



# Theoretical Models of Cross-border Integration<sup>1</sup>

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**ABSTRACT** This article attempts to summarize the most important definitions and theoretical models related to cross-border spatial integration based on scientific literature. It would not be possible without defining several border phenomena, because different types of borders have distinct features and form space differently. The role of borders has constantly changed over time, depending on the historical, political, geographical and other characteristics of the given region. There were times when a given border was easily permeable and at other times it was difficult to cross. Therefore, the depth of integration is also changeable. This article tries to collect the most important theoretical models which explain these cross-border spatial processes and emphasizes the importance of the characteristics of urban networks in cross-border integration. We think there are many conceptual models in international border studies which explain several border processes from different points of view, but they are not properly collected in order to explain the cross-border integration process. In addition, some theoretical models are inadequately positioned in the research of cross-border integration that is why we intend to analyze their relevance to this topic as well. Hopefully, our work will help to understand the main factors and elements influencing cross-border integration through the explanatory theoretical models collected here.

**KEY WORDS** cross-border, spatial integration, physical border, mental border, urban network, border area

## Introduction

Borders are human artefacts, lines in space, drawn on a map by human beings, at a certain moment in time and for certain political or military purposes. Their impact stretches far beyond political or military affairs. National borders may represent natural, cultural, psychological, economic, political, or geographical dividing lines (Houtum 1998). The birth, change and character of spatial borders depend to a large extent on the spatial unit they surround (in this case: the state), but this is a mutual relationship: states, border regions, and the characteristics of the state border all influence each other (Hardi 2001). This is why it is not enough to analyze the political, social, economic and cultural features of the border regions; we have to strive for a generalization of the underlying reasons, placing them into a theoretical context.

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Our aim with this article is to clarify several phenomena in connection with borders, border regions, the cross-border integration process, and moreover to answer the following questions:

- What special characteristics of European borders can be identified?
- How can border regions and cross-border integration be defined?
- What kinds of theoretical models can be found in the scientific literature for describing, understanding and explaining the cross-border integration process?
- What type of spatial processes are taking place in the centres and hinterlands along and across open and closed borders?

To answer the above questions, the article relies heavily on the findings of a number of academic disciplines, such as geography, regional studies, economics, the social sciences, and so on. Such an approach is necessary because of the multidisciplinary nature of the topic.

### **Conceptual framework: European borders, border regions and cross-border integration**

Firstly, we have to mention that *European borders* are mostly unnatural, political constructions. Looking at European history, border drawing has been a consequence of the struggles over the formation and re-formation of nation states, and the majority of contemporary European borders have been drawn as a consequence of the two world wars in the 20<sup>th</sup> century (Yndigeñ 2011). Furthermore, borders are multidimensional (Risse 2004) and can break the continuity of space (Kovács and Bacsí 2006). They are physical entities, determining people's perceptions and spatial representations of power relations. They become reflected in the minds of the people who live with and along the borders (Anderson and O'Dowd 1999; Delanty 2006). Besides being physical realities in geographical space, borders are social constructions. They divide people between known and unknown, between native and foreign, between us and them; moreover, they produce meaning and significance beyond their existence and signify the relationships between actors and institutions in the borderland (Yndigeñ 2011). Paasi (1996) pointed out that borders or boundaries have identity producing functions. Furthermore, let us consider the words of Newman and Paasi (1998: 194), who said "identity and boundaries seem to be different sides of the same coin", based on the fact that state borders are symbols of social institutions and power relations. Especially in border areas, space-related identity is an important topic, because political borders do not necessarily mean cultural, social and economic borders, even in cases where they are permeable. In these areas, the population may have a specific identity that can be characterized by two or more identities. These border areas can be seen as areas of interference, where heterogeneous societies with overlapping identities are established. Moreover, the history and the conception of history (cultural memory) which a population has can be important factors for the building of identity (Heller 2011). Within the disciplines of sociology, history, psychology and political science, memory functions are considered fundamental for the process of identity formation (Zimmermann and Steinhart 2005). Van Houtum, Kramsch and Zierhofer (2005) argue that the hybrid culture that develops in cooperative cross-border urban areas supports the emergence of a new regional identity (Uszkai 2015). Because of all of these specialities,

the human dimension (including mental borders) is particularly important in European border researches. The border in the mind of people may be either a barrier or a support of integration in cross-border areas. The image of the other side may reflect either an alien world, or the continuation of one's own world, reflecting geographical and political factors in the minds of the people. Changes in mental borders are slow and may take several years, even decades, after the physical and political changes of the borders (Hardi 2004; Kovács and Bacsi 2006).

As far as the *border regions* are concerned, our starting point is Hansen's definition, according to whom the concept of border region relates to "that part of the natural space where economic and social life is directly and significantly influenced by the existence of an international border. In this sense we can differentiate between open or potentially open regions and closed regions" (Hansen 1977). In his definition, Hansen determines the basic types of border areas. On the basis of his designation we can say that the characteristics of these areas are mostly influenced by the border; accordingly, the types of borders also define the characteristic features of the areas next to the borders. The border itself, however, can be characterized in many ways, and the characteristics of every border are also influenced by the qualities of the nearby territories, i.e. we can actually see a close interrelatedness. On the other hand, it is precisely this variety and uniqueness that makes it difficult to categorize border regions, because border regions – starting from Hansen's definition – spread to the point where the social and economic modifying effects of the border are still palpable. Borders or border sections of different types may have totally different impacts on the economies of border regions, so it is not possible to *generally* demonstrate the existence of socio-economic indices significantly correlating with the presence of a border. The author made attempts in which correlations between the distance from the border and different indices (incomes, export ratio etc.) were taken into consideration, but no general correlation could be detected. Guichonnet and Raffestin (1974) said that the border is a unique system of relations in itself; it may be conflict-laden or free from conflicts, depending on place and time. As regards the impacts of borders, we can distinguish between short-, medium- and long-term effects, which can also differ in their intensity and direction and also can be direct or indirect (induced) effects.

As the most general characteristic, border regions are often cited in literature as areas in a peripheral situation compared to the national centre. So much is correct; however, in a given country only a relatively small area can be defined as the national centre, compared to which all other areas show peripheral characteristics to some extent, and this national centre is not necessarily far from some (modern) border. Moving in any direction away from the centre, it is a natural tendency to observe differences increase as we get farther and farther from the centre. This difference is true in the neighbourhood of the central area just as in more distant areas, and it is a question where we can draw the boundary of the zone where the *proximity of the border* has a stronger impact on socio-economic processes than the *distance from the centre* does. The proximity of the border can increase the features that get worse and worse as we approach the periphery (e.g. isolation, inadequate accessibility, poor economic indicators), but the border may, as well, have positive impacts on the economy and society, effects that can even turn around this tendency (e.g. a traffic

junction near the neighbouring country may alleviate isolation; capital may find the border region more attractive as a result of geographical proximity or cultural similarity). So we can only say that border regions are *always different in some way* from non-border regions, but border regions cannot be designated, theoretically or on the basis of a few indices, as a hinterland or an agglomeration can be. Border regions are such unique phenomena that they can only be examined in terms of individual border sections categorized according to known types of borders. We can examine border regions as geographical peripheries in a country; we can designate as border areas administrative units (municipalities, micro-regions, counties etc.) that are in the proximity of a border, so we assume that the presence of the border has an impact on them. We can see to what extent these areas are different from the national average, and what typical disparities can be demonstrated among the respective border regions and the sections within the same border region (Hardi 2010).

It is also necessary to define the meaning of *spatial integration*. The idea of integration (social, economic, political) underpins the formation of the European Union. Integration tends to be regarded as a positive response to the disintegration of traditional structures caused by globalization. Within the EU, several distinct concepts of integration can currently be identified. One often applied definition comes from the first official project of the ESDP:

Spatial integration expresses the opportunities for and level of (economic, cultural) interaction within and between areas and may reflect the willingness to co-operate. It also indicates, for example, levels of connectivity between transport systems of different geographical scales. Spatial integration is positively influenced by the presence of efficient administrative bodies, physical and functional complementarity between areas and the absence of cultural and political controversies. (Boe et al. 1999: 7)

Marcuse (1997, 2005) affirms that integration represents the elimination of barriers to free mobility and the establishment of positive, non-hierarchical relationships. The dimensions are specifiable aspects of a concept to help grasp the complex meaning of *socio-spatial integration* (Table 1). The *physical dimension* means the proximity between social groups and can involve variables like space design, spatial distance according to social distance, agglomeration, clustering and so on. The *functional dimension* is related to access to opportunities and can involve variables like spatial distance to opportunities, quality of opportunities, economic access to services, level of state involvement and the presence of public and private institutions. The *relational dimension* implies the interaction between different social groups, and can involve variables like hierarchical and non-hierarchical relations, social control, leadership, community institutions, cultural exchange and assimilation between groups, social capital, social networks, political participation, etc. Finally, the *symbolic dimension* is related to identification with a common ground, and can involve variables like real and imaginary boundaries, partial and common identity and differentiation, separation between established members and outsiders etc. (Ruiz and Tagle 2013).

“Integration within a territory” refers to the creation of a national identity based on the characteristics of a core ethnic community. The nation is more or less a reproduction of the state. “Integration across borders” points to people of the same group, for example ethnic minorities living in different states, who are trying to re-unite. The third category, “distinction

within a territory”, describes a situation in which multiple minority groups are living together in one territory. One might think of territorially-bound “Them” and “Us” groups in one country, such as the North-South relationship in Italy or that between Flanders and Wallonia in Belgium. Paasi himself puts forward the example of refugees, so typical of our modern world. It is the last category in the matrix of Paasi: “the distinction between the “Them” and “Us” groups” (Paasi 1996, Houtum 1998).

**Table 1:** The dimensions of socio-spatial integration

Macro dimensions	Socio-spatial dimensions	Characterization
Systemic	Physical	Physical proximity between social groups (defined by power and status)
	Functional	Effective access to opportunities and services in the territory
Social	Relational	Non-hierarchical interaction between different social groups
	Symbolic	Identification with a common group

Source: Ruiz and Tagle (2013)

Paasi (1996) offers an explanatory scheme of the specific characteristics of the geography of borders and border landscapes. The analytical framework incorporating the differences between ‘Here’ and ‘There’ and ‘Us’ and ‘Them’ is used to illustrate how the construction of territorial identities occurs in relation to social distinctions (Table 2).

**Table 2:** An analytic framework for forms of socio-spatial integration and distinction

	Here	There
Us	Integration within a territory	Integration across borders
Them	Distinction within a territory	Distinction between us and others across borders

Source: Paasi (1996)

One of the sub-types of spatial integration can be labeled *cross-border integration*. This phenomenon encompasses numerous understandings, but the different approaches are classified into four main dimensions in Durand’s (2015) work. The *structural dimension* represents the spatial characteristics of cross-border spaces, thus allowing an analysis of complementarities and differences between territories, or the dynamics of convergence and divergence; that is to say, towards tendencies of homogeneity or specialization (see the exploratory studies on spatial integration of Boe et al. [1999: 49–153]). The *functional dimension* is linked to cross-border flows. It represents all the exchanges and cross-border journeys linked to economic activity, to the socio-spatial practices that take part in the formation of a cross-border living area (Spierings and van der Velde 2013), which range from tourism, leisure and shopping to residential mobility (Carpentier and Gerber 2009). It also expresses the connectedness of territories through communication networks.

The *institutional dimension* is characterized by cooperation, highlighting the networking of actors and their involvement in cross-border cooperation. Spatial as well as relational proximity (Lundquist and Trippel 2009) plays a vital role in the consolidation of cross-border partnerships. In addition, the institutionalization of cross-border cooperation (Sohn et al. 2009), or the adoption and efficiency of public policies, constitute both fundamental and symbolic levers in the promotion and development of cross-border cooperation (Blatter 2004; Scott 2000; Durand 2013). Lastly, the *ideational dimension* regroups a mix of more subjective elements that are linked to individual and collective representations involved in the process of integration. Sharing the same social and political references, the sense of belonging to a cross-border living area, and identifying with common memories, images and symbols, all play important roles since they testify to the impressions and opinions of populations faced with the changes involved in territorial construction (Morehouse 2004; Zhurzhenko 2011). In parallel, artistic, cultural and media productions bring other views on the border and the construction of a cross-border space (Amilhat and Szary 2012). In return, they feed and influence individual and collective representations as well as socio-spatial practices. In addition, the ideational dimension takes into account the perceptions of actors or people on the cross-border integration issue, and, notably, on the three other dimensions of cross-border integration (Durand 2015).

### Explaining models of cross-border movements, interactions and integration

This section summarizes those theoretical models, which can be easily connected to the cross-border integration process from a different point of view. The main criterion for selecting models was to include examples for physical and mental borders in our analysis. In the international scientific literature, we can find theoretical models related to both types of borders and several mixed models also occur. The type of border can determine the cross-border integration process, which is why we should take it into consideration.

We can say that the basis of the birth of border areas and cross-border regions is the existence of cross-border movements and interactions (i.e. movements and interactions maintained with the neighbouring border area). This circle contains not only travels but also other dimensions of contact, such as friendships, acquaintanceships, marital relations and media consumption. It is important, however, for our analysis that the regular interactions and movements matter most, not occasional ones (Hardi 2010).

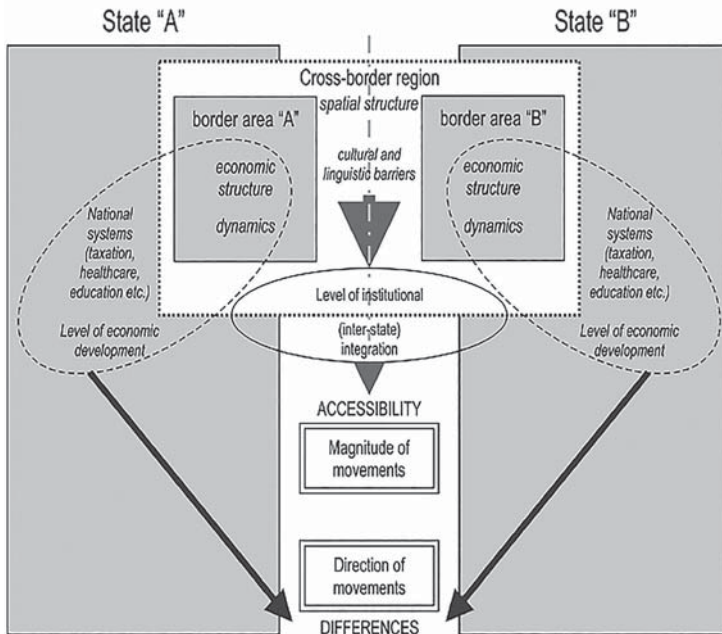
From the perspective of physical borders, the opening of the borders necessarily leads to an increase in the number and range of motivations for movement. Krakover (1997), however, emphasizes that the openness of the border does not always result in tangible achievements, especially in situations where it is not possible to establish significant trade relations between the two separated countries (e.g. because of a weak economy). Short-term interests (e.g. the incubation of start-up economic companies, or protectionism) are thus against the opening of the borders. Anderson and O'Dowd (1999) emphasize that cross-border relations are asymmetric because there are differences between the border regions, as well.

We should, then, examine the geographical frameworks and social, political and economic factors that determine these interactions, their directions, frequency and magnitude.

The spatial movements of humans are usually motivated by economic necessities and benefits. The concept of economic benefit includes not only profits realized during economic activity (business, work) but also when the individual can use certain functions, services (education, healthcare, transport infrastructure, residence) with less travel, or at lower price, maybe at a higher quality – with less expenses. The basic reason for regular cross-border movements is the benefit derived from them.

Due to the spatial organizing activity of the nation state, “the other side of the border” is not our natural space of movement. In order to use the other side more or less regularly during our everyday activities, we must have a benefit that makes us overlook the obstacles arising from the existence of the state border (e.g. border checks, a different social and cultural environment, the mental border, foreign currency etc.). In other words, the realizable profit must be bigger than the existing barriers. This is true for inter-state and international migration in general. What makes the movement between border areas different is usually that the benefits coming from the differences are made more accessible by spatial proximity, so local or regional-level paths of movement are enough to achieve the benefits as a normal activity of everyday life. The direction and magnitude of the movements are determined, in our opinion, by the features of the neighbouring states and border areas, their differences, and the accessibility of the other side. The mechanism of these factors is summarized in Figure 1.

**Figure 1:** A model of the development of cross-border movements

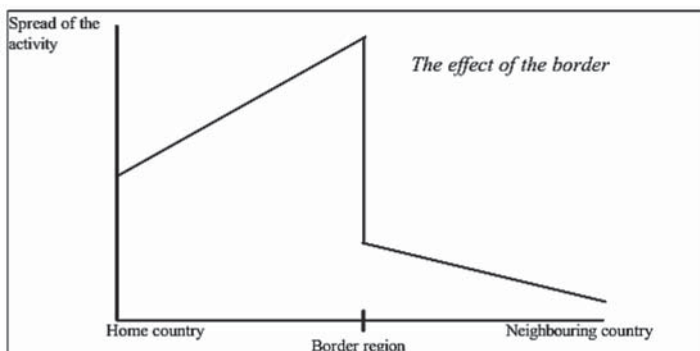


Source: Hardi (2010)

Movements and migrations between two states occur as a result of differences that have evolved between socio-economic development levels (and accordingly the realizable incomes) and the national systems (e.g. systems of taxation, healthcare, education etc.). Naturally, this motivation can also appear in case of movements between border regions; in fact, the probability of movements is greatly promoted by the spatial proximity of the neighbouring system. The attraction coming from the differences between the states can be modified considerably by the economic features, structure and development dynamics of the border areas. It is of little use to neighbour the peripheral area of a rich country: there, we cannot utilize the income disparities between the states, and a citizen living in the border area can only take part in long-distance international migration (Hardi 2010).

A border can be viewed as a barrier to interaction (Ratti and Schuler 2013). Barriers, in the words of Nijkamp et al. (1990: 239), are obstacles in space or time that – apart from the normal average distance friction costs in spatial interaction – impede a smooth transfer or free movement of information and activities. These barriers can cause nonlinear shock-wise discontinuities. Below, in Figure 2, the effect of the border functioning as a barrier on interaction between border regions, is represented schematically (Houtum 1998).

**Figure 2:** Discontinuity in interaction between border regions



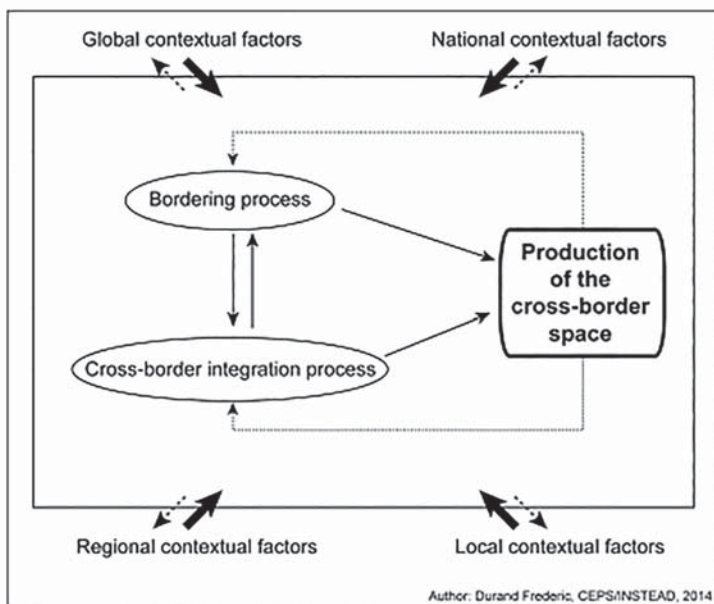
Source: Houtum (1998)

The next model – published by Durand (2015) – takes into account not only the movements and several interactions across the border, but also the cross-border space production process as well. According to the Figure 3, the production of a cross-border space arises from two processes, bordering and cross-border integration, which interact with each other. Several contextual factors intervene and influence the dynamics and processes taking place within the cross-border space. Whether on the global, national, regional or local level, the contexts operate as structuring factors in the production of cross-border space. They play an important role in social and economic transformations and territorial reconfigurations, but also in the practices of individuals, which in return influence the cross-border space production. These contexts impact and frame the dynamic of bordering and the cross-border integration process. An unfavorable environment for cross-border cooperation (political and cultural tensions, armed conflict) will limit the opening of the border and the integration process,



constraining the cross-border space production. In contrast, a set of contextual factors will promote the production of a cross-border space (e.g. willingness of actors to cooperate, pacified geopolitical situation). This conceptual framework shows the unstable and protean character of cross-border space production, and cross-border integration seems to be the driving force of cross-border space production (Durand 2015).

**Figure 3:** Conceptual framework of cross-border space production



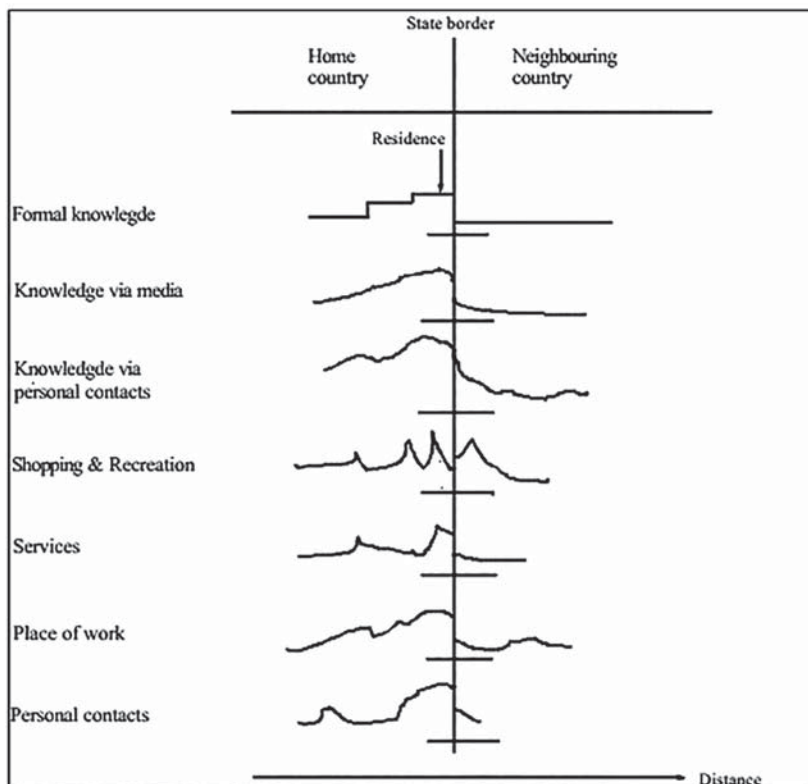
Source: Durand (2015)

In connection with cross-border spaces, we should go back to Oscar Martinez’s model (1994), which attempts to categorize borderlands according to the level of integration, as follows:

- “Alienated borderlands”, created by a border that does not allow any cross-border interaction. This situation exists when neighbouring countries have serious conflicts, the border between North and South Korea being an example. There are not many cases of this kind of border, though for short periods, certain borders may be completely sealed.
- “Coexistent borderlands”, a border where in a certain sense there are conflicts or different interests, too, but they are less problematic, and manageable. Such borders allow for controlled cross-border interaction.
- “Interdependent borderlands” are regions with a border between neighbouring states that have relations. This border allows for a significant amount of exchange, although there is not yet a situation of free flow of goods or persons.
- “Integrated borderlands”, a situation where a border has in fact been eliminated, implying the free flow of goods and labour.

The models described above are usually based on interactions and movements across physical borders (Martinez 1994). We can say that this approach is the one most commonly found in the scientific literature. The other important approach focuses on human perceptions, cognitive and mental spaces. Based on Houtum (1998), a border may sometimes function as a true barrier in a cognitive sense. This is clearly illustrated by the fact that information about events on one side of the border reaches the other side rarely, or not at all. Newspapers and television programmes focus primarily on the country or region in which they are made. Even in areas near the border, national emphasis characterizes the flow of information. In this respect, the border functions as a dividing line. Spatial cognition, the frame of reference for economic, socio-cultural and political activities in space, clearly declines across the border. Lundén (1973) has transformed this process into a theoretical diagram of different kinds of spatial cognition by the inhabitants of a country. It is clearly discernible that the border can cause a true division. Only recreational activities and shopping profit from the division; all other activities show a negative curve in the diagram as a result of the border's presence (Figure 4).

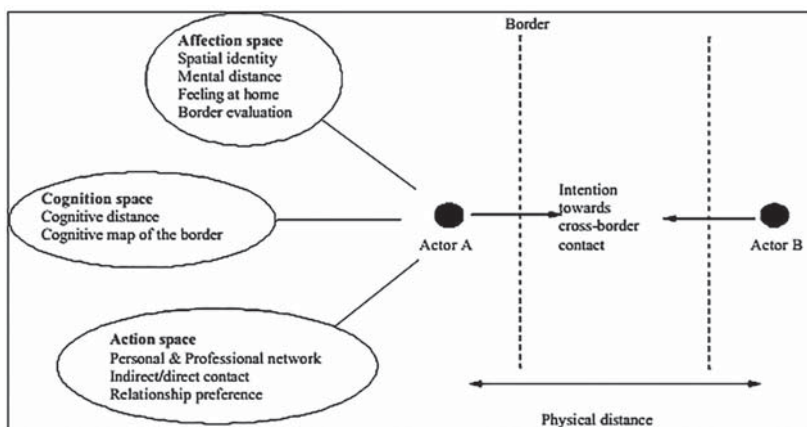
**Figure 4:** Spatial cognition in a border region



Source: Lundén (1973)

The model of Houtum (1998) – represented in Figure 5 – also focuses on the cognitive space and represents schematically the factors that are important in determining the chance that two entrepreneurs from different countries will meet, and of whom at least one intends further contact. In order to determine the “readiness and preparedness” of individual actors for cross-border contact with a possible economic partner, Figure 5 distinguishes three spatial dimensions: the actor’s actions in cross-border space, the actor’s cognition of cross-border space, and the actor’s level of affect towards the cross-border space. Within these three dimensions, the most important determinants are summed up in Figure 5 (Houtum [1998]).

**Figure 5:** Contact determinants



Source: Houtum (1998)

## Connection between the border and urban networks

The geographical character and the function of borders have changed a lot in the course of history. Nevertheless, the border has retained its basic function as the dominant spatial structural element and factor of society and the economy. This spatial role of the border was strengthened with the birth of the nation state borders. The inner spatial structures of the states are usually adjusted to the state borders. The backbone of this spatial structure is the urban network, the total of the junctions of space, and their relations. The urban network of the respective political entities (states) evolves specifically within the borders of the entity, influenced by both the natural and the socio-economic environments.

### Centres in proximity of the border

Haggett (2006), when introducing the analysis phases of nodal regions, describes the spatial process by which the birth of the urban network can also be comprehended. The first of the six phases is analysis of the directions of spatial movements and relations. On a historical scale this is strongly influenced by the natural environment, as the directions of the relations

have been very much influenced by transport possibilities. The content and intensity of the relations, on the other hand, were influenced by the economy and society, after they reached a development level at which they could produce for exchange (i.e. with appearance of marketed goods as opposed to self-subsistence) (Beluszky 2001). The transport of these goods is what created the basic structure of the space, the system of transportation routes. The junctions of the routes provided chances for the development of centres and towns by offering the best available geographical location. The potential for development of a settlement, arising from the possibility of relations and from the central location, is what Tibor Mendöl called *positional energies* (Mendöl 1963). These positional energies, in turn, determine the development of the junctions, and their actual or potential positions in the urban hierarchy. Junctions are surrounded by zones of different levels of development, which influence the birth of the hinterlands of the towns, the functional content and symmetry of the inter-city relations, and the functional hierarchy of the settlements.

Walter Christaller, the academic working out the theoretically ideal system of central places, proved that in a theoretically single plainland with homogeneous population density, the settlements at different levels in the hierarchy are located in a hexagonal system, such that a hexagon is made from the lower-rank central places, with a higher-rank central place in the middle of each hexagon, and these places also make a hexagon, in the middle of which an even higher level central place is born. This hexagonal order is repeated at ever higher grades. This theoretical order of Christaller's space is, of course, disturbed by the lack of spatial homogeneity (different population densities, natural conditions, orography), and as Mendöl (1963) remarks, the disparities of the positional energies basically distort this hexagonal system, as there will be places and junctions in better positions where more important central places will be born.

Because positional energies are functions of spatial relations, state territories and accordingly state borders can have a considerable impact on them. Partly, the borders themselves can have such impacts, and partly also the neighbouring states and territories.

The direct impact of borders can vary, depending on the character of the border. First, borders separate two urban networks with different historical development paths. Within a national economy, the sizes of the central places, the distances between them, and the majority of other functions determining central goods and services (e.g. the structure of demand, prices, wages, tax system and the cost of transportation) are the same. Crossing the border, however, all of these factors are different, which changes the location and size of the central places and their distance from one another (Jeanneret 1984). In the case of a strongly separating border, the units of an urban network close to the state border are in worse positions than their counterparts in the vicinity of the national centre. The opening up of the border will have different impacts on the respective centres. The possibility of crossing the border can in itself be an important positional energy, similar to that offered by a ford or a ferry across a river in the Middle Ages: it attracts movement, especially when there are few border crossing facilities; it manages special cross-border commerce; and the location is a place for storing the goods transported (legally or illegally) across the border and distributing them towards the interior of the country. Let us think here of the settlements along the borders of Austria, Yugoslavia, or Ukraine in the 1980s and 1990s, invaded by

merchants and soldiers of fortune from all parts of the country, who even rented garages in both Hungary and Burgenland at a high price to store their goods.

If borders are open, this positional energy more or less ceases to exist. The opening up of the border takes place anyway between countries whose socio-economic systems are converging towards each other. The border region actually becomes a transit area in this case, whereby its positional energy is influenced primarily by the development level of the state and region on the other side. A more developed state can have a positive impact on the centres in the border area of a less advanced state. If state “A” is more developed than state “B”, the following situations can emerge.

- The border area of state “A” is a periphery within its own country and its centres in the vicinity of the border are weak, while there are important centres in the border area of state “B”. Such a situation has evolved in the Austrian-Hungarian border region, apart from the hinterland of Vienna, and also in the middle and southern parts of the Romanian-Hungarian border region. In these areas, the border cities in the poorer countries have considerable capital absorption capacity, as they are situated close to the more developed country and are important economic centres in their own countries. This leads to an interesting asymmetry between the periphery of the advanced state and the dynamic urban area of the less developed country. For example, many people have moved from the Slovakian capital, Bratislava, to the border areas of Austria, and a similar phenomenon can be seen in the cases of Oradea and Arad in Romania, from where many move to Hungary, while many Hungarian employees commute to Romania to work.
- An important urban centre can be found in the border area of state “A”, and there are developed centres in state “B” as well. In these cases the border cities of state “B” gain a significant positional energy from their location. A typical example for this is the relationship among Vienna and Sopron, Győr and Bratislava, where it is the relations towards Vienna and access to the Austrian capital city that have given a tremendous amount of positional energy to the other respective cities. Their development has been much more dynamic over the last two decades than the progress of Eisenstadt and Wiener Neustadt, both in the vicinity of Vienna in their own country. The three cities (Bratislava, Győr and Sopron) have profited from the proximity of Vienna according to the hierarchy levels they occupy in their respective countries. The greatest benefit has been achieved by Bratislava, due to its geographical location right by the border.
- Both states have peripheral regions, void of centres, in the adjacent areas. In this case the institutionalized openness of the border is in vain, as it can only give a very weak positional energy to the local municipalities, towns and cities. We may even call the border an iron curtain of settlement geography (Hardi 2010).

#### Hinterlands and state borders

One of the most striking phenomena in the relations of the border and cities is the case of fragmented hinterlands. A city near the state border cannot shape its hinterland in all directions around itself, because it cannot have attraction on the other side of the border,

or this attraction is incomplete. If we examine the issue of complex hinterlands in itself, this statement seems to be true. On the other hand, we have to consider that the proximity of the border can also be a positive energy for the development of a city, as we have already demonstrated. These positive energies can even be very large in some cases, and the hinterlands of the city may reach into the territory of the other state in some functions. The concept of cross-border “shopping tourism” covers the phenomenon when differences in exchange rates or prices, disparities in the supply of goods, and perhaps differences in regulations concerning trade or services, lead to the purchase or use of goods and (non-touristic) services in another country by private persons. The quantities of purchases may be below the volume of trade on a personal basis but considerable on the whole, and the main motivation of travel may be the purchase or use of goods or services. If these disparities are significant, a small town in the border area can have a hinterland much larger on the other side of the border than in its own country, even including settlements at higher levels of the hierarchy than the respective town itself. An example of this is Lenti, whose marketplace was regularly visited in the second half of the 1990s by customers from the capital cities of Slovenia and Croatia, while its hinterland in Hungary at that time did not reach beyond 15–20 kilometres. Similar examples could be mentioned in commuting employment and the use of certain services (e.g. dentistry). If the prices and costs decrease, shopping tourism will survive where differences in supply are a strong motivation. This may mean the rich country-poor country disparity, but the really lasting disparities in supply come from disparities in the network of settlements, i.e. from cross-border rural-urban relations.

In Lösch’s theory, the catchment areas of markets theoretically have a circular or hexagonal shape in cases of undisturbed development, so they spread in all directions from the centre, while in reality this pattern is blocked by state borders, with their political and customs border functions, thus impeding the birth of a complete market catchment area, or hinterland (Rechnitzer 1999; Niebuhr and Stiller 2004).

We have to add that the distortion of the market catchment area is not only the effect of the border as a barrier. Even in the case of open borders, the market catchment area may be narrowed if the socio-economic or even the technical systems of the neighbouring country are more or less different, such that a town in the vicinity of the border cannot extend its hinterland as freely into the neighbouring cross-border areas of the other country as into its own national territories. What does this mean? There may be several deviations between the two states that can make urban-rural relations across the border more problematic and expensive. From the perspective of administrative and public services, citizens living on one side of the border in state “A” are foreign citizens, even if they are close spatially, so they do not have, or have only limited, access to institutions maintained by the taxpayers of state “B” (healthcare, education, labour services), or they may have access at higher costs, and thus prefer to use these services on the territory of their own state, which may be further away in space but lower cost. The category of cost-increasing factors contains many other items: currency exchange, higher telephone and transport tariffs, the uncertainty of border crossing, loss of time, less dense transport network etc. Accordingly, a city can extend its hinterland across the border only in those urban functions where border crossing does not mean an increase of costs, or causes only a negligible cost increase, and where either

the increased costs are compensated by spatial proximity or even a profit may be made from the comparative advantages.

Hansen (1981), using the logic of growth pole theories, comes to the conclusion that the border is a barrier to the diffusion impacts radiating from the centre to nearby areas and the hinterland, and it blocks the spread of innovations. Thus, the centre cannot take advantage of the benefits deriving from economies of scale and agglomerative factors. The opening of the border will eliminate these obstacles, and with the restart of diffusion processes, centres reinforce their positions and start to develop. Hansen complemented his concept by saying that the launch of economic development in border regions depends to a large extent on the centre–periphery relations, the accessibility of centres, and the economic development level of the other, neighbouring border area. The opening up of borders will not eliminate the peripheral situation of the areas without centres or far from the centres, as the centres are looking for each other’s complementary resources, which strengthens centre-to-centre relations in the first place. On the other hand, it is precisely the different economic conditions (prices, supply of goods and services, consumption structure, supply of resources) that may trigger the activity of border regions and their centres, which can lead to specialization in some activities (Rechnitzer 1999).

It is already clear from Hansen’s activity that a development pole can have an ambivalent impact on the territory on the other side of the border. The existence of both a *backwash* or *spread* effect is possible as a result of the centres. A developing urban centre may drain resources from its environment (labour force, capital flows, radial transport network etc.), but it may, as well, develop its area by the spread effect, distributing civilizational goods, innovation and incomes there, provided that the conditions for that are given. In cases of permeable borders, the developing centres can also have similar impacts on the other side of the border; in fact, the proximity of the different systems (with different taxation and wage costs in most cases) may even reinforce these – either positive or negative – impacts. For example, in the western border areas of Hungary, the Austrian demand for labour resulted in a shortage of labour supply in Hungary in some professions, especially in the trained labour force. This is a strong backwash effect, because the education of the labour force, financed by Hungarian taxpayers, generated incomes in another country. It is true, however, that the larger part of the wages earned in Austria by Hungarian employees is spent in Hungary, and parallel to the incomes, work ethic, innovation etc. – in other words, spread effects – also arrived in the Hungarian region.

Backwash effects can be considerably reinforced by disparities on the two sides of the border, as a result of which a developing urban centre may cause problems for the other side, but spread effects can also be strong, because in some cases certain things may become innovations (e.g. work ethic, behaviour culture, language skills etc.) which are no longer innovations in the country of the centre (Hardi 2010).

#### Specific city types along the borders

As we have demonstrated, the impact of the state border on a border city or area can be extremely varied; border location in itself is neither advantage nor disadvantage, and the treatment of

the same border area can vary by historical periods and states. The development of border cities depends to a large extent on the geographical location of the city or the region within its own country, and also on the characteristics of the neighbouring city or region on the other side of the border. This means that practically all examples are unique and it is hard to generalize, or we can come to only very superficial conclusions. Nevertheless, we still have to define general phenomena that may be generated in the life of the border city or region by the state border and the change of its spatial and functional character. The ESPON project conducted an analysis of morphological character (ESPON 2007 in Székely 2007). This classification gives a graphic description of the relationship of the city, the border and the neighbouring city (and also the functional urban zones of the cities), and classifies several European cases according to this system. The nine types are based on the size of the cities, their proximity to each other and the state border, and the extension of their functional urban areas (narrow hinterland).

*Type 1:* twin cities, typically of small size, maybe making a structurally single city cut by the borderline. Both have their own functional urban areas, even if they have public transport connections. The best known example is the Gorkitz-Zgorzelec city pair on the German-Polish border.

*Type 2:* a large city, whose morphological zone extends into neighbouring state(s) in the form of small towns within the functional urban area of the city, or as a contiguous suburban zone. Typical examples include Basel – Switzerland (Saint-Louis – France, Lorrach – Germany) or Geneva – Switzerland (Anemasse – France). A key area of cooperation is the organization of joint public transport networks. There may be legal obstacles, especially if service providers are not managed locally (e.g. state railways). In the ideal case, cross-border service companies are established.

*Type 3:* a big city whose morphological zone does not extend into the neighbouring state(s), with small towns that have their own functional urban areas, and a relatively small number of people who commute daily from the small towns to the neighbouring city. Such an arrangement definitely decreases the necessity of cross-border service companies. It is usually the small town that profits from its proximity to the larger city's service providers. The best example is Strasbourg-Kehl.

*Type 4:* a small cross-border morphological set. Because of its smaller size, there are much fewer organizational problems than those in Type 2 conditions. Examples include d'Esch-sur-Alzette (Luxembourg) – Audun-le-Tiche (France), and Longwy (France) – Petange (Luxembourg) – Aubange (Belgium).

*Type 5:* a large city whose functional urban zone extends into the neighbouring state(s), and which may be spotted with small towns with their own secondary functional urban areas. The macro-region of Luxembourg can be a good example. The two major areas of cross-border interaction is (1) the accessibility of the large city from the other side (movement of labour force) and (2) the development of the educational infrastructure of the country of origin so that it satisfies the labour demand of the large city.

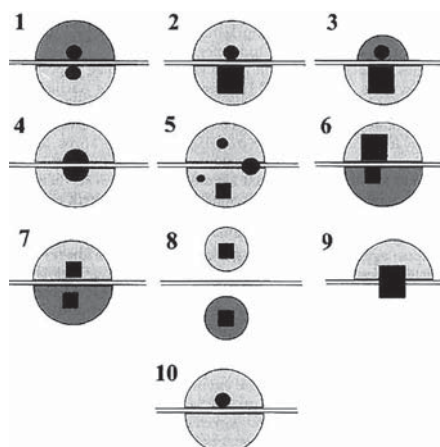
*Type 6:* two structurally connected large cities, one on each side of the border, such as Heerlen (Holland) and Aachen (Germany). If cross-border technical co-operation is needed, it is organized at a higher level. However, a relatively large proportion of the cities of this type prefer to pursue joint city marketing (auxiliary functions).



*Type 7:* two large cities, one on each side of the border, which are not connected structurally; only their functional urban zones are adjacent to each other. This is a version of Type 6, and a typical example for this is the cities of Vienna and Bratislava.

*Type 8:* large cities relatively close to each other (at a distance of approximately 50 kilometres), whose functional urban zones are not adjacent in most cases. Examples are the group of four cities: Hasselt-Genk, Maastricht, Aachen and Liege; or Hasselt-Genk and Eindhoven. Even if there is some organization for cooperation, it only has a consultative and occasional role. Global strategies very rapidly lead to fierce competition, because the cities are located at a large enough distance to be able to avoid the joint use of infrastructure. Large-scale and high quality intellectual centres (universities) or service centres (hospitals) are limited by national regulations, so they are not more disposed to cross-border cooperation than to collaboration with other institutions located farther away.

**Figure 6:** Types of functional urban areas along borders



Legend:

Type 1: twin-cities, generally quite small, sometimes a former single city, cut by a border, each with their own FUA even if some transborder commuting is present

Type 2: a metropolis or large city, with a morphological area extending across the border into the neighbouring country, through suburban areas or small cities, more included in the FUA of the main city

Type 3: a metropolis or large city, with a contiguity in the neighbouring country to smaller cities with their own FUA or sending quite few commuters to the main city in the other country

Type 4: a small transborder urban area with a quite well integrated common commuting basin

Type 5: a metropolis or a large city, with its FUA extending into the neighbouring country, possibly with a scattered network of secondary centres

Type 6: two metropolises or large cities, one on each side of the border, with tangential MUAs

Type 7: two or more metropolises or large cities, one on each side of the border, with tangential FUAs

Type 8: a transborder FUA type without contiguity

Type 9: a “city divided by a border” transborder type (ESPON 2007: 129–133)

Type 10: category of towns in the vicinity of which there is no central settlement on the other side of the border which could influence the spread of the functional space of the town beyond the border (Hardi 2009, 2010)

Sources: ESPON (2007 in Székely [2007]); Hardi (2009)

*Type 9*: a large city cut into two by the borderline. An example for this was divided, Cold War Berlin (West Berlin did not have a functional urban area) or Nicosia (Cyprus). It is an exceptional situation stemming from problematic political decisions, where there is no cross-border cooperation (ESPON 2007 in Székely 2007).

Based on our analyses made in the Carpathian Basin, we propose to complement the nine types with a tenth one: this is the category of towns in the vicinity of which there is no central settlement on the other side of the border that could influence the spread of the functional space of the town beyond the border (Hardi 2009, 2010) (Figure 6).

## Conclusion

To conclude, we can say that European borders are unnatural, multidimensional, political constructions which can break the continuity of space. Besides being physical realities in geographical space, they are social constructions as well. That is why this article has highlighted the fact that cross-border integration processes can be explained not only through physical, but also with cognitive factors. Our other important statement is that the urban network has impacts on cross-border relations, and therefore on cross-border integration as well.

As for the theoretical models, it can be concluded that they usually explain cross-border integration through several cross-border interactions and concentrate predominantly on physical borders. We can identify a relatively small number of models focusing on mental borders and therefore on the perceptions and identity of the people living near the border. The main reason for the limited number of models could be that the human aspects of the integration process are very difficult to detect and measure. It can be a more complicated task than the measuring the number and type of border crossings on road, rail, and so on. Table 3 summarizes the main focus of each of the analyzed theoretical models. According to our typology, three main categories can be identified: in the first category, the main focus of the models is the physical borders and the several cross-border interactions. The next category focuses on mental borders, human perceptions and identity factors. This includes Houtum’s model (1998) related to the contact determinants. We can identify a third category as well. These models represent elements from both approaches; they usually take into consideration the intensity of cross-border interactions, the motivations for border crossings, several institutional barriers, several human factors, and so on.

**Table 3:** Main focus of analyzed theoretical models

Physical borders and interactions	Complex approach	Mental borders and human perceptions, identity
Houtum (1998) – Discontinuity in interaction between border regions	Lundén (1973) – Spatial cognition in a border region	Houtum (1998) – Contact determinants
Martinez (1994) – Border region typology	Hardi (2010) – Model of the development of cross-border movements	
ESPON (2007) – Functional urban areas along the borders	Durand (2015) – Conceptual framework of cross-border space production	

Finally, why is the cross-border integration process an important issue for the future? We think an important arena of international integration is the sphere of national systems (education, healthcare etc.), which are only slowly approaching each other and retain major differences despite European Union integration. These may be barriers to movement across border areas. Perhaps in the future, through the integration of national systems, we will be able to relatively easily use the institutions and infrastructure of other countries.

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