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Caragliu, Andrea

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FULL ARTICLE

Better together: Untapped potentials in Central Europe

Andrea Caragliu

Politecnico di Milano, ABC Department, Piazza Leonardo da Vinci, Milan, Italy

Correspondence
Andrea Caragliu, Politecnico di Milano, ABC Department, Piazza Leonardo da Vinci, 32, BLD 5, 20133 Milan, Italy.
Email: andrea.caragliu@polimi.it

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Abstract

Borders prevent the optimal exploitation of socio-economic and environmental resources. A relevant obstacle due to missed integration is associated with legal and administrative barriers, which cause the emergence of *untapped potentials*.

This paper exploits the case study of the *Interreg Central Europe* programme. Removing borders among countries in the area enhances scale economies due to a large market for inputs and goods, both within regions and across Central European area regions.

This paper identifies untapped potentials by looking at the missed regional GDP growth due to the inefficient exploitation of regional growth assets. Results hint at a complex and heterogeneous spatial distribution of untapped potentials, involving several growth factors.

KEYWORDS
border constraints, European integration, regional growth, untapped potentials

JEL CLASSIFICATION
R11, R12, O11, F15

1 | INTRODUCTION

Empirical studies on the economic gains stemming from economic integration have become relatively dormant, after the initial wave of works forecasting or appraising the potential economic benefits stemming from the largest experiment of economic integration in the last half century, that is, the emergence of the European Union.

Following early studies around the late 1990s and early 2000s, documenting both static and dynamic (growth) gains, as well as location effects of EU integration, over the past decade, and following the EU productivity slowdown (Van Ark et al., 2008), studies on integration benefits gradually faded also in the light of the relatively disappointing growth performance of EU economies against similarly-sized economies (chiefly, the US and China).[1] Recent exceptions to this trend include Comerford and Rodríguez Mora (2019), who simulate the potential gains from integration as applied to three regions (Catalonia and the Basque Country and Quebec, in Spain and Canada, respectively); and Campos et al. (2019), who provide synthetic counterfactual estimates suggesting a rather substantial gain from economic integration in the EU following country accession, with the exception of Greece.[2]

The EU's sluggish growth emerged rather dramatically in the wake of the 2007–2008 financial crisis. The latter has exposed several weaknesses in the way the European Union's economic and institutional structures had been formerly conceived. While prior to 2008 the European Union's forward-looking project translated into a large consensus among many member states, the recent crisis caused a substantial decrease in the perceived approval of major EU institutions,[3] with substantial consequences being felt mostly in Southern European countries. This shock was topped up by the ongoing COVID-19 pandemic, which represents a symmetric shock simultaneously affecting all countries and regions, again contributing to a decrease in trust both among citizens, as well as in institutions (Capello & Caragliu, 2021).

A vast debate on the reasons for the declining trust in EU institutions has raged both among academics and policymakers.[4] The academic literature has not shied away from trying and explaining these complex events. However, their intertwined nature makes it difficult to capture their effects and to quantitatively assess their long-run consequences for EU member states, let alone to identify the spatial (regional) distribution of these impacts. One aspect deserving particular attention is the indirect costs of a progressive disintegration of economic and social relations within the EU, which would be caused by giving up the likely benefits of a more integrated structure for the EU economy.

However, economic theory would suggest potential gains from economic integration to be substantial. Baldwin and Venables (1995) propose to classify sources of such gains as static (i.e., associated with level effects, for instance in terms of productivity), dynamic (i.e., causing permanently faster GDP growth rates), and related to location (i.e., being associated with changing location behaviours for firms and consumers).

This paper enters this literature and provides a quantitative assessment of the potential benefits stemming from furthering EU integration. The paper focuses in particular on the role of legal and administrative barriers that still offer resistance to the achievement of full economic integration among EU member states. My work is related to the broader literature dealing with the growth effect of economic integration in the EU, and focuses in particular on the branch hosting empirical studies dealing with the spatial distribution of the gains from integration.

The paper proceeds as follows. Section 2 first describes the historical process that led to the emergence of the EU, then summarizes the three main sources of benefits from EU economic integration, with a particular focus on growth impacts. Section 3 describes the methodology for estimating regional gains from the reduction of legal and administrative barriers, the data collected for the empirical analyses, and the chosen case study. Section 4 presents baseline results and a range of robustness checks. Finally, Section 5 concludes.

2 | HOW DO ADMINISTRATIVE BARRIERS AFFECT REGIONAL INTEGRATION?

This section builds the rationale for the empirical work quantifying the missed growth due to incomplete removal of legal and administrative barriers within the EU. First, a concise summary of the main steps undertaken to reach the

present state of the affairs for the European Union is presented (subsection 2.1). Next, an overview of the three main approaches so far adopted to gauge the welfare benefits of furthering EU integration is illustrated (subsection 2.2). Lastly, subsection 2.3 focuses on the empirical work dealing with growth effects due to EU integration, and proposes the research question this paper answers to.

2.1 | How did European economic integration evolve?

The role of administrative barriers in hampering regional integration fits a broader literature more generally dealing with the economic benefits stemming from integrated areas. This literature's founding father is Balassa (1961), who at the beginning of the EU's history (in 1957 the Treaty of Rome, creating the European Economic Community, had just been signed) ominously foresaw that European integration would undergo five main steps (a free trade agreement (FTA); a customs union (CU); a common market; an economic union; and, lastly, a completely integrated area).

Passages across these five steps are not necessarily only incremental in terms of welfare gains for individual consumers and firms. In particular, extending a relatively simple FTA to a full-fledged CU typically comes with a steep reduction in tariffs-induced distortions (Hornok & Koren, 2015). Presently, the EU has not reached full integration, in particular lacking fiscal powers that are still in the hands of national governments. While not necessarily full concentration of fiscal power in EU hands would automatically trigger faster growth, as demonstrated by several cases of fast-growing countries with decentralized fiscal systems, more integration would likely lead to more coordination and a reduction in management costs.

Economic integration in Europe walked through three major steps (Camagni et al., 2019):

1. the creation of the Common Market (1957);
2. its evolution into a single market between 1985 and 1992; and
3. the emergence of the European Monetary Union (EMU) in the 2000s.

From a theoretical point of view, Balassa (1961) laid the foundations of the way benefits from economic integration are to be assessed. Balassa` book has been incredibly prescient, in that it foresaw both the natural evolution of the European Community towards the adoption of a common currency, and the emergence of a single market, as well as the obstacles the Union would likely face were political and economic integration not walk hand-in-hand (Sapir, 2011). While the future of the EU still looks uncertain in the face of the Eurozone debt crisis prompted by subprime mortgages and global financial distress in 2007/2008, the very existence of its complex institutions represents a unique case study that this paper will exploit.[5]

2.2 | Estimating welfare benefits from the EU's economic integration

Within the rather broad literature on the benefits of EU integration, three main effects have emerged as standard outcomes explained by empirical works quantifying welfare benefits stemming from EU integration (Baldwin & Venables, 1995):

1. static (allocation) effects;
2. dynamic (growth) effects; and
3. location decision effects.

Concerning works dealing with allocation effects, empirical studies seek welfare impacts of furthering EU integration, and in particular in terms of the effects of integration on price homogenization. In other words, a large area characterized by substantial trade integration would improve its terms of trade against the rest of the world (Meade, 1955).

More specifically, the static theoretical argument suggested by this block of studies deals with the role of FTAs in abating trade costs within integrated areas. In this sense, the EU has enhanced the ease with which its member states signed RTAs. According to the WTO's regional trade agreements (RTAs) database (WTO, 2021), EU member states benefit from as many as 46 RTAs. The UK, which was recently forced to re-negotiate the vast network of treaties it once benefited from as a member of the EU because of its decision to withdraw its EU membership, and EFTA[6] countries come second and third, respectively, with 37 and 32 RTAs, respectively.

A workhorse of this literature is the gravity model applied to trade flows. Starting with McCallum (1995), this literature explains the home bias in trade puzzle, which posits that if borders between countries would not matter, their effects on the intensity of trade flows should not be relevant. Consequently, trade flows should only depend on geographic proximity, or other forms of closeness (such as technological relatedness, cultural and language proximity, etc.).

Within studies following in McCallum (1995)'s footsteps, efforts have been made to conceive of space as something going beyond pure geographical proximity. For instance, Rauch (1999) first breaks down borders by dividing between pure physical proximity effects, and effects induced by common language and colonial ties. Along the same lines, Evans (2003) looks into the black box of pure geographical border effects, and shows that after taking product differentiation, tariffs and other institutional factors into account, the measured home bias effect abates. However, as argued in Capello et al. (2018a), the international trade approach makes a theoretical shortcut in taking for granted that increased trade is necessarily associated with faster growth (a point also criticized in Frankel & Romer, 1999).[7]

The third approach deals instead with the potential effects of EU integration on the location decisions of consumers and firms affected by the process of economic homogenization. An intuition about potential agglomerative effects to reaching scale economies as a consequence of furthering integration had already been suggested in Balassa (1961). However, it was only with the quantitative revolution induced by the adoption of the Dixit–Stiglitz monopolistic competition framework in international trade theory that this mechanism was empirically verified.

Theoretical predictions on what furthering EU integration would cause were provided in Krugman and Venables (1996), who model these mechanisms within a new economic geography framework. Within a two-region, two-industry (one operating in constant returns to scale, the other under increasing returns to scale) economy, they show that initially, with high barriers to trade, the tradable sector produces in both countries in order to serve local markets. Later, as barriers are progressively removed, agglomeration effects take place, initially causing wage disparities and welfare losses in the least competitive economy. However, in the long run, real incomes and cost savings due to agglomeration economies would accrue to both countries. Despite this clear theoretical insight, Brülhart (2011) surveyed the empirical literature on the available evidence of location effects, finding that the next impact is at best not fully clear.[8]

The second approach, dealing with dynamic effects, will be discussed in the next subsection.

2.3 | Growth effects due to EU's economic integration

The process of economic integration has spurred several works in the economics discipline exploiting the quasi-experimental nature of this phenomenon to empirically test the validity of the Balassa framework, and in particular of its growth predictions.

For instance, Badinger (2005) finds that on a panel of 15 EU countries GDP *per capita* would be roughly 20% lower were no integration been undertaken since 1950. While often the impacts of economic integration identified in the literature are mainly translated into level effects, some evidence is also available on permanent, long-run growth effects (see e.g. Henrekson et al., 1997).

More recently, Dreyer and Schmid (2017) find a positive impact of EU membership on economic growth for EU member states, while a negative impact is found for countries entering the Euro Zone (EZ). Similar findings have also been more recently confirmed in Campos et al. (2019), who find growth effects on the basis of a synthetic

counterfactual. Their findings suggest that assuming no process of European integration, *per capita* income levels would be roughly 10% lower in the ten years following a country's accession to the EU.

The exact microfoundations for this potential dynamic effects initially remained rather obscure. In fact, the literature dealing with static effects of integration makes a powerful case for productivity gains stemming from furthering EU integration, through scale economies and increased competition. However, this effect is expected to take place in the short run, and induce level increases, and not permanently faster GDP growth rates.

The way out of this conundrum came with Rivera-Batiz and Romer (1991), who suggested that a possible mechanism channelling the growth effects of EU integration lies in increasing returns to knowledge creation. This justifies the host of positive empirical evidence found on growth effects, mostly by Richard Baldwin and coauthors. For instance, criticizing the Cecchini report (Emerson & Generaldirektion Wirtschaft und Finanzen Europäische Gemeinschaften, 1988) for underestimating the potential benefits stemming from EU integration, Baldwin (1989) estimates additional growth in the 0.2–0.9% range (on an yearly basis). The microfoundations for this additional growth would have to be sought in additional investment engendered by more integration (Baldwin, 1993).

Parallel to the developments in the international economics literature, the black box of dynamic integration effects has also been opened by political scientists. In this literature, work (mostly of theoretical nature) focuses on understanding the degree to which EU Countries entered a process of creation of a common European administrative space. Olsen (2003) finds that, despite the relatively slow progress and the insufficient availability of quantitative information, evidence hints at a progressive reduction of administrative differences across European Countries. Grabbe (2015) follows up to this discussion, and shows how European institutions prompted a process of *Europeanization*, mostly by leveraging on soft power and the system of incentives to lure Central and Eastern European countries (CEECs) into EU membership after the fall of the iron curtain. It must also be acknowledged, though, that critiques against economic integration without political integration are frequent. For instance, Brou and Ruta (2011) model the process of integration and find that in a context of economic integration without a political one, effects may be perverse and lead to rent-seeking behaviours in firms.

This literature presents legal and administrative barriers as the main microfoundation for border effects. Legal and administrative barriers appear when a firm has to change its output "in order to comply with differing partner country requirements such as for health, safety, environmental and consumer protection issues" (Brenton et al., 2001, p. 268). In addition to tariff barriers, limitations can also take the form of "regulations: Any rules which dictate how a product can be manufactured, handled, or advertised; rules of origin: Rules which require proof of which country goods were produced in; and quotas: Rules that limit the amount of a certain product that can be sold in a market" (Institute for Government, 2021).[9] In this field, EU institutions have been at the forefront of pro-competitive policies since the inception of the European Community.[10] Over the past decade, characterized by a resurgence of protectionist attitudes and discontent for globalization effects, the EU has often acted counter-cyclically by removing international differences and tariffs between its member states. For instance, EC (2018) reports that in 2017 alone 45 barriers were removed.[11]

Yet, while over time the EU experiment did achieve a substantial reduction of administrative differences, the burden on firms and consumers remains tangible. For this reason, a recent turn in the literature is provided in Camagni et al. (2019), who fine-tune the method for assessing border effects among EU Countries proposed in Capello et al. (2018a) to evaluate the impact of legal and administrative barriers on regional growth.

This paper extends their results by answering the following research question:

Research question. *What is the impact of legal and administrative barriers on regional growth in Europe?*

This rather broad question is specifically declined by looking at the effects of legal and administrative barriers on regional economic growth through their effects on several types of economic assets, involving human and social capital, agglomeration economies, financial institutions, accessibility, governance, and environmental sustainability.

By answering this question, this paper provides the following five main advances with respect to the extant literature:

1. the method first proposed in Camagni et al. (2019) is extended to account for border effects in fifteen different assets;
2. the methodology is applied to a relatively homogeneous case study, that of Central and Eastern Europe, which represents a relevant share of the EU economic activities;
3. the spatial distribution of economic gains is assessed, thereby allowing us to break down overall costs into their geographical and asset distribution;
4. regional assets for which untapped potential are identified are classified according to static, dynamic, and location effects as in the Baldwin and Venables (1995) classification; and
5. lastly, specific attention is devoted to identification issues.

3 | METHODOLOGY FOR ASSESSING INTEGRATION BENEFITS, DATA, AND THE SELECTED CASE STUDY

3.1 | Methodology for assessing integration benefits

Integration is expected to partially or fully overcome border effects. While borders affect economic interactions through several channels, one that remains a substantial obstacle for economic co-operation is represented by legal and administrative barriers. In fact, administrative and legal barriers hamper the efficient exploitation of both the internal resources of a region and those of a neighbouring region. Borders represent an obstacle to the efficient exploitation of internal resources, limiting economies of scale or preventing the formation of larger markets. They also prevent synergies and complementarities among assets and limit accessibility to neighbouring regions' resources (Capello et al., 2018b, 2018c).

A way to measure the effects of integration is to calculate how efficiently economic resources (e.g., labour force, human, social and financial capital and urban amenities) of border regions and of their neighbouring regions are exploited with respect to other non-border areas. The aim of this exercise is to quantify untapped potentials caused by borders; untapped potentials represent regional resources that, due to the presence of a border between countries, are not exploited as efficiently as across the EU as a whole. Because of these untapped potentials, regions experience lower socio-economic development. This paper focuses on the case study of Central and Eastern (CE) European countries, which represents an internally homogeneous set of countries.[12]

To quantify untapped potentials, the following reduced form baseline specification is first tested:

$$\Delta Y = \alpha + \Sigma\beta_k * control_k + \gamma * border + \delta_i * assets_i + \vartheta_i * border * assets_i + \mu_{ij} * border * assets_i * inst\_barrier + \Sigma\rho_c * country, + \varepsilon_{ij}, c = 1, \quad (1)$$

where ΔY is 2008–2018 regional GDP growth rate, *i* refers to individual assets, *inst_barrier* to whether the region suffers from legal and administrative barriers more than the EU average, and *c* to countries. δ_i measures the impact of each regional growth asset *i* on regional growth, ϑ_i captures the impact of asset *i* on the growth of international border regions with respect to all other regions, and μ_{ij} measures the impact of assets *i* on the growth of border regions characterized by legal and administrative barriers *j*, with respect to all other regions.

As the estimated $\widehat{\mu}_{ij}$ coefficient is found to be negative and significant, CE regions characterised by legal and administrative barriers have a lower growth impact from a specific asset with respect to all other EU regions; in turn,

this suggests that, given the presence of legal and administrative borders, this asset is not exploited as efficiently as in other regions.

The same framework can be next applied to the analysis of the costs of borders on the exploitation of neighbouring resources, defined as the potential resource spillovers from nearby regions. More specifically, external assets are calculated as the level of each asset in all regions other than region *i*, weighted by geographical distance between *i* and *j*, $i \neq j$. This implies estimating the following equation:

$$\Delta Y = \alpha + \Sigma\beta_k * control_k + \gamma * border + \delta_i * external\ assets_i + \vartheta_i * border * external\ assets_i + \mu_{ij} * border * external\ assets_i * inst\_barrier + \Sigma\rho_c * country + \varepsilon_{ij}, c = 1. \quad (2)$$

The logic remains the same as in Equation (1). When the estimated parameter $\widehat{\mu_{ij}}$ is negative and significant, external resource *i* has a lower growth impact in regions characterized by legal and administrative barriers within the CE area with respect to a region without these barriers. The removal of the barrier would make the access to the resource easier, and its exploitation more efficient.

The structure of the model presented in Equations (1) and (2) reflects a standard approach to understanding regional economic growth processes. Economic performance depends on the endowment with local factors, with bottlenecks represented by the role of international borders, and within them, of legal and administrative barriers. Specifications in Equations (1) and (2) control for the initial level of income, to account for convergence or divergence patterns within the observed time span (Harris, 2011).

In Equation (1) and (2), the γ, δ, and μ parameters allow to identify resources that are inefficiently exploited:

- in all border regions in Europe, and therefore also in the CE area;
- in all border regions in Europe, and particularly in the case of the CE area; and
- only in the CE area.

In the second step, in order to estimate the potential benefits stemming from furthering integration among regions, two levels of regional GDP are simulated (Figure 1).

The left-hand side of Figure 1 shows how a baseline GDP is obtained, by predicting GDP levels based on the estimated parameters in Equations (1) and (2). On the right-hand side, predicted GDP levels are instead obtained by dropping the $\widehat{\mu_{ij}}$* border * internal assets$_i$ * inst_barrier and $\widehat{\mu_{ij}}$ * border * external assets$_i$ * inst_barrier components of Equation (1) and (2), respectively. By definition, because only negative and significant $\widehat{\mu_{ij}}$s are considered associated with untapped potentials, the resulting product is negative and the difference between the two predicted values provides a quantification of the missed GDP level due to the existence of the legal and administrative border (bottom part of Figure 1).

Altogether, dropping $\widehat{\mu_{ij}}$s has a relevant meaning that is worth making explicit: this implies assuming a complete removal of legal and administrative barriers between border regions characterized by legal and administrative obstacles. While this rather extreme outcome is unlikely to happen in the short-medium run, especially because of the substantial incentives to maintain secluded political lobbies alive (Alesina et al., 2000), holding to this assumption implies these estimates are to be considered as upper bounds for the true integration benefits.

It is also here briefly worth stressing the main advantages and disadvantages of the method. Among the former, as suggested in Capello et al. (2018a), this method allows to more directly pinpoint the association between obstacles and regional growth, which is often implicitly assumed to exist in particular in applied work based on the gravity model explaining trade flows. The method is also amenable to be applied to the analysis of multiple intangible barriers to regional growth, as done in Capello et al. (2018b, 2018c). At the same time, this method is not exempt from limitations, the most relevant being that a negative and significant estimate for the $\widehat{\mu_{ij}}$ parameter does not allow one to rule out the possibility that barriers do not just prevent the inefficient exploitation of resources; in fact, this is also

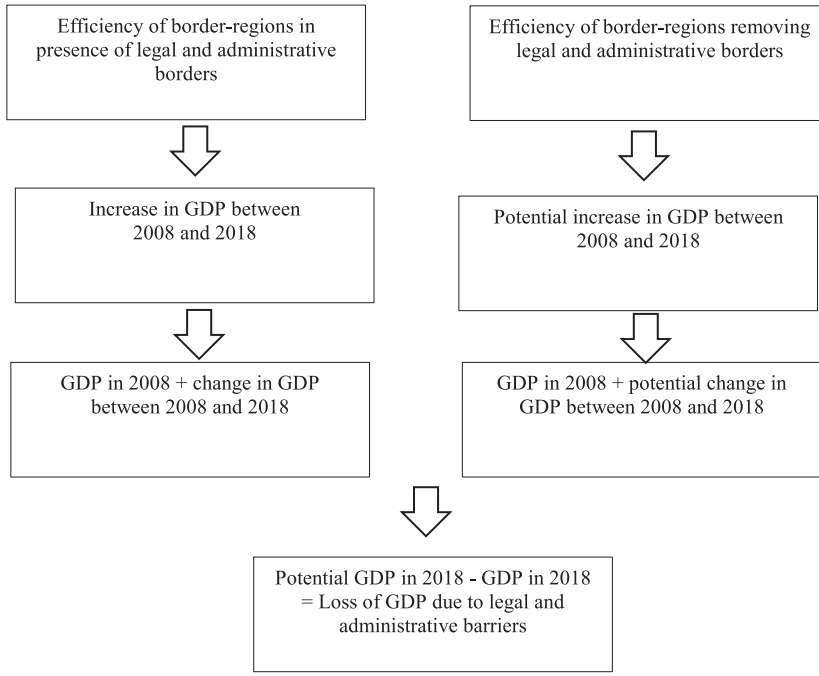

FIGURE 1 Logic of the simulation stage
Source: Author's elaboration

compatible with a situation in which regions are under-endowed with the assets whose border effect is being assessed (Capello et al., 2018a). For the sake of this paper's analyses, this possibility has been ruled out by running classical *t*-tests for mean differences for all assets included in the analyses. Tests suggested that mean endowments with the growth assets do not significantly differ between border and non-border regions at any conventional level.

3.2 | Data

Untapped potentials can affect different regional assets. Data measuring the intensity of various assets are presented in Table 1, organized in classes of regional assets, each with the corresponding indicator chosen. On each of the assets listed in Table 1, heteroscedastic-robust OLS regressions on the specifications in Equations (1.) and (2.) were run, and only significant $\widehat{\mu_{ij}}$ estimates are discussed in Section 4.

Before describing assets, it is crucial to illustrate the way legal and administrative barriers are measured. To build a comparable vector of data with information on perceived legal and administrative barriers, this paper exploits information collected in Flash Eurobarometer 422 (EC, 2015). This survey is based on interviews specifically dealing with the benefits of, and the obstacles for, cross-border co-operation. The survey was administered to 40,619 individuals (with a sample stratified to be representative of the 15 + population for all EU 28 member states plus Norway and Switzerland), in the period June 10–30, 2015.[13] Within the questionnaire, a question (encoded *q6_1*) reads "Thinking about the co-operation between your country and [COUNTRY FROM CROSS-BORDER CO-OPERATION PROGRAMME XX], to what extent are legal or administrative differences a problem?". Individual answers are encoded as "a major problem", "A minor problem", and "Not a problem at all".

Each respondent to the questionnaire is associated with a unique id related to EU's cross-border co-operation programmes. Respondents located in border regions involved in multiple cross-border co-operation programmes

TABLE 1 Regional assets included in the analysis of untapped potentials

Class of regional asset	Regional asset	Indicator	Source of raw data	Years available
Market size and market institutions	Manufacturing specialization	Gross value added in manufacturing activities over total regional value added	EUROSTAT	2008
	Market potential	Percentage of GVA in manufacturing in neighbouring areas	EUROSTAT	2008
	Local labour market	Employment rate	EUROSTAT	2008
	Financial capital	Saving propensity in neighbouring areas	European Value Study	2008/2009
	Accessibility	Multimodal accessibility	ESPON	2006
Human and social capital, co-operation	Human capital	Percentage pop. With tertiary degree	EUROSTAT	2008
	Innovation intensity	Trademark applications to the EPO per 1 m inhabitants	EUROSTAT, OECD RegPat Database	2008
	Trust	Percentage of people answering they trust others "A lot" or "Enough" to the European Values Study question "Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?"	European Value Study	2008/2009
	Scientific co-operation	Number of Framework Programme 7 co-participations	CORDIS	Average 2007/2008
Urban amenities	Cultural heritage	Number of museums per 1,000 inhabitants	ESPON	2008
	Agglomeration economies	Population density	EUROSTAT	2008
	Regional quality of governance	Regional score in University of Gothenburg's Regional Quality of Government Index	QoG database	2010
	Public safety	Number of recorded crimes per 1,000 inhabitants	EUROSTAT	2008
	Compact urban form	% of artificial urban fabric	Corine Land Cover	2006
	Waste management	% of waste recycled	EUROSTAT	2008

have been asked the same question for all programmes; thus, the variable captures the perceived intensity of legal and administrative barriers for economic co-operation between each country and all countries to its borders.

In order to obtain the final vector measuring the intensity of institutional barriers, an unweighted average intensity of the perceived role of legal and administrative barriers in hampering cross-border co-operation is calculated for each NUTS 3 region in the database; a median value for the whole EU is calculated; and, lastly, a dummy variable, equal to one if a region's average perceived barrier is higher than the EU's median, and zero otherwise, is calculated.[14] The choice of NUTS 3 regions as a baseline geography is due to the fact that cross-border regions are statistically identified as combinations of NUTS 3 areas.[15]

Focusing instead on regional assets, dividing the latter by classes allows to focus on three major channels of regional economic growth. These are related to the classification of extant integration studies into static, dynamic, and location effects of integration (subsections 2.2 and 2.3).

The first class of assets includes features related to market size and market institutions. This comprises characteristics that fall within the perimeter of *static integration effects*; these factors are labelled "Market size and market institutions". EU integration is expected to enhance firms' and regions' productivity through increasing market size (Kutan & Yigit, 2007; Notaro, 2011).

The second family of regional characteristics include factors enhancing regional innovation and co-operation; this class is instead more closely associated with empirical work on *dynamic integration effects*. These elements fall under the label "Human and social capital, co-operation". Following Rivera-Batiz and Romer (1991), increasing returns to knowledge would allow more integrated regions to escape the trap of decreasing returns to production factors (Campos et al., 2019; Henrekson et al., 1997).

Lastly, a third class of factors includes "Urban amenities", and is more directly related to *location* integration effects. While not directly focusing on (re) location decisions of firms and consumers, estimates also deal with the more efficient use of location-specific assets (Sapir, 2011).[16]

3.3 | Central and Eastern Europe as a case study

These analyses focus on the rather unique case study of Central Europe (Figure 2). This is a core area for the European Union. It is the object of a EU Interreg project involving (as of the latest, 2014–2020, programming period) nine Countries, 246 Million € ERDF funds, four funding priorities, and 138 development projects.[17]

CE regions play a rather relevant role within the EU's economy. In fact, they file around 30% of all patent applications to the European patent office; they contribute for slightly more than 23% of all trademark applications; and, altogether, they produce 28% of the EU 27's GDP. These figures make the CE an ideal testbed for verifying the assumption that the missed integration among CE regions causes substantial GDP losses.

The CE Interreg programme includes all regions from Austria, Croatia, the Czech Republic, Hungary, Poland, Slovakia and Slovenia, as well as eight Länder from Germany (Baden-Württemberg, Bayern, Berlin, Brandenburg,

FIGURE 2 CE Interreg area
Source: Interreg Central Europe (2015)

Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt, and Thüringen) and nine regions from Italy (Emilia-Romagna, Friuli Venezia Giulia, Liguria, Lombardia, Piemonte, Provincia Autonoma Bolzano, Provincia Autonoma Trento, Valle d'Aosta, and Veneto). All in all, the programme area is made up of 76 statistical NUTS 2 regions.

Given its relative homogeneity, the CE area offers the chance to infer the likely savings that would be associated with the complete removal of remaining legal and administrative barriers. In fact, substantial cost reductions may be obtained by concentrating public investment for shared resources (hospitals, universities, airports) in a smaller number of areas, thereby maximizing their efficient use and avoiding duplication of infrastructure that may otherwise be shared. Moreover, borders among countries in the area represent a barrier that, if removed, can enhance scale economies due to larger markets for inputs, and for intermediate and final goods, both within each region as well as across CE area regions.

Figure 3 maps the intensity of legal barriers between Countries located in the analysed area. In Figure 3, the diagonal texture shows NUTS 3 regions included in these analyses. Country borders between regions within the CE area are marked with lines following a three- colour pale: the thicker continuous black lines indicate borders characterized by major intensity of legal barriers (top 33% of the distribution); the thinner continuous black lines indicate borders characterized by average intensity of legal barriers (mid 33% of the distribution); and the dashed black lines indicate borders characterized by minor intensity of legal barriers (bottom 33% of the distribution). Figure 3 confirms theoretical priors: barriers appear thicker along borders between regions characterized by heterogeneous business practices and different administrative norms.

4 | EMPIRICAL RESULTS

This section presents empirical results in three main blocks. Subsection 4.1 discusses results of baseline OLS and IV estimates of Equations (1) and (2). Subsection 4.2 aggregates results, thereby allowing inference on the percentage GDP losses suffered by NUTS 3 regions as a consequence of remaining legal and administrative barriers. Subsection 4.3 presents robustness checks including estimates based on the control function approach as well as alternative IV specifications based on the use of historical railways. Lastly, subsection 4.4 discusses the spatial distribution of GDP losses in CE border regions.

FIGURE 3 Intensity of legal and administrative barriers between CE Countries
Source: Author's elaboration

4.1 | Baseline estimates

Table 2 present the baseline estimates. In Table 2, estimates are presented in couples, with odd columns showing OLS results, and even ones IV results for the same specification. For ease of read, all triple interactions are listed as "border effects" at the bottom of the table, despite being obtained as products of different assets.

For each IV specification, instruments chosen are reported in the bottom section of the table along with other standard statistics. Baseline IV estimates exploit information on the following instruments:

- lagged trade openness (2008; EUROSTAT data);
- lagged Heating degree days (1979; EUROSTAT data);
- region area;
- bilateral trust (2015: Eurobarometer 422);
- count of theatres (ESPON 2008 data);
- degree of soil erosion (EUROSTAT/JRC 2000 data); and
- location on a mountainous border (EUROSTAT).

The intuition behind the choice of each of the above is to seek sources of variation in legal and administrative barriers, but *ex ante* uncorrelated with GDP growth. Geographical and weather features (region area, soil erosion, prevalence of steep terrain, heating degree days; see Ellison & Glaeser, 1999) represent excellent candidates to this aim, in that they are expected to make it more difficult to homogenize legal norms and institutions across borders by hampering transnational co-operation. Lagged values of trade openness are also added, as proxy for the initial trade intensity between region couples, and bilateral trust, as a soft institution facilitating cross-border co-operation (Guiso et al., 2009).

Table 2 suggests that assets associated with border effects include trust, manufacturing specialization, innovative activities, employment rate, financial capital, and market potential. Internal and external manufacturing levels come as no surprise-the CE area is among the most relevant manufacturing powerhouses in Europe (Marin, 2006). Across all IV model specifications, all tests (underidentification, weak identification, and overidentification) are statistically not rejected (rejected in the case of the overidentification test), with *p*-values ranging from 0.001 to 0.09.

4.2 | Costs of missed integration

Results of these analyses are presented in Table 3, showing which regional growth factors are characterized by untapped potentials according to whether all EU border regions face the same untapped potential (column 1), whether they are stronger in the CE area (column 2) or whether they represent untapped potentials only for the CE area (column 3). Table 3 reports the intensity of the untapped potentials as a percentage of missed GDP.

For border regions located in the CE area, the overall loss is equal to 4.18% of regional GDP.[18] This turns out to be slightly higher than the aggregate loss, measured with the same methodology, of about 3% (Camagni et al., 2019) for the whole EU 28: this suggests that the CE area may be potentially more internally coherent and benefit more from furthering integration and abating legal and administrative barriers. These estimates remain somewhere in between recent findings, ranging between 0.6 to 0.8% in Henrekson et al. (1997) to 10% in Campos et al. (2019).

TABLE 2 Baseline estimates of Equations (1) and (2)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable: 2008–2018 growth of total value added												
Log of total 2008 value added	−0.00170 (−0.67)	−0.00341 (−0.96)	−0.00127 (−0.50)	−0.00276 (−0.77)	−0.00177 (−0.69)	−0.00716 (−1.24)	−0.00437* (−1.44)	−0.0283*** (−2.62)	−0.00156 (−0.61)	−0.00318 (−1.05)	−0.00153 (−0.60)	−0.00313 (−0.54)
Rural region dummy	0.0240*** (3.89)	0.0303*** (3.35)	0.0232*** (3.73)	0.0297*** (3.16)	0.0233*** (3.69)	0.0227*** (2.60)	0.0237*** (3.82)	−0.0455*** (−4.29)	0.0237*** (3.82)	0.0258*** (3.81)	0.0235*** (3.77)	−0.0107 (−0.76)
Urban region dummy	0.00839* (1.65)	0.0103 (1.43)	0.00728 (1.42)	0.0106 (1.36)	0.00699 (1.29)	0.00412 (0.56)	0.00898* (1.75)	−0.0223** (−2.17)	0.00808* (1.59)	0.00813* (1.51)	0.00799* (1.57)	−0.00300 (−0.24)
Border region dummy	0.00251 (0.53)	0.0557* (1.88)	0.00188 (0.40)	0.0555* (1.89)	0.00382 (0.77)	0.0129 (0.18)	−0.00106 (−0.25)	0.0299* (1.66)	0.00423 (0.82)	0.0323* (1.56)	0.00535 (1.03)	0.223*** (7.95)
CE area dummy	0.0323*** (4.58)	0.0635*** (3.19)	0.0320*** (4.54)	0.0649*** (3.17)	0.0321*** (4.44)	0.0328 (0.64)	0.0287*** (4.34)	0.0314*** (4.66)	0.0353*** (4.50)	0.0314*** (4.66)	0.0363*** (4.67)	0.292*** (8.54)
Trust	0.00438 (0.37)	0.0291 (1.44)	-	-	-	-	-	-	-	-	-	-
Employment rate	-	-	−0.0471** (−2.06)	−0.0305 (−0.85)	-	-	-	-	-	-	-	-
Man. specialization	-	-	-	-	0.0576 (1.40)	0.200*** (2.68)	-	-	-	-	-	-
Innovative activity	-	-	-	-	-	-	0.0432** (2.58)	0.553* (1.65)	-	-	-	-
Financial capital	-	-	-	-	-	-	-	-	−0.00244 (−0.04)	0.0643 (0.95)	-	-
Market potential	-	-	-	-	-	-	-	-	-	-	0.0206 (0.21)	−1.204*** (−4.21)
Border effect	−0.00933* (−1.69)	−0.0986* (−1.86)	−0.0187 (−1.37)	−0.248* (−1.85)	−0.0560* (−1.85)	−0.579* (−1.66)	−0.0495* (−1.65)	−0.309* (−1.46)	−0.484** (−2.02)	−2.319* (−1.58)	−1.027** (−2.33)	−26.26*** (−7.90)
Constant term	0.102 (1.58)	0.138 (1.57)	0.129** (2.09)	0.188** (2.40)	0.0951 (1.55)	0.203 (1.39)	0.164** (2.31)	0.190*** (2.63)	0.104* (1.64)	0.117* (1.64)	0.100* (1.60)	0.264* (1.84)
Method of estimation	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV

(Continues)

TABLE 2 (Continued)

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Instruments	-	Initial trade openness; Heating degree days in 1979	-	Initial trade openness; Heating degree days in 1979	-	Initial trade openness; Heating degree days in 1979; total region area; bilateral trust	-	Count of theatres; initial trade openness	-	Soil erosion; bilateral trust	-	Initial trade openness; Heating degree days in 1979, soil erosion, location on a mountainous border
Underidentification test (Kleibergen–Paap rk LM statistic)	-	14.504***	-	13.585***	-	8.616*	-	16.909***	-	23.687***	-	77.420***
Weak identification test (Cragg–Donald Wald F statistic)	-	7.187**	-	7.363**	-	1.655*	-	132.64***	-	14.284***	-	16.308***
Observations	1,316	987	1,317	988	1,316	987	1,311	1,285	1,317	1,141	1,317	988
Adjusted R^2	0.637	0.611	0.638	0.607	0.639	0.598	0.635	0.620	0.637	0.641	0.638	0.646

Notes: *t* statistics in parentheses.

*p < 0.15, **p < 0.05, ***p < 0.01. Only significant border effects are shown.

TABLE 3 Untapped potentials in Central and Eastern Europe: percentage increase of CE GDP growth under full removal of legal and administrative barriers

Class of regional asset	Regional asset	Untapped potential in CE and in the EU 28	Untapped potential in EU 28, but stronger in the CE area	Untapped potential only for the CE area
Market size and market institutions	Manufacturing activity	-	-	0.75%
	Innovation intensity	-	-	1.34%
	Market potential	-	0.07%	-
	Local labour market	0.04%	-	-
	Financial capital	-	0.10%	-
	Accessibility	-	-	-
Human and social capital, co-operation	Human capital	-	-	-
	Trust	-	1.88%	-
	Scientific co-operation	-	-	-
Urban amenities	Cultural heritage	-	-	-
	Agglomeration economies	-	-	-
	Regional quality of governance	-	-	-
	Public safety	-	-	-
	Compact urban form	-	-	-
	Waste management	-	-	-

Source: Author's calculations.

4.3 | Robustness checks

4.3.1 | Control function approach

Control functions offer a means to correct for potential endogeneity issues by modelling endogeneity in the error term (Heckman & Robb, 1985). The control function estimator is implemented by first estimating the baseline OLS specification in Equations (1) and (2), thereby obtaining fitted values of the error term *e*. The *e* vector is then included as an additional regressors. As a result, the model "no longer has an endogeneity problem and so can be estimated in some standard way in place of the original model *M*" (Lewbel et al., 2012, p. 817).

Results of estimating control functions are shown in Table 4. For ease of reading results, Table 4 shows only parameter estimates for the variables of interest, most importantly border effects (i.e., $\widehat{\mu_{ij}}$ parameters). These findings document that border effects remain negative and, whenever standard errors can be calculated (for trust, manufacturing specialization, and innovation intensity), strongly significant.[19]

At the bottom of Table 4, results of Wald tests of endogeneity are also provided. The null hypothesis of this test is that there is no endogeneity, which translates, defining as ε the vector of errors in the baseline specification, and

TABLE 4 Control function estimates of Equations (1) and (2)

Model Dep. variable	(1) 2008–2018 growth of total value added	(2)	(3)	(4)	(5)	(6)
Log of initial value added	−0.132*** (−4.57)	0.0248 (0.54)	0.0636* (1.69)	−0.0886** (−2.11)	−0.0386 (−0.77)	−0.116*** (−2.69)
Rural region dummy	−0.252*** (−2.58)	0.148 (1.16)	0.167* (1.74)	−0.119 (−1.32)	0.154 (1.11)	−0.149 (−1.36)
Urban region dummy	−0.104 (−1.13)	0.107 (0.97)	0.154* (1.77)	−0.0281 (−0.37)	0.152 (1.33)	−0.0803 (−0.87)
Border region dummy	0.793*** (4.44)	1.258*** (14.24)	1.558*** (20.54)	0.154** (2.50)	1.296*** (13.82)	−1.367*** (−16.22)
CE area dummy	1.081*** (10.75)	1.011*** (10.06)	1.654*** (20.55)	0.486*** (5.78)	1.652*** (13.44)	−1.425*** (−16.12)
Trust	−0.839*** (−2.70)	-	-	-	-	-
Employment rate	-	−0.465 (−0.92)	-	-	-	-
Manufacturing specialization			2.968*** (8.71)			
Innovation intensity	-	-	-	0.00414*** (11.53)	-	-
Financial capital	-			-	14.81*** (7.02)	-
Market potential	-	-	-	-	-	4.095** (2.11)
Border effects	−1.810*** (−4.86)	−4.214 (.)	−12.95*** (−42.58)	−0.0288*** (−49.10)	−72.68 (.)	186.4 (.)
Constant term	4.243 (.)	−0.911 (−0.83)	−2.787*** (−3.19)	2.197** (2.31)	−5.538*** (−4.19)	2.288** (1.97)
Observations	987	988	987	1,285	1,141	987
Wald test of exogeneity	6.54**	159.09***	102.35***	102.9***	57.61***	54.11***

Notes: t statistics in parentheses.
*p < 0.10, **p < 0.05, ***p < 0.01.

with u the vector of the auxiliary regression, into imposing $corr_{\epsilon,u} = 0$), Across all six specification, the Wald test is rejected at the 1 to 5% level, which provides further evidence about endogeneity of the triple interaction term (Wooldrige, 2010).

4.3.2 | Historical railways

To deal with identification, one must seek a variable that is plausibly correlated with the likely source of endogeneity in the model—the triple interaction among each regional growth asset, the border region dummy, and the dummy capturing whether the region faces legal and administrative barriers higher than the EU median—but proves orthogonal with respect to GDP growth.

An alternative choice of instruments resorts to historical data. In this paper, the choice falls upon historical railways. This is the first time this instrument is being used for identification purposes in the European context.

The development of an extensive network of railways represents a shock exogenous to local labour markets that enhanced accessibility and thereby caused a dramatic decrease in trade costs, and a consequent increase in the size of markets for local products (Cronon, 2009). More in general, the choice of this instrument is in line with the literature linking long lags of transport infrastructure to present-day market access (Banerjee et al., 2020; Holl, 2016).

Shape files needed for mapping the spatial distribution of historical railways are not publicly available. To overcome the obstacle, this paper exploits data from Morillas-Torné (2012), and proceed as follows. Digital maps are rendered as vector files on a GIS. Next, the file is georeferenced by spatially-adjusting the graphic file to an underlying shape file with the system of coordinates indicated in the source map (European Terrestrial Reference System 1989), on the basis of a second order polynomial. The error of adjustment is equal to 1.21794 (against the usual maximum threshold of 20). Figure 4 maps the resulting network of railways as of 1870.

Many years of developments since the invention of the steam-powered railways by Richard Trevithick in 1803 (Britannica, 1999), railways had extended to continental Europe. Their geography displayed concentration around major urban areas and was characterized by substantial lags in the Habsburg empire, which started to show economic backwardness that led to its collapse in 1918. The identifying assumption is that proximity to railways in 1870 contributed to enhancing a reduction in administrative barriers that helped in homogenizing regional labour markets, thus allowing us to isolate causation in these analyses.

This additional instrument is calculated as the geodesic distance between each NUTS 3 region centroid and the closest 1870 railway line. This is used as the only instrument in Table 5. Results turn out to be much weaker with respect to the baseline estimates presented in Table 2 and the control function approach used for Table 4, though. Border effects (i.e., negative and significant $\widehat{\mu_{ij}}$ parameter estimates) are identified only for trust and manufacturing specialization among the top three most relevant factors hinted at in Table 3. Using standard IV tests, historical railways prove to be weak instruments. In fact, in all other model specifications the use of historical railways as instrument for the triple interaction term is associated with *positive* and significant $\widehat{\mu_{ij}}$ estimates.

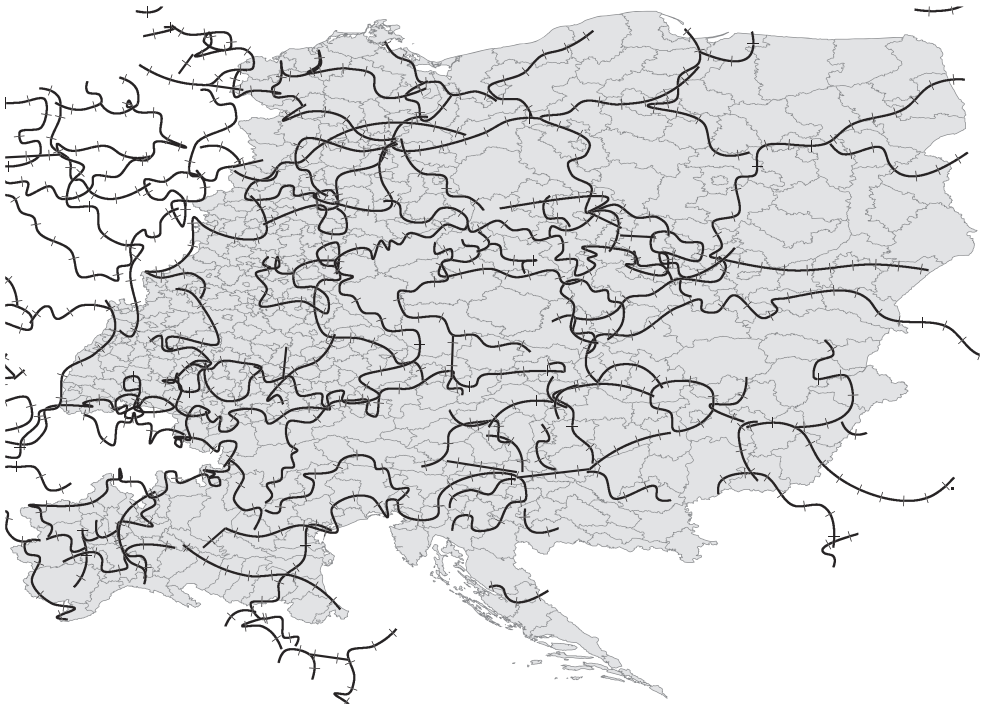

FIGURE 4 1870 railway network in Central Europe
Source: Morillas-Torné (2012), Author's elaboration

TABLE 5 Instrumental variables estimates of Equations (1) and (2), using historical railways only

Model Dep. variable	(1) 2008–2018 growth of total value added	(2)	(3)	(4)	(5)	(6)
Log of initial value added	−0.00835 (−0.70)	−0.00584* (−1.49)	−0.00350 (−0.38)	0.0121 (0.47)	−0.0131** (−2.36)	−0.0124** (−2.32)
Rural region dummy	−0.0219 (−0.89)	0.0125 (1.18)	−0.0178 (−1.04)	0.0305* (1.59)	0.0202* (1.50)	0.0256* (1.94)
Urban region dummy	0.00329 (0.14)	−0.000744 (−0.09)	−0.00615 (−0.40)	0.00127 (0.09)	0.0108 (1.01)	0.0125 (1.19)
Border region dummy	0.249 (1.32)	−0.0934*** (−3.51)	0.138 (1.33)	−0.0576** (−2.15)	−0.172*** (−3.61)	−0.171*** (−3.63)
CE area dummy	0.391* (1.52)	−0.0551** (−2.14)	0.204* (1.59)	−0.0555 (−1.16)	−0.169*** (−2.93)	−0.159*** (−2.90)
Trust	−0.0990** (−2.14)	-	-	-	-	-
Employment rate	-	−0.117*** (−3.26)	-	-	-	-
Manufacturing specialization	-	-	0.463** (2.50)	-	-	-
Innovation intensity	-	-	-	−0.00113* (−1.50)	-	-
Financial capital	-	-	-	-	0.0175 (0.12)	-
Market potential	-	-	-	-	-	0.192 (0.93)
Border effects	−0.711¥ (−1.34)	0.549*** (3.38)	−1.435¥ (−1.35)	0.00807* (1.62)	14.46*** (3.50)	25.47*** (3.52)
Constant	0.280 (0.75)	0.159* (1.59)	−0.0433 (−0.15)	−0.370 (−0.70)	0.300** (2.17)	0.218* (1.66)
Observations	1,316	1,317	1,316	1,311	1,317	1,317
Adjusted R^2	−7.314	0.160	−0.471	−5.683	−0.450	−0.410

Notes: *t* statistics in parentheses.
¥p < 0.20,
*p < 0.10, **p < 0.05, ***p < 0.01.

The weak evidence thereby obtained suggests interpreting overall losses from missed integration with caution, and this will be taken into account in the back-of-the- envelope calculations in the conclusions of this work.

4.4 | Geographical distribution of GDP losses

As a final analysis, this subsection deals with the spatial distribution of overall GDP losses in CE border regions. This means looking at the total sum of GDP losses induced by the inefficient exploitation of the six growth assets identified as significantly hampered by the remaining legal and administrative barriers among. CE regions. The map shown in Figure 5 shows the intensity of losses as differences between the GDP predicted on the basis of the full-fledged specification of Equations (1) and (2), as well as as a result of dropping the terms associated with the μ_{ij} parameters.

The spatial distribution of losses suggested by Figure 5 follows the theoretical priors in Brülhart (2011). Areas closest to political borders seem to incur the highest losses. Since darker colours are associated with more intense

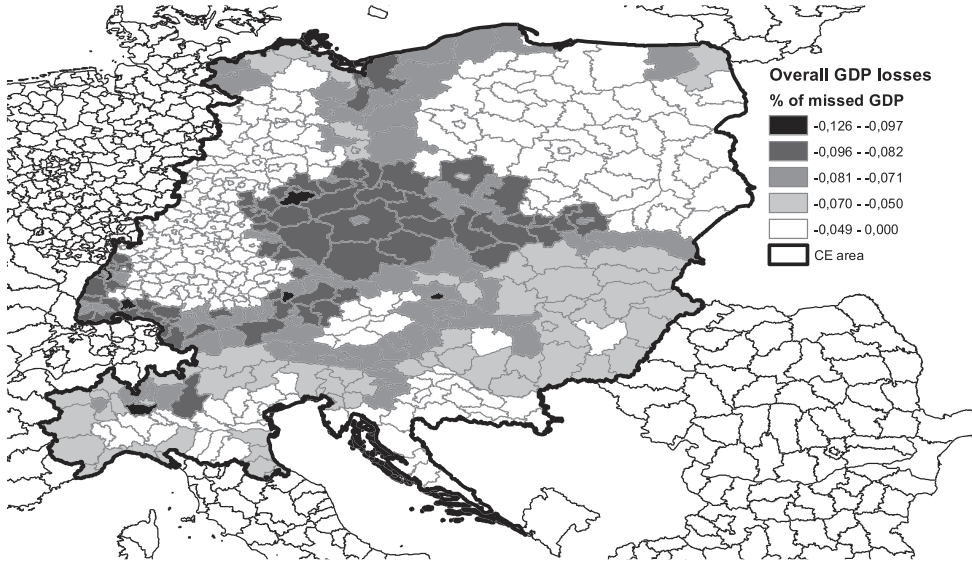

FIGURE 5 Geographical distribution of GDP losses
Source: Author's calculation

TABLE 6 Determinants of GDP losses in CE border regions

Model	(1)	(2)	(3)	(4)
Dependent variable	GDP losses due to legal and administrative barriers			
Distance from the political border	−0.000435*** (−22.29)	−0.000437*** (−18.23)	−0.000435*** (−18.04)	−0.000438*** (−18.63)
Share of college-educated	-	−0.0403** (−2.13)	−0.0419** (−2.21)	−0.0448** (−2.29)
Capital region dummy	-	-	0.0212* (1.78)	0.0224* (1.84)
Dummy, =1 if Country belongs to NMS	-	-	-	−0.00300 (−0.81)
Constant term	0.0674*** (28.89)	0.0778*** (17.04)	0.0778*** (16.94)	0.0796*** (16.19)
Observations	446	420	420	420
Adjusted R^2	0.425	0.431	0.434	0.434

Notes: *t* statistics in parentheses.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

losses, Figure 5 also seem to suggest that large cities, and more specifically capital regions, tend to suffer the most. This is compatible with the interpretation of a cushion effect that structural funds and other policies aiming at supporting lagging regions may have offered. In order to quantify these potential effects, Table 6 shows results of regressing the intensity of losses (for the subsample of border regions in the CE area only) on the distance from the political border. Column (1) shows that indeed losses decrease as we move away from the border, likely to be more affected because of embedded trade decreases.

Column (2) in Table 6 also controls for the share of college educated workers in the region, as means of resilience to border effects. Evidence does suggest that areas with a larger share of workers with ISCED 5 and 6 degrees[20] tend to suffer less from aggregate losses. This may act through the trust channel.

Column (3) also shows positive evidence of the existence of larger losses for capital regions in the area. This finding is robust to controlling for geographical shelteredness: all else being equal, and in particular at the same distance from the border, capital cities tend to register slightly larger losses (around 2.1% of regional GDP).

Lastly, column (4) verifies whether the recent history of EU membership on the eastern side of the CE area may affect these findings. In particular, the model controls for whether regions in the CE area belong to countries that have a centrally planned economic past. One may expect this to matter less as regions in the area become increasingly integrated, and in the light of the relevant internal degree of coherence of the CE area regions documented in subsection 3.3. In fact, results support this expectation: the new member states dummy variable turns out to be statistically indistinguishable from zero, while leaving results for other controls unaffected.[21]

While far from being conclusive, these last analyses shed light on areas being most exposed to border effects, suggesting policy implications discussed in the conclusions.

5 | CONCLUSIONS AND POLICY IMPLICATIONS

This work contributes the literature on the quantification of growth effects induced by economic integration among EU Countries, focusing in particular on a specific aspect of the integration process, that is, the decrease in legal and administrative barriers across EU countries. Reducing legal and administrative barriers is expected to enhance trade flows, increase productivity, avoid duplication of public infrastructure across borders, and facilitate economic interactions.

In order to measure losses engendered by remaining barriers, this paper estimates a growth model using data collected for European NUTS 3 regions for the period 2008–2018. Identification takes place by means of standard geographical and weather instruments, as well as through a control function approach and the use (for the first time) of historical railway networks as an alternative instrumental variable.

Overall, results suggest a strong and persistent role of legal and administrative barriers in hampering the impact of trust and manufacturing specialization on regional GDP growth. Weaker evidence is instead found for the remaining assets, including employment rate, innovation intensity, financial capital, and market potential. Using baseline standardized betas from OLS specifications, this suggests that overall losses could lie in the range between 2.63 and 4.18% of regional GDP. This is somewhere in between recent estimates, ranging between 0.6 to 0.8% in Henrekson et al. (1997) to 10% in Campos et al. (2019).

These analyses also allow a spatial breakdown of overall losses. Results hint at a positive role for geographical shelteredness and human capital as factors of resilience to the losses induced by missed integration, while capital cities tend to incur larger losses, topping an additional 2% all else being equal.

Policy implications from this study are rather rich if complex to be enacted. On the one hand, potential gains from further integration still appear rather relevant, despite the loss in confidence in EU institutions that seems to characterize EU citizens. On the other hand, while this work does not enter the political science literature dealing with the obstacles to political integration, despite these potential gains, moving on the European project towards political integration may be a rather long step. Welfare analyses seeking evidence of increases in life satisfaction among EU dwellers could help in the direction of pinpointing whether gains are actually perceived by EU citizens.

Furthermore, future research directions may extend the analysis to other sources of intangible barriers within cross-border regions. The spatial distribution of intangible barriers shows in fact substantial and persisting differences also in terms of language, culture, and organizational routines; these may hinder the effective exploitation of local and external resources to degrees similar to legal and administrative barriers.

This work also comes with some potential limitations. Because of the methodology adopted, my estimates represent a top result for overall potential benefits, which may turn out to be smaller, especially were legal and administrative barriers only *partially* removed. In this sense, future research would benefit from the analysis of

micro data on trade flows as well as on location decisions for both firms and individuals, to complement these findings with level and location effects. Lastly, the COVID-19 pandemic starting at the beginning of 2020 may have partially altered the picture here provided. In particular, some of the partial stay-at-home measures enacted after the first wave of lockdowns on Europe may have strengthened legal and administrative barriers between EU Countries (Peyrony et al., 2021), thereby possibly affecting their impact on regional growth. While this point is left for future research, it is worth stressing that a proper assessment may not happen before full regional statistics become available, with a typical 2 years delay as with every EUROSTAT information at infra-national level.

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ORCID

Andrea Caragliu https://orcid.org/0000-0003-0865-3404

ENDNOTES

[1] The Appendix supports this with evidence based on four specifications of a Country-level growth model whereas Country real GDP is regressed on initial GDP levels, a human capital indicator, country fixed effects, with or without treatment effects. Data are from Penn World Table 10.0 (Feenstra et al., 2015).

[2] The theoretical underpinnings of regional integration effects are summarized in Camagni and Capello (2011).

[3] The decline in the approval of EU institutions reached a climax with the UK's decision to quit its EU membership following the split vote in the 23 June 2016 referendum.

[4] While the aim of this paper is not to discuss Euroscepticism, The Appendix provides evidence of the decline in confidence in EU institutions both among citizens, as well as on financial markets.

[5] The financial crisis 2007/2008 was triggered by the collapse in subprime mortgage-backed assets, but in the EU its implications turned regional as a consequence of country-specific factors (chiefly associated with the relevant stocks of debt held by Southern European countries), as well as to other more space-specific factors.

[6] The European Free Trade Association was founded in 1960 by then seven member states, and is now made up by Iceland, Liechtenstein, Norway and Switzerland. Its members somehow disagreed with the seemingly more intense strive of the then European Economic Community to seek further economic integration. Instead, EFTA Countries wish(ed) to enforce free trade within themselves, and with the EU, without such furthering their economic homogenization. Since 1960, three of the original EFTA members eventually joined the EU (Sapir, 2011).

[7] This paper addresses this critique in the empirical part, by breaking down the impact of further integration into three main channels.

[8] The conclusion that "the available models predict that, other things equal, regions with inherently less costly access to foreign markets, such as border or port regions, stand to reap the largest gains from trade liberalisation" (Brülhart, 2011, p. 59) will be particularly relevant for providing a sound rationale for the choice of the empirical method underlying this paper.

[9] Legal and administrative barriers can relate to several cases of economic interaction. For instance, EC (2021a) mentions the following barriers affecting the service industry: minimum and maximum tariff requirements, legal form requirements,

shareholding requirements, multidisciplinary restrictions, advertising restrictions, the availability or lack of electronic procedure to complete the applicable formalities.

[10] A notable exception to this statement is the EU's Common Agricultural Policy, that stands out as a measure of agricultural protectionism.

[11] Examples *include "Elimination of administrative barriers for services in Argentina" and "Recognition of safety standards used by the EU machinery industry in Brazil's new safety legislation"* (EC, 2018).

[12] See subsection 3.3 for more details.

[13] Flash Eurobarometer 422 was carried out for the European Commission. It was specifically requested by the Directorate-General for Regional and Urban Policy (DG REGIO) and coordinated by the Directorate-General for Communication – "Strategy, Corporate Communication Actions and Eurobarometer" Unit.

[14] Additional details on this vector and its distribution across Cross-Border Cooperation Programme regions are available in the Appendix.

[15] When NUTS 3 areas belong to mupltiple cross-border co-operation programmes, a weighted average of responses is calculated, with weights based on regional population levels.

[16] A table with the main descriptive statistics for all variables included in Table 1 is presented in the Appendix.

[17] The area has a long history of common events, also through the Habsburg empire, culture (countless writers depicting its epic, including, among many, Wittgenstein, Loos, Schönberg, Kokoschka, Musil, Schnitzler, von Hofmannsthal, Rilke, Kafka, Svevo, Roth, Singer, and Canetti), and languages.

[18] The Appendix shows results of simulating in the long-run a complete removal of legal and administrative barriers in the CE area, as well as a focus on the Country breakdown of losses.

[19] Full control function estimates are presented in the Appendix.

[20] ISCED (International Standard Classification of Education) is "the reference international classification for organising education programmes and related qualifications by levels and fields" (EUROSTAT;, 2020).

[21] Data included in this regression are obtained on the basis of the following sources and time periods:

Indicator	Source of raw data	Time period
Distance from the political border	GIS, Author's elaboration	-
Share of college-educated	EUROSTAT	2001
Capital region dummy; Dummy, =1 if Country belongs to NMS	*Source*: Author's elaboration	-

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APPENDIX

DESCRIPTIVE STATISTICS FOR THE VARIABLES INCLUDED IN THE EMPIRICAL ANALYSES

Table A1 shows the main descriptive statistics for the variables included in the empirical analyses (see also Table 1 in the main text).

PENN WORLD TABLE REGRESSIONS ON THE IMPACT OF EU MEMBERSHIP ON COUNTRY GDP GROWTH

Table A2 shows the impact of EU membership ($t = 1959$ for Belgium, France, Germany, Italy, Luxembourg, and the Netherlands; 1973 for Denmark, Ireland, and the United Kingdom; 1981 for Greece; 1986 for Portugal and Spain; 1995 for Austria, Finland, and Sweden; 2004 for Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia; 2007 for Bulgaria and Romania; and, lastly, 2013 form Croatia).

EURO SCEPTICISM

The debate on the possible unsuccessful result of the creation of the EU is exacerbated by a recent wave of political and administrative elections in various EU member states where sovereigntist parties gained large consensus, if not the majority of the votes. This is the case of Alternative for Germany (DE), Lega Nord (IT), Law and Justice (PL), Fidesz (HU), and UKIP (UK), among many. A common tract among such rather diverse political formations is a widely held scepticism against EU institutions and, more in general, about the very project of political and economic unification of EU countries that was at the very basis of the long run view of the founding fathers of the European Community, such as Konrad Adenauer, Winston Churchill, Alcide De Gasperi, Jean Monnet, and Robert Schuman.

Along with political elections turnover, financial markets have also changed their views on the likely resilience of (some) EU countries to possible negative shocks to their levels of public debt. For some, this meant a substantial increase in the cost of servicing public debt, while Greece was forced to partially default.

Figure A1 shows the remarkable decline in EU citizens confidence in the three major EU institutions (the EU Parliament, in charge of the legislative; the EU commission, responsible for the executive; and the European Central Bank, henceforth ECB, in charge of monetary policy), as measured by Eurobarometer polls. Data are collected on a

TABLE A1 Main descriptive statistics for the variables included in the empirical analyses

Variable	Obs	Mean	Std. Dev.	Min	Max
2008–2018 growth of value added	1,317	0.04016	0.111024	−0.40171	0.817778
Trust	1,397	0.642527	0.192789	0	1
Accessibility	1,480	0.881851	0.421706	0.22	2
Agglomeration economies	1,230	571.1284	1321.935	1.1	20751.4
Local labour market	1,398	0.640179	0.095106	0.02	0.96
Manufacturing specialization	1,360	0.234527	0.104717	0.02	0.71
Cultural heritage	1,361	1390.129	2233.71	0	24,799
Innovation intensity	1,376	38.30015	99.70588	0	1,493
Human capital	1,397	0.159872	0.090016	0	0.47
Regional quality of governance	1,380	0.20451	0.918941	−2.83772	1.762
Scientific co-operation	1,480	5.460811	16.87983	0	249
Financial capital	1,398	0.387391	0.028109	0.363	0.535
Market potential	1,398	0.214834	0.019236	0.199	0.314

TABLE A2 Impact of EU membership on GDP growth

Model	(1)	(2)	(3)	(4)
Dependent variable	Yearly growth of real GDP			
Main				
Lagged EU membership	0.00929 (0.63)	0.00209 (0.14)	−0.0140** (−2.19)	
Lagged TFP growth	0.0600*** (8.24)	0.0600*** (8.25)		
Lagged human capital	−0.0181*** (−9.92)	−0.0177*** (−9.10)	−0.0140*** (−7.45)	
r1vs0.eu_membership				−0.781*** (−242.28)
Constant term	0.0844*** (7.13)	0.0904*** (7.19)	0.0712*** (18.68)	
Potential outcome mean (EU membership = 0)				0.0319*** (50.29)
TME1				
Real GDP at constant 2017 national prices (in mil. 2017US$)				8.35e-08*** (7.33)
Constant term				−1.182*** (−73.19)
OME0				
Real GDP at constant 2017 national prices (in mil. 2017US$)				−2.41e-09*** (−6.46)
Constant term				0.0327*** (48.70)
OME1				
Real GDP at constant 2017 national prices (in mil. 2017US$)				1.15e-08*** (4.24)
Constant term				−0.753*** (−231.29)
TEOM0				
Constant				−0.0735*** (−35.23)
TEOM1				
Constant				0.891 (.)
Observations	6,176	6,176	8,492	10,216
Adjusted R^2	0.073	0.073	−0.007	

Notes: *t statistics in parentheses*.
*$p < 0.1$, **$p < 0.05$,
***$p < 0.01$.
Column (1) shows results of a baseline specification with pooled OLS and country fixed effects. Column (2) also controls for initial levels of GDP to account for convergence. Column (3) introduces a panel specification (with country fixed effects). Lastly, column (4) shows potential-outcome means from observational data assuming that treatment assignment (EU membership) is correlated with the potential outcome (GDP growth).

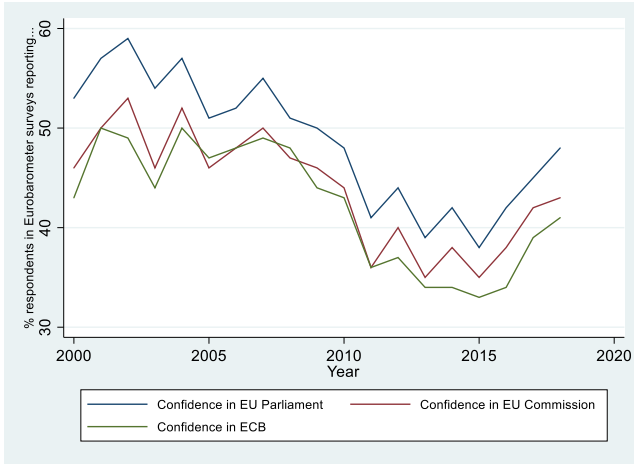

FIGURE A1 Population with confidence in EU institutions by institution
Source: DG Comm/EUROSTAT, Authors elaboration 21Data retrieved on EUROSTAT on Sep. 9, 2019 at the URL https://ec.europa.eu/eurostat/databrowser/view/sdg_16_60/default/table?lang=en

regular basis via yearly surveys, in order to monitor the changing landscape of attitudes, values, and norms amongst EU citizens.

Further issues with the confidence in EU institutions also took place in Spring 2020, as a consequence of the initially sparse and weak reaction of European Union institutions to the impact of the COVID-19 pandemic. In the EU 28, the virus initially hit hard Italy, and only subsequently diffused to Spain, France, Belgium, and the UK (Capello & Caragliu, 2021). While Spring 2021 brought levels of trust in EU institutions back to pre-pandemic levels, mostly at the expense of citizens confidence in national institutions (EC, 2021b), the relevance of populistic movements remains rather substantial, as demonstrated by the support garnered by many populist movements all over Europe (Giebler et al., 2021).

The rise of populism is linked to a diffused perception of higher insolvency risk, associated to the substantial stocks of debt held by (mostly) Southern European countries. During the early stages of the 2007/2008 crisis, this prompted a spike in interest rates: Figure A2 shows the interest rates on 10 years' maturity bonds, Euro-denominated debt, for Germany, Spain, Greece, and Italy, for the period 1993-2019. The graph highlights first a process of quick convergence to common (and low) interest rates, as a consequence of the emergence of the European Union, followed by remarkable divergence when the crisis hit.

ADDITIONAL COMMENTS TO BASELINE ESTIMATES

Simulated long-run effect of fully removing legal and administrative barriers in the CE area

Given the short period analysed, the 4% loss identified in this paper is rather substantial. While this figure may appear trivial, Figure A3 shows what would happen to the live showing forecasted GDP growth into 2050 (solid line) with a complete removal of legal and administrative barriers, assuming a 1% (dashed line) or 2% (dotted line) yearly growth rates.

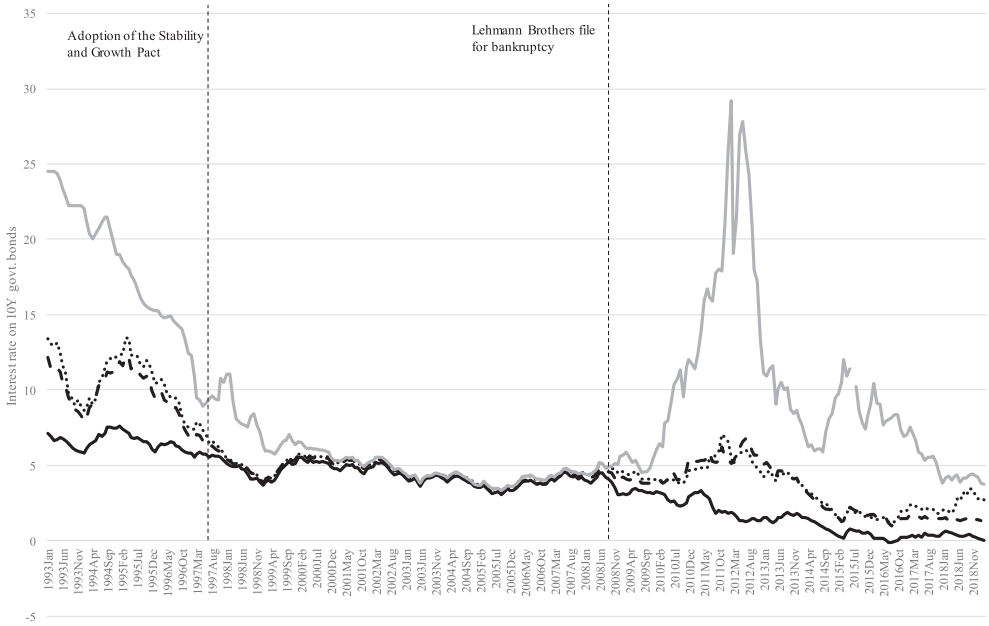

FIGURE A2 Interest rates on 10 years maturity bonds, Euro-denominated debt, for Germany, Spain, Greece, and Italy (1993–2019)
Source: EUROSTAT, Authors elaboration

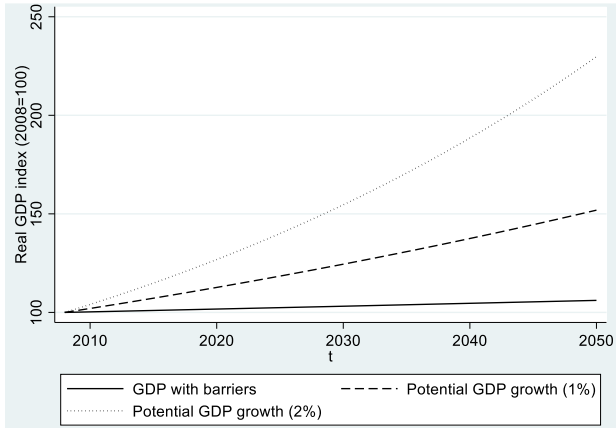

FIGURE A3 Potential GDP gains with complete removal of legal and administrative barriers
Source: Authors elaboration

Breakdown of losses by country

Aggregate losses can also be analysed with a Country breakdown (Table A3). Due to the nature of the method used for these analyses, the spatial distribution of losses can be explained by the prevalence of border regions in the countries belonging to the CE area. While some countries are totally included in the area (e.g., Austria, Czech Republic),

TABLE A3 Aggregate losses by country

Country	Average loss
Austria	−8.11%
Czech Republic	−8.46%
Germany	−2.25%
Croatia	0.00%
Hungary	−5.84%
Italy	−5.71%
Poland	−3.87%
Slovenia	−6.63%
Slovakia	−6.45%

Source: Authors elaboration.

others are only partially joining the area (e.g., Germany and Italy). Nevertheless, spatial variation still remains visible, with countries belonging to the same typology showing rather different results. For instance, among countries only partially comprised in the CE area, Italy losses slightly less than 6% of its potential GDP due to legal and administrative barriers, while Germany loses only 2%. At the opposite end of the spectrum, among countries totally included in the CE area, Austria loses more than 8%, while Croatia is exempt from losses.

DETAILS ON THE LEGAL AND ADMINISTRATIVE BARRIER VECTOR

Table A4 shows the relative frequency of interviewees by EUs cross-border co-operation programme:

TABLE A4 frequency of interviewees by EUs cross-border co-operation programme

Interreg Cross-Border Co-operation Programme	Frequency	Perc.	Cum.
CB001 BE-DE-NL	1,204	2.96	2.96
CB002 AT-CZ	604	1.49	4.45
CB003 SK-AT	605	1.49	5.94
CB004 AT-DE/Bavaria	600	1.48	7.42
CB005 ES-PT (POCTEP)	600	1.48	8.89
CB006 ES-FR-AD (POCTEFA)	608	1.5	10.39
CB008 HU-HR	602	1.48	11.87
CB009DE/Bavaria-CZ	601	1.48	13.35
CB010 AT-HU	605	1.49	14.84
CB011 DE/Brandenburg-PL	603	1.48	16.33
CB012 PL-SK	606	1.49	17.82
CB013 PL-DK-DE-LT-SE	2,020	4.97	22.79
CB014 FI-EE-LV-SE	1,607	3.96	26.75
CB015 SK-HU	609	1.5	28.25
CB016 SE-NO	605	1.49	29.74
CB017 DE/Saxony-CZ	600	1.48	31.21
CB018 PL-DE/Saxony	604	1.49	32.7
CB019 DE-PL	603	1.48	34.19

(Continues)

TABLE A4 (Continued)

Interreg Cross-Border Co-operation Programme	Frequency	Perc.	Cum.
CB020 EL-IT	603	1.48	35.67
CB021 RO-BG	604	1.49	37.16
CB022 EL-BG	602	1.48	38.64
CB023 DE-NL	603	1.48	40.12
CB024 DE-AT-CH-LI	1,212	2.98	43.11
CB025 CZ-PL	605	1.49	44.6
CB026 SE-DK-NO	1,206	2.97	47.57
CB027 LV-LT	600	1.48	49.04
CB028 SE-FI-NO	1,203	2.96	52.01
CB029 SI-HR	602	1.48	53.49
CB030 SK-CZ	604	1.49	54.97
CB031 LT-PL	600	1.48	56.45
CB032 SE-FI-NO (Nord)	1,204	2.96	59.42
CB033 IT-FR (Maritime)	601	1.48	60.9
CB034 FR-IT (ALCOTRA)	603	1.48	62.38
CB035 IT-CH	603	1.48	63.86
CB036 IT-SI	603	1.48	65.35
CB037 IT-MT	601	1.48	66.83
CB038 FR-BE-NL-UK	1,616	3.98	70.81
CB039 FR-DE-CH	1,196	2.94	73.75
CB040 FR-UK	605	1.49	75.24
CB041 FR-CH	604	1.49	76.73
CB042 IT-HR	603	1.48	78.21
CB044 BE-FR	603	1.48	79.7
CB045 FR-BE-DE-LU	1,604	3.95	83.65
CB046 BE-NL	601	1.48	85.13
CB047 UK-IE	602	1.48	86.61
CB048 UK-IE	618	1.52	88.13
CB049 HU-RO	608	1.5	89.63
CB050 EE-LV	598	1.47	91.1
CB052 IT-AT	603	1.48	92.58
CB053 SI-HU	600	1.48	94.06
CB054 SI-AT	605	1.49	95.55
CB055 EL-CY	602	1.48	97.03
CB056 DE-DK	606	1.49	98.52
PC001 IE-UK (PEACE)	600	1.48	100

Moving to the distribution of barrier intensity, Table A5 provides a cross-tabulation of legal and administrative barriers vector, while Figure A4 shows a series of histograms of the distribution of legal and administrative barriers by EU's Cross-Border Cooperation Programme Country couples.

TABLE A5 Cross-tabulation of legal and administrative barriers vector

"Thinking about the co-operation between your country and [COUNTRY FROM CROSS-BORDER CO-OPERATION PROGRAMME XX], to what extent are legal or administrative differences a problem?"	Freq.	Percent	Cum.
A major problem	5,619	13.83	13.83
A minor problem	11,767	28.97	42.8
Not a problem at all	14,040	34.57	77.37
Not Available	9,193	22.63	100
Total	40,619	100	

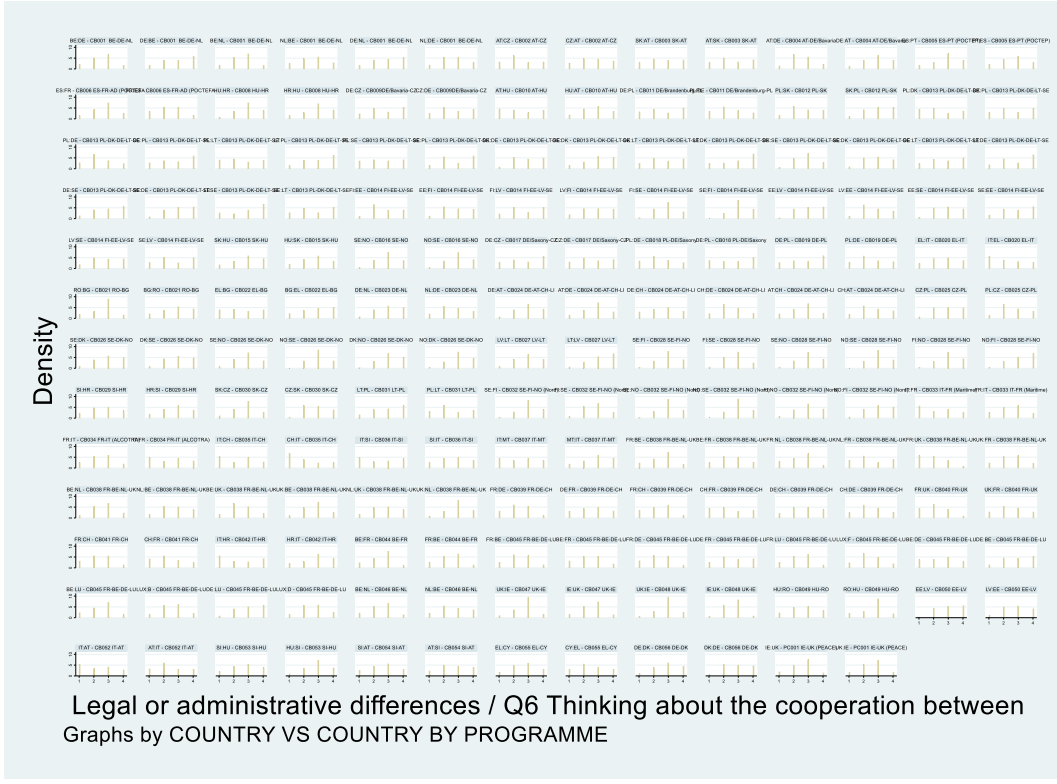

FIGURE A4 **Histograms of the distribution of legal and administrative barriers by EUs Cross-Border Co-operation Programme Country couple**

Source: Authors elaboration on the basis of Flash Eurobarometer 422

FULL CONTROL FUNCTION ESTIMATES

TABLE A6 Untapped potentials in internal assets

Model Dep. variable	(1) 2008–2018 growth of total value added	(2)	(3)	(4)	(5)	(6)
Log of initial value added	−0.132*** (−4.57)	0.0248 (0.54)	0.0636* (1.69)	−0.0886** (−2.11)	−0.0386 (−0.77)	−0.116*** (−2.69)
Rural region dummy	−0.252*** (−2.58)	0.148 (1.16)	0.167* (1.74)	−0.119 (−1.32)	0.154 (1.11)	−0.149 (−1.36)
Urban region dummy	−0.104 (−1.13)	0.107 (0.97)	0.154* (1.77)	−0.0281 (−0.37)	0.152 (1.33)	−0.0803 (−0.87)
Border region dummy	0.793*** (4.44)	1.258*** (14.24)	1.558*** (20.54)	0.154** (2.50)	1.296*** (13.82)	−1.367*** (−16.22)
CE area dummy	1.081*** (10.75)	1.011*** (10.06)	1.654*** (20.55)	0.486*** (5.78)	1.652*** (13.44)	−1.425*** (−16.12)
Trust	−0.839*** (−2.70)	-	-	-	-	-
Employment rate	-	−0.465 (−0.92)	-	-	-	-
Innovation intensity	-	-	-	0.00414*** (11.53)	-	-
Financial capital	-			-	14.81*** (7.02)	-
Market potential	-	-	-	-	-	4.095** (2.11)
Border effect	−1.810*** (−4.86)	−4.214 (.)	−12.95*** (−42.58)	−0.0288*** (−49.10)	−72.68 (.)	186.4 (.)
Constant term	4.243 (.)	−0.911 (−0.83)	−2.787*** (−3.19)	2.197** (2.31)	−5.538*** (−4.19)	2.288** (1.97)
Interaction trust border-legal barrier-CE dummy						
Log of total 2008 value added	0.0430 (0.47)					
rural	0.0634 (0.64)					
urban	0.0446 (0.74)					
Dummy overall border, final version (June 24, 2016)	0.459*** (15.19)					
Dummy, =1 if NUTS3 belongs to CE area	0.535*** (17.31)					
People can be trusted/cant be too careful	−0.000588 (−0.00)					
trade_2008_int	0.000000281 (0.17)					
hdd_1979	−0.0000843*** (−7.36)					
Constant	−0.942 (−0.39)					

(Continued)

Model Dep. variable	(1) 2008–2018 growth of total value added	(2)	(3)	(4)	(5)	(6)
/						
athrho2_1	1.547** (2.56)	1.179*** (12.61)	2.307*** (11.50)	3.307*** (10.14)	0.616*** (7.59)	−2.157*** (−7.36)
lnsigma2	−0.769*** (−26.86)	−1.897*** (−73.68)	−2.540*** (−112.43)	3.546*** (175.97)	−4.859*** (−228.44)	−5.334*** (−148.61)
Interaction employment rate border-legal barrier-CE dummy						
Log of total 2008 value added		0.0218*** (3.03)				
rural		0.0201 (1.27)				
urban		0.0199* (1.50)				
Dummy overall border, final version (June 24, 2016)		0.228*** (21.25)				
Employed/pop. Between 15 and 64		0.0301 (0.50)				
Dummy, =1 if NUTS3 belongs to CE area		0.160*** (12.33)				
trade_2008_int		−0.00000100** (−2.47)				
hdd_1979		−0.0000332*** (−3.62)				
Constant		−0.348** (−2.04)				
bor_leg_man_ce						
Log of total 2008 value added			0.00633** (2.17)			
rural			0.0202*** (2.83)			
urban			0.0150** (2.30)			
Dummy overall border, final version (June 24, 2016)			0.122*** (23.78)			
Manufacturing specialisation			0.230*** (9.00)			
Dummy, =1 if NUTS3 belongs to CE area			0.129*** (23.73)			
trade_2008_int			0.000000286*** (2.63)			
hdd_1979			−0.0000166*** (−5.18)			
SHAPE_AREA			0.00211* (1.95)			
bil_trust_bin			0.000434 (0.25)			

(Continues)

(Continued)

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dep. variable	2008–2018 growth of total value added					
Constant			−0.211*** (−3.08)			
Interaction trademarks- border-legal barrier-CE dummy						
Log of total 2008 value added				−3.071** (−2.13)		
rural				−5.323* (−1.70)		
urban				−1.788 (−0.68)		
Dummy overall border, final version (June 24, 2016)				5.108** (2.42)		
Dummy, =1 if NUTS3 belongs to CE area				15.35*** (5.47)		
TM applications to the EPO per mil. Pop.				0.144*** (11.96)		
Presence of theaters				−0.0409* (−1.72)		
load_2008				0.00000246 (0.16)		
Constant				75.64** (2.32)		
Interaction lagged saving propensity- border-legal barrier-CE dummy						
Log of total 2008 value added					0.000855*** (2.63)	
rural					−0.000339 (−0.43)	
urban					−0.000334 (−0.54)	
Dummy overall border, final version (June 24, 2016)					0.0137*** (26.40)	
Spatial lags of EVS (thrift)					−0.00712 (−0.78)	
Dummy, =1 if NUTS3 belongs to CE area					0.0137*** (19.45)	
soil_eros_sev_2000					0.000156*** (3.44)	
bil_trust_bin					−0.00243*** (−3.69)	
Constant					−0.0163* (−1.94)	

(Continued)

Model Dep. variable	(1)	(2)	(3)	(4)	(5)	(6)
	2008–2018 growth of total value added					
Interaction lagged man- empl.- border-legal barrier-CE dummy						
Log of total 2008 value added						0.000961*** (4.34)
rural						0.00130*** (2.68)
urban						0.000665* (1.60)
Dummy overall border, final version (June 24, 2016)						0.00776*** (22.85)
Spatial lags of manufacturing specialisation						−0.00740 (−0.90)
Dummy, =1 if NUTS3 belongs to CE area						0.00768*** (18.39)
trade_2008_int						−6.03e-08* (−1.80)
hdd_1979						0.000000676** (2.49)
load_2008						4.24e-08* (1.60)
soil_eros_2000						0.0000494* (1.85)
mount_no_highway						0.000209 (1.19)
Constant						−0.0226*** (−3.84)
Observations	987	988	987	1,285	1,141	987
Wald test of exogeneity	6.54**	159.09***	102.35***	102.9***	57.61***	54.11***

Notes: t statistics in brackets.
* $p < 0.10$, ** $p < 0.05$,
*** $p < 0.01$.

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Resumen. Las fronteras impiden la explotación óptima de los recursos socioeconómicos y medioambientales. Un obstáculo relevante debido a la falta de integración se asocia a las barreras legales y administrativas, que provocan la aparición de *potenciales no aprovechados*. Este artículo aprovecha el estudio de caso del programa *Interreg Europa* Central. La eliminación de las fronteras entre los países de la zona favorece las economías de escala debido a la existencia de un gran mercado de insumos y bienes, tanto dentro de las regiones como entre las regiones de la zona centroeuropea. El estudio identifica los potenciales no aprovechados mediante el análisis del crecimiento del PIB regional no logrado debido a la explotación ineficiente de los activos de crecimiento regionales. Los resultados apuntan a una distribución espacial compleja y heterogénea de los potenciales no aprovechados, en la que intervienen varios factores de crecimiento.

抄録: 国境は、社会経済的及び環境的資源の最大限の利用を妨げる。統合の失敗による大きな障害は、法的および行政的な障壁と関連しており、これが「未開発の可能性」の出現を引き起こす。

本稿では、*Interreg Central Europe*プログラムの事例研究を利用する。地域内の国境を撤廃することは、地域内及び中央ヨーロッパ地域全体の双方において、投入財及び財にとって大きな市場が存在するため、規模の経済を促進する。

本稿では、地域の成長の資源が効率的に活用されないことによって失われた地域のGDP成長を調査することから、未開発の可能性を特定する。結果から、未開発の可能性は、複数の成長要因が関与しており、その空間分布は複雑かつ不均一であることが示唆される。