

# THEORETICAL PRECONDITIONS VERSUS THE REAL EXISTENCE OF CROSS-BORDER RELATIONS IN THE SLOVAK-CZECH BORDERLAND

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**Abstract:** The submitted article deals with a comparison of theoretical preconditions for cross-border relations with the real existence of cross-border relations in the Slovak-Czech borderland. For a partial analysis of theoretical preconditions for cross-border relations, two basic indicators have been selected – transport communication through the border crossings and the settlement hinterland of the border region. For an analysis of the real existence of cross-border relations, the most important indicator is that of labour migration across the borderline. We try to present a final regionalisation of the Slovak part of the Slovak-Czech borderland synthesising the studied theoretical preconditions for and the real existence of cross-border relations.

**Key words:** cross-border relations, cross-border interaction potential, cross-border labour migration, Slovak-Czech borderland

## INTRODUCTION

Cross-border relations represent a complex of all processes that are a result of the dependence of a territory from one side of the State border on the potential of a territory from the other side. A basic impulse for the creation of such relations rests on differences between the supply and demand of selected social-economic components of the geographic environment in the regions situated on both opposite sides of the border. These differences are thus a fundamental impetus to balance such disequilibrium as well

as motivation for inhabitants to use a more advantageous supply of components from the other side of the border (free jobs, supply of goods and services and the like).

Our analysis of cross-border relations may be divided into two levels: the first is formed by potential (theoretical) preconditions for the existence of relations; the second one resides in a direct evaluation of the real state and development of cross-border relations. The application of both levels to the region of the Slovak-Czech borderland makes it possible to prepare its final regional characterisation. With respect to the asymmetric nature of cross-border relations in the studied region (the prevalence of relations in the direction from Slovakia to the Czech Republic) we try to make a regionalisation of the Slovak part of the Slovak-Czech borderland only in dependence of the intensity of relations towards the Moravian part. (Note: Because of local specificities we use a more frequent term “the Moravian [not Czech] part” of the Slovak-Czech borderland in the contribution.)

## THEORETICAL BASIS

### CROSS-BORDER INTERACTION POTENTIAL

In particular, the accessibility of centres from the other side of the border and their size structure is important for a detailed analysis of the potential creation of cross-border relations. Therefore, we use an interaction potential frequently applied to geography in order to evaluate theoretical possibilities of cross-border relations.

Let us define a set of basic territorial units  $A = \{a_i; i = 1, 2, \dots, m\}$  and a set of target territorial units  $B = \{b_j; j = 1, 2, \dots, n\}$ . The theoretical number of moving entities (persons, goods, raw materials, information etc.) from  $a_i$  to  $b_j$  is denoted as  $T_{ij}$ . Then we may express a gravitational (interaction) hypothesis in its most simple form as follows (Paulov, 1986):

$$T_{ij} = K \cdot M_i \cdot Q_j \cdot f(d_{ij})$$

where  $K$  is a constant, proportionality coefficient;  $M_i$  is the mass (e.g. the number of inhabitants) of a basic territorial unit  $a_i$ ;  $Q_j$  is the mass of a target territorial unit  $b_j$ ;  $f(d_{ij})$  is a function of the distance,  $d_{ij}$  represents the distance from  $a_i$  to  $b_j$ .

We obtain the interaction potential of a point (a settlement in our case) as a sum of the interactions of neighbouring points (settlements) having an influence on it; in this case we must not take into account the power itself of the basic point. Then, this relation is valid:

$${}_iV = K \cdot \sum_{j=1}^n \frac{Q_j}{d_{ij}^b}$$

Every bell-shaped curve, asymptotically approaching the x-axis, may be used as a function of spatial interaction (Řehák, 2004). A principle that the force expressing the influence of a settlement is increased with rising mass and decreased with growing distance is respected by that. Besides the power function given in the relation, we can also use the exponential function or the special function with an inflection point (Grasland, 1991). But most often the power function is used to set the interaction potential with regard to the possible daily movement of population. The determination of the exponent  $b$  corrects the weight of the number of inhabitants or of the distance to define the final

potential. Tikunov (1985) argues that this value may vary from 0.5 (the greatest emphasis on the distance) up to 3.5 (the greatest emphasis on the power). In our case – after a test analysis – we chose the value of 2 as the most suitable exponent, the power of a settlement is represented by its number of residents in 2001, and the distance  $d$  is calculated as the road distance of settlements measured in a road atlas at a scale of 1 : 100 000 with the accuracy of 0.5 km. The constant  $k$  can equal to 1, since we do not express a concrete movement but examine the interaction potential generally.

On the basis of the above stated premises, we obtain the relation:

$${}_iV = \sum_{j=1}^n \frac{Po_j}{d_{ij}^2}$$

where  $Po_j$  is the number of inhabitants in the target settlements. In this manner we may determine the interaction potential of all communes in the delimited Slovak part of the Slovak-Czech borderland with an area from the other side of the border for  $n = 1, 3, 5$ . Because the results for these three values of  $n$  are not much different, we use  $n = 5$  in the cartographic interpretation. It means that we obtain the values for the interactions of the communes with five most influencing towns on the Moravian side (Moravian rural settlements were not taken into account since their impact is almost negligible). The final results are thus denoted as the cross-border interaction potential.

After that, for the rural settlements, we carried out a comparison of their cross-border interaction potential with the towns on the Moravian side ( ${}_iV\check{c}$ ) and their cross-border interaction potential with the towns on the Slovak side ( ${}_iV_s$ ). This was done with the help of a relative cross-border interaction potential  ${}_iV$  with an area on the other side of the border, defined by the relation:

$${}_iV = k \cdot \frac{{}_iV\check{c}}{{}_iV_s}$$

where the constant  $k$  was determined as 100 and the individual shares were once again calculated separately for  $n = 1, 3, 5$ . For the same reasons as in the case of the (absolute) cross-border interaction potential, we take only the values for  $n = 5$  in the cartographic interpretation into account. (Note: The Slovak part of the Slovak-Czech borderland is defined with the help of the districts located in the direct hinterland of the border – i.e. those of Čadca, Kysucké Nové Mesto, Byča, Považská Bystrica, Púchov, Ilava, Trenčín, Nové Mesto nad Váhom, Myjava, Senica, and Skalica – Figure 1.)

#### SYNTHESIS OF POTENTIAL AND REAL CROSS-BORDER RELATIONS

The regionalisation of the Slovak part of the Slovak-Czech borderland on the basis of the intensity of cross-border relations requires an inclusion of theoretical preconditions for their forming on the one hand as well as the existing reality on the other hand. According to our opinion, we used for both categories the most representative indicators being considered as equivalent. The theoretical part is expressed by means of the cross-border interaction potential  $V$  for  $n = 5$  (i.e. interaction with the five most influencing towns beyond the border), reality is represented by commuting to work – more precisely by the share of those commuting to work across the State border in the total number of commuting. (Note: Because we deal with the border area, we may use the term “commuting to work” instead of “labour migration”.)

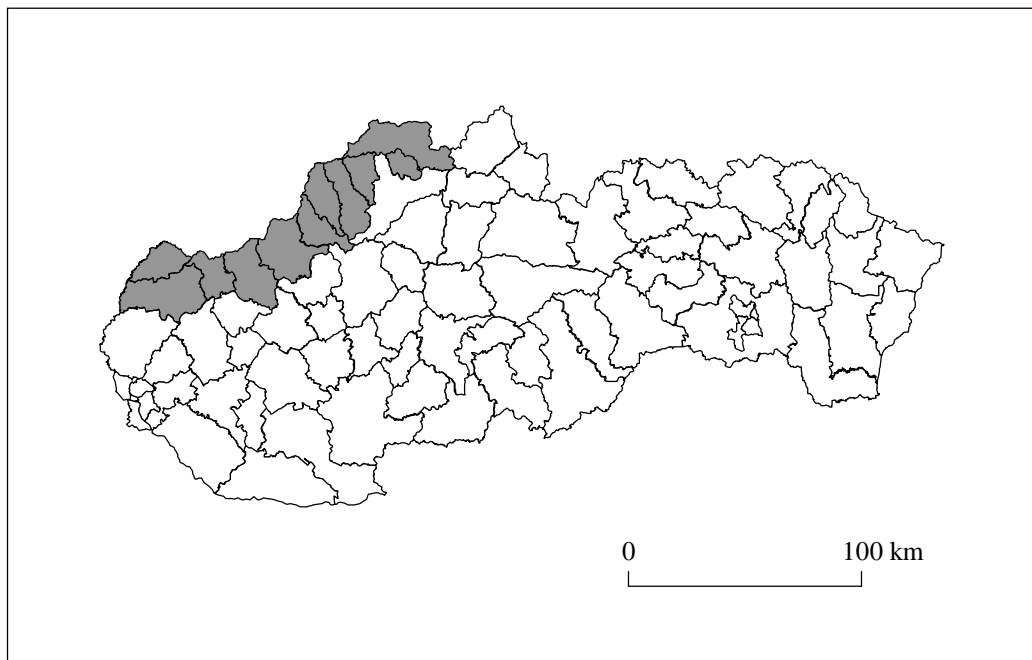


Figure 1. Delimitation of the studied region (Slovak part of the Slovak-Czech borderland).

In this context, data on commuting at the level of communes were applied, namely from the census taken in 1991; at present sole accessible detailed data. Although the absolute numbers of Slovaks on the Czech labour market have markedly been increased since then, accessible data from the intercensal period at the level of districts suggest that no radical changes happened in the main directions of commuting in the borderland. The only exception is made by a modest weakening of commuting flows in the northern part of the Slovak-Czech borderland.

Reasons to select right these indicators are as follows: the cross-border interaction potential  $V$  for  $n = 5$  is the most balanced variable used to express theoretical preconditions for cross-border relations and implies both transport accessibility and the size structure of urban settlements from the Moravian side of the border. Then, commuting to work maps best the cardinal flows of the daily movement of inhabitants and, at the same time, it is an indicator used most frequently to evaluate settlement-spatial relations. One could polemise with the fact that just one direction of this movement was taken into account. However, the inverse direction is in this case of minimum significance (position of a “weaker” vs. “more powerful” nation) and even negligible when compared to commuting from the Slovak side to the Moravian one.

We ensured necessary equivalence in this way: the median (this parameter was chosen not to influence the results by some very extreme values that were quite evident particularly in the case of the cross-border interaction potential) value of 1 was attributed to the cross-border interaction potential as well as commuting to work. The values for the

communes were subsequently defined in a proportional way (for instance, if the median had equalled to 4 and the value for the *a* commune had equalled to 5, after recalculation the median was 1 and the value for the *a* commune made 5 : 4, i.e. 1.2). For each commune we thus obtained two data and their total then determined the intensity of cross-border relations of the commune with the territory on the Moravian side of the Slovak-Czech borderland.

Within the cartographic interpretation, some corrections were necessary for classifying the single communes into the individual categories. Communes, that occurred alone in a certain category (i.e. did not neighbour with any commune of the same category) and this was not caused by any explicit natural or artificial barrier, were classified into the closest (by its value) category, in which minimally one neighbouring settlement had to be included. In so doing, the regulation of deviation - that may happen in small sets as are communes in view of commuting - was ensured. In this way we achieved a regionalisation of the Slovak part of the Slovak-Czech borderland on the basis of cross-border relations synthesising theoretical and factual indicators.

## RESULTS

### POTENTIAL PRECONDITIONS FOR THE CREATION OF RELATIONS IN THE SLOVAK-CZECH BORDERLAND

The cross-border interaction potential of communes in the Slovak part of the Slovak-Czech borderland is spatially rather polarised (Figure 2). The highest values may be found in its northern and southern parts. As regards the north, i.e. the Kysuce region, it is a result of the influence of the Ostrava city and a group of surrounding towns (Havířov, Třinec, Frýdek-Místek, Karviná). Though - in comparison with the towns of Hodonín and Břeclav in the south - these are more remote, their size structure is here more pronounced. In the south, the obvious influence of Hodonín (mostly in the Skalica district and the north of the Senica district), Břeclav (mostly in the west of the Senica district) and partly also of the Brno city, 70 km far from the border, is evident. The very maximum values of interactions were registered in the region of Northern Záhorie (Holíč and the nearest communes) due to the position of Hodonín. The impact of Brno was manifest even in the Myjava district and some communes of the Nové Mesto nad Váhom district, both with good access to the border; on the other hand the influence of Ostrava is also noticeable in the northern part of the Púchov district.

The Central Považie region interacts with Moravian towns much less compared to the north and south of the borderland. The low accessibility of the Považská Bystrica district (especially its northern and southern parts) was here clearly proved. It was also interesting to study the impact of the Váh River as a natural communication barrier. However, the barrier influence of this river did not show itself as significant; it was basically apparent only south of the section Púchov-Ilava where the distance between two neighbouring bridges over the river (17 km by road) is the greatest. On the whole, we may consider the number of passages across the Váh River in the studied section to be sufficient.

The spatial differentiation of the relative cross-border interaction potential is diametrically opposed (Figure 3). It does not decrease with growing distance from the border

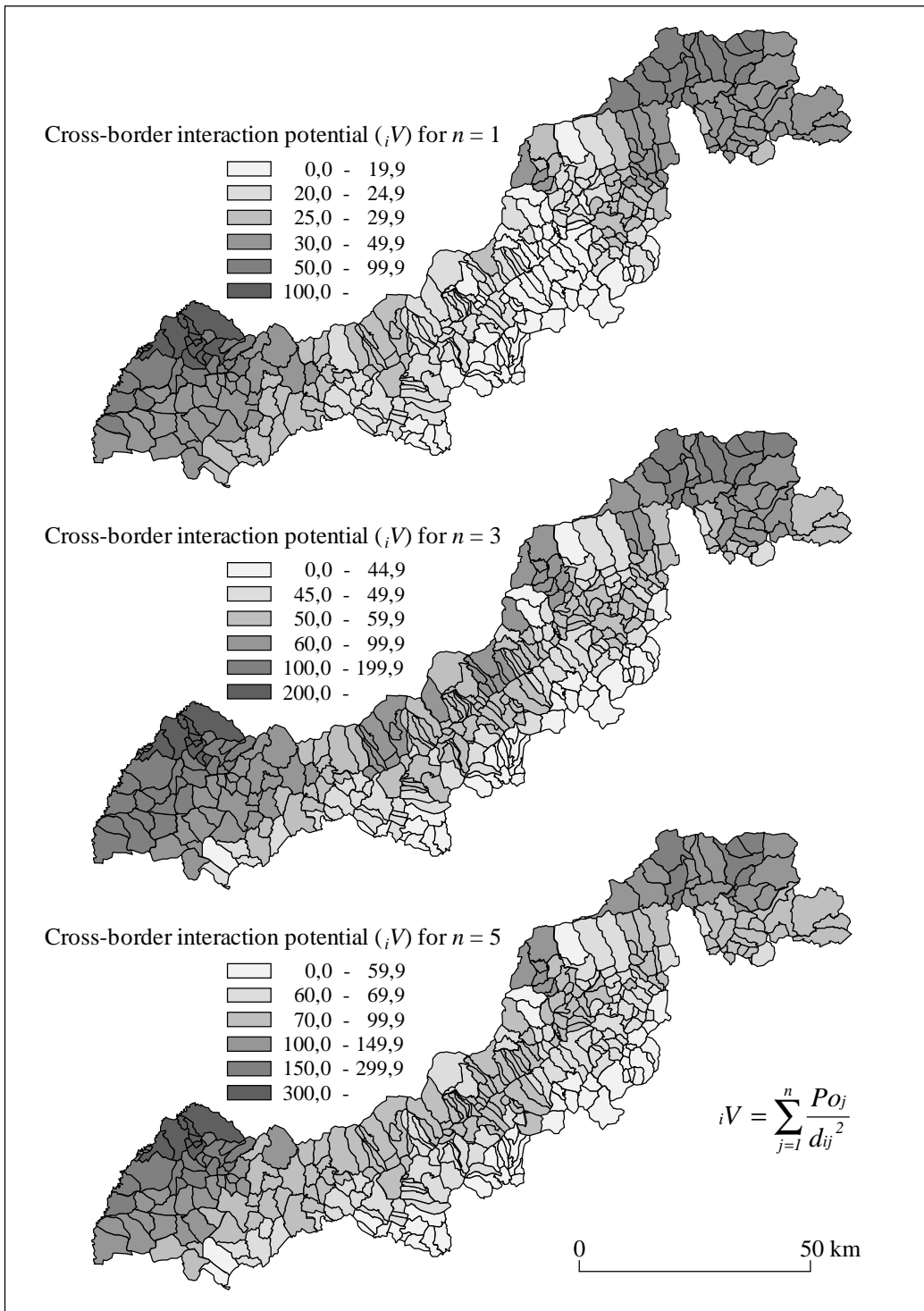


Figure 2. Cross-border interaction potential in the Slovak part of the Slovak-Czech borderland.

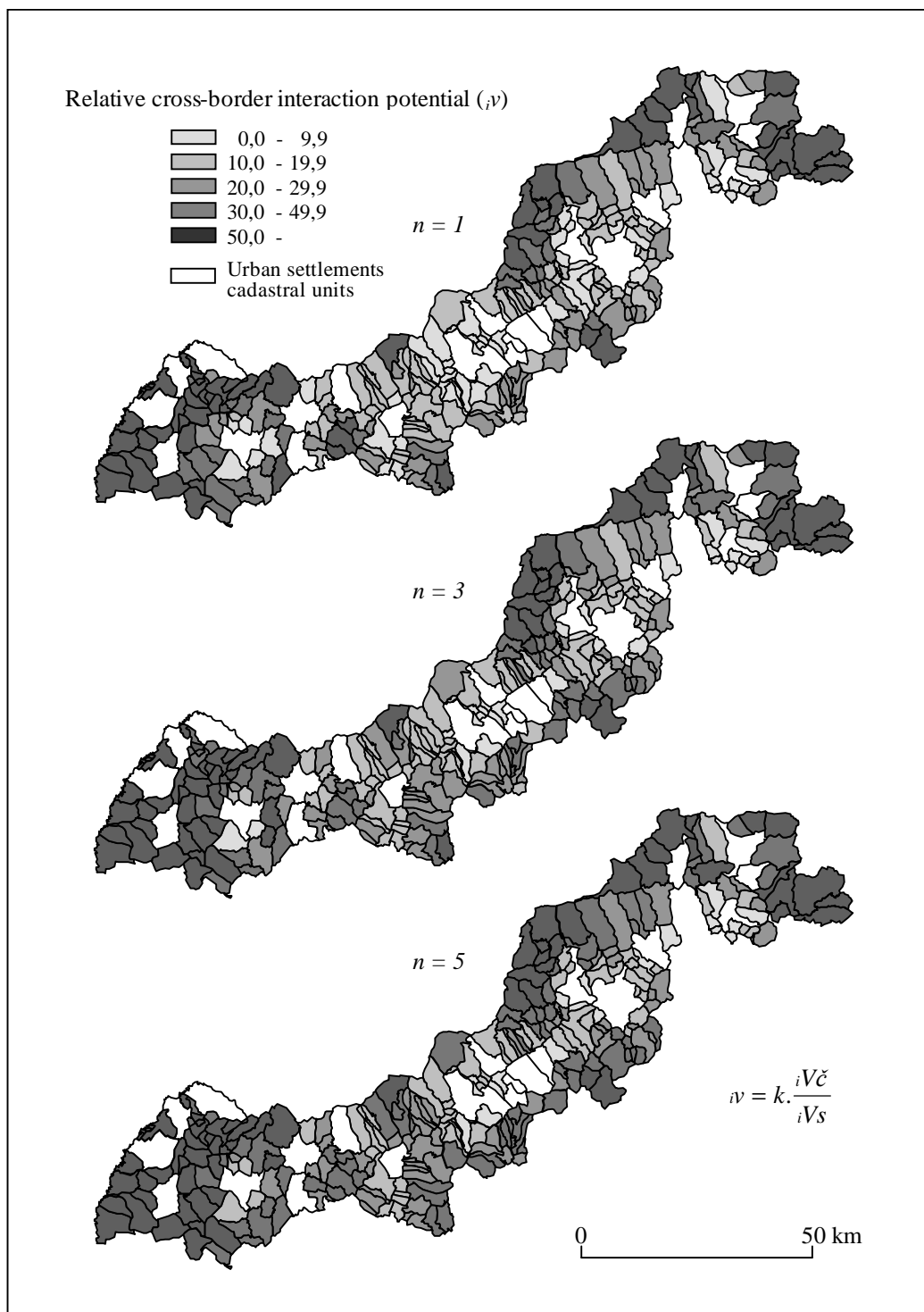


Figure 3. Relative cross-border interaction potential in the Slovak part of the Slovak-Czech borderland.

but mainly in the direction from marginal territories to regional settlements. Some communes at the foot of the Strážovské Mts. and the Považský Inovec Mts. may reach high values too. However, this is not thanks to the direct interaction influence of the Moravian side, but as a consequence of impaired transport accessibility and a weaker impact of Slovak towns. On the contrary, the lowest values are achieved by rural settlements from the central part of the Považie basin; they have very good connections to a numerous set of towns in the Považie region and, at the same time, a weaker cross-border interaction potential.

The highest values of the relative cross-border interaction potential may again be found in the northern and southern parts; only their spatial distribution is moderately different. The influence of Žilina is unequivocally evident in the Kysuce region: though communes of the Nové Mesto nad Váhom district, belonging in essence to the functional urban region of Žilina, have – as a result of this city's impact – visibly lower final values of the relative cross-border interaction potential in comparison with the Čadca district.

#### REAL (MIGRATION-COMMUTING) RELATIONS IN THE SLOVAK-CZECH BORDERLAND

Labour migration (commuting to work) across the Slovak-Czech border was last ascertained in detail during the census taken in 1991 (Figure 4). Data from the census of 2001 comprise only single section “foreign countries”; therefore their utilisation is considerably limited in our research. In 1991, the border districts (except for the Byša district) recorded as much as 27.4% out of the total labour migration of Czech citizens to the Slovak Republic, whereas 19.6% in the opposite direction. These values approximately corresponded to a share of daily commuting, which is basically a logical fact with regard to the traffic conditions. In the former case, the share of the borderland in labour migration radically decreased (making merely 6.3% in mid-2003) due to the growth of migration towards Bratislava. In view of the labour migration of Slovak citizens to the Czech Republic, the share of the borderland fell to 15% immediately following the split of Czecho-Slovakia; this value continues to be the same up to now.

When analysing briefly the situation in the Slovak-Czech borderland we can also lean on a research by the Geographical Institution of the Faculty of Natural Sciences at Masaryk University in Brno. The research was carried out at labour offices within the border districts as of September 30, 1997 (Figure 5). The research examined – among other things – the main directions of commuting to work from the Slovak Republic to the territory of six Moravian border districts. According to this research, the most intensive intercommunal commuting flows were as follows: Hodčín – Hodonín (538 persons), Čadca – Třinec (209 persons), Skalica – Hodonín (173 persons), Brodské – Břeclav (172 persons), Kúty – Břeclav (123 persons), Kopčany – Hodonín (113 persons) and Skalité – Třinec (106 persons). The most significant interdistrict (taking the former Slovak districts into account) commuting flows were these: Senica – Hodonín (1 867 persons), Čadca – Frýdek-Místek (1 650 persons), Senica – Břeclav (917 persons) and Čadca – Vsetín (603 persons). Some other intensive interdistrict connections such as Čadca – Ostrava-město and Čadca – Karviná (the third and fourth most numerous ones in 1991) were not observed and thus identified in this research since Ostrava-město and Karviná are not districts neighbouring with Slovakia.



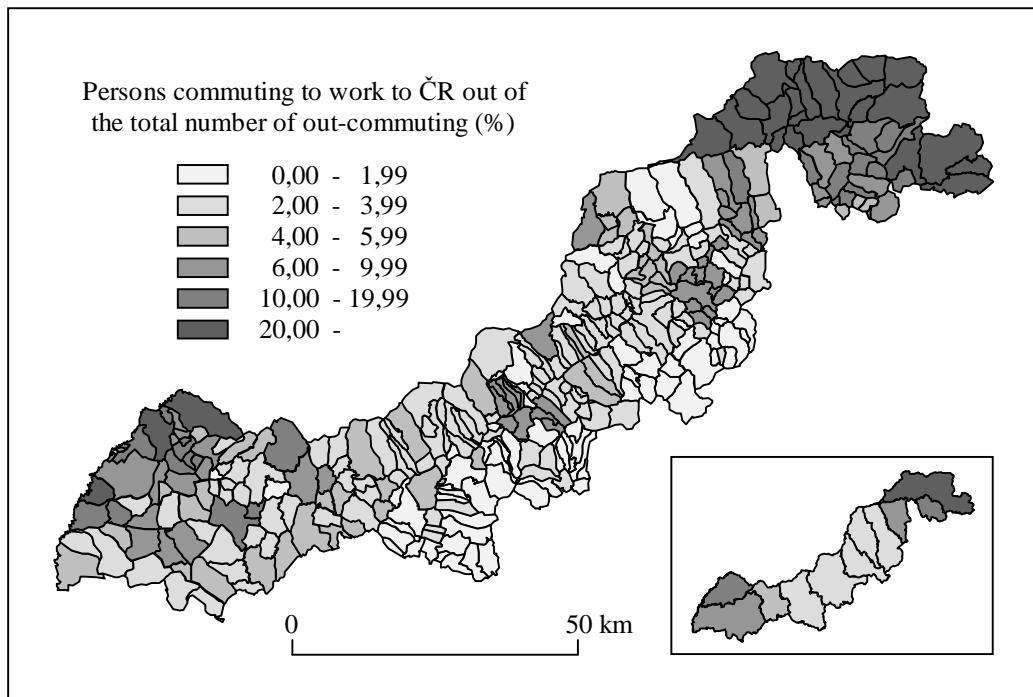


Figure 4. Labour migration from the Slovak part of the borderland to the Czech Republic (1991).

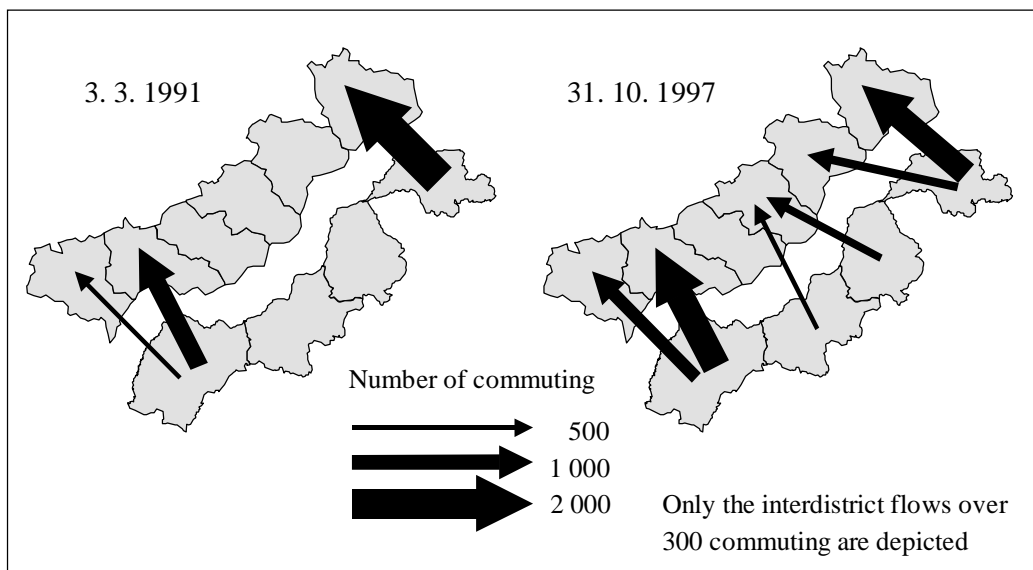


Figure 5. Changes in labour migration in the Slovak-Czech borderland (direction SR-ČR).

The intensity of population mobility across the border expressed by the frequency of its passages (i.e. the intensity of movement through the official border crossings) is also included in the evaluation of migration-commuting relations. A radical increase of this indicator was registered at the Slovak-Czech border during 1994-1996 – then the number of its passages (through the railway and road crossings in total) by inhabitants increased 2.4 times. From then, this intensity has not been increasing further; even we may say that it slightly decreased in the period of 1996-2002. Changes in the number of Slovaks on the Czech labour market had the greatest influence on the growing pressure of border crossings – the number of Slovaks employed in the Czech Republic increased from 25,000 to 70,000 persons between 1994 and 1996. This is a quite understandable phenomenon considering a 15 per cent share of daily commuting from Slovakia to the Czech Republic. Other ways (i.e. for other reasons) – with a several times lower frequency – do practically not influence total mobility through the border. As an example, introducing the return of VAT by the Czech side for foreigners shopping in the country may be given. This act, without any doubt, brought a certain increase in the number of ways for shopping to the Czech Republic. The return of VAT came into effect in April 2000; however, no substantial increase in monthly changes of the overall pressure on border crossings has been recorded since then.

#### SYNTHESIS OF POTENTIAL AND REAL CROSS-BORDER RELATIONS, REGIONALISATION

On the basis of achieved results, we delimited the four essential categories of regions in evaluating the cross-border relations (Figure 6):

- Region with a very high intensity of cross-border relations with the Moravian side
  - Subregion with prevailing real cross-border relations
  - Subregion with the prevailing theoretical potential for cross-border relations
- Region with a high intensity of cross-border relations with the Moravian side
- Region with a mean intensity of cross-border relations with the Moravian side
- Region with a low intensity of cross-border relations with the Moravian side

The northern-southern polarisation of both theoretical and real preconditions had to be reflected in the final regionalisation. The first category with very strong cross-border relations well corresponds to the area of the Čadca district (except for the Dunajov commune) in the northern part and to the area of the Skalica district (except for the communes of Oreské and Lopašov) in the southern part of the borderland – the strategically situated (from the viewpoint of its transport position) commune of Kúty also belongs to this category. We divided this first category into two subcategories on the basis of marked differences due to the way of obtaining final results – the subcategory with prevailing real cross-border relations (in the north) and the subcategory with the prevailing theoretical potential for cross-border relations (in the south). The second category with a high intensity of cross-border relations – besides the Nové Mesto nad Váhom district and the substantial parts of the Bytča and Senica districts – includes also three communes in the Púchov district (Lysá pod Makytou, Lazy pod Makytou and Lúky) completed with two communes in the Myjava district (Vrbovce, Myjava). They all are situated in a territory with the good transport accessibility of the border and within the partial influence of the strong hinterland of towns in the northern and southern parts of the Moravian side of the Slovak-Czech borderland.

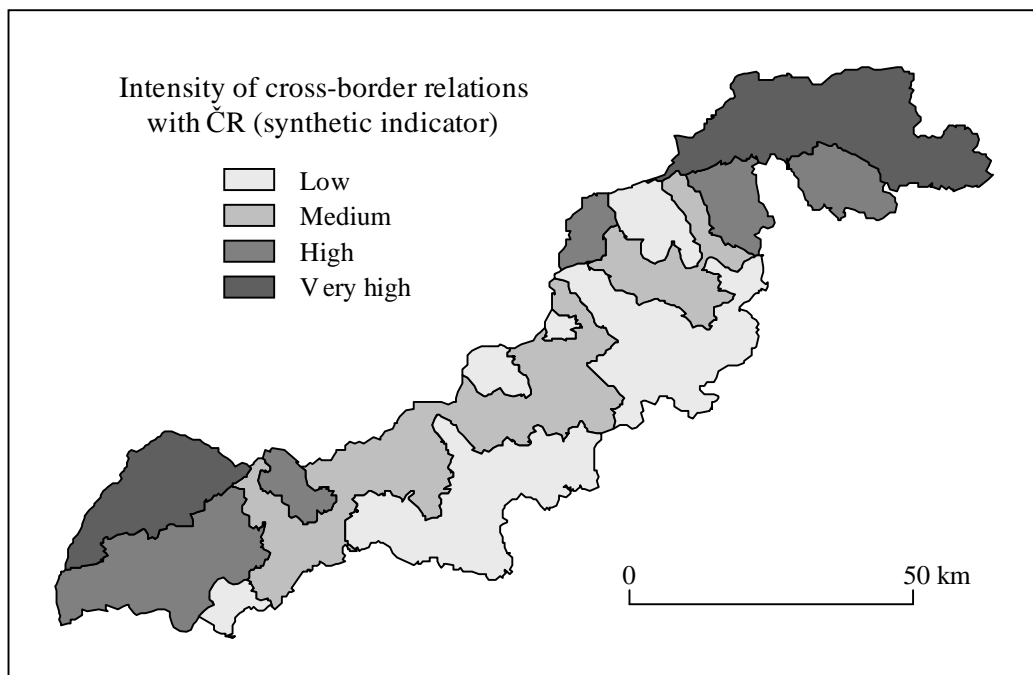


Figure 6. Regionalisation of the Slovak part of the Slovak-Czech borderland on the basis of the intensity of cross-border relations with the Czech Republic.

On the other side, a mean to low intensity of cross-border relations is typical of nearly the whole Central Považie region, the Myjava district (except for the Vrbovce and Myjava communes), and the south-west of the Senica district. The intensity of cross-border relations over almost all this area is conditioned by the spatial distribution of border crossings. The lowest impact of the Moravian side is logically manifested in communes with the greatest distance from the State border, i.e. in the southern parts of districts in the Považie region. The low intensity of cross-border relations is also reached by some communes close to the border in an air line but without a direct connection to the other side. The potential development of these communes is thus considerably limited for spatial reasons (they are accessible only in one direction – the so-called dead-end communes). Among such communes belong those of Papradno, Horná Mariková and Dolná Mariková in the Považská Bystrica district (the already mentioned worst accessibility of the Moravian part), Zubák and Lednica in the Púchov district, Vršatské Podhradie and Krivoklát in the Ilava district as well as Horná Súča and Dolná Súča in the Trenčín district. (The latter two pairs of communes arose during the final regionalisation as an isolated unit coming under the lowest category.) The given communes deserve the greatest attention in the framework of supporting the border regions because – with regard to their marginal geographical position – they have also the greatest predisposition to social-economical marginalisation. In the southern part of the borderland, the communes of Cerová, Prievaly and Plavecký Peter from the Senica district show the low intensity of cross-border relations. This is a result of the specific character of the

settlement network in the Záhorie region. The barrier impact of a military district (Military training area of Záhorie) here limits the transport interconnection of the western and eastern parts of the Záhorie region (which would be more pronounced if the research was extended by the Malacky district).

## CONCLUSION

The intensity of cross-border relations is high especially in the northern and southern parts of the Slovak-Czech borderland; but both sections are of a clearly different character. Theoretical preconditions for the creation of relations and cross-border collaboration are unequivocally the best in the southernmost part. Besides a good permeability of the State border, this is also a consequence of the location of urban settlements in its close vicinity. This fact makes it possible to expand intersettlement relations. At the same time, considering short transport distances, the creation of relations may already be evoked by minimal differences in partial social-economic components, which are worth of travelling across the border. Over against, in the north, much greater differences are needed for mobility across the border. In fact, they always were here very perspicuous and now are still persisting (though moderately decreasing after the required restructuring of heavy industry in the region of Northern Moravia). Therefore despite lesser theoretical preconditions (compared to the south), inhabitants of the Kysuce region in Slovakia are highly oriented to the urban centres of the Ostrava-Karviná region in the Czech Republic. These centres are more remote from the State border in comparison with Hodonín or Břeclav in the south, but are much more numerous and larger. However, development after the split of Czecho-Slovakia is increasingly aiming to fulfil theoretical preconditions and cross-border relations as well as cross-border collaboration in the north begin to stagnate compared to the situation in the south. In the central section of the borderland, the intensity of cross-border relations is the lowest. The reason for that is the orientation of local communes mainly to the regional centres (linear urban system) of the Central Považie region.

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