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Industrial zones – an effective tool of regional development support in transitive economy? Case study: The Czech Republic

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Introduction

Investment incentives as well as promotion of industrial zones become one of the most debated issue for experts, especially in connection with the effect of foreign direct investments on economies at both national and regional levels. FDIs are frequent themes in monographs and papers mainly when a small open economy, such as the economy of the Czech Republic, is concerned, e.g. Wokoun, Tvrdon (2010), or Novotny (2004) and others. Regarding this fact, the aim of this paper has been set: to assess the effectiveness of promotion of industrial zones as the key tool of regional development support in the framework of economic conditions in the Czech Republic. The assessment is focused on industrial zones support which was provided by the Ministry of Industry and Trade in the Czech Republic or, more precisely, the CzechInvest agency in the framework of the Programme on Industrial Zones Development Support, Programme on Business Zones and Infrastructure Support and the Investment Incentives System. This paper's main source is the data set obtained in empirical research carried out by authors throughout industrial zones Kolin-Ovcary, Nosovice, Most Joseph, Liberec South, Plzen – Borska pole, Pisek – Cizovska, Zlin East, Sumperk and Hodonin Kapriska. Another important source was the accomplished analysis of economic management of all economic subjects observed in the supported industrial zones mentioned above. That makes this paper significantly different when comparing to other studies provided by Deloitte company (2010) and Schwarz et al. (2007) as it provides a more real and flexible view of this issue. The final release by Deloitte company is based on available statistical data only and its results are extremely positive when it comes to investment incentives impacts on working positions creation, development of wages, fiscal effects, export, co-operation with universities, R&D and know-how mobility. The study made by Schwarz et al. (2007) is also based on available general statistical data and provides totally different assessment of investment incentives effects. In short, the results are negative in all criteria targeted: investment incentives have not contributed to regional disparities reduction when it comes to unemployment rates, and they are effective from the viewpoint of working position costs, the state budget expenditure seems to highly exceed its income, e.t.c.

Theoretical background to assess foreign direct investment effects on regional economies

Globalization together with technical innovations bring worldwide investment opportunities to companies. A foreign direct investment could be the way to expand on international or other national markets (Harrison, 2003).

The FDI inflow has the following effects on the host economy: direct and indirect. Direct effects result from a precise investment features and are more or less expressible. Indirect

effects do not result directly from precise investment features, they appear as secondary effects. Indirect effects may also be called externalities and it is quite difficult to quantify them; while direct effects appear in the short term period, indirect effects are not significant earlier than in the long term.

An important issue related to foreign direct investment effects is its impact on the labor market. From this point of view, it is to identify some direct effects in the form of new working positions and related unemployment reduction. Foreign direct investment to already existing companies, though, are often connected with a restructurizing process leading to working positions reduction. In connection with the labor market, it is also possible to identify the crowding-out effect caused by limiting of domestic competitors' production; that is significant especially in the case of „market-seeking“ investments.

The essential effect in the field of labor market may be seen in indirectly created working positions in supply companies. Zamrazilova (2007) declares that a new investor can either strengthen relationships with domestic suppliers, or cancel all previous co-elaboration relationships and prefer imported supply components. In the first case, very positive effects would appear, especially in the field of employment; in the second case, there is a threat of working position losses. In general, companies with foreign participation provide above-average wages; this is to be considered as a positive phenomenon only if above-average wages respond to the labour productivity rate. Above-average wages in foreign companies induce growth of wages in domestic companies.

Another positive effect for a host economy is the technology transfer leading to higher productivity and competitiveness of economies. Kokko (1992) claims that the technology transfer is one of the key factors to supporting foreign direct investments. Also Srholec (2004) claims that supranational companies mostly use new technologies, so they are to be considered as tools for dissemination of technologies. Srholec (2004) then classifies direct and indirect technology transfer. Direct technology transfer means an ongoing transfer between the headquarters and their branch offices in a host economy. Indirect technology transfer (technology spillover) means in fact the reduction of the technology gap (the difference in productivity between domestic companies and those with foreign participation) based on the diffusion process, where the key part is taken by workers changing their employer. He then adds that the strongest technology transfer can be identified when „market-seeking“ investments such as consultancy, logistics or distribution network, are concerned.

According to Dunning (1994) the transfer intensity is determined by the position of the company with foreign participation in the national corporation production chain, for example, whether it is just an assembly plant or a more autonomous type of production. Blomström, Sjöholm (1998) claim that the technology transfer depends on the hosting economy's character.

Fallon, Cook (2010) point out that, even though foreign direct investments are generally considered beneficial for further development of regional economies, final results are not so clear. FDI and host country relations have their limits, the companies' top management is distant and the decision-making autonomy is weak. Regional companies take a subordinate part: the production is not so sophisticated and sales lines lie below the corporation strategy.

Foreign direct investments have significant influence on the balance of payments. A current account deficit can be financed by the foreign direct investment inflow. An extremely positive impact on the balance of payments is distinct when „cost-seeking“ investments are concerned as they are quite export-oriented. Thus, foreign direct investments encourage penetration of the parent company markets and, eventually, markets where sister companies operate. Foreign direct investments generate export potential of the region or state (Blomström, Kokko, 1996).

For an overall assessment of the impact of FDI on national and regional economies, reinvested earnings are of a great importance. It depends on the life stage of the investment (Vernon, 1966, Markusen, 1985). The share of reinvested earnings is the highest in the early life stages of the investment. In this period, foreign investors also take advantage of tax holidays.

Foreign direct investment often contributes to strengthening the protection and enforcement of property rights, to streamlining public administration, to implementing higher levels of entrepreneurial culture and to opening the economy (Dvoracek, 2005). This is a transmission of a home country's investment standard or international investment standards.

Foreign direct investments, next to their positive effects, also bring negative ones. Benacek (1999) draws attention to the problem of hostile takeover motivated by restriction of competition. Foreign direct investments may also result in unilateral national or regional focus demanding economy, which increases the risk of economic recession. In connection with the Czech Republic, a strong dependence on the automotive industry is often mentioned in this context.

Assessment of industrial zones by empirical survey

The following part of this paper introduces the results of empirical investigation in industrial zones Kolin - Ovcary, Nosovice, Most Joseph, Liberec South, Plzen - Bory fields, Pisek - Cizovska, Zlin East, Sumperk and Hodonin Kapriska. All industrial zones were visited several times during the empirical investigation. The sources of information came in the form of conducted interviews carried out with the management of localized businesses and local government representatives. The empirical investigation was carried out in the first half of 2010. From the performed case studies, the following findings related to regional development came up:

- Firms in investigated industrial zones have a positive impact on the regional labor market.

A key regional employer, the EPCOS company, is located in the industrial zone Sumperk. The industrial zone Liberec South is crucial for its impact on the labor market not only in Liberec but also Frydlant. Industrial zone Borska Pole reacts to the existence of a technically oriented free labor force left there by no longer existing Skoda Plzen. The Nosovice industrial zone is a key location with a region-wide impact on the labor market. Also, the industrial zone Hodonin - Kapriska, Zlin - East or Pisek may be evaluated similarly. In these zones, firms make use of free labor force; they contribute to a higher use of economic potential in the region.

The TPCA (industrial zones Kolin-Ovcary) company is located in a region with a limited amount of free labor (this disadvantage in the labor market has been offset by other factors, such as transport accessibility). The regional market reacted to this new investor by increasing the price of labor; positively, this increase in the price of labor improved the population's disposable income. On the other hand, there is a negative impact of this as the increase in labor costs drove out a part of economic activities. The positive effect of this industrial zone located in the regional labor market is very limited due to the crowding-out effect.

The industrial Zone Joseph in Most falls short of its planned results and its positive impact on increasing regional employment remains behind expectations. This should be evaluated in the context that this industrial zone is located in a seriously structurally affected region that shows

high unemployment rates and, respectively, an available labor force for a long time; industrial Zone Joseph in Most is an untapped economic potential.

Despite the critical remarks concerning the industrial zones Kolin - Ovcary and Joseph in Most, the studies clearly show a positive impact of companies on the regional or local labor markets.

- companies in industrial zones contribute to technological development through industrial restructuring

Companies in the industrial zones selected for the research may be divided into three categories according to their contribution to technological development. The first category consists of companies that are subsidiaries of a company and perform as assembly plants. Even though these companies do not implement their own research, their technological contribution is quite significant. They are actually middlemen in the transfer of know-how from multinational corporations to national or regional economies, and they make it more efficient. The know-how then diffuses through the carriers, especially employees. In fact, it is an adaptive behavior according to the classical triad of Schumpeterian patterns of the innovation process: "invention-innovation-imitation". Generally put, companies in the surveyed areas mostly do not make space for technology and innovation centers. However, there are companies with their own significant research, for example the Tescoma company. Its innovations are based mostly on their own research. This type of firms is included in the second category. The third type may then be defined as companies floating between the first and second categories. Often, these are subsidiaries with significant autonomy.

- companies in industrial zones affect small and medium-sized businesses in a positive way

In industrial zones, large companies play a key role; Small and medium-sized firms' performance is only very limited. To determine the relationship of small and medium-sized enterprises and large enterprises, two factors play a key role: the labor market situation (see the crowding out effect), and supplier-customer relationships. The case studies dealt with large companies using mainly available free labor; in this regard, the participation of small and medium-sized enterprises is very small. In the frame of completed case studies, the only exception standing out is the situation in Kolin - Ovcary. In terms of supplier-customer relationships, it creates significant demand incentives for small and medium-sized businesses. Besides their main activities, large companies use small and medium sized businesses for service activities (such as catering, maintenance, etc.).

- Industrial zones improve business image

Companies in industrial zones are positive examples of successful companies. They create a positive model, increasing investment attractiveness of the regions and the Czech Republic internationally. The image of each region is a very important complement to quantifiable localization factors. The importance of the image also increases proportionately in the case that firms' decision-making processes are based on uncertainty.

- Negative effects on the environment are small

Industrial zones are an additional burden to environmental infrastructure (sewage treatment plants, sewers, etc.); they create significant additional demands on transport infrastructure (particularly when logistical centers are present). Furthermore, it should be noted that industrial zones negatively affect the landscape; the scope of this disruption varies according to individual cases. No completed case study (or industrial zone), identified situations of significant deterioration of the environment.

- The impact of industrial zones on the population's social cohesion may be assessed as neutral

With regard to social cohesion, in currently investigated industrial zones, there are no significant problems. Some cities/ regions faced increased petty crime, especially at the beginning of the firms' existence in the location (see e.g. Pisek - Cizovska); after stabilizing of the workforce, the situation improved. The role of firms located in industrial zones in relation to the support provided to communities for social, cultural, and sporting activities may be evaluated positively.

Evaluation of industrial zones by analysis of firms' economic management

To assess the effectiveness of industrial zones promotion as a key tool of regional development support, an analysis of randomly selected firms operating in supported industrial zones were carried out in addition to the empirical investigation; the survey involved a total of 127 companies. The analysis focused on issues related to economic benefits of industrial zones (more precisely, benefits of companies located there).

The empirical investigation was designed to show whether industrial zones contribute to the restructuring of industry, i.e. whether the located firms are progressive ones.

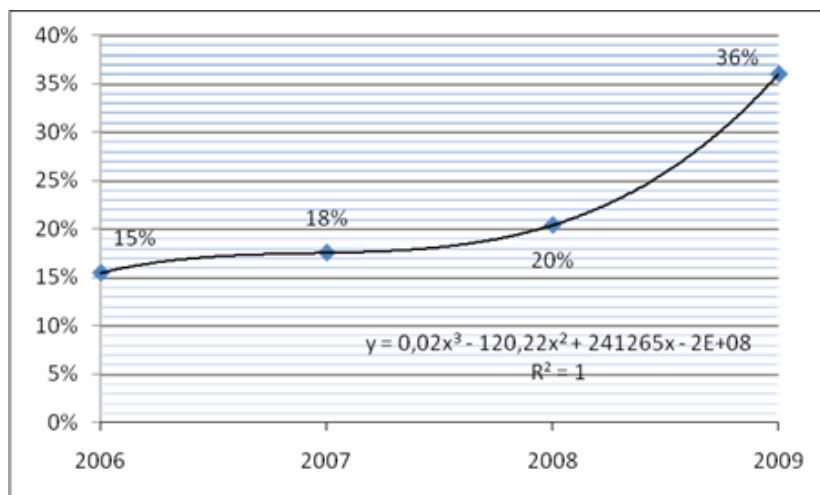
Since the register of economic entities (or records of businesses) has proved inaccurate and the inclusion of companies in NACE misleading, companies were marked as progressive on the basis of investigations of their real activities in industrial zones. To determine innovative, more precisely, economically progressive companies, 3 criteria were selected:

- Environmental friendliness (e.g. certified technology)
- New introduction of technologies, research activities, products development
- Performance in the field of education

An innovative company should meet the criterion of environmental friendliness and one of the following two criteria.

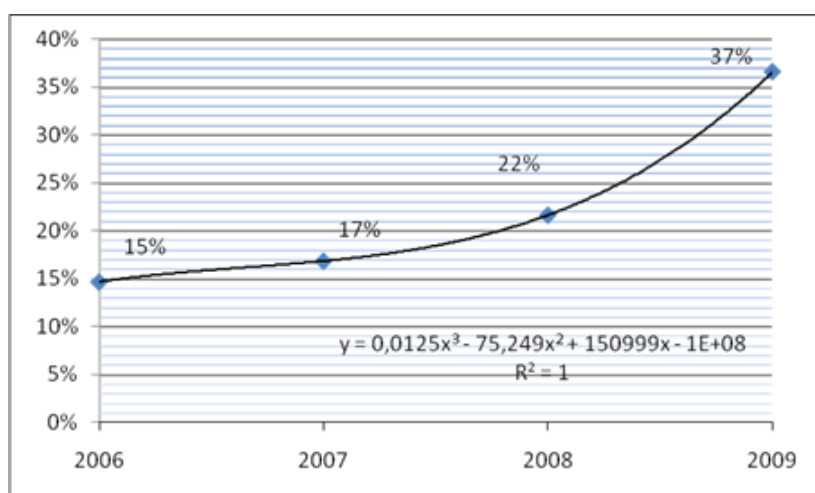
In total, according to these criteria, 39 of the 127 companies observed have been stated as progressive, i.e. about 30%; the highest share among these companies belongs to the automotive industry (31%), followed by engineering (25%). It is possible to identify dynamic increase in the share of total revenues, from 15% in 2006 to 36% in 2009 (Figure 1). The average revenues growth rate of progressive companies reached 51.6% annually. A similar evolution may be seen when considering the share of total costs from 2006 to 2009. The share of progressive companies rose from 15% to 37% (Figure 2). The average growth rate of the cost reached 56.5% annually, with progressive companies concerned.

Figure 1: Development of progressive companies share of total revenues



Source: authors

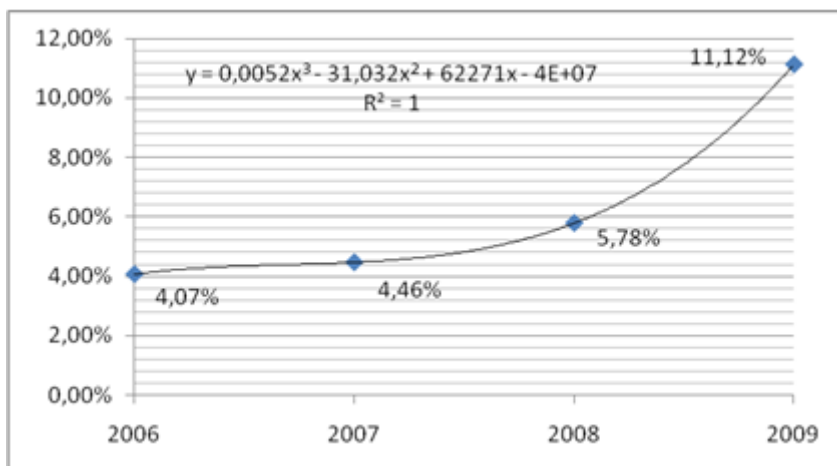
Figure 2: Development of progressive companies share of total costs



Source: authors

During the period of 2006 to 2009, 89 companies reached a positive average annual outcome; on the contrary, 36 companies reached a negative outcome. Moreover, the average absolute value of profits increased from 44.5 to 203.0 million CZK. The cost efficiency also increased between 2006 and 2009. The ratio of income / expenses has increased from an average of 4.07% to 11.12% (Figure 3). Under current economic conditions, this share of profits on costs may be considered as above average. These observed companies contribute to the efficient use of available resources, and to growth of national economy as a whole.

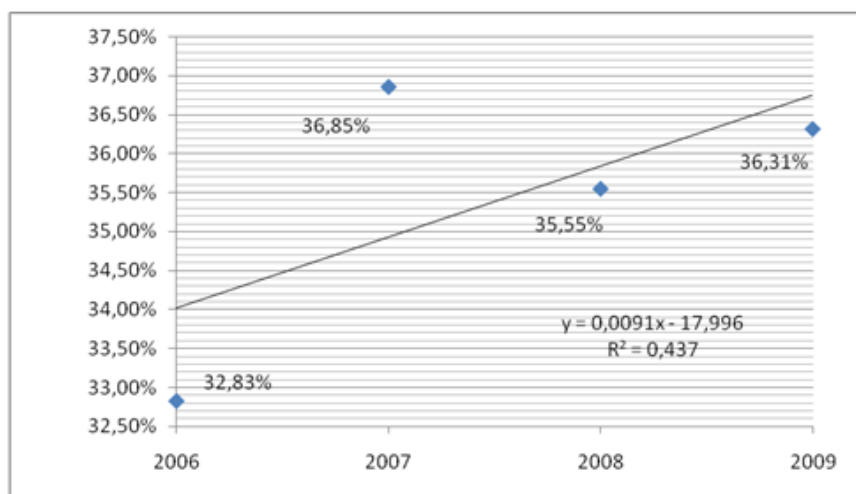
Figure 3: Evolution of the profit/cost ratio



Source: authors

The average amount of exports in selected companies in the mentioned period rose from 323 million CZK in 2006 to 576 million CZK in 2009. The average export share on total revenues of companies increased from 32.83% in 2006 to 36.31% in 2009 (Figure 4). The highest value of this ratio was reached in 2007 (36.85%), i.e. before the peak of the global economic crisis. Regarding the conditions throughout Europe or the world economy in 2008 and 2009, the increase in the absolute amount of export may be assessed very positively. The decline in the share of exports on total revenues of companies in 2008 may be described as a manifestation of declining demand in the western part of the European Union and the USA.

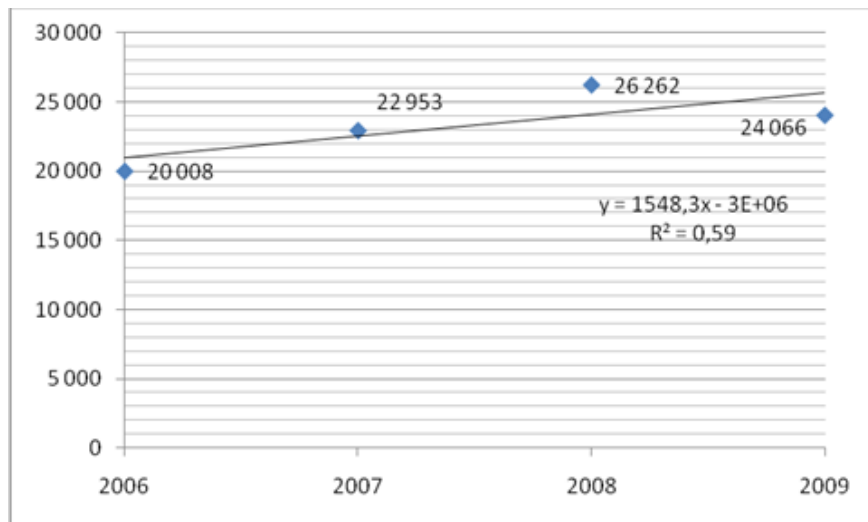
Figure 4: Average export share on total revenues of the company



Source: authors

In the period 2006 to 2009, the average wage in the surveyed companies increased from 20,008 CZK to 24,066 CZK (Figure 5). In 2009, wages, apparently due to the economic recession, fell by about 2000 CZK. The observed data on wages of employees allow to state that the cost/evaluation of employees in selected industrial companies (or zones) is generally above average. This may, again, be assessed positively in the context of the use of economic resources of the economy (production factor of labor).

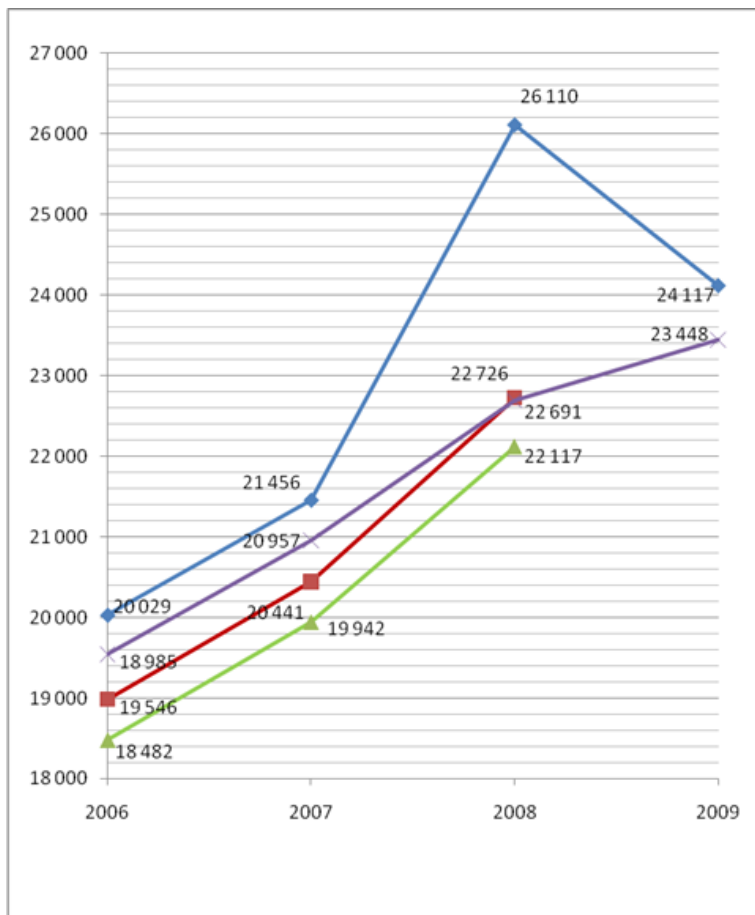
Figure 5: The average monthly wage in selected companies (CZK)



Source: authors

To assess the amount of wages, it is possible to use available data provided by the Czech Statistical Office. While the average wage in industry increased from 18,985 CZK in 2006 to 22,726 CZK in 2008 and the average wage in manufacturing increased from 18,482 CZK in 2006 to 22,117 CZK in 2008, the observed firms located in industrial zones have increased wages from 20,029 CZK to 26,110 CZK. The average wage in the Czech Republic in 2006 reached 19 546 CZK, 20,957 CZK in 2007, then 22,691 CZK in 2008, and CZK 23,448 in 2009 (Figure 6).

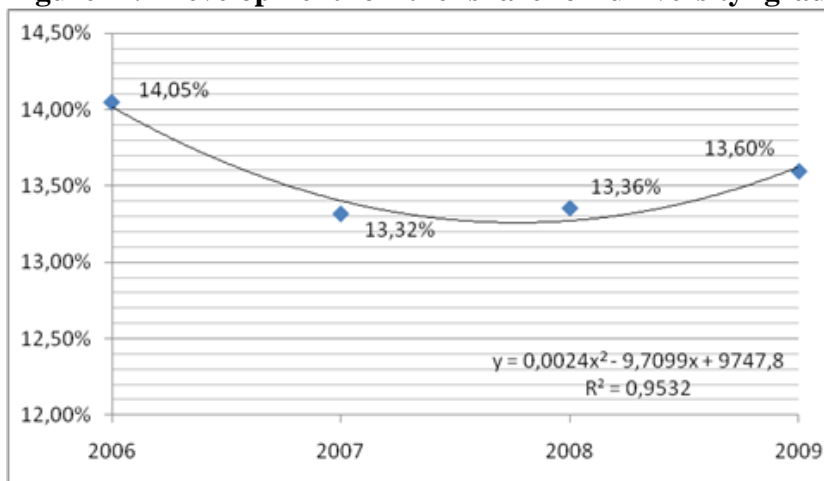
Figure 6: Comparison of monthly wages - observed companies (blue), Czech Republic (purple), industry (red), manufacturing (green), in CZK



Source: authors

The proportion of university graduates among employees of reporting companies is relatively constant (Figure 7). It ranges between 14.05% (in 2006) and 13.32% (in 2007).

Figure 7: Development of the share of university graduates among employees of



companies observed

Source: authors

In 2006, according to CSO data, the percentage of university graduates in the total number of people employed in the national economy was 14.9%, then 15.0% in 2007, and 15.8% in 2008.

Based on this data, when it comes to university educated employees, we can say that the share of the set of 127 firms located in industrial zones did not reach the national average in the period from 2006 to 2008. However, it is important to note in this context that the comparison is good for companies in industrial zones as the nationwide figures indicate the number of employees in all sectors of the national economy, i.e. including services, while, in some sectors (e.g. education), university graduates dominate. In industrial zones, where mainly manufacturing or transport (logistics) firms are located, other services are only of a very limited extent. It is expected that the share of employees with university education and research and development (R & D) will increase in the coming years, together with further development of technology centers that have adopted support from MIT, and a total departure from "assembly plants" to more advanced subjects. The current trend in the proportion of university graduates in the total number of employees is ambiguous. The total number of jobs created in research and development in observed companies may be assessed as low. During the reporting period, the biggest amount of jobs created was, in 2007, 236 in total, the lowest amount appeared in 2009, 128 in total. In the context of the above, it can be stated that the influence of observed companies (or industrial zones) on the total number of jobs created in research and development in the national economy is positive, but very limited.

The analysis results in the following findings related to the usefulness and effectiveness of industrial zones public support:

- given the high proportion of progressive companies in the activities implemented in supported industrial zones, it may be said that the industrial zones contribute to greater dynamism of economic restructuring in the Czech Republic,
- based on the analysis of reporting companies' profit, it can be stated that the companies in the supported industrial zones contribute to the efficient use of available resources and to creating greater added value,
- in the context of economic development, the export growth in its absolute amount may be positively evaluated as stable when observed firms are concerned
- wages of employees in industrial zones may be assessed as above average, which can be explained by firms trying to get a quality workforce,
- within the sector, the share of university graduates in the total number of employees in industrial zones may be evaluated positively, but the trend is not quite clear,
- the impact of monitored companies (or industrial zones) on the total number of jobs created in research and development is very limited.

Regarding all the above mentioned, industrial zones are to be considered as significant accelerators of secondary sector development, with a relatively limited positive impact on the Quaternary and Quinary.

Assessment of effectiveness of industrial zones promotion as a key tool of regional development support

The theoretical foundations, empirical research, and the analysis of economic management (below) mentioned impacts of FDIs on regional economies. Quite a few positive effects of foreign direct investment may be considered: higher dynamics of industrial restructuring and technological development, greater use of export potential, development of small and

medium-sized enterprises, a focus on skilled workforce, improvement of the region's business image and, finally, positive impact on regional local labor markets. There are some negatives (damping effects); these may include transfer-pricing and the crowding-out effect in the market of production factors. Their performance in the economy, effects on the state budget in the short and medium term, and quantification possibilities are presented in Table 1.

To assess the effectiveness of promoting industrial zones as a key tool of regional development support, it is crucial to consider conditions of the return of spent funds. On the basis of the above mentioned results, a model of industrial zones support impacts on the state (public) budget has been compiled:

$$TE = m \cdot TRB + RST - SBE - SAC \quad (1)$$

where

$$TRB = f(i \cdot AP; j \cdot APr; k \cdot AIP) \quad (2)$$

$$RST = f(n \cdot NE \cdot STU) \quad (3)$$

$$AP = f(APr; IRTD; HEP; TP; COELM) \quad (4)$$

$$APr = f(IRTD; HEP; TP; COELM) \quad (5)$$

$$AIP = f(n \cdot NE) \quad (6)$$

while

TE – total effect of industrial zones support on the state budget

TRB – tax revenues of the budget

SBE – state budget expenditure

SAC – state administrative costs

RST- reduced social transfers (unemployment benefits)

i - additional profit tax rate (direct taxes)

AP – additional profit (as a result of the industrial zones' establishment and existence)

j- additional production tax rate (indirect taxes)

APr – additional production (as a result of the industrial zones' establishment and existence)

k- additional income tax rate of population (including insurance)

AIP – additional income of population

m- crowding-out coefficient (1minus share of industrial zones that would arise even without the state support)

IRTD – Industry restructuring and technological development

HEP – Higher export potential

FSL – focus on skilled labor

PILM –positive influence on the labor market

TP – transfer pricing

COELM – crowding out effects of the labor market

NE – number of employees in industrial zones

n- crowding-out coefficient (1 minus proportion of employees who would seek jobs outside industrial zones)

STU – social transfer to the unemployed (especially unemployment support)

Positive effects		Manifestation in the economy				Impact on the state budget	Possibility to quantify by expert's estimation	
Higher dynamics of restructuralization in industry and technological development	➡	Higher effectiveness of production factors' use	➡	Higher production volume and corporate profit	➡	Positive – growth of income and indirect taxes revenues	Good	Expert estimation resulting from comparison of profits in and out industrial zones
Higher use of export potential	➡	Additional foreign demand	➡	Higher production volume	➡	Positive –indirect taxes revenues growth	Difficult	Expert estimation resulting from the share of export on production volume
			➡	Production factors price increase causing production volume reduction	➡	Negative – tax revenues decrease		
Small and medium-sized enterprises development	➡	Business “mycelium” creation	➡			Positive in long term period	Minimal	--
Focus on skilled labor	➡	Maximum of education use	➡	Higher income of population	➡	Positive – growth in tax revenues from wages	Good	Expert estimation resulting from comparison of wages in and out industrial zones
Improve of the business image of the region	➡	Additional investments (production capacities)	➡	Higher production volume	➡	Positive – growth in tax revenues from both profit and indirect taxes	Minimal	--
Positive effects on both regional and local labor markets	➡	Higher use of production factors	➡	Additional higher use of labor	➡	Positive – growth in tax revenues from wages	Good	Estimation of the share of unemployment regarding to case studies
					➡	Positive – decrease of social transfers		
Dumping effects		Manifestation in the economy				Impact on the state budget in short and medium- term period	Possibility to quantify by expert's estimation	

Transfer-pricing	➡	Artificial reduction of corporate profits	➡	Negative – tax revenues decrease	Good	On the basis of study cases and expert estimation
Crowding-out effects in the labor market	➡	Dampens above mentioned effects	➡	Negative – tax revenues decrease	Good	On the basis of study cases and expert estimation

Table 1: Positive and negative effects of industrial zones support

Source: authors

The model is applied in three variants, "pessimistic", "medium" and "optimistic", for the period from 2006 to 2009. The model is based on the observed support implemented in the period 1998 to 2006. The total range of assisted areas reaches 4125 ha. The supported industrial zones created up to 133,100 jobs. The occupied area in industrial zones reaches 73% (Table 2). The total state support to industrial zones amounts to 18.8 billion CZK (Table 3).

Year	Size of supported areas (ha)	Cumulative area (ha)	Occupancy percentage	Jobs directly created (cumulative)
1998	52	52	0 %	0
1999	381	433	12 %	4 650
2000	629	1 062	32 %	7 619
2001	562	1 624	46 %	15 806
2002	475	2 099	51 %	21 857
2003	420	2 519	58 %	22 718
2004	370	2 889	62 %	32 948
2005	258	3 147	78 %	50 810
2006	1 017	4 164	70 %	63 830
2007	-29	4 125	70 %	88 228
2008	0	4 125	71 %	110 000
2009	0	4 125	72 %	121 000
2010	0	4 125	73 %	133 100

Table 2: The size industrial zones supported, occupancy and created jobs

Source: MIT, CzechInvest

Year	Subsidies within Programmes	Incentives to create jobs	Incentives to retraining	Total state budget expenditure
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1998	61	0	0	61
1999	296	122	55	473
2000	245	448	143	836
2001	515	454	178	1 147
2002	1236	471	115	1 822
2003	849	532	127	1 508
2004	1 058	320	255	1 633
2005	1 367	240	200	1 807
2006	1 600	214	12	1 826
2007	1 657	276	8	1 941
2008	1 600	300	10	1 910
2009	1 600	300	10	1 910
2010	1 600	300	10	1 910

Table 3: The state budget funds spent in support of industrial zones

Source: MIT, CzechInvest

When analyzing the impact on the state budget, based on empirical investigation and the following analysis, accompanying effects were determined: "industrial restructuring and technological development", evaluated by high efficiency (profitability) of firms and higher production volume; "higher export potential", evaluated by increased production; "the focus on skilled strength ", determined by the difference between the average wage in the CR and the average wage in the industrial zones; and "positive impact on the labor market", determined by the effect of reducing unemployment. The consequences of this model are described in Table 4.

Variant		Pesimistic	Medium	Optimistic
Industry restructuring and technological development	Firms are more effective (profitable) by	5%	10%	15%
	Production increases by	2%	4%	8%
	Profit realized in industrial zones (thousands CZK)	89 881 057		
	Total production (revenues) in industrial zones (thousands CZK)	691 706 046		
	Additional profit (thousands CZK)	4 494 053	8 988 106	13 482 158
	Additional production (thousands CZK)	13 834 121	27 668 242	55 336 484

	Effect for the state budget (profit taxes, in thousands CZK) with 20% of tax rate	898 811	1 797 621	2 696 432
	Effect for the state budget (indirect taxes, in thousands CZK) with 5% of tax rate	691 706	1 383 412	2 766 824
Higher export potential	Production (export) increases by	2,0%	4%	8%
	Total export in industrial zones (thousands CZK)	295 057 306		
	Additional production, resp. export (thousands CZK)	5 901 146	11 802 292	23 604 585
	Effect for the state budget (indirect taxes) with 5% of tax rate	295 057	590 115	1 180 229
Focus on skilled labor	Wage per employee increases by (thousands CZK/year)	8,028		
	Average wage in CR (thousands CZK /year)	281		
	Average wage in industrial zone (thousands CZK/year)	289		
	Number of jobs	133 000		
	Total additional wage (thousands CZK/year)	1 067 724		
	Effect for the state budget (thousands CZK) with 40% of tax rate	427 090		
Positive impact on the labor market	Estimated proportion of employees of total number of employees in industrial zones transferred from the „unemployed“ category to „employed“	0,5%	1,0%	2%
	Total additional jobs	665	1 330	2 660
	Additional wage to taxation (thousands CZK/year)	2 309 444	4 618 888	9 237 776
	Effect for the state budget (thousand CZK) with 40% of tax rate	923 778	1 847 555	3 695 110
	Social benefits savings (thousands CZK/person/year)	120		
	Effect for the state budget in	79 800	159 600	319 200

	thousands CZK (social benefits savings)			
Total positive effects of industrial zones for the state budget (thousands CZK)		3 316 241	6 205 393	11 084 885
Total positive effect (in thousand CZK), provided that no state aid would be implemented in 75% of industrial zones		829 060	1 551 348	2 771 221
Total costs of the state budget (thousands CZK)		2 010 000		
Of which subsidies		1 910 000		
Of which administrative costs		100 000		

Table 4: Analysis of the impact of industrial zones support on the state budget in 2009

Source: authors

Under certain conditions, the overall positive effect of the state support reached 0.83 billion CZK in 2009, concerning the pessimistic variant; the medium variant shows the effect of 1.55 billion CZK; the optimistic scenario demonstrates the effect of 2.77 billion CZK. In a similar way, results for 2006, 2007 and 2008 were obtained: for the period 1998 to 2005 and 2010 to 2030, the estimation was made by extrapolation. The results are presented in Table 5. Opportunity costs and additional opportunities are discounted by 5%.

Year	Estimated revenues of the state budget and additional opportunities			Explicit expenditure and opportunity costs accumulated for all three variants
	Medium variant	Pessimistic variant	Optimistic variant	
1998	1 025	1 025	10 250	83 025
1999	5 176	3 126	51 763	519 726
2000	51 509	8 356	105 088	923 886
2001	105 075	41 418	210 254	1 273 119
2002	210 254	81 034	420 513	1 992 706
2003	318 013	122 496	636 026	1 717 085
2004	425 901	183 791	851 801	1 841 679
2005	533 795	275 690	1 067 590	2 036 509
2006	730 862	422 518	1 310 775	2 075 975
2007	928 813	501 018	1 725 377	2 195 824
2008	1 573 604	1 040 453	2 554 849	2 170 041

2009	1 668 812	901 809	2 968 244	2 168 752
2010	1 723 441	977 840	3 018 412	2 168 688
2011	1 726 172	991 892	3 020 921	208 434
2012	1 726 309	992 595	3 021 046	30 922
2013	1 726 315	992 630	3 021 052	22 046
2014	1 726 316	992 631	3 021 053	21 602
2015	1 726 316	992 632	3 021 053	11 330
2016	1 664 816	941 382	2 918 553	10 817
2017	1 600 241	897 819	2 810 928	10 791
2018	1 535 512	854 641	2 703 046	10 790
2019	1 470 776	811 482	2 595 152	10 789
2020	1 406 039	768 324	2 487 258	3 102
2021	1 341 302	725 166	2 379 363	155
2022	1 276 565	682 008	2 271 468	8
2023	1 211 828	638 850	2 163 573	0
2024	1 147 091	595 693	2 055 679	0
2025	1 082 355	552 535	1 947 784	0
2026	1 017 618	509 377	1 839 889	0
2027	952 881	466 219	1 731 994	0
2028	888 144	423 061	1 624 100	0
2029	823 407	379 903	1 516 205	0
2030	758 670	336 745	1 408 310	0
Celkem	35 084 952	19 106 160	62 489 369	21 507 803

Table 5: Expenditures and revenues of the state budget derived from the industrial zones support (in thousands CZK)

Source: authors

When the medium variant is concerned, estimated revenues of the state budget will reach 35.1 billion CZK in 2030, the pessimistic variant shows revenues in the amount of 19.1 billion CZK, and the optimistic scenario 62.5 billion CZK. Estimated expenditures reach, for all three variants, 21.5 billion CZK. Thus, in the pessimistic scenario, the state loses 2.4 billion CZK due to supporting industrial zones. In the optimistic scenario, the state gets a positive difference value of 41 billion CZK and, in case of the median variant, 16 billion CZK, which means that each CZK invested by the state returns 1.63 times.

Conclusion

Investment incentives and related support of industrial zones are becoming of increasingly debated subject for experts, especially in the context of the impact of foreign direct investment. The FDI inflow has many consequences to the host economy. The authors of this paper focus on assessing the effectiveness of promoting industrial zones as a key tool of regional development support within the economy in the Czech Republic.

The research shows that firms in industrial zones have positive effects on the regional labor market, that companies in industrial zones contribute to technological development through restructuring of industry and affect SMEs positively, that industrial zones improve the business image of the region. The negative effect on the environment is low and the impact of industrial zones on social cohesion may be considered as neutral.

The analysis of economic management of companies in industrial zones shows that, given the high proportion of progressive companies in economic activities throughout the supported industrial zones, these companies contribute to higher dynamics of economic restructuring in the Czech Republic. Firms contribute to efficient use of available resources, creating greater added value. In the context of economic development, it is also possible to evaluate positively stable export growth in its absolute value; wages of workers in industrial zones may be assessed as above average as firms try to get quality workforce. The proportion of university graduates in the total number of employees in industrial zones can be evaluated positively from the sector point of view, but the trend is not quite clear. The contribution of observed companies (or industrial zones) to the total number of jobs created in R&D is very limited. According to the information provided above, industrial zones may be considered as significant accelerators of secondary sector development and, to a relatively lesser extent, also on the Quaternary and Quinary.

The authors then assessed positive and negative effects of industrial zones promotion, when it comes to foreign direct investment incentives. Positive effects of foreign direct investment are higher dynamics of industrial restructuring and technological development, greater use of export potential, development of small and medium-sized enterprises, a focus on skilled workforce, improvement of the region's business image, positive impact on the regional (local) labor markets. Concerning negative (damping) effects, these may include transfer-pricing and the crowding-out effect on the production factors market.

To assess the impact of the state support in industrial zones on the state budget, a complex function has been compiled to count tax revenues of the state budget, its expenditures, administrative costs of the state, reduced social transfers (unemployment benefits), additional profits tax rate (direct taxes), additional profit (as a result of industrial zones establishment and existence), additional production tax rate (indirect taxes), additional production (as a result of industrial zones establishment and existence), additional income of population tax rate (including insurance), additional income of population, crowding-out coefficient (1 minus proportion of industrial zones that would arise even without the state support).

The model has been applied in three variants: "pessimistic", "medium" and "optimistic." The model has implemented data from the period of 2006 to 2009. In the medium variant, the estimated state budget revenues will reach 35.1 billion CZK in 2030. The pessimistic variant doesn't show more than 19.1 billion CZK. The optimistic scenario projects 62.5 billion CZK. Estimated expenditures seem to be in the same amount of 21.5 billion CZK for all three variants. Concerning the pessimistic scenario, the state budget loses the amount of 2.4 billion CZK in industrial zones support. According to the optimistic scenario, the state will achieve a positive difference value of 41 billion CZK, and, in case of the medium variant, the state will gain 16 billion CZK, which means that each CZK invested by the state returns 1.63 times.

Based on the above mentioned facts, it may be stated that the industrial zones promotion is an effective tool of regional economic development support in the Czech Republic.

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