

VERKEHRSGEOGRAPHIE *TRANSPORT GEOGRAPHY*

BORDER TRAFFIC AS A MEASURE OF TRANS-BORDER RELATIONS¹⁾

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Zusammenfassung

Grenzverkehr als ein Maß für grenzüberschreitende Beziehungen

Intensität und Struktur des Grenzverkehrs werden durch wirtschaftliche, soziale, politische, formal-rechtliche, infrastrukturelle, ökologische und auch historische Faktoren be-

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stimmt. Einige dieser Faktoren ergeben sich aus globalen Prozessen, die zu schnellen Veränderungen mit sehr weitreichenden Auswirkungen führen können. In diesem Artikel wird der Einfluss ausgewählter wirtschaftlicher und geopolitischer Ereignisse auf den Grenzverkehr über die polnische Ostgrenze dargestellt. Solche Ereignisse sind u.a. der Beitritt Polens zur EU und zur Schengen-Zone, der ukrainisch-russische Konflikt und die Einführung eines russischen Embargos für bestimmte Warengruppen. Verkehr wird also als ein Maß für die Verwundbarkeit des grenzüberschreitenden sozio-ökonomischen Systems herangezogen. Der Grenzverkehr wird nach Personen- und LKW-Verkehr analysiert. Es zeigt sich, dass der Güterverkehr sehr von der makro-ökonomischen und geopolitischen Situation abhängig ist, während Umfang und Richtung des Personenverkehrs vor allem von der rechtlichen Lage und von der grenzüberschreitenden Handelssituation bestimmt werden.

Schlagwörter: Grenzverkehr, grenzüberschreitende Interaktionen, Verwundbarkeit, Polen

Summary

Intensity and structure of cross-border traffic are influenced by economic, social, political, formal-legal, infrastructural, environmental, and even historical factors. A part of these factors result from global processes, which may lead to dramatic transformations having very broad repercussions. The present article tracks the influence exerted by selected economic and geopolitical events on traffic across the eastern border of Poland. These events include the accession of Poland to the EU and to the Schengen Zone, the Russian-Ukrainian conflict, and the introduction of embargoes on definite groups of goods by Russia. The characteristics of cross-border traffic are treated, therefore, as representing a measure for the resilience displayed by the trans-border system of socio-economic connections. Cross-border traffic is analysed by traffic of persons and heavy goods vehicles (HGV). It is demonstrated that cargo traffic is subjected to the geopolitical and macro-economic situation, while sizes and directions of the traffic of persons are mainly shaped by legal and local cross-border trade conditions.

Keywords: Border traffic, trans-border interactions, vulnerability, Poland

1 Introduction

Political borders, their functions and their level of permeability belong to the classical subjects of political geography. Contemporary socio-economic space is to an increasing degree the space of flows (CASTELLS 2007). Measurement of the intensity of these flows remains a challenge, which is hardly effectively faced by the systems of public statistics in many countries. Political borders constitute ‘natural’ reference items, convenient for appropriate measurement. Limitation of the control functions of borders – like within the Schengen Zone in Europe – constrained significantly the possibility of making this kind of investigations. This made a detailed analysis of size and structure of traffic even more im-

portant in these locations, where traffic is still registered. Such an analysis can, ultimately, be the basis for the modelling and estimation of trans-border relations including borders at which registering is no longer done.

At the same time, transformations of the geopolitical situation, which have been taking place in close neighbourhood of the European Union (beyond its southern and eastern borders), are the reason that analysis of traffic intensity and structure across the external borders of the European Union (EU) gains significant cognitive as well as application-oriented value (in terms of prerequisites for visa, migration and transport policies). In a short-term perspective, cross-border flows are often assessed in the context of concrete events of political and economic character, triggering changes in regulations concerning traffic of persons, goods and vehicles, or conditioning economic circumstances on local scale (local cross-border trade). Rational assessment of the influence exerted by geopolitical and macro-economic occurrences is possible, however, only by using adequately long-time series. Their analysis may allow for the evaluation of adaptation capacities not only of the local (regional) trans-border socio-economic systems (like, e.g., time of return to a growth path after an event limiting the intensity of interactions), but also reflect socio-economic relations at a higher (international) level.

A convenient border, proper for undertaking this kind of investigations, is the Polish segment of the EU eastern border after the system transformation of 1990. Social and economic interactions across this border have since 1990 been exposed several times to jump-like changes of the geopolitical and macro-economic situation. Moreover, these changes had different effects on various sections of Poland's eastern border (KOMORNICKI 2010; JAKUBOWSKI et al. 2017). An additional element of importance was the development of trans-border transport infrastructure.

2 Research concept

2.1 The research problem

In the past, studies associated with political borders have evolved from the inquiry into functional changes of borders (KOLOSSOV 2005) and analyses of the influence they exert on the intensity of spatial interactions. More recent directions of research have been more closely connected with integration processes in the wider sense. A significant factor for the intensification of research was the fall of the Iron Curtain and the swift liberalisation of border regimes in East-Central Europe. Based on these processes many theoretical generalisations have been formulated. These generalisations assume in their majority a continuous (linear) direction of processes, perhaps with varying speed: from a hardly permeable border through a reduction of border functions up to far-reaching spatial integration and complete permeability (SANGUIN 1983; MARTINEZ 1994; CHOJNICKI 1998) and even to simultaneous management integration of border regions (LEIBENATH 2008). Such generalisations were, however, mainly formulated at the end of the 20th century, and their em-

pirical basis was the abrupt increase of trans-border interactions, especially border traffic, after 1989 in countries such as Poland. Yet, studies of spatial interactions conducted, e.g., in the countries of the Benelux (where the borders were formally completely open since the 1960s, see RIETVELD 2001) and at the French-German border (HELBLE 2007) indicated that the disappearance of spatial barriers is a much slower process and that it takes place selectively in sectoral terms. A border crossed for shopping is, e.g., not necessarily crossed for education and health-care services (KNIPPENBERG 2004).

Moreover, as numerous more detailed studies have been carried out, they indicated that functional border transformation and the increase of permeability had increasingly spatially different results. In addition, the accession of the countries of East-Central Europe to the EU meant a decrease in permeability of their eastern borders. The re-formalisation of these borders entailed a jump-like increase in transaction costs, associated not only with custom payments and related fees, but also with travel time (MEGORAN et al. 2005). Factors of a global character (terrorism, migration) started also to limit the permeability of borders. Hence, changes in border traffic cannot any longer be explained by the previously mentioned simple theoretical constructs. The intensity of various kinds of international interactions proved to be dependent upon many factors of political, macro-economic, social, infrastructural as well as local character.

The role of borders in the context of trans-border infrastructure and the functional interconnections have been undergoing intensive transformations. Compression of space-time, as defined by HARVEY (1989), and associated changes in accessibility, take place selectively in a territorial sense. The development of transport removes some of the traditional barriers, including political borders, but gives at the same time rise to such barriers in other places (SPARKE 2006). European integration did not so much liquidate borders as transfer them in space and changed their functions (WIĘCKOWSKI 2014). The significance of all those still existing spatial barriers has, moreover, increased along with the transformation of the space of places into a space of flows (CASTELLS 2007). The so-called border effect refers to the difference in size of international and interregional flows (the latter within a given country), resulting directly from the existence of state borders (HELBLE 2007). The existence of borders understood as spatial barriers (RYKIEL 1990) exerts an influence on the size of flows of people and goods, which could be expected from the very basic gravity models, in which the only factor limiting interactions is constituted by the friction of distance. A jump-like break in the regression line illustrating mutual interactions (both economic and social) is more pronounced when the political border constitutes a strong formal and legal barrier (LOWE & MORYADAS 1975). Interrelations between functions of borders, trans-border socio-economic interactions and transport infrastructure are multidirectional and assume often the form of feedbacks. The scope of these relations is variable and strongly historically, geopolitically and economically conditioned (KOMORNICKI 2014).

The increasing intensity of flows of people and goods between countries (SCOTT 1998; BRENNER 1999; UNITED NATIONS 2001; NEWMAN 2006) reflects the progressing globalisation, similarly as the development of trans-border cooperation at the regional level, not only in Europe (e.g., INTERREG). Thus, on the one hand, a new 'borderless' world is being created, which makes it necessary to have a new perspective on the border as a zone

of contact (RATTI 1993) and of the consequences of increase in permeability of the borders. On the other hand, one should not forget that this optimistic vision of a disappearance of borders as barriers between states (VAN HOUTUM 2005) functions only in some parts of the world (e.g., in Europe within the Schengen Zone). But even there exist distinct borders between the countries integrating and the ones remaining outside the Zone. Recent geopolitical events provide evidence that the process of increasing permeability of borders has not necessarily a linear character and is not irreversible.

The persistence of the process of functional transformations of borders can, however, be questioned. This applies not only to external borders of integrating zones, but also to internal ones in the case of unexpected geopolitical events (like, e.g., temporary border inspections within the Schengen Zone during the migration crisis). Such events may affect size and structure of border traffic. It was already stated by MINGHI (1963) that among the few political problems that can be investigated by using secondary statistical data are those that can be studied through trans-border flows of people, goods and services. Obviously, the size of border traffic is the result of numerous factors changing over time including

- **economic** like, e.g., different levels of economic development, different incomes of the respective populations, different price levels of consumer goods (see, e.g., FULLERTON & WALKE 2012; KARLSSON & OSTENBERG 2009a, 2009b) as well as exchange rates of currencies and their shifts, levels of remuneration and inflation rates (see POWĘSKA 2016; SITEK 2016);
- **social and psychological** like interrelations at the personal level, stereotypes (see e.g., KOMORNICKI 1999);
- **formal-legal** like partnership agreements at the regional level, Euroregions, resulting from the policies implemented (both home and foreign policies, e.g., the agreements on local border traffic, visa-based or visa-less regimes, in general the degree of formalisation of the border as a barrier), which can in some cases have a multiplier effect on trans-border interactions and in other cases reduce these interactions practically to zero (BATTEN 2003, p. 145);
- **infrastructural** like border-crossing infrastructure, roads, railways;
- **historical and environmental** like natural barriers.

Most of these factors do not undergo abrupt changes, especially when the stable borders between democratic countries featuring similar levels of development are considered. In other cases, changes of this kind may take place after unexpected geopolitical and macro-economic events. Size and timing of such disturbances of trans-border relations might then be subject to investigation. A respective analysis allows for the assessment of the persistence of international interactions.

2.2 Aims, methods and data

With gross simplification it can be stated that the open borders within the Schengen Zone and associated freedom of movement of goods and people constitute the ultimate

yardstick for the process of integration and geopolitical change. External borders of the Schengen Zone, however, pass different stages of functional transformation reflecting short- or longer-term conditions of formal-legal and macro-economic character.

In search for objective measures of geopolitical situations it was asked, whether cross-border traffic was indicating relatively soon changing economic and political conditions. This was done under two perspectives: social (border traffic as indicator of social/ interpersonal relations, but also of economic relations at the microlevel) and economic (heavy goods vehicles [HGV] traffic as indicator of the macro-economic situation reflecting bilateral trade exchange). Both kinds of border traffic were analysed for all segments of Poland's eastern border. With traffic of persons not only its sheer intensity was considered, but also its national structure. Traffic was perceived as related to selected events that could have exerted an impact on its size and structure (Table 1).

	Traffic of persons	HGV traffic
1	Economic crisis in Russia (1998)	Economic crisis in Russia (1998)
2	Introduction of visa for Russians, Belarusians and Ukrainians (2003)	Introduction of visa for Russians, Belarusians and Ukrainians (2003)
3		Russian embargo on food and farming products (2005–2007)
4	Poland's access to the Schengen Zone (2007)	Poland's access to the Schengen Zone (2007)
5	Global financial crisis (2008)	Global financial crisis (2008)
6	Agreement on local cross-border traffic with Ukraine (2009)	
7		Russian embargo on fresh vegetables (2011)
8	Poland and Ukraine organise European soccer championship (2012)	
9	Agreement on local cross-border traffic with Russia (2012)	
10		Russian embargo on meat, fruits and vegetables (2014)
11	Annexation of Crimea (2014) and military operations in eastern Ukraine (2014–)	Annexation of Crimea (2014) and military operations in eastern Ukraine (2014–)

Source: Own elaboration

Tab. 1: Selected economic and political events regarded in the analysis of border traffic

Analysis of border traffic size was split into two periods. The first encompassed the years 1946–1993, i.e. the entire period of the Socialist People's Republic of Poland (1945–1989), along with the beginning of the system and economic transformation. The respective data constitute the background for further considerations. Since the middle of the 1990s (1994), detailed data from border guards are available on size and structure of

movements across the border. The second period encompasses the years 1994–2016 (year-after-year). The analysis accounts explicitly for the border segments with Ukraine, Belarus and Russia (Kaliningrad District [Kaliningradskaja oblast’]), and until 2007 also with Lithuania. Available general data on border traffic include incoming and outgoing traffic distinguishing Polish citizens and foreigners. Detailed data on citizenship of foreigners refer only to incoming traffic.

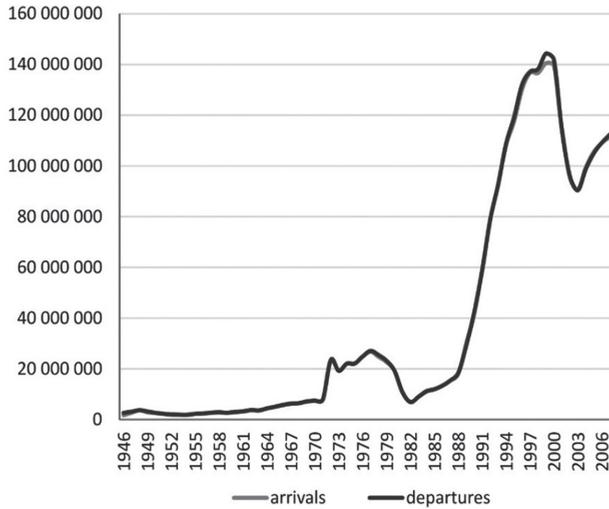
The report to be presented here has both cognitive and methodological purposes. The primary cognitive objective of the article is to determine the vulnerability of the trans-border system of socio-economic interactions, expressed through cross-border traffic (of persons and HGV) with reference to selected economic and geopolitical events. In other words: It is the purpose of the article to define the capacity of the system of trans-border interactions to overcome potential economic, political and geopolitical barriers and its adaptation capacities in this respect – also in view of future developments and conditions.

3 Results

3.1 Case study – Polish eastern border

Assessment of the entire passenger-traffic intensity (in both directions) observed over the whole period after World War II until 1989 reflects very well the political changes in Poland during the Socialist period. The size of traffic was insignificant until the middle of the 1950s. After the system liberalisation in 1956 it very slowly increased until the end of the 1960s (Fig. 1). A jump-like increase in cross-border traffic took place after 1970, when a new leading group (with Edward Gierek as the first secretary) seized power in the Polish Communist Party and the policy of international opening and liberalisation of traffic with the neighbouring German Democratic Republic began. Under these new circumstances the intensity of cross-border traffic reached its maximum in 1977. This was followed by a collapse in the years of martial law in Poland (1981–1984). The final years of the Socialist economy (after 1985) were characterised by a rapid abolition – once more – of foreign travel restraints (KOMORNICKI 1999; STOLA 2012).

A consequence of the political changes during the 1950s was also a new foreign travel policy. A new model was sought, somewhere between the principle of tightly closed borders (the Stalinist model) and a free flow of people (the model of the Western countries). A characteristic feature of the foreign travel system in Socialist Poland was the duty to hand back the passport (issued usually only for a selected group of countries) to the respective office within a week after having returned home. This regulation has been gradually loosened over time, mainly with respect to travelling to European Socialist countries. The state border could now be crossed with a so-called passport booklet, valid along with an identity card, and thereafter with an entry in the identity card. (“The document entitles to crossing the border.”) Yet, travelling to Western countries was possible only with passport.



Source: Own elaboration based on data from the border guards

Fig. 1: Passenger traffic frequency across all borders of Poland 1946–2007

The subsequent liberalisation took place at the beginning of the 1980s. Passports started to be issued valid for several years, but it was still required to hand them back to the Ministry of Home Affairs after having returned. Moreover, the procedure of obtaining the already issued passport was simplified. The essential changes took place at the end of 1988, when passports valid for multiple travels and for all countries of the world were introduced and it was no longer required to return them to the issuing office (STOLA 2012).

In the case of the eastern border, post-war migration movements and the appearance of a new tight border resulted in the interruption of earlier social ties after World War II as well as in severe limitations of economic interactions. During the period of the People's Republic of Poland (1945–1989), the entire border with the Soviet Union featured a very low degree of permeability, which found its reflection in the size of border traffic. This border constituted a kind of a 'second Iron Curtain' separating the Socialist countries of Central Europe from their 'Big Brother' (KOMORNICKI & MISZCZUK 2010). Over time, limitations to border traffic across this dividing line became even more restrictive than for travels to Western Europe.

Essential changes in crossing the eastern border took place at the end of the 1980s along with the perestroika in the Soviet Union. An agreement concerning visa-less travel to the USSR that had been in force already before was now interpreted differently. Travel vouchers required until then for organised excursions could now be purchased in shops near the border. Bilateral public transport connections as well as new border-crossing points (including the very first Polish-Lithuanian crossing point at Ogrodniki) were opened.

Due to these changes, the early 1990s were a period of extremely dynamic border-traffic increase (of both persons and vehicles) (KOMORNICKI & MISZCZUK 2010). Changes in prices of many commodities in Poland and Ukraine as an effect of transition to market

economy (and the different progress of transformation in the two countries) together with the appearance of explicit unemployment caused petty local cross-border trade becoming highly attractive. It consisted initially mainly in importing cheap products of the declining Soviet economy and selling them at Polish bazaars. At the same time, many Poles visited for the first time since World War II the 'lost' former Polish territories in the East. In subsequent years, cross-border trade converted mainly to visits in Poland for buying goods to be then sold in Ukraine. A first break in upward dynamics took place in the years 1992–1993 associated with the replacement of mass visits of persons selling goods in local cross-border trade (retailers) by visits of purchasing wholesalers (KOMORNICKI 1995).

In conclusion, traffic at the Polish eastern border was subject to significant changes since the beginning of the socio-economic transformation in 1989. Direct causes of these changes in the first part of the period were (KOMORNICKI 1999): (a) ultimate liberalisation of Polish passport-related regulations; (b) loosening of passport regimes in the countries of the former Soviet Union; (c) decentralisation and privatisation of road transport and foreign trade; (d) growing poverty in the societies of the former Soviet Union (motivation to travel to Poland to sell goods of low quality) and in a part of the Polish society (demand for such goods); (e) competitiveness of goods produced by some branches of Polish industry on the markets of the eastern neighbours; (f) high customs and excise taxes on alcoholic beverages, tobacco and fuels in Poland motivating to petty smuggling from behind the eastern border; (g) establishment of new border-crossing points and development of bilateral railway and coach connections. Several of these factors were only short-term and unstable causing fluctuations in the intensity of cross-border traffic.

A factor with persistent impact on the situation at the Polish eastern border was the introduction of visa for citizens of Russia, Belarus and Ukraine by Poland in October 2003 (immediately before EU accession). Thereby a process of strong differentiation of the Polish eastern border started, modified thereafter by Poland's entry into the Schengen Zone (2007).

This explains why Poland's eastern border with its dynamic changes in cross-border traffic and its functional transformation (transition from a closed border through complete permeability to a tightening of the border) constitutes an exceptionally good example for empirical studies in this domain. The border in question can actually – as it was in the past, even before 1939 (see HARTSHORNE 1936) – be regarded as a model border for theoretical approaches. Poland as such is an example, on the one hand, of border opening opposite the Schengen Zone countries (border as a contact zone) and on the other of border tightening towards the East (after a period of relatively easy permeability during the 1990s). Hence, Polish borders feature a definite functional dichotomy (border as a contact zone vs. border as a barrier).

3.2 Trans-border traffic of persons

During the entire period of transformation, individual border segments featured different dynamics by structure of passenger traffic related to Polish citizens and foreigners. In the years 1991–2003, the size of traffic across the borders with Belarus and Ukraine was

fully determined by inward traffic of foreigners (mainly Belarusians and Ukrainians) (Fig. 2). Traffic of Poles was relatively limited, even though it has been increasing. Thus, the share of Poles in border traffic (both directions) along the entire segment with Ukraine was in 1991 23.3%, while in 2003 28.5%. At all three segments of the border a strong decline is obvious, especially in traffic of foreigners, associated with the so-called 'Russian crisis'.

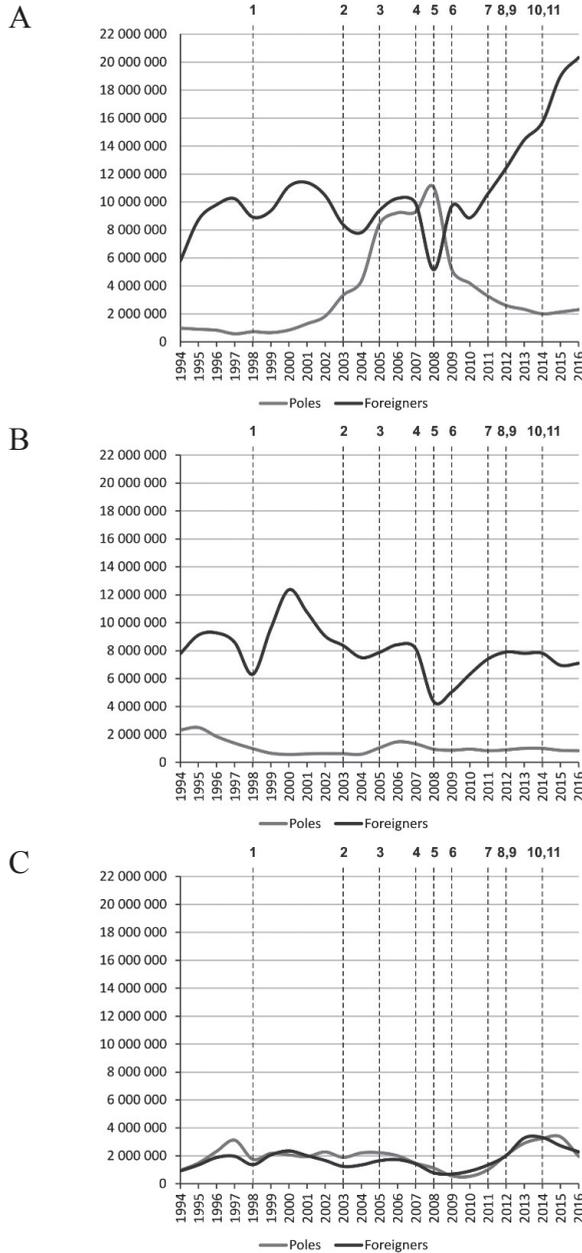
After the introduction of visa and the accession of Poland to the EU the situation changed at the border with Ukraine. There was a spectacular increase in the number of Poles travelling to Ukraine (primarily to buy goods charged in Poland with excise tax). At the same time, in Polish-Belarusian traffic foreigners (mainly Belarusians) clearly persisted to dominate. The share of Poles, who crossed this border in the year 2007, amounted to only 13% (at the Ukrainian border to 48%, and at the Russian border to 50%). This shows that at the Belarusian segment of the border the trade-and-smuggling activities have not been taken over by residents of Poland.

The Russian embargo on food and agricultural products (2005–2007) was not reflected by a downward shift of passenger traffic. The decline of traffic in 2008 (after Poland's access to the Schengen Zone) had quite varied effects on traffic structure. At the border with Russia the decline concerned both Poles and foreigners, while at the Ukrainian border a decrease in traffic of Ukrainian citizens was accompanied by a continued increase in the number of Poles. In the case of the Belarusian border there was a fast decrease of foreigners, but only a slow decrease of Poles. The dynamics of passenger traffic does neither reflect, in principle, the global financial crisis, nor the subsequent Russian embargo (2011). Thus, after the decline of passenger traffic caused by the introduction of the Schengen regime, there has been a relatively dynamic increase in the intensity of traffic across all segments of the Polish eastern border, and that despite of the financial crisis and embargos.

In 2012, a maximum of Russian citizens was observed at the Polish-Belarusian border (the highest value since visa had been introduced). It can be supposed that the increase by more than 10% compared to the preceding year might have resulted from the European soccer championship in Poland and Ukraine and the associated inflow of fans of the Russian soccer team.

Then, in 2014, there was a drastic change in traffic structure across the Ukrainian border preserving, however, the trend of fast increase in overall traffic intensity. Poles accounted, again, only for 11.3% of the total traffic. Compared to the year 2010 the absolute number of Poles crossing the border with Ukraine (in both directions) decreased by a half. There was also a decrease in comparison with the year 2013 by some 300,000. Still, one should be careful in connecting this observation with the geopolitical situation. The biggest changes had taken place yet in the years 2010–2012, and so it should be considered that they were caused by import limitations of goods charged with excise tax or by the taking over of border-adjacent markets again by citizens of Ukraine (due to the new law on local cross-border traffic). Even bigger changes are observed when we compare the maximum of cross-border traffic of Poles in 2008, i.e. immediately after the introduction of Schengen-Zone visa for Ukrainian citizens, with the entire traffic of foreigners (among whom Ukrainians clearly dominate).

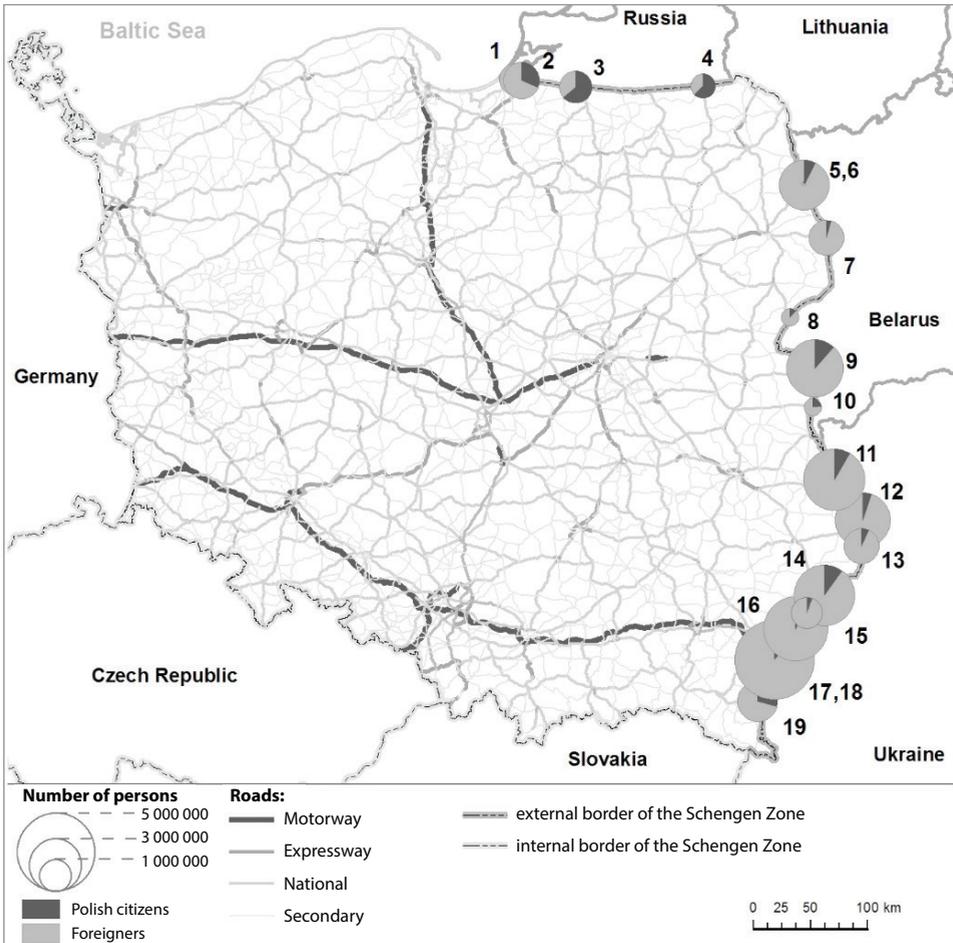
In absolute terms, the number of Poles going to Ukraine (one-way border-crossing events) decreased from 2.1 million in 2010 to only 1 million in 2014 and 1.15 million in



Source: Own elaboration based on data from the border guards (for explanation of numbers see Table 1)

Fig. 2: Changes in passenger traffic 1994–2016 at the border segments with (A) Ukraine, (B) Belarus, and (C) Russia

2016. At the same time, there has been a continuous increase of Polish citizens travelling to the District of Kaliningrad (from 268,000 to 1.6 million). The contemporary increase at the border with Belarus was quite small. Altogether, around 3 million Poles travelled beyond the eastern border in 2014, which means an increase in comparison to four years earlier, but a slight decrease in comparison to 2016 (2.5 million) (Fig. 3). This increase, though, was the result of drastic changes in the structure of traffic.



1 – Gronowo-Mamonowo, 2 – Grzechotki-Mamonowo II, 3 – Bezledy-Bagratiowski, 4 – Gódkap-Gusiew, 5 – Kuźnica-Grodno, 6 – Kuźnica-Bruzgi, 7 – Bobrowniki-Bierestowica, 8 – Połowce-Pieszczałka, 9 – Terespol-Brześć, 10 – Sławatycze-Domaczewo, 11 – Dorohusk-Jagodzin, 12 – Zosin-Uściług, 13 – Dołhobyczów-Uhrynów, 14 – Hrebenne-Rawa Ruska, 15 – Budomierz-Hruszów, 16 – Korczowa-Krakowiec, 17 – Przemyśl-Mościska, 18 – Medyka-Szeżynie, 19 – Krościenko-Smolnica

Source: Own elaboration based on data from the border guards

Fig. 3: Border traffic of persons in 2016 according to border crossing points

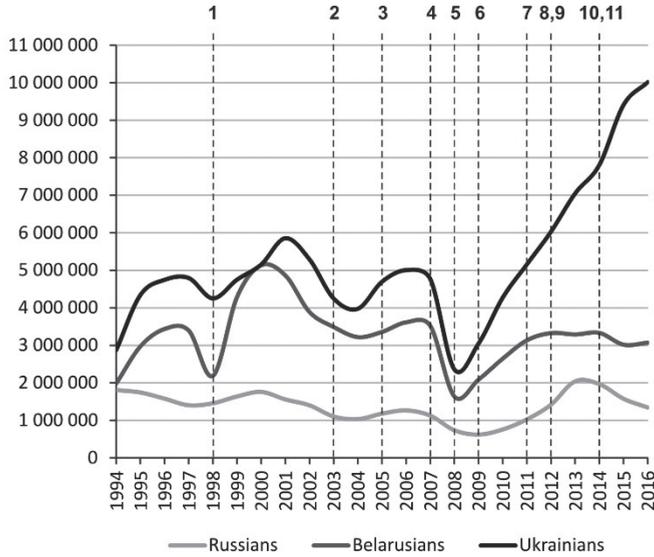
To answer the question whether geopolitical changes east of Poland found their reflection in border traffic, it is worthwhile to take a closer look at changes in inbound traffic to Poland by segments of its eastern border. It is natural that at each of these segments citizens of the respective neighbouring country dominate. In the case of Ukraine, the corresponding percentage is as high as 97% (2016). In the cases of Russia and Belarus the percentages equal 89% and 88%, respectively (2016). Somewhat lower values are registered for the Belarusian border, which is crossed by a significant number of Russians in transit. In this context, let us note that at this border a distinct decrease in the number of Russians can be observed – in the years 2013–2016, for instance, by some 35%. This corresponds to an absolute decrease from approximately 460,000 to 296,500. A downward tendency is also perceived at the Polish-Russian border (District of Kaliningrad), which might partly result from the Polish suspension of the agreement on local cross-border traffic in the middle of 2016. Even though we do not know the number of Russians, who come to Poland through the border with Lithuania (having first entered the Schengen Zone in Estonia or Latvia), the decrease in the number of border crossings by Russian citizens across all segments of the Polish eastern border is quite obvious, and one can hardly expect that unregistered traffic across the Polish-Lithuanian border significantly affects the general pattern. (In 2007, the number of border crossings by Russian citizens through the Polish-Lithuanian border amounted to 20,600.) It is also highly telling that the number of Russians entering Poland through the border with Ukraine decreased fourfold (from roughly 40,000 in 2013 to 8,900 in 2015 and 11,300 in 2016).

The overall number of citizens of neighbouring countries, who entered Poland by crossing her eastern land border remained in the years 2013–2016 quite stable in the case of Belarusians (a marginal decrease by 6.7%), while there has been a significant drop of Russians (by 34.2%) and a significant increase of Ukrainians (by near to 3 million, i.e. 42%) (Fig. 4).

Can the changes in cross-border traffic as considered here be associated with the geopolitical situation in eastern Ukraine? It is, of course, hard to answer this question without reference to specific studies. On the one hand, we face an enormous increase in cross-border traffic of Ukrainians, on the other we observe a significant (in relative terms) decrease of Russians crossing all the segments of the Polish eastern border.

It should be noted that the increase of traffic at the Polish-Ukrainian border due to travels of Ukrainians since 2008 is partly the consequence of regulations on local cross-border traffic introduced in 2009. The share of this kind of traffic in total intensity oscillates around forty-some percent (44.5% in 2013, 50.8% in 2015, and 43.4% in 2016). This implies that more than half of the Ukrainians, who cross the border with Poland, head for destinations outside the border area. The primary motivation for these travels is a paid job, with the difference that persons, who cross the border in the framework of the local cross-border traffic agreement acquire financial benefits from petty trade, while the remaining part of the flow benefit from employment.

Quite interesting conclusions can be drawn from the differences in size of inward and outward traffic of foreigners across the Polish-Ukrainian border (Fig. 5), 97–98% of whom are citizens of Ukraine. During the last couple of years, the number of entries was higher than the number of exits by roughly 145,000 per year, which could have been ex-



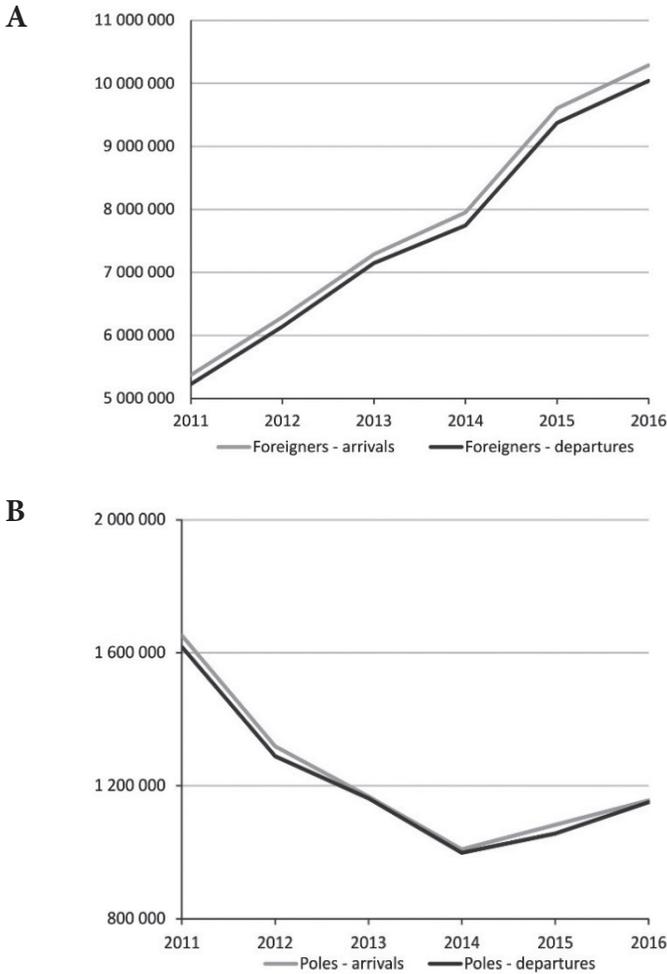
Source: Own elaboration based on data from the border guards (for explanation of numbers see Table 1)

Fig. 4: Incoming traffic of foreigners (by selected nations) to Poland across the entire eastern border (until 2007 including the Polish-Lithuanian border)

plained by returns over different land routes or by air. It is, however, highly significant that this number remains roughly stable. From 2014 onward, a dynamic increase of the surplus of entries over exits can be observed, with more than 248,000 in 2016. We can assume that in the initial period this surplus was resulting in particular from return travels across different borders. Thus, e.g., at the Polish-Belarusian border there is a persistent surplus of exits of foreigners over entries, on the average almost 113,000 per year in the years 2014–2016. Yet, the increase above this stable value in the year 2014 and in subsequent years can be interpreted as indicating permanent migration movements. Moreover, the value of this surplus in 2016 corresponds roughly to the number of work licences issued for citizens of Ukraine in Poland, namely 116,000 (data from the Polish Ministry of Family, Labour and Social Policy). This observation is confirmed by much more balanced values of inward and outward travels of Poles across the Polish-Ukrainian border.

However, the previously mentioned decrease in the number of travels of Russians could also indirectly result from the events in Ukraine. In their consequence sanctions were imposed by the EU, and the value of the Russian Rouble fell in relation to Euro and Dollar making foreign travels of Russians more expensive.

Also travel characteristics of Poles changed. In 2014, the lowest number of border crossings by Poles since 2002 was observed at the Polish-Ukrainian border (close to 160,000 less than in the preceding year). This could have been a reaction to the then current events in Ukraine and the associated apprehensions as travelling to the East. In



Source: Own elaboration based on data from the border guards

Fig. 5: Inward and outward traffic of foreigners (A) and Poles (B) across the Polish-Ukrainian border

the subsequent years, the numbers of Poles crossing the Polish-Ukrainian border has increased again (by close to 150,000 in 2014–2016).

Among citizens of other ('third') countries crossing the Polish eastern border in terms of transit Moldavians deserve special attention. Their number registered at the Polish-Ukrainian border was very high in the 1990s (more than 100,000 per year), while it significantly decreased thereafter (down to less than 20,000). A new increase since 2015 can be explained by the fact that they now enjoy visa-less entry to the Schengen Zone.

3.3 Cross-border traffic of heavy goods vehicles (HGV)

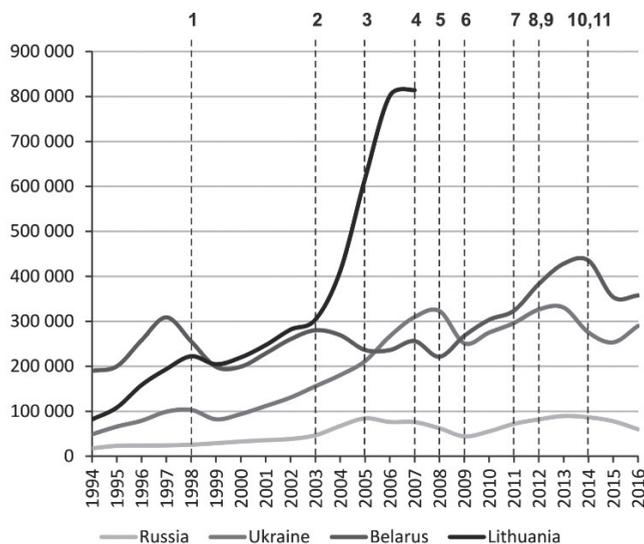
The movement of heavy goods vehicles (HGV) across the eastern border in the period 1994–2016 was in general characterised by an upward tendency (Fig. 6). At the beginning of transformation, the majority of HGV traffic in the direction of the countries of the former USSR was concentrated at the Belarusian border, even more so, when the small number of functioning border crossings is taken into account.

Until 1998, a fast increase of traffic intensity could be observed across all border segments, along with a gradual dispersion of vehicles to other crossing points, first of all the Polish-Lithuanian ones (initially towards Ogrodniki, then Budzisko), followed by the Polish-Ukrainian crossing points. In 1998, there was a collapse in traffic with Belarus, and a stop of traffic increase at the borders with Lithuania and Ukraine. This was the consequence of the Russian crisis. After the year 2000, the increase returned at all border segments (despite the introduction of visa regimes). This increase was the slowest at the Belarusian border, where it was only in 2007 that the level of 1997 was reached again (KOMORNICKI 2010).

The accession of Poland and the Baltic countries to the EU in 2004 entailed a spectacular increase in Polish-Lithuanian traffic in the years 2004–2006. Budzisko became, side by side with Świecie at the Polish-German border, the most intensively used cargo-crossing point along the Polish borders. One of the reasons was the transfer of a part of transit traffic from and to Russia through Latvia and Lithuania, which gave the opportunity of avoiding double border checking at the Belarusian borders. This coincided with an increase in the share of Lithuanian carrier companies in servicing transit transport. There was also a fast increase of traffic at the border with Ukraine.

Membership of Poland in the Schengen Zone has not affected essentially the upward tendency of traffic either at the Belarusian or the Ukrainian border. Roughly in the same period, i.e. starting with 2005, an opposite trend was observed at the Polish-Russian border, a clear decline in the intensity of HGV traffic. This, in turn, coincided in time with the introduction of the Russian embargo on Polish food and agricultural products. The downward trend, thus initiated, lasted until 2009 and was deepened by the global financial crisis.

In 2009, the decline of Polish-Ukrainian traffic clearly results from the global economic crisis. There is only a short stagnation at the Belarusian border, after which the intensity of traffic across the Belarusian border exceeded again Polish-Ukrainian traffic. In the years 2010–2013, an increase of HGV traffic was noted again across all border segments considered. (The negative impact of the Russian embargo of 2011 had declined.) In 2013, the Polish section of EU external borders (borders with Ukraine, Belarus and the Kaliningrad District of the Russian Federation) was crossed in both directions by more than two million HGV. By the year 2015, this number decreased to 1.59 million, and then again slightly increased to 1.65 million (Fig. 7). The decrease could be attributed to the events taking place in eastern Ukraine, preceded by the annexation of Crimea [Krym]. The statistics quoted do not include the traffic across the Polish-Lithuanian border, which is no longer registered (due to being part of the Schengen treaty area), this traffic amounting in the last year, when it was registered, to 1.48 million vehicles. This is largely the flow



Source: Own elaboration based on data from the border guards (for explanation of numbers see Table 1)

Fig. 6: HGV traffic across the Polish eastern border 1990–2014

directed to the Russian border avoiding Belarus. Vehicles with foreign license plates account for 77.6% (2016) of all traffic across the eastern borders of Poland, and this equals, by careful estimation, the scale of transit traffic.

The trends described were interrupted by the events of 2014. The entire HGV traffic across the Belarusian border decreased from 1,088,000 vehicles in 2013 to 892,000 in 2016, and across the Russian border from 186,000 to 123,000. The most significant decline occurred at the border with Ukraine, where the number of HGV dropped from 748,000 to 547,000 in 2015 and 634,000 in 2016. Total HGV traffic across the eastern border decreased by 18.5%, which can be regarded, with appropriate care, as the effect of geopolitical disturbances, strengthened by the subsequent Russian embargo on meat, vegetables and fruits. It deserves, however, also to be mentioned that border traffic intensity at the Russian, Belarusian and Ukrainian borders was in 2014 still significantly higher than in 2009. Thus, decrease of trade exchange did not mean a return to the state during the first wave of the global economic crisis.

It is also characteristic that the decrease of HGV traffic across the Belarusian border was slowed down in the years 2015–2016 (with simultaneous continuing decrease across the Russian segment). This might be associated with the Russian embargo on farm products. This embargo is frequently avoided by transiting products (mainly apples) over Belarus, from where they are re-exported to Russia. This results in the transfer of a part of HGV flows from the Polish-Lithuanian border (actually from the Latvian-Russian border) towards the Polish-Belarusian border.



1 – Gronowo-Mamonowo, 2 – Grzechotki-Mamonowo II, 3 – Bezledy-Bagrationski, 4 – Goldap-Gusiew, 5 – Kuźnica-Bruzgi, 6 – Bobrowniki-Bierestowica, 7 – Połowce-Pieszczatka, 8 – Kukuryki-Kozłowicze, 9 – Dorohusk-Jagodzin, 10 – Hrebennie-Rawa Ruska, 11 – Korczowa-Krakowiec, 12 – Medyka-Szeginie

Source: Own elaboration based on data from the border guards

Fig. 7: HGV border traffic in 2016 according to border crossing points

4 Conclusions

Research undertaken in this article for an objective measurement of the vulnerability of socio-economic relations expressed through border traffic with respect to economic and geopolitical events should be placed in the context of attempts to grasp the constantly

changing conditioning of border traffic at various spatial levels. Here, this wider task is confined to the question whether events and decisions taking place at supra-national and state levels are reflected at lower levels, i.e. at the level of decisions of (a) enterprises engaged in trade (export/import) and transport activities; (b) individual people and societies participating in migrations, job-related travels, local cross-border trade, as well as tourism. Do statistics on cross-border traffic allow for perceiving patterns of regularities associated with concrete actions or geopolitical and macro-economic events?

The answer to these questions is at the same time simple and difficult. On the one hand intuition suggests a hypothetically strong influence exerted by such events on the size of border traffic. This assumption is also confirmed by an initial analysis of the materials collected. The economic and political events considered here are very well reflected by changes in border traffic, both of persons and commodities. The picture becomes much more complex, however, when we analyse dynamics and structure of cross-border movements in more detail. Thus, it was shown that cargo traffic has clearly been influenced by the geopolitical and macro-economic situation (e.g., the Russian crisis, the global financial crisis), while size and directions of passenger traffic depended mainly on formal regulations (introduction of visa regimes, agreements on local cross-border traffic) as well as local cross-border trade conditions and opportunities being in part a reflection of the macro-economic situation. Moreover, the events in Ukraine (2014) brought rather an increase than a drop in traffic intensity, although this was in roughly half of the cases due to movements in the framework of local traffic agreements, i.e. movements of people residing close to the border and not in the areas ravaged by war. This fact ought to be associated with the worsening economic situation resulting in search for additional sources of income (petty trade or work in Poland). Besides, the events in eastern Ukraine constituted an accelerator of population outflow in the sense that in cases of uncertainty and lack of development perspectives (partly spoiled by the conflict) these events contributed to triggering the decision to leave the country. This finding is confirmed by the increasing difference between the number of foreigners entering and exiting Poland across the Polish-Ukrainian border. Related to Russia it can be assumed (irrespective of the incompleteness of the data available) that due to the geopolitical situation the traffic of persons between this country (except the District of Kaliningrad) and Poland has significantly decreased. Contacts in the framework of local border interactions, however, proved to be more resilient.

Still, answering the question concerning resilience of trans-border interaction patterns remains difficult. It has to be admitted that reactions to sudden geopolitical and macro-economic events are usually quite abrupt proving the sensitivity of these patterns and also their incomplete development or immaturity (this being due to the relatively short time having elapsed since the system transformation). However, in most cases considered border traffic returned quite quickly to previous trends. The number of events exerting a persistent impact on the intensity of traffic revealed to be smaller than initially assumed. This is confirmed by diachronic data series for all borders of Poland during several decades. The only event, which caused a drastic interruption of growth in cross-border movements was the proclamation of martial law in Poland in December 1981. Yet, even in this case, traffic of persons surprisingly quickly returned to the levels registered during the 1970s.

Among the events analysed in this article to be regarded as particularly significant are the accession of Poland to the EU, the continued integration in the framework of the Schengen Zone, and, most probably, also the Ukrainian crisis of 2014, although the period of observation may still be too short in this latter case.

Our analysis also demonstrates that local and long-distance movements are subject to very different conditions. They feature different resilience and sensitivity in respect to sudden geopolitical and macro-economic events.

Hence, size and structure of cross-border traffic can be applied as measures reflecting changing economic and political conditions. The correct use of these measures, however, requires profound data on traffic structure by residence location and activity of traffic participants (persons or companies).

Forecasting future transformations at the Polish eastern border is not an easy task. It can be supposed that the situation will develop according to one of these basic scenarios:

1. Escalation of the situation in Ukraine and worsening of bilateral relations between Poland and Russia (maintenance or even increase of the scope of sanctions). One can expect in such a case a decrease in HGV traffic across all borders. Russian restrictions regarding Lithuanian carriers will then end up in the collapse of transit through the Baltic states, and the importance of routes crossing Belarus will relatively increase. The border with Belarus may experience the smallest decrease in cargo traffic, also under the aspect that this country will take over the role of a mediator in Polish-Russian contacts. Traffic of persons at the border with Belarus will continue at the present level, while it will increase at the border with Ukraine as the living conditions in that country will worsen. Such a scenario would confirm the supposition that the Ukrainian crisis was one of the few events that seriously affected intensity and structure of trans-border interactions along the Polish eastern border.
2. Stabilisation of the current situation in Ukraine, with simultaneous gradual improvement in relations with Russia (step-wise withdrawal of the sanctions). In this case one should expect stabilisation of cargo traffic to and from Russia and Belarus at a level somewhat lower than today. Cargo traffic across the border with Ukraine will increase anew. Concerning the traffic of persons, decisive will remain local, border-adjacent economic circumstances. Essential trends to date will in principle persist. It would then be possible to state that trans-border relation patterns have actually adapted to the new geopolitical situation.

5 References

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