (particularly for small- and medium-sized enterprises), and improving the country's public finances to prepare the way for the adoption of the euro.

ECONOMIC PERFORMANCE

Due to the effort made by the government, also the privatization, modernization and reconstruction of many firms, Poland experienced an impressive GDP growth during the 1990s. However, signs of overheating that emerged from 1999 were replaced by a rapid weakening of activity towards the end of 2000. Real GDP growth has declined severely, with 1.2% in 2001 and 1.4% in 2002. In response, the Monetary Policy Council (MPC) raised its leading interest rates in several steps to adjust the growing imbalances. Then economic performance began to recover from high unemployment rate, severe account deficit and inflation. The GDP grows steadily and reached 6.5% per capita in 2007. Meanwhile, the real imports overweigh the exports slightly by about 3%. In the last two decades, the FDI peaked at 5.45% in 2000, then declined to 2.12% in the following three years and reached 4.11% in 2006. Over the past few years, the labour productivity growth has declined by 3.8% since 2000. Total debt to GDP decreased dramatically from 69.95% to 38.72% during 1990s and has been steady around 37.5% since the beginning of the decade.

According to Exhibit II, Poland's GDP growth (6.5%) falls behind only Latvia (10.7%), Slovakia (9%) and Estonia (7.1%), while far outperforms the average of EU15 (2.6%). The labour cost per hour (9.57) in Poland is relative high to other new members, but it is still much lower than the average of that in EU15, which is 29.64. The percentage of information technology expenditure to GDP in Poland (2.6%) is similar to that of EU15 (AGG). And the expenditure on education accounts for 5.6% of the GDP in Poland, which is more than that of the other new members except Hungary. As we can see in Exhibit Ⅲ, the attractiveness of foreign investment is not satisfying. The FDI in Poland fluctuated slightly in the last decade. Compared to the other EU new members, in 2006, it is the lowest, 6.09% less than that in Estonia (the highest).

Let's take a look at some specific indicators of the overall economic performance of Poland. For instance, Poland ranks 22 and 34 in perspective of tertiary enrolment and quality of education system respectively. In terms of buyer sophistication, laws relating to ICT, local supplier quality, extent and effect of taxation and quality of scientific research institution, Poland ranks 60 or so. These fields definitely require much more efforts to get improvement. The worst ranking is the state of cluster development; Poland is the 79th with a score of 3.26, far behind the other EU countries.

Business Environment

Foreign Direct Investment

Poland jumped in 2005 from 12th to 5th place in the A.T. Kearney FDI Index—its highest ranking since 2000—driven by increased interest from U.S. and European investors. U.S. investors ranked Poland as their 7th most attractive FDI location (up from 12th a year ago), while European investors ranked Poland 3rd, up from 6th in 2004.

Then in 2007 Poland dropped to 22nd position in ranking (A.T. Kearney 2007). Even so, for European investors Poland is still attractive, on the 5th rank, because they, just like their Asian counterparts prefer to invest in the „near abroad".

Poland was also evaluated as excelling at first-time investments, because of several reasons, which are Poland's full membership in the EU, which has meant the adoption of EU laws, greater regulatory stability and reduced risk premiums. Similarly, EU Structural Funds are aimed at improving infrastructure, human resources, competitiveness and enterprise development.

In 2004, Poland received $12.6 billion FDI inflows (A.T. Kearney 2005) —up from $4.6 billion in 2003. 60 percent of these flows were attributed to greenfield investments (new investments by entrepreneurs, as well as profits posted to previous greenfield investments). Nearly 1 in 10 of this sort of investments in the European Union went to Poland in 2004. And from a sector perspective, manufacturing accounted for most FDI, with automotive, chemical and metal investments leading the way.

Productivity & Competitiveness

Poland ranks last overall in the EU25 Lisbon Scores (World Economic Forum 2007). Problems in Poland range from low adoption of ICTs, companies that are not aggressively adopting new technologies, lack of competition in the local market, government favouritism in deciding on policies and contracts and network industries, which aimed to liberalizing and promoting greater efficiency and quality of service, are not liberalized enough to provide competitive economic environment. This demonstrates the extent of work to be done by Poland to come closer to meeting the Lisbon goals.

According to Global Competitiveness report 2007-2008, Poland is at the 51st place out of 131 countries. Poland continues to slip in the rankings down from 45th place in 2006.

The top five most problematic factors for doing business are considered to be tax regulations, inefficient government bureaucracy, policy instability and corruption together with low public trust in politicians, inadequate supply of infrastructure and tax rates. As advantages only the following are mentioned:

- Stable inflation (3rd rank);
- Labour market efficiency, in particular the pay and productivity category (30th rank);
- Flexibility of wage determination (35th rank).

This development stands in contrast with Estonia (27th rank), which continues to be the most competitive economy among the countries that joined the EU in its 5th wave of enlargement. The efficiency of Estonia's government institutions (22nd), the excellent management of public finance, and its aggressiveness in adopting new technologies (19th) outshine the performance of many of the old EU-members.

Innovation

Poland together with Slovenia, Czech Republic, Lithuania, Portugal, Latvia, Greece and Bulgaria is part of the group of catching-up countries, with Summary Innovation Index (SII) scores well below that of the EU25-average and of other innovation leaders such as the US, but with faster than average innovation performance improvement (Pro Inno Europe 2006).

By category, Poland's best performance is in innovation and entrepreneurship and in innovation drivers. The supply of new Science and Engineering (S&E) graduates has been growing consistently since 1998. The share of the population with a tertiary education is currently 73% of the EU average but this trend is also favourable (European Union Rapid 2006).

Conditions for knowledge creation, in contrast, are worsening, particularly due to a decline in business R&D, from 0.23% of GDP in 2001 to 0.18% in 2006, although this marks a recovery from a low of 0.13% in 2002 (European Union Rapid 2006).

With respect to EPO patents per million inhabitants, the EU 25 average is 136.7 while Poland stands at just 4.2., which is one of the lowest results in the whole continent (Pro Inno Europe 2006). Partly due to very low levels of R&D, Poland ranks near the bottom in the EU in Knowledge creation and also in category Intellectual property, because of low number of patents.

The main challenge for Poland according to European Innovation Scoreboard is to build up capabilities in innovation diffusion. With respect to diffusion, the trends for skills are favourable, total innovation expenditures are above EU average as well as ICT expenditures, where EU average is 6.4 % of GDP and Poland has 7.2 % of GDP (Joint Research Centre: Institute for the Protection and Security of the Citizen 2007). A possible bottleneck is the low percentage of SMEs that collaborate on innovation and the low share of university R&D funded by businesses. The latter could indicate that firms have very few opportunities to outsource necessary research within Poland.

Evolution of IT

Poland ranks 30th in terms of IT industry competitiveness index in a table of 64 countries ranked by the Economist Intelligence Unit (EIU) in November 2007. The United States, Japan, South Korea and Britain occupy the top four places. Of the new EU members, Estonia ranks the highest, in 25th place, while Slovenia, Hungary and the Czech Republic have similar ratings to Poland's, ranking 27th, 28th and 29th respectively.

Closer observation reveals that Poland scores the lowest the category of R&D environment and IT infrastructure. The highest score is in the category of legal environment.

Cluster Policy

An official cluster policy is non-existent in Poland (IRE Innovation Network 2006).

However, current policies to support SMEs could play an important role in fostering networking and clustering. A policy supporting SMEs in Poland has been implemented since 1995 when a program was launched to support these. Along with that program, the national fund of credit guarantees was established and there are now several such regional and local funds in the country.

Both public and private SME supporting institutions are well developed in the form of business incubators, centres for technology and information transfer, loan-guarantee funds and technology parks. In all regions there are also platforms of dialogue and co-operation among firms present, such as the chamber of commerce, the chamber of commerce and industry, bilateral chambers, sector-specific chambers and various other associations and organisations.

In spite of this, many barriers and shortcomings to cluster development persist and have not been correctly addressed by governmental policies. Firstly, the existing regional business associations and chamber of commerce do not provide an effective dialog or co-operation platform since membership in these bodies is not as developed as it needs to be to create a formal co-operation within the emerging cluster. Secondly, knowledge transfer among the companies is predominantly found at the national level. Thirdly, co-operation with local authorities is very sporadic.

Although there is no cluster-based policy, Poland has the potential to develop strong regional clusters but needs to overcome the challenges of its relatively weak general business environment (Ketels e Sölvell 2007).

Poland has recently started a number of cluster programmes and the cluster concept is gaining the attention of politicians and some cluster specific measures are being introduced. Traditionally cluster programmes have been the result of initiatives at the local and regional level. It is important to integrate the different efforts and make them part of a consistent national policy.

The first attempt to establish consistent national policy was in 2005, when the Polish Lisbon Strategy Forum (PFSL) organised a conference together with the Polish Agency for Enterprise Development and the Innovation Department at the Ministry of Economy and Labour on 'Policies of cluster support: recommendations for Poland.' (Walendowski 2005)

The main aim of this conference was to discuss the objectives of the national policy of cluster support that could become one of the elements of the National Development Programme 2007-2013. Prior to the conference, the Ministry of Economy and Labour asked the Gdansk Institute for Market Economics to prepare an 'Analysis of possibilities of industrial cluster development in Poland and recommendations of support instruments'.

The recommendations for Poland were formulated in two groups. First, concerning the support at the regional level, in other words the bottom-up cluster initiatives. Second, recommendations were formulated at horizontal level, recognising that the concept of clustering requires effective co-ordination between different policy areas.

Three types of activities were recommended:

- supporting of analytical and co-ordination activities;
- advisory and training;
- direct support to the development of cluster initiatives.

The next proposal was to analyse mega-clusters, in order to identify priorities for sustainable economic development which should be broad and not just sector specific.

At the beginning, three pilot projects were proposed with a budget of about 100,000 euro, in order to prepare regional/local strategy for the development of clusters. Within the regional programme, it was recommended to plan for about 100,000-150,000 euro annually and for a period of three years, in order to cover the cost of 'soft' initiatives e.g. cluster manager, elaboration of regional cluster policy, analysis of cluster competitiveness and/or preparation of action plans. In addition to this, concrete investment or research projects could receive financial support mainly via EU Structural Funds. Concerning the national programme, it was proposed to finance about ten more advanced cluster initiatives. The value of each initiative for the period of six years is estimated at one million euro.

The first Polish cluster mapping exercise was undertaken by the Gdansk Institute for Market Economics. The institute found a number of significant industry concentrations, all but two situated in the more developed regions of Poland: in central Poland, in southern Poland and northern Poland (IRE Innovation Network 2006). Two concentrations are situated in a structurally weak region in northeast of Poland at the Baltic Sea.

Another cluster mapping project was done by European Cluster Observatory, which showed presence of the strongest clusters mainly in regions:

- Mazowieckie- strong Education, Finance and Food
- Wielkopolskie – Food, Apparel and Furniture
- Lodzkie – Apparel,Textiles and Food
- Slaskie – Buildig fixtures and Production Tech. and Construction
- Pomorskie- Transportation

These mapping projects could be widely used by national and regional governments to define regional strengths and unique opportunities for a particular region, they are not only a good starting point for identifying on which industrial basis cluster initiatives could be built, but it also allows later assessment of the success or failure of such initiatives.

National Diamond

Factor Conditions

Ease of...	2008 rank	2007 rank	Change in rank
Doing Business	74	68	-6
Starting a Business	129	118	-11
Dealing with Licenses	156	154	-2
Employing Workers	78	62	-16
Registering Property	81	86	5
Getting Credit	68	62	-6
Protecting Investors	33	32	-1
Paying Taxes	125	121	-4
Trading Across Borders	40	33	-7
Enforcing Contracts	68	74	6
Closing a Business	88	85	-3

Source: World Bank *Doing Business 2008*

Labour force

Some of the most important characteristics of the Polish labour force are:

- long working hours, the 3rd highest among OECD members;
- a very high proportion of them are self-employed, around 26,7% in 2004;
- very high unemployment rates;
- very low labour force participation rate;
- extremely high percentage of employment is agriculture related;
- relatively low number of large employers, the SMEs dominate.
  (OECD 2006)

Although the level of spending on education as a percentage of GDP has increased drastically since 1990, the number of students studying has increased at an even faster rate and as such, spending on a per student basis is currently the 3rd lowest in the OECD (Fulton, et al. 2007).

Graduates in Poland tend also to be in the social sciences (41.4%) whilst engineering, manufacturing and construction graduates constitute a mere 7.5% and, as such, Poland has the 5th lowest score in the OECD (Fulton, et al. 2007).

Labour Market

One problem affecting Poland is the fact that for the past three years real wage growth has outstripped labour productivity growth and is predicted to carry on so during 2008 (Economist Intelligence Unit 2007). Furthermore, Poland has also dropped dangerously in the ranking of ease of employing workers from 62nd in the 2007 report to 78th for 2008 (World Bank 2007). This ranking is based on the "rigidity of employment index, a nonwage labour cost measure and a firing cost measure".

Poland's labour market is "arguably the worst in the OECD" (OECD 2006), having experienced a strong deterioration between 1998 and 2003. One of the main problems is the long-term unemployed with nearly half of all the current unemployed being in the situation for over a year (OECD 2006). Social security contribution relative to wages is also very high at 48% (UNIDO 2006).

While disparities between regions are strong in Poland, inter-regional migration is low compared with other OECD countries. Labour mobility is low, contributing to stark regional employment disparities which indicate problems in the functioning of the labour market (OECD 2006). Moreover, the strict Employment Protection Legislation (EPL) hampers labour force reallocation (OECD 2006)

Another issue affecting the Polish labour market is the high level of emigration. With unemployment in some regions at over 20% (Eurostat 2008) and the advent of low-cost flights, many have left bound to the United Kingdom and other countries that did not close their doors to the new members in 2004 (The Economist 2006). Many students also head abroad to study due to the lack of conditions at most of the Polish universities as referred to in the infrastructure section. On the other hand, Poland currently suffers, according to some to a form of "brain overflow" as a small baby boom occurred in the beginning of the 1980s (Economist Intelligence Unit 2007). Moreover, most of the Poles currently living abroad plan on returning, bringing back a whole new set of skills, both in languages and know-how (The Economist 2006).

INFRASTRUCTURE

Poland serves as an important transit country for goods between Eastern and Western Europe due to its strategic location.

The country's road network density is low at 1.19km/sqkm, lower than comparable countries such as the Czech Republic (1.62) or Hungary (1,73) (EuroMonitor 2007). This has been further aggravated by the boom in car ownership that has increased congestion.

Another issues affecting the road network is the low quality of the roads (EuroMonitor 2007). Only approximately 3% of the network meets EU-standards, meaning that most roads cannot handle EU heavy trucks (World Bank 2006).

Although its current motorway structure is relatively underdeveloped, a new strategy is being implemented with the backing of the European Union that will lead to a great expansion of the transport network, at a cost of about 0,7% GDP per year (World Bank 2006). Most OECD countries spend approximately 1-2% of their GDP on infrastructure while the Polish rate is about half of this (UNIDO 2006).

Higher Education Institutes also suffer from a chronic lack of investment into infrastructure, "resulting in overcrowded lecture rooms and insufficient numbers of adequately equipped laboratories" (OECD 2006).

The EU is planning on providing funds to Poland that will reach approximately 4% of its GDP in the 2007-2013 timeframe, with a particular focus on transport infrastructure, totalling about €60 billion Euros (EuroMonitor 2007).

The telecommunication infrastructure has been developing fast, mainly with respect to mobile telephony where the growth rate has been over 25% for several years running and currently estimates point to a mobile penetration of 95 mobiles connections per 100 inhabitants (ITU 2006). Landline usage has also increased but at a slower rate and is currently at 106 telephone main lines per 100 inhabitants (ITU 2006). This places Poland on the 42nd rank for landlines in the Global Information Technology Report (World Economic Forum 2007).

Internet usage has also lagged behind other nations and growth rates are currently still disappointing compared to countries such as Slovakia, Hungary or the Czech Republic (ITU 2006).

One of the reasons for this relatively slow development in the telecommunications sector, when taking into account its potential, is the dominance of the former state-owned telecom (TPSA), although EU-membership should weaken its stronghold on the market (UNIDO 2006).

Innovation Capacity

Poland's expenditure on R&D is low at 0,56% of GDP, with public expenditure (Government & Higher Education) accounting for the majority, 0,4% (Eurostat 2008). The average for the NMS10 stands at about 0,78% while the EU15 is at 1,92% of GDP. Thus, this low performance of the country can be attributed to low expenditure by business.

Financial Markets

With the accession to the European Union, Poland was forced to review its banking system and introduce new EU-level harmonised regulations (Gràt, et al. 2006).

Poland has no fixed target date for EMU Membership but is predicted to join only around 2012-2014, even though most research has indicated that it would benefit the Polish economy greatly (OECD 2006).

Polish banks have invested heavily into payment network systems and modernisation is progressing well (UNIDO 2006). Foreign-owned banks accounted for approximately 69% of the total assets of the banking sector with Italian, Dutch and German banking groups controlling about 40% of the market (UNIDO 2006). Nonetheless, it still ranks poorly on the Financial Market Sophistication Pillar of the Global Competitiveness Report, at 64th position with one of the main issues highlighted in the Report being the "soundness of banks" (World Economic Forum 2007).

Context for Firm Strategy and Rivalry

Corruption

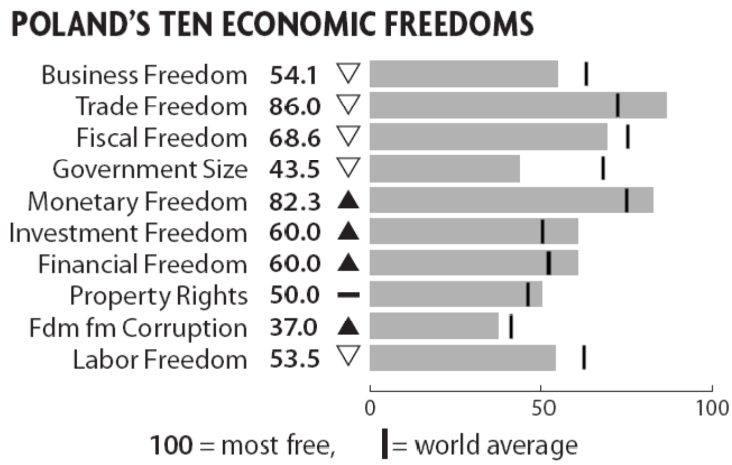
Corruption has been a serious topic for many years in Poland. According to the CPI tables issued by Transparency International, although Poland's CPI score has no apparent fluctuation, its rank has fallen behind by around 20, from 43 to 61 since 2000. Compared to other members of the NMS10, Poland is in an unfavourable situation concerning corruption. In the CPI, Slovenia ranks 27, the highest of the new members, with a score of 6.6; meanwhile, Poland is at the bottom (61) with a CPI score of 4.2. Corruption has been quite persistent and eradicating it will be a long process (OECD 2006).

	2000	2001	2002	2003	2004	2005	2006	2007
Country Rank	43	44	45	64	67	70	61	61
CPI Score	4.1	4.1	4.0	3.6	3.5	3.4	3.7	4.2

Source: Transparency International *Corruption Perception Index 2007; Note: The CPI score varies between 1("highly corrupt") and 10 ("highly clean"). According to TI, a score of below 3 indicates "rampant corruption".*

GOVERNMENT INTERVENTION IN THE ECONOMY

Since the 1990s, Poland has pursued the policy of economic liberalization and achieved great economic growth (OECD 2006). The role of the government can never be ignored, as many business decisions are influenced by politicisation. Some investors complain about the state regulation is not transparent, which affects the competitiveness of many business sectors (The Economist 2006). The privatization of small and medium state-owned companies has contributed most to the country's economic growth (Kotowski e Zagozdzinska 2006). The government also passed some laws that are favourable to foreign enterprises, such as CIT tax at the level of 19% and investment incentives in 14 Special Economic Zones. However, the overall situation is not optimistic. Based on a 2008 assessment, Poland's economy is 59.5% free, below both the EU's average (66.8) and the world's average (60.3), which enables it to rank 83 in the worldwide environment.



Source: The Heritage Foundation *Index of Economic Freedom 2008*

As can be seen above, half of the indicators--- Monetary Freedom, Investment Freedom, Financial Freedom and Trade Freedom are slightly above the world average. But the size of the Government "freedom" is far lower than the average. Total government expenditures are high and have reached 43.4% of GDP in recent years. The Freedom from Corruption is much below the average with only 37%, the government has established central office to combat corruption, and the private sector is now paying greater attention in fighting it. The outgoing administration has steadily reduced the budget deficit and promoted the adoption of Euro in the near future (The Economist 2007). In 2008, the new government is facing challenges to keep the economy on track, as public-finance reform is pressing; so are wage demands by teachers and health-care workers, stoked by labour shortages (The Economist 2007)

Integration in the European Union.

Poland began to negotiate with the European Union on economic integration right after its economic liberalization in 1990. Pre-Accession Assistance started with the "Poland and Hungary: Action for the Restructuring of the Economy" (PHARE) programme which provided help for the establishment of public institutions and the financing of investment, with about 10bn Euro (2000-2006) available for the candidate countries. The two other major programmes were the "Instrument for Structural Policies for Pre-Accession" (ISPA) with approx. 7,5bn Euro (2000-2006) and the "Special Accession Programme for Agriculture and Rural Development" (SAPARD) with about 3.6bn Euro (2000-2006).

In July 1996, Poland became the 28th OECD member, which improved Poland's credibility, quotation and ratings in international financial markets. Three years later, Poland became a NATO member with the submission of the ratification treaty to the North Atlantic Treaty's Depository Office.

The prospect of EU membership also spurred the reform process as the NMS10 countries were also obliged to fulfil the newly established "Copenhagen Criteria" concerning issues such as human rights, democracy, functioning market economy and so forth.

One of the major tasks to integrate to the EU is to make Polish laws compatible with those of the EU. The process of harmonizing took about a decade and was mostly finished by 1 May 2004. Poland successfully concluded accession negotiations on 13 December 2002 and on the 16th April 2003 signed the Accession Treaty, the most complex international agreement, which includes the proper Accession Treaty, Accession Act, and a number of protocols and enclosures. Meanwhile, Poland is granted a five-year transitional arrangement during which it can maintain the national legislation regarding the acquisition of secondary residences and a twelve-year transitional arrangement during which Poland can maintain its national legislation regarding the purchase of agricultural land and forests. Its membership in EU means active participation in creating and taking advantages from the benefits of European policies, such as the Common Agriculture Policy and the Cohesion Policy of EU. The agriculture sector benefits a lot through the integration to EU (BBC 2005). Following the "four freedom" principle, the Poles are enabled to emigrate and work abroad more easily. Moreover, with tariff and border-cost reduction and the removal of the requirement for additional testing and product certification, trade with the other EU countries is more frequent and deepened, creating more opportunities for business cooperation and contacts with EU partners. Accordingly, the investment attractiveness of Poland is increased. It is worth noting that GDP in Poland grew more than twice as fast (3.4% in 2005 and 5.3% in 2004) as that of the EU (1.6% and 2.4% respectively)

Foreign Trade

As a recent report highlighted, the increasingly active foreign trade activities are positive phenomena (Polish Ministry of Economy 2007). Although the long holding deteriorated domestic demand of German market, Poland's main trading partner, affects Poland to a certain degree, Polish exporters continue to strengthen their position in the EU market. The problem of current account deficit is minimised due to the fact that most of imports are capital goods for manufacturing instead of for consumption.

Privatisation

The privatization program significantly transformed the economy between 1990 and 1991 (Kotowski e Zagozdzinska 2006). However, since then, the transition process has slowed down and may slow down further in the future (OECD 2006). The ownership transformation process involved only 107 entities with 1000 state enterprises remaining in the market in 2004. This indirectly hinders innovation for sector adjustment. The privatization policy focuses on seeking investors for sustainable capital involvement and stable effect on labour market. Meanwhile, Poland frequently resorted to retaining state control over special shares more often than any other countries. Consequently, a limitation on the number of special shares (no more than 14) is implemented. Besides, the labour productivity gap between private sectors and stated enterprises can never be ignored. Although a systematic increase in the labour productivity of both groups is observed, the rate in privatized entities sharply overweighs that of the state entities by around 70% untill 2004. Thus, it is recommended by the Previous Economic Survey that privatization be pursued more vigorously.

EU market mobility

After the integration to EU, more and more Poles immigrate to short-distance countries, particularly to the neighbouring new EU member states (EurActiv 2007). A lot of people, especially the young leave Poland for better-paid jobs. Accordingly, the departures of many highly qualified people worsen the already existing labour shortages in certain sectors, such as the healthcare professions.

Related and Supporting Industries

Strengths

Government support of Special Economic Zones:

The government is supporting Special Economic Zones (SEZ), which were established in order to counteract structural unemployment in some regions of the country (Polish Ministry of Economy 2007). In the presently existing 14 zones, entrepreneurs which had permissions were fully entitled to income tax exemption for first 10 years of activities and in subsequent years to 50% exemption, until the end of the zones' existence.

Entrepreneurs acting in SEZ were also exempted from the tax on real properties. However, it should be noted that the accession to the European Union and resulting necessity to harmonize Polish law with the EU law limited to a great extent the scope and amounts of public aid. By the end of 2006, a total of PLN 35.4bn had been invested in the SEZ. In 2006 the number of valid permissions was 20% higher than in 2005 and amounted to 924.

National System of support for Small and Medium-sized enterprises

This national system has as an aim providing consulting services for SME sized companies, improving regulatory environment of entrepreneurs and granting financial support State budget funds and from European Union funds (Polish Ministry of Economy 2007).

Polish Information and Foreign Investment Agency

This agency serves to provide information on:

- the Polish market,

- existing foreign investors,
- sector-oriented studies,
- descriptions of regions, technology parks and special economic zones

with the aim of attracting FDI into Poland and to provide links between foreign investors and local buyers, suppliers and organizations (Polish Information and Foreign Investment Agency 2007)

Cluster Development Initiative

As stated before, the Polish government is currently in the pilot phase of national policy of cluster support that became one of the elements of the National Development Programme 2007-2013.

The need to support and develop clusters in Poland was stressed in the strategic document entitled "Directions for increasing innovativeness of economy 2007-2013". The importance of supporting common actions of entrepreneurs and having network character was heavily emphasised in the report. The main goals defined were:

- increase in awareness of entrepreneurs about benefits from cooperation with science units and other enterprises,
- create effective public-private partnerships,
- provide conditions for network cooperation,
- support the development of clusters,
- support for development of technological platforms in technologically advanced sectors

(Polish Ministry of Economy 2007).

Weaknesses

Self-government institutions

Existing organizations of economic self-government in Poland (including chambers of commerce, chambers of crafts, entrepreneurs associations and their national representations) do not provide an effective dialog or co-operation platform since membership in these bodies is not as developed as it needs to be to create a formal co-operation within the emerging cluster (IRE Innovation Network 2006).

Cooperation and trust between companies

A series of surveys (IRE 2008) confirm that, not only is the cooperation of companies with each other low, but also the cooperation with business environment is worryingly lacking. This situation is caused by a lack of trust between business partners and a miscomprehension of the concept of competition. Companies do not see that cooperation in chosen areas of activities can give chances for mutual development and improve also individual competitive position (Polish Ministry of Economy 2007).

Cooperation between R&D sector and enterprises

Enterprises are not eager to cooperate with R&D units, which is mainly connected to a lack of information about such opportunities and, although to declining degree so, to lack of access to capital (Polish Ministry of Economy 2007).

The absence of appropriate mechanisms for the flow of knowledge leads to research programmes of R&D institutions that are not sufficiently directed into creation of practical solutions, into responding to market expectations.

Connected to this is a strong need for development of private R&D sector in order to stimulate transfer of new technologies to the economy, because most of the research centres are financed from public sources and they are not forced to focus on research subjects close to the needs of entrepreneurs.

Demand Conditions

Large but not sophisticated

Poland has 38.52 million citizens with an average GDP per head of 15,560$, one of the lowest of the NMS10 and about 46% of the EU15 average (Economist Intelligence Unit 2007).

Buyer sophistication in Poland ranks on 60th place, far behind closely located Estonia, which is on 37th place (World Economic Forum 2007). This lack of sophisticated buyers leads to low pressure on companies to improve, innovate and to upgrade into more advanced segments.

Growing and more demanding IT Sector

Polish IT market was rapidly expanding with growth of 18.6%, which was largely driven by computer hardware sector and in 2006 with modest growth of 13% (EITO 2006).

PC sales with growth of 17% in 2006 were driven mainly by SMEs, reflecting high level of confidence in making IT investments. Desktop sales increased by double digits mainly because of large investment of Ministry of Education for computer classrooms. Also software market is in continuing to growth approaching 14% in 2006, which is driven by two trends. First, SMEs are becoming important buyers and vendors are offering them new pricing policies and launching special products for this segment. Secondly, large companies are undertaking new wave of investments into IT infrastructure and they are not only upgrading their core systems but they are also seeking for new solutions. Moreover IT services are constantly growing strongly around 14%. Various factors drove this growth, for instance membership in EU continues to stimulate demand and also local companies have to react on increasing competition. Also mid-market is beginning to develop as larger SMEs are investing in networking, IT security and ERP systems implementation. Lastly telecommunication sector is also growing but not that extremely as other ones.

As consequence of all these trends ICT market reached and impressive growth of 11.1% in 2005 and was expended by further 7.5% in 2006.

POMERANIA

The Pomerania region is situated in the north of Poland on the Baltic Sea cost and the Gdansk Bay coast and has a population of around 2.2 million inhabitants. The regional capital – Gdansk – is known for being in 1980 the birthplace of the famous “Solidarity”, which for over 15 years played a leading role in the process of transforming Poland with strong reflexes in Central and Eastern Europe. Regional GDP is about 97% of the national average of a per capita basis (Eurostat 2008).

Three cities in region: Gdańsk, Gdynia and Sopot are part of a metropolitan area called “The Tricity” which has population of over 1 million people. The name Tricity was used informally only, until 28 March 2007, when "Tricity Charter" (in Polish "Karta Trójmiasta") was signed as a declaration of cities' cooperation.

SMEs are the driving force of the regional economy (there are about 200,000 SMEs compared to about 3,000 large enterprises). The region is home to a high level of business activity.

In 2004, 15% of the regional workforce was employed in the agricultural sector, while 29% was employed in manufacturing and 56% in services. The unemployment rate was 23% (Eurostat 2008).

All regional clusters in Pomorskie, PL

1, 2 and 3 star regional clusters

Region	Cluster category	Employees	Size	Spec.	Focus	Stars	Innovation	Exports	Notes
Pomorskie	Transportation	45 279	0.73%	3.17	10.61%	**	Low	Strong	b
Pomorskie	Fishing	6 512	1.81%	7.79	1.53%	**	Low	Weak	b
Pomorskie	Construction	20 114	0.31%	1.32	4.71%	*	Low	N/A	b
Pomorskie	Food	19 313	0.39%	1.67	4.52%	*	Low	Strong	b
Pomorskie	Finance	16 929	0.24%	1.03	3.97%	*	Low	Weak	b
Pomorskie	Education	14 447	0.41%	1.75	3.38%	*	Low	N/A	b
Pomorskie	Furniture	7 277	0.64%	2.77	1.70%	*	Low	Very strong	b
Pomorskie	Footwear	2 839	0.65%	2.80	0.66%	*	Low	Weak	b
Pomorskie	Sporting	1 057	0.50%	2.14	0.25%	*	Low	Weak	b

Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070613

Pomerania’s economy has traditionally been linked to the sea, with shipbuilding and port services being of particular importance, which is also apparent from European cluster observatory, where as fishing cluster has the 2nd highest rating (European Cluster Observatory 2007).

Because of its strategic position and well developed infrastructure containing, 2 sea ports (Gdańsk and Gdynia), an international airport named after Lech Wałęsa, railway interchange (rail connections are an integral part of the Trans-European transport corridor) and also road transport (including two trans-European transport corridors), has in this region the most relevant transportation cluster, with strong export activity and high number of employees (Invest in Poland 2007).

More recently, a rapid development of boat-building has occurred. The food processing and furniture manufacturing are prominent and fast developing industries in the region (European Cluster Observatory 2007).

In the region is also developing High-tech sector. Leading branches in the High Tech sector in the Pomeranian region include:

- Biotechnology (Ziaja, Oceanic, Symbios, EURx)
- Industrial automation (Elektromontaż Gdańsk)
- Electronics & telecommunications (Radmor SA, DGT, Telkom-Telmor, Vector, Unimor, Radicom, Satel, Proelco)
- IT (Intel Technologies Poland, Prokom Software, YDP).

The region offers a good infrastructure for entrepreneurs in the high-tech sector: such as high level of education among residents and easy access to qualified personnel, technology parks in Gdansk and Gdynia and also eight universities and about 30 other higher education institutions in the Pomerania region. The most important ones are the Gdansk University of Technology, the Gdansk University, the Gdynia Maritime University, and the Academia Medica Gedanensis (IRE Innovation Network 2006).

Lack of an appropriate mechanism for the flow of knowledge leads to research programmes of R&D institutions not being sufficiently directed to the creation of practical solutions, an issue already aforementioned but which is even more pronounced in Pomerania.

Connected to this is a strong need for development of the private R&D sector in order to stimulate transfer of new technologies to the economy because most of the research centres are financed from public sources and they are not forced to focus on issues closer to the needs of entrepreneurs. The ratio between the number of businesses and the number of inhabitants is the second highest in Poland (Pomeranian Development Agency Co. 2007).

Poland's accession to the European Union brought many challenges for the Pomerania region fundamentally, how to utilise emerging development opportunities. Region created "Regional Innovation Strategy for the Pomerania Region - complement and action plan RISP", which was confirmed by the Pomerania Assembly in December 2004 and it is oriented toward building structures and broadly starting and intensifying innovation processes on the regional level.

The RISP project is financed by EU 6 Framework Programme and Project participants and involves above all widening and improving the RIS-P Strategy by enriching the European experience and cooperation with partner regions as well as innovation knowledge and skills transfer from European Union partner regions to Pomerania, creating a regional innovation system by developing a collaborative platform and also stimulating cooperation between areas from partner regions, especially small and medium enterprises, interested in development of innovation.

To reach these aims new functional entities are planned (Pomerania Voivodship: Regional Innovation Strategy 2006):

- The Centre for Advanced Technologies “Pomorze” (CZTP)

  A new organizational entity that will be established from the initiative of the research centres in the Pomeranian Region. It will be one of the main regional centres for the commercialization of the results of the R&D research. The CZTP will offer product and technological innovations particularly to the Pomeranian SMEs.

- The Infrastructure for the Innovative Firms Development (IRFI)

  This regional infrastructure will be the basis for supporting development of development of innovative SMEs in the region.

- The Regional Centre of Innovation Transfer “Pomorze" (RCTIP)

  RCTIP will facilitate searching cooperation partners and serve as an intermediary in selling technologies at the national and international levels, it should also establish a regional intermediary system to search, associate, and build innovations and build patent and technical information base, etc.

- The Regional Institutions and Instruments for Financing of Innovation (RIIFI)

  The RIIFI will provide the means and resources for companies to introduce innovative products and technological processes. It will consist of Structural Funds, regional R&D funds, fund of loan guarantees, Seed Capital, Venture Capital providing credit and capital for innovation.

- The RIS-P Implementation Office (BW RIS-P)
  To coordinate the strategy implementation system

All above mentioned entities will be functioning within the cooperation network called the Pomeranian Innovation Network (PSI).

Building a complete RIS-P system is a process, which was divided into Initial stage, which comprises building institution of the RIS-P Implementation System, including initiation of execution main aims and create Pomeranian Innovation Network (years 2004-2006) and Mature functionality stage of Regional Innovation Strategy, which include wide realisation of delimited main aims and tasks within the framework of existing Pomeranian Innovation Net (years 2007-2013)

Another initiative in the region is The National Strategy for Regional Development (Ministry of Economic Affairs & Labour 2005). This Strategy takes accounts of the solutions adopted in the National Development Plan for 2007–2013 (institutional-legal changes and financial instruments are shared by both documents) and determines key problems affecting regional development and points to possible solutions and ways in which such solutions might align with the development processes specified in the National Development Plan.

The most important institutions for cooperation are Pomeranian Development Agency and Pomeranian Marshall’s Office.

The Marshall’s Office, which is a unit of the provincial government, assists the marshal, the voivodship board and the provincial parliament in performing their tasks and coordinates usage of structural funds provided by EU. The Marshall’s Office together with the Agency of Pomeranian Development S.A., started an intensive informative-training action, during which propositions on the specific investments concerning road infrastructure, environmental protection and so forth were debated.

Information, training and advisory services for SMEs, local authorities and foreign investors are also provided by Pomeranian Development Agency.

This organisation also provides advice to SMEs on applying for EU grants, organising and hosting business missions, initiating and participating in regional projects focused on entrepreneurship development as well as monitoring Pomeranian SMEs sector. Another important activity is investor assistance (Pomeranian Development Agency Co. 2007). The agency informs the latter on the state economy of the region and also maintains a database with investment opportunities.

The biggest department within the Pomeranian Development Agency is the Regional Financial Institution (RIF), which, together with Pomeranian Marshall's Office and the Regional Financing Institution, supervises EU programmes for micro, small and medium sized enterprises (SME), self governmental bodies, higher schools of education and institutions in the business environment.

ICT Pomerania

The Technology Park

The Pomeranian Science and Technology Park (PPNT), set up in Gdynia in 2001, was the first large-scale project undertaken to create favourable conditions for Polish high-tech companies and foreign investors. The park was a joint undertaking of the Pomeranian Technology Centre and the authorities of the city of Gdynia. It is managed by the Gdynia Innovation Centre, an organization financed by the Municipality of Gdynia. Later in 2004 The Pomeranian Innovation and Business Incubator was set up as part of the PPNT to foster hi-tech start-ups and their expansion. At present, 60 companies operate in the park, most of them from the ICT sector.

Baltic cooperation- Baltic innovation bridge

A major European Union cross-border program is being carried out in the Technology park of Gdynia as part of the Interreg III A Community Initiative. The program is called BaltInno, short for The Baltic Innovation Bridge: Strengthening Business and Technological Cooperation of Gdynia and Klaipeda, Lithuania. Partners in this project are the Science and Technology Parks in both cities. The project is worth nearly 500,000 euros, of which 315,000 euros will be provided from the European Regional Development Fund. The objective of the project is to create a scientific exchange network and conditions for the operation of high-tech companies on both sides of the border.

Seagull II Innovation Network

The Pomeranian Science and Technology Park is also a member of Seagull II Innovation Network. In this network, regional and local institutions, universities and colleges, and experts on innovative solutions are active. The main objective of this network is to establish permanent cooperative ERB networks of professionals within five areas:

- Infrastructure;
- rural development;
- innovation and SME development;
- labour market cooperation;
- environment and energy.

The Cluster

The information technology cluster, ICT Pomerania, was set up in January 2006. The project was created by the Pomeranian Centre of Technology and ELAB Group in December 2005, both of which operate within the Pomeranian Science and Technology Park (Mejssner 2007).

Although the ICT industry has existed for a while and some companies co-operated, there was not a formal recognition of the existence of a cluster until recently. The formal agreements only began in 2006 with some companies signing letters of intent with “ICT Pomerania”. The idea of creating an organisation to increase the co-operation between companies in the cluster came from Maciej Stachowiak and his experience in the Swedish TelcomCity (Karlskrona).

Persuading the local authorities was “difficult to say the least” and as of yet many are still not familiar with the cluster concept (Jablonski 2008). This makes obtaining resources and funds harder, although some progress has been made. ICT Pomerania is currently not receiving much direct financial support and the city of Gdynia is merely providing some staff and other resources. Nonetheless, they are planning on applying for EU funds from new programmes that are beginning this year.

An association called Klastropolis ensures cooperation with local authorities and universities. The association also supports the cluster financially, meeting its day-to-day needs, because participation in ICT Pomerania is voluntary and free of charge (Mejssner 2007).

Meetings between the companies take place twice a month and are rather general in content, they simply try to bring all of them together and analyse what issues affect the cluster as a whole (Jablonski 2008). Other than these, there are also individual project meetings, in other words, meetings between the companies that co-operate specific tasks and programmes.

MEMBERS

The companies in the cluster can be categorised in five main groups. Below is a current list of members.

IT application

- Astcon Rozwiązania Informatyczne
- IT PARTNERZY Ł.Gutarowski i J.Lasota Spółka Jawna
- MadKom Sp. z o.o.
- PSWE
- Soft-M
- Spitfire Networks
- EXTREMUM-Information Technologies
- Agencja Hetman

Electronic and Microelectronic

- Net4You
- SUNSARAN
- ULTRAPHON

Multimedia

- e-biznes.pl
- ELAB Group
- News Med
- Open-Productions Łaźniak Sp.j.
- rapan.pl
- Spitfire Networks
- InteliWISE
- fido intelligence
- IVO Software Ltd. Co

Information systems

- Agencja Hetman
- BARTNIK.EU Łukasz Bartnik
- ComFUTURA
- Extend.pl
- Firenet Multimedia Studio
- HeeX
- James van Earth
- Justbemore
- Legenhit
- PayLane Sp. z o.o.
- PROGRA
- Wirtualny Transport
- "XEROSERVICE NORTH" Sp. z o.o
- Agencja J&J.

Telecommunication

- TeleMobile Electronics Sp. z o.o.
- TELEnet 1 Ltd. Group
- Datera

Members		Total Number	Share of Total in %
ICT Companies	IT application	8	16%
	Electronic and microelectronic:	3	6%
	Multimedia:	9	18%
	Information systems	14	28%
	Telecommunication:	3	6%
	Total	37	74%
Public Institutions	Public Universities	1	2%
	Private Universities	10	20%
	Marshall's Office	1	2%
	Pomerania Development Agency	1	2%
	Total	13	26%
	Final Total	50	100%

Potential Members

There are a number of potential members that work in related fields but have chosen not to co-operate with the cluster initiative. Intel is one of the biggest ICT employers in the region, the largest Polish software company, Prokom, has its main offices in Gdynia.

We also conducted a survey to research what companies are in the region, using as our main tools business directories and search engines. Based on these findings, we concluded that there were at least 129 companies employing over 4700 people in the region, a more detailed breakdown is visible in the Appendix, under Exhibit III.

Performance

Statistics concerning the contribution of the cluster to regional GDP were not available for our report. According to Martin Jablonski, most of the companies in the region are not public limited companies and do not have to declare their revenue. As such, only employment figures were available. Approximately 400 people are employed in the member companies. Even though according to the senior executive of ICT Pomerania there are 87 companies in the cluster, we were only able to find 37 of these and our findings are based on these. Of these, only about 10 can be said to be active to some degree in the cluster initiative.

Issues & Problems

Tri-city competition is a major issue. Although a formal agreement between Gdynia, Gdansk and Sopot was signed, it has remained only on paper and not been enforced (Jablonski 2008). Each municipality wants the companies to be located in their area. One such example is the fact that Gdynia has forced ICT Pomerania to spend the funds it receives only in its own region and not spread out. Clusters are usually cross-county and borders tend not to coincide with the administrative ones. Gdansk Technical University has created an “academic” incubator and are promoting their own cluster initiative, in other words, there is a great deal of duplication of efforts and wasting of resources.

Universities are another problem area. Although the University of Gdansk does co-operate to a certain extent, most public educational institutions are reluctant to establish partnerships with the private sector. Private universities on the other hand, tend to adapt their curricula more to business' needs and, because of competition for tuition fees and resources, they are more flexible.

Due to mainly historical reasons and the fact that many companies have military contracts, sharing information is not something the companies excel at either (Jablonski 2008).

Although in the region there are a few large companies such as Prokom, these do not cooperate with local partners. Furthermore, the size of the Polish economy, though it could be viewed as a benefit is actually a disadvantage as companies do not see the need to deal with companies and customers abroad. They are happy with modest success.

Many companies that signed letters of intent with ICT Pomerania, when contacted, were extremely hostile to the idea of co-operation. The organisation was also considered to be mainly a promotion agency with few or none real clustering activities, essentially only focusing on attracting foreign investors but not upgrading the local conditions in any way (Chojnacki 2008).

Diamond

Factor Conditions

Labour Force

In general, the Pomeranian labour force has a lower degree of education than the rest of Poland. Although the percentage of people currently in education (5.7% in upper secondary and 4.7% in tertiary) is roughly similar to the Polish (5.5% and 5.5%), it lags behind on the highest educational level attained for the 25–64 aged cohort with only 14.7% having achieved tertiary education compared to a national average of 17.6% and 56.5% compared to 66.8% for upper secondary and post-secondary non-tertiary (Eurostat 2008).

Innovation Capacity

The region is slightly better positioned than the country as a whole, with an average of about 0.89 ICT patents per million inhabitants to the EPO, compared to 0.53 for Poland (Eurostat 2008).

Expenditure on R&D on the other hand is lower than the National Average, and as a % of GDP the Government expenditure on R&D is extremely low, having averaged about half the national level over the last 5 years (Eurostat 2008).

Employment in High-Tech in the region is about 50% higher as a percentage of total employment than the national average (Eurostat 2008), which could in theory lead to a workforce with better know-how in the area.

On the most recent regional innovation scorecard no data is available down to the voivodeship and only up to a higher level that is only used for statistical purposes. The greater area ranks as 162nd in Europe for innovation (Hollanders 2006).

On a side note, nearly 80% of SMEs have an e-mail address, but only 55% of SMEs have their own website (Pomeranian Development Agency Co. 2007).

Infrastructure

Pomerania benefits immensely from its location, being at the Baltic coast and possessing two major ports in Gdynia and Gdansk. The former is responsible for approximately 83% of all container shipments in Poland, has been partially privatised and is currently expanding its facilities and capacity (Pomeranian Development Agency Co. 2007).

Context for Firm Strategy and Rivalry

FDI influence on Local Markets

Among exporters the dominant firms are the companies with at least a 50% share of foreign capital and if they start to export, foreign sales tend to dominate and foreign customers as a rule become their principal clients (Pomeranian Development Agency Co. 2007).

Local Competition

Over two thirds of small and medium–sized enterprises did not make any attempts to export to external markets. This fact reiterates remarks by the senior executive of ICT Pomerania, that SMEs are focusing their activity to the territory of theirs country. Attempts aimed at export markets were made mostly by larger firms and firms with a longer record of activity.

SMEs in Pomerania are also implementing, technological and production process innovations. In the context of relatively weak involvement of companies in market research, it means, that the market effectively enforced the rivalry among companies and enhanced their competitiveness. This fact contributes that decisive majority of SMEs feels either strong or very strong competition, even though most companies are of the opinion that they are able to cope with such competitive pressure.

Nearly a half of SMEs are afraid of local competition but just only 13.3 % of firms afraid of the competition from abroad (Pomeranian Development Agency Co. 2007).

Related and Supporting Industries

Cooperation and trust between companies and with research centres

What was stated on the national level is true also for Pomeranian region.

The majority of companies do not see the need for co-operation with other companies in innovation activities and if the co-operation occurs it refers mainly to vertical linkages, that means in relations with customers and suppliers. The most significant barrier for all firms was the prevailing opinion that other firms are competitors with whom they should fight for market position and also co-operation in innovation could lead to stealing of their know-how and qualified employees.

Furthermore, the co-operation with R&D institutions is very weak and sporadic and whenever any demand for co-operation comes up, it is just oriented only towards The Gdansk University of Technology (Wojnicka, Rot, et al. 2002).

The problem resides in the fact that the Gdansk Technical University has created its own “academic” incubator and are promoting their own cluster initiative (Jablonski 2008), not co-operating with the “ICT Pomerania” initiative.

Regional Business Associations

The weakness of this regional cooperation and innovation system is partly due to the weakness of regional business association. If interactions occur they refer mainly to partners from outside the region. Intra-regional co-operation is important only in terms of contacts with R&D institutions. The majority of firms in the region belong to various national business associations. However, co-operation on the regional level might be more effective. Regional authorities should induce such dialog between firms and other regional agents (Wojnicka, Brodzicki and Szultka 2005).

Public Authorities in the Region

In the Pomeranian Region are public authorities willing to support regional development. In Regional Innovation Strategy for the Pomerania Region RIS-P”, which was created and unanimously confirmed by the Pomerania Assembly in December 2004, the main priority was building an effective regional innovation system (Pomerania Voivodship: Regional Innovation Strategy 2006).

Another initiative is the Pomeranian Development Agency, which focuses on providing information, training and advisory services for SMEs and also initiating and participating in regional projects focused on entrepreneurship development (Pomeranian Development Agency Co. 2007).

Nonetheless, co-operation of SMEs with local authorities is still almost non-existent in all sectors (Wojnicka, Brodzicki and Szultka 2005).

Region is not a producer of Technology

The Pomeranian region, and the entire country, is mainly a user and not a producer of technology. The main sources of different components of companies' capital come from foreign countries (Wojnicka, Rot, et al. 2002).

This fact is also confirmed by report done by Pomerania Development Agency in 2007. In which they found out that SME's are purchasing new technologies outside of the Pomeranian Voivodship.

Demand Conditions

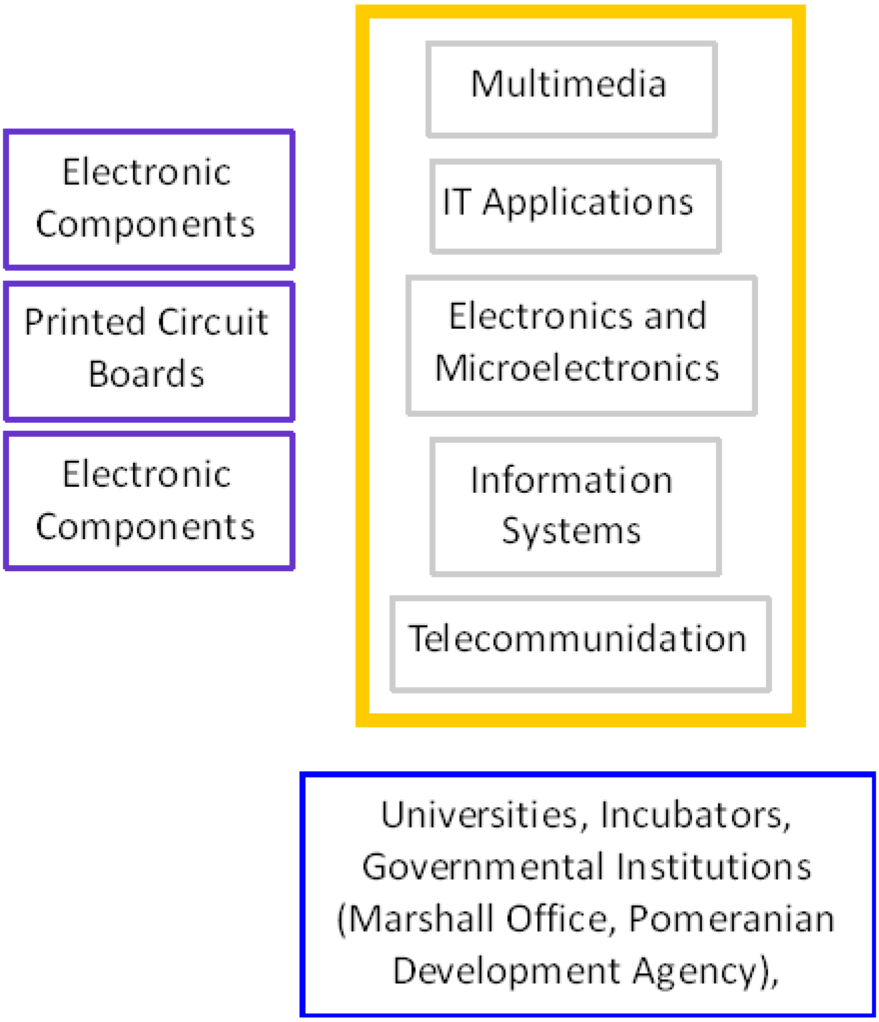
About half of SMEs in Pomeranian region were of the opinion that demand is adequate to their production capacities or only slightly below (Pomeranian Development Agency Co. 2007). Over one fourth of companies were of the opinion, that the demand exceeds the current output capacities of the companies (as many as 11.4% companies considered that relationship as substantially large). In the subjective assessment of the entrepreneurs the barrier of demand for their products is thus not an essential element. Problems related to insufficient demand are rather experienced by companies with a longer record of activities in the market, which may indicate a rather low mobility of the SME sector, while younger companies were created and focused their activity in the areas of strong demand for their products and services.

More over there is also a lack of demand for High-Tech products and above all the industrial demand almost non-existent, almost the whole Polish ITC market growth is driven by SMEs, confidently making IT investments and only to a small degree by large companies attempting to improve their performance (Wojnicka, Brodzicki and Szultka 2005).

CLUSTER MAP

Producing a cluster map has proven quite challenging as in industries such as this one there are not many inputs other than human capital. Furthermore, this cluster is focused mainly on the "software" and service part of the industry and not on the hardware, reducing the scope of suppliers even further. Together with unwillingness of companies to provide information about their suppliers we were not able to create proper cluster map. As such we resorted to the Microeconomics of Competition lecture slides example of an IT cluster and modified it to fit out cluster.

Most of the SMEs in general co-operate mainly with their business partners (suppliers or customers) in the region, though as many as 84% of suppliers are located all over Poland (Pomeranian Development Agency Co. 2007). Moreover, international co-operation is rather insignificant.



Orange: Cluster Members
Blue: Public Institutions
Purple: Related and Supporting

Recommendations

The Final Question

To answer the question on the cover of the report one has to begin by looking at the existing pre-conditions of which at least two must be met to be considered as an emerging cluster:

- Several small and medium sized companies exist but we cannot determine whether they have met the market test although some like Datera, Radmor and Atena seem to have done so (Warsaw Voice 2007)
- Pomerania does possess some advantages for the ICT cluster, ranging from the above-average patenting in the sector over the close proximity to Scandinavia, which has an established and world-leading ICT sector, to the high level of entrepreneurship. Though a framework for innovation is still in the process of being established. Regional demand for ICT is growing fast but it is relatively unsophisticated.
- Intel is present in the region but its role in the cluster is minimal and does not co-operate with the ICT Pomerania members
- We have neither found any relevant related clusters in the area.

Therefore, we must say that for the moment it is a case of wishful thinking.

Nonetheless, there are several recommendations we can make to improve the environment for an emergent cluster to develop.

Private Sector

1. Implications of Clustering

Most of the companies we interviewed were equally unfamiliar with the real implications of clustering, considering clusters to be an alternative designation for industry and as such did not see the advantages of working together. Low trust and poor contract enforcement mechanism comprise the potential to reap the benefits of clustering. Although some potential externalities, such as reduction of barriers to entry for new companies creating excess of supply clusters' main product, accrue to clustered enterprises, in case of survival clusters this can lead to ruinous competition instead of rivalry-driven upgrading as observed in innovative and dynamic clusters (Altenburg and Meyer-Stamer 1999).

2. Large Enterprises

ICT Pomerania cluster efforts have emerged out of SME policies and thus tended to focus on smaller companies and start-ups, but a low presence of larger companies may limit the economic impact of cluster.

It is clear from evidence that full cluster effects can only develop if all types of companies are actively engaged, independent of size or ownership.

Similarly, participation of companies cannot be just limited to companies that have a direct need for the available government support, because successful cluster initiatives also require 'opportunity-based' participation where successful companies see additional benefits (DG Enterprise and Industry, 'Innovation Policy' 2007). That is why the Pomeranian cluster should focus more on developing cooperation with existing larger companies in the region.

3. Cluster Concept Awareness

Authorities are still unfamiliar with the cluster concept. Their awareness needs to be raised to be able to provide cluster associations with the right resources and enhanced priority within the government. Although the Ministry of Economy is beginning to engage in the concept, this support is not present throughout all the levels of authority; it is a “top-down” initiative (Jablonski 2008). That is why fear of co-operation, opportunistic behaviour and path-dependent preference for vertical integration has to change. The cluster concept must be further promoted among firms to increase cooperation between companies, in other words, a form of “competition through cooperation”. Regional business associations need to be improved to facilitate the transfer of knowledge. Policy makers should raise awareness of the advantages of networking. An important starting point would be to encourage the establishment of local stakeholder dialog to identify economically viable projects of collective actions where economies of scale occur. Also network brokers can be very helpful as catalyst and they could help to identify missing links in local production system and subsequently develop these missing links by linking network firms up with support institutions and getting public funding or by transmitting organizational know-how. Their main objective would then be consolidation of trust relations and definitions of rules of interaction between cluster members. Finally, the cluster should become independent of public support and operate like any other private-sector firm.

4. Workshops and Ongoing Training

By organising common workshops and training sessions with specialists from varied firms present, these would lose their inhibition to co-operation as they would have the same knowledge and have a established a personal relationship with each other, making working together more natural.

5. Export Markets

Businesses need to be made aware of the benefits of serving an export market which is more demanding than the national. For those companies that follow this strategy, it has been proven to be worthwhile (Pomeranian Development Agency Co. 2007). They increased their productivity and, in general, once exports begin they tend to make up the majority of their sales due to the increased size of the market. Exporting also forces the companies to research better their market and improve their products to better satisfy customer needs, a step many SMEs often completely skip in their product development cycle. Public services should assist companies in their research.

The environment for entrepreneurship development, mainly related to activities such as venture funding and “business angel” networks can be a useful tool in the ICT industry, like as the Silicon Valley model demonstrates.

6. Expenditure on R&D

R&D expenditure needs to be raised to reduce the dependency on imported technology and allow the upgrading of the whole cluster. The ICT Cluster is one in which patents and innovation are crucial. Tighter co-operation between Higher Educational Institutes and industry would allow a faster transfer of technology and better directed research efforts, into areas which businesses consider to be most pressing and with the most market potential.

Public Authorities

7. Patents and Technology Transfer

In some Scandinavian countries patents are issued to the universities only for a year and are then transferred back progressively to the researchers themselves. This forces the universities to transfer the technology into practical applications as fast as it can. This is one of the areas at which Europe lags the most behind the US and Japan, as a recent article in The Economist highlighted, “the problem is that their ideas tend to stay in their ivory towers”. Universities also need to adapt their curricula more to the needs of businesses. The institutions tend to be inward looking and the teaching too academic in nature, this has been found to be true even for supposedly “vocational” institutions. Some authors have even connected this to the worsening structural conditions of the employment market (Fulton, et al. 2007).

8. Laboratories

Pomerania also needs to avoid the problem of underutilisation of laboratories. In Sweden, local governments often build research facilities for companies but these end up being used only on three or four projects.

9. Student Motivation

As mentioned in the report, the percentage of students in social sciences is disproportionately high. More emphasis must be given to technical branches such as engineering to those facing the question of what course to take. Human capital is the main input in the ICT industry and must be given special consideration.

10. Corruption & Justice

As previously noted, corruption is a major issue in Poland and the country has been bordering on “rampant corruption” (Transparency International 2007). To fight this, a stronger and speedier judicial system is required. For example, obtaining a judgement against a defaulting debtor currently takes 850 days on average (The Economist 2006). Although an anti-corruption “super-authority” has been established, its effectiveness has been questioned and is considered to be by several simply another bureaucratic layer.

Appendix

Exhibit I: Historical Economic Performance 1990-2007

Column1	1991	1992	1993	1994	1995	1996	1997	1998	1999
GDP (% real change pa)	-6,9	2,6	3,7	5,2	7	6,2	7,1	5	4,5
Real GDP (PPP US$ at 2005 prices)	273,121	280,295	290,943	306,072	327,497	347,801	372,495	391,12	408,721
Real GDP (US$ at 2005 prices)	167,492	171,891	178,421	187,699	200,838	213,29	228,433	239,855	250,648
Real private consumption (%GDP)	64,6%	64,6%	66,1%	65,2%	62,9%	64,4%	64,4%	64,4%	64,9%
Real government consumption (%GDP)	20,9%	21,6%	21,6%	21,1%	20,4%	19,7%	19,0%	18,5%	18,1%
Real gross fixed investment (%GDP)	15,2%	15,1%	14,9%	15,4%	16,7%	18,7%	21,2%	22,9%	23,2%
Real exports of G&S (%GDP)	16,2%	17,4%	17,3%	18,6%	21,4%	22,6%	23,6%	25,8%	24,0%
Real imports of G&S (%GDP)	15,5%	15,3%	16,7%	17,7%	20,6%	24,8%	28,1%	31,7%	30,7%
Labour productivity growth (%)	n.a.	n.a.	n.a.	6,9	6	4,9	5,6	3,8	8,7
Average real wages (% change pa)	1,282	-4,144	-0,831	3,516	-1,107	5,539	6,091	3,455	4,846
GDP per head ($ at PPP)	5.357,30	5.612,80	5.951,60	6.386,50	6.973,40	7.546,00	8.218,10	8.729,80	9.265,00
Total debt/GDP	69,954	57,338	52,465	45,891	31,692	27,629	26,429	32,98	38,722

	2000	2001	2002	2003	2004	2005	2006	2007	2008
GDP (% real change pa)	4,3	1,2	1,4	3,9	5,3	3,6	6,2	6,5	5,2
Real GDP (PPP US$ at 2005 prices)	426,296	431,411	437,451	454,511	478,601	495,83	526,572	560,929	589,826
Real GDP (US$ at 2005 prices)	261,426	264,563	268,267	278,73	293,502	304,069	322,921	343,99	361,712
Real private consumption (%GDP)	64,2%	64,8%	66,0%	64,7%	64,1%	63,0%	62,2%	61,6%	61,6%
Real government consumption (%GDP)	17,7%	18,0%	18,0%	18,2%	17,8%	18,1%	18,0%	17,1%	16,5%
Real gross fixed investment (%GDP)	23,2%	19,8%	18,1%	18,0%	19,6%	19,2%	21,1%	23,8%	25,1%
Real exports of G&S (%GDP)	28,4%	28,9%	29,9%	32,9%	35,6%	37,1%	40,0%	41,0%	42,3%
Real imports of G&S (%GDP)	34,0%	31,8%	32,2%	33,9%	37,0%	37,4%	41,4%	43,4%	45,7%
Labour productivity growth (%)	6	3,5	4,5	5,2	3,9	1,2	2,7	2,2	2,9
Average real wages (% change pa)	1,349	2,363	0,665	3,33	0,528	1,699	3,901	6,5	5,9
GDP per head ($ at PPP)	9.874,40	10.233,60	10.563,80	11.206,00	12.142,20	12.991,60	14.240,00	15.560,00	16.730,00
Total debt/GDP	37,846	34,531	38,691	43,242	38,479	32,499	35,9	38,2	37,8

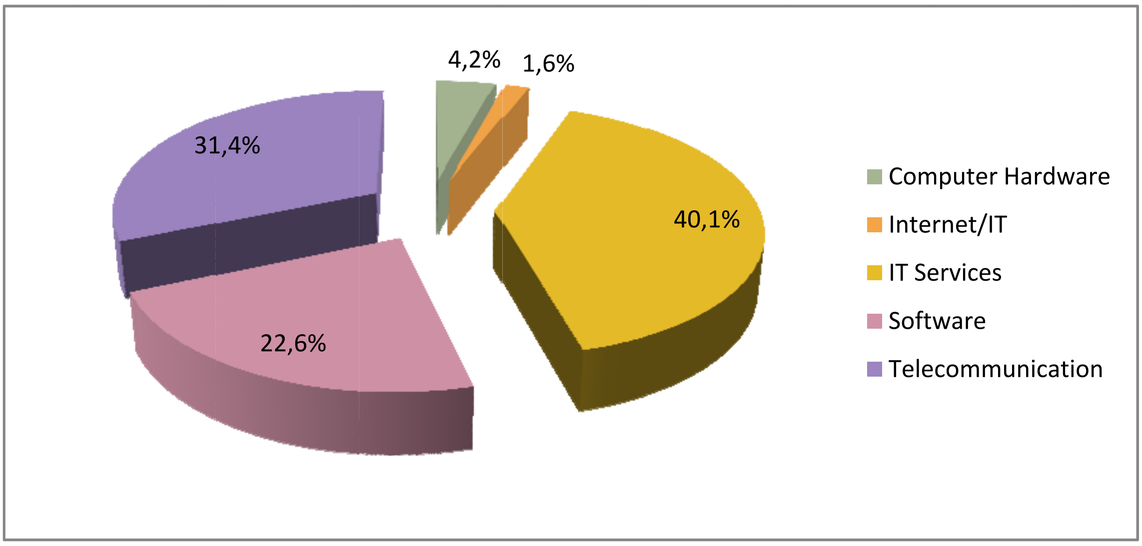
Source: EIU *Country Dataset* (2007)

EXHIBIT II: CURRENT ECONOMIC PERFORMANCE COMPARISON TO PEER GROUP

Column1	POLAND	ESTONIA	HUNGARY	LATVIA	CZECH REPUBLIC	ROMANIA	SLOVAKIA	EU15 (AGG.)
GDP (% real change pa) (a)	6,5	7,1	2	10,7	6	5,8	9	2,6
Nominal GDP (US$ at PPP) (a)	592,876	28,559	190,114	38,968	228,949	228,028	108,936	13.090,55
Government consumption (% of GDP) (a)	17,1	16,1	9,7	16,1	20	17,6	17,9	20,8
Gross national savings/investment (a)	82,8	58,4	76,5	35,1	87,2	47,5	83,6	98,7
Budget balance (% of GDP) (a)	-1,8	2,7	-6	0,4	-3,6	-2,5	-2,9	-1,1
Consumer prices (% change pa; av) (a)	2,3	6,6	7,8	10,1	2,8	4,8	2,7	2,1
Producer prices (% change pa; av) (a)	2,3	8,2	3	16,7	4	7,8	-1,2	2,7
Average real wage index (LCU, 2005=100) (a)	110,7	124,6	104	137,3	108,3	126,7	108,8	101,6
Average real wages (% change pa) (a)	6,5	11,7	0	19	4,5	13,5	4,7	0,7
Unit labour costs (% change pa) (a)	18,5	29,9	20,2	29,2	14,1	32,5	21,2	10,1
Labour costs per hour (a)	9,57	8,96	9,41	6,14	11,59	5,48	8,78	29,64
Population (a)	38,11	1,341	9,96	2,281	10,23	21,63	5,458	389,628
GDP per head ($ at PPP) (a)	15.560,00	21.300,00	19.100,00	17.080,00	22.380,00	10.540,00	19.960,00	33.600,00
Population (% change pa) (a)	-0,1	-0,2	-0,3	-0,6	-0,1	-0,1	0,1	0,4
Labour force (a)	17,01	0,69	4,19	1,167	5,35	9,35	2,661	188,253
Recorded unemployment (%) (a)	12,8	4,7	7,4	5,9	6,4	4,5	8,5	7,1
Broadband penetration rate (%) (b)	6,8	20	11,6	11,6	12,2	6,6	6,9	20,8
Information technology expenditure (%GDP) (b)	2,6	2,9	2,5	2,3	3,2	2,1	2,5	2,7
Number of patent applications to the EPO / million inhab. (1999-2003) (b)	3,5	10,6	18,6	5	12,06	1,2	6,4	157,7
Expenditure on education (%GDP) (2003)	5,6	5,4	5,9	5,3	4,5	3,4	4,3	5
Expenditure on education (per student) (2003) (b)	2654,3	n/a	n/a	2257,9	3392,3	n/a	2346,2	5864,2
Participation rate in education (15-24) (2004) (b)	68,6	63	59,7	64,8	59,2	47,4	52,1	59,1

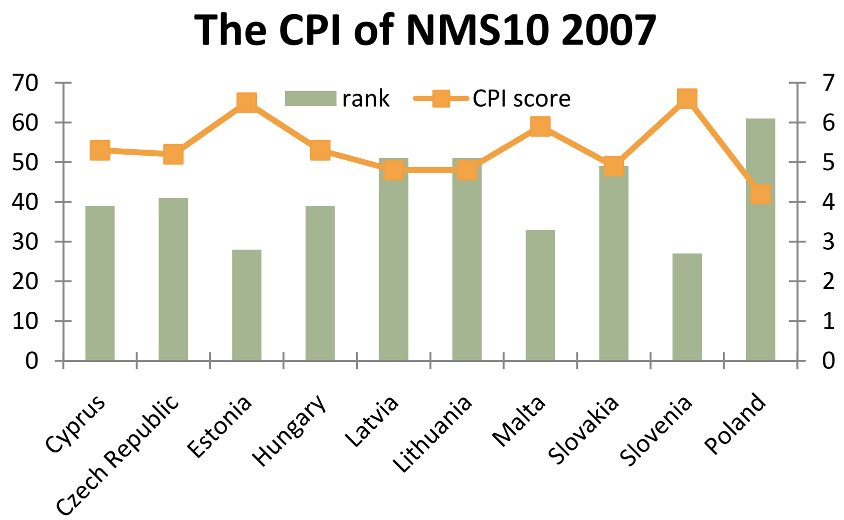
Sources: (a) EIU *Country Dataset* (2007); (b) Eurostat (2007, unless otherwise noted)

EXHIBIT III: COMPANIES BY SECTOR INSIDE THE ICT INDUSTRY IN THE POMERANIA REGION



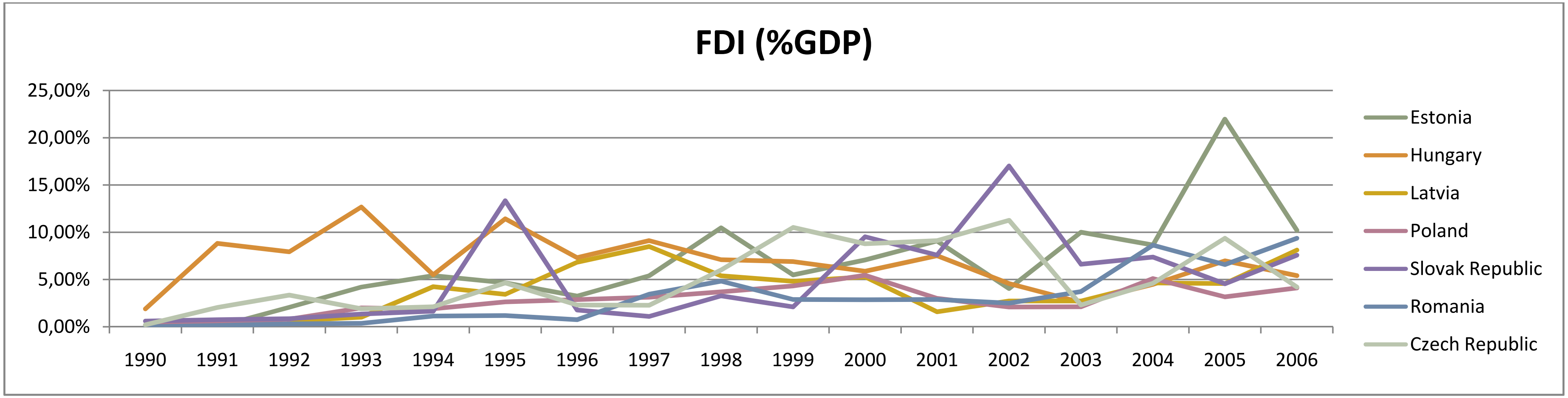
Source: www.bizpoland.pl, Authors' own calculations

EXHIBIT IV: CPI IN POLAND AND COMPARISON TO PEERS



Source: Transparency International *Corruption Perception Index 2007*

EXHIBIT V: FDI AS A PERCENTAGE OF GDP AMONG PEER GROUP



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Estonia	0,00%	0,00%	2,05%	4,20%	5,41%	4,65%	3,24%	5,40%	10,47%	5,48%	7,07%	9,08%	4,04%	10,00%	8,64%	21,97%	10,20%
Hungary	1,89%	8,83%	7,93%	12,67%	5,51%	11,43%	7,31%	9,11%	7,09%	6,89%	5,88%	7,52%	4,56%	2,57%	4,47%	6,97%	5,40%
Latvia			0,61%	1,01%	4,24%	3,43%	6,83%	8,49%	5,40%	4,81%	5,27%	1,58%	2,72%	2,72%	4,64%	4,58%	8,12%
Poland	0,15%	0,38%	0,80%	2,00%	1,90%	2,63%	2,87%	3,12%	3,70%	4,33%	5,45%	3,00%	2,09%	2,12%	5,10%	3,17%	4,11%
Slovak Republic	0,60%	0,75%	0,85%	1,34%	1,65%	13,33%	1,78%	1,09%	3,27%	2,10%	9,52%	7,58%	17,01%	6,61%	7,37%	4,54%	7,57%
Romania	0,00%	0,14%	0,31%	0,36%	1,13%	1,18%	0,74%	3,44%	4,82%	2,89%	2,85%	2,88%	2,50%	3,72%	8,63%	6,58%	9,37%
Czech Republic	0,21%	2,05%	3,35%	1,90%	2,11%	4,64%	2,30%	2,28%	6,01%	10,52%	8,79%	9,12%	11,27%	2,30%	4,60%	9,37%	4,20%

Source: UNCTAD *FDIStat* (2006); World Bank *World Development Indicators* (2006); authors' calculations

Exhibit VI: Ranking in Comparison to Peers and Leader

Buyer Sophistication

Rank	Country	Score
8	Finland	5.74
37	Estonia	4.60
45	Czech Republic	4.41
60	**Poland**	**3.99**
64	Latvia	3.91
69	Romania	3.82
77	Slovak Republic	3.59
84	Hungary	3.48

Quality of Edu. Sys.

Rank	Country	Score
1	Finland	6.00
30	Czech Republic	4.48
31	Estonia	4.42
34	**Poland**	**4.36**
35	Latvia	4.35
42	Hungary	4.04
49	Slovak Republic	3.86
51	Romania	3.83

Laws Relating to ICT

Rank	Country	Score
1	Estonia	5.73
9	Finland	5.40
40	Hungary	4.24
43	Czech Republic	4.15
45	Slovak Republic	4.14
57	Romania	3.79
60	**Poland**	**3.71**
63	Latvia	3.68

Tertiary Enrollment

Rank	Country	Score
1	Finland	7.00
9	Latvia	5.98
18	Estonia	5.35
22	**Poland**	**5.08**
25	Hungary	4.99
36	Czech Republic	3.88
42	Romania	3.68
52	Slovak Republic	3.40

Local Supplier Quality

Rank	Country	Score
9	Finland	5.90
22	Czech Republic	5.48
32	Estonia	5.12
42	Slovak Republic	4.78
45	Latvia	4.65
58	Hungary	4.41
60	**Poland**	**4.37**
69	Romania	4.12

University/Industry Collaboration

Rank	Country	Score
3	Finland	5.53
26	Czech Republic	4.02
28	Estonia	3.89
30	Hungary	3.82
31	Slovak Republic	3.75
37	**Poland**	**3.56**
51	Latvia	3.21
77	Romania	2.86

State of Cluster Development

Rank	Country	Score
3	Finland	5.07
6	Hungary	4.94
10	Romania	4.78
23	Czech Republic	4.46
44	Latvia	3.68
51	Slovak Republic	3.61
65	Estonia	3.45
79	**Poland**	**3.26**

High-Tech Exports

Rank	Country	Score
11	Hungary	4.48
17	Finland	3.50
24	Czech Republic	2.62
29	Estonia	2.08
39	Slovak Republic	1.62
45	Romania	1.39
49	Latvia	1.35
52	**Poland**	**1.33**

Burden of Gov't Regulation

Rank	Country	Score
3	Finland	4.85
9	Estonia	4.21
36	Latvia	3.33
50	Romania	3.10
50	Slovak Republic	3.10
54	**Poland**	**3.07**
75	Hungary	2.82
110	Czech Republic	2.33

Extent and Effect of Taxation

Rank	Country	Score
8	Slovak Republic	5.49
13	Estonia	5.00
38	Latvia	3.74
62	**Poland**	**3.20**
77	Hungary	3.00
87	Czech Republic	2.83
98	Finland	2.55
106	Romania	2.44

Time Required to Start a Business

Rank	Country	Score
12	Romania	6.64
19	Finland	6.52
20	Latvia	6.44
38	Czech Republic	6.12
43	Slovak Republic	6.08
56	**Poland**	**5.84**
65	Estonia	5.68
74	Hungary	5.56

Quality of Scientific Research Inst.

Rank	Country	Score
7	Finland	5.73
26	Hungary	4.74
28	Estonia	4.68
29	Czech Republic	4.65
58	**Poland**	**3.81**
61	Latvia	3.76
66	Romania	3.70
71	Slovak Republic	3.58

Source: World Economic Forum Global Information Technology Report 2006-2007

Exhibit VII: R&D Expenditure Comparison

R&D (%GDP)

	2000	2002	2003	2004	2005
EU15	1,91	1,94	1,95	1,95	1,92
NMS10	0,77	0,79	0,78	0,77	0,78
Poland	0,64	0,62	0,56	0,54	0,56
Pomorskie	0,49	0,47	0,36	0,42	n/a

R&D by Business (%GDP)

	2000	2002	2003	2004	2005
EU15	1,25	1,27	1,27	1,26	1,24
NMS10	0,36	0,36	0,32	0,34	0,36
Poland	0,23	0,22	0,11	0,15	0,16
Pomorskie	0,15	0,15	0,08	0,12	n/a

R&D by Government (%GDP)

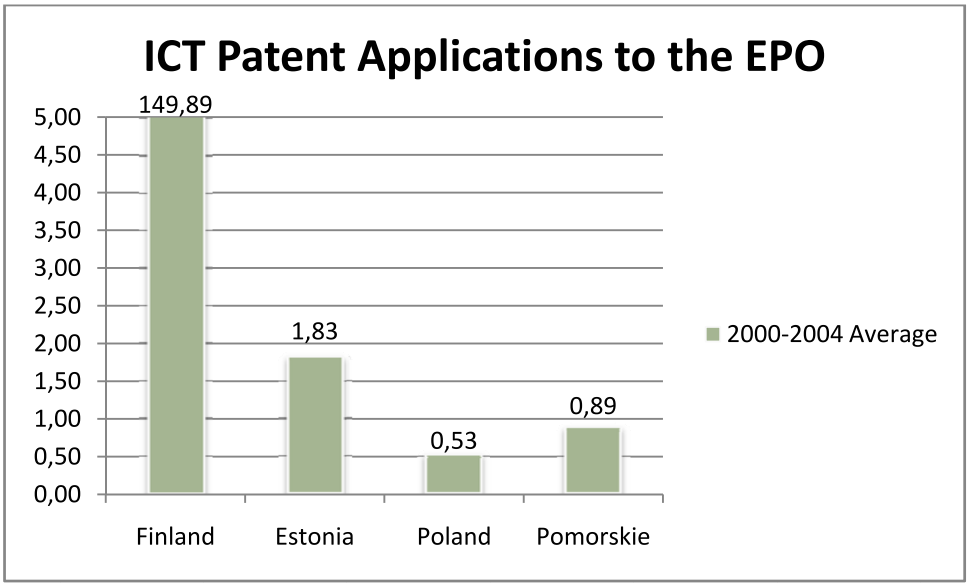
	2000	2002	2003	2004	2005
EU15	0,26	0,25	0,25	0,25	0,24
NMS10	0,22	0,22	0,26	0,24	0,22
Poland	0,21	0,19	0,25	0,22	0,22
Pomorskie	0,11	0,09	0,09	0,13	n/a

R&D by Higher Education (%GDP)

	2000	2002	2003	2004	2005
EU15	0,39	0,41	0,42	0,42	0,42
NMS10	0,19	0,2	0,2	0,19	0,19
Poland	0,2	0,2	0,19	0,17	0,18
Pomorskie	0,22	0,22	0,18	0,17	n/a

Source: Eurostat *New Cronos Database* 2008, authors' calculations

EXHIBIT VIII: ICT PATENT APPLICATIONS



Source: Eurostat *New Cronos Database* 2008

EXHIBIT IX: STUDENT POPULATION EVOLUTION COMPARED TO PEERS

Students in Upper secondary education (% Total Population)

	2000	2001	2002	2003	2004	2005
EU27	5,1%	5,1%	5,2%	5,1%	5,2%	5,3%
Estonia	4,1%	4,1%	4,2%	4,2%	4,3%	4,5%
Finland	5,6%	5,8%	5,8%	5,8%	5,8%	6,4%
Poland	7,1%	7,3%	5,7%	5,7%	5,7%	5,5%
Pomorskie	n/a	7,4%	5,9%	5,8%	5,9%	5,7%

Students in Tertiary education (% Total Population)

	2000	2001	2002	2003	2004	2005
EU27	3,3%	3,4%	3,5%	3,6%	3,7%	3,8%
Estonia	3,9%	4,2%	4,5%	4,7%	4,9%	5,0%
Finland	5,2%	5,4%	5,5%	5,6%	5,7%	5,8%
Poland	4,1%	4,6%	5,0%	5,2%	5,4%	5,5%
Pomorskie	n/a	3,8%	4,1%	4,2%	4,4%	4,7%

Source: Eurostat *New Cronos Database* 2008, authors' calculations

Exhibit X: Highest level of educational attainment as % of 25-64 aged

Upper secondary and post-secondary non-tertiary education

	1999	2000	2001	2002	2003	2004	2005	2006
EU15	35,5%	38,5%	40,0%	41,2%	41,8%	42,5%	43,3%	44,2%
NMS10	64,6%	65,4%	66,3%	67,2%	66,9%	66,7%	66,7%	66,6%
Estonia	55,0%	57,2%	57,1%	57,0%	57,7%	57,4%	55,7%	55,0%
Poland	67,4%	68,6%	68,1%	69,0%	67,8%	67,6%	67,5%	66,8%
Pomorskie	62,7%	60,5%	62,4%	63,2%	62,2%	61,1%	59,5%	56,5%
Finland	30,3%	40,7%	41,6%	42,6%	42,9%	43,5%	44,2%	44,5%

Tertiary education

	1999	2000	2001	2002	2003	2004	2005	2006
EU15	18,3%	19,8%	20,6%	20,9%	21,8%	22,9%	23,6%	24,5%
NMS10	13,4%	13,8%	13,2%	13,8%	14,8%	16,0%	17,0%	18,0%
Estonia	29,5%	28,9%	30,3%	30,4%	30,6%	31,4%	33,3%	33,2%
Poland	11,3%	11,4%	11,8%	12,7%	14,0%	15,5%	16,7%	17,6%
Pomorskie	11,3%	11,5%	11,6%	12,3%	13,2%	14,1%	14,6%	14,7%
Finland	23,4%	32,1%	32,3%	32,4%	33,2%	34,2%	34,7%	35,1%

Source: Eurostat *New Cronos Database* 2008, authors' calculations

Exhibit XI: Regional GDP Comparison

Real GDP growth rate

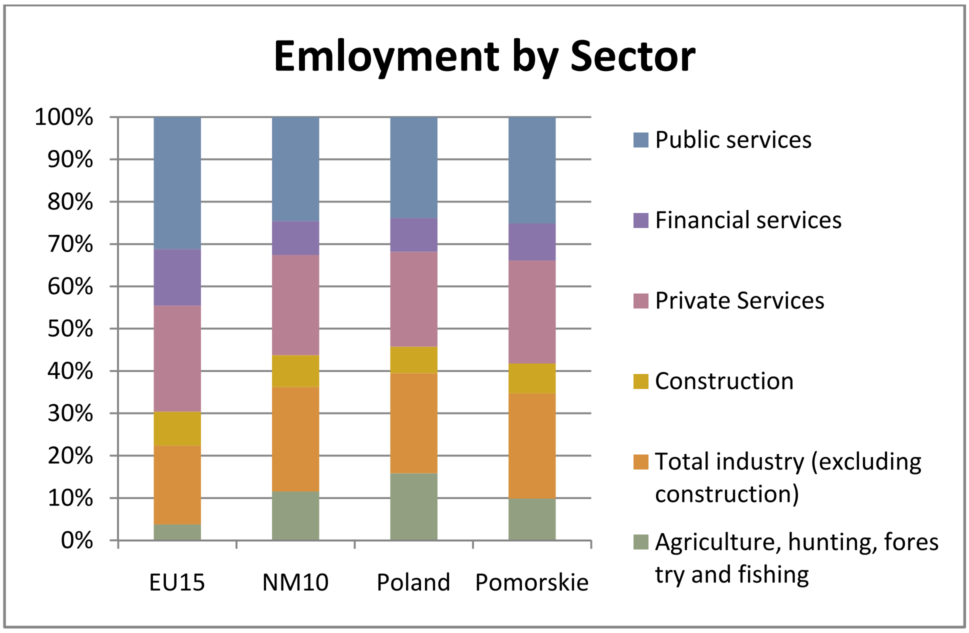
	2000	2001	2002	2003	2004
EU15	3,6	1,7	1	1,2	2,3
NMS10	4,2	2,3	2,4	4,1	5,2
Poland	4,2	1,1	1,4	3,8	5,3
Pomorskie	2,2	-0,1	3,4	2,9	4,6

GDP per head (PPP)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EU15	16865	17651,4	18580	19494,5	20430,5	21822,5	22588,8	23268,4	23428,4	24336,1
NM10	7070,2	7676,6	8269,8	8770,9	9255	10050,3	10533,7	11105,4	11555,5	12405,6
Poland	6193,7	6784,2	7455,6	7993,9	8522,1	9282,5	9495,3	9862,3	10080,3	10908,4
Pomorskie	6295,6	6713,4	7336,1	7933,8	8629,5	9223,1	9307,6	9838,5	9926	10658,5

Source: Eurostat *New Cronos Database* 2008

Exhibit XII: Employment Structure Comparison



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