

Social Inclusion, Employment and Intra-National Trade: some Evidence from Spanish Regions

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Abstract

This paper explores the relationship between intra-national trade, employment, and social inclusion using panel data including 15 Spanish regions from 1999 to 2019. We adopt the instrumental variables approach to investigate how Spanish intra-national trade affects the regional labour market. The main results indicate interregional trade has a significant and positive impact on regional employment. In contrast, the empirical results suggest that the effects of intra-regional trade on employment are negative and insignificant. We also adopt the instrumental variables method to address the issue of endogeneity, taking into account spatial dependence. The findings confirm that interregional trade has a significant and positive impact on the share of the employed population, while reducing the number of unemployed people.

Keywords: social inclusion, employment, intra-national trade, spatial panel models

Riassunto. *Inclusione sociale, occupazione e commercio intra-nazionale: alcune evidenze dalle regioni spagnole*

Questo articolo esplora la relazione tra commercio intra-nazionale, occupazione ed inclusione sociale utilizzando un panel data che include 15 regioni spagnole dal 1999 al 2019. Adottiamo l'approccio delle variabili strumentali per indagare come il commercio intra-nazionale spagnolo influisce sul mercato del lavoro regionale. I principali risultati indicano che il commercio interregionale ha un impatto significativo e positivo sull'occupazione regionale. Invece, i risultati empirici suggeriscono che gli effetti degli scambi intraregionali sull'occupazione sono negativi e non significativi. Adottiamo inoltre il metodo delle variabili strumentali per affrontare la questione dell'endogeneità, tenendo conto della dipendenza spaziale. I principali risultati confermano che il commercio interregionale da un lato ha un impatto significativo e positivo sulla quota della popolazione occupata, dall'altro riduce il numero delle persone disoccupate.

Parole chiave: inclusione sociale, occupazione, commercio intra-nazionale, modelli panel spaziali

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1. Introduction

The World Bank defines social inclusion as the process of improving the participation of individuals and groups in society through the development of skills and opportunities as well as the enhancement of the dignity of disadvantaged people based on their identities (World Bank, 2013). It can be inferred from this definition that work is, along with family and social relations, the main dimension that characterizes social inclusion in developed societies (Castel, 1995). The importance of work as the main mechanism of social inclusion

has been widely analysed by the social sciences since Atkinson's (1998) study pointed out that the repercussions of unemployment go beyond removing the individual from the labour market as it also has negative implications in terms of social relations.

In this context, trade, if supported by appropriate supportive policies, could play a significant role in fomenting economic growth and creating new jobs, generating benefits not only from a quantitative point of view (Lippoldt, 2012) but also in qualitative terms (Flanagan and Khor, 2012). Despite the processes of trade integration that have affected economies on a global scale over the past 30 years, regions tend to trade more within national borders than the rest of the world. This phenomenon, known as the border effect (McCallum, 1995), is not surprising given that intra-national trade is characterized by lower barriers and greater openness than international trade. In this regard, intra-national trade can rely on nearly identical governmental and monetary institutions, a single language, the elimination of many tariff and non-tariff barriers, and usually smaller geographic distances.

Despite the above claims, this field of economic research has attracted less interest than international trade studies. A key factor is undoubtedly the lack of clarity regarding appropriate theoretical approaches and analytical techniques, which are always an adaptation of those used in international trade theory. This has resulted in a dearth of empirical studies that address the effects of intra-national trade on regional income and employment. According to traditional trade theory, the elimination of trade barriers would give economic benefits to regional economies, however, new theories hold that the positive effects of free trade can be countered by negative ones, and the end result will not be conducive to regional growth. More recently, New Economic Geography, assuming that production occurs with increasing returns to scale, states that economic integration produces significant effects on the distribution of economic activity among regions.

In assessing the effect of intra-national trade on regional employment, there are basically three issues that must be prioritized. The first and crucial issue is simultaneous causality because these two quantities affect each other. Indeed, it is logical to assume that intra-national trade affects employment, but at the same time, regions with better employment performance are able to trade larger volumes of goods and services than regions with less

efficient labour markets. This means that the use of the intra-national trade variable in employment regressions poses an endogeneity problem. Second, small geographic units, such as regions, might follow a spatial pattern when the value associated with one spatial unit depends on that recorded by other spatial units; therefore, a spatial regression model must be implemented that takes into account the presence of spatial dependence. Third, the unavailability of intra-national trade statistics, which, on many occasions, leads to the use of various approximation methods that could lead to biased estimates (see, among others, Nitsch, 2000; Chen, 2004).

This paper aims to contribute to the lack of empirical studies on trade at the regional level by estimating the impact of intra-national trade flows on employment in Spanish regions, taking into account the three problems outlined above. Methodologically, an econometric approach based on instrumental variables (IV), introduced by Frankel and Romer (1999), was adopted to address the issue of endogeneity. In addition, with the introduction of spatial lags, improvements in the original specification were obtained by taking into account the presence of spatial dependence. Regarding the third issue, in this paper we rely on a special dataset that measures trade flows between and within Spanish regions (NUTS2 level) from 1999 to 2019. In addition, to get an idea of the impact of intra-national trade flows on regional labour market, the effects of intra-national trade flows on employment and unemployment are analysed differentially to assess their importance and relevance.

The structure of this paper is as follows. The second section discusses the main links between trade, employment and social inclusion. Section 3 presents the data used for this paper and descriptive evidence on intra-national trade flows in Spain. The following sections present the econometric model and the main results of the econometric analysis. The last section is devoted to conclusions.

2. A theoretical and empirical framework

In the current social and economic situation strongly deteriorated considerably as a result of the pandemic crisis and the Russian-Ukrainian war, the social inclusion of the weakest sections of the population can play a central role in the economic recovery of European countries. At the national level, the Spanish Government's Recovery, Transformation and Resilience Plan (*Plan de Recuperación, Transformación and Resiliencia*), approved by the Council of Ministers Decision of 27 April 2021, identifies as the eighth strategic policy lever enhancing the functioning of the labour market to improve social cohesion, stimulate economic growth and eliminate inequalities. In the Recovery, Transformation and Resilience Plan, therefore, the dynamism of the labour market is the key element to ensure an inclusive future for the entire Spanish population. On the one hand, investments have been launched to enhance the labour market and vocational training with the aim of reducing the high rate of structural unemployment by implementing active labour policies. On the other hand, specific actions have been considered to contain the strong segmentation that characterizes the Spanish labour market and, in this way, reduce inequalities (Dolado, Felgueroso and Jimeno, 2021).

Considering the composite and multidimensional nature of social inclusion, the Social Protection Committee of the European Commission (2003) considered it appropriate to divide the indicators into two levels: 1) first-level indicators referring to key elements of the labour market that can measure social inclusion; 2) second-level indicators that support the main indicators and describe other dimensions of the problem in more detail. These two levels, which include indicators agreed and defined by common agreement at European level, must be included both in the National Action Plan for Social Inclusion of individual member states and in the Joint Report on Social Protection and Social Inclusion. In addition, member states are also encouraged to consider third-level indicators in their National Action Plans that can capture national specificities in areas of particular interest and encourage the interpretation of primary and secondary indicators.

With regard to the social inclusion dimension being studied, Table 1 shows a breakdown of labour market indicators. This ranking is not intended to be exhaustive and takes account of the specific characteristics of the Spanish labour market. The agreement between the EU Member States on the adoption of a set of common labour market indicators on social inclusion is undoubtedly a major achievement. However, it is equally important to identify critical areas not covered by agreed indicators or requiring significant development.

Indicator	Definition
<i>First level indicators</i>	
Employment rate (aged 15-64)	Percentage ratio of employees aged 15-64 and population aged 15-64
Long-term unemployment rate	Ratio of persons seeking employment for 12 months and over to the labour force, referring to population aged 15-74
Inactivity rate (aged 15-64)	Percentage ratio of inactive persons aged 15-64 and population aged 15-64
Non-participation rate	Ratio between the sum of unemployed and inactive "available" (people who are not looking for work but would be willing to work), and the sum of labour force and inactive "available", referring to the population between 15 and 74 years.
<i>Second level indicators</i>	
Rate of youth employment (aged 15-29)	Percentage ratio of employees aged 15-29 and population aged 15-29
Smart working	Percentage of employees who have worked from home in the last 4 weeks out of total employment.
Temporary employment	Percentage of temporary employees who have started the current work for at least 5 years out of the total number of temporary employees
Involuntary part-time	Percentage of employees who claim to work part time because they have not found a full time job out of the total workforce.
Transformations from unstable work to stable work	Percentage of persons employed in unstable jobs at time t_0 who at a year's distance are engaged in stable work (permanent employees) out of the total number employed in unstable jobs at time t_0
<i>Third level indicators</i>	
Employees with low pay	Percentage of employees with less than 2/3 of the median hourly earnings of total employees
Overeducated employed	Percentage of persons in employment who hold a higher qualification than most to carry out that occupation
Perceived insecurity in employment	Percentage of employed persons who, in the following 6 months, believe that they are likely to lose their current job and that they are unlikely or not likely to find a similar one in the total employment
Satisfaction with the work done	Percentage of employed who expressed an average score of satisfaction between 8 and 10 for the following aspects of the work done: earning, career opportunities, number of hours worked, job stability, distance home-work, interest in work

Table 1 – Labour market indicators. Source: European Commission (2003); authors' illustration.

In the European context, social inclusion is a key priority for the long-term well-being of societies and for the economic stability of countries belonging to the European Union (EU). On the basis of this consideration, the European Commission presented the Action Plan for

Integration and Inclusion 2021-27, identifying employment as one of the four operational guidelines (European Commission, 2020). In the Plan, therefore, it is highlighted how important it is to identify targeted and tailored actions according to the specific obstacles and barriers to inclusion. For this reason, although the EU plays a leading role in supporting member countries' inclusion efforts, responsibility for implementing inclusion policies remains with individual states. The EU itself has raised how over the past decade employment has lost some of its capacity to promote social inclusion due to, on the one hand, the economic crisis (Eurofound, 2013) and, on the other hand, technological change and the exponential acceleration of new occupational forms associated with the digital economy (European Commission, 2018).

The interconnections between employment/unemployment and social inclusion/exclusion have been analysed at the national level (Gallie, Paugam and Jacobs, 2003; Caritas Europa, 2015) as well as at the regional level (Jurado Málaga and Pérez Mayo, 2010; Hernández Pedreño, 2014). Numerous studies have raised that the presence of labour and, above all, social barriers hinder the process of social integration of the most vulnerable groups (Wilton and Schuer, 2006; Barreiro Gen, Novo Corti and Ramil Díaz, 2013, Nota *et al.*, 2014). Still other studies focused their attention on the construction of composite indices of employment exclusion that can capture regional labour market imbalances, including in qualitative terms (Merino Llorente, Somarriba Arechavala and Negro, 2012; Lafuente Lechuga, Faura Martínez and García Luque, 2019).

Our study aims to analyse the impact of intra-national trade on employment and, through the labour market channel, on social inclusion. Isard (1960), founder of regional science, already pointed out in a long-standing study that the dynamics of intra-national commodity flows give rise to changes in regional income and employment. Despite Isard's insight, intra-national trade has received less attention than international trade in terms of both the development of an appropriate theoretical framework and the development of structured empirical research.

In an attempt to understand the pattern of trade, the gravity model (Tinbergen, 1962) has been widely used in the analysis of bilateral trade flows. For a long time, the gravity

equation was considered a simple physical application, with surprising empirical results but no theoretical validity. The links between trade theories and the gravity model were identified only later (Anderson, 1979; McCallum, 1995; Anderson and Van Wincoop, 2003). Feenstra (2002) used the gravity equation to distinguish between different trade theories, noting that the results depend on the type of good and the presence or absence of barriers to entry. In particular, the authors found that the concentration of a certain industry in a large market, where most of its goods are consumed, is significant for differentiated goods and that increasing returns are a necessary, but not sufficient, condition to ensure that such industrial concentration occurs. The gravity model has been widely used to measure the effect of international trade on income in order to solve the simultaneous causality problem. In a brilliant paper, Frankel and Romer (1999), employ a two-stage least squares regression (2SLS) to analyse the relationship between international trade and income.

There is a large literature studying the relationship between international trade and employment, income and wages. The first issue to consider is the direction of trade flows. While some studies show that imports have a negative impact of employment (Tuhin, 2015) and labour demand (Greenaway, Hine and Wright, 1999) because increased trade openness pushes firms to use the labour factor more efficiently, in others the effect of imports on employment, through productivity growth, is positive (Newfarmer and Sztajerowska, 2012). The effect of exports on the labour market is also mixed (Greenaway, Hine and Wright, 1999; Bernard and Jensen, 1999). In this case, exports could create incentives for firms to invest in new technologies, production scales as well as foster worker training processes (Newfarmer and Sztajerowska, 2012). Moreover, the establishment of a vicious/virtuous circle between increased trade and employment growth depends on the business sectors involved in trade flows (Görg and Görlich, 2012) and the countries between which trade takes place (Greenaway, Hine and Wright, 1999; Mashayekhi, Peters and Vanzetti, 2012).

In light of the previous literature, the debate on intra-national trade and its links to employment remains open. Therefore, intra-national flow exchanges between Spanish regions deserve to be deeply analysed to improve the understanding of the relationship between employment growth and intra-national trade.

3. Data and descriptive analysis

The data used in this article come from different sources. The main source is the C-Intereg database, which contains data on intra-national trade between Spanish regions. This database is integrated into the C-Intereg project, which was developed to have comparable and permanent estimates of trade flows within Spain (Llano *et al.*, 2010). Currently, the database collects information on interregional and intra-regional trade in goods for 18 Spanish regions from 1995 to 2020, specifying the origin and geographic destination of annual trade flows. The last year of the time series was excluded from the analyses because the data for the year 2020 are an advance; therefore, their inclusion in the econometric analyses could lead to biased results.

In addition, data from the autonomous cities of Ceuta and Melilla and the Balearic and Canary Islands are not included because they account for less than 5 percent of Spain's interregional trade and contain many zeros. Indeed, a typical feature of trade data is the asymmetric presence of zeros, due in particular to non-existent trade flows between some pairs of countries (or between pairs of regions located in different countries) or to rounding errors. In this case, when the dependent variable takes a value equal to zero, there are difficulties in estimating trade (Silva and Tenreyro, 2006). However, we should keep in mind that this problem is clearly less of an issue in the context of intra-national trade, as non-existent trade flows between a couple of regions within a country are less likely to occur than those between a region and any other country.

Data on employment, unemployment, gross domestic product (GDP), population and area for Spain's 15 autonomous communities were extracted from the Spanish National Statistical Institute (INE - *Instituto Nacional de Estadística*). GDP is measured in current prices, that is, the values that are recorded at the time of the survey are considered. Finally, data on education come from the database of the *Ministerio de Educación y Formación Profesional*, which, considering information from population censuses, provides the level of education of people aged 25-64, a variable that measures the endowment of human capital available in each region. For descriptive statistics of the variables included in the analysis,

see Table A1 in Appendix A.

In Spain, interregional trade accounts for an important share of each region's total trade. Indeed, several studies confirm that the border effect is positive and significant in Spain (Gil Pareja *et al.*, 2005). In recent years, however, the border effect in the Iberian Peninsula, although it remains positive and significant, has been declining (Gallego and Llano, 2015). Figure 1 shows a general overview of Spanish trade confirming what has just been stated. Indeed, the data highlight the relative importance of intra-national trade and at the same time show the sharp increase in the openness of Spanish regions to international markets. The volume of interregional trade (defined by the sum of interregional exports and interregional imports) was always higher than international trade (represented by the sum of exports and imports) in absolute value until 2011, the year of the sovereign debt crisis.

As a result, except for the special situation of the islands, regional economies have high levels of relations and interrelationships with other Spanish regions. Only in the second decade of the 2000s did the value of international trade exceed that of interregional trade. Specifically, the volume of interregional trade increased until the onset of the financial crisis in the second half of 2007 to follow a seesaw trend thereafter, while international trade has shown an upward trend since that period.



Figure 1 - International, interregional and intra-regional trade of Spanish regions in billions of euros, 1999-2019. Source: INE - C-Intereg database (interregional and intra-regional trade), DataComex (international trade); authors' illustration.

Figure 2 maps average regional employment growth and intra-national trade for the period 1999-2019. Specifically, in Figure 2(a) each Spanish region is shaded with an intensity proportional to the standard deviation (SD) of the average annual growth in the share of employment in the working population (15-64 years). Regions within the ± 0.4 range of the SD have the closest average employment growth. Regions shown in lighter shades of green have employment growth shares ranging from -0.4 to -1.2 and less than -1.2 of SD below the average, and regions in darker shades of green show average employment growth that falls within the range 0.4-1.2 and more than 1.2 of SD above the average. The spatial distribution of employment share indicates that five Spanish regions fall between -0.4 and 0.4 SD from the mean. The average growth in employment share is above average (Asturias, Cantabria, Basque Country, Castile and Leon, Madrid, and Extremadura) and below average (Navarre, Castile La-Mancia, Catalonia, Valencia, and Murcia) in five regions as well.

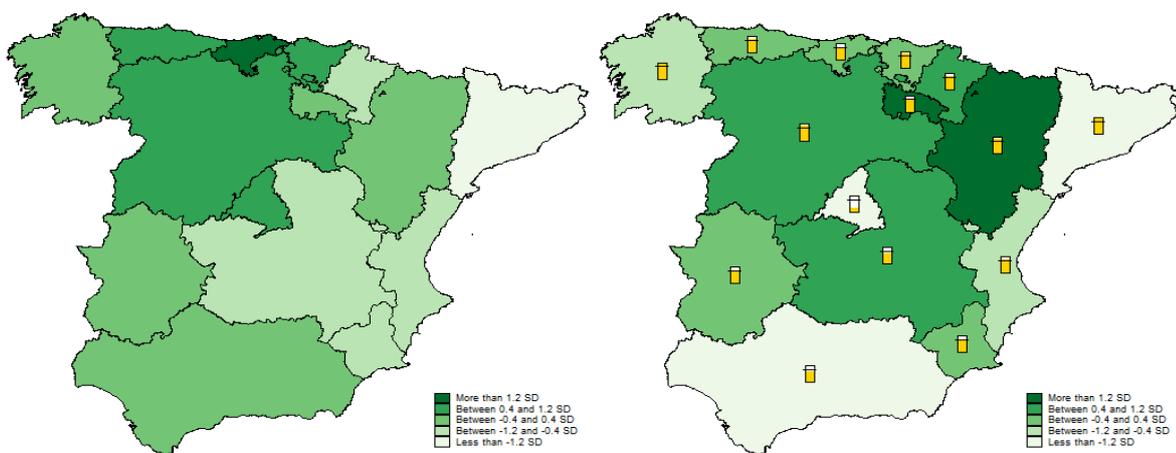


Figure 2 - Interregional trade and employment growth in Spanish regions, 1999-2019. Figure 2 (a) average annual growth in the share of employment in the population 15-64 years old; (b) average interregional trade as a percentage of GDP and average intra-regional trade as a percentage of GDP. Source: INE - Spanish National Statistical Institute and C-Interreg database; authors' illustration.

Figure 2(b) provides an overview of intra-national trade. The standard deviation method is also used to map the average of interregional trade as a percentage of GDP; instead, intra-regional trade as a percentage of GDP is represented by yellow rectangular plots.

In particular, we observe that both the most populated regions such as Andalusia, Madrid

and Catalonia, having a share of interregional trade less than 1.2 SD below the average, are the regions with the most significant shortcomings in interregional trade. In contrast, La Rioja, a small, sparsely populated Spanish region, has an imperative to intensify trade relations with other regions and has an interregional trade share 1.2 SD above the average.

Regarding intra-regional trade, northern Spanish regions have a higher share in terms of GDP than southern regions. Thus, intra-regional trade reflects the classic north-south divide in Spain, that is, the gap that exists between poorer and richer Spanish regions. To analyse the situation in Spain, the share of the employed population has been used, which is a significant indicator as it offers a quantitative measure of the portion of the population that is actually working.

4. Methodology

As outlined earlier, this paper exploits Frankel and Romer's (1999) key idea that a country's geographic attributes are important factors that drive bilateral trade without affecting income and, therefore, employment. More specifically, the hypothesis that geographic attributes are highly correlated with trade but unrelated to employment allows the difficulties generated by simultaneous causality to be addressed. This proposal can be applied at the regional level, to identify the relationships between intra-national trade and employment, because geographic attributes are important factors that drive intra-national trade without affecting the level of employment. Thus, the equation devised by Frankel and Romer (1999) can be revised as follows:

$$\text{employment_it} = \alpha + \gamma \text{inter_it} + \delta \text{intra_it} + \sigma \quad (1)$$

where employment_it is the number of people employed in region i , inter_it is interregional trade, intra_it is intra-regional trade, and σ includes other factors affecting regional employment for each time period t .

Frankel and Romer's instrumental variables method involves a two-stage regression. In the first stage, interregional trade is estimated by the following linear logarithmic gravity equation:

$$\ln(\text{inter}_{ij}/y_i) = \alpha_0 + \alpha_1 \ln(\text{distance}_{ij}) + \alpha_2 \ln(\text{population}_i) + \alpha_3 \ln(\text{population}_j) + \alpha_4 \ln(\text{land}_i) + \alpha_5 \ln(\text{land}_j) + \alpha_6 \text{border}_{ij} + \mu \quad (2)$$

where index i and j denote the source region and destination region of trade flows, respectively; inter_{ij} is the bilateral interregional trade between i and j in thousands of euros; y_i is the gross domestic product at market prices of region i measured in thousands of euros; distance_{ij} is the distance from i to j ; population is the regional population; land is the regional land area measured in square kilometres; and border_{ij} is a contiguity dummy for a common border between i and j . To limit the risk of introducing redundant variables that do not contribute in terms of statistical significance, the interaction terms of the contiguity dummy are excluded from the model (Head and Mayer, 2002).

In estimating the value of intraregional trade, the gravity equation is modified as follows:

$$\ln(\text{intra}_i/y_i) = \alpha_0 + \alpha_2 \ln(\text{population}_i) + \alpha_3 \ln(\text{land}_i) + \varepsilon \quad (3)$$

where intra_i is intra-regional trade.

Among the geographic variables used to estimate trade, the distance measure has raised many questions. Although distance is widely used in gravity models, it has been criticized by many authors (see, among others, Head and Mayer, 2002; Novy, 2013) who argue that, in the literature on this topic, distance has traditionally been measured incorrectly. In particular, Head and Mayer (2002) constructed an accurate measure based on constant elasticity substitution index of effective distance that can be used in the context of intra-national trade:

$$\text{distance}_{ij} = \left[\sum_{k \in i} (y_k / y_i) \sum_{l \in j} (y_l / y_j) d_{kl}^\theta \right]^{1/\theta} \quad (4)$$

where, in the case of interregional trade, i and j are regions and k and l are provinces within regions i and j , respectively; d_{kl} measures the Euclidean distance from k to l ; and y represents GDP at market prices. With reference to the parameter θ , some times it takes a value equal to 1; however, Head and Mayer (2022) found that in most cases it takes a value approximately equal to -1. The major difference is that the weights given to small and large distances are higher in the harmonic mean ($\theta=-1$) and lower in the arithmetic mean ($\theta=1$), respectively.

In the second step, the estimated values obtained through the interregional and intra-regional trade equations are aggregated in order to analyse the impact of global intra-national trade on employment. In this way, a predicted value is obtained for each region i for both the share of interregional and intra-regional trade. The second linear logarithmic equation can be specified as follows:

$$\ln(\text{employment})_i = \alpha_0 + \alpha_1 \ln(\text{intershare})_i + \alpha_2 \ln(\text{intrashare})_i + \alpha_3 \ln(\text{education})_i + \omega \quad (5)$$

where employment is the share of the employed population in relation to the working population (15-64 years old), intershare is the instrumental variable for interregional trade generated by equation (2), intrashare is the instrumental variable for intra-regional trade generated by equation (3), and education is a proxy for human capital, measured by the percentage of the population aged 25-64 who have attained a tertiary level of education.

5. Econometric analysis

5.1 First stage: gravity models of intra-national trade

In the first stage of the analysis, panel data of interregional and intra-regional trade are used, covering 15 Spanish regions during a 21-year time interval (1999 to 2019). At this stage, the choice of model should aim to analyse the time-varying effects that geographic variables have on intra-national trade. Statistical tests performed on the panel data raise three types of issues to be dealt with, heteroscedasticity, contemporaneous correlation among the panel data, and first-order autocorrelation.

Table A2 in Appendix A contains a series of tests for the gravity models of intra-national trade, which includes interregional and intra-regional trade. A joint test was performed to examine the hypothesis that the dummies for all years are equal to 0 in order to clarify whether time fixed effects are necessary. The result of the test indicates that temporal variables should be included in the intra-national trade severity model.

The panel-data literature has repeatedly pointed out that panel-data models are likely to incorporate substantial interdependence in errors. We use the test of Pesaran CD (2004) to test whether the residuals are correlated across Spanish regions. The results of this test suggest the presence of cross-sectional dependence only in the regression of intra-regional trade. In addition, the modified Wald test indicates that the errors show heteroscedasticity. Finally, since panel data were used to calibrate the gravity model, a first-order autocorrelation test is also performed. Specifically, we perform the Wooldridge (2002) test, which derives a simple autocorrelation test in models with panel data. The results confirm the presence of first-order autocorrelation.

To address the problems of contemporaneous correlation, heteroscedasticity and first-order autocorrelation, we use a Prais-Winsten regression that computes corrected estimates of standard errors, assuming heteroscedasticity and contemporaneous correlation among panel data and specifying first-order autocorrelation within the same panel data.

Following standard practice, we measure interregional trade in equation (2) with the sum

of interregional exports and imports. Next, we estimate equation (2) separately for interregional exports and imports. The coefficients estimated with the gravity model of interregional trade described by equation (2) are shown in Table 2. As expected, the distance coefficient is negative in all three regressions. The population of source regions decreases interregional trade by about 0.2. In contrast, the population of destination regions increases interregional trade as well as sharing a common border, which exerts the strongest effect on trade between region *i* and region *j*. Finally, the coefficients of the regional land area, for both the regions of origin and the destination, are negative.

	inter _{ij} (a)	intra _i (b)
ln(distance) _{ij}	-0.01** [0.00]	
ln(population) _i	-0.15*** [0.02]	-0.12*** [0.03]
ln(population) _j	0.90*** [0.02]	
ln(area) _i	-0.08*** [0.02]	0.13*** [0.03]
ln(area) _j	-0.24*** [0.02]	
border	1.643*** [0.04]	
Regions	15	15
Observations	4398	315
R ²	0.57	0.62

*Table 2 – Gravity model of intra-national trade, 1999-2019. Notes: (a) The dependent variable is bilateral interregional trade; (b) the dependent variable is intra-regional trade; (i) Standard error corrected in parentheses; (ii) *Statistically significant at the 10% level; **statistically significant at the 5% level; ***statistically significant at the 1% level. Source: authors' illustration.*

Next, we also evaluate intra-regional trade with geographic variables using the logarithmic linear gravity equation (3). Table 2 reports the results. Our estimates suggest that regional population has a negative impact on trade, as a percentage of GDP, within Spanish regions, while regional area has a positive one.

The next logical step is to ascertain whether geographic factors, just as for international

trade (Frankel and Romer, 1999), retain their predictive power for intra-national trade. For this purpose, the values estimated from equations (2) and (3) are aggregated to obtain the predicted values of the share of interregional and intra-regional trade. To assess the quality of the instruments in terms of the correlation between the actual and predicted trade ratios, a scatter plot is used. Their graphical representation is shown in Figure 3, which gives evidence of the power of geographic attributes in explaining both interregional and intra-regional trade.

Figure 3 (a) shows the relationship between actual and predicted interregional trade. As we expected, there is a strong positive correlation between the share of actual and predicted interregional trade. In fact, both Pearson's and Spearman's correlation coefficients show the strength of the association between the two measured variables of 0.93 and 0.92, respectively. The relationship between the actual and predicted intra-regional trade share is illustrated in Figure 3 (b). In this case, the Pearson and Spearman correlation coefficients take slightly lower correlation values than before, 0.92 and 0.91, respectively.

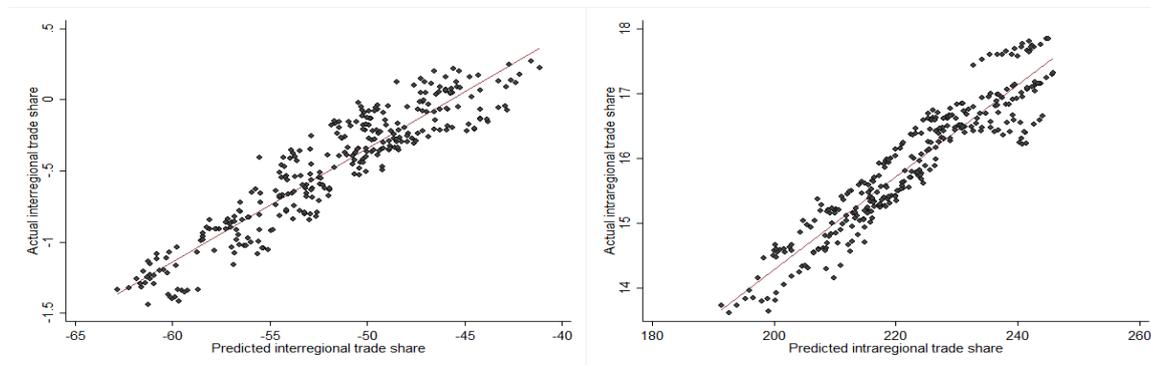


Figure 3 - Actual vs predicted intra-national trade, 1999-2019.

Figure 3 (a) - Correlation between actual and predicted interregional trade; (b) correlation between actual and predicted intra-regional trade. Source: authors' illustration.

As will be described in the second stage of the analysis, estimates of intra-national trade, derived from the gravity models of interregional and intra-regional trade, are used to explore the impact of intra-national trade on regional employment.

5.2 Second stage: the relationship between intra-national trade and employment

In this section, the values obtained through equations (2) and (3), are aggregated to produce a share of each Spanish region's predicted trade with each other. The predicted shares of trade are used in equation (5) to estimate the impact of intra-national trade on employment. In what follows, we compare the estimation results of three regression models: the least squares method, a fixed effects (FE) model and the instrumental variables (IV) method. The choice of the fixed-effects model, which aims to analyse the time-varying effects that the independent variables in equation (5) have on employment, rather than a random-effects one is supported by the Hausman test (Table A3 in Appendix A). The panel data for 1999-2019 are presented in Table 3. As in the first stage, the test results indicate that fixed time effects are needed in all three regressions (Table A3 in Appendix A).

	OLS		FE		IV	
	(a)	(b)	(c)	(d)	(e)	(f)
intershare	0.00** (0.00)	0.01*** (0.00)	-0.1 (0.01)	-0.01 (0.01)	0.05** (0.02)	0.14* (0.08)
intrashare	-0.00 (0.00)	-0.03*** (0.00)	0.34*** (0.09)	0.34*** (0.08)	-0.08 (0.06)	-0.03 (0.12)
education	0.32*** (0.02)		0.00 (0.06)		0.25*** (0.03)	
Regions	15	15	15	15	15	15
Observations	315	315	315	315	315	315
R ²	0.69	0.52	0.89	0.89	0.63	0.24

Table 3 - Relationship between intra-national trade and employment, 1999-2019.

*Notes: (a) The dependent variable is the share of the employed population; (i) Standard error corrected; (ii) Standard error corrected in parentheses; (ii) *Statistically significant at the 10% level; **statistically significant at the 5% level; ***statistically significant at the 1% level. Source: authors' illustration.*

Before commenting on the results obtained by applying the regression models, it is appropriate to conduct the unit root analysis, performed by a Levin-Li-Chun (2002) test, whereby the null hypothesis of a unit root can be rejected in favour of the alternative hypothesis that the employment share is stationary.

The empirical results suggest that the total OLS regression is able to explain a good deal

of the variation in the share of the employed population, with an overall R² of 0.69. The statistically significant coefficient for the share of interregional trade indicates a positive effect on employment. The coefficient for the explanatory variable of education, 0.32, has the expected sign (Table 3).

Improvements in fit are obtained with the specification of the fixed-effects regression model (R² = 0.89). The coefficient associated with interregional trade is positive and significant. The inclusion of the education-related explanatory variable in the FE regression model has no effect on the proportion of the variance in employment that is explained by the independent variables. However, despite the advantages of FE regressions, only IV method adequately addresses the problem of endogeneity.

The full regression with instrumental variables is able to explain much of the variance in the share of the employed population, with an overall R² of 0.63. Regarding the effect of interregional trade on employment, the empirical results of IV method indicate that interregional trade has a positive and significant impact on the share of the employed relative to the population aged 15-64. A 1 percent increase in interregional trade increases the employment share by about 0.1 percent. This result is in line with neoclassical predictions when open economies face different relative prices. As a result, domestic producers and consumers would adjust their production and consumption patterns through reallocation processes, and it is precisely these processes that would lead to employment benefits of trade. On the production side, these would be gains from specialization associated with the incentive to shift production based on comparative advantages. In support of this, a large number of firms in Spanish industry, particularly specializing in high-tech manufacturing industries, are geographically concentrated, underscoring the importance of the supply of highly educated and skilled workers in the labour market (Alonso Villar, Chamorro Rivas and González Cerdeira, 2004). In fact, when we exclude the education variable, a measure of human capital quality, although the coefficient of interregional trade remains positive and significant, the ability of the intra-national trade variables to explain variation in employment plummets dramatically.

Looking at the results, we find that intra-regional trade has a negative and non-significant

impact on employment over the reference period (1999-2019). In addition, we find a stronger effect of regional human capital on income. In fact, a 1 percent increase in the percentage of the population in the 25-64 age group with a tertiary education degree increases employment by about 0.3 percent.

	Without spatial lag				With spatial lag			
	employment		unemployment		employment		unemployment	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Wemployment _{it}	-	-			-0.05*	-0.16***	0.52*	1.94***
					(0.03)	(0.03)	(0.31)	(0.20)
intershare	0.05**	0.14*	-0.27***	-0.74**	0.05**	0.08**	-0.20***	-0.14**
	(0.02)	(0.08)	(0.05)	(0.33)	(0.02)	(0.03)	(0.04)	(0.06)
intrashare	-0.08	-0.03	0.01	0.46	-0.05	-0.09	0.04	0.68***
	(0.06)	(0.12)	(0.15)	(0.60)	(0.04)	(0.06)	(0.15)	(0.14)
education	0.25***		-1.13***		0.21***		-0.94***	
	(0.03)		(0.08)		(0.04)		(0.20)	
Regions	15	15	15	15	15	15	15	15
Observations	315	315	315	315	315	315	315	315
R ²	0.63	0.24	0.88	0.55	0.66	0.55	0.89	0.77

Table 4 - Estimation using the instrumental variables (IV) method and spatial lag, 1999-2019.

*Notes: (a), (b), (e) and (f) The dependent variable is the share of the employed population; (c), (d), (g) and (h) The dependent variable is the share of the unemployed population; (i) Standard error corrected in parentheses; (ii) *Statistically significant at the 10% level; **statistically significant at the 5% level; ***statistically significant at the 1% level. Source: authors' illustration.*

The results are tested for robustness of the regressors by estimating the IV regression with panel data described in equation (5) in order to estimate the effects of interregional trade on the share of the unemployed population aged between 15 and 74. Table 4 reports the results of the first robustness test using the two indicators reflecting social inclusion. In regression models (c) and (d) the impact of intra-national trade on unemployment is estimated while columns (a) and (b) refer to estimates computed by the IV basic method of Table 2. The coefficient estimates for regression (c) and (d) are consistent with those previously estimated and reported in Table 2, thus indicating the robustness of the regressors to assess the effects of interregional trade on the regional labour market. Indeed, interregional trade and human capital reduce unemployment (an increase of 1% in interregional trade and in the percentage of people who have attained a higher education

qualification decreases unemployment by 0.27% and 1.13% respectively). The coefficients for interregional trade and human capital are statistically significant in all regressions. Conversely, intra-regional trade has a positive and not significant impact on the share of unemployed.

We observe that the instrumental variables method explains a higher proportion of the change in the regional labour market in the regression using the share of unemployed as an independent variable ($R^2=0.88$). The main finding concerns the substantial increase of the coefficient of the interregional trade, while maintaining the positive sign, when the variable capturing the quality of regional human capital is excluded.

In light of these results, interregional trade appears to have a positive effect on the regional labour market, but its intensity and significance depends on the quality of human capital the region has. On the other hand, intra-regional trade follows a pattern exactly opposite to that recorded by interregional trade. In fact, intra-regional trade within Spanish regions, although not significant, decreases the share of the employed and increases that of the unemployed population.

In what follows, we explore the presence of spatial effects in the form of spatial dependence in equation (5). If the variables are spatially correlated, a spatial modelling framework may be more appropriate. To get a formal indication of the degree of linear association between the values of the variables at each location relative to the values of its neighbours, we rely on the Moran I statistic (Moran, 1950). In the Moran I calculation, a crucial role is played by defining the spatial linkage between spatial units. Neighbours can be defined in various ways. Consequently, several strategies for determining the spatial weights matrix are discussed in the literature (Anselin, 1988; Rey and Montuori, 1999), ranging from simple binary contiguity matrix to more sophisticated distance-based spatial weights matrices. In our study we construct the spatial weights matrix based on the distance strategy, using the inverse square distance as the functional form, which can be interpreted as reflecting a gravity function. The results of the Moran I test on the variables indicate that we can reject the null hypothesis that there is zero spatial correlation (see Table A4 in Appendix A). Thus equation (5) can be rewritten as follows:

$$\ln(\text{employment})_{it} = \alpha_0 + \alpha_1(W)_{it-1} + \alpha_2 \ln(\text{intershare})_{it} + \alpha_3 (\text{intrashare})_{it} + \alpha_4 \ln(\text{education})_{it} + \varphi \quad (6)$$

where W_{it-1} is the share of the employed (unemployed) population lagged in space and W is the matrix of spatial weights.

Table 4 shows the results of estimating method IV with spatial effects. The spatially lagged dependent variable has a clear impact on the employment level indicating the presence of spatial effects. Controlling for the values of the employed of neighbouring regions reduces the share of the employed population by 0.05%. Therefore, a region has a less dynamic labour market when neighbouring regions have high shares of employed population relative to the population aged 25 to 64. Moreover, the same variable, when we control for intra-national trade but not for regional human capital, indicates a further reduction in the share of employed people. These results again seem to confirm the emergence of clusters at the regional level. Major regions, specializing in higher value-added production, support the creation of linkages between firms, skills and knowledge in a way that stimulates regional employment.

Regarding the impact on the regional labour market, the full model shows that interregional trade maintains a positive and significant effect. A 0.05 percent increase in interregional trade increases the employment share by about 0.1 percent, still in line with the neoclassical prediction. These results are confirmed by regressions (g) and (h) using the share of unemployed population as an dependent variable. Interregional trade and human capital have a negative and significant effect on regional unemployment, while intra-regional trade has a positive and not significant impact.

6. Conclusion

The aim of this study is to analyse intra-national trade as a tool for social inclusion in Spanish regions, assuming that employment does not automatically generate integration and

inclusion. In this context, in order to establish a virtuous link between these two components of society, the institutional system must assume an appropriate structure, through the adoption of adequate political strategies and within the framework of an appropriate form of social governance.

Social inclusion must not be an impossible utopian aim to achieve. In the current context, which has been severely deteriorated by the energy crisis, social inclusion through one of its key components, namely labour market participation, could play a central role in Spain's economic recovery, raising, in addition, the level of well-being and satisfaction of its population. The problems highlighted the great importance of active labour policies within the Spanish Government's Recovery, Transformation and Resilience Plan. Europe has faced the difficult pandemic by suspending some of the budgetary rigidities inherent in the Stability and Growth Pact and the Fiscal Compact. An important choice that can give impetus to the process of European unification. It should be pointed out that the large resources provided must not be conceived in terms of exceptionality and temporariness, but as a great opportunity to relaunch the economy and make the necessary reforms. The strategic objective of achieving social cohesion belongs to the category of priority reforms. In this sense, policies for social inclusion pass, above all, through support for participation in the labour market and the professional and career development of the Spanish and European population.

Although countries tend to trade more within national borders, the effects of intra-national trade on regional employment have remained poorly studied. Using the instrumental variables method with spatial lags, this paper aims to fill part of this gap by estimating the impact of interregional and intra-regional trade flows on employment and unemployment by addressing endogeneity. Our study considers the case of Spanish regions from 1999 to 2019. In the first decade of this period, Spain experienced significant growth in intra-national trade both in terms of trade flows between regions and trade within each individual region. However, since 2008, the Iberian country has been severely affected by the global financial crisis and has fallen into a deep depression that has persisted for several years, affecting the labour market more intensely than in other European countries (Dolado,

Felgueroso and Jimeno, 2020). It is precisely since the financial crisis of 2007 that intra-national trade has also been on a downward trend to slowly recover thereafter only since 2015.

Overall, the results reveal that interregional trade appears to have positive effects on the regional labour market, both when considering the share of employed population as an dependent variable and when analysing the impact of intra-national trade on unemployment separately, confirming the prediction of the neoclassical growth model. In addition, increasing regional human capital endowment also improves labour market conditions in terms of employment. In contrast, intra-regional trade has a no significant negative effect on the share of the employed population, while it has a positive and non significant one on regional unemployment.

The results obtained from the model with spatial lags led to the same conclusion regarding the role played by intra-regional trade in promoting employment. First, when the number of people employed relative to the working population of neighbouring regions is controlled, the share of the employed population is reduced by 0.16 percent, while that of the unemployed population increases by 1.94%. Second, a moderate effect of interregional trade on employment and unemployment emerges when the spatially lagged dependent variable is included among the explanatory variables. Third, the magnitude of the coefficient of interregional trade appears to be slightly larger when the variable measuring human capital is excluded from the regressions.

What recommendations or proposals can be made regarding the important policy goal of promoting regional employment? Our results clearly indicate that interregional trade makes the labour market more efficient. Future research should therefore deepen the links between intra-national trade and the labour market, using third-level indicators that capture the specific and characteristic features of the Spanish labour market. In addition, the issue of regional heterogeneity should be addressed by considering a smaller and larger sampling unit such as the provinces. Another interesting point should involve a more in-depth analysis of intra-national trade by productive sectors to identify which of them make a more decisive contribution to employment growth.

The “issue of inclusion” assumes a priority role. It is a challenge that Spain must face if it is not to see its progressive detachment from the most advanced areas of Europe. Moreover, a better functioning of the labour market means not only more integration and inclusion, employment and well-being, but also the ability to connect with the other aggregates of the economic system called innovation, productivity, entrepreneurship. The values examined are quite eloquent in supporting the strategic role of interregional trade in promoting greater labour market efficiency.

Appendix A

	Average	Standard deviation	Minimum	Maximum
<i>First stage</i>				
$inter_{ij}/y_i$	0.0477841	0.0587768	0	0.530857
$export_{ij}/y_i$	0.0229873	0.027735	0	0.2141897
$import_{ij}/y_i$	0.0247967	0.0339567	0	0.3247809
$intra_i/y_i$	0.2160052	0.0560613	0.0563907	0.3411831
pop_i	2822848	2428578	27665	8427403
pop_j	2822848	2428578	272665	8427403
$area_i$	32901.1	303119.1	5045	94228
$area_j$	32901.1	303119.1	5045	94228
$distance_{ij}$	248860.1	266645.5	2.67e-06	206839
<i>Second stage</i>				
$employment_t$	0.6010444	0.0592845	0.441	0.715
$unemployment_t$	0.145581	0.067115	0.041	0.362
$education_t$	31.04012	7.739488	14.8989	50.7655

Table A1 - Summary of descriptive statistics. Source: authors' illustration.

	inter_{ij}	intra_{ij}
Time-related variables	si	si
Time fixed effects test ^a	976.52***	1257.04***
Pesaran CD test ^b	1.11	12.35***

Modified Wald test ^c	54651.88** *	72019.03***
Wooldridge test ^d	7.42***	125.02***

Table A2 - Tests for gravity model of intra-national trade.

Notes: a The test for time effects is a joint test where the null hypothesis is that the coefficient for all years is jointly equal to zero; b The Pesaran CD test is a test for correlation between residuals, where the null hypothesis is that the residuals are uncorrelated; c The modified Wald test is a test for heteroscedasticity in residuals, where the null hypothesis is homoscedasticity (or constant variance); d The Wooldridge test is a test that measures first-order autocorrelation, where the null hypothesis is the absence of first-order autocorrelation. Source: authors' illustration.

	OLS	FE	IV	IV with spatial lag
employment				
Time-related variables	yes	yes	yes	yes
Time fixed effects test ^a	10.30***	46.44***	647,75***	672.11***
Hausman test ^b	-	113,85***	27.51	22.71
unemployment				
Time-related variables	yes	yes	yes	yes
Time fixed effects test ^a	50.21***	43.39***	1549.43***	29.22*
Hausman test ^b	-	72.98***	15.92	9.87

Table A3 - Tests for regressions of intra-national trade on employment.

Notes: a The test for time effects is a joint test in which the null hypothesis is that the coefficient for all years is jointly equal to zero; b Hausman's test is a test for choosing between fixed-effects and random-effects models in which the null hypothesis is that the preferred model is the random-effects model. Source: authors' illustration.

	Moran's I statistics
lnemployment	23.5 [0.000]***
lnunemployment	19.8 [0.000]***
intershare	-7.07 [0.000]***

intrashare	-42.89 [0.000]***
lneducation	12.84 [0.000]***

Table A4 - Global spatial autocorrelation Moran's I statistics (z-scores).

Notes: (i) A 15x15 inverse matrix of standardized distances was used; (ii) *Statistically significant at the 10% level; **statistically significant at the 5% level; ***statistically significant at the 1% level. Source: authors' illustration.

References

- Alonso Villar O., Chamorro Rivas J.M., González Cerdeira X. (2004). Agglomeration economies in manufacturing industries: The case of Spain. *Applied Economics*, 36, 18: 2103. DOI: 10.1080/0003684042000264029.
- Anderson J.E. (1979). A theoretical foundation for the gravity equation. *American Economic Review*, 69, 1: 106.
- Anderson J.E., Van Wincoop E. (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review* 93, 1: 170.
- Anselin L. (1988). *Spatial economy: Methods and models*. Dordrecht: Springer. DOI: 10.1007/978-94-015-7799-1.
- Atkinson A.B. (1998). Social exclusion, poverty and unemployment. In Atkinson A.B., Hills J., a cura di, *Exclusion, employment and opportunity*. London: London School of Economics and Political Science, Centre for Analysis of Social Exclusion. Retrieved from: <https://sticerd.lse.ac.uk/dps/case/cp/Paper4.PDF> (07/08/2023).
- Barreiro Gen M., Novo Corti I., Ramil Díaz M. (2013). Employment, education and social exclusion: Analyzing the situation of people at prison in Galicia. *Galician Journal of Economics* 22, special issue: 225. DOI: 10.15304/rge.22.Extra.1409.
- Bernard A.B., Bradford Jensen J. (1999). Exceptional exporter performance: cause, effect, or both? *Journal of International Economics* 47, 1: 1. DOI: 10.1016/S0022-1996(98)00027-0.

- Caritas Europa (2015). *Poverty and inequalities on the rise. Just social models needed as the solution*. Brussels: Caritas Europa. Retrieved from: <https://www.caritas.eu/wordpress/wp-content/uploads/2018/09/150101-PU-Poverty-and-inequalities-on-the-rise.pdf> (07/08/2023).
- Castel R. (1995). *Les métamorphoses de la question sociale. Une chronique du salariat*. Paris: Fayard.
- Chen N. (2004). Intra-national versus international trade in the European Union: why do national borders matter? *Journal of International Economics*, 63, 1: 93. DOI: 10.1016/S0022-1996(03)00042-4.
- Dolado J.J., Felgueroso F., Jimeno J.F. (2021). Past, present and future of the Spanish labour market: when the pandemic meets the megatrends. *Applied Economic Analysis*, 29, 85: 21. DOI: 10.1108/AEA-11-2020-0154.
- Eurofound (2013). *Impact of the crisis on working conditions in Europe*. Luxembourg: Publications Office of the European Union. Retrieved from: <https://www.eurofound.europa.eu/publications/reports/2013/impact-of-the-crisis-on-working-conditions-in-europe> (07/08/2023).
- European Commission (2003). *Common outline for the 2003/2005 NAPs/inclusion*. Brussels: European Commission. Retrieved from: https://ec.europa.eu/employment_social/social_inclusion/docs/commonoutline2003final_en.pdf (07/08/2023).
- European Commission (2018). *Employment and Social Developments in Europe. Annual Review 2018*. Luxembourg: Publications Office of the European Union. Retrieved from: <https://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=9150> (07/08/2023).
- European Commission (2020). *Action plan of integration and inclusion 2021-2027*. Brussels: European Commission. Retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0758> (07/08/2023).
- Feenstra R.C. (2002). Border effects and the gravity equation: Consistent methods for estimation. *Scottish Journal of Political Economy*, 49, 5: 491. DOI: 10.1111/1467-9485.00244.
- Flanagan R.J., Khor N. (2012). Trade and quality of employment: Asian and non-Asian

- economies. In Lippoldt D., a cura di, *Policy priorities for international trade and jobs*. Paris: OECD. Retrieved from: <https://www.oecd.org/site/tadicite/50258009.pdf> (07/08/2023).
- Frankel J.A., Romer D.H. (1999). Does trade cause growth? *American Economic Review*, 89, 3: 379. DOI: 10.1257/aer.89.3.379.
- Gallego N., Llano C. (2015). Thick and thin borders in the European Union: How deep internal integration is within countries, and how shallow between them. *The World Economy*, 38, 12: 1850. DOI: 10.1111/twec.12242.
- Gallie D., Paugam S., Jacobs S. (2003). Unemployment, poverty and social isolation: Is there a vicious circle of social exclusion? *European Societies*, 5, 1: 1. DOI: 10.1080/1461669032000057668.
- Gil Pareja S., Llorca Vivero R., Martínez Serrano J.A., Oliver Alonso J. (2005). The border effect in Spain. *The World Economy* 28, 11: 1617. DOI: 10.1111/j.1467-9701.2005.00749.x.
- Görg H., Görlich D. (2012). Trade and labour market outcomes in Germany. In Lippoldt D., a cura di, *Policy priorities for international trade and jobs*. Paris: OECD. Retrieved from: <https://www.oecd.org/site/tadicite/50258009.pdf> (07/08/2023).
- Greenaway D., Hine R. C., Wright P. (1999). An empirical assessment of impact of trade on employment in the United Kingdom. *European Journal of Political Economy*, 15, 3: 485. DOI: 10.1016/S0176-2680(99)00023-3.
- Head K., Mayer T. (2002). *Illusory border effects: Distance mismeasurement inflates estimates of home bias in trade*. Paris: CEPII Working Paper. Retrieved from: http://www.cepii.fr/PDF_PUB/wp/2002/wp2002-01.pdf (07/08/2023).
- Hernández Pedreño M., a cura di (2014). *Evolución de la exclusión social en la Region de Murcia: Repercusiones sociales de la crisis*. Murcia: Editum.
- Isard W. (1960). *Methods of regional analysis: an introduction to regional science*. Cambridge: MIT Press.
- Jurado Málaga A., Pérez Mayo J. (2010). Dimensión territorial de la pobreza en España. *Revista Española del Tercer Sector*, 15: 43. Retrieved from:

<http://www.plataformatercersector.es/sites/default/files/N15%20RETS%20Exclusi%C3%B3n%20social%20y%20pobreza%20en%20Espa%C3%B1a%20en%20el%20contexto%20de%20la%20Uni%C3%B3n%20Europea.pdf> (07/08/2023).

Lafuente Lechuga M., Faura Martínez U., García Luque O. (2019). Employment exclusion in Spain: a territorial approach. *Applied Economic Analysis*, 27, 80: 127. DOI: 10.1108/AEA-06-2019-0001.

Levin A., Lin C-F., Chu C-S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, 108, 1: 1. DOI: 10.1016/S0304-4076(01)00098-7.

Lippoldt D., a cura di, (2012). *Policy priorities for international trade and jobs*. Paris: OECD.

Llano C., Esteban A., Perez J., Pulido A. (2010). Opening the interregional trade “Black Box”: The C-interreg database for the Spanish economy (1995-2005). *International Regional Science Review*, 33, 3: 302. DOI: 10.1177/0160017610370701.

Mashayekhi M., Peters R., Vanzetti D. (2012). Regional integration and employment effects in SADC. In Lippoldt D., a cura di, *Policy priorities for international trade and jobs*. Paris: OECD. Retrieved from: <https://www.oecd.org/site/tadicite/50258009.pdf> (07/08/2023).

McCallum J. (1995). National borders matter: Canada-U.S. regional trade patterns. *American Economic Review*, 85, 3: 615.

Merino Llorente M.C., Somarriba Arechavala N., Negro Macho A.M. (2012). Un análisis dinámico de la calidad del trabajo en España. Los efectos de la crisis económica. *Estudios de Economía Aplicada*, 30, 1: 261. Retrieved from: <https://www.redalyc.org/pdf/301/30123286009.pdf> (07/08/2023).

Moran P.A.P. (1950). Notes on continuous stochastic phenomena. *Biometrika*, 37, 1/2: 17. DOI: 10.2307/2332142.

Newfarmer R., Sztajerowska M. (2012). Trade and employment in a fast-changing world. In Lippoldt D., a cura di, *Policy priorities for international trade and jobs*. Paris: OECD. Retrieved from: <https://www.oecd.org/site/tadicite/50258009.pdf> (07/08/2023).

- Nitsch V. (2000). National borders and international trade: evidence from the European Union. *Canadian Journal of Economics*, 33, 4: 1091. DOI: 10.1111/0008-4085.00055.
- Nota L., Santilli S., Ginevra M.C., Soresi S. (2014). Employer attitudes towards the work inclusion of people with disability. *Journal of Applied Research in Intellectual Disabilities*, 27, 6: 511. DOI: 10.1111/jar.12081.
- Novy D. (2013). Gravity redux: measuring international trade costs with panel data. *Economic Inquiry*, 51, 1:101. DOI: 10.1111/j.1465-7295.2011.00439.x.
- Pesaran M.H. (2004). *General diagnostic tests for cross section dependence in panels*. Cambridge: Cambridge Working Paper in Economics. DOI: 10.17863/CAM.5113.
- Rey S.J., Montouri B.D. (1999). US regional income convergence: A spatial econometric perspective. *Regional Studies*, 33, 2: 143. DOI: 10.1080/00343409950122945.
- Silva J.M.C.S., Tenreyro S. (2006). The log of gravity. *The Review of Economics and Statistics*, 88, 4: 641. DOI: 10.1162/rest.88.4.641.
- Tinbergen J. (1962). *Shaping the world economy: Suggestions for an international economic policy*. New York: Twentieth Century Fund.
- Tuhin R. (2015). *Impact of international trade on employment: evidence from Australian manufacturing industries*. Canberra: Department on Industry and Science of the Australian Government. Retrieved from: https://www.industry.gov.au/sites/default/files/June%202018/document/pdf/impact-of-international-trade-on-employment_-_evidence_from_australian_manufacturing_industries.pdf (07/08/2023).
- Wilton R., Schuer S. (2006). Towards socio-spatial inclusion? Disabled people, neoliberalism and the contemporary labour market. *Area*, 38, 2: 186.
- Wooldridge J.M. (2002). *Econometric analysis of cross section and panel data*. Cambridge: MIT Press.
- World Bank (2013). *Inclusion matters: the foundation for shared prosperity. New Frontiers of Social Policy*. Washington: World Bank. DOI: 10.1596/978-1-4648-0010-8.