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**AN ASSESSMENT OF LOGISTICS SYSTEM
OPPORTUNITIES FOR LODZ – LESSONS LEARNED
FROM THE ZARAGOZA EXPERIENCE**

Abstract: This paper has the objective of analysing strengths, weakness and real opportunities available to Lodz concerning logistics. Moreover, the analysis will be done utilizing examples, insights and concrete results provided by the Spanish experience in Zaragoza.

Introduction

Since the end of the 1989, Poland has faced several transformations throughout every sector of its economy. The GDP growth registered since 2002 is significantly higher than the average of other EU nations. It provides evidence of the significant progress accomplished by this county in recent years. However, specific regions of Poland have found severe difficulties in adapting themselves to a world scenario of strong competition. The collapse of a diverse range of industries, strongly affected by the movement of production sites to Asia, has elevated the unemployment rate to alarming levels. Lodz, a city located in the heart of Poland, the second in size of Polish cities and the

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focus of this paper, is a major example of this unfortunate reality. The death of its manufacturing industries, mainly concentrated in the textile sector, has imposed a threat to the development and growth of an area that once was home to the magnates of the Polish textile industry.

The poor economical situation faced by Lodz in recent years has attracted the attention of the local administration in finding a new source of prosperity for the region. A number of possibilities have been considered, taking into account current global economic realities as well as the resources available in the area. In this context, logistics has been recognized as an ideal business for the future of Lodz.

In contrast, in another part of the continent, a country has managed well the task of implementing a major logistics centre: Spain. Investments in the city of Zaragoza are transforming this town into one of the largest logistics sites in Europe.

1. Logistics and theoretical view

At the root of regional developments is the coherence of local government and the strategies of new investors. West (1998) noted that distribution was extremely difficult for global markets and differed in such countries as Poland, Japan, France or India. The development of logistics capacity involves the use of country or regional infrastructures, such as: roads, transport systems, telecommunication networks, insurance opportunities, job mobility *etc.* to reach logistics system goals. The selection of locations for overseas logistics facilities is an important decision with consequences. Cost savings and potential new market opportunities are frequently driving factors in determining the locations for new logistics businesses. Global logistics costs are not only connected with regional infrastructure but also with the business climate and economic risks. Minor errors in the location of logistics facilities can result in major financial losses in the long term because of the sunk costs involved and the risk of future stranded assets. In comparing business climate and risk in different countries political stability, government regulations, business practice, culture, relationship with the local community and the possibility to provide special economic zones must also be taken into consideration (Xue, Lee 1998).

Most of the literature on logistics has taken only a firm level perspective. The value chains, network and value migration concepts are frequently reported by academic researchers as being the main theoretical issues (Ciesielski 2003).

However in order to describe the full dynamics of logistics company strategy development, the effect of country or regional capital also has to be taken into account. Regional and country governments have great impact on creation of the new sources of sales growth and profitability, making market access and achieving higher levels of market attraction, satisfaction and retention (Best 2000).

Best argues that a business generally prefers to sell and distribute directly to target customers, because such distribution options offer the most control and greatest potential for value-added sales. The development of world trade, international trade relationships and development of global companies have forced a rapid increase in alternative channels for system development. The major dimensions of logistics development are cost, delivery-time and infrastructure quality.

Logistics activities include distribution channels relationship management and physical distribution such as inventory, transportation, order processing, warehousing and materials handling decisions. Effective logistics allows a firm to identify redundancies, to develop relationships and alliances with key players, and to achieve cost advantage and to improve customer satisfaction. The global logistics companies may perform their function in an effective and an efficient way if country's economic factors provide value to them. Some people argue that logistics companies should focus only on costs that can be eliminated in the distribution function, but the more holistic *logistical partnership* approach allows system members to receive a higher level of quality, improved cost control and more efficient deliveries. These factors are a major impetus on today's markets for new technologies (Mohr 2001). Therefore, in addition, external environment, type of intermediaries, control and coordination and legal issues must all be taken into consideration. Murtha *et al.* (2001) indicate that the international or global logistics capacity exploits a firm's advantage by leveraging its value chain activities across geographic locations to create cost advantages, differentiation advantages, or even both. Countries and regions compete for logistics sector development by creating and sustaining their competencies, in turn producing fresh synergistic benefits to logistics sector players. In a knowledge-driven competition, companies leverage their value chains across rapidly changing technology generations but the infrastructure is an enduring element which to a varying degree enhances business competitiveness. In addition to its business benefits, the major civil infrastructure of a logistics system has the potential to be socially useful. These considerations complement consideration of economic efficiency and technical feasibility (Skayannis, Markatou 2005). In the logistics sector,

competitive advantage is related to costs as well as to the capability of the firm to offer to the market something that nobody else can offer. Therefore countries and regions improve and develop infrastructures not only to allow the firm to reduce operating costs, but also to increase the firm's capability to innovate.

Irwin (2002) argues that technological innovations have expanded the array of delivery mechanisms. Containerization, bulk shipping, online monitoring and online information access have cut loading times and resulted in the development of logistics around the world. The rise of East European countries' economies, lower costs in these regions and the existence of a high quality of labour force have favoured logistics system development. International trade has also expanded because more entrepreneurship friendly regulation has been introduced. Most European countries including Poland have established special zones reducing greatly the cost of logistics operations. Furthermore European Union regulations have already been adopted reducing the risk of company activities but the influence of the EU policy is still not strong. However it is constantly growing (Piątkowski 2005). US market research shows that the logistics sector are keen to see reduced development costs in logistics to compensate for the fact that distribution costs are rising far more rapidly than production costs (Pfohl 1998). Nevertheless the regions and countries have to offer added value which gives logistics companies competitive advantage on other attributes than just price. That added value allows regions and countries to develop logistics sectors despite a decreasing cost competitiveness.

2. Infrastructure and communication, Lodz and Zaragoza comparison

Anyone planning to invest in a logistics operation in Zaragoza can take comfort from the fact that land is not a source of any difficulty. This achievement is thanks to the Government of Aragon, which has prepared and separated real estate for the particular purpose of logistics. Also, the prices in this part of Aragon are much lower than in other important commercial centres of Spain, such as Madrid or Barcelona. Aragon is connected to important cities in Spain, such as Bilbao on the Atlantic coast and to Barcelona and Valencia in the Mediterranean Arc. At the same time, it is an important link to the southern areas of France, providing good access from Spain and Portugal to the European Union market. Zaragoza, the most important city of the region, is the main location of the infrastructure hub.

In many ways Lodz follows a similar path in respect of relative land prices, and the number of sites available. Prices are much lower than those in Cracow or Warsaw. A strategic way of seeing Lodzkie is that western companies might target the eastern countries' market (particularly the ones created with the nations that joined the EU recently). An opportunity to access better those markets could be through the establishment of their businesses in Poland, since it is a representative former eastern country closely located to the west. Learning with the local community, understanding their preferences and tastes, could be a useful technique in order to be aware of the former eastern European market behaviour and, in the sequence, producing and exporting goods to those places (*Cap Gemini Ernst & Young* 2005).

2.1. Air transport

Zaragoza has an airport, originally designed for military purposes, able to handle substantial air traffic. Equipped with modern and complete installations, Zaragoza airport is prepared to accommodate movements of airliners of any type or size. From 1992 to 2003 the volume of traffic in this airport has increased 14 times and a great part of this huge increase can be attributed to the start of low cost airline companies flying to Zaragoza. Good climate conditions guarantee high availability at the airport. Also, the geographical location is hazard-protected, in the sense that it is positioned at a reasonable distance from the Zaragoza city itself. The airport is located in a large open field, improving safety as well.

Even with its complete infrastructure, Zaragoza airport is still mainly utilized for passenger transport. In 2005, 376,000 passengers flew from and to this airport. However, only 3,900 tons of goods were transported to/from this airport in the same period, representing a decline of 58% of the volume transported in 2004 (*AENA* 2006).

Similar to Zaragoza, an airport originally developed for military purposes is used today in Lodz, for the transportation of passengers and goods. Lodz Lublinek Airport is located 6km from Lodz city centre. During its almost 40 years of regular operation, improvements have been made in order to increase its capacity and safety. Such enhancements have allowed the airport to accommodate the aircrafts ATR 42 and ATR 72 safely. However, the utilisation of the airport is still extremely low, with a volume of only 15,000 people annually (*The City of Lodz Office* 2006). The lack of a superior and complete infrastructure is one of

the causes of low travelling volume (*Polish Air Traffic Agency* 2005). Practically no cargo is transported to this airport due to its operational constraints.

2.2. Road transport

Aragon is crossed by two of the most important Spanish road transport routes:

The first is the north-south route that links Valencia and the Mediterranean highway to parts of southern France, including the city of Pau. The second is the East-west route, which is composed by two paths: one connecting Madrid to Barcelona, via the Aragon highway and the A-2 highway; another connecting Zaragoza to the western part of Spain, via the A-68 highway. These roads confirm Aragon's favourable location. It is well served by modern roads linking the region to major centres in Spain, Portugal and France. Zaragoza's current infrastructure and its successful use represent a good example of successful development by all levels of government in Spain over many years and changes of political leadership.

In contrast, the situation in Poland is not that positive. Poland has a total of 423,997 km of roads, of which 295,356 km is paved and only 484 km are expressways (*CIA* 2006). Even so, the majority of the few existing expressways are not up to modern standards. Polish roads are superficially EU compliant, according to the Polish International Freight Forwarders Association. However, they are not capable of handling loads of 11.5 tons per axle; in most cases they achieve a maximum of 8 tons per axle (*Chapman* 2006).

Analyzing Łódź in particular, the city is conveniently located in the central part of the country and it is also situated close to the junctions of the most important expressways that are under construction right now. Moreover, in order to facilitate the access from the city to those modern motorways, internal city junctions and exit roads are being constructed or, in some cases, repaired.

The challenge for Poland and for Lodz in particular, in the coming years will be to ensure the efficient management of resources received from the European Union. If all goes well and projects are well planned and managed, there is the possibility that by 2015 the Polish road network could match the quality of that achieved by the EU-15 in the 1980s (*Answers.com* 2006). Conversely, if the Government does not invest enough effort in order to control the budget tightly, being careful to achieve the milestones involved in the relatively complex infrastructure reconstruction project, then Poland risks getting stuck in an unfavourable position with a slim chance to integrate fully with the rest of Europe.

2.3. Rail infrastructure

Zaragoza will soon become part of the European high-speed train network, once an improved Madrid-Barcelona rail route passes through the city. Today the only very-high-speed ("AVE") train route between Madrid and Barcelona is via Valencia. It is planned that from 2007 an AVE service will be available from Zaragoza making it possible to reach either Madrid or Barcelona in about 90 minutes (*Railway Technology* 2006). Furthermore, convenient conventional railway lines already serve Zaragoza, including the ones linking the northern and the western parts of Spain and to Valencia, on the Mediterranean coast. Recent rail sector restructuring split the lines transporting goods and passengers, in order to improve the quality of both services. Once different speeds can be reached in each of those lines, higher speeds are guaranteed to passengers, at the same time safety is improved for travellers as well as for goods. Congestion is avoided in this way, especially in critical regions such as the Pyrenees.

In contrast, the Polish rail transport system has suffered from insufficient investments for many years. Previous attempts to restructure the railway have failed. Lines were closed and staff reductions occurred during the reorganization process. However, even after the reforms, PKP (the Polish railway company) still employs an enormous number of people (*PKP* 2006). The railway system as a whole is inefficient, consuming substantial resources from the public administration while providing a very poor service (United Nations Economic Commission for Europe 2005). Today, only 2,300 km of the railway network is capable of speeds above 120 km/h. A trip from Lodz to Warsaw takes two hours and to Cracow, around five. Personal security is questionable in passenger trains (mainly because of the risk of crime), particularly for people travelling at night.

The main challenge concerning the railway system that the Polish Government faces is the modernization of the infrastructure. A clear plan is needed in order to provide efficient and reliable signs to investors that better system conditions can be expected in the future. A lot has been said about high-speed train lines connecting major cities such as Cracow, Lodz and Warsaw, but still there are no concrete plans showing in detail what is required. Most of all, without a clear and consistent plan showing what is being designed for the future, there will be fewer chances of obtaining resources from the European Union.

2.4. Energy infrastructure

Aragon is well served with energy and it is an electricity exporter. Average electricity generation per capita is much higher than the average of the rest of Spain (11.7 MW compared to 5.5 MW) (Gobierno de Aragon 2002). Lodz is also supplied by substantial local energy sources. Belchatów, for example, is the largest conventional thermal power station in Europe and this is located in Lodzkie province. This particular power station is responsible for the production of almost 20% of the entire total electrical energy consumed in Poland (Belchatow S.A. Power Station 2004).

3. The economy structure by sector

According to the Government of Aragon, in 2002 there were 190 industrial estates established in the Aragon province, and a 4 year industrial plan has been executed, in order to attract new industrial estates as well as modernizing and consolidating the ones already located in the region (Gobierno de Aragon 2002). Zaragoza, as the capital and most important city in the region, benefits most from these investments.

Lodz, on the other hand, lacks such prosperity. In recent years Łódź has ceased to be a competitive location for manufacturing. Labour intensive businesses all over the world started moving their industrial sites to Asia, stimulated by cost reduction opportunities. This displacement of demand strongly affected Ldz, causing a profound crisis that continues to this day. Thus far, no other activity has been able to replace the textile industry in the city.

However, it would be unfair to conclude that the city and Lodzkie province are not attracting investments from the local and foreign investors. Despite the fact that these investments have been insufficient to bring back the prosperity that city and the region once had, they are nevertheless substantial. Lodzkie today accommodates industries of high global significance, such as: BSN Gervais Danone, Linde-BOC, Saint Gobain, Philips, IKEA, ABB, Nibco, Icopal, LG group, Sud Wolle, Veka and AEG Niederspannungstechnik (Polish Information and Foreign Investment Agency 2006). Those companies are located in several different areas of Łódzkie province.

We note that the GDP growths of both Spain and Poland exceed the average of EU countries. In Spain the province of Aragon, occupies the 6th posi-

tion in Spain in respect of GDP *per capita* and this index is growing faster than in other regions of Spain.

Łódzkie has also shown increasing GDP *per capita* in recent years, although it is still only the 7th strongest regional economy in Poland. In contrast to Aragon, Lodzkie achieved a GDP *per capita* only 56.6% of the average of the EU countries in 2003.

In Aragon, services represent 60% and industry 25% of the economy. The most important industry in Aragon is transport equipment, which accounts for 30% of production and 16% of employment (*i.e.* the vehicle sector is extremely strong in this region). The second most important sector is food, drinks and tobacco, representing together around 13% of total production. The third and fourth sectors are machinery and mechanical equipment (around 8%) and metallic products (6%), respectively. The electric, electronic and optical equipment industry is also relevant, representing 6% of the total manufacturing segment. Compared to the rest of Spain, Aragon is highly specialized in transport equipment, machinery and the electrical, electronic and optical equipment industries (Gobierno de Aragon 2002).

Examining services in Aragon, more than 20% of the wealth generated by this sector relates to property and professional services (21%). The second most important services activity, excluding the public sector activities, is retail trade and repair (17.1%), followed by transport and communications (11.9%) and hotels and catering (10.5%). Public services represent 23.5% of the total services production. The number of bank branches in Aragon is higher than in the rest of Spain. It is perhaps a sign that the financial network in the region is strong. The financial sector comprises almost 8% of the total services production in Aragon (*Ibidem*). Lodzkie province, is noteworthy for the fact that the majority of the businesses in the region are small. In Lodzkie there more than 200,000 separate business ventures. Most of these are micro-companies operating with 5 employees or less. Around 90% of those businesses are privately owned. Enterprises with foreign investors mostly operate in commerce and manufacturing and they account only for 1% of the total number of ventures.

Around 16% of the companies operating in Lodzkie are in the manufacturing sector. Slightly more than 10% provide real estate services and a little more than 33% are trade ventures. Together, these three activities (manufacturing, real estate and trade) comprise 63% of the total number of enterprises located in the province (The Lodz Voivodship 2004).

Today the industry sector is mainly composed of ceramic tile production (around 70% of total Polish production), hosiery products (65% of Polish production), brown coal (60%), construction glass (50%), roofing/building paper (45%), cotton fabric (40%), electrical energy (20%) and clothes (16%). Food, beverages, furniture, metal finished products and timber are also important industries (*Ibid.*).

The availability of brown coal in the region has motivated the development of mining and energy industries. Elektrownia Belchatow generates 19% of the total electrical energy of Poland (Lodz Special Economic Zone 2006). Lodzkie also has easy accessibility to hot water by-products of electricity generation (combined heat and power), supplying resources for instance to the recreation (*e.g.* leisure centres) and health service (*e.g.* hospitals) sectors.

3.1. Role of foreign trade

According to the Aragon Government, the total quantity of provincial exports and imports, in relation to the GDP, was 54.49% in 2000, attesting to the successful and long-term growth in the volume of trade with foreign countries. The ratio of the exports over the imports in the same year was 104%. Aragon's international trade is mainly with other European countries and it is particularly intense with Germany, UK and France (Gobierno de Aragon 2002).

In Poland openness to foreign investment is relatively new starting only after the end of the communist regime. Lodzkie province has attracted foreign capital from some important multinational enterprises that have each invested more than 1 million US dollars. Examples of such companies include: BSN Gervais Danone, Linde-BOC, Saint Gobain, Philips, IKEA and ABB. In total, since 1995, 96 foreign companies of different sizes and investment capacities have established themselves in Lodz city.

Recent data shows that Poland has registered successive increases in foreign trade during the years 2004 and 2005. Specifically in 2005, the value of exports increased 19.6% and of imports 13%. The total trade deficit decreased by one fifth, thanks largely to higher demand for Polish products. According to a PMR Business Services forecast, exports will rise by 11.6% in 2006 and imports by 13.5%. During the first three months of 2006, Polish exports represented €19.9bn, and imports €22.0bn, demonstrating a growth of 22.3% and 20.8% respectively, when compared to equivalent period of 2005. The highest growth in exports occurred to the Ukraine, where the volume doubled in rela-

tion to the previous year. The Czech Republic also considerably increased its imports of Polish products. Russia and China, in contrast, were the countries from which Poland imported the most in the first trimester of 2006 (*PMR* 2006).

4. Workforce, education level and government incentives

Aragon aims for a highly-qualified workforce. More than 70% of its working population has a high school or University degree. The percentage of the population with no education whatsoever is practically zero. Analyzing the workforce in Aragon, 28.4% has University education, 43.4% has a high school education, and 28.1% has only compulsory education (Gobierno de Aragon 2002). By contrast, 32% of Lodzkie population more than 15 years old has only compulsory education, 57% has further education (secondary degree) and only 11% has a university education (*Eurostat* 2006).

Education in Spain is mandatory until the age of 16. After that, students can decide between two more years in high school possibly followed by university or alternatively vocational studies. More than 114,000 students in Aragon attended vocational courses in 2000-2001. The University of Zaragoza is one of the oldest in Spain. It was founded in 1583. In this university, Engineering and Business Administration students together account for 46% of the total of 41,455 students (academic year 2000-2001) (Gobierno de Aragon 2002).

Lodzkie province has 21 Universities, of which 8 are public and 13 are private. The University of Łódź and the Technical University of Łódź are the largest in the region. Together, they have more than 55,000 students. Those Universities are well equipped to prepare students in a diverse range of fields, including biology, chemistry, economics, technology and finance (*Polish Information and Foreign Investment Agency* 2006). Complementing these two premier broad-based universities is the highly regarded Medical University. Art is another area of significant relevance in Lodzkie. The Music Academy, The Academy of Fine Arts and the State Higher School of Film, Television and Theatre are all important schools to be highlighted (The Lodz Voivodship 2004).

Nominal labour costs in Spain are lower than the European average, which is an advantage when attracting investors. Labour costs in Aragon are close to the Spanish national average. From 1987-2000, Spain had a labour

productivity growth rate equal to the Euro Zone average (1.6) and higher than other European countries and the US (1.5).

Lodzkie, however, has an average monthly salary 12.2% lower than the rest of the Poland (1,966 PLN in 2002). The Polish average is also significantly lower than the average of other EU countries and maintaining an enterprise in the Lodzkie region can therefore represent a considerable cost advantage for investors.

The Government of Aragon and the Government of Spain offer several incentives in order to attract companies to set up local businesses. Those incentives cover a huge range of sectors and areas. Some examples are the technology incentive, covering research and technological development activities carried out by companies established in Spain; the tax credits for investments in research, development and innovation; training incentives; hiring incentives, and others.

The situation in Lodzkie region is also favourable for investors. Lodz Special Economic Zone was created in 1997 for a period of 20 years. It is a decree that defines particular inhabited areas of the territory around Lodz where enterprises can be installed and benefit from special preferential treatment (*Lodz Special Economic Zone 2006*). All Governmental aid is done in accordance with the EU regulations on competition. Investors can benefit from public aid when they are establishing new businesses or creating new positions (work places) in Lodz Special Economic Zone. Investors are entitled to refund of up to 65% of their total expenditure. The refund is made through a tax exemption until the year 2017, since this date marks the end of Lodz Special Economic Zone incentive. Investments on land purchase, construction of buildings, expenditure on fixed assets and the purchase of intangible or legal assets necessary to get patents all qualify for the benefit.

A maximum of 65% of the whole amount spent with labour costs (including legal fees) during the first two years is also refunded to investors creating new work places. The Government limits the financial aid to 50% in case of bigger enterprises. The basic conditions of entitlement are: a minimum investment of 100,000 Euros, that the enterprise is run for at least 5 years and that it is not sold or transferred during this same period. Companies in IT services, R&D related to natural and technical sciences, accounting services, and call centres are all entitled to receive the benefit (*Ibid.*).

Lodz Special Economic Zone decree was created in response to the poor economic conditions faced by the region, especially after the collapse of the

textile industry. It is widely regarded as being one of the best schemes of public financial aid in the whole of Poland.

5. Spanish and Polish logistics initiatives

Successful logistics sites and enterprises require an exceptional location and the availability of good infrastructure and resources, especially concerning transportation and access to suitable land.

As we have described, Lodzkie is extremely well located in relation to the rest of Europe (both Western and Eastern Europe). It has sufficient transportation and has prospects for good transport infrastructure. While good land exists property rights and associated risks will need to be handled carefully. Perhaps the biggest obstacle facing logistics in Lodzkie is a lack of skilled people. Some specialists have already been trained, but thus far in Lodzkie they lack real and sufficient opportunities to make use of their new knowledge.

The Government of Aragon in Spain, aiming to promote logistics in the province and, moreover, in Zaragoza, has developed a logistics park called 'Plaza'. Plaza is an enterprise in which the railway, important roads and Zaragoza airport are all strategically integrated. Such integration permits the export and the commercial development of Spanish products for a wide range of European and global markets. In Plaza, a precise urbanization project has been undertaken. This guarantees the availability of real estate, carefully designed for new offices and warehouses. Especially interesting is a partnership between Zaragoza University, one of the most traditional institutions in Spain, and the well-known and respected American technical university the Massachusetts Institute of Technology (MIT). A key part of the mission of this academic partnership is to help guarantee the preparation of new professionals specialized in logistics.

In summary, national and regional government, academia and the private sector (including local investors) have all worked together with the single goal of stimulating and supporting the logistics development of the Aragon province based around the Plaza development in Zaragoza.

Poland, by contrast, has developed a different strategy in order to promote the country as a logistics hub. No national plans have been prepared, and different cities and regions have each conducted their own separated initiatives in order to attract attention of outside investors. The Polish experience is more one of inter-regional competition than co-ordinated policy-making and

strategy. Entering into this competitive spirit, Lodz, has hired McKinsey & Co. to analyze and present impartial expert opinion. The emerging idea is for Lodz to be able show to investors that the location of the city is superb, with much cheap land available and adequate infrastructure to support successful logistics ventures. The City has the further aim of informing potential investors about the large well-prepared workforce available in the area. Seminars promulgating the McKinsey conclusions have been presented to key Polish stakeholders.

Partnerships between the City of Lodz and a private consultancy, such as McKinsey, have been considered an example of innovative best practice as a way to bring fresh insights and expertise into regional public policy. Local academics and investors attest that such openness to non-Governmental enterprises/consultancies is indeed a positive step as, in particular, it shows that Polish politicians are becoming more flexible and open-minded.

The idea of developing Lodz as a logistics centre started 15 years ago, when plans were made concerning road construction. At that time, it was observed that Łódź would be the site of the convergence of the two most important motorways in Poland. Later following the collapse of the textile industry, the City of Lodz initiated a process of identifying alternative sources of development. During these discussions, the idea of promoting the region as logistics centre grew in strength. The continuing decline of Lodz pushes the city to find and develop new sustainable sources of prosperity. The high level of unemployment (at least as high as the rest of Poland and achieving 30% in some parts of the work force) is a sign that, if no solution is achieved quickly, even more people will leave to seek a better life.

At present the City of Lodz is the most important agent promoting Lodz as a logistics site. By improving and advertising the features of the city, the administration hopes to attract investors. Independent reports from renowned consultancies have been used as part of this strategy. The hope is that, if investors recognize the potential of the region, then they will come. "Market forces indicate that the region is good for logistics, so investors will come" is a sentence commonly heard from people who are promoting logistics. The aim is to attract investors not to the city itself, but to an area near to the city. In this way benefits can accrue to the city but without harmful increases in congestion. A key advantage in the Lodz context is that such potential locations usually belong to small farmers and have simple and stable histories. As such they tend not to be vulnerable to the land ownership problems described earlier.

6. Analysis of logistics system opportunities for Lodz and Zaragoza – recommendations

Analysing all the data gathered concerning logistics in Lodz, and also comparing it to the reality faced in Zaragoza, we recommend:

- 1) The minimum scale for planning is at the provincial level
- 2) Provincial and City government must set aside specific real estate as part of a coordinated plan
- 3) Railway and Airport strategies are of central importance
- 4) Lodz Universities – Government relationships must be improved
- 5) The need for formal project management techniques
- 6) Attract a major logistics enterprise to the region
- 7) Public private partnerships are key
- 8) Restore beauty to Lodz
- 9) Develop a strategy for foreign inward investment
- 10) Take the long view

Lodz and its small surrounding cities represent a most attractive location for a new logistics hub. Together the City of Lodz and the province of Lodzkie have the potential to benefit from numerous national and EU incentives and to tackle and manage special risks, such as those relating to property rights. Success by the City of Lodz and the province of Lodzkie in such a strategy would be of enormous benefit to Poland and to central Europe. The economic benefits would be felt far and wide.

The City of Lodz and the province of Lodzkie have an opportunity to learn from the Plaza experience in Zaragoza and should establish a specific area for logistics development. This piece of land must be chosen so as to maximize project success and great care must be taken to avoid corruption and any improper influences. Independent into this process would be advisable. As with Plaza and Zaragoza both the city and the region should not assume any revenue growth in their budgets arising from this activity. Initially the project will be a public cost moving to an activity of neutral budgetary impact for the city and the region.

A logistics centre does not make sense in any environment where only one mode of transport is available. Even though 80% of the whole goods transport in Poland today is done by road, the railway and airports still represents an essential long-term option and must be available within a short distance of the logistics centre. Other regions in Europe can offer such multi-modal en-

vironments. A concrete plan interfaced to the future strategies of Polish rail is essential. Such a strategy must include infrastructure development (engineering and financing – including real options), infrastructure maintenance, bipartisan political support, regional and national coordination. Considering air transport: we note the currently small size of the Lodz Lublinek Airport today and its relatively poor capacity to increase flights in order to accommodate large-size cargo transport. We recommend a clear and transparent policy decision. The Government should adopt one of two alternatives: further improve Lodz Lublinek in order to accommodate larger volumes of cargo traffic or convert Łask Airport into a civilian-military airport. The better runway at Łask makes this option especially attractive. These decisions are exclusive and would benefit from clear co-ordinated decision making. It is not appropriate to have these two airports compete in order one day for one to emerge as a logistics hub. The Zaragoza experience tells us that a clear provincial/city plan picking a clear site is both efficient and effective. Competition is not between cities within a region but between one European region and another. In this real competition, national boundaries are of relatively little importance.

We note the possibility of a third Warsaw/Lodz international airport option. We do not recommend a strategy based on this option. It would demand larger amount of resources (budget and time) as well as political influence. Such an option is unlikely to protect the interests of Lodzkie province and its component parts. Clearly such a project could be hugely beneficial for the whole of central Europe, but our analysis is affected concerns as to project timescales and the risk of project failure.

Finally, from what can be learnt from Zaragoza and others examples in Europe, most of the cargo will continue to be transported by road. All proposing logistics enterprises anywhere in Europe understand this reality. Polish road infrastructure must improve and the improving motorway network is a key motivator for a Lodz logistics center. Good roads are necessary, but we suggest that they are not sufficient to ensure a sustainable competitive advantage. The central European economy will be global and as such international rail and air links will be fundamental in the long-term.

Lodz is blessed with a number of good Universities several of which possess competencies key to the successful development of the region as a logistics centre. In particular the Business School of the University of Lodz is well placed to play a helpful role in scholarship and intellectual coordination. However, at present there appears to be no clear relationship established between

the various public administrations and higher education institutions in the area. In this sense, the knowledge that has been generated in either academia or practice might not produce maximal benefit for the region. The university sector has attempted to convene multi-stakeholder interest groups, but so far impact fails to extend beyond the university sphere and several non-academic stakeholders reported that they were unaware of their institutional involvement. Simultaneously city government stakeholders reported that the current situation to be satisfactory. This perhaps indicates a failure on their part to appreciate the benefits that industry-government-academia partnerships can bring. Zaragoza shows the benefit of such partnerships and the possibility for academia to act as a conduit for international best practice. In some small way this paper is motivated by a desire to bring such perspectives to Lodz via common involvement in the International Conferences on Technology Policy and Innovation by the University of Cambridge and the University of Lodz. Cambridge University links to MIT have been leveraged in support of this work.

Zaragoza and the Plaza project show that, if government and universities join forces to produce specialized people for logistics positions, then both sectors benefit. The University of Zaragoza, in a partnership with MIT, trains highly skilled students for important professional roles in logistics. These people benefit Zaragoza or anywhere else in the world. During their courses they have the opportunity of using Plaza as a laboratory in their studies. In addition these students, because of their high capacity and formation, also attract attention to the region and Plaza. We recommend that any logistics operation in Lodz seeks to recruit staff experienced with the Plaza experience.

Today in Lodz, however, university faculty propose that it is necessary to develop specific courses in logistics in order to address future demand. In contrast, the city administration believes there are already sufficient people being prepared and that no extra effort is necessary in that direction. We recommend that both parties reassess their ideas following improved communication between government (provincial and city), industry and academia. Together these actors should develop a common strategy and then undertake activities consistent with that strategy. An isolated academic programme in logistics theory is clearly not sufficient and there are suggestions that it is not even necessary. Yet we hear that skilled people are a problem holding back logistics in the Lodz region. We suggest what is needed are practical professional high quality academic programmes emulating international best practice (e.g. MIT-Zaragoza).

Huge infrastructure projects have been underway in Poland since 2004, especially concerning roads and related infrastructure. Several others will be developed in the coming years based upon European Union support. In the case of road repair and construction, however, even if Poland manages to do the work well, in accordance with schedules and budgets, by 2015 the country will only achieve a level of development already achieved a long time ago in Western Europe (Answers.com 2006). If it fails, the development of the country will be delayed, and already some signs of delay can be seen. In order to improve credibility in these initiatives, expert government officials (as in future might be trained by Lodz area universities) should monitor project milestones tightly. Openness and transparency concerning any reasons for any delay or cost-overrun will improve investor and public confidence and help to militate against any fears of corruption.

When Plaza was just a plan, no one was sure about how it would be perceived by the investors. Inditex (the Zara distribution centre) was the first enterprise to acquire a presence in Plaza. Subsequently, and largely because of Zara's good reputation and business success, much diverse corporate and media interest was shown in Plaza. Future negotiations were facilitated, and in a short period of time, all the component sites were sold.

In the Zaragoza case, there was a beneficial convergence of interests. On one side, the Government had a number of free areas to sell; while on the other side, Zara was looking for a new site in Spain for its expansion.

In the case of Lodz, the Government, when developing a logistics centre, should look for attracting a major specific logistics enterprise to the region. Bringing a respected enterprise such as TNT, DHL, the Polish Mail Service or Fedex could represent a major step for the project. Offering the possibility for a company to develop a major logistics hub at a low cost could open space for negotiations concerning wider investments in infrastructure.

In practice, European Union funds designated to infrastructure projects cover only a portion of project costs. As an example, cross-border sections of projects that are part of the Trans-European Transport Network programme can benefit from EU funds up to a level of 20% co-financing (European Commission 2005). In this scenario, even if Poland is able to benefit from EU funds, it will always be required to contribute a significant part of the total project cost.

Considering that Poland still faces a delicate financial situation, establishing partnerships with private enterprises is one way of developing infrastructure projects, using private capital as part of the project financing. Such

public-private partnerships are particularly suitable for logistics projects. The counterpart Polish national, regional and city governments can help companies by pre-selecting areas in strategic locations and by offering them favourable business conditions free from risks associated with property rights. Issues of property rights are of greater concern in Lodz than in Zaragoza as a consequence of the two cities very different experiences of the Second World War. While Spain was officially neutral following its damaging Civil War (1936-1939), Lodz was among the Polish cities most badly affected by German occupation and associated war crimes. Many properties were confiscated and today many (especially Jewish) descendants are in a position to assert property rights dating back to the 1940s. Without wishing to overstate the issue, some of these cases can be complex and cumbersome and therefore those contemplating inward investment into the region (and especially those unfamiliar with these issues) are often keen to avoid locations in around the city that face such risks. A logistics park is a substantial undertaking and it may be preferable therefore in the Lodz context for planners to favour a "green field" development free from any issues concerning complex property rights.

Signs of improved maintenance and repair of old buildings are evident when walking around Lodz. However, the city, in general, still has a certain grey aspect. A breakthrough change in the city's appearance will be achieved only after more investment is made and when a larger number of projects are addressed. There may be opportunities for novel incentive schemes and subsidies.

It can be said that if Zaragoza has failed in any aspect of its Plaza project, it is in respect of the low number of foreign firms attracted. Plaza can be considered a success when analysing the speed that the areas were sold as well as the construction of the site in accordance with the schedule and budget. However, the number of foreign enterprises that came to Zaragoza was lower than expected.

Lodz can learn from Zaragoza's failure. Selling areas with good infrastructure at reasonable prices does not mean that the attention of foreign investor will automatically follow. Since Zaragoza also offered special incentives, such as Lodz has the Special Economic Zone, such initiatives cannot be assumed to be sufficient either. International visibility and credibility will be key. International academic links can help in this respect.

In the case of Lodz it is noteworthy that the location is much more promising than Zaragoza location in Spain. Since Zaragoza is the gateway for Portugal and Spain, it is understandable that Spanish companies expressed most interest in Plaza. Despite probably benefits, French and other European com-

panies did not express much interest in the Plaza project. This may be regarded as a natural consequence of a gateway strategy and the need to be located on one side of the gate or the other. Lodz's strategy is less restricted and is potentially much more flexible as a nexus in central Europe.

17% of the population in Poland, a country with 39 million people, live below the poverty line (CIA 2006). Knowing how best to spend public money is a challenge for the government. Pressure to attend to basic needs is strong and politically sensitive.

However, it is also essential to liberate enough resources in order to guarantee the development of the long-term future of the country. Infrastructure is a major concern.

As a once in a lifetime opportunity, European Union funds will be provided in the coming years. Spending that money effectively will be a test for Polish Institutions.

Conclusion

Poland is strategically located in the centre of Europe, with the potential to become a major link between West and East, and North and South. Lodzkie, as a central province in Poland, has specific attributes favouring the logistics business. Excellent location, the potential for highly qualified people and a cheap labour force are some of the key attractors. Also, openness to foreign investment and the desire of the local administration in promoting such activity are further positive signs.

Nevertheless, the country has very poor infrastructure in general. Roads, airports and the railway all need upgrading in the near future. The motorways are already being improved, but even these projects are not yet complete.

Managing European Union resources efficiently will be a major challenge for the Polish administration. We suggest that there is much scope for beneficial collaboration between stakeholders from government, industry and academia in this important and timely challenge.

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