

## Influence of the A2 motorway on the economic development at local level

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### How to cite:

Bogdański, M., 2016: Influence of the A2 motorway on the economic development at local level. In: Szymańska, D. and Chodkowska-Miszczuk, J. editors, *Bulletin of Geography. Socio-economic Series*, No. 32, Toruń: Nicolaus Copernicus University, pp. 49–59. DOI: <http://dx.doi.org/10.1515/bog-2016-0014>

**Abstract:** The aim of the paper is to analyze the selected investment in transport infrastructure in terms of its impact on the economy at the local level. The study involves ten gminas within a 60 km radius (approximately 1 hour's traveling distance) of Poznań. Using the available statistical data set, it was determined whether the construction of the motorway had an impact on the number and the structure of enterprises located in the surveyed communities, the levels of gmina revenues, and the situation on the labour market.

Performed analysis allowed reaching a positive verification of the research hypothesis, which predicts that the A2 did not have a decisive impact on the economic development of the gminas. In all of the included aspects, gminas located along the A2 were characterized by a relatively high level of economic development compared to the Wielkopolskie Voivodship and the rest of Poland. At the same time, the level of development was lower when compared with gminas within the Poznań Poviát. These results suggest that the decisive factor in shaping the level of economic development was their geographic location in relation to the nearby urban agglomeration of Poznań.

### Article details:

Received: 22 April 2014  
Revised: 21 September 2015  
Accepted: 20 February 2016

### Key words:

transport infrastructure,  
motorways,  
economic development.

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## 1. Introduction

Transport infrastructure, including roads and motorways, is often mentioned as an important determinant of economic development. However, for several years now, a number of scientific publications has questioned the significance of this factor. In some cases, the expansion of the roads network can even weaken the development dynamics of selected areas. At the same time, after the Polish accession to the European Union (EU), one can observe a visible increase in the number of new investments aimed at expanding and modernizing the network of roads in Poland. The scale and scope of these investments are mainly caused by the low density and a high degree of decapitalisation of Polish roads. The declared objectives of infrastructure investments include both improving transport availability and accelerating economic development.

The view of transport infrastructure as having a positive impact on local and regional economy still prevails among policymakers at various levels of government. The practical expression of this belief is the significant share of spending on transport infrastructure (mainly roads) in the total pool of funds allocated to stimulate economic development. For example, during years 2007–2013 over 42% of all expenditures designed to increase the level of regional development (including EU's structural funds) were spent on Operational Programme called "Infrastructure and Environment" with the biggest spending on the transport network (Miszczak, 2009: 328). Of course, given the state and the density of the economic infrastructure in Poland every action aimed at its modernization and expansion should be assessed positively. However, some doubts arise when considering its supposed economic benefits.

The aim of the analysis was to assess the impact of the construction of the A2 motorway on the level of economic development of selected gminas of the Wielkopolskie Voivodship. The study involved ten gminas in the radius of 60 km from Poznań, which roughly translates into a one hour commute. Using the available statistical data set it was examined whether the construction of the A2 motorway had an impact on the number and the structure of enterprises located in the surveyed communities, value of gminas' own revenues, and the situation on

the labour market. The results, although they cannot be generalized to all such investments made in the country, may constitute a contribution to the debate on the economic benefits generated by the expansion of transport infrastructure. They suggest that the transport infrastructure investments alone cannot be a sufficient factor for local development. It seems that there are other more significant determinants of the process, with the absolute distance from a city agglomeration as the most important one.

## 2. The aim and the time scope of the analysis, research hypothesis

In order to determine the impact of selected investments in the expansion of transport infrastructure on the economic development at a local level, the paper focuses on examining the economic effects generated by the A2 motorway on the economic performance of selected gminas of Wielkopolskie Voivodship. The choice of this specific investment within this region was decided by the fact that the modern A2 is a motorway which has been in use for a long time now. For example, the newest motorway section in the analysis (Poznań-Nowy Tomysl) was opened on the 27<sup>th</sup> of October 2004(1). As a result, it was possible to analyze the long-term effects of the A2's impact on local economies of this area.

Among the territorial units selected for the analysis, there are ten gminas located along the motorway, namely: Nowy Tomysl, Kuslin, Duszniki, Buk, Dopiewo, Komorniki, Kleszczewo, Sroda Wielkopolska, Dominowo, and Wrzesnia. Out of these units, five (Nowy Tomysl, Buk, Komorniki, Kleszczewo and Wrzesnia) have motorway exits. They were selected due to being located in a relatively short distance from Poznań, within one hour's travelling time. Furthermore, they were chosen because it was assumed in this study that all economic effects (both negative and positive) resulting from the presence of the motorway will be most apparent in the vicinity of Poznań, a large and fast developing urban agglomeration.

Based on the analysis of the available literature, a research hypothesis was adopted in which it was assumed that the construction of the motorway has had no significant effect on the level and the dynamics of economic development of the ten gmi-

nas surveyed. The key task in seeking to verify or reject the research hypothesis was the selection of indicators reflecting the process of economic development. The nature of this process, its complexity and multidimensionality, necessitate the selection of various indicators. As a result, the following set of variables was used in the analysis: 1) the number of enterprises catalogued in the REGON register; 2) the structure of enterprises by the section in accordance with PKD nomenclature (2), 3) gminas' own revenues per 1 inhabitant, 4) the share of registered unemployed persons as a percentage of population of working age, and 5) number of buildings completed during the period studied.

To present the problem in a wider context, respective indicators were also calculated for all gminas in Poland, in the Wielkopolskie Voivodship and for the gminas of Poznań Powiat. The results of data analysis on the gminas of Poznań Powiat allow at least a partial answering of the question of whether the changes observed in the economy of the surveyed units were influenced by the presence of the motorway or were instead a result of the Poznań agglomeration's positive impact.

The time range of the research covered the period from 2003 to 2012. The first section (Września-Poznań) of A2 motorway was opened for normal operation on November 27, 2003. Taking into account that some of the effects associated with the investment could appear before completion of the motorway – some enterprises relocating closer to the motorway before it was completed – some older data were used when appropriate. This refers to the data on the number of enterprises and the value of gminas' own revenues. The data were obtained from *Bank Danych Lokalnych* (Local Data Bank) of GUS (acronym for *Główny Urząd Statystyczny*, Central Statistics Office), reports published by Ministry of Regional Development, and by Autostrada Wielkopolska S.A. (the operator of the A2 motorway).

### **3. The importance of transport infrastructure in stimulating economic development**

The state and the density of infrastructure are considered an important stimulant of economic devel-

opment at different scales of analysis, ranging from macroeconomic to microeconomic scale. It should be noted, however, that the views on the role of infrastructure, particularly transport infrastructure, as an economic development stimulant, have been gradually changing. The World Bank estimates that a 1% increase in the stock of infrastructure increases the GDP by 1% (World Development Report, 2004: 2). At the same time it should be emphasized that the development of infrastructure networks alone is not enough for the occurrence of economic development; however, the lack of it is an important factor limiting the development potential of territorial units (Brzozowska, 2005:10).

The basic difficulty in assessing the impact of the transport infrastructure on economic development stems from the fact that there is no uniform methodology of analysis in this field. The methods used vary from qualitative research (cf. Bryan et al., 1997) to sophisticated econometric analysis and economic modelling (Spiekermann, Wegener 2006; Simoes et al., 2010). As noted by Simoes et al. depending on the research model, its specification, and a set of variables adopted, results of studies aimed at determining the relationship between the degree and dynamics of the development of road networks and the dynamics of economic growth may be different, often mutually excluding (Simoes et al., 2010: 1388). An added difficulty is that there are examples of countries and regions with well-developed transport networks which are also characterized by a low level of socio-economic development, as well as examples of relatively wealthy areas with underdeveloped networks of roads and motorways (Spiekermann, Wegener, 2006: 16).

A reason for these difficulties is also related to the fact that the economic effects caused by the expansion and modernization of transport infrastructure are not only positive. Furthermore, a full evaluation of the economic effects is only possible in the long run. Therefore, it follows that the net effect of transport investments should be evaluated. This task is especially difficult when taking into account that the level of socio-economic development, the level of competitiveness, and investment attractiveness, are all the result of an interaction between many factors.

Regional and local economy can obtain a number of benefits resulting from the expansion and

modernization of the network of roads and motorways. Potential benefits may be derived by both businesses and households. From the perspective of enterprises, the improvement in transport availability may primarily lead to the reduction of transport costs, which in turn may lead to an expansion of their sales and supply markets, reduction of wages, and gaining access to new resources and production factors (Holvad, Preston, 2005: 7-8; Holl, 2007: 294-295, Condeco-Melhorado et al., 2014: 1). Improved transport accessibility usually results in a more intensive penetration of local and regional markets by enterprises located outside their borders. It increases competition, which often leads to the reduction of goods prices (Holvad, Preston, 2005: 7-8). Lower prices of goods and services are the most important benefits obtained by households from the improvement of transport infrastructure. In addition, households gain access to a wider range of goods, which, in the long run, may induce new entities to move to the region, and by increasing the local market size makes firms concentrate there. As a consequence, the situation on regional labour market improves (Holl, 2007: 295).

Undoubtedly, an important aspect of the development of transport infrastructure is the increase of agglomeration benefits. Extending the boundaries of spatial interaction between economic actors promotes the formation and intensification of linkages between enterprises, between enterprises and employees, and between enterprises and scientific institutes. It streamlines the process of creating knowledge spillovers (Mucha-Leszko, Kąkol, 2009: 13, Holvad, Preston, 2005: 8).

Among other benefits resulting from the expansion and modernization of roads network one can distinguish also an increase in the value of real estates (Karlsson 2011: 227-229) as well as multiplier effects generated during construction as a result of an increase in regional and local demand. However, in the case of the latter effect there is a rather short-term impact on the economy, and it lasts as long as the investment is being realized (Wpływ budowy autostrad..., 2013: 108).

The benefits associated with improved transport accessibility may, therefore, contribute to improving the competitiveness of the economy, increasing its investment attractiveness, and then stimulating the inflow of capital and the creation of new businesses.

For example, nearly 70% of greenfield investments in Poland during 1990s were localized within a 30 km radius from motorways (Domański, 2001: 92). However, the scale of actual economic effects also depends on the on the strength and the extent of the impact of negative effects of the infrastructure.

Competition on regional and local markets usually increases with the improvement of transport linkages. Therefore, the relative isolation of enterprises located in regions with low transport accessibility may be considered in terms of competitive advantage (Bryan et al., 1997: 231). Improvements in a transport infrastructure resulting in an increased accessibility may lead to a reduction in the number of enterprises, unemployment growth and the reduction of households revenues. Improvements made in the transport network may also induce firms to relocate to other regions as the increase in the distance is compensated by the reduction of transport costs (Gorzela, 2009: 20). It may also be the factor which strengthens the migration of labour force to more developed areas, thereby, reducing the potential for the development of poorer regions (Holvad, Preston, 2005: 8).

Among negative effects associated with the construction of motorways one can also distinguish the so-called corridor effect also known as the tunnel effect. The effect can be observed at three levels of geographical scales: regional, local, and access scale. At the regional scale, it appears when the distance between successive nodes of a motorway is high, thus limiting the possibility of using positive economic effects of the investment. It may also appear, when a motorway connects two rapidly developing and competitive areas. It leads then to an outmigration of human and capital resources from areas between them. At the local and access scales, the corridor effect is associated with limitations and handicaps, which the motorway causes for local traffic and for access to certain facilities and real estates located along the road (Wpływ budowy autostrad..., 2013:160).

The crowding-out effect can also be included with the negative effects associated with the development of transport infrastructure. Most programs for the economic infrastructure development are financed from public funds. Economic theory holds that this may lead to the increase of interest rates. This may reduce the volume of private investment

and thereby cause a reduction in the level of economic activity. It should be noted, however, that the results of empirical studies in this field are not conclusive (Traum, Yang, 2013: 2-3).

Despite these objections, the potential benefits of investments in transport infrastructure and their material, long-lasting effects often encourage policy makers to implement different programs of investment in transport infrastructure. This occurs despite the fact that there are more and more doubts, supported by both the results of the economic analysis as well as examples from real economies (Spain, former East Germany), about the effectiveness of this kind of economic policy. Professor G. Gorzelak defines it as the myth of hard infrastructure in regional development (Gorzelak, 2009: 19). One of the reasons of this is that at the stage of ex-ante analysis performed on behalf of the investor one can observe primarily the highlighting of the benefits expected from the implementation of transport investment with a very careful identification of its negative effects (Llewelyn-Davies et al., 2004: 14).—Ex-post analysis occurs much less frequently, and often indicates a relatively small positive effect of the development of the network of roads and highways on the economy of the region (Pugh, Fairburn, 2007: 979, 987-988) (3).

#### 4. Effect of the A2 motorway at the level of economic development of selected territorial units

Among the most frequently mentioned benefits associated with the construction and modernization of roads and motorways there is an increase in the transport availability of areas located along the investments, which in turn lowers costs for enterprises and increases their size of markets. Consequently, this should lead to the inflow of new enterprises and to the increase in the level of entrepreneurship. Figure 1 shows the changes in the number of enterprises per 10,000 inhabitants in the gminas analyzed recorded in the REGON register for years 2000-2012.

In each of the analyzed years, the highest number of enterprises could be observed in the Poznań Poviát. The number of enterprises catalogued there

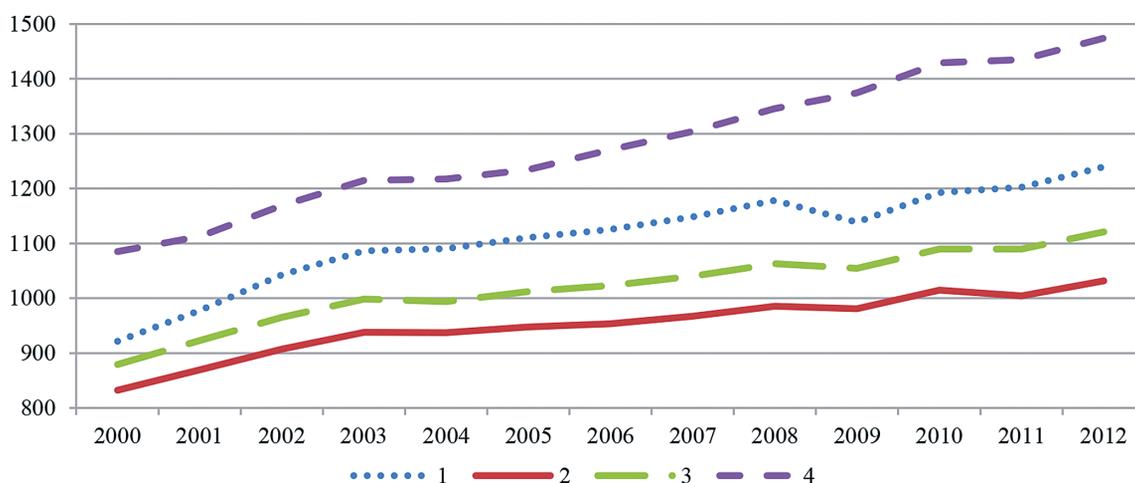
was 20% higher than in the gminas located along the A2 motorway (gminas A2), more than 25% higher than in the Wielkopolskie Voivodship and 34% higher than in the whole country.

The thesis is supported when one compares the changes of the relative number of enterprises in the surveyed gminas during years before (2000-2004) and after the opening of successive sections of the A2 motorway. Both in the years before the launch of the investment and in the few years thereafter, one cannot observe significant changes in the number of registered enterprises. At the same time, it seems that the most important factor influencing the dynamics of new enterprises was the overall economic situation in Poland. As it can be observed, the number of enterprises in the surveyed gminas changed according to the same pattern as in the whole country (Fig.1).

The presence of the motorway also had no effect on the structure of the registered enterprises and thus it did not influence the structure of production. This is one of the potential effects of transport infrastructure development, which was observed by Lakshmanan (Lakshmanan 2011: 4). Investments in the infrastructure especially attract investors from the manufacturing and service industries, for which transport costs and a short commuting time are particularly important for the probability of production (Lakshmanan 2011: 4). Therefore, the structure of economic activity in areas with relatively good transport accessibility may be different.

Using data from PKD (*Polska Klasyfikacja Działalności* – Polish Classification of Activities), Table 1 shows the difference (in percentage points) in the structure of registered enterprises in the ten surveyed gminas in relation to the analogous structures in the Poznań Poviát, the Wielkopolskie Voivodship, and Poland as whole.

Analysis of Table 1 allows ascertaining that the structure of economic activity in all of the surveyed units was similar. The observed differences did not exceed 2 percentage points and there was no clear regularity in their shaping. If only taking into account the relatively small share of enterprises operating in sections L (real estates) and M (professional, scientific and technical services) in the total number of enterprises (which did not exceed 5%), the differences are noticeably large. Their distribution, however, does not allow making decisive conclusions on the A2 motorway influence in their formation.



**Fig. 1.** The number of enterprises registered in the REGON register per 10,000 inhabitants during years 2000-2012

Explanation: 1- A2 Gminas, 2 – Poland, 3 – Wielkopolskie Voivodship, 4 – Poznań Poviát

Source: Authors's calculations based on Bank Danych Lokalnych (Local Data Bank) GUS: [http://www.stat.gov.pl/bdl/app/strona.html?p\\_name=indeks](http://www.stat.gov.pl/bdl/app/strona.html?p_name=indeks).

**Table 1.** Differences in the structure of registered enterprises in the analyzed gminas in relation to Poznań Poviát, Wielkopolskie Voivodship, and Poland according to PKD 2007 nomenclature in 2012 (in percentage points)

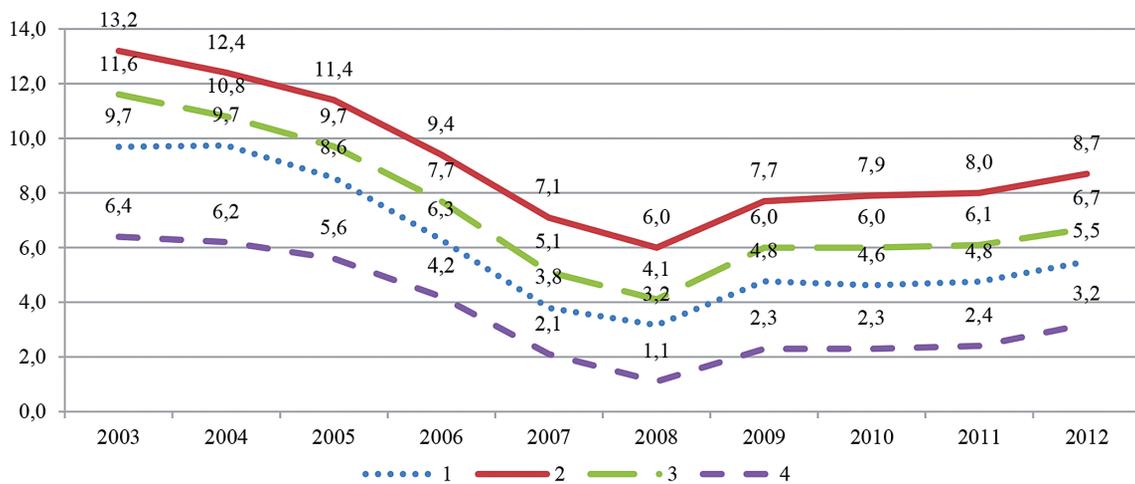
	Section A	Section B	Section C	Section D	Section E	Section F	Section G	Section H	Section I	Section J
Poviát	0.75	0.04	-0.79	0.07	0.00	0.02	0.20	-0.34	-0.04	-0.34
Wielkopolskie	-1.11	0.05	1.11	-0.02	0.00	0.29	0.34	0.82	-0.10	0.04
Poland	0.18	0.05	1.79	-0.01	0.04	1.29	0.48	0.37	-0.86	-0.17
	Section K	Section L	Section M	Section N	Section O	Section P	Section Q	Section R	Sections S and T	Section U
Poviát	0.03	0.97	-1.60	-0.40	0.31	0.62	0.22	0.22	0.09	0.00
Wielkopolskie	-0.15	-0.02	-0.11	0.03	-0.21	-0.08	-0.25	-0.16	-0.48	0.00
Poland	-0.36	-1.55	0.05	0.12	-0.18	-0.15	-0.25	-0.27	-0.57	-0.01

Source: Authors's calculations based on Bank Danych Lokalnych (Local Data Bank) GUS: [http://www.stat.gov.pl/bdl/app/strona.html?p\\_name=indeks](http://www.stat.gov.pl/bdl/app/strona.html?p_name=indeks).

Assuming that the presence of the motorway in the analyzed gminas increases the demand for labour, as it is emphasized in the subject literature, it should lead to a decrease of unemployment. The improvement in the labour market situation may also result from the fact that the presence of the motorway increases the area of daily commutes to work. It increases the possibility of finding a job, especially in the impact area of a large and rapidly developing urban agglomeration. Hence, in Fig-

ure 2 the data on the proportion of the unemployed in the total population of working age inhabitants during years 2003-2012 is presented (4).

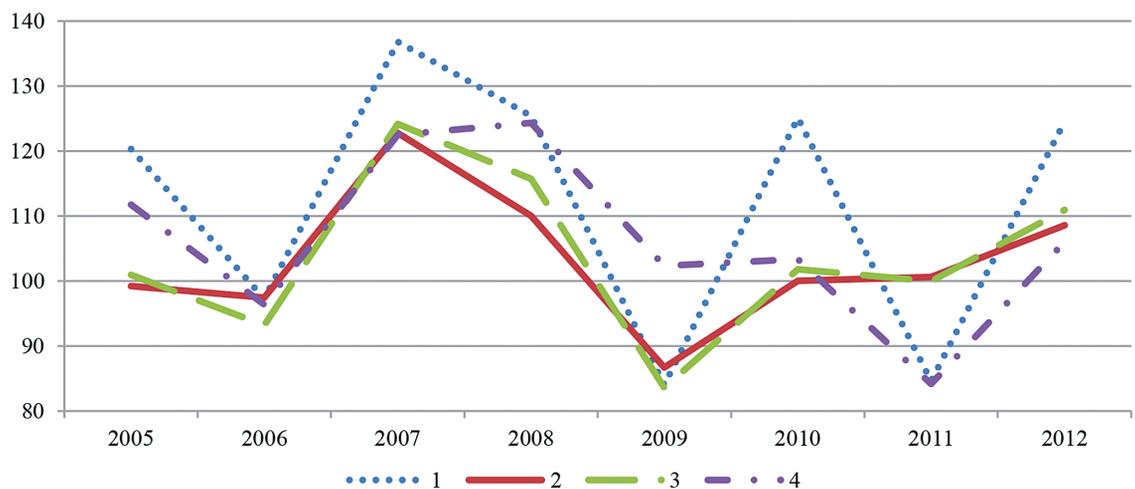
The presented data show that the average rate of unemployment in the period 2003-2012 in the ten studied gminas was relatively low (average rate of the unemployed in the period 2003-2012 was 6.1%), compared to the national average (9.2%) and to the Wielkopolskie Voivodship (7.4%). However, the best labour market by far was in the Poznań Poviát, in



**Fig. 2.** The share of the unemployed in the total population in a working age in the analyzed territorial units in the years 2003-2012 (in %).

Explanation: 1- A2 Gminas, 2 – Poland, 3 – Wielkopolskie Voivodship, 4 – Poznań Poviát

Source: Authors` calculations based on Bank Danych Lokalnych (Local Data Bank) GUS: [http://www.stat.gov.pl/bdl/app/strona.html?p\\_name=indeks](http://www.stat.gov.pl/bdl/app/strona.html?p_name=indeks).



**Fig. 3.** Dynamics of changes in the number of completed buildings in the surveyed gminas in 2005-2012 (previous year = 100%).

Explanation: 1- A2 Gminas, 2 – Poland, 3 – Wielkopolskie Voivodship, 4 – Poznań Poviát

Source: Authors` calculations based on Bank Danych Lokalnych (Local Data Bank) GUS: [http://www.stat.gov.pl/bdl/app/strona.html?p\\_name=indeks](http://www.stat.gov.pl/bdl/app/strona.html?p_name=indeks).

which the share of the unemployed was at its lowest level, with the average of 3.6%, during all of the years surveyed. This may therefore indicate that the more important factor, than the presence of the mo-

torway, in influencing the level of unemployment in the analyzed units was not a relative (as measured by commuting time) but absolute distance from Poznań. This is indicated by the fact that if one lim-

its the analysis to only 10 gminas located along A2 motorway, it turns out that the proportion of people without a job was the lowest in units closest to Poznań, the capital of Wielkopolskie Voivodship. In the gmina of Kleszczewo the average proportion of the unemployed to the total population of working age in the years 2003–2012 was 3.6%, in Dopiewo it was 3.3% and in Komorniki it was only 2.9%. The further away from Poznań, the more the percentage of the unemployed increased.

Another effect associated with the expansion of roads and motorways, observed by Pugh and Fairburn, is a change in land use in the vicinity of the investment. The construction of a motorway usually increases the amount of other ongoing construction projects, mainly for industrial activity. However, the results of studies of these authors found that the increased demand for investment land was noticeable in the area within 10 minutes from the motorway (Pugh, Fairburn 2008: 987). Trying to determine the impact of A2 motorway on the economies of surveyed territorial units, in Figure 3 the data on the dynamics of completed buildings in 2005–2012 were presented (the lack of statistical data did not allow to present the supposed functions of completed buildings).

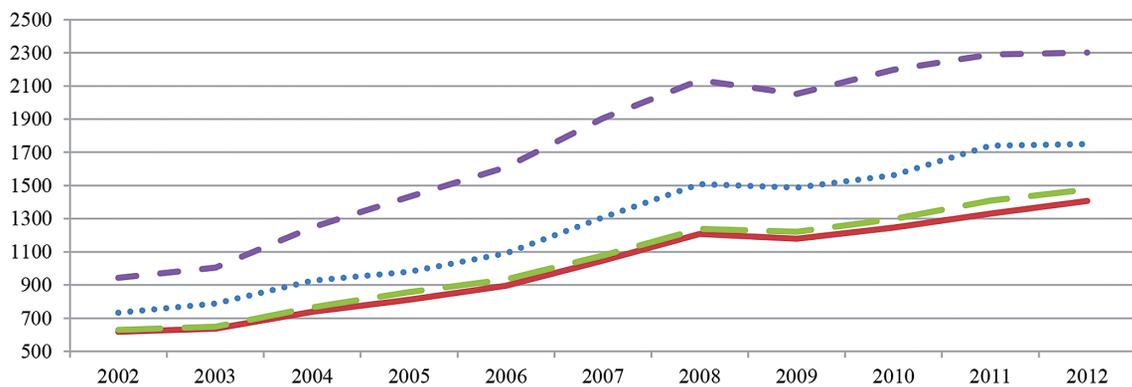
In this instance, it appears that the presence of the motorway had a positive impact on the economy of the surveyed gminas. The number of completed buildings grew in their area the fastest, with the average annual rate of 12.3%. In Poznań Povi at the average, annual growth rate of the number of completed buildings was at a nearly twice lower level (6.3%), in the Wielkopolskie Voivodship it was 3.8% and in the whole country 3.2%. However, it should be noted that in the case of the analyzed gminas the dynamics of change were characterized by major fluctuation. Among the gminas, the greatest dynamics in the number of completed buildings could be observed in the gminas closest to Poznań, which again indicates that the main causes of the changes observed were the processes of suburbanization and urban sprawl.

The indicators presented above are only partial. They refer to certain aspects and dimensions of economic development. Hence, there is a need to use an indicator, which in a synthetic way would describe the level of economic development of the gminas, taking into account those dimensions not included earlier. The indicator that is typically used

in this respect is GDP per capita, the most synthetic measure of socio-economic development. Unfortunately, GDP per capita values are not published at such low level of data aggregation. Hence, it was necessary to seek other synthetic measures available for gminas. It was assumed that such an indicator may be the value of gminas' own revenues per 1 inhabitant. The budgets of gminas are partially derived from taxes paid by households and enterprises. As they increase with the growth of the economic development level, this means that the higher the incomes of households and enterprises, the larger own revenues of gminas become. Figure 4 contains the data on gminas' revenue levels per 1 inhabitant during years 2002–2012.

The analysis of the data presented in Figure 4 allows to state, as in previous cases, that the relatively best situation in terms of the level of economic development is to be found in the gminas located around the Poznań agglomeration. In the analyzed period, the revenues of these territorial units were at clearly higher level, with the average value off nearly 1,740 PLN per inhabitant. In the group of gminas located along the A2 highway, the average value of the revenues was nearly 30% lower and amounted to 1,261 PLN. In turn, the revenues of all Wielkopolskie Voivodship and Polish gminas were at a close level, at 1,050 PLN and 1,010 PLN respectively. Furthermore, the growth rates of gminas' own revenues were the highest in the Poznań Povi. In the analyzed period they grew with an average, annual rate of 9.6%, while in the A2 gminas it was 9.3%. What is important is the fact that the revenues growth rate in this group did not change significantly after the motorway was opened. For the Wielkopolskie gminas the average, annual growth rate of own revenues was 9.1% and for other gminas in Poland it reached 8.7%.

If the analysis is limited to the ten gminas located along the A2 motorway, it is clear that the revenues decrease with the increase of the distance from the agglomeration. Their average value over the 11 studied years in four gminas closest to Poznań (Dopiewo, Komorniki, Kleszczewo, and Buk) amounted to 1641 PLN, while in the remaining 6 gminas averaged only 1,008 PLN. This confirms the thesis that the key factor influencing the level of economic development of the gminas analyzed is their location in relation to the nearby growth pole of the Poznań agglomeration.



**Fig. 4.** Own revenues of the selected territorial units per 1 inhabitant, in the period of 2002-2012 in PLN (current prices).  
Explanation: 1- A2 Gminas, 2 – Poland, 3 – Wielkopolskie Voivodship, 4 – Poznań Poviát

Source: Authors' calculations based on Bank Danych Lokalnych (Local Data Bank) GUS: [http://www.stat.gov.pl/bdl/app/strona.html?p\\_name=indeks](http://www.stat.gov.pl/bdl/app/strona.html?p_name=indeks).

## 5. Summary and conclusions

The aim of the analysis was to determine the impact of the construction of the A2 motorway on the level of economic development of selected gminas of the Wielkopolskie Voivodship. The study group consisted of ten gminas located along the A2 motorway within 60 km of Poznań. A number of indicators were used to determine the impact of the motorway on the economies of surveyed gminas. These included, among others, the number of registered enterprises, their structure by type of activity, and the level of gminas own revenues per 1 inhabitant. The values obtained were presented at the background of all gminas in Poland, gminas of the Wielkopolskie Voivodship, and the gminas located in Poznań Poviát. The choice of the last control group allowed for assessing if a possible level of economic development of the units studied, was not due the positive economic impact of the Poznań agglomeration.

The analysis performed allowed for a positive verification of the research hypothesis that the A2 did not have a decisive impact on the economic development of surveyed gminas. In all of the included aspects gminas located along the A2 were characterized by a relatively high level of economic development compared to the Wielkopolskie Voivodship and Poland. At the same time, the level of development was lower when compared with gminas of

Poznań Poviát. Gminas located in the Poviát were characterized by significantly higher number of enterprises per 10.000 inhabitants. They also have had visibly higher level of own revenues. It therefore shows that the decisive factor in shaping the level and dynamics of economic development was not their accessibility associated with the presence of the motorway, but their geographic location in relation to the urban agglomeration.

Thus, the improvement of the interregional communication accessibility of surveyed units, has not contributed to the dynamics of their economic development. Therefore, this type of investment should not be regarded as an essential tool for stimulating development at a local level. However, it raises a question of whether the development of transport infrastructure could be a tool which would improve the internal communication accessibility in the region? In the light of the research results, would the positive economic effects generated by the Poznań agglomeration be more effectively distributed in space if the network of local roads were denser?

One can also conclude that the observed differences in the level of economic development of the units studied, had even grown during the analyzed period. It means that the A2 has not let to convergence between gminas located along the motorway and those surrounding Poznań agglomeration. Hence, in the light of the research results and the literature study, one can risk a statement, that the con-

struction of the motorway has initiated centrifugal forces which by reducing transport costs have shifted some endogenous potential from outside of the Poznań agglomeration to its center. In other words the A2 motorway construction was one of the factors of economic divergence. These findings seem to confirm some research doubts (Gorzelał 2009, Pugh and Fairburn 2007) as to the effectiveness of infrastructure investments perceived as a tool supporting the process of economic convergence. This however opens a new research question, if and under what conditions the process of economic convergence between relatively high developed urban agglomeration and its further surroundings can be achieved.

## Notes

- (1) <http://autostrada-a2.pl/pl/o-nas>, DoA: 22 of March 2014.
- (2) REGON (*Rejestr Gospodarki Narodowej*) is a database of all enterprises operating in Poland. PKD (*Polska Klasyfikacja Działalności* - Polish Classification of Activities) is a classification of all economic activities divided in different sections according to the type of activities. For example section L denotes real estates and M describes professional, scientific, and technical services.
- (3) A good example is adopted in 2013 by the Council of Ministers of Transport Development Strategy, which emphasizes that transport is one of the most important factors determining the economic development of the country, enabling the achievement next to the territorial cohesion, the economic and social cohesion (Transport Development Strategy in 2013: 5).
- (4) the need to use this approximate measure of labour market state is due to the lack of other data available at this level of aggregation.

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