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Contents

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Regional Science Inquiry, Vol. VII, (1), 2015 – Editorial

A multifaceted approach of regional policy analysis characterizes the present issue of RSI. It is expected to interest scholars and policy-makers who focus on environmental, geographical, tourist, trade and spatial planning topics at theoretical, methodological or practical level.

The ecological and financial interactions are of utmost importance for many countries and regions. ***Adrianus Amheka*** and ***Yoshiro Higano*** try to depict the trends of Greenhouse Gass emissions in relation to economic parameters in selected areas of Indonesia. Legislation is used as a framework of reference and a substantial literature review is conducted. Actually, the implementation of the legislation is examined through the descriptive data. The authors argue about the regulative and economic aspect of the afore-mentioned ecological phenomenon, contributing to an insightful approach. The concept of technical-economic innovation as achieving certain prosperity level using conventional ways of life is discussed. The existence of single market and production base, regional competitiveness, equitable economic development at regional level and integration of regional policy into the global economy are considered as key parameters. The need of mapping economic- and social-geographical information as well as of capacity building is pointed out. This contribution can be helpful to regional governmental structures and may serve as a triggering for extending the study to further questions concerning alternative energy policies.

Let's explain the monetary phenomenon simply and without scientific terminology. When a national government has the freedom to print new banknotes, everyone can maintain the hope that these will lead to new entrepreneurship and to new products which are going to be competitive. If, however, the new banknotes are used for consumption, then inflation is inevitable. In any case, printing and distributing new banknotes seems to be the only possible strategy to combat unemployment and inequality (even if the jobs created in this way produce no competitive product or service and one can buy nothing with these banknotes). On the contrary, when printing new banknotes is forbidden, then few people (entrepreneurs) in few regions concentrate almost all banknotes and the inequality is inevitable. The introduction of the Euro has been followed by noticeable fiscal divergence between the core and the periphery economies. In this conceptual framework, ***Georgios Karras*** is developing an insightful discourse on the hypotheses mentioned above, using empirical findings and elaborated macro-economic methods and models. He uses empirical data of thirty European economies, measures the response of government budget deficits to changes in economic activity and estimates fiscal policy rules. He examines the basic properties of fiscal policy in Europe and discusses whether these properties are affected by euro membership.

The classical hypothesis that the market economy leads to congestion places remains an inexhaustible research question. ***Hasan Engin Duran*** and ***Sevim Pelin Özkan*** are focusing on the relation between liberalization and crucial spatial features, such as city growth and urban concentration, enriching the academic literature of this field with more detailed results. The distribution of the population across cities is examined and geographical, trade-relevant as well as socio-economic determinants of city-size growth are explored through cross-sectional and spatial-econometric tools, specifically focusing on Zipf' s law. Urban congestion centers are indeed emerging, intensified by trade liberalization and the economic-functional specialization of cities.

Do institutions matter? The institutionalist approach seems not to be criticized but to be complemented by the analysis of ***Ziba Karjoo*** and ***Majid Sameti*** who try to present the relevance of spatial-economic and geographic parameters. These basically consist in "neighborhood" and "location" factors. Ram's growth model is used in the case of US case. It is pointed out that the growth of each state is influenced by that of its neighboring states and not by the state government expenditures. The growth of the labor force is also considered as a determinant as well.

Recognizing agglomeration economies is closely connected with the need of geographical and provincial clustering. In the light of this assumption, ***Kiatkajon Chairat, Sumalee Santipolvut*** and ***Supachart Sukharomana*** try to formulate propose an integrated system of multifarious criteria for clustering areas. Spatial, functional and micro-foundational features

are processed through a funneling procedure, leading to provincial clusters through factor, cluster and discriminant analysis successively.

Not only conceptually but also empirically, this paper has to present a noticeable added value, as it uses data from provinces in the Southern part of Thailand.

Whether the EU structural is progressing toward convergence or divergence, it is always a burning political and scientific issue, and possibly it will remain such one, as long as EU is still only a program of unpredictable integration and not a cohesive state. ***Olcay Çolak*** attempts to explore to what extent the relation between parts of the EU which are considered to be quite different (central, eastern, southern, developed older member countries) is progressing to a convergent pattern. A panel data analysis is performed, revealing that there is a strong tendency on convergence for the new entrants of European Union after 2004. The neoclassical paradigm hypothesis that poorer countries will grow faster than richer ones is supported. Also, private domestic investment seems to be a leading determinant of growth and convergence process of Eastern European countries.

Tourism is normally expected to be a factor of regional development. However, not always this expectation is fulfilled. ***Tudorel Andrei, Constantin Mitrut, Daniela-Luminita Constantin*** and ***Bogdan Oancea*** try to examine why the high potential of the Romanian tourism competitiveness and the much promising interregional convergent tendencies do not assure the expected success. National and regional features of tourism are considered. Determinants of foreigners' visit in Romania as well as of travel of Romanian tourists abroad are discussed. The role of road infrastructure and of the accommodation capacity utilization is regarded as quite crucial and examined with econometric techniques. The importance of the relation between territorial distribution of road infrastructure and the concentration of accommodation capacity is depicted.

What is the real effect of the borders? ***Luis Lanaspa Santolaria, Irene Olloqui Cuartero*** and ***Fernando Sanz Gracia*** try to see beyond institutionalized demarcation of the space, on the basis of empirical data concerning the so-called "Spanish Autonomous Communities". They attempted to quantify how intensive the flows of goods are between these regions ("border effect"). Comparisons between regions flows system and whole Spain flows as well as between other countries make their analysis insightful. The gravity equation model of trade is used. Various detailed quantitative findings are presented. Basically, it is supported that the border effect exists, tends to diminish over time, and distinguishing between regions' imports and exports, the border effect is significantly higher for the former.

On behalf of the Editorial Board,

Nikolaos Hasanagas*, RSI editor*
Maria Goula*, RSI critical surveys editor*

Articles

AN INTRODUCTION TO REGIONAL GOVERNMENT IN INDONESIA TO SUCCESS RAD-GRK PROGRAM: LITERATURE REVIEW OF GHG EMISSION TRENDS IN INDONESIA

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Abstract

This paper tried to figure out the extent to which trends of GHG emissions were accurately introduced in some province in Indonesia and a possibility elaborate the GHG emission trends each provinces comprehensively through their economic activities. So far based on Presidential Decrees of the RI No.61 Year 2011 regarding National/Regional Action Plan for Reducing Greenhouse Gas Emissions (RAN/RAD-GRK), No.71 Year 2011 regarding national GHG inventory system and No.62 year 2013 regarding Managing Agency for the Reduction of Emission from Deforestation and Degradation of Forest and Peatlands shown only 6 provinces from 34 provinces have counted their GHG emission according to the Decrees. We argue the regulation as foundation must be also covered activities economic in respective provinces which the activity given large GHG emission contribution. By literatures reviewed, this paper aims as proposal to regional government counts their emissions based on activities economic to success RAN/RAD-GRK and integrated with improve regional competitiveness prior engaged on ASEAN Economic Community and preparation to enter SDG's post MDG`s of Indonesian government by 2015. As further work suggested to extend the study more broad related to renewable energy technology and possibility to count carbon tax, Feed-in tariff of electricity in regional areas Indonesia.

Keywords: Indonesia's RAN-GRK program, Regional GHG emission trends
JEL classification:

1. Introduction

Indonesia is the world's largest archipelagic country comprising around 18,306 islands. Of these, 8,844 islands have been named according to government estimates, with 922 of those permanently inhabited and the rest, being small islands along the coastline that have not yet been recorded formally. Indonesian livelihoods mostly depend on natural resources as well as related economic sectors. Indonesia is prone to natural disasters due to its geographical position and geological condition and a lack in public commitment in maintaining a sustainable environment. This in turn increases the level of risk for climate change impact threats. As this country is a victim of climate change impacts mentioned above, it is reasonable that Indonesia should take the front line in global efforts to address climate change impacts. Moreover, there is huge potential for conducting climate change mitigation actions for Indonesia to optimize its strategic position in various international forums and foster bilateral or multilateral cooperation (BAPPENAS, 2011).

Efforts to deal with climate change impacts constitute an integral part of the national development, so that all planning must be in line with national economic development planning. Thus, climate change adaptation and mitigation action planning are integrated into the national and local development planning including provincial, district or city. Indonesia also has huge potential for reducing GHG emission significantly and cumulatively by 2020. Therefore, it is necessary to take prioritize sectors and programs, their various aspects such as abatement cost and, investment and taxes for each sector's actions, and also have the tools to

evaluate economic impacts against GHG emission reduction achievements. It is necessary to take into consideration that target for GHG emission reduction may increase if the scenario used is different. Therefore, there is a need to develop a GHG emission inventory and monitoring systems to incorporate measuring, reporting and verification from all sectors. Economic activities as key indicators of a region need to be carried out as part of the business as usual (BAU) scenario and obtain maximum results in pursuit of significant GHG emission reduction. In addition, institutional capacity in every regional level and their related sectors become instrumental. Kupang City, plays an important role as the capital city of NTT province and the main gateway between Australia and Timor Leste as well as being the centre of economic activities in NTT province which contributes to GHG emissions in Indonesia.

In order to pursue national government target to reduce GHG emission 26% from BAU and 41% if assist from abroad, a number of efforts has been set by local government and fully support by Regional Planning Agency called BAPPEDA as the institution responsible for the work and National Planning Agency or called BAPPENAS as institutional in charge for the program at national level. Therefore, it is necessary to detect challenges in the policy and/or mechanism implementation to reduce GHG emission in economic activities in order to prepare appropriate policy of GHG emission in regional level under the short-term and long-term strategy and how achieve the target. Moreover, to establish the program in regional level required comprehensive assessment considers on-going dynamic developments of the provinces/cities. In addition, scientific and technological developments such as introduce new renewable energy sectors to enable various new breakthroughs that can provide an alternative approach and solutions for GHG emission reduction in regional side indispensable. To ensure the GHG emissions at national and regional levels are accurate and accepted by international committees, a comprehensive evaluation of related sectors is necessary in conjunction with negotiation with the United Nation Convention on Climate Change (UNFCCC).

2. Review of previous study

Indonesian government continues to make efforts to reduce GHG emission up to 26% by self-effort or about 0.767giga tons (Gt) carbon dioxide equivalent (CO2e) by 2020 as well as involve stakeholders from regional, national and international levels to carry out studies in order to give recommendation for policy-makers. In this review we focused on studies were done using macro-economic indicator in counts GHG emission, in this sense using input output analysis as principle reference and previous studies in terms of GHG emission in some regional area in Indonesia.

2.1. Research of Input-Output Model

Input output (IO) model according to Miller and Blair (2009) is generally constructed by observed real data from any economic aspect of a region with respect to specific geographic of that region, concerned with the activity of a group of industries that both produce goods (outputs) and consume goods from other industries (inputs) in a process production of every industry's own output. In fact, the number of industries considered may vary from only a few to hundreds or even thousands. In order to grasp the economic impact caused by increase GHG emission, we need to examine historically the impact of industry infrastructure development periodically with respects to economic growth by use an IO model (Faizah, 2008). Duchin and Lange (1992) their assumption in a formal working group regarding IO analysis in the future for Indonesia stated that technically, most likely future changes of Indonesia in household consumption, especially energy use, construction, transportation, and key manufacturing sectors. Hulu and Hewings (1993) under conditions of limited information has constructed an interregional IO table for Indonesia to develop relationship between social-economic and future change of economic in Indonesia through computable general equilibrium model which will be useful as reference in calculating whole of GHG emission in Indonesia based on economic activity as indicated in IO table which allow compared to regional GHG emission.

We found very little study studying IO model analysis in Indonesia especially focused on social-economic, environment and energy to produce comprehensive evaluation of GHG emission for both regional and national level. So far study about Indonesian and surrounding

using IO model as reference is not comprehensive because not touching aspects thoroughly and do not integrate to all sectors.

Sasai, Hasegawa, Imagawa, and Ono (2012) clarified the prediction of GHG emission in Japan emitted by industrial and household activities and how nuclear generation as replacement for thermal power generation will contribute to cut-off amount of the GHG emission by 2020. The complexity and comprehensively done in this study shows one step ahead clarified estimated amount of GHG emission emitted by Japan's economic activities by 2020, however, they do not clarify GHG emission contributed from economic activities in regional area Japan. Mizunoya and Higano (1999) formulated a model of total environmental economic system based on Japan IO model to control air pollutants emitted by industries including households, then recommend an optimal level of economic activities and air pollutants emission with respect to emission taxes. Moreover, Uchida, Mizunoya, and Higano (2008) evaluated effect of economic policies in use potential energy of wastes. They study shown new energy industries were achieved the production and able to replace fossil fuels or in the other word, to change industrial structure in reducing fossil fuels consumption would be achieved through introduction new energy industry that impact gross domestic product (GDP) increased under GHG emission constraints by respect to emission tax and subsidy. Both Uchida and Mizunoya use and present an IO model for a national level in case of Japan by endogenously determined. Thus, the IO model is a good reference to calculate and/or formulate estimated amount of GHG emission in a region. In this sense, there is no study counts GHG emission in regional and national level in Indonesia refers to economic activities especially using IO model as reference.

3. GHG Emission Trends in Indonesian

After the United States 5.95 Gt and China 5.06Gt (MoE, 2010), Indonesia is the world's third largest emitter of CO2e, with estimated GHG emissions of 2.183Gt as of 2005 accounting for 4.5% of global emissions. Indonesia's emissions are projected to rise to almost 2.95Gt CO2e by 2020 under a BAU scenario (MoE, 2010; Tedjakusuma, 2013; Thamrin, 2011). Almost of Indonesia's current GHG emissions estimates are based on reduce emission from deforestation and degradation (REDD) and land use aspects, in addition to the drying, decomposing and burning of peat land (ADB Climate Change team, 2008). In response challenges to reduce the emissions, Indonesia is in process of establish a national policy framework to address climate change issues where consider socio-economic attributes including population density, income levels and other related sectors in provide livelihoods to communities (ADB Climate Change team, 2008; MoE, 2010; Thamrin, 2011).

Many studies already suggest that if we continue current levels of industrialization and socio-economic activities coupled with high population growth the environmental consequences will be much harsher in the near future. The accumulation of industry and population in regional areas Indonesia will also trigger waste generation that will cause serious environmental and health impacts, and if industrialization and urbanization levels keep increasing this will have a significant impact on GHG emissions and hence the consequences of climate change will be harsher. In this regard necessary to estimate amount of GHG emissions based on integrated analysis of socio-economic and industrial activities. Due to political and economic conditions in Indonesia, the creation of such a program is necessarily an evolutionary process. Ideally, the Indonesian government should implement many steps of the process concurrently to deal with environmental matters (Damanhuri, 2010; Damanhuri and Padmi, 2008; Faizah, 2008; EPA US, 2013). Moreover, Boyle (1998) reported environmental impact assessment with respect to culture factor become important thing for Indonesia in conjunction with develops proper environmental policy. A life cycle assessment analysis of waste disposal of traditional markets in Indonesia has potentially to conduct a biogas system due to lowest environmental impacts such as GHG emission and it necessary established (Aye and Widjaya, 2006; Amheka, Higano, Mizunoya and Yabar, 2014). Some studies have measured GHG emissions where the land-use as a benchmark on regional level Indonesia without considers the economic development at designated areas (Hadi, Inubushi, Furukawa, Purnomo, Rasmadi and Tsuruta, 2005; Ishizuka, Iswandi, Nakajima, Yonemura, Sudo, Tsuruta and Murdiyarso, 2005; Murdiyarso, Hergoualc'h and

Verchot, 2010; Okimori, Ogawa and Takahashi, 2003). So far there is no specific studies investigate issues on GHG emission and its relation to economic development in Indonesia such as increase in GDP, GRP, etc. The only policy regarding GHG emissions reduction is designed by BAPPENAS office through National/Regional Action Plan for Reducing Greenhouse Gas Emissions (RAN/RAD-GRK) program. From 2011, the program was delegated to BAPPENAS office at national level and BAPPEDA office at local level. The action plan program provides directions for local and national governments to carry out multi-sector GHG emission reduction efforts directly and indirectly through specific efforts considering local characteristics, potential, and authority that must be integrated into a local development plan (ADB Climate Change team, 2008).

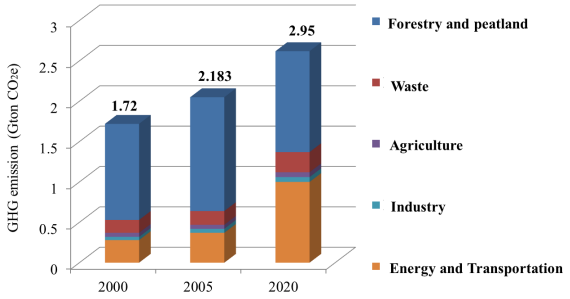

Figure 1-1 GHG emission trends in Indonesia (source, BAPPENAS, 2013)

Indonesia government regulation appears in the Presidential Decrees of Republic of Indonesia No.61 Year 2011 regarding RAN/RAD-GRK, No.71 Year 2011 regarding National GHG Inventory System and No.62 year 2013 regarding Managing Agency for the REDD of Forest and Peatlands were prepared following President Susilo Bambang Yudhoyono direction to various related Ministries/Institutions and regional government commitment to implement activities to reduce GHG emissions directly or indirectly. Yudhoyono in his speech at the G-20 summit in Pittsburgh, USA on September, 25th 2009 targeted a reduction of the emissions up to 26% (self-effort) from the BAU by 2020 as showed in Figure 1-1 (BAPPENAS, 2011; MoE, 2010; Thamrin, 2011; Tedjakusuma, 2013). The RAN/RAD-GRK program expected to become an integrated, concrete, measurable and practical action plan for the period between 2010 and 2020 and the activities shall be prepared by taking into account national and regional development principle where priority scale is given to mitigate GHG and other emissions reduction scenario from national and regional levels through comprehensive way (Thamrin, 2011). Therefore, the preparation of local government as part of regional focal point to reduce GHG emission while keeping economic growth must be a priority. In this sense we need comprehensive evaluate growth of the different industrial sectors coupled with final demand (public and private sectors including households) to provide a picture implication of GHG reduction target based on social-economic activity in related sectors. In addition, another objective of national government perspective is to serve investors who invest to reduce GHG emission at national and regional levels in Indonesia (Helmreich, Sterk, Wehnert and Arens, 2011; Situmeang and Lubis, 2011; Thamrin, 2011). Our paper focused on a literatures review of GHG emission trends in Indonesia as a first step in identifying the extent to which the trends already achieved, then recommend to government to success RAD-GRK program in regional areas Indonesia in conjunction with economic activities as the main cause. Furthermore, Amheka, Higano, Mizunoya and Yabar (2014) reported a study in calculating GHG emission caused by activity economy on regional level case study Kupang city along with a framework as optimal solution to integrate related sectors, natural resources, final demand and a possibility to introduce renewable energy technology including energy supply from waste treatment plant where the study became the first study focused on GHG emission in city level Indonesia.

An investigation as indicated in Table 1, shown only 6 provinces in Indonesia has counted their GHG emission according to the Presidential Decrees and intensively involved in RAD-GRK program. However, most provinces around 34 provinces have never participated in the program. This is due to a shortage of human resources, lack of data availability and local government support such as technical, institutional and financial factors.

Table 1 Latest data trends of GHG emission every province in Indonesia (Unit: 1,000 tons)

		GHG emission sources							
Base year	Province	land used sector	percentage	energy, transportation, industry	percentage	waste sector	percentage	total GHG	percentage
2010	Sumatera Utara	168,080	88%	21,010	11%	1,910	1%	191,000	100%
2011	Sumatera Selatan	74,328	76%	22,494	23%	978	1%	97,800	100%
2006-2007	Jawa Barat	1,122.42	-	75,805.83	-	-	-	76,928.25	-
2010	Jawa Tengah	7,308	18%	28,420	70%	4,872	12%	40,600	100%
2010	D.I Jogjakarta	372.4	19%	1,509.2	77%	78.4	4%	1,960	100%
2007	Maluku Utara	-		819.51	-	-		819.51	-
2010	NTT (Kupang City)	-	-	-	-	-	-	-	-
-	Aceh	-	-	-	-	-	-	-	-
-	Sumatera Barat	-	-	-	-	-	-	-	-
-	Riau	-	-	-	-	-	-	-	-
-	Jambi	-	-	-	-	-		-	-
-	Bengkulu	-	-	-	-	-	-	-	-
-	Lampung	-	-	-	-	-	-	-	-
-	Kep. Babel	-	-	-	-	-	-	-	-
-	Kep. Riau	-	-	-	-	-	-	-	-
-	DKI Jakarta	-	-	-	-		-	-	-
-	Jawa Timur	-	-		-	-	-	-	-
-	Banten	-	-		-		-	-	-
-	Bali	-	-	-	-	-	-	-	-
-	NTB	-	-	-	-	-	-	-	-
-	Kalimatan Barat	-	-	-	-	-	-	-	-
-	Kalimatan Tengah	-	-	-	-	-	-	-	-
-	Kalimatan Selatan	-	-	-	-	-	-	-	-
-	Kalimatan Timur	-	-	-	-	-	-	-	-
-	Sulawesi Utara	-	-	-	-	-		-	-
-	Sulawesi Tengah	-	-	-	-	-	-	-	-
-	Sulawesi Selatan	-	-	-	-	-	-	-	
-	Sulawesi Tenggara	-	-	-	-	-	-	-	-
-	Sulawesi Barat	-	-	-	-	-	-	-	-
-	Gorontalo	-	-	-	-	-	-	-	-
-	Maluku	-	-	-	-	-	-	-	-
-	Maluku Utara	-	-	-	-	-	-	-	-
-	Papua Barat	-	-	-	-	-	-	-	-
-	Papua	-	-	-	-	-	-	-	-

Note: Summarized by Amheka, 2014.

The Table shown progress and development in calculation estimated amount of GHG emissions by some provinces refers to Presidential Decrees (most refers to REDD). In this

sense, we argue that such calculations are not comprehensive because the calculations do not identify all the relevant sectors of economic activity that contribute most to GHG emissions.

Take example Kupang city and NTT Province has a goal to be referred as a Model Eco-friendly province/city in which nowadays many programs organized by the government deal with environmental sustainability such as "Kupang Green and Clean, District Race Clean" and competitions between government agencies and private sectors with regard to environmental sustainability (Amheka, Higano, Mizunoya and Yabar, 2014). This is proof the local government dedicate to promote programs in support GHG emission reduction while promoting prosperity. Further in terms of social activities, the government needs to improve introduction and promote eco-conscious urban development across community. As part of environmental promotion, we assume that the provinces/cities in Indonesia needs comprehensive analysis to ascertain detailed amount of GHG emission emitted by sectors activity (economic activity), and therefore, the information the extent to which the achievement has been achieved by local governments are provided in this paper is very important and useful for realize government goal in reducing GHG emissions and act as a core facility dedicated to revitalization of local economy through commitment to establish "Carbon projects" in Indonesia, then involved in RAD-GRK program.

4. Conclusion and suggestion for further work

An assumption of local government's ambition in Indonesia for maintain a sustainable environment be one of a number reasons in conduct this review. On one occasion the Governor of NTT province together Mayor of Kupang city stated "we need to change our attitude and reconsider conventional ways of living as part of innovative environment solution". This indicates an example the government effort to improve eco-conscious regional development.

Integration between local governments in Indonesia and globalization is necessary in which government has commitment to engage in the ASEAN Economic Community (AEC) by 2015 where correspondence with AEC goals to integrate regional economic among AEC members. AEC Blueprint (2008) envisages following key characteristics: First, a single market and production base; Second, a highly competitive economic region; Three, a region of equitable economic development; and four, a region fully integrated into the global economy. Moreover, develop a regional guideline on competition policy in environment sustainability is being developed by Indonesia government and it supposed to completed before enter AEC by 2015. In conjunction with this, the local government set integration with global economy with respect to uphold the green economy towards supporting sustainable global environment, for instance participate in RAD-GRK program. Perhaps, this option became value added of local government to be more confidential participate on several program set by AEC to compete internationally and make ASEAN more dynamic and stronger segment of the global supply chain and internal market remains attractive for foreign investment outside ASEAN countries, and in this sense we thinking GHG emission restriction must be set by provinces/cities in Indonesia in order to pursue as role model among provinces/cities in ASEAN countries to look beyond the borders of AEC participate globally such as establish initiative to create a carbon market not only among ASEAN countries but across the globe. To keep this on track the local government in Indonesia should consider when the mechanism and/or policies in terms of rules and regulations of AEC internally and externally will develop in relation with GHG emission.

Another important thing must be considered of local and central governments in Indonesia are in terms of energy cooperation, secure and reliable supply of energy including renewable energy (RE). It is crucial in support and sustain economic and industrial activities regionally especially for projects related to the ASEAN Power Grid (APG) where allows optimization of the regional's energy resources for greater security as a wise thinking in terms of preventive measures in reducing amount of GHG emissions. Recognizing the limited global reserve of fossil energy and unstable world prices of fuel oil, thus it is essential for ASEAN to strengthen RE development through promotion free trade, facilitation and cooperation related to RE sectors such as new energy industries including investment to develop and strengthen RE infrastructure. Therefore, we pleased to other researchers conduct further research in

assessing, mapping and informing potential for RE in regional side Indonesia with considers geography, population and social-economic condition at designated areas. Capacity building for regional economic integration, energy and mitigate of GHG emission necessary as foundation to improve quality of life for regional Indonesia in participate to AEC. In relation to future perspective, recently elected President of Republic of Indonesia, Mr. Joko Widodo, said national security which includes security and environmental health endurance energy availability is indispensable in supporting the Indonesian economy. Thus, based on description above, literature review and several analyses, we decide the future objectives of Indonesian government to success RAD-GRK program divided into two integral part is that national and regional perspectives in order to produce comprehensive policy to reduce GHG emission in regional side Indonesia with respect to keep their improve of economic development. For National level is meet agreement COP-15 Copenhagen by Indonesian government to reduce GHG emissions between 26% and 41% with a range between 0.767 Gt CO2e and 1.189 Gt CO2e under BAU by 2020 from base year 2005 and prepare to enter Sustainable Development Goals as post Millennium Development Goals of Indonesian government by 2015. While for Regional level is expected to produce an evaluation framework to succeed RAD-GRK program and improve regional competitiveness prior involved on AEC 2015.

For suggestion work we highly recommend to other researcher conduct widely and deeply relationship between environmental policies and economic structural emphasis on control GHG emission reduction refers on economic activities instead REDD in regional level (provinces/cities) in Indonesia by introducing Carbon tax, RE technology sectors, Feed-in tariff of electricity sector supplied by RE technology to answer the future objectives which we had decided.

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FISCAL ACTIVISM IN EUROPEAN REGIONS: EVIDENCE ON FISCAL RULES BEFORE AND AFTER THE EURO

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Abstract
The introduction of the euro has been followed by noticeable fiscal divergence between the core and the periphery economies. This paper investigates the basic properties of fiscal policy in Europe and asks whether these properties are affected by euro membership. The empirical findings suggest that fiscal policy has been decisively countercyclical and generally sustainable. Adopting the euro raises the average country member's primary deficit by about 0.5% of GDP within a year and the effect accumulates to 1.76% of GDP ten years later, but these dynamic responses are far more pronounced in the periphery economies than in the core.

Keywords: Fiscal Rules, Euro zone, Fiscal Policy
JEL classification: E62, F45

1. Introduction

Fiscal policy has been at the heart of European economic developments since the beginning of the global financial crisis. Early on, and particularly when the limitations of monetary policy were revealed, active fiscal policy was considered to be an integral part of the solution. More recently, however, as the financial crisis gave way to the sovereign debt crisis, fiscal activism has tended to be viewed as part of the problem.

This paper asks whether fiscal policy in Europe has been stabilizing and sustainable and examines whether these properties of fiscal policy have been sensitive to euro membership.[2] Theoretically, euro members, having lost their ability to stabilize their economies with independent monetary policy, may opt to rely on more activist fiscal policy to accomplish this task. However, similar differences may also exist within the euro zone. If the loss of independent monetary policy is more costly for the countries of the "periphery" than for the "core" countries, the incentive to substitute fiscal for monetary policy should be greater for the periphery, suggesting a more activist policy in these countries.

The evidence will suggest that mechanisms like these may well be responsible for the observed *fiscal divergence* between core and periphery economies after the introduction of the euro. In particular, the data show clearly that after adopting the euro, the average primary budget balance swings from a deficit to a surplus for the core countries, but from a surplus to a deficit in the periphery.

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[2] Therefore, the emphasis here is different from that of the vast recent literature that attempts to quantify the output effects of fiscal shocks. Theoretical contributions on the fiscal multiplier include Christiano, Eichenbaum, and Rebelo (2011), Eggertsson (2010), and Woodford (2011). For empirical contributions, see Barro and Redlick (2011), Hall (2009), Mountford and Uhlig (2009), and Cogan, Cwik, Taylor, and Wieland (2010). Ramey (2011) provides an excellent survey and guide.

The two studies that are closest to the present paper are Galí and Perotti (2003) and Fatás and Mihov (2010), both of which estimate standard fiscal rules and investigate whether they have been affected by European monetary integration.[3] Galí and Perotti (2003) ask whether the Maastricht Treaty and the Stability and Growth Pact reduced the ability of EMU countries to pursue stabilizing fiscal policy. Their empirical evidence is not supportive of such an effect. Fatás and Mihov (2010) follow a similar estimation strategy and, enjoying the advantage of a longer data set, try to determine the extent to which the introduction of the euro may have changed the conduct of fiscal policy. Their estimates show no big differences between the behavior of fiscal policy in the euro area compared to that of other countries, as well as no evidence that introducing the euro leads to substantial changes.[4]

The present study adopts a similar methodological framework. It uses annual data from 1989 to 2010 for various panels of thirty European economies and estimates fiscal policy rules that measure the response of government budget (total, structural, or primary) deficits to changes in economic activity (measured by the real GDP growth rate or the output gap) and the government-debt-to-GDP ratio. It then asks how these fiscal policy rules differ between euro members and nonmembers, as well as between core and periphery euro countries, and whether adopting the euro changes an economy's fiscal rule.

The empirical findings show important similarities but also significant differences with those of the earlier literature. In particular, our findings support the following conclusions: (i) fiscal policy has been decisively countercyclical; (ii) fiscal policy has been generally sustainable; (iii) membership in the euro raises the average country member's primary budget deficit by about 0.5% of GDP on impact (within the year of adopting the common currency) but the effect accumulates to 1.76% of GDP ten years later; (iv) these dynamic responses are far more pronounced for the periphery economies than for the core ones.

The rest of the paper is organized as follows. Section 2 discusses the sources of the data and defines the variables to be used in the estimation. Section 3 outlines the estimation methodology, derives the main empirical results, and implements an interesting extension. Section 4 discusses the findings and concludes.

2. The Data

All data are obtained from the IMF's World Economic Outlook database. The full data set consists of a panel of thirty European countries over the time period 1989-2010. Table A1 in the Appendix lists the countries and classifies them in terms of a couple of widely used criteria. The most obvious distinction is between euro members and nonmembers. In addition, of interest here is the split of the twelve original euro members between "core" and "periphery" subsets.[5]

Fiscal variables include the general government's primary balance (s, expressed as a percent of Gross Domestic Product) and the general government's primary deficit (d, also expressed as a percent of GDP). Public debt is measured by the general government's gross debt (b, expressed in percent of GDP). Output growth (Δy) is measured by the growth rate of GDP in constant prices, while the output gap (gap) is expressed in percent of potential GDP.

Table 1, Panel A reports sample means of the main variables of interest over the entire period for the full set and four subsets of countries. Focusing first on the government budget balance, it is clear that euro members have run higher deficits (2.97% of GDP on average) than non-members (average of 0.19% of GDP). Within the euro, as expected, the periphery

[3] The literature on fiscal rules is also large. For a recent overview and critical discussion see Charles Wyplosz (2013).

[4] This strand of the literature is related to, but distinct from, the strand on the cyclical behavior of fiscal policy (see Lane, 2003; Frankel, Vegh and Vuletin, 2013; and Riera-Crichton, Vegh, and Vuletin, 2015). It is much more closely related to the literature on fiscal activism (see Auerbach, 2009).

[5] While this division is somewhat arbitrary, the paper follows the standard practice of assigning Greece, Ireland, Italy, Portugal, and Spain to the "periphery", and the remainder seven countries (Austria, Belgium, Finland, France, Germany, Luxembourg, and the Netherlands) to the "core".

countries have run substantially greater deficits (4.48% of GDP on average) than the core countries (1.78% of GDP).

We note, however, that these differences shrink significantly when one looks at the primary balance: the differences between euro members (0.48%) and nonmembers (0.46%), and between core (0.54%) and periphery (0.42%) are considerably smaller. Part of the reason for this different picture, is made clear by the data on government debt. As Table 1 makes clear, governments of euro members are more heavily indebted (66.99% of GDP on average) than governments of nonmembers (46.88% of GDP). Similarly, the debt of core-country governments (59.61% of GDP on average) is lower than the periphery's (76.39% of GDP). Finally, the average real growth rate of euro members over this period (2.38%) has exceeded the growth rate of nonmembers (2.09%), though not by much; while, within the euro, the periphery (2.55%) has grown a bit faster than the core (2.36%).

Figures A1 – A5 in the Appendix add a time dimension to this picture by presenting the full times series on government budget balance and government debt, both as shares of GDP, for each of the thirty economies over the 1989-2010 period. As the graphs make clear, the fiscal experiences of these countries are far from homogeneous, indeed displaying a lot of diversity that ranges from the chronic budget surpluses of Luxembourg and Norway to the consistent deficits of Greece and Italy. For the euro members, the shaded areas of Figures A1 – A5 highlight each member country's post-euro period. The goal is to make it easier to detect euro membership-related changes in fiscal behavior, in terms of either the government budget balance or government debt – however, relevant patterns do not appear to be obvious to the naked eye.

For a more focused approach to this question, Table 1, Panel B reports average primary balances over the pre- and post-euro periods for the twelve original euro members, the seven core countries, and the five periphery economies. It is interesting to note that the pre-and post-euro primary balances (0.57% and 0.43% of GDP, respectively) are not all that different for the full sample of the twelve euro members.

This, however, masks a very significant difference in fiscal behavior between the core and periphery countries. Specifically, in the core countries, the pre-euro average primary *deficit* of 0.41% swung to an average *surplus* of 1.06% after the euro; while in the periphery, the pre-euro average primary *surplus* of 1.55% changed to an average *deficit* of 0.48%.

It appears that the introduction of the euro resulted in a substantial divergence between the fiscal policies of the core and the periphery countries. This is the subject of the more rigorous econometric scrutiny of the next section.

3. Econometric Methodology and Empirical Evidence

3.1. Organizing Framework

As noted above, the introduction of the euro has been followed by noticeable fiscal divergence between the core and periphery countries. Therefore, the crucial question is not *what* happened to fiscal policy after the euro, but rather *why* it happened. To make progress in answering this question, we will follow a time series framework that distinguishes between the effects of impulses and the propagation mechanism.

To illustrate, we write a general fiscal rule in the form

$$f_{i,t} = h\left(\mathbf{z}_{i,t}\ , f_{i,t-1}\right) + e_{i,t} \qquad (1)$$

where f is the fiscal policy variable and $\mathbf{z}$ is a vector of other economic variables (to be specified below) to which fiscal policy is responding. The policy function h represents the propagation mechanism, while the innovation e represents the fiscal shocks, or impulses. Estimating equation (1) can shed light to the causes of the fiscal divergence after the introduction of the euro. In particular, it can be used to determine how much of the changes in fiscal policy are the result of the euro shock (the impulse) and how much can be attributed to differences in the structure (the propagation mechanism).

3.2. The Benchmark Model

We start with the following specification, standard in the empirical literature on fiscal rules:

$$d_{i,t} = w_i + \alpha_x x_{i,t} + \alpha_b b_{i,t-1} + \alpha_d d_{i,t-1} + e_{i,t} \qquad (2)$$

where d is the government primary deficit (as percent of GDP), x represents cyclical economic activity which is measured by real output growth ($x = \Delta y$) or by the output gap ($x = gap$), b is the gross government debt, i is indexing over countries and t over time, the w's capture country-specific effects, and the α's are parameters to be estimated.[6]

We expect the estimated parameters to have the following signs. First, $\alpha_x < 0$ because of countercyclical fiscal policy: the fiscal stance is expected to be expansionary when the economy is cyclically weaker, and contractionary when the economy appears to be overheating. Second, $\alpha_b < 0$ because of the debt-stabilization motive: holding everything else constant, debt sustainability requires a smaller budget deficit when the level of government debt is high, while on the contrary low levels of debt permit higher deficits. Finally, $\alpha_d > 0$ because of fiscal policy persistence: the effects of a fiscal policy shock will normally last more than one period.

Table 2 estimates model (2) using output growth as the cyclical economic activity proxy ($x = \Delta y$). The first column of estimates reports the results for the full sample. As expected, primary fiscal deficits are shown to be negatively related to both output growth ($\alpha_{\Delta y} = -0.499$) and the government debt ($\alpha_b = -0.023$), and exhibit strong persistence ($\alpha_d = 0.729$). Note that all three estimated coefficients are highly statistically significant, and the model accounts for a sizable 81% of the total variability in the dependent variable ($R^2 = 0.807$).

The remaining four columns ask how the fiscal rule applies to different subsets of countries. First, we distinguish between euro-members (Table 2, 3rd column of results) and nonmembers (2nd column). All estimated coefficients have the expected signs and remain statistically significant, despite the smaller numbers of observations. Comparing the estimates, there is some evidence that deficits in euro members ($\alpha_{\Delta y} = -0.523$) respond more aggressively to cyclical economic conditions than nonmembers ($\alpha_{\Delta y} = -0.485$), though the difference is slight and statistically insignificant. There is stronger evidence that nonmembers ($\alpha_b = -0.033$) have a stronger debt-stabilization motive than euro members ($\alpha_b = -0.018$), but again this difference, though proportionately larger, is not statistically significant.

Finally, Table 2 splits the euro members into Core (4th column of results) and Periphery (5th column) subsamples. Again, all estimates have the expected signs and (with the exception of α_b) remain highly statistically significant. The point estimates suggest that that deficits in core euro members ($\alpha_{\Delta y} = -0.570$) respond more aggressively to cyclical economic conditions than in peripheral members ($\alpha_{\Delta y} = -0.483$), but again the difference is statistically insignificant.

Table 3 repeats the exercise for the version of model (2) that uses the output gap as the proxy for cyclical economic activity ($x = gap$). Starting with the full sample, we note again that the model's coefficients have the expected signs, are statistically significant, and continue to explain a large part of the dependent variable's variance ($R^2 = 0.759$). Turning to the different sets of countries, the *gap* models of Table 3 imply some larger differences between subsamples, and especially between core and periphery euro members. In particular, primary deficits in core members are shown to be more countercyclical ($\alpha_{gap} = -0.831$ versus $\alpha_{gap} \approx 0$ in the periphery), more sensitive to the debt sustainability motive ($\alpha_b = -0.085$ versus $\alpha_b = -0.025$ in the periphery), and much less persistent ($\alpha_b = 0.392$ versus $\alpha_b = 0.893$ in the periphery). Overall, the *gap* regressions are less precisely estimated. This may be partly because they are based on fewer observations than the Δy regressions (the availability of the

[6] In terms of equation (1), equation (2) sets $f = d$, and $\mathbf{z} = (gap, b)'$ or $\mathbf{z} = (\Delta y, b)'$.

gap time series is more limited), but not entirely (the periphery subsamples use the same number of observations).

In general, therefore, the estimates of Tables 2 and 3 suggest that the fiscal policy rule estimated here captures the behavior of EU primary budget deficits rather well, and strongly supports our main priors: primary deficits are generally countercyclical, sensitive to the debt-stability motive, and persistent.

3.3. An Extended Model

To further investigate the possible role of euro membership in fiscal policy, we now turn to an extended specification that treats euro membership as an additional shock to the fiscal rule in the following specific way:

$$d_{i,t} = w_i + \alpha_x x_{i,t} + \alpha_b b_{i,t-1} + \alpha_d d_{i,t-1} + \theta_e euro_{i,t} + e_{i,t} \qquad (3)$$

where $euro_{i,t}$ is a binary variable that equals 1 if country i is a euro member time t, and 0 otherwise.[7]

Table 4 reports the estimated θ_e's for the full sample and various subsamples (except for the subset of euro nonmembers, for which the *euro* binary variable always equals zero), two different fiscal variables (the primary and total budget deficit), and two measures of cyclical economic activity (output growth and the output gap).

Focusing first on the full sample (Table 4, 1st column of results), the effect of euro membership on the primary deficit is seen to be positive, statistically significant, and economically sizeable, with an impact (contemporaneous, i.e. within-the-year) effect that ranges from 0.56% of GDP in the output growth specification to 1.25% of GDP in the output gap specification. The impact effects on the total budget deficit are substantially smaller (and in fact statistically insignificant in the output growth specification). Very similar results are obtained when the sample is constrained to the euro members only (Table 4, 3rd column of results).

Perhaps the most interesting findings of Table 4 are in the last two columns that compare the deficit effects of euro membership between core and periphery countries. We note first, that in terms of the primary deficit, all estimated θ_e's are positive and (with one exception) statistically significant. They are, however, substantially higher for the periphery: the impact deterioration of the primary deficit from adopting the euro for an economy in the periphery (0.9% to 1.3% of GDP) is roughly twice as large as for the core economies (0.3% to 0.7% of GDP).

The evidence becomes more complex for the total budget deficit. As expected, euro membership is causing an impact deterioration in the periphery (thought the effect is not statistically significant when output growth is used); but, somewhat surprisingly, adopting the euro in a core country causes the total deficit to improve (though not statistically significantly).[8]

The various versions of estimated model (3) can then be used to trace the effects of a euro membership shock on the deficit over time. The estimated Impulse Response Functions (IRF) are shown in Figures 3 and 4. What these dynamic responses make clear is that the impact effects are actually rather small compared to the long-run, cumulative effects implied by the estimated propagation mechanisms.

Figure 3 plots the estimated IRFs of the primary deficit to a euro membership shock in the output growth specifications, for three samples: all euro members, the core, and the periphery. Qualitatively the patterns are quite similar across the three country groups, starting with a positive impact that quickly accumulates to a much larger long-run effect. Quantitatively,

[7] For an example of a similar empirical specification (though in a different context), see Acemoglu, Naidu, Restrepo, and Robinson (2014).

[8] All in all, the primary deficit specifications are more precisely estimated, which is one more reason why we focus on those results in the rest of this section.

however, the differences are telling. Most importantly, both impact and long-run effects are substantially larger for the periphery than the core.[9] Specifically, in the core [periphery] countries, the impact (within-the-year) deterioration of the primary budget deficit by 0.3% [0.9%] of GDP rapidly accumulates to 1.3% [2.9%] of GDP ten years later.

Similar conclusions can be drawn from the IRFs implied by the output gap models, reported in Figure 4. Once again, the periphery IRF is uniformly higher than the core IRF. In particular, in the core countries the impact deterioration of the primary budget deficit by 0.7% of GDP accumulates to 1.2% of GDP ten years later, whereas in the periphery the corresponding values are 1.3% of GDP contemporaneously and (an astonishing) 8.1% of GDP ten years later.

4. Discussion and Conclusions

The introduction of the euro has been followed by noticeable fiscal divergence between the core and periphery countries. A clear example is the behavior of the primary government budget balance: in the core countries, the pre-euro average primary *deficit* of 0.41% swung to an average *surplus* of 1.06% after the euro; while in the periphery, the pre-euro average primary *surplus* of 1.55% changed to an average *deficit* of 0.48%.

This paper asks whether fiscal policy in Europe has been stabilizing and sustainable and examines whether these properties of fiscal policy are sensitive to euro membership. Using annual data from 1989 to 2010 for several panels of 30 European economies, the study employs various techniques to estimate fiscal policy rules that measure the response of government budget deficits (total, structural, or primary) to changes in economic activity (measured by the real GDP growth rate or the output gap) and the government-debt-to-GDP ratio.

The empirical findings support the following conclusions:

(i) fiscal policy has been decisively countercyclical: expansionary during economic downturns and contractionary during economic expansions;

(ii) fiscal policy has been generally sustainable: overall, primary budget deficits fall (increase) when government debt is increased (reduced) as a fraction of GDP;

(iii) membership in the euro raises the average country member's primary budget deficit by about 0.5% of GDP on impact (within the year of adopting the common currency) but the effect accumulates to 1.76% of GDP ten years later; and

(iv) these dynamic responses are far more pronounced for the periphery economies (0.9% of GDP on impact, accumulating to 2.9% of GDP ten years later) than for the core (0.3% of GDP on impact to 1.3% of GDP after ten years).

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[9] For the sample of all member economies the numbers are 0.5% of GDP on impact and 1.77% after ten years. Not surprisingly, the IRF for the full members sample is somewhere in between the higher periphery and lower core IRFs.

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Table 1: Sample Means

PANEL A

	Govt Budget Balance	Primary Balance	Govt Debt	Real GDP Growth
Full sample	–2.26%	0.25%	53.42%	2.44%
Euro NonMembers	–0.19	0.46	46.88	2.09
Euro Members	–2.97	0.48	66.99	2.38
Euro Core	–1.78	0.54	59.61	2.26
Euro Periphery	–4.48	0.42	76.39	2.55

PANEL B

Primary Balance

	12 euro members	7 core	5 periphery
Pre-euro	0.57%	–0.41%	1.55%
Post-euro	0.43%	1.06%	–0.48%

Note: Government Budget Balance, Primary Balance, and Government Debt are in percent of GDP; Real Growth Rate is annual percentage rate

Table 2: Benchmark Model (2a)

$$d_{i,t} = w_i + \alpha_{\Delta y}\Delta y_{i,t} + \alpha_b b_{i,t-1} + \alpha_d d_{i,t-1} + e_{i,t}$$

Dependent Variable: Primary budget deficit

	ALL	NonMembers	Members	Core	Periphery
$\alpha_{\Delta y}$	–0.499**	–0.485**	–0.523**	–0.570**	–0.483**
	(0.038)	(0.072)	(0.044)	(0.055)	(0.080)
α_b	–0.023**	–0.033*	–0.018*	–0.022	–0.017
	(0.008)	(0.017)	(0.009)	(0.014)	(0.012)
α_d	0.729**	0.763**	0.690**	0.726**	0.676**
	(0.029)	(0.047)	(0.039)	(0.047)	(0.072)
R^2	0.807	0.828	0.785	0.806	0.771
N	347	127	220	122	98

Note: All models estimated with country-specific fixed effects (not reported). Estimated standard errors in parentheses. **:significant at 1%, *:significant at 5%.

Table 3: Benchmark Model (2b)

$$d_{i,t} = w_i + \alpha_{gap} gap_{i,t} + \alpha_b b_{i,t-1} + \alpha_d d_{i,t-1} + e_{i,t}$$

Dependent Variable: Primary budget deficit

	ALL	NonMembers	Members	Core	Periphery
α_{gap}	–0.325**	–0.581**	–0.260**	–0.831**	–0.007
	(0.060)	(0.143)	(0.066)	(0.074)	(0.095)
α_b	–0.056**	–0.046	–0.054**	–0.085**	–0.025
	(0.010)	(0.026)	(0.011)	(0.013)	(0.015)
α_d	0.735**	0.674**	0.748**	0.392**	0.893**
	(0.038)	(0.065)	(0.050)	(0.054)	(0.075)
R^2	0.759	0.854	0.675	0.841	0.677
N	277	71	206	108	98

Note: All models estimated with country-specific fixed effects (not reported). Estimated standard errors in parentheses. **:significant at 1%, *:significant at 5%.

Table 4: Extended Model

$$d_{i,t} = w_i + \theta_e euro_{i,t} + \alpha_x x_{i,t} + \alpha_b b_{i,t-1} + \alpha_d d_{i,t-1} + u_{i,t}$$

	ALL	NonMembers	Members	Core	Periphery
A. Dependent Variable: Primary budget deficit; x = output growth					
θ_e	0.558*	0.0	0.540*	0.340	0.941**
	(0.256)		(0.234)	(0.301)	(0.385)
B. Dependent Variable: Primary budget deficit; x = output gap					
θ_e	1.247**	0.0	1.206**	0.683*	1.324**
	(0.304)		(0.297)	(0.287)	(0.467)
C. Dependent Variable: Budget deficit; x = output growth					
θ_e	0.110	0.0	0.211	–0.340	0.886
	(0.288)		(0.304)	(0.334)	(0.571)
D. Dependent Variable: Budget deficit; x = output gap					
θ_e	0.728*	0.0	0.957**	–0.507	1.956**
	(0.343)		(0.362)	(0.361)	(0.587)

Note: All models estimated with country-specific fixed effects (not reported). Estimated standard errors in parentheses. **:significant at 1%, *:significant at 5%.

Figure 1 Deficits around the year of Euro adoption

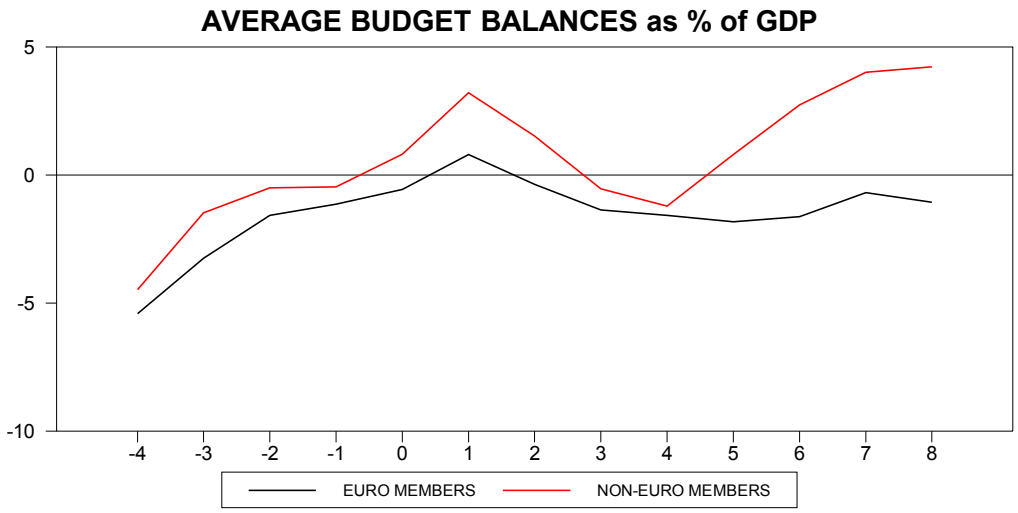


Figure 2 Deficits around the year of Euro adoption

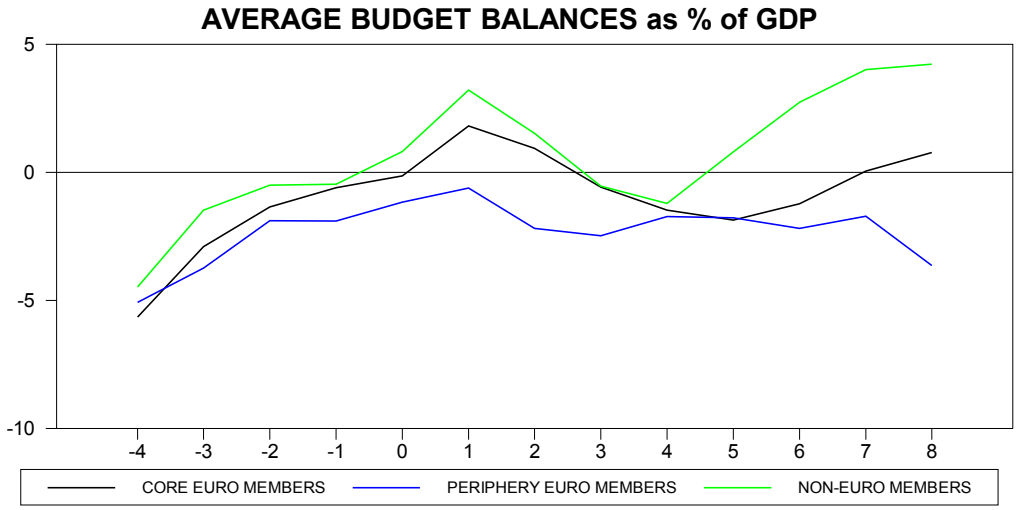


Figure 3

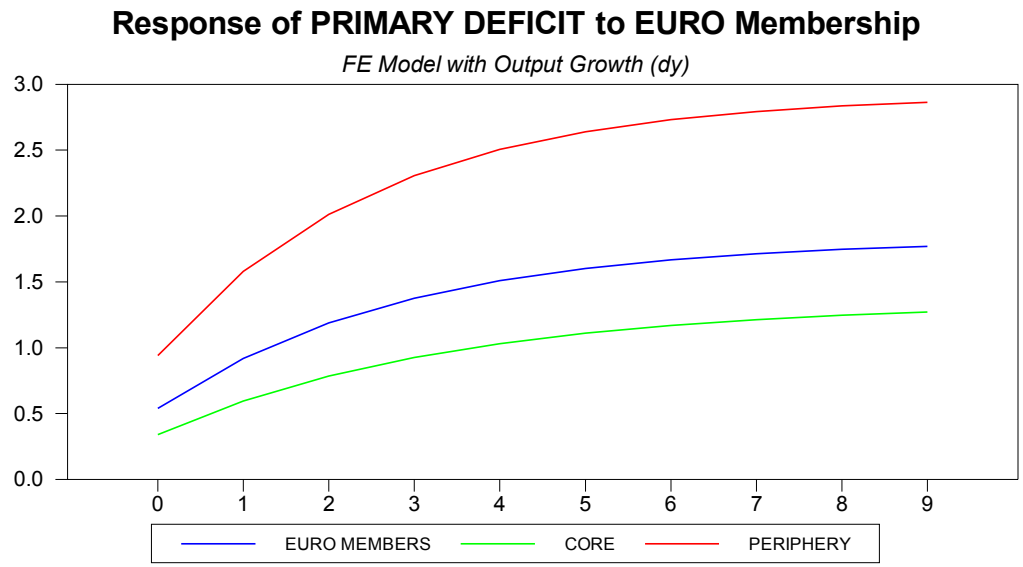
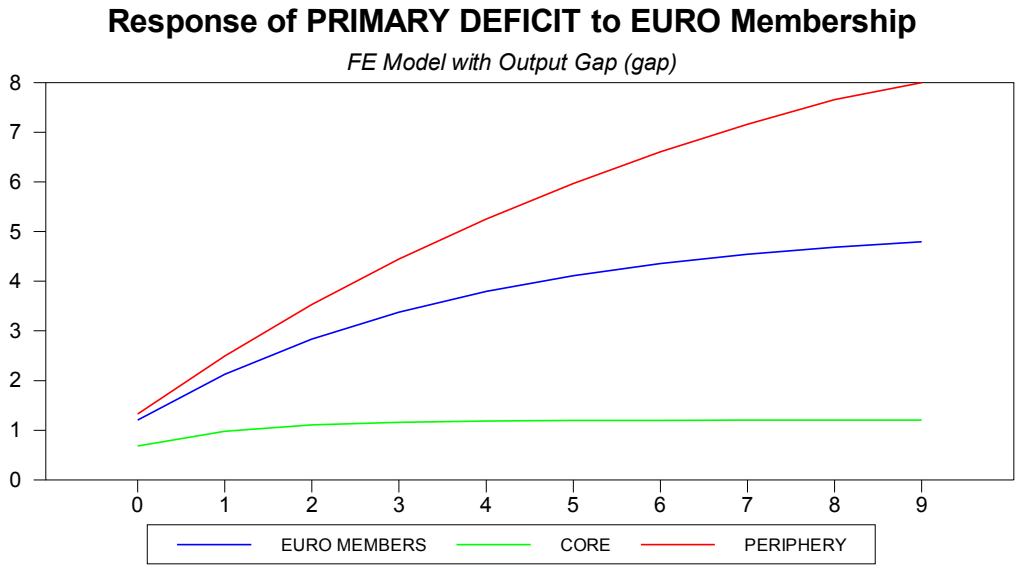


Figure 4



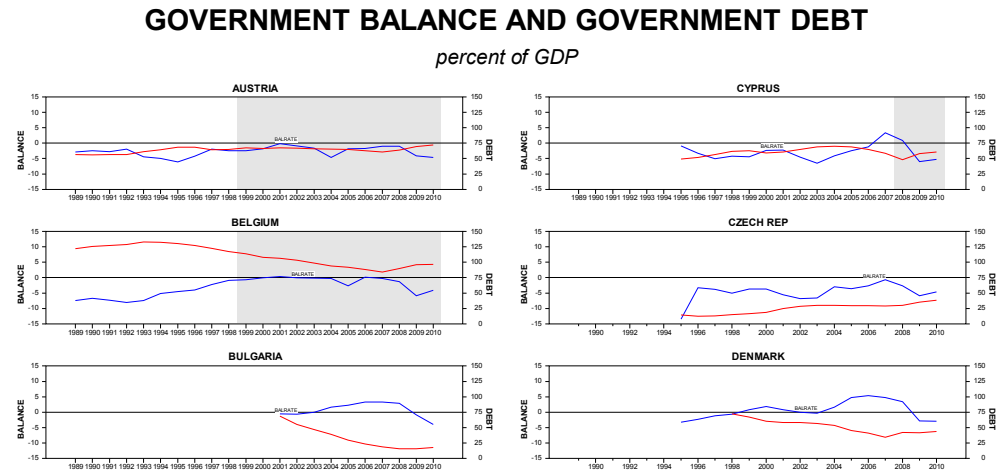
APPENDIX

Table A1: Country Classification

Original Euro Members [12]		**Newer Members**	**Non-Members** [7]
Austria ('99)		Slovenia ('07)	Czech Republic
Belgium ('99)		Cyprus ('08)	Denmark
Finland ('99)		Malta ('08)	Iceland
France ('99)	core [7]	Slovakia ('09)	Norway
Germany ('99)		Estonia ('11)	Sweden
Luxembourg ('99)		Latvia ('14)	Switzerland
Netherlands ('99)		Lithuania ('15)	UK
Greece ('01)			
Ireland ('99)		**Non-Members** (incomplete data)	
Italy ('99)	periphery [5]	Bulgaria	Poland
Portugal ('99)		Hungary	Romania
Spain ('99)			

Note: Year of euro membership in parentheses, number of countries in each subset in square brackets.

Figure A1

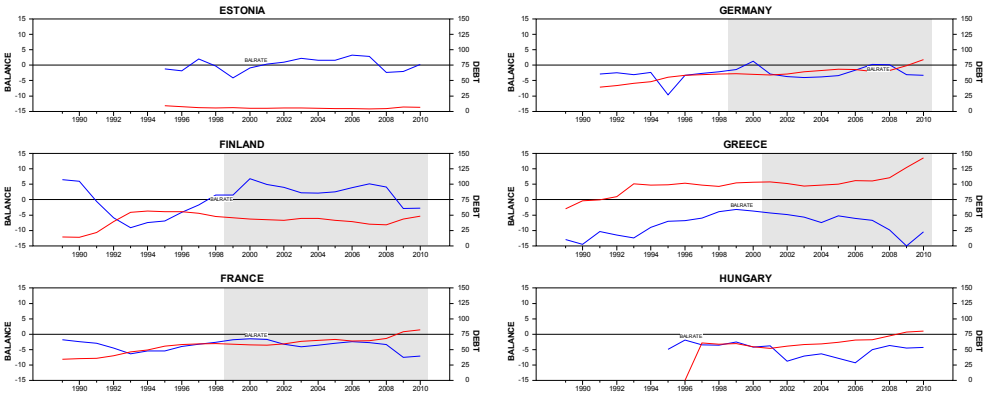


Blue line: Govt Balance (left axis); Red line: Govt Debt (right axis); Shaded area: Euro member

Figure A2

GOVERNMENT BALANCE AND GOVERNMENT DEBT

percent of GDP

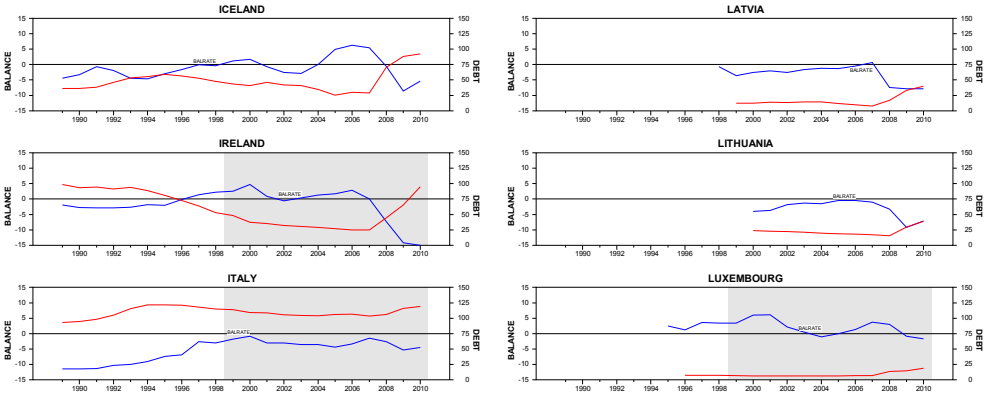


Blue line: Govt Balance (left axis); Red line: Govt Debt (right axis); Shaded area: Euro member

Figure A3

GOVERNMENT BALANCE AND GOVERNMENT DEBT

percent of GDP

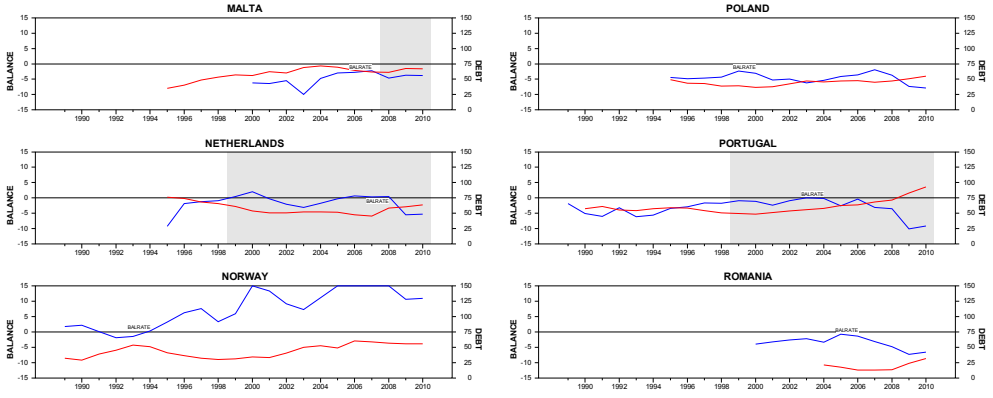


Blue line: Govt Balance (left axis); Red line: Govt Debt (right axis); Shaded area: Euro member

Figure A4

GOVERNMENT BALANCE AND GOVERNMENT DEBT

percent of GDP

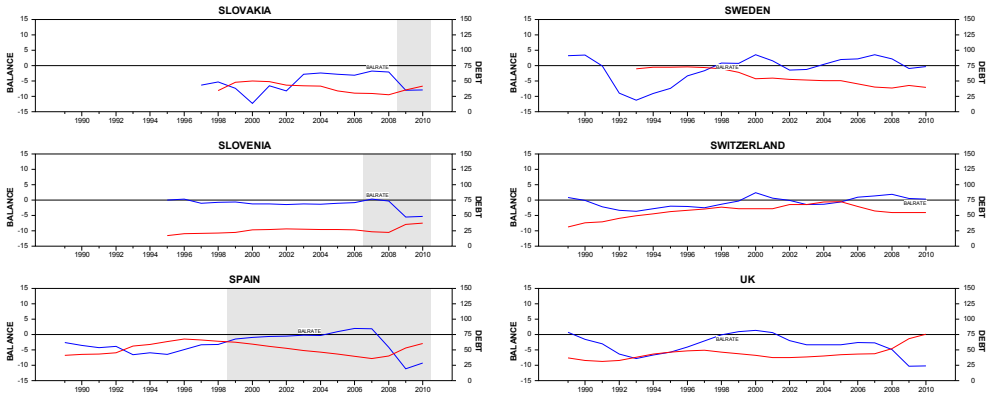


Blue line: Govt Balance (left axis); Red line: Govt Debt (right axis); Shaded area: Euro member

Figure A5

GOVERNMENT BALANCE AND GOVERNMENT DEBT

percent of GDP



Blue line: Govt Balance (left axis); Red line: Govt Debt (right axis); Shaded area: Euro member

TRADE OPENNESS, URBAN CONCENTRATION AND CITY-SIZE GROWTH IN TURKEY

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Abstract

Aim of the present study is to investigate two important issues on urban concentration in Turkey. First, we investigate whether population tend to have an uneven distribution across cities between 1965-2012, second, we analyze the determinants of city-size growth by relating it to the process of trade liberalization and to a range of other socio-economic and geographical factors. In terms of methodology, we employ various cross sectional and spatial econometric tools to implement our analysis. Our results indicate three major conclusions: First, urban concentration tends to increase recently, leading to an unevenly growing cities and creating urban giants (i.e. Istanbul). Second, trade liberalization is shown to intensify this process since metropolitan areas, which are more open to trade, tend to grow faster than others. Third, specialization of cities in industrial activities (i.e. manufacturing) and economies of agglomeration are likely to reinforce the spatial concentration of population around larger cities.

Keywords: Trade Liberalization, City Growth, Urban Concentration, Zipf Law
JEL classification: R12, R23, F14

1. Introduction

The world population has been steadily increasing over the last century. While it was about 2 billion in 1900s, it has reached to 6 billion in 2000, 6.8 billion in 2013 and estimated to be about 10 billion in 2100. (Source: United Nations (UN)). More importantly, urban population has been rising at a faster pace. For instance, its share in total population has risen from 30 % in 1950s and to about 50 % in 2010 (Source: UN).

Rapid urbanization is seen as one of the most important threats against sustainable development. As emphasized in World Bank's Development Report (2003), uneven distribution of population within a country (i.e. excessive urban primacy) is likely to bring about severe socio-economic and environmental problems (Nitch 2006). Such that it might lead to increased real economic costs, urban crime, congestion and inequalities.

The issue of urban concentration and its recent trends has been analyzed in a number of empirical studies. Some recent examples are Glaeser et al. (1995) who focus on 203 large cities in U.S., Giesen and Sudekum (2009) who analyze 2143 largest German cities in the same context and Eaton and Eckstein (1997) who studies urban concentration in France.

Regarding Turkey, rate of urbanization has also risen substantially over the last few decades. Share of urban population has increased from 24 % in 1927 to 44 % in 1980 and to 65 % in 2000 (Evcil et al. 2006; Deliktas et al. 2013)[1]. Several scholars have pointed out this fact in empirical studies. The most remarkable ones are Deliktas et al (2013) and Marin (2007) who reach to similar conclusions that Turkish urban system has followed an uneven development after 1980s with high concentration around metropolitan cities.

[1] Source: TUIK

The reason of why such an unbalanced urbanization and city growth exist is an important question. Deliktas et al. (2013) analyze the determinants of city-size growth in Turkey between 1980-2007. They employ a wide range of economic, social and cultural variables and report that cities with high fertility and net migration rate and those of which specialize in manufacturing sector and located along the coast tend to exhibit higher population growth. Similarly, Filitekin (2006) investigates the same issue for Turkish cities between 1950-2000 and reports that cities which have high market potential and located along the coast are likely to have higher population growth. Finally, Marin (2007) argues that uneven development of urban areas in Turkey is related to liberal economic and social policies applied after 1980s.

Although these issues have been heatedly discussed within the literature, there are several directions that need to be further explored:

First, among the variety of determinants, the impact of trade openness and liberalization process has not yet adequately been studied. In fact, trade liberalization might have substantial and varying effects on the city-size distribution and growth. The impact can actually be twofold:

One the one hand, Krugman and Elizondo (1996) claim that trade liberalization makes it more likely that the population is spatially dispersed. In a similar vein, Hanson (1998), Krugman and Hanson (1993), Nitch (2006) and Ades and Glaeser (1995) argue that trade openness is generally coupled with decentralization of economic activity and population. The rationale behind this claim is that as the country opens its markets to trade, level of competition intensifies in core and metropolitan areas that pushes firms and laborers to relocate towards low-cost peripheral cities in search of cheaper capital and land and higher profit rates (Erdem 2015; Fan and Casetti, 1994;Rodriquez-Pose and Gill, 2006; Krugman and Elizondo 1996). This diffusion process will naturally make population and firms more dispersed within the country.

On the other hand, a counter argument, which is in line with the views of Myrdal (1957) has been put forward. Such that trade liberalization is likely to benefit central-metropolitan cities which attract firms and laborers as these areas provide several advantages such as low cost access to foreign markets, reduced transport costs, developed infrastructure, public services and job incentives (Rivas 2007; Erdem 2015). Increasing returns to scale created by locational agglomeration will reinforce the centrifugal effects and direct firms and laborers to flow into large metropolitan cities. Thus, it will lead to a spatially concentrated population.

Empirically, trade openness is likely to be a relevant variable for Turkey which has been experiencing a period of rapid liberalization during the last few decade, i.e. post 1980

In fact, prior to 1980, more closed and import substitution approached have been adopted. In 1930s, state assisted industrialization has been followed and 5 year development plans were initiated (Uckac, 2010; Özcan, 1998). During 1940s and 1950s, increased imports were coupled with external debts and trade deficits (Uckac, 2010; Özcan, 1998). Economic approach to growth has been started to change towards free trade, loans and foreign aid (Uckac, 2010; Özcan, 1998). Starting from 1980, a real turning point for the liberalization was experienced. Export-led economic growth has been adopted as a main strategy, instead of import substitution. Integration to commodity markets were achieved in several steps, i.e. international trade agreements For instance, Turkish Lira has become convertible in 1989, Customs Union agreement were signed in 1995 and Turkey has participated in World Trade Organization in 1996. These institutional arrangements were aimed to remove all types of barriers against the free flow of commodities and production factors among partner countries. As a consequence, the volume of foreign trade has dramatically risen (i.e. from about 11 Billion dollars in 1980 to 389 Billion dollars in 2012.)

Our second contribution to the literature is rather methodological. So far, existing studies has largely neglected the possible spatial dependence and interconnectivity among the populations of neighboring cities in their empirical analysis. Failing to take into account the spatial autocorrelation might, in fact, create a serious bias for estimations. For this reason, we address this issue by incorporating the geographical weights and spatial factors into our analysis.

So, aim of the present study is twofold. First, we analyze whether population in Turkey tend to have an uneven distribution across cities over the period of 1965-2012 by testing the famous Zipf's law. Second, we analyze the determinants of city-size growth by relating it to

the process of trade liberalization and to a range of other social, economic and geographical variables. In terms of methodology, we employ various cross sectional and spatial regression models to implement our analysis.

2. Urban Concentration and Zipf's Law in Turkey, 1965-2012

The recent trends of urban concentration have been currently discussed for various countries. The vast majority of researchers find evidence in favor of stable populations and parallel growth of cities over time. Some examples of these studies are Eaton and Eckstein (1997) who investigates the populations of 40 urban areas in France and Japan for the period of 1876-1990 and 1925-1985, Giesen and Sudekum (2009) who focus on 2143 German cities between 1975-1997 and Ionnides and Skouras (2009) who study large U.S. urban places in 2000.

Regarding Turkey, the picture is somewhat different as the results are quite mixed. For instance, Filiztekin (2006) analyzes the city-size distributions over the period of 1950-2000 and report evidence of stable distribution of populations. Similarly, Turk and Dokmeci (2001) find evidence in favour of parallel growth of cities over the period of 1980-1997. In contrast, Deliktas et al. (2013) and Marin (2007) are the authors who report a tendency towards unevenly distributed city populations within the country, especially after mid-1980s.

To shed more light on this issue, we empirically analyze and demonstrate the evolution of city-size distributions within the country. As a start, we summarize in Table 1 the descriptive statistics. Specifically, it documents the maximum and minimum values of city populations along with their mean, standard deviation and coefficient of variation values for the years between 1965 and 2012.

Table 1: Descriptive Statistics on City sizes (populations), 1965-2012

Years	max	min	mean	SD	SD/Mean
1965	1792071	14132	161280,9	254167,1	1,575928
1970	2203337	20794	204344,8	320519,5	1,568523
1975	2648006	30332	251777,1	401566	1,594926
1980	2909455	36184	293209,1	448027,2	1,528013
1985	5560908	43085	405489	763676,3	1,883346
1990	6753929	41295	453196	862440,7	1,903019
2000	9085599	39725	543286,2	1101175	2,026878
2007	11174257	35835	614171,1	1346775	2,192834
2008	12569041	36502	661873,1	1507497	2,277622
2009	12782960	34548	676632,3	1535451	2,269255
2010	13120596	33701	694103,2	1576054	2,270634
2011	13483052	37424	708465,5	1617687	2,283367
2012	13710512	37522	721585,6	1644688	2,279269

At a glance, an interesting observation appears to emerge that the mean values tend to increase over time (i.e. from 161.280 inhabitants in 1965 to 721.585 inhabitants in 2012) while the standard deviation increases at a faster pace (i.e. from 254.167 in 1965 to 1.644.688 in 2012). This indicates the fact that Turkish cities tend to grow quite unevenly over time. Similarly, Coefficient of Variation, which is shown in the last column, confirms this trend as it rises steadily in the recent decades. In sum, city-sizes tend to become more and more heterogeneous over time, thereby, creating urban giants one the one hand (i.e. Istanbul, Izmir and Ankara) and some tiny cities on the other (i.e. Bayburt, Tunceli).

To support these findings visually, we provide two additional analyses. First, we chart in Figure 1 the evolutions of populations in 3 largest cities relative to the average city population. Second, we demonstrate in Figure 2 the population shares of cities in total population using a map.

Figure 1 : Relative population of cities (average of Turkey=1), 1965-2011

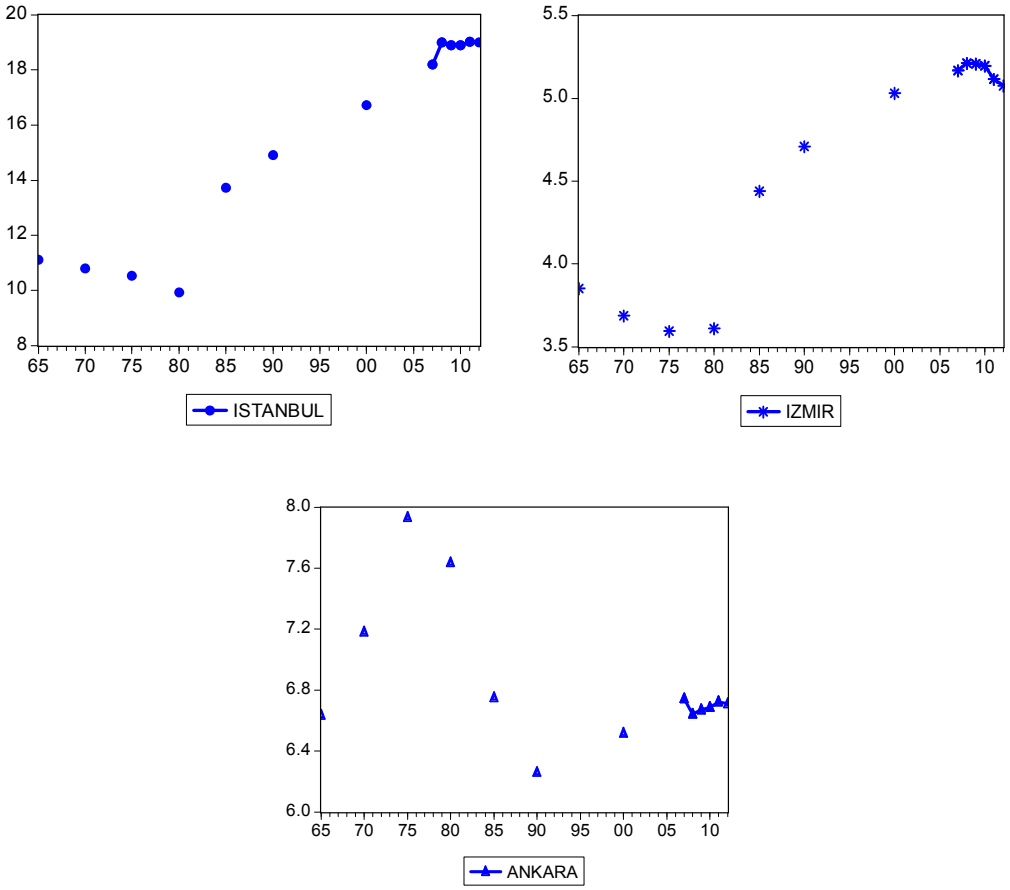

Figure 2: Population Share of Cities, 2012

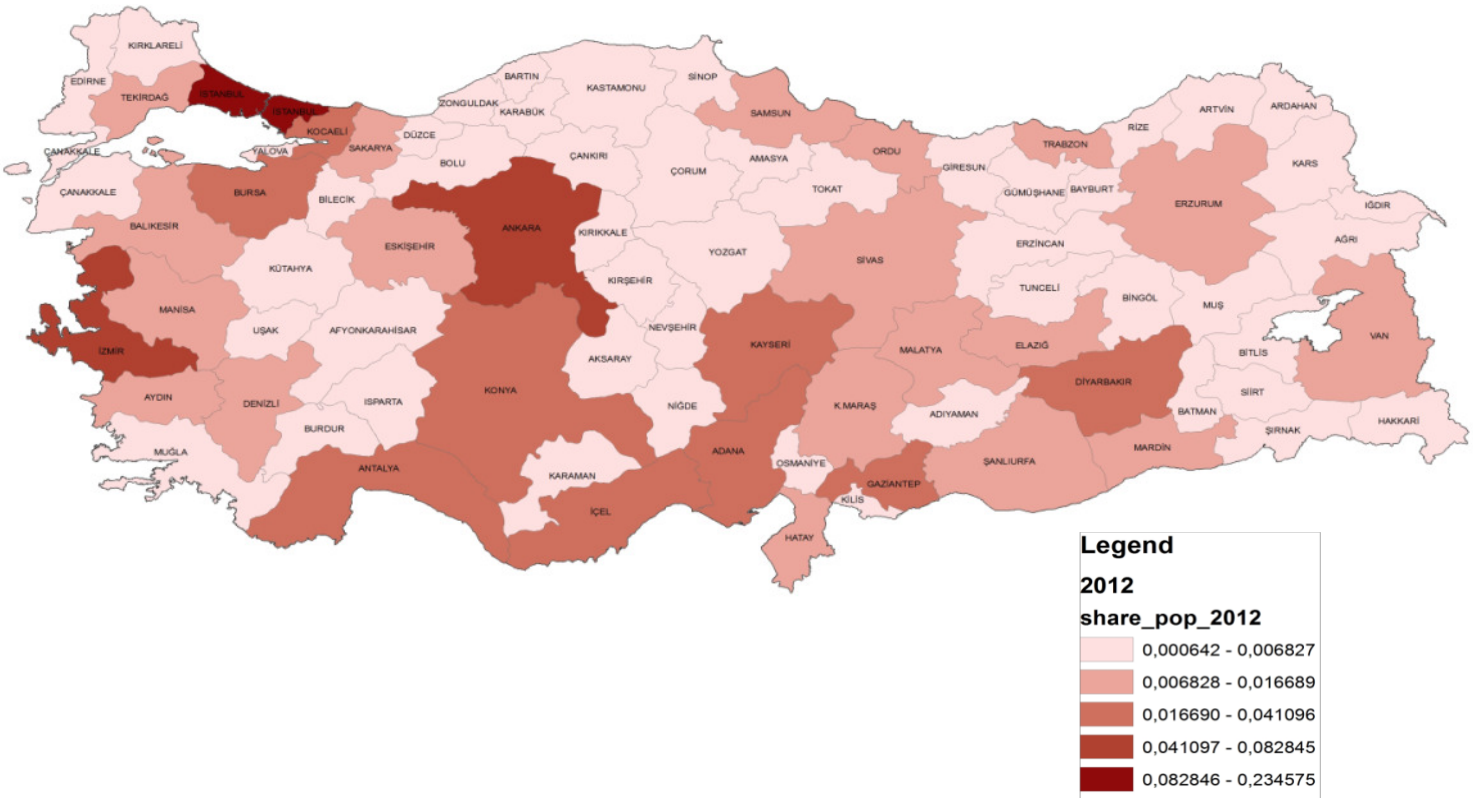

Figure 1 provides evidence in favor of polarizing populations across cities. For instance, Istanbul, the largest city in Turkey, had a population (about) 11 times bigger than an average city in 1965, and, this has risen to 19 times in 2012. A similar tendency has also been observed for Izmir which has grown faster than the average. However, for Ankara, an opposite trend is present.

Figure 2 illustrates, instead, the geographical pattern of population shares. We observe that the most populated cities are concentrated around coastal, Western and Middle Anatolian regions while cities in Eastern and South-Eastern regions are less populated. From 1965 to 2012, the range of population shares change substantially. While it ranges between 0.1 % and 16.5 % in 1965, this interval widens in 2012 and becomes 0.06 %-23.5 % which indicates, once more, an increasing heterogeneity of city-sizes.

Testing the Zipf Law.

More formally, one may attempt to test the validity of uneven city-sizes and its tendency over time using Zipf's law (Gabaix 1999; Zipf, 1949). It is a statistical test initially introduced by Auerbach in 1913 and, currently, known as one of the most commonly accepted approaches in the literature. Specifically, it is based on the following Pareto distribution (Deliktas et al. 2013)[2]:

$$R_i = AS_i^{-\beta} \quad (1)$$

where *S* represents the population of city *i* and *R* is the rank of cities starting from the most populated city to the least one. *A* represents the expected population of the largest city (Deliktas et al. 2013).

Most important, Pareto Exponent, β, captures the validity of Zipf's law. If β=1, for instance, it would mean that cities follow a proportional growth and stable relative populations (Deliktas et al. 2013)

. As β<1 or β>1, it deviates from Zipf's Law. In order to perform this test, we refer to the following regression equation (Deliktas et al. 2013)[3]:

$$\ln R_i = \gamma - \beta \ln S_i + u_i \quad (2)$$

which takes a log-linearized form. We estimate it using OLS for the years which the data is available. We adopt Newey–West HAC Heteroskedasticity and Autocorrelation consistent errors to avoid possible bias and inconsistency driven by heteroskedasticity and autocorrelation. Additionally, we test whether β=1 using Wald test (Ho: β=1) to understand the validity of Zipf's Law.

The estimations are summarized in Table 2 from which we can derive several results: First, initially in 1965, Pareto exponent is 1.004 but not significantly different from 1 as the Wald test statistic is insignificant. Therefore, the Zipf's law seems to hold and populations are somewhat homogenously distributed throughout the country. However, over the years, increases until 1980 and decreases afterwards. It becomes, for instance, 1.014 in 1980, 0.960 in 1990, 0.894 in 2000, 0.824 in 2010 and 0.832 in 2012.

Moreover, the Wald statistic turns to be significant from 2007 onwards, indicating the fact that Zipf's law does not hold anymore and population is distributed more heterogeneously within the country.

[2] The following equation is borrowed from Deliktas et al. (2013)
[3] The following equation is borrowed from Deliktas et al. (2013)

Table 2: Zipf Law Test, OLS Results, 1965-2012

Dep. Var: ln (Rank)	1965	1970	1975	1980	1985	1990
constant	14.818***	15.348***	15.404***	15.546***	15.190***	15.310***
(S.E)	1.144	1.019	0.948	0.978	0.833	0.909
ln(pop)	-1.004***	-1.028***	-1.016***	-1.014***	-0.967***	-0.960***
(S.E)	0.098	0.085	0.078	0.079	0.066	0.072
Wald Test	0.0016	0.1077	0.0433	0.0335	0.2336	0.3022
R-Squared	0.92	0.92	0.93	0.93	0.94	0.94

Table 2 (continued)

Dep. Var: ln (Rank)	2000	2007	2008	2009	2010	2011	2012
constant	14.699***	14.285***	14.005***	13.965***	13.909***	14.0310***	14.049***
(S.E)	1.089	1.021	0.965	0.993	1.028	0.966	0.970
ln(pop)	-0.894***	-0.858***	-0.834***	-0.829***	-0.824***	-0.832***	-0.832***
(S.E)	0.085	0.079	0.075	0.077	0.079	0.075	0.752
Wald Test	1.5020	3.1418*	4.8297**	4.8323**	4.8474**	4.9959**	4.9598**
R-Squared	0.92	0.92	0.93	0.93	0.92	0.93	0.93

S.E.: Newey West, Heteroskedasticity andf Autocorrelation consistent standard errors., Note: ***indicates significance at 1 %, ** at 5 %, * at 1%

One may consequently argue that, these tendencies might be driven by a range of social, economic, political and geographical determinants which is a subject to be investigated in the next section.

3. Determinants of city growth, 2000-2012

Various determinants of city-size growth have been considered in the literature. In general, we can classify them into several categories such as ***economic***, ***social, cultural*** and ***geographical*** variables**.**

In terms of economic ones, industrial structure and specialization, agglomeration of activities, level of development (i.e. per capita GDP), trade openness, market size, level competition and infrastructure are recognized as the most popular determinants (Deliktas et al. 2013). Rosen and Resnick (1980) and Alperovich (1993), for instance, argues, that Pareto exponent of countries rises with higher per capita income and better infrastructure facilities (i.e. rail-road density). Deliktas et al. (2013) points to the importance of industrial structure and agglomeration and claim that cities which specialize in industrial and commercial activities (i.e. manufacturing) are likely to have higher population growth given the availability of job opportunities in these areas. Da Mata et al. (2007) suggests that the population growth in Brazil is higher in cities with high market potential, good labor force quality and lower transport costs.

With regard to social and cultural variables, net migration rate, health indicators, rate of fertility, literacy rate, schooling and crime rate may be referred to as the most well-known ones. Deliktas et al. (2013), for instance, report evidence of the fact that Turkish cities which have relatively higher net migration and fertility rate, and lower schooling rate tend to have higher population growth.

Geographical variables mostly refer to the location of cities. According to Filiztekin (2006) and Deliktas et al. (2013) cities that are located in the core regions and along the coast

are particularly likely to grow as the natural amenities, climate, market size and economic incentives attract the laborers to these places.

Among other variables, trade openness and liberalization policies deserve a special attention. As anticipated earlier, two different interpretations exist.

One the one hand, Krugman and Elizondo (1996) claim that trade liberalization makes it more likely that the population will be diffused throughout the country. In support of this argument, Hanson (1998), Nitch (2006), Krugman and Hanson (1993) and Ades and Glaeser (1995) argue that trade openness is associated with less centralized population and weaker urban primacy. As the country opens up the markets to foreign trade, level of competition among domestic and foreign firms intensify in metropoliten areas that forces firms and laborers to move towards low-cost peripheral cities (Krugman and Elizondo 1996; Erdem 2015).

On the other hand, a counter-argument points to an opposite effect (in line with Myrdal 1957). Such that trade liberalization generates additional advantages to already developed metropolitan cities. It attracts firms and laborers as these cities provide low cost access to foreign markets, job opportunities, reduced transport costs, developed infrastructure and public goods. Positive externality and increasing returns to scale created by locational concentration will reinforce the centrifugal effects. It will, hence, create spatially uneven city-sizes (Rivas 2007; Erdem 2015).

Indeed, we think trade openness might be a relevant variable as Turkey has experienced a rapid liberalization process in recent decades. As a consequence of liberal policies, deregulations and international agreements (i.e. Customs Union), barriers against the free flow of commodities and production factors are eliminated. Thus, the volume of exports and imports has grown about 40 times over the last 50 years. To illustrate this, the evolution of foreign trade volume is depicted in Figure 3 for the period of 1923-2011. It clearly follows an exponential upward-trend with a great jump after 2000.

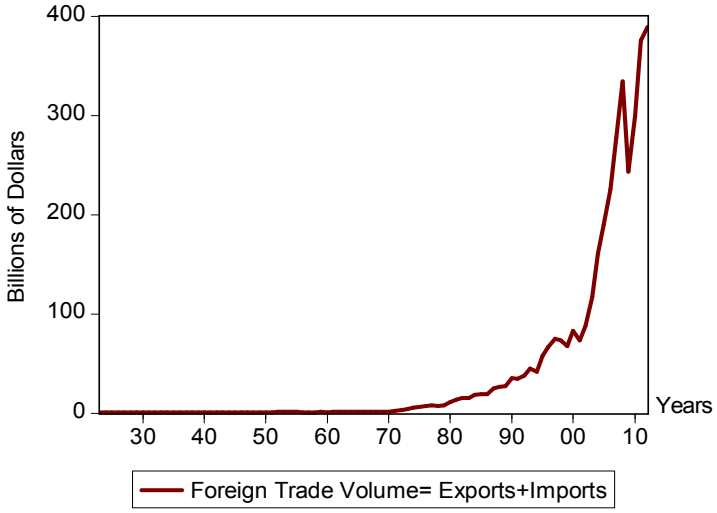

Figure 3: Evolution of Trade Liberalization in Turkey, 1923-2011

Our empirical model which incorporates a range of factors is based on the following regression equation (3):

$$ln\,\Delta pop_i = \alpha + \beta_1\ ln\,trade_i + \beta_2\,ln\,indus_i + \beta_3\,ln\,aggl_i + \beta_4\,ln\,migr_i + \beta_5\,ln\,fert_i + \beta_6\,ln\,crime_i + \beta_7 d\_coast_i + \beta_8 d\_capital_i + \beta_9 d\_border_i + e_i \quad (3)$$

The dependent variable is the growth rate of populations in 81 provinces (in the centre of province and sub-provinces) over the period of 2000-2012.

Regarding the explanatory variables, *ln_trade* represents the openness of province to trade in year 2000 and defined as *(exports+imports)/GDP*. *ln_indus* is the variable of specialization in industrial activities measured by its share in total employment. *ln_aggl* shows the level of

agglomeration measured by the Real GDP of the province in 2000 divided into its land area (in meter squares). *ln_migr* is the net migration rate in year 2000 and *ln_fert* is the rate of fertility. (an average of 2009-2012 years used). *ln_crime* is the percentage of people that are penalized by court (average of 2007-2011 years used). *d_coast, d_border* and *d_capital* are the dummy variables capturing the effect of different locations (being on the coast line, on the border and capital city). The data for all variables is obtained from TUIK (Turkish Statistical Institute).[4] Finally, e_i represents the error terms which are assumed to follow a *NID(0,σ)* normal distribution with zero mean and constant variance.

Regarding the estimation methodology, we are aware of the fact that in urban and regional analysis, spatial dependence among cross sectional units is an important issue. Failing to take into account such interconnectivity might, in fact, create a serious bias for estimations.

So, we run the regression using OLS by including separately *ln_indus* and *ln_aggl* variables into the model since the inclusion of both creates a multicollinearity problem. Thus, we resort to two models; (1) and (2). Having estimated them, we test the presence of spatial autocorrelation using Lagrange Multiplier Error (LMerr), Lagrange Multiplier Lag (Lmlag) and SARMA tests.

In terms of spatial weights, we use three different adjency matrices (W2,W4,W6) in which neighboring cities are defined as the ones which are closer than 200km, 400km and 600km to each other respectively . The matrices are constructed in a way that if two cities are neighbors they take on value 1 and 0 otherwise.

The results are presented in Table 3. In all models and tests, positive spatial autocorrelation is evident regardless of the type of weight matrices used. Thus, it has been shown empirically that spatial dependence is a crucial issue which needs to be taken into account.

Table 3: Spatial Autocorrelation Tests

	Model (1)			Model (2)		
Test:	W200	W300	W400	W200	W300	W400
LMerr	6,19**	6,11**	4,82**	4,72**	4,84**	5,60**
Lmlag	6,04**	5,46**	5,13**	6,20**	6,47**	7,60***
SARMA	6,63**	6,46**	5,68*	6,20**	6,51**	7,75**

Note: ***indicates significance at 1 %, ** at 5 %, * at 10, LMerr:Lagrange Multiplier Error, Lmlag: Lagrange Multiplier Lag , SARMA : Spatial Autoregressive Moving Average

To do so, we consider two standard spatial regression models. First, we incorporate the spatial connectivity in error terms in a Spatial Error Model (SEM) and in this way, get rid of a possible bias driven (Anselin 1988). Such that;

$$e_i = \lambda W e_j \tag{4}$$

where λ captures the spatial dependence across the error terms of neighbouring cities *i* and *j*. *W* denotes the spatial weight matrices.

Second, we consider a Spatial Autoregressive Model (SAR) which assumes spatial connectivity in dependent variables. Such that the SAR model is specified as (Anselin,1988);

$$\ln \Delta pop_i = \alpha + \rho W \ln \Delta pop_i + \beta_1 \ln trade_i + \beta_2 \ln indus_i + \beta_3 \ln aggl_i + \beta_4 \ln migr_i$$

$$+\beta_5 \ln fert_i + \beta_6 \ln crime_i + \beta_7 d\_coast_i + \beta_8 d\_capital_i + \beta_9 d\_border_i + e_i \tag{5}$$

where ρ captures the impact of population growth in neighboring cities on city *i's* population. We estimate the models using a Maximum Likelihood approach and present the

[4] GDP data at year 2000 has been obtained from Karaca (2004) and Kasman and Turgutlu (2009). Distance data between two cities is obtained from KGM (General Directorate of Highways).

results in Table 4 (Spatial Error Model) and in Table 5 (Spatial Autoregressive Model). Several interesting results emerge:

Table 4: Spatial Error Model (Determinants of City-size Growth), 2000-2012

	Model (1)			Model (2)		
Variables	**W200**	**W300**	**W400**	**W200**	**W300**	**W400**
λ	0,34**	0,43**	0,51**	0,32**	0,40**	0,52***
trade	0,033**	0,030**	0,032**	0,028**	0,025**	0,027**
industry	0,084**	0,081**	0,083**	-	-	-
aggl	-	-	-	0,047**	0,045**	0,047**
migration	0,0004*	0,0004*	0,0003	0,0004*	0,0004*	0,0003
fertility	-0,040	-0,048	-0,035	-0,017	-0,025	-0,016
crime_rate	3,565	5,087	4,181	9,285	10,055	8,451
coast_dummy	0,026	0,031*	0,032*	0,018	0,024	0,025
capital_dummy	0,051	0,038	0,021	0,041	0,030	0,008
border_dummy	0,016	0,016	0,005	0,018	0,019	0,007
N	81	81	81	81	81	81
AIC	-206,26	-205,35	-204,5	-198,56	-197,98	-198,53

Note: ***indicates significance at 1 %, ** at 5 %, * at 10%

Table 5: Spatial Autoregressive Model (Determinants of City-size Growth),2000-2012

	Model (1)			Model (2)		
Variables	**W200**	**W300**	**W400**	**W200**	**W300**	**W400**
ρ	0,26**	0,28*	0,31*	0,28**	0,33**	0,38**
trade	0,032***	0,031***	0,033***	0,028**	0,026**	0,028**
industry	0,078***	0,077***	0,078***	-	-	-
aggl	-	-	-	0,044***	0,043***	0,044***
migration	0,0004*	0,0004*	0,0003	0,0004*	0,0004	0,0003
fertility	-0,047	-0,048	-0,042	-0,024	-0,027	-0,022
crime_rate	0,784	-0,529	-1,563	5,731	3,870	2,046
coast_dummy	0,016	0,020	0,020	0,010	0,013	0,013
capital_dummy	0,037	0,023	0,013	0,034	0,020	0,007
border_dummy	0,014	0,013	0,011	0,014	0,013	0,010
N	81	81	81	81	81	81
AIC	-205,5	-203,98	-203,45	-199,3	-198,38	-198,54
LM Test	0,34	0,23	0,07	0,009	0,12	0,004

Note: ***indicates significance at 1 %, ** at 5 %, * at 10%

First, in all regressions, trade variable has a positive and significant coefficient regardless of the type of model and spatial weights used. So, it is firmly evident that cities which are more open to trade experience a higher population growth. One may, therefore argue that trade liberalization has favored the large metropolitan cities in Turkey which are possibly

more open to trade. Thus, trade openness might be seen among the factors that contribute to the spatial concentration of populations. Given the availability of job opportunities in these areas, easy access to foreign markets, ports and other economic incentives, it is plausible that it attracts firms and laborers. As a consequence, an excessive urban primacy and uneven distribution of population exist within the country.

As a second result, specialization in industrial activities and agglomeration variable has a positive and significant coefficient in all regressions. It actually means that cities which include highly dense and concentrated economic activity with particular focus on industrial production (i.e. manufacturing) are likely to have higher population growth.

Third, spatial factors and connectivity among neighbor cities matter in all regressions. In SAR model, for instance, ρ is found to be positive and significant in all specifications. It means that population growth in one city is spilled over to the neighboring locations. This may happen through commuting patterns or migration flows.

Finally, with regard to other social and geographical variables, only net migration rate is found to be significant and positive while crime rate, fertility and other locational variables are found to be insignificant.

4. Conclusions

We investigated in this paper the recent tendencies of urban concentration and city size distribution in Turkey between 1965-2012 and the determinants behind city-growth. Our findings indicate three major conclusions.

First, urban concentration tends to increase recently, leading to an unevenly growing cities and creating urban giants (i.e. Istanbul). This result has been shown in section 2 using several illustrative analyses (i.e. maps and figures). Moreover, it has statistically been confirmed by Zipf's Law which does not hold after 2007.

Second, through a regression analysis, trade liberalization is shown to intensify this process since metropolitan places, which are likely to be more open to trade, tend to grow faster than others. Third, specialization of cities in industrial activities (i.e. manufacturing) and economies of agglomeration are likely to reinforce the spatial concentration of population around larger cities.

Finally, the results so far obtained provide important policy implications. First, the tendencies we have so far observed might be seen as an outcome of neoliberal urban policies (such as promoting trade and financial openness within the cities) which have led to the population agglomerations. Thus, policy makers should bear this in mind and approach with a caution to such policies.

Second, to be able to overcome the uneven urban development induced by liberalization, authorities should distinguish between two scales of policies; the centrally decided ones and the local policies. At the national scale, openness and liberal policies should be approached with a caution while alternative policy tools, i.e. tax incentives and public subsidies, can be directed towards backward regions to stimulate the entrepreneurship and investment, hence, attract the firms and laborers to these areas. Some examples of these regional development programs are GAP (Southern Anatolian Project) and large organized industrial zones in many Anatolian cities, State Development Agencies and rural development programs which are still ongoing and aimed to extract the local potentials and enhance the sustained rural life against migration.

At a local scale, several policies can be implemented. For instance, improvement of the physical and virtual infrastructure, education and health services, housing and other social problems might well contribute to the development of rural areas and hamper the out migration.

Overall, perhaps the most crucial lesson we get is that uneven development in urban areas is accompanied by liberal trade policies which needs a deep consideration of additional policies in action.

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SPATIAL ANALISIS OF EFFECT OF GOVERNMENT EXPENDITURES ON ECONOMIC GROWTH

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Abstract

Among the many factors which affect the economic growth of a country, governments are considered to be the most influential stimulants. Due to the importance of studying government expenditure on economic growth, many techniques have been suggested in this regard..

In this article we apply a new technique, namely the Spatial Econometrics Method. This method examines "neighborhood" and "location" factors, which are influential in debilitation and reinforcement. Using Ram's growth model (1986) and applying the geographic aspect to global regression models, we attempt to discover the effect of U.S state government expenditures on the economic growth of its states. It was revealed that the growth of each state is influenced by that of its neighboring states and that state government expenditures have no effect on economic growth. In addition, the growth of the labor force is introduced as an influential element affecting state economic growth.

Keywords: Government expenditures, spatial econometrics, geographic weighted regression

JEL classification: C31, E62, H72, R12

1. Introduction

Economic growth and its underlying foundations are important factors discussed widely in recent years. Government expenditure is a major factor that influences economic growth through its allocation to education, infrastructure, public goods and services and law enforcement. Various methods have been used to investigate the effect of government expenditure on economic growth with different results. Based on a cross-country study for 96 countries, Landau 1983 [1], found a negative relationship between government expenditure and economic growth. Atrayee. 2009 [2] reached the same results for the United States over the years between 1950-1998 by developing a multi-equation model. However, Kormendi and Meguire 1985 [3] found a non-significant relationship while Summer and Heston 1984, Ram 1986 [4] found positive and significant effect. Moreover; Haggins et al (2006 [5], based on data from 1970 to 1998, examine this relationship on three i.e. the federal, state and local levels. Using the 3SLS-IV approach they clarified that the federal, state and local governments are either negatively correlated, or, uncorrelated with economic growth.

Most of the studies mentioned above considered the economic growth of one or several places as dependent variable and place-specific factors as independent variables. But one of the influential factors which was most often ignored was "location" and, as a result, the contiguousness of physical place. Therefore, because of the spatial dependency that exists between various regions the classical assumptions for estimation using the OLS approach would not be satisfied [6]. By adding geographic aspects to econometric analysis, a new method was introduced called spatial econometrics. Consequently the methods of estimation changed.

Today many economic studies use this method as a useful technique to complete previous models and increase the power of prospective prediction [7],[8],[9].

In this study, we present a brief introduction to spatial econometrics. We then compare the global regression and geographic weighted regression models and prove that the latter is the more appropriate choice. Finally we apply spatial analysis to examine the effect of government expenditure on economic growth and to detect models of spatial dependency.

2. Methodology

2.1. Geographic weighted regression

This method was introduced for the first time by L.Anselin [10]. Many specialists in economy, geography and other regional sciences use the technique as a major part of planning for urban development. In this kind of regression, the global form of regression such as

$$Y_i = a_0 + \sum_k a_k x_{ik} + \varepsilon_i \quad (1)$$

changes to:

$$y_i = a_0(u_i, v_i) + \sum_k a_k(u_i, v_i) x_{ik} + \varepsilon_i \quad (2)$$

where (u_i, v_i) is the co-ordinate of the ith point in space and $a_k(u_i, v_i)$ is a realization of the continuous function $a_k(u, v)$ at point i. Consequently the estimator of the variables is shown as:

$$\hat{a}(u_i, v_i) = \left(X^T w(u_i, v_i) X\right)^{-1} X^T w(u_i, v_i) Y \quad (3)$$

W denotes an n×n weighted matrix similar to the weighted regression matrix, the elements of which are 1 if the two regions are contiguous and 0 if otherwise. For easier computation the matrix has to be normalized so that its elements are divided by the number of neighbors [11]. One of the ways to form this matrix is by using the latitude and longitude of the regions as used in certain software such as GWR.

2.2. Spatial heterogeneity

Spatial heterogeneity is variation in relationship over space such that every point in space may have different relationships. Thus the linear relationship is shown as:

$$y_i = x_i \beta_i + \varepsilon_i \quad (4)$$

Where i represents points in space and x_i is a vector of independent variables associated with its parameter β_i . ε_i denotes a stochastic disturbance.

2.3. Spatial dependency

Spatial dependency may occur in many models which mean that the amount of Y in location i might be associated with Y in neighboring location j. In other words [12]:

$$y_i = f(y_j) \quad i = 1, 2, ..., n (i \neq j) \quad (5)$$

There are two major models that contain spatial dependency:
The first is the spatial autoregressive model (SAR) shown as:

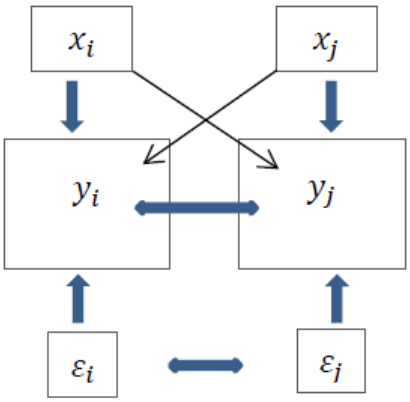
$$y = \rho w y + x\beta + \varepsilon \quad (6)$$

$$\varepsilon \sim N(0, \sigma^2 I_n)$$

where y is an n×1 vector of dependent variables, x contains the n×k vector of independent variables and w is a spatial weighted matrix always of first-order contiguity. If ρ , the

coefficient on the spatial lagged dependent variable, is significant the model will be proved to be SAR. In other words the level of Y (the dependent variable) depends on the level of Y in neighboring regions. Figure.1 illustrates this concept.

Figure 1. Spatial autoregressive model (SAR)



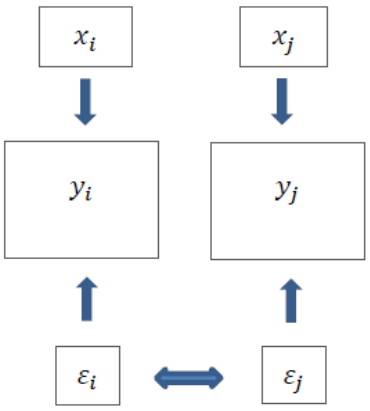
Source: www. s4.brown.edu

The second model is the Spatial Error Model (SEM). This model includes the unmeasured errors and independent variables of contiguous points which, being unmeasurable, are considered within the error domain. This model is shown as:

$$\begin{aligned} y &= x\,\beta + u \\ u &= \lambda w\,u + \varepsilon \\ \varepsilon &\sim N\left(0, \sigma^2 I_n\right) \end{aligned} \tag{7}$$

Y is an n×1 vector of dependent variables, x is an n×k matrix of independent variables and w is a spatial weighted matrix. Statistically significant, a coefficient on the spatially correlated errors, is the sign of the existence of an SEM model shown in Figure 2.

Figure 2. Spatial error model (SEM)



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2.4. Economic model and data sources

To analyze the spatial aspect, and investigate the effect of government expenditures on economic growth the Rati Ram 1984 growth model was used. Based on this model, which is adapted from reasoning developed by Greshon Feder[13], economy consists of two sectors: government and non-government. The output of these sectors is the result of their labor and capital. In addition, non-government outputs are derived from government outputs. The final

model is shown with Y representing the total output of the two sectors, *I* the total investment, $\dot{L}$ the growth of the labor force, and finally $\dot{G}$ representing government expenditures:

$$\dot{Y} = \alpha\left(\frac{I}{Y}\right) + \beta\dot{L} + \left(\frac{\delta}{1+\delta} - \theta\right)\dot{G}\left(\frac{G}{Y}\right) + \theta\left(\dot{G}\right) \quad \textbf{(8)}$$

Moreover α is the marginal product of capital in the non-government sectors, β and θ are respectively the elasticity of non-government output with respect to L and the elasticity of nongovernment output with respect to G. indicates differences in input factors in the two sectors. For example positive shows higher input productivity in the government sector.

3. Data

Data was collected from the US Census Bureau, Federal Reserve and State Government Finances. Spatial analysis is carried out for 2006 and 2009 (before and after the 2008 United States financial crisis) with the data of all fifty states. GWR, Geoda and GIS were used as the necessary software.

4. Result

4.1. Global regression versus geographic weighted regression

The first step in proving the difference between global regression and Geographic Weighted Regression (GWR), is estimating the parameters of the global model using the OLS approach over a period of two years. According to the t-statistic, the growth of the labor force is the only significant variable whereas the growth of government expenditures, beside other variables, is insignificant.

Table 1. Parameter estimation of global model by OLS approach

YEAR	Intercept	I/GDP	$\dot{L}$	$\dot{G}$ (G/Y)	$\dot{G}$
2006	4.81***	-43.2	0.81	1.53	-0.09
	(3.1)**	(-0.54)*	(2.55)	(0.75)	(-0.33)
2009	-1.07	-18.23	-0.17	-1.29	0.2
	(-1.27)	(-0.36)	(-0.62)	(-1.1)	(1.06)

*** Estimated values
** t-statistic values
* Rejection of H_0 at 5% level of significance

To compare these two models, an ANOVA test has been used to test the null hypothesis that the GWR model represents no improvement over a global model. As the F-statistics results show, GWR is the appropriate model for prediction.

Table 2. An ANOVA test for comparison of two models

Year	F- statistics
2006	3.28
2009	3.72

By switching the model from global to GWR, the values of R^2 and R^2_{Adj} change; according to Table 3 these values increase. This can be described as increase in the power of the model as a result of considering location factors collectively as a new independent variable.

Table 3. Coefficient of determination and adjusted coefficient of determination in two models

Global Regression		Geographic Weighted Regression	
R^2_{Adj}	R^2	R^2_{Adj}	R^2

2006	0.05	0.15	0.23	0.38
2009	-0.07	0.03	0.12	0.28

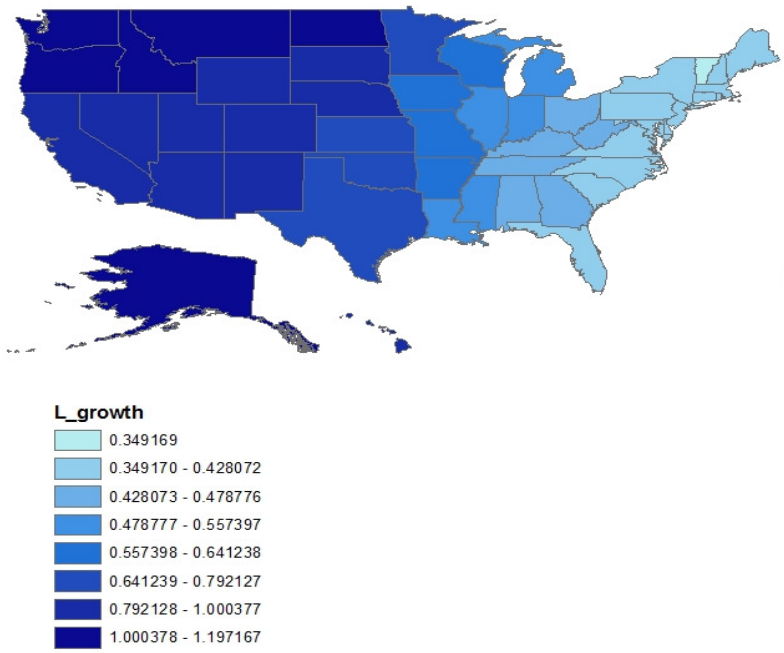
A five-number summary of the local parameters estimates is shown in Table 5. The minimum effectiveness of the only significant variable i.e. the growth of the labor force on economic growth is 0.36 and belongs to the state of Vermont and its maximum, 1.19, to the state of Alaska.

Table 4. A five-number summary of the local parameters estimation

	Year	Min	Lower Quartile	Median	Upper Quartile	Max
Intercept	**2006**	3.23	3.64	4.14	4.32	7.86
	2009	-2.37	-1.31	-0.8	-0.51	-0.36
(I /Y)	**2006**	-140.42	5.93	14.46	31.6	77.14
	2009	-66.89	-63.09	-54.56	-27.57	-52.67
$\dot{L}$	**2006**	0.34	0.42	0.54	0.9	1.19
	2009	-0.6	-0.19	-0.01	0.09	0.13
$\dot{G}\left(\frac{G}{Y}\right)$	**2006**	-1.06	-0.14	-0.0003	0.46	3.23
	2009	-3.33	-0.49	0.24	0.87	1.2
$\dot{G}$	**2006**	-0.56	-0.03	0.063	0.09	0.2
	2009	-0.1	-0.05	0.03	0.1	0.47

To illustrate the intensity of this effect, a GIS map was designed (Figure3). The dark and bright colors respectively represent the strong and weak influence of labor force growth on economic growth. As is shown, the highest effect of labor growth on the economic growth of the states is seen in the northern and north western states (Alaska being one) and its least effect belongs to the eastern and north eastern states (such as Vermont).

Figure 3. Intensity of labor growth effects on economic growth



4.2. Detecting spatial dependency

The Moran-I statistics and scatterplot are two indices used to examine the presence and extent of spatial dependency in economic growth. The results below show a spatial dependency in the economic growth of the states in the 2009 model (Figure 4). The Moran-I scatterplot also demonstrates this. This plot presents economic growth on the horizontal and

spatial lag on the vertical axis. Based on this scatterplot, the states' dispersion in the first and third quadrants in Figure.4 declares that the states with positive economic growth are located near other states which likewise have positive growth and states with negative growth are neighbors to their likewise peers.

Figure 4. Spatial dependency among economic growth of states (2009)

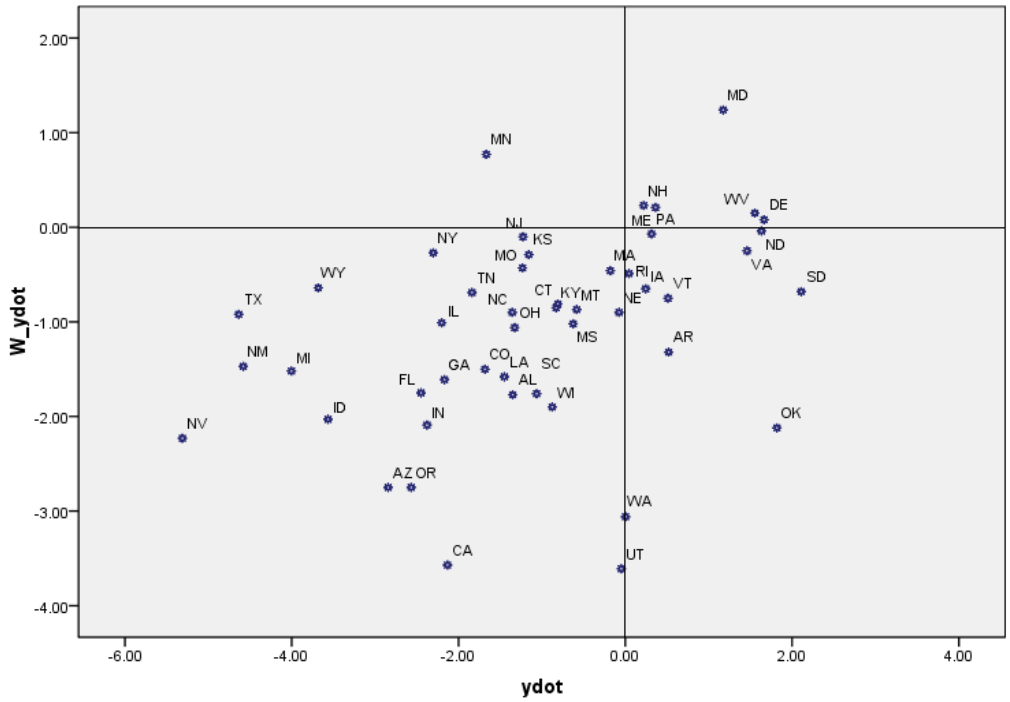


Table 5 shows the existence of spatial dependency as SAR and SEM models. The significant P-values admit the existence of these two models. These two kinds of spatial dependencies have been confirmed only in the 2009 model.

Table 5. Models of spatial dependency

	MI/DF		VALUE		PROB	
	2006	**2009**	**2006**	**2009**	**2006**	**2009**
Test						
Moran's I (error)	0.089	0.18	1.27	2.34	0.2	0.01
Lagrange Multiplier (lag)	1	1	0.12	3.08	0.72	0.07
Lagrange Multiplier (error)	1	1	0.84	3.65	0.35	0.05
Lagrange Multiplier (SARMA)	1	1	1.45	4.42	0.48	0.11

After detecting these dependencies, the estimation of variables is provided. The coefficient estimation of the SAR and SEM 2009 models are presented in Table 6 as:

Table 6. Estimation of, SAR and SEM model (2009)

Variables\models	**SAR**	**SEM**
Intercept	-0.87 (-1.11)*	-1.41 (-1.72)
I/GDP	-2.46	10.04

	(-0.054)	(0.19)
$\dot{L}$	-0.16	-0.16
	(-0.63)	(-0.63)
$\dot{G}\left(\frac{G}{Y}\right)$	-1.49	-1.28
	(-1.4)	(-1.24)
$\dot{G}$	0.22	0.19
	(1.3)	(1.16)
ρ	0.32	-
	(1.9)	-
λ	-	0.37
	-	(2.25)
R^2	0.11	0.13

*t-statistic

t-statistic of Table 6 shows the parameters are not significant but λ (t =2.25) and ρ (t=1.9) are significant. So the presence of neighborhood effects is proved. Also the other important results which can be concluded from this table are:

1. Significant ρ shows that economic growth of states is affected by economic growth of contiguous states.

2. significant λ and consequently presence of SEM model confirm that there are some unknown factors of contiguous states that have influence on economic growth which is consider as an error term of the model.

5. Conclusion

Government expenditure and its effects on economic growth have been subjected to various economic studies in the past few decades. Among the possible methods, spatial analysis with its consideration of the contiguity factor is one of the new and competent ways to investigate this cause and effect.

By applying this method to the Rati Ram 1986 growth model for the 2006 and 2009 data, the results presented in this study indicated that geographic weighted regression was more appropriate than global models. Moreover, state government expenditure has no effect on economic growth but the growth of the labor force has a significant and positive effect on the economic growth of the states. As spatial analysis results showed, two models of spatial dependency, SAR and SEM, have been absorbed in the 2009 model.

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PROVINCIAL CLUSTERING IN THE SOUTH OF THAILAND: CONCEPTUAL AND EMPIRICAL

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Abstract

This paper aims to determine the cluster of 14 provinces in the Southern part of Thailand. We formulated 24 indicators for provincial clustering based on three major concepts: spatial, functional, and micro-foundational. Factor analysis shows that 10 of these indicators significantly determine provincial clustering. Cluster analysis obviously categorises 14 provinces into five cases of three to seven provincial clusters. In each case, the formation of groups is determined using the proximity criteria. Discrimination analysis helps to classify the most appropriate form, and in each case shows that suggested clusters three and four are appropriate for provincial clustering.

Keywords: Geographical cluster, Provincial clustering, Agglomeration effect
JEL classification: N95, R12, R58

1. Introduction

The main purposes of economic development are to enhance economic growth, create stability, and ensure a more equal income distribution. In terms of geographical area, the difference in structure of economy and society is a major factor for determining development policy. The approach for development is usually considered in response to the capacity and potential that each area can achieve according to its economic goals.

Over the past three decades Thailand has focused on spatial development. The early stages of spatial development planning for urban and regional areas started under The Third National Economic and Social Development Plan (1972–1976). During the Fourth to Sixth Plans (1977–1991), the emphasis of development policy focused more on primary and secondary cities in various regions, including the development of new economic areas. Following the introduction of the Seventh Plan (1992–1996) the focus was on regional networks through the building of the physical infrastructure and social services to support the development of the urban system and expand economic growth as a regional centre that would further lead to local development as part of urban hierarchy.

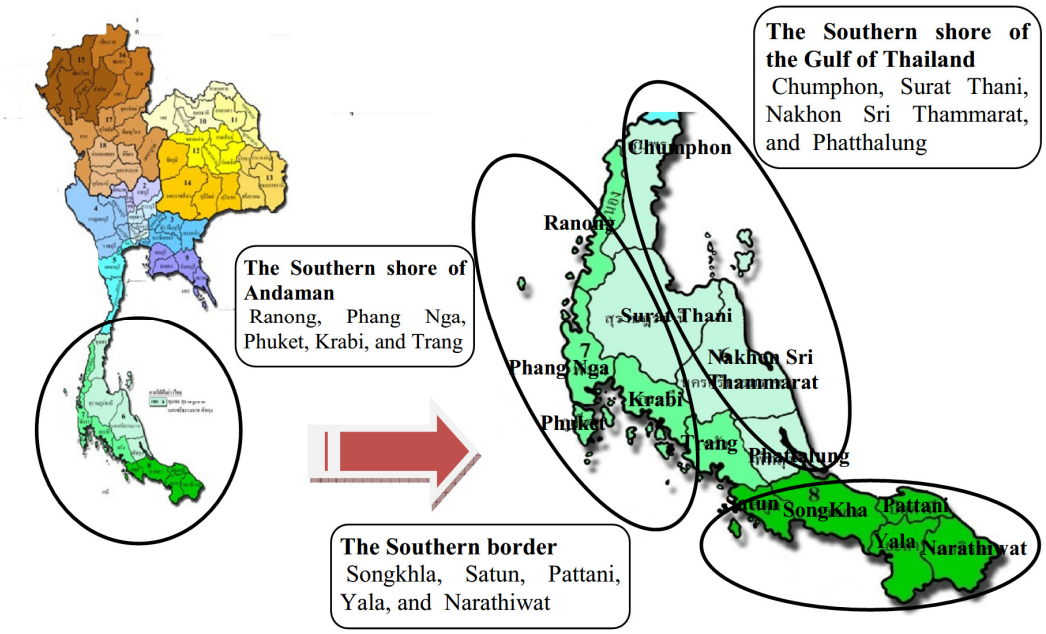
During the Eighth Plan (1997–2001), in a period of economic crisis, the concept of sustainable development was adopted for economic development policies based on the allocation of government resources to encourage the participation of all sectors and organisations for joint effect. The Ninth and Tenth Plans (2002–2011) offered holistic approaches aimed at supporting decentralisation to encourage a fair distribution of economic power and resources. Accordingly, the policy for public administration uses the concept of provincial clustering as the approach for development implementation.

Following the Regulation of the Prime Minister's office with the Integrated Provincial Administration (B.E. 2003), Article 4 established the definition of provincial clustering as provinces and territories to support the relationship between economic and social development of the country in all aspects of production, trade, and investment for specific problems requiring cooperation between the provinces concerned. On 15 January 2008, the

Cabinet approved 18 provincial clusters (Figure 1) and implemented them under the legislation with government support.

Figure 1, shows the 14 Southern provinces grouped into three existing groups. Firstly, the Southern shore of the Gulf of Thailand including Chumphon, Surat Thani, Nakhon Sri Thammarat, and Phatthalung. Secondly, the Southern shore of Andaman containing Ranong, Phang Nga, Phuket, Krabi, and Trang. Lastly, the Southern border consisting of Songkhla, Satun, Pattani, Yala, and Narathiwat. The first and second groups are located along the coast of the Andaman Sea and the Gulf of Thailand. Both groups reflect the formula of the geographical approach. The three Southern provincial clustering groups may not be formulated based on the concept of cluster.

Figure 1. Map of the three existing provincial clusters in the South of Thailand



Accordingly, there is a suspicion that provincial clustering may not be formulated based on the economic justification of the concept of cluster. This study aims to develop indicators based on the concept of cluster, which may be useful for exploring provincial clustering through the spatial variation of factor scores to determine each province in Southern Thailand in terms of geographical cluster with the indicators that have been developed.

2. Concept of cluster

The term cluster is used synonymously in literature using such terms as the industrial district, industrial cluster, agglomeration of economies, and others. The concept of cluster captures attention and is applied in different contexts. The Academic Development of the Global Cluster Initiative Survey (GCIS) presented information to support that the implementation of the cluster has been an important approach in the regional economic development policy since 2003. In the past decade, there are more than 500 cluster areas in North America, Europe, Australia, and New Zealand. An economic development agency based in North America and Europe has a set of policies consistent with the characteristics of regional cluster and is targeting support operations in economic development.

Porter (1990) associated the academic term industrial cluster with popularity and favour. He defined industrial cluster in terms of a concentrated area with interconnections between business units and institutions linked by commodities and complements. The definition of cluster is often used in different ways by academics such as Marshall (1890), Krugman (1991), Saxenian (1994), Hill and Brennan (2000), Van den Berg, Braun and van Winden (2001), Rosenfeld (2005), Cortright (2006), and Glaeser and Gottlieb (2009). Generally, the definitions used are mostly for the description and operation of the conceptual framework. Therefore, the wide range of author ideas depends on different terminology to expand and

clarify the different meanings of cluster. Furthermore, a wide range of ideas depends on the focus of the objectives, methodology, and unit of analysis in each study.

Most authors propose their own typologies of cluster in literature depending on their research objectives. For example, Markusen (1996) proposed the typology of industrial districts as cluster. Rosenfield (1997) described the characteristics of cluster based on the evolution of the cycle of cluster processes. Gordon and McCann (2000) proposed three basic types of cluster by processes: pure agglomeration economies, industrial complexes, and social networks. Enright (2003) posited cluster in various dimensions and also characterised cluster by relying on the state of development. Martin and Sunley (2003) categorised 10 different ways of defining clusters and Feser (2004) considered three dimensions of clusters: life cycle, linkage, and geography. Nonetheless, literature and empirical research capture the broad definition of cluster to provide three core consistent characteristics comprising proximity, linkage, and externalities. In this paper, three concepts of cluster are identified for a conceptual framework. The three concepts of cluster are based on the key features of each concept and the role of variable factors are considered and used for analysis, namely: spatial, functional, and micro-foundational.

(1) The Spatial Concept

The key feature of spatial concept implies the proximity of economic agents in space. The location theory is crucial to the foundation of the cluster concept and the main idea used in the analysis of an economic space system. The theory explains the reasons for location decisions in relation to each economic activity in different areas. These are due to various factors such as natural resources, economic systems, social institutions, and the culture influencing the structure of economic activity in space. In the location theory, economic activity decisions are considered to be a major factor for minimising distance, resulting in a reduction in transportation and production costs as well as providing cheap labour. In the early stages of this theory, Von Thunen (1826) considered land use and allocation surrounding the city in order to provide the lowest production and transportation costs for the sale of goods. Alonso (1964) extended the Von Thunen idea to consider the issue of land use around the business centre of a district, known as a monocentric city model.

Marshall (1890), Weber (1929), Ohlin (1933), and Hoover (1937, 1948) defined the benefits and proposed a variety of explanations for firms locating with other spatial concentrations of economic agents to become agglomeration economies. The result of locating economic activity in one area affects the specialisation of labour as well as the issue of external economies in relation to the economies of scale. There are three major themes of economic benefit in terms of spatial concept: localisation, urbanisation, and Jacob's conomies.

Even though the importance of localisation, urbanisation, and Jacob’s economies on location decisions and the formation of urban areas have been widely discussed in terms of economic advantage, this may not provide a sufficient explanation for the location decisions of industries or the existence of agglomerations. This is because some spatial agglomeration may result from natural advantages. Ricado (1986) describes comparative advantages in different areas as being due to specific input factors such as certain specialised production activities causing some industries to obtain an advantage over others.

The New Economic Geography (NEG) introduced by Krugman (1991) and Fugita, Krugman, and Venables (1998) describes the decision of the business units to group together and decide to locate close to their customers in the city. They obtain the benefit of low transportation costs, increased productivity and city or urban competition based on variety or diversity. The businesses are also strengthened and able to set prices under conditions where customers and suppliers can be moved freely to other areas by reason of economic incentive. Consumers or customers are more willing to accept the higher cost of living in the city by responding to the demand for a variety of products. The equilibrium of the NEG model shows the core-periphery structure, where economic agents are located in the core while the others are located on the periphery.

(2) The Functional Concept

The spatial concept explains the reasons and crucial decisions of economic entities to be located in close proximity to one another. The relationship between economic agents leads to the local economy being associated with the production, exchange, and consumption of goods and services. In terms of function, there is a variety of terminology such as network

communication, input/output linkage, or functional region (urban) such as headquarters. The key feature in terms of functional concept underlines interaction and mutually beneficial cooperation between economic agents. Most studies on industrial clusters focus on the different kinds of linkages: production, intermediate goods or services, and marketing linkages that co-exist between industries. The direct and indirect linkages and interactions among industries have been in the form of core (pole/centre) and may dominate other spaces as peripheral.

Christaller (1933) and Losch (1940) introduced the central-place theory based on the economic agent trade-off between the cost of living and cost of transportation. The cluster of economic activity incorporated into the centre and other areas encourages a reduction in transportation costs with the possible density of agents in the central area. Harris (1954) proposed the concept of market potential analysis to measure the purchasing power in the core and periphery. This idea represents the self-reinforcing process in the concentration of economic activity as a driven or continuous reinforcement of the process.

Isard et al. (1959), Streit (1969), Czamanski and Ablas (1979), Roepke et al. (1974), and Howe (1991) proposed inter-industry linkages using input-output data from a regional economy. The major focus is on identifying key sectors which imply a form of industrial clusters and complexes seen primarily as geographical clusters in the form of inter-firms as an input-output linkage. Therefore, the mechanisms of industrial linkages give an economic advantage to firms located in close proximity to others of a similar nature.

Fujita and Ogawa (1982) created a multi sub-centre model to describe the city as a hub, on the assumption that the influence of external economies between each manufacturer diminishes by distance. Porter (1998) pointed out the concept of cluster through the interaction of business units via the supply chain. The advantage of logistical management in manufacturing systems is known as linkage between the buyer and seller. As a result, agglomeration economies in a cluster of economic activity create specialisation in production and enhanced interaction between suppliers and customers.

The NEG model explains the interaction between producers and consumers in the market and describes the growth of economic activity using the core and periphery model. The NEG model explains the relationship between externalities and distance and the opposing relationship between the centripetal forces that tend to pull together labour and producers in the form of co-location, and the centrifugal forces that tend to decline in coexistence with economic agents. The demand and supply side of economic agents in the aggregate market influence the forward and backward linkage among economic activities. Sellers can satisfy the demand of consumers by the low cost of transportation and specialisation of labour in the area, while buyers can achieve an adequate supply by a concentration of input, commodities, or complementariness.

(3) The Micro-foundational Concept

The driving force factors of cluster and micro-foundation can explain the benefits of economic units deciding to locate in an area by micro-foundation. The key feature relies on a micro level that describes the economic behaviour of economic agents in an area. Von Thunen (1826), Weber (1920), Hoover (1937, 1948), and Losch (1954) presented the theory of location as a basic idea of the decision by economic agents to locate in a space as a cluster and described the economic benefit of the proximity of economic activity by two sides of business implementing transportation and transaction costs.

Porter (1990) proposed four important driving force factors for the cluster: local demand, circumstances of rivalry, elements of complementing economic activity, and input sharing. Cortright (2006) proposed seven micro-fundamental factors to explain the behaviour of economic activity consisting of labour market pooling, supplier specialisation, knowledge spillovers, entrepreneurship, path dependency and lock-in, culture through confidence, and communication with each unit of economic activity, providing a trust network for local demand. Labour market pooling, supplier specialisation, and knowledge spillovers are based on the concept known as Marshall Externalities or Marshall's Trinity. Hanson (2003) points out that the driving force for cluster also relates to the home market effect; consumption and economical rent.

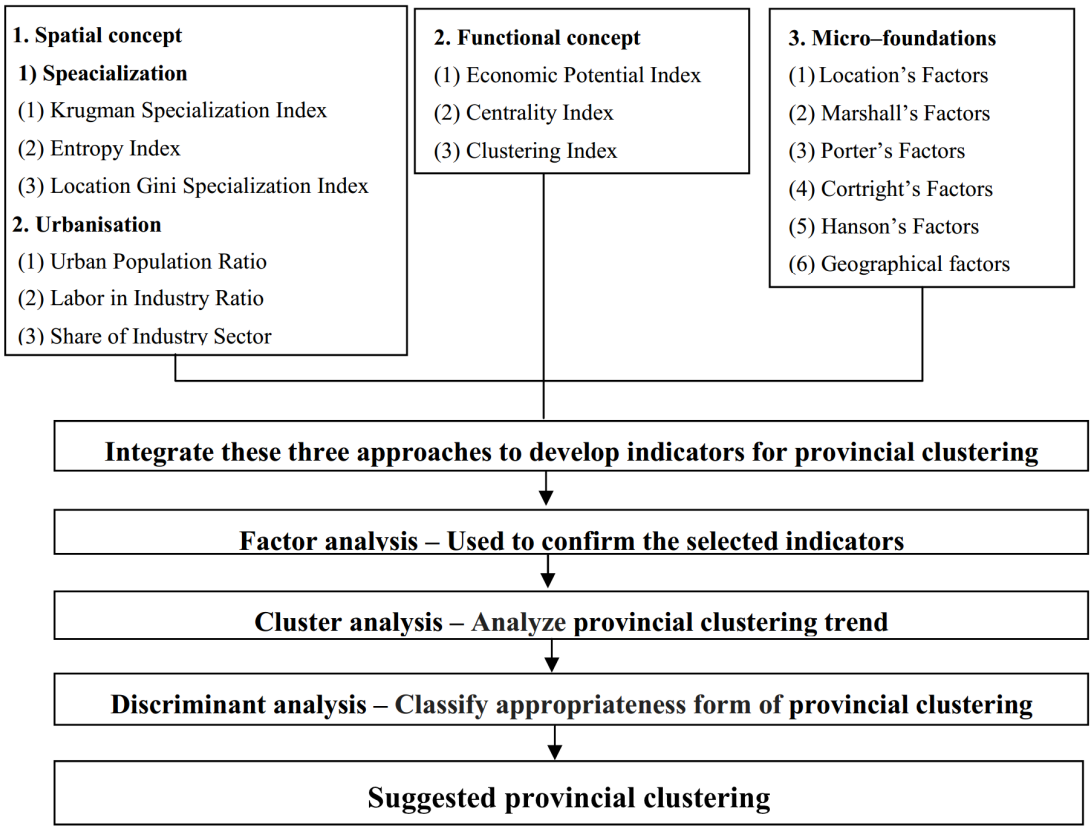
From the geographical viewpoint, Dicken and Lloyd (1990) proposed that cluster is caused by natural resources, climate, physical structure, communication, culture, and the local

economy. Cortright suggests that cluster in different phenomena can be composed of different elements and varies throughout the cycle of cluster. The micro-foundations are important for indicating the different phenomena of the cluster cycle and some factors may explain the formation of the cluster while others play a role in cluster growth.

3. Conceptual Framework

As mentioned in the previous section, a wide range of approaches and techniques are employed to analyse the consequences of geographical cluster and can be classified at national level, industry level, and business unit level. Porter (1996) proposed the concept to identify cluster as a blueprint for grouping economic activity associated with linkage to each other. In addition, it leads to the formulation of a policy for economic development. Anderson (2004) proposed a procedure to identify the nature of regional cluster: 1) defining a unit for analysis; 2) determining the economic indicators used in the analysis; 3) identification and selection of the economic activity as a cluster; 4) defining a cluster in each group; 5) creating a cluster map; and 6) explaining the relationship of the cluster. The second and third steps identify characteristics of the cluster with several techniques depending on the definition or unit of analysis. Much of the research uses single methodology and this definition has been debated. The definition of cluster measures its characteristics with a variety of different features.

Figure 2. Conceptual approaches to integrate the concept of cluster and the development of indicators for provincial clustering



Most empirical research presents measurements in three theme concepts of cluster. Firstly, the most commonly used to measure spatial concept emphasises sector composition resulting in a form of co-location for each similar economic activity known as localisation (specialisation/concentration), urbanisation, and Jacob's economies. Secondly, the functional concept is mostly used to measure underlying variables indicating interaction or relationships between agents. Lastly, the micro-foundational concept measures variables based on a literature review of tests proposed by authors. A wide range of disciplines have been relied on

by authors using different measurements and techniques. There is, therefore, no single approach or method for analysing the concept of cluster.

Limitations in empirical research of the cluster have not really explained or determined specific boundaries in terms of geographical cluster. Most research on cluster follows certain characteristics to determine the specifications of the business or industry in the area as cluster, and classifies or identifies cluster only in terms of one concept. This identifies the variables associated with the three concepts used to describe a cluster; spatial, functional, and micro-foundational. This study proposes the development of indicators to determine each Southern province as a provincial clustering. Therefore, this paper integrates the three concepts for determining provincial clustering as shown in Figure 2.

4. Methodology

This paper describes the concept of cluster and aims to find facts to explain the phenomenon relating to the cluster concept. Panel data was collected from 14 provinces for the years 1996 through to 2010. The collection of secondary data sources associated and significant in meaning to explain the concept of cluster were used in the analysis. The units of analysis for this research are 14 provinces in the South of Thailand, comprising Chumphon, Ranong, Phang Nga, Surat Thani, Phuket, Krabi, Nakhon Sri Thammarat, Phatthalung, Trang, Satun, Songkhla, Pattani, Yala, and Narathiwat.

Analysis is defined through the following procedure. Firstly, the definition of cluster proposed is collected from an academic perspective. A conceptual framework is then formulated to develop indicators based on the concept of cluster. Next, indicators are collected and selected for the identification of a precise set of potential variables for provincial grouping (Table 1). The selected indicators reflect the clearest definition possible and are easy to interpret with no redundant measurement. Lastly, a factor analysis confirms variables and evaluates their ability as a set of indicators to be used for provincial grouping and is also applied to a set of variables by summarising many variables into a few factors. The analysis considers clustering trends in each year and declares them reasonable in the case of a group. Discriminant analysis considers the influence of each indicator and clarifies their appropriateness in the form of provincial clustering in each case.

Table 1. Selected indicators to determine provincial clustering

Concept of Cluster	Variable	Description
1. Spatial Concept		
1.1 Specialisation		
(1) Krugman Specialisation Index	K Specialise	The absolute difference between the share of i^{th} sector in each province per share in the South
(2) Entropy Index	Entropy	The negative sum of sector shares multiplied by the natural logarithm of shares in each sector
(3) Location Gini Specialisation Index	LOCATION_Gini	The sum of the differences of the sector share by the addition of the differences of the weights of each sector, and the weights of the arithmetic mean obtained after the decreasing classification
1.2 Urbanisation		
(1) Urban Population Ratio	POP_Urban	Proportion of population in urban area

Table 1. Selected indicators to determine provincial clustering (Cont.)

Concept of Cluster	Variable	Description
(2) Labor in Industry Ratio	LABOUR_Indus	Proportion of labour in industry sector
(3) Share of Industry Sector	SHARE Indus	Proportion of industry sector
2. Functional Concept		
(1) Economic Potential Index	MKT_Poten	GPP in a province p^{th} weighted by the summation of distance of all other provinces
(2) Centrality Index	Centrality	Proportion of i^{th} sector of economic potential index with the total sector
(3) Clustering Index	Clustering	Proportion of i^{th} sector to distance of all pairs of all provinces
3. Micro–Foundational Concept		
3.1 Location theory		
(1) Transportation	Transport	Proportion of manufacturing sector
(2) Transaction	Transaction	Proportion of electricity, gas and water supply sector
3.2 Marshall's concept		
(1) Supplier Specialisation	SUPPLIER_Special	Concentration of agriculture sector
(2) Knowledge Spillover	KHOW_Spill	Proportion of the workers with a bachelor's degree
(3) Labour Pooling	LABOUR_Pool	Proportion of workers
3.3 Porter's concept		
(1) Local Demand	LOCAL_Demand	Proportion of wholesale and retail trade sectors
(2) Rivalry	Rivalry	Sums up the squares of sector share in all economic activity in a province
3.4 Cortright's concept		
(1) Entrepreneur	Entrepreneur	Proportion of establishment
(2) Path Dependence	Path	Rate of change in establishment in a province
3.5 Hanson's concept		
(1) Home Market Demand	Deposit	Proportion of deposit
(2) Consumption	GDP_Per	Proportion of income per capita
(3) Rent Seeking	ECON_Rent	Proportion of tax revenue
3.6 Geographical concept		
(1) Physical	Physical	Proportion of telephone numbers
(2) Population	Population	Proportion of population
(3) Local Economy	Loan	Proportion of loan

5. Result of determination of provincial clustering

(1) A set of variables using a factor by factor analysis

The Kaiser-Meyer-Olkin (KMO) demonstrates the suitability of the variables for analysis. The KMO was 0.542 (i.e. greater than 0.5). It concludes that the variables are adequate using the factor analysis technique. The Bartlett's test of sphericity found that it is statistically significant, meaning that the 24 variables are correlated with each other and suitable for factor analysis techniques. Furthermore, communality extraction values of all variables in Table 3

have a value greater than 0.5 indicating that variance in each variable is accounted for as a set of variables and strong enough to respond in terms of factor.

Table 2. The Kaiser-Meyer-Olkin measure of sampling adequacy and the Bartlett's test of sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.542
Bartlett's Test of Sphericity	Approx. Chi-Square	2013.286
	df	276
	Sig.	0.00

Factor analysis revealed 10 factors from 24 variables that have an Eigenvalue greater than one. The 10 selected factors together accounted for 76.11% of the total variance of variables (Cumulative percentage of Variance). In Table 2, the bold mark value of loading coefficients in 10 selected factors are correlated between variables and corresponding factors. Selected factors can be interpreted by a set of variables in each factor as follows.

Table 3. Confirms suitability of 24 indicators and reveals 10 factors

	Factor										Communalities
	1	2	3	4	5	6	7	8	9	10	Extractions
Transportation	**.876**										.914
GDP_Per	**.827**										.914
Centrality	**813**										681
Rivalry	**.702**										.752
LOCAL Demand	**.695**										.697
MKT_Poten		**.934**									.797
LABOUR_Pool		**.926**									.665
Deposit			**-.849**								.737
Loan			**-.815**								.604
ECON_Rent			**-.707**								.599
K_Specialise				**.916**							.768
POP_Urban				**.913**							.677
Physical					**.837**						.646
Entropy					**.664**						.668
LABOUR_Indus						**.907**					.849
Clustering						**.901**					.864
Entrepreneur							**.900**				.813
Path							**.889**				.812
Population								**-.829**			.599
Transaction								**.777**			.542
SUPPLIER_Special									**-.825**		.695
SHARE_Indus									**.734**		.728
LOCATION_Gini										**.799**	.709
KHOW_Spill										**-.696**	.575
Eigenvalues	3.83	2.33	2.08	1.96	1.66	1.48	1.35	1.31	1.28	1.05	
% of Variance	15.97	9.71	8.66	8.15	6.90	6.17	5.62	5.47	5.07	15.97	
Cumulative % of Variance	15.97	25.68	34.34	42.48	49.38	55.56	61.18	66.64	71.71	76.11	

The first factor consists of Transportation, GDP_Per, Centrality, Rivalry, and LOCAL_Demand variables, which reflect the economic fundamentals in the area. The second

factor consists of MKT_Poten and LABOUR_Pool variables, which reflect the accessibility of labor. The third factor consists of Deposit, Loan, and ECON_Rent variables, which reflect economic potential. The fourth factor consists of K_Specialise and POP_Urban variables, which reflect the state of urbanisation. The fifth factor consists of Physical and Entropy, which reflect the state's geography. The sixth factor consists of LABOUR_Indus and Clustering variables, which reflect labour in industry sector pooling. The seventh factor consists of Entrepreneur and Path variables, which reflect the status of the establishment. The eighth factor consists of Population and Transaction variables, which reflect population and transaction. The ninth factor consists of SUPPLIER_Special and SHARE_Indus variables, which reflect the concentration of the inputs. The tenth factor consists of LOCATION_ Gini and KHOW_Spill variables, which reflect labour ability in the area.

Factor analysis presents the variables of three concepts of 14 provinces comprising a set of variables. The similar information of each variable as a factor indicates that at least one concept of cluster is embedded. This result is consistent with the previous section that discussed the definition and typology of cluster in a different way. Cortright (2006) suggests that not just one factor offers an explanation for cluster, and Gordon and McCann (2004) noted that the mechanisms of agglomeration economies operate simultaneously, often indirectly and cumulatively. That agglomeration process cannot be identified by only a single factor. Therefore steps should be taken to identify cluster factors and the interaction between each variable in those factors. These are important steps towards understanding the range of characteristics that describe and classify cluster with different phenomena.

(2) Analysing trends in each group by cluster analysis

The study groups together 14 provinces by using cluster analysis from the years 1996 through to 2010. Cluster analysis considers the provincial clustering trends of each group in each year. The 14 provinces are grouped starting from 2 to 13 for provincial clustering. These are organised into two provinces. Phuket has a unique feature not apparent in other provinces and cannot be identified as the primacy province. Classified into eight provincial clusters, the results of the grouping in each year show an unclarified pattern of cluster. It is suggested that each province has its own group.

Therefore, groupings of five different cases were considered since there are three to seven groups of province. In each case, forms of provincial clustering were categorised. Each form was determined by significantly important characteristics of cluster for use as a proximity criterion. The provincial borders located close together will be determined within the group as provincial clustering. Under the conditions above, any form of provincial clustering can be formulated into five cases as follows: Firstly, seven provincial clusters comprise 46 forms. Secondly, six provincial clusters comprise 39 forms. Thirdly, five provincial clusters comprise 43 forms. Fourthly, four provincial clusters comprise 26 forms and three provincial clusters comprise two forms.

(3) Classification of the appropriate forms in each group

- Significant variables.

Discriminant analysis determines the influence of each variable to classify a provincial group. Variable Deposit, Population, and Loan were found to be statistically significant at the 0.01 level; variable Transaction and ECON_Rent are statistically significant at the 0.05 level, and the Transportation variable is statistically significant at the 0.10 level.

- Accurate classification of each form of provincial clustering

The most appropriate form of provincial clustering will be determined by the percentage of accuracy in the classification (Hit Ratio) and the probability of the membership of each province (Proportional Chance Criteria: CPRO) accruing during the classification of each form. The acceptance criteria for the appropriate form of provincial clustering are that the value of Hit Ratio should be greater than 1.25 of the CPRO. Therefore, the most appropriate form of provincial clustering is determined by the difference in Hit Ratio and CPRO.

Table 4. Appropriate form of provincial clustering in each case

Provincial Clustering	3 Groups	4 Groups	5 Groups	6 Groups	7 Groups	
					Form 1	Form 2
	Chumphon	Chumphon	Chumphon	Chumphon	Chumphon	Chumphon
	Surat Thani	Surat Thani	Surat Thani	Surat Thani	Surat Thani	Surat Thani
	Ranong	Ranong	Ranong	Ranong	Ranong	Ranong
	Phang Nga	Phang Nga	Phang Nga	Phang Nga	Phang Nga	Phang Nga
	Phuket	Phuket	Phuket	Phuket	Phuket	Phuket
	Krabi	Krabi	Krabi	Krabi	Krabi	Krabi
	Nakhon Sri	Nakhon Sri	Nakhon Sri	Nakhon Sri	Nakhon Sri	Trang
	Phatthalung	Phatthalung	Phatthalung	Phatthalung	Phatthalung	Nakhon Sri
	Trang	Trang	Trang	Trang	Trang	Phatthalung
	Satun	Satun	Satun	Satun	Satun	Satun
	Songkhla	Songkhla	Songkhla	Songkhla	Songkhla	Songkhla
	Pattani	Pattani	Pattani	Pattani	Pattani	Pattani
	Yala	Yala	Yala	Yala	Yala	Yala
	Narathiwat	Narathiwat	Narathiwat	Narathiwat	Narathiwat	Narathiwat
Hit Ratio	52.38	49.05	49.52	47.62	45.24	
C_{PRO}	42.09	34.44	29.34	25.51	20.41	
Difference	10.29	14.61	20.19	22.11	24.83	

Under the economic concept of cluster, to determine 14 provinces as provincial clustering, Table 3 shows the appropriate groups in each case. For cases 5, 6, and 7 of provincial clustering, Phuket is the only province separated from another. Such a case represents a form of primacy province (Phuket only). These results do not indicate provincial groups where at least two provinces are in geographical proximity as provincial clustering. As such, only new groups 3 and 4 are in an appropriate form for analysis using the indicators of the three concepts of cluster to show provincial clustering (Figure 5 and 6). This is because these exist in proximity and imply interactions and linkages among the provinces with the advantage of their co-location, which are also consistent with both the definition and goal of provincial clustering.

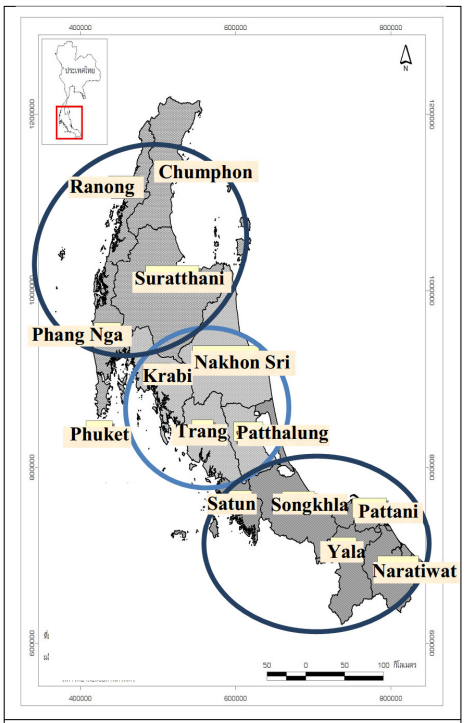


Figure 5. Suggests three provincial clusters

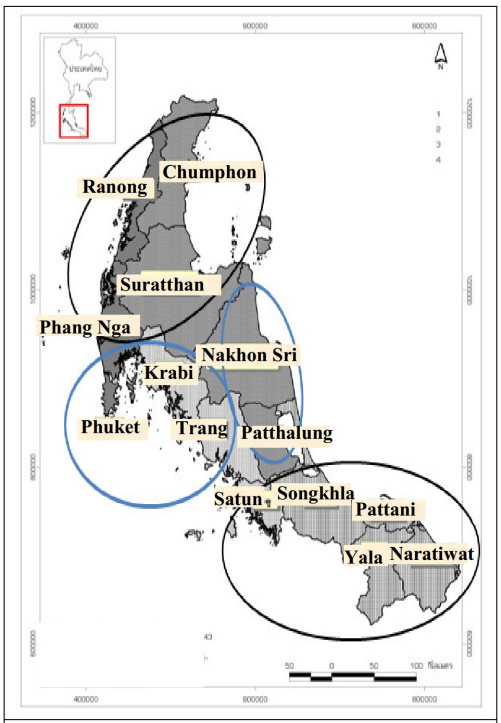


Figure 6. Suggests four provincial clusters

6. Conclusion

This paper has developed indicators useful for provincial clustering in the Southern provinces of Thailand based on three major concepts of cluster: spatial, functional, and micro-foundational. The results from factor analysis show 24 indicators as variables to determine provincial clustering and reveal 10 selected factors that imply there is no single variable to explain or analyse the characteristics and process of cluster and cannot identify a single factor. Mechanisms of provincial cluster economies operate simultaneously and cumulatively. The results from cluster analysis determine a group trend during the period 1996 through to 2010. The study was categorised into two provinces. Phuket has a unique feature not apparent in other provinces. From the eighth provincial cluster onwards, the results of the grouping in each year show an unclarified pattern of cluster. Therefore grouping into five different cases was considered since there were three to seven groups of province. In each case provincial clustering was categorised in any form. Forms were determined in each case of provincial clustering using the proximity criteria that the boundaries of each province within the group are located near each other.

Discrimination analysis classifies the most appropriate forms in each case and the influence of each variable to classify a group of provinces. We found six variables: Deposit, Population, and Loan all of which reflect the economic potential of the area; variable Transaction and ECON_Rent which reflect the population and transaction of space, and Transportation which was part of a variable factor reflecting the economic fundamentals. All variables fall under the micro-foundational concept. This means that the role of micro data is an important factor in Southern Thailand and affects the provincial clustering.

The results show that a suitable form of provincial clustering, as considered by the difference between the accuracy of classification (Hit Ratio) and the ratio of the probability of group membership of each province (CPRO), suggest that three and four provincial clustering groups within the group are closely located, making the provincial linkages consistent with the definition and goal of provincial clustering. Further research should aim at identifying the consequences of appropriate provincial clustering on economic development.

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CONVERGENCE REVISITED: CASE OF EU AND EASTERN EUROPE

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Abstract

This paper aims to analyze the convergence pattern of the Central and Eastern European (CEE) and South Eastern European (SEE) to the developed older member countries of European Union. In this context, by performing panel data analysis to 33 countries and each subgroup between 1993 and 2012, results reveal that there is a strong tendency on convergence for the new entrants of European Union after 2004 and for the candidate countries in terms of both convergence types which confirm the findings of neoclassical paradigm states that poorer countries will grow faster than richer ones. The speed of β convergence varies between 1.3 % to 4.2 for each group and the findings suggest that private domestic investment is the most leading determinant of growth and convergence process of Eastern European countries.

Keywords: β Convergence, σ Convergence, Eastern Europe
JEL classification: O11, O47, O52

1. Introduction

By the end of Cold War and the fall of Eastern Bloc, new political and economic environment formed in Eastern Europe. Increasing tendency of globalization caused rapid transformation of economic systems in Eastern European countries. By the commencement of new millennium, integration process of Eastern European countries to European Union (EU) is brought to agenda of EU. In this context, the greatest enlargement of EU was experienced in 2004, by including ten countries from Central and Eastern Europe. The enlargement process has been continued by including Romania and Bulgaria in 2007 and Croatia in 2013. On the other hand, status of pending candidates and potential candidates are still vital that will shape the near agenda of EU.

Besides integration issues in terms of politics, main drawback of enlargement strategy for EU is dispersion or income gap with those new entrants of EU from Eastern Europe. According to European Statistical Office (EUROSTAT), as of 2011, income gap between the richest member state (Luxembourg) and the poorest member state (Bulgaria) is almost sixteen fold in real per capita terms. In contrast to this dramatic dispersion in income level, new member states perform better in terms of economic growth. According to United Nations Conference on Trade and Development (UNCTAD), the period of 1992-2010 for which covers the transition and integration process of Eastern European countries, Estonia experienced the most rapid growth rate by 5.9 % followed by Lithuania with 5.4 %. On the other hand, during this period, the most rapid growing member state within EU-15 which consists of older and richer member states is Ireland with 4.6 % while the richest member state Luxembourg grew by 2.8 %.

The aim of this paper is to analyze the convergence aspect of CEE, candidate and potential candidate countries of EU with EU-15. Neoclassical Growth Models (NGM) pioneered by Solow (1956) indicate that initially poorer countries will grow faster than richer countries and finally countries will converge to the same steady state income level independent of their initial conditions if they display the same structural characteristics (same technology, saving behavior, etc.). This refers to absolute β convergence in the literature. However, if the countries have different structural characteristics and if initially poorer countries grow faster than richer ones, then conditional β convergence occurs. On the other hand, in the convergence literature, Sala-i Martin (1996a, 1996b) proposes "classical approach" to convergence analysis derived by NGM. The classical approach classifies the convergence as β and σ convergence and the latter is related with the dispersion in standard

deviation of income over time span. If the standard deviation of income series diminishes within time, then income series display σ convergence. In this context, the layout of the paper is organized as follows. In the next section, I will introduce a brief literature of convergence especially based on the studies of European case. In the section three, the methodology and brief information about the variables and the data will be presented. In section four, econometric results and findings will be displayed while in the final section I will present concluding remarks.

2. Literature Review

The issue of convergence has a key and deep convention in the literature of economic growth. Advocates of NGM such as Ramsey (1928), Solow (1956) Cass (1965), and Koopmans (1965) indicates the existence of convergence among the homogenous economic entities such as regions, countries, etc. Because of diminishing marginal productivity of capital, initially low capital intensive economies will grow faster than high capital intensive countries and finally will converge to their income levels. On the other hand, sources of economic growth in NGM are exogenous factors such as technology, population growth, etc. Endogenous Growth Models (EGM), rise up by the works of Romer (1986), Lucas (1988) and Romer (1990) rejects the assumption of diminishing marginal productivity of capital. Besides this, EGM consider the sources of growth as endogenous such as human capital, R&D, diffusion of technology, etc. By taking into consideration of those assumptions, findings of EGM stress that richer countries are endowed with the factors related with knowledge and innovation in production means that growth of richer countries will never end up and the income gap with poorer countries will not narrow. Unlike NGM, EGM proposes that there is divergence among economies. Ability for poorer countries to catch-up those richer countries depend on their capability in transferring technology, generating innovations or imitating those innovations which is less costly then generating.

Alongside those theoretical developments in the convergence studies, based on cross-country and cross-regional empirical studies emerged by the middle of 1980s. In this context, Baumol (1986), Barro (1991), Barro and Sala-i Martin (1992), Mankiw, et al. (1992), Islam (1995), Sala-i Martin (1996a, 1996b) are the proponents of empirical convergence studies. Besides their classification attempts on convergence types, most of them found that economies with similar characteristics display tendency of convergence and the speed of convergence is found to be about 2 % per year. Those findings in favor of convergence are even more evident within the regions, prefectures and states of countries. Initially empirical convergence studies for Europe are based on regional context, especially for analyzing regional income disparities or regional cohesion for founding member states of European Community (EC). In this respect, one of the earlier attempts belongs to Barro and Sala-i Martin (1991). For 73 regions of selected 7 EC countries, they analyze the convergence tendency for the period of 1950-1988. Their findings indicate that regions of selected EC countries display β and σ convergence and the speed of convergence per year was found to be 2 % which indicates as similar pattern as the states of United States (US). Button and Pentecost (1995) as distinct from Barro and Sala-i Martin (1991) analyze the convergence in regional context by adding Greece, Ireland and Luxembourg for the period of 1975-1988. 51 selected NUTS-1[1] regions of those EC countries displayed both absolute and conditional β convergence and σ convergence as well. Their finding for the speed of convergence is 3 % indicates higher speed of convergence compared to Barro and Sala-i Martin (1991). Neven and Gouyette (1995) analyze regional convergence for 108 NUTS-2 regions of the selected EC countries for the period of 1975-1990. Their findings yield that β convergence exists in absolute and conditional sense while σ convergence exists too. They find that the speed of convergence is above 2 % which reflects similarity with Button and Pentecost's (1995) finding. Sala-i Martin (1996a, 1996b) by referring to Barro and Sala-i Martin (1991) analyze the existence of convergence for 90 selected regions of 6 EC countries which are the founder and oldest developed member states of EU currently, for the period of 1950-1990. By

[1] NUTS: Nomenclature Units for Territorial Statistics.

performing cross-section and panel data analysis, absolute and conditional β convergence exist together while the speed of convergence for cross-sectional analysis found to be 1.5 %, for panel data analysis found to be 1.8 % per year. In both studies, data set display σ convergence as well.

Recent attempts on empirical convergence analysis mainly deal with cross-country analysis within EU, considering the status after Maastricht Treaty (1992) which is the founding Treaty of today's EU and enlargement process in the new millennium. In this context, Yin, et al. (2003) investigates convergence pattern for EU-15 countries for the period of 1960-1995. Except for 1980-1985, both absolute and conditional β convergence observed for all 5-year sub periods and joint sub periods too. They find that the speed of absolute β convergence is 1.5 % while conditional β convergence is 2.5 %. They also suggest that private domestic investment expenditures are the main leading factor in ensuring growth and conditional β convergence. Cuaresma, et al. (2008) investigates the relationship between duration of EU membership and convergence between 1960 and 1998. They claim the existence of both type of β convergence and the speed of absolute β convergence is 3 % and for conditional β convergence is between 4 and 6 % which indicates higher rate when it is compared to previous empirical studies for EU case. They propose that growth enhancing effect of EU membership emanates via financial supports of EU (structural funds, etc.) and openness which causes diffusion of technology throughout EU countries as the duration of EU membership lasts long. The most striking finding of their work is that Greece, Spain, and Portugal are the most benefiting countries for EU membership during the decades.

Cavenaile and Dubois (2011) consider the greatest enlargement period of EU in 2004 and analyze convergence tendency of EU-27 between 1990 and 2007. They confirm strong tendency in favor of conditional β convergence by suggesting exports and domestic savings are the key determinants while government expenditures have no growth enhancing effect. On the other hand, Matkowski and Prochniak (2007) consider the case for CEE countries which became member of EU in 2004 except for Malta and Cyprus. They analyze convergence pattern of 8 CEE countries with EU-15 for 1993-2004. Their findings indicate that both country groups display absolute and conditional β convergence within and between each other. The speed of absolute convergence is found to be 2.3 % per year and free trade, increasing inflow of foreign direct investments (FDI), maintaining coordination and cohesion of common EU policies strongly are the key factors in facilitating growth and conditional β convergence. Vojinovic, et al. (2010) investigates the existence of convergence among CEE-10 countries join EU in 2004 for the period between 1992 and 2006. After the second half of 1990s, both types of β convergence observed as well as σ convergence which is based on the fall in income dispersion over time. The speed of absolute convergence is found 4.2 % while for conditional β convergence ranges between 2.9 % and 6.5 % over the sample period. Their findings reveal that gross fixed capital formation and exports as portion of GDP are the main factors that facilitate growth and conditional β convergence.

3. The Methodology and Data

As indicated introduction part, I will follow Sala-i Martin's (1996a, 1996b) "classical approach" and the analysis will cover SEE-8, CEE-10 and 33 countries with the combination of EU-15. In this respect, the analysis will start with σ convergence which occurs when cross-sectional income dispersion or differentiation among economies decreases over time. To measure σ convergence or cross-sectional income dispersion following expression which is the sample variance of income per capita series needed:

$$\sigma_t^2 = (1/n)\sum_{i=1}^{N}\left[\log(y_{it}) - \mu_t\right]^2 \quad (1)$$

where $\log(y_{it})$ indicates log of income per capita while μ_t indicates sample mean of $\log(y_{it})$. If σ_t^2 decreases over time, then income series display σ convergence and income dispersion among economies fall as well.

The analysis will continue by the estimation of absolute β convergence which indicates initially poorer countries will grow faster than richer countries and approach to the common steady state income level in neoclassical sense. In this context, the following equation will be estimated.

$$\frac{1}{T}\ln\left[\frac{y_{it}}{y_{i0}}\right] = \beta_0 + \beta_1 \ln(y_{i0}) + u_{it} \quad (2)$$

In this equation i=1,…,N represents the cross-sectional units, u_{it} represents disturbance term and left hand side of the equation is average growth rate. Absolute β convergence indicates the negative relationship between growth rate and initial level of income per capita. If $\beta_1 < 0$, negative relationship between growth rate and initial level of income is satisfied which indicates the presence of absolute β convergence holds among economies.

Finally, the analysis will end up by estimating conditional β convergence. As indicated by Sala-i Martin (1996b), when a cross-sectional regression of growth is performed on initial income, holding constant a number of additional control variables, if resulting coefficient on initial income is negative, then the date set display conditional β convergence. For conditional β convergence the following equation will be estimated.

$$\frac{1}{T}\ln\left[\frac{y_{it}}{y_{i0}}\right] = \beta_0 + \beta_1 \ln(y_{i0}) + \sum_{k=1}^{n}\beta_k X_{kt} + u_{it} \quad (3)$$

Different from equation 2, in this equation we have vector of control variables is captured by X_{kt} which is needed to control the steady state level of income per capita. Here convergence occurs, if $\beta_1 < 0$ holds which indicates growth is negatively affected by initial income. On the other hand, as indicated by Barro and Sala-i Martin (1992), Sala-i Martin (1996a, 1996b) and Yin, et al. (2003) two measures of convergence, namely β and σ convergence are closely related. According to Sala-i Martin (1996b) if β convergence holds, then variance of income series approaches its steady state value monotonically. The key point, however, is that variance of income series can increase or decrease towards steady state depending on whether the initial value of variance is above or below the steady state. But even if β convergence holds, variance could be rising along the transition sometimes. In summary, β convergence is a necessary, but not sufficient condition for σ convergence. On the other hand, the speed of convergence, the rate at which an economy's ability to catch up steady state level of income per capita is calculated by the following equation.

$$\beta = -\ln(1+\beta_1 T)/T \quad (4)$$

T is the length of period and as indicated by Vojinovic, et al. (2010), the length of period in panel data studies accepted as one (T=1).

In this paper, data set covers 33 countries which consists of EU-28, candidate and potential candidate countries from South Eastern Europe. The analysis will be conducted by panel data estimation methods for the period of 1993-2012 includes the transition period of CEE countries and enlargement period of EU aftermath of 2000. By constructing panel data, Islam's (1995) methodology will be used. Islam (1995) suggests that to abstain from the negative effects of short-run business cycles, sample period should be divided into the several sub periods which also makes possible to shift from cross-section to panel data. Islam (1995) also suggests that 5 year sub periods are more proper interval than shorter intervals such as 1 or 3 year intervals and short-run disturbances may loom large in such situation. That's why he prefers 5 year intervals and in this respect panel data constructed by taking the 5 year averages of each variables.

Since annual GDP growth rates are influenced by the fluctuations of aggregate demand, demand-side macroeconomic variables in conditional convergence equation is included by

following Vojinovic, et al. (2010). Data set for all variables obtained from UNCTAD's UNCTADSTAT database. As dependent variable, annual average real GDP per capita growth rate is taken which is then transformed by taking 5 year averages. As initial income, GDP per capita in US Dollars at constant prices (2005) and constant exchange rates of the base year (annual period average) is constructed by UNCTADSTAT which is then transformed by taking 5 year averages. The same procedure is applied for the rest of variables which are the components of GDP by expenditure approach, namely final consumption expenditures (percentage of real GDP), general government final consumption expenditures (percentage of real GDP), gross fixed capital formation (percentage of real GDP) and exports of goods and services (percentage of real GDP).

4. Econometric Results

In this section, econometric results regarding with the estimation of convergence models provided in the previous section will be displayed by each group of countries, SEE-8[2], CEE-10[3] and 33 countries by including EU-15 together. First, results for σ convergence, then results for absolute and conditional β convergence will be presented with theoretical discussions responsibly.

4.1. Sigma Convergence

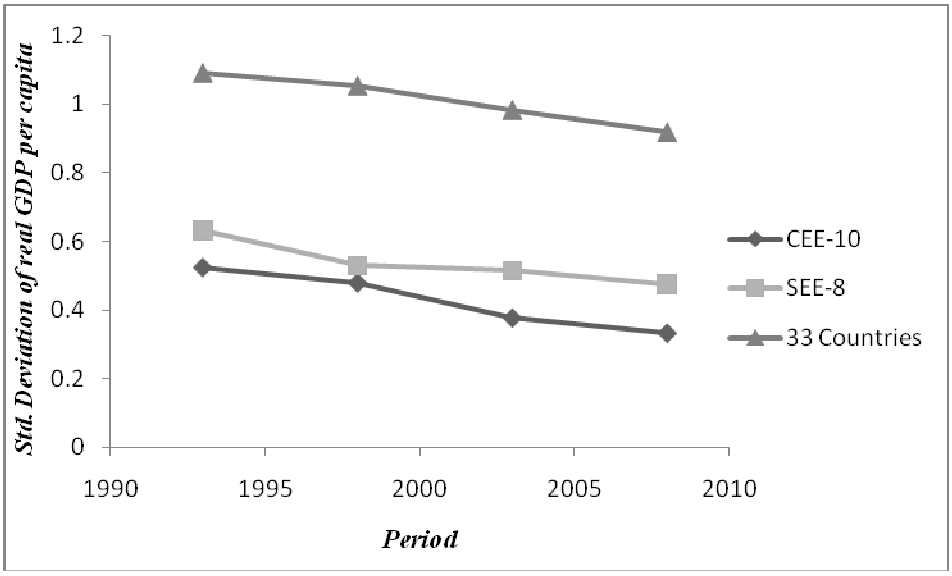
Based on the cross-sectional standard deviations of income per capita, Figure 1 represents the dispersion of real GDP per capita for all country groups. As seen in Figure 1, dispersion of real GDP per capita represented by the standard deviation of real GDP per capita series declines over time for all country groups. It reveals that over the sample period, 1993-2012 σ convergence exists for all selected countries within EU-15, CEE-10 and SEE-8. Because of the large income gap between EU-15 and Eastern European countries, for whole sample (33 countries) value of standard deviation is above compared to homogenous groups such as CEE-10 and SEE-8. According to Figure 1, as the income gap narrows and structural characteristics display similarities or countries become more homogenous, then value of standard deviation becomes smaller which is the case for CEE-10 and SEE-8. As indicated by Sapir (1988), Lloyd (1992) and Yin, et al. (2003) this declining trend in standard deviation for all country groups is the sign for the close accomplishment of integration process for CEE-10 and SEE-8 that also bears some current EU member countries. During the transition period in 1990s, as those countries liberalized their economies and become as open economies, they receive foreign direct investments and deal with foreign trade. Geographical closeness to EU market increased their export and import share with EU countries, which in turn caused rapid growth for those countries. This declining trend in σ seems to be sluggish because of the experienced financial turmoil and debt crisis of some EU countries after 2008. The new member states and candidate countries also negatively affected by the slowdown observed in developed economies of EU which are the main trading partners and have significant share in trade for those countries as well. On the other hand, measures and bail out plans against these crises are still not enough as the recovery process gets longer which in turn shrinks the economies of new members and current candidates of EU.

The findings in favor of σ convergence, supports the findings of previous studies concerning with EU such as Barro and Sala-i Martin (1991), Neven and Gouyette (1995), Button and Pentecost (1995), and Sala-i Martin (1996a, 1996b). The existence of σ convergence especially for CEE and SEE countries supports the findings of previous studies concerning with the new member states from Central and Eastern Europe such as Matkowski and Prochniak (2007) and Vojinovic, et al. (2010).

[2] SEE-8 countries are Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Romania, Serbia, The Former Yugoslav Republic of Macedonia, and Turkey.

[3] CEE-10 countries are Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.

Figure. 1. Sigma Convergence for SEE-8 Countries



4.2. Beta Convergence

The analysis of β convergence will be conducted through the models described in section 3. In this context, this section first will be devoted to the estimation results of absolute β convergence and then conditional β convergence. Estimation of absolute and conditional β convergence is performed by panel data methods namely pooled OLS, fixed effects models (FEM), and random effects model (REM). Selection of appropriate panel data method is done by performing F-Test, LM-Test and Hausman Test proposed by Hausman (1978). For appropriateness of Pooled OLS over FEM F-Test, while for appropriateness of REM over pooled OLS and FEM, LM-Test and Hausman Test performed respectively. For F-Test, as a null hypothesis of "no individual effects" ($H_0 : \mu_i = 0$) tested, for LM-Test "variances of individual effects are zero" or ($H_0 : \sigma_\mu^2 = 0$) and finally for Hausman Test "no correlation between random individual effects and explanatory variables" or ($H_0 : Cor(\mu_i, X_{it}) = 0$) tested. Results for appropriate panel data method selection are given in Table 1. Based on these considerations for SEE-8 and whole sample (33 countries) regressions for conditional β convergence will be estimated by FEM while for CEE-10 group will be estimated by REM. On the other hand, regressions based on absolute β convergence will be estimated by Pooled OLS for SEE-8 and whole sample, while for CEE-10 will be estimated by REM.

Table 1: Model Selection

Model Name/Number	Country Group	F-Test	LM-Test	Hausman Test	Model Selection Result
		F-Stat. (p-value)	χ^2 Stat. (p-value)	χ^2 Stat. (p-value)	
Abs. β Conv.	SEE-8	1.96 (0.1059)	0.18 (0.3373)		Pooled OLS
Cond. β Conv.					
1	SEE-8	6.97*** (0.0003)		33.23*** (0.0000)	FEM
2	SEE-8	6.61*** (0.0004)		45.76*** (0.0000)	FEM
3	SEE-8	7.15*** (0.0002)		45.13*** (0.0000)	FEM
4	SEE-8	4.97*** (0.0017)		24.15*** (0.0000)	FEM
Abs. β Conv.	CEE-10	0.21 (0.9900)	4.14** (0.0418)		REM
Cond. β Conv.					
1	CEE-10	0.28 (0.9750)	4.08** (0.0433)		REM
2	CEE-10	0.40 (0.9216)	3.11* (0.0776)		REM
3	CEE-10	0.42 (0.9119)	3.59* (0.0580)		REM
4	CEE-10	0.86 (0.5732)	1.57 (0.2107)		Pooled OLS
Abs. β Conv.	33 countries	1.08 (0.3722)	0.51 (0.4743)		Pooled OLS
Cond. β Conv.					
1	33 countries	2.04*** (0.0043)		40.83*** (0.0000)	FEM
2	33 countries	1.91*** (0.0086)		33.16*** (0.0000)	FEM
3	33 countries	1.90*** (0.0089)		32.18*** (0.0000)	FEM
4	33 countries	1.74** (0.0205)		27.30*** (0.0000)	FEM

Notes: Asterisks *, ** and *** denote statistical significance at the 10 percent, 5 percent and 1 percent level, respectively. **Source:** Author's Calculations.

Based on these appropriate panel data model selection results, analysis of β convergence is devoted to absolute and conditional β convergence respectively and discussion of results are given in following part of the study.

4.2.1. Absolute Beta Convergence

The analysis of absolute β convergence is done by estimating equation 2 that is described in the previous section. By performing panel data methods, estimation results are given in Table 1 for each country groups. The most crucial point in Table 2 is the existence of absolute β convergence for each country groups. The coefficient of initial level of income in natural logarithm (LY) is negative and significant in each regression for all country groups indicates that initially poorer countries in terms of per capita real GDP grow faster than those richer countries and catch-up the steady state level of income. The findings in favor of absolute β convergence, supports the idea of NGM indicated in introduction section. According to NGM, if economies are homogenous and far below steady state level of income, then they will record rapid growth performance compared the richer counterparts and eventually catch up steady state level of income. In the case of Table 2, SEE-8 countries display similar economic structure within the group and far below the income levels of CEE-10 and EU-15, display absolute β convergence and the speed of convergence indicated by implied β convergence yields higher speed compared to CEE-10 and whole sample including EU-15. As discussed for σ convergence, possible explanation could be the efforts for integration process with EU and for this purpose financial assistance in implementing the common EU policies which help those countries to catch up with the developed member states of EU, increasing capital flows after liberalization took place and increasing foreign direct investments which in turn accelerates the growth process in those countries. The findings in favor of absolute β

convergence in Table 2 support the findings of previous studies such as Barro and Sala-i Martin (1991), Neven and Gouyette (1995), Button and Pentecost (1995), Sala-i Martin (1996a, 1996b), Yin, et al. (2003), and Cuaresma, et al. (2008) in which older members or today's EU-15 countries are analyzed. On the other hand, Matkowski and Prochniak (2007), Vojinovic, et al. (2010), and Cavenaile and Dubois (2011) consider the case by including the new members of EU from CEE and achieve the presence of absolute β convergence supports the findings in Table 2 in terms of countries from SEE and CEE.

Table 2. Absolute Beta Convergence

Dependent Variable: GR	SEE-8	CEE-10	33 Countries
Constant	0.3289 [0.1271]**	0.2055 [0.0552]***	0.1463 [0.0471]***
LY	-0.0355 [0.0155]**	-0.0187 [0.0059]***	-0.0126 [0.0047]***
R^2 (within)	-	0.003	-
R^2 (between)	-	0.67	-
R^2 (overall)	0.148	0.083	0.136
Observations	32	40	132
F Stat. (p-value)	5.23 (0.0294)	-	7.01 (0.0091)
Wald χ^2 (p-value)	-	9.89 (0.0017)	-
Implied β	0.0362**	0.0189***	0.0127***

Notes: Dependent variable for each regression is annual average growth rate of real GDP (GR). For SEE-8 and 33 countries, estimation is done by pooled OLS while for CEE-10 REM is performed. Robust standard errors are given in square brackets. Asterisks *, ** and *** denote statistical significance at the 10 percent, 5 percent and 1 percent level, respectively. **Source:** Author's Calculations.

4.2.2. Conditional Beta Convergence

The analysis of conditional β convergence will be done separately for each country group, through equation 3 described in the previous section. As indicated in the previous section, components of GDP by expenditure method will be used as control variables in explaining growth and convergence process in estimation procedure. In this context, estimation results of conditional β convergence are provided in Table 3. In all regressions, the negative relationship between initial level of income (LY) and growth (GR) is satisfied which indicates the existence of conditional β convergence in line with the arguments of NGM in Table 3. However, the most striking point in Table 3 is that the speed of conditional β convergence (implied β) calculated by equation 4 corresponds to higher rates and ranges between 18 % and 22 %. Alongside adding more control variables which result higher speed of convergence, as depicted in appendix part, according to model selection results regressions for conditional β convergence is estimated by Fixed Effects Model (FEM) causes higher speed of convergence as well. Following Islam (1995), Canova and Mercet (1995) use panel data regional data while Caselli, et al. (1996) use panel data for a cross-section of countries. Their findings reveal that one of the advantages of using panel data over cross-sections one doesn't necessary to hold constant steady state because it can be implicitly estimated using fixed effects. By estimating with panel data with fixed effects, the speed of convergence could exceed 2 % per annum which is much larger than the speed by estimating cross-sections or other panel data models such as random effects or pooled OLS. As discussed for the analysis of absolute β convergence, economic rationale behind this finding or possible explanation could be SEE-8 countries are the most disadvantageous and laggard countries compared to counterparts from EU-15 and CEE-10 in terms of income and structure of economy. On the other hand, as it is analyzed in terms of the determinants of growth, private domestic expenditures (LINV) are the most leading factor which positively affects growth and convergence process as in line with the expectations. This finding also confirms Mankiw et al. (1992), Islam (1995), Barro (1997), Yin, et al. (2003) and Vojinovic, et al. (2010). Private consumption expenditures (LC) don't have any affect on growth, while on the contrary to expectations, export share in GDP (LX) doesn't have any affect on growth. Unlike most of the studies above, in the second and third regressions government expenditures (LGOV)

which is expected to crowd out private domestic investments, positively affect growth. This result shows that even government expenditures are expected to be far from efficiency, it accompanies with private sector in growth process for those disadvantageous countries.

Table 3. Conditional Beta Convergence: SEE-8

Dependent Variable: GR	Regression Number			
	1	**2**	**3**	**4**
Constant	0.9148 [0.2175]***	0.4484 [0.1735]**	0.4959 [0.2085]**	-0.2741 [0.9537]
LY	-0.1695 [0.0377]***	-0.1953 [0.0253]***	-0.2077 [0.0288]***	-0.1966 [0.0394]***
LINV	0.1678 [0.0349]***	0.2174 [0.0249]***	0.2061 [0.0300]***	0.2105 [0.0250]***
LGOV		0.1863 [0.0488]***	0.1761 [0.0543]**	0.1254 [0.0757]
LX			0.0341 [0.0376]	0.0383 [0.0404]
LC				0.1760 [0.1903]
R^2 (within)	0.655	0.746	0.753	0.771
R^2 (between)	0.393	0.378	0.324	0.393
R^2 (overall)	0.308	0.293	0.264	0.286
Observations	32	32	32	32
F Stat. (p-value)	11.61 (0.0060)	25.63 (0.0004)	24.30 (0.0003)	191.95 (0.0000)
Wald χ^2 (p-value)				
Implied β	0.1858***	0.2173***	0.2329***	0.2190***

Notes: Dependent variable for each regression is annual average growth rate of real GDP (GR). Robust standard errors are given in square brackets. All independent variables except for constant are transformed into the natural logarithm and shown by capital l (L). Asterisks *, ** and *** denote statistical significance at the 10 percent, 5 percent and 1 percent level, respectively. **Source:** Authors' Calculations.

The picture differs in terms of convergence speed for CEE-10 countries which have almost same duration in candidacy and membership process. In this context, estimation results of conditional β convergence for CEE-10 countries are shown in Table 4. In all regressions, negative relationship between annual average growth rate and initial level of income (LY) is satisfied which indicates the presence of conditional β convergence and confirms the findings of NGM in the context of CEE-10 as well. Here the speed of convergence represented by implied β is substantially slower than the speed for SEE-8. Even private domestic investments (LINV) are the most substantial factor and positively affect growth, inefficient government expenditures (LGOV) enter regressions with other control variables causes productivity loses and partially crowd out private domestic investments compared to case of SEE-8. As a result, the speed of conditional β convergence and growth process is negatively affected by the inclusion of government expenditures into the regressions. Presence of conditional β convergence for CEE-10 confirms the findings of Matkowski and Prochniak (2007) and Vojinovic, et al. (2010) for CEE countries. On the other hand, findings in favor of positive effect of private domestic investments on growth and convergence confirm the findings in this line with the indicated studies above. Many authors such as Barro (1991, 1997), Barro and Lee (1993) indicates the negative effect of government expenditures which is supported by the findings in Table 4 while Yin, et al. (2003) and Vojinovic, et al. (2010) couldn't find any significant effect on growth. As in the case of SEE-8, exports (LX) do not have any significant effect on growth while consumption expenditures (LC) enter in only one regression and do positively affect average growth rate.

Table 4. Conditional Beta Convergence: CEE-10

Dependent Variable: GR	Regression Number			
	1	**2**	**3**	**4**
Constant	-0.0824 [0.1197]	0.3652 [0.1367]***	0.3285 [0.1460]**	-0.2855 [0.4305]
LY	-0.0147 [0.0020]***	-0.0260 [0.0041]***	-0.0224 [0.0055]***	-0.0182 [0.0082]**
LINV	0.0803 [0.0242]***	0.0819 [0.0202]***	0.0855 [0.0230]***	0.1068 [0.0258]***
LGOV		-0.1169 [0.0272]***	-0.1049 [0.0294]***	-0.1002 [0.0324]***
LX			-0.0106 [0.0107]	-0.0075 [0.0092]
LC				0.1104 [0.0630]*
R^2 (within)		0.371	0.390	0.386
R^2 (between)		0.821	0.780	0.836
R^2 (overall)		0.402	0.411	0.434
R^2	0.293			
Observations	40	40	40	40
F Stat. (p-value)	7.70 (0.0016)			
Wald χ^2 (p-value)		80.24 (0.0000)	105.96 (0.0000)	64.74 (0.0000)
Implied β	0.0148***	0.0263***	0.0226***	0.0183**

Notes: Dependent variable for each regression is annual average growth rate of real GDP (GR). Robust standard errors are given in square brackets. All independent variables except for constant are transformed into the natural logarithm and shown by capital l (L). Asterisks *, ** and *** denote statistical significance at the 10 percent, 5 percent and 1 percent level, respectively. **Source:** Author's Calculations.

Table 5 provides the results by bringing whole sample including EU-15. In all regressions, negative relationship between initial level of income and average growth rate is satisfied and yields the presence of convergence in conditional form. The results in Table 5 also supports the arguments of NGM which indicates that poorer countries will catch-up richer counterparts and retain the same steady income level after controlling steady state income level by control variables. After model selection test results, regressions in Table 5 decided to be estimated by FEM which yields higher speed of convergence ranges between 7.8 % and 8.7 %. This striking finding supports the findings by Canova and Mercet (1995) and Caselli, et al. (1996) whom address much larger than 2 % speed of convergence by estimating with FEM. On the other hand, private domestic investments (LINV) positively affect growth and stand out as the most leading factor in growth and convergence in accordance with expectations through above indicated studies in the literature. Unlike in the case of CEE-10, crowding out effect of inefficient or lower productive government expenditures (LGOV) reflected only in fourth regression in Table 5 while consumption expenditures (LC) have positive effect on growth in the same regression. Finally, even export share in GDP (LX) bears positive sign in third and fourth regressions; statistically it is insignificant yielding to have not any effect on growth and convergence.

Table 5. Conditional Beta Convergence: 33 Countries

Dependent Variable: GR	Regression Number			
	1	2	3	4
Constant	0.3961 [0.2466]	0.6504 [0.3003]**	0.6678 [0.3219]**	-0.988 [0.5123]
LY	-0.0757 [0.0308]**	-0.0755 [0.0292]**	-0.0841 [0.0468]*	-0.0800 [0.0453]*
LINV	0.1148 [0.0254]***	0.1021 [0.0261]***	0.1038 [0.0289]***	0.1117 [0.0260]***
LGOV		-0.0736 [0.0503]	-0.0739 [0.0505]	-0.1116 [0.0450]**
LX			0.0160 [0.0396]	0.0262 [0.0366]
LC				0.1773 [0.0726]**
R^2 (within)	0.351	0.375	0.379	0.401
R^2 (between)	0.447	0.424	0.437	0.442
R^2 (overall)	0.206	0.199	0.199	0.196
R^2				
Observations	132	132	132	132
F Stat. (p-value)	10.61 (0.0003)	7.55 (0.0006)	6.73 (0.0005)	8.59 (0.0000)
Wald χ^2 (p-value)				
Implied β	0.0788**	0.0785**	0.0878*	0.0834*

Notes: Dependent variable for each regression is annual average growth rate of real GDP (GR). Robust standard errors are given in square brackets. All independent variables except for constant are transformed into the natural logarithm and shown by capital l (L). Asterisks *, ** and *** denote statistical significance at the 10 percent, 5 percent and 1 percent level, respectively. **Source:** Author's Calculations.

5. Concluding Remarks

This paper aims to examine the convergence process of Eastern European countries including candidate and potential candidates of EU with EU's old and developed states. In this context, two well known measures of convergence, namely σ and β (absolute and conditional) convergence employed for the period 1993-2012 which covers the transition period of Eastern Bloc and their integration to EU as well. In terms of σ convergence which is measured by the fall or rise in standard deviation of income series reveals that income dispersion among each group decreases indicates the presence of σ convergence. On the other hand, by performing panel data, presence of both types of β convergence examine and the results yield the existence of both types of convergence for each group of countries confirming the findings of NGM in which poorer countries by growing faster than their richer counterparts and eventually will retain the common steady state level of income. The most striking result of the convergence analysis observed in terms of the speed of convergence especially for SEE-8 group which consist mainly by candidate and potential candidates of EU from South Eastern Europe and EU's latest entrants aftermath of 2007. The speed of absolute β convergence is 3.6 % while the speed of conditional β convergence ranges between 18 % and 23 % which is uncommon in conventional convergence literature.

These findings are worth emphasizing the future prospects of EU enlargement. Even the analysis of convergence in this paper is limited to components of GDP by expenditure method as determinants of growth and excluding the other important determinants which is highlighted by the many conventional convergence studies, it is important that there is a tendency for catch-up. Even observed recession in Europe overall and financial turmoil and solvency crisis experienced by some major member states and its ongoing negative impact not only for those states but also as their main trading partners for the new members and candidates, successful coordination and adoption of common EU policies, financial assistance of EU (structural funds, etc.) for member states and candidate states, flow of foreign direct investments and financial capital movements could be effective mechanisms to record such a convergence tendency. Also the findings in favor of convergence could reject the idea of

"enlargement will create a burden for EU in the future". In this context, EU's enlargement process should be maintained despite ongoing debates against this fact.

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GREAT EXPECTATIONS FOR TOURISM AND REGIONAL DEVELOPMENT IN ROMANIA: WHY ARE NOT THEY MET?

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Abstract

Despite the high potential of the Romanian tourism competitiveness and reducing interregional disparities, the results obtained in the last fifteen-twenty years are far below expectations. This paper aims to identify national and regional characteristics of tourism in Romania during the period 1990 to 2010 and to evaluate the most important factors that influenced foreign tourists' arrivals in Romania and the departures of Romanian tourists abroad. As infrastructure is one of the main obstacles to tourism development we have used data from development regions in order to explore the changes in the concentration of accommodation capacities. We have developed econometric models estimated on panel data to assess the implications of road infrastructure development and accommodation capacity utilization on economic results of tourism. The results indicate the important relationship between the territorial distribution of road infrastructure and the concentration of accommodation capacity.

Keywords: tourism infrastructure, regional analysis, panel data, regression models, Herfindall concentration degree

JEL classification:

1. Introduction

Considering its largely acknowledged economic and social effects, tourism represents a sector of great interest to many countries' development strategies (Zanina, 2011), (Egan 2003). The positive impact of tourism development is usually addressed in connection with the balance of payments, regional development, diversification of the economy, income levels, state revenue, employment opportunities (Pearce, 1991). The tourist life cycle, the local tourist strategies and policies, the use of information and communication technologies in promotion campaigns, etc. have an important influence in this context (Quian, 2010), (Hu, 1996).

As far as regional development is concerned, tourism is seen as a driver able to turn to good account the less developed regions' potential and, thus, to contribute to a more balanced distribution of economic activities over time and space as well as to the co-ordination of

various policies in an inter-sectorial perspective (Nijkamp, 1999), (Constantin and Mitrut, 2008). It can also bring about encouraging responses to the question of regional competitiveness, based on the positive influence on regional employment and income. As a result of the indirect and induced effects, tourism generates jobs not only in its own sector, but also in connected sectors such as financial services, retailing, telecommunications, etc. However, the regional multipliers record significant variations, depending on the characteristics of each region, locality, project, etc. (Armstrong and Taylor, 2000) so that careful analyses are recommended in order to promote those projects able to generate the most important benefits to the region.

Highly beneficial are the coastal, mountainous, urban and historic regions as well as those with exquisite natural resources. On the other hand, regions with different profile such as rural regions promoting green tourism, leisure and nature activities, the remote ones or undergoing industrial restructuring can also benefit from tourism growth (OECD, 1999)

A focus on the factors that influence tourism development is also required in this respect, considering that, depending on the regional profile in terms of tourist attractions and economic situation, they might have a different significance within the corresponding strategies (Aghdaie and Momeni, 2011, Fletcher and Cooper, 1996).

Thus, Ritchie and Croutch (2003) quoted by Koufodontis et al. (2007) place a special emphasis on the physical, economic and social factors embedded in the so-called "region's image". Among them, the supporting factors and resources such as infrastructure, accessibility, facilitating resources (human, knowledge and financial capital), hospitality, and factors political will seem to play a special role.

Only infrastructure alone, to mention one of them, is a multifaceted factor, with manifold implications. It is considered a component of the regional touristic product, comprising basic devices, buildings and service institutions of a major importance for economy and society. The main defining elements relating to a certain destination refer to accommodation facilities, gastronomy facilities, transport to destination, services for active leisure (e.g. ski resorts, sailing schools, golf clubs, etc.), retail network, other services (e.g. information, equipment rental companies, etc.) (Panasiuk, 2007).

From a broader perspective, the Travel and Tourism Competitiveness Report prepared by the World Economic Forum (2011) has developed a complex, overall competitiveness index made of three main sub-indexes, namely regulatory framework, business environment and infrastructure and human, cultural and natural resources. Again, if reference is made to the business environment and infrastructure component, the corresponding sub-index takes into consideration the following pillars: air transport infrastructure, ground transport infrastructure, tourism infrastructure, information and communication technical infrastructure, price competitiveness in travel and tourism industry.

Consequently, the regional policy measures meant to improve the frame conditions for tourism development at regional and local level play a key role: they should constitute a coherent 'package', including economic, legal, institutional, infrastructure, cultural and social elements. The aim of the package must be the definition of a regional profile, stressing and taking advantage of specific feature of each local area (Funck and Kowalski, 1997).

Based on these overall considerations our paper aims to discuss the tourism development factors proposing Romania as a relevant case study from two complementary perspectives: on the one hand, it displays an uneven regional development, which requires appropriate solutions in terms of regional strategies and policies; on the other hand the less developed regions have an important touristic potential, which might and should be turned to good account in order to reduce the gap separating them from the developed ones. Though, despite this potential the results are far behind the expectations, so that the study of the factors that still need a special consideration is highly required.

In line with the results provided by the World Tourism Organization via the country ranking in terms of Travel and Tourism Competitiveness Index (Blanke and Chiesa, 2011), which indicate the weak infrastructure as one of the major obstacles for the development of the tourism in Romania, we have proposed and tested a model able to quantify and shed light on the regional disparities in this respect.

Accordingly, the paper is organized as follows. First, a review on the tourism development in Romania is provided, emphasizing the disparities between its eight NUTS 2 regions.

Second, a couple of econometric models are elaborated and tested in order to analyze the number of arrivals of foreign tourists in Romania and the departures of Romanian tourists and to evaluate the impact of infrastructure on tourism activity, revealing the specific bottlenecks at regional level. Third, various solutions for tourism support, focusing on those able to surmount the infrastructure hurdle are discussed.

2. General discussion on tourism development in Romania

The evaluation of Romania's tourist patrimony relies on a comprehensive activity of tourist zoning that was first developed in 1975-1977 and then periodically updated. Considering tourism as a system at national scale it has aimed at establishing a model for evaluating, constructing a hierarchy and proposing the most suitable ways of turning the tourist patrimony to good account. Multiple criteria have been used in order to delimit the tourist zones and to propose the priority actions in each specific case. As a result, a wide range of tourist zones have been identified, some of them of a particular importance to the European and world's natural and cultural heritage.

Thus, the natural patrimony includes the Delta of Danube as biosphere reservation, the Romanian shore of the Black Sea, the Romanian Carpathians, North Oltenia, Banat area, the Danube Valley, and so on. The most representative areas for the cultural heritage are North Moldova (with monasteries and churches declared world's heritage by UNESCO), the medieval core of Brasov and Sibiu cities in Transylvania, the medieval fortress of Sighisoara – also in Transylvania (the only one still inhabited in Europe), Bucharest and its surroundings, the Greek, Dacian and Roman archaeological sites in Dobrogea and Transylvania, the Neolithic archaeological sites in Moldova – most of them located in extremely attractive areas from natural beauty viewpoint as well.

More recently, the Spatial Planning of the National Territory has structured the zones of a major touristic potential into two categories, namely: (1) zones of a highly valuable and complex touristic potential (24% of the national territory) which includes national parks and biosphere reservations, protected national areas, cultural patrimony of national and international interest, museums and memorial houses, spa resources[1]; (2) zones of a high touristic potential (34% of the national territory) with natural and cultural patrimony resources of especially national interest.

An important characteristic of Romania's natural and cultural-historic patrimony is its relatively well-balanced territorial distribution that has a particular significance especially for the lagging regions, with other economic activities less developed.

Based on its potential contribution to the general economic recovery, competitiveness and reduction of interregional disparities tourism is approached by all significant actors – population included – as one of the priority sectors of the Romanian economy. All governments after 1990 have included tourism development in their strategies, this interest being reflected by its privatization prior to other sectors[2]. Though, the results recorded in the last fifteen years are far below the expectations: the rate of tourism growth is under the economic growth rate and the contribution of tourism to GDP is pretty low (2.3% in 2005 and approx. 2.0% in 2009 according to the methodology of the National Institute of Statistics[3].).

According to the Travel and Tourism Competitiveness Index launched by the World Economic Forum in March 2007 Romania was ranked the 76th among 124 countries in 2006, with a score of 3.91 on a scale from 1 to 7. In 2011 the overall rank of Romania is 63, with a score of 4.17. With its three pillars referring to travel and tourism regulatory framework, business environment and infrastructure and human, cultural and natural resources, the index reveals relatively good results in terms of policy rules and regulations, price competitiveness in travel and tourism industry, human resources (education and training, workforce wellness),

[1] One third of Europe's mineral and thermal waters are located in Romania.

[2] Romania was severely criticized (especially during the '90s) by EU, IMF and other international organizations for the delays in privatization process and institutional reforms.

[3] Based on the data provided by the WTO, the contribution of Tourism to Romania's GDP was 4.7% in 2005.

natural and cultural resources and quite poor results in terms of environmental regulation, air transport infrastructure, ICT infrastructure, availability of qualified labor. As a result, about Travel and Tourism Competitiveness Index Romania is behind almost all former or current EU candidate countries such as Estonia (score 4.88 and rank 28), Czech Republic (4.77 and 35) , Slovakia (4.68 and 37), Hungary (4.54 and 40), Slovenia (4.64 and 44), Bulgaria (4.39 and 54), Poland 4.38 and 63), etc. and, respectively, Croatia (4.61 and 38), Turkey (4.37 and 52) (**Source:** The Travel & Tourism Competitiveness Report 2011, World Economic Forum, Geneva, 2011).

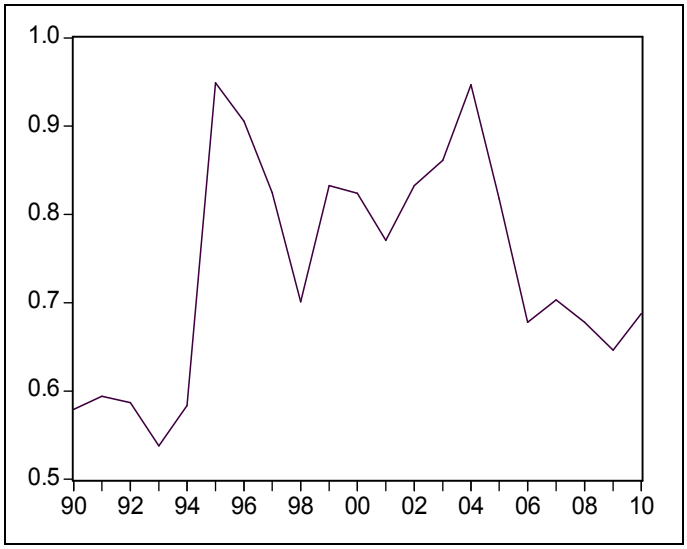
3. Some comments on the number of departures and arrivals of international tourists in Romania

Romanian tourism has seen important changes during the transition from planned economy to market economy. Table 1 presents a series of indicators calculated in order to characterize arrivals and departures of tourists in Romania during the period 1990 to 2010, and also during the political cycles in this period. Statistical indicators are computed on the total number of tourists and transport categories.

Table 1. The dynamic of the arrivals and departures of tourists for Romania (%)

Indicator	Index/rhythm	Time period for indicator					
		1990-2010	1990-1992	1993-1996	1997-2000	2001-2004	2005-2010
Arrivals of tourists in Romania							
Total	Index change	114.8	98.0	90.0	102.2	133.7	128.4
	The average annual rate of change	0.7	-1.0	-3.5	0.7	10.2	5.1
Road transport	Index change	161.0	131.5	94.5	98.9	149.1	133.4
	The average annual rate of change	2.4	14.7	-1.9	-0.4	14.2	5.9
Railway transport	Index change	9.5	48.0	49.0	110.6	64.7	72.8
	The average annual rate of change	-11.1	-30.7	-21.2	3.4	-13.5	-6.2
Air transport	Index change	448.0	113.7	147.2	122.9	100.0	132.1
	The average annual rate of change	7.8	6.6	13.8	7.1	0.0	5.7
Ship transport	Index change	63.6	57.4	110.3	82.5	137.8	82.4
	The average annual rate of change	-2.2	-24.2	3.3	-6.2	11.3	-3.8
Tourists departures from Romania							
Total	Index change	96.7	96.7	53.4	102.3	108.8	152.7
	The average annual rate of change	-0.2	-1.7	-18.9	0.8	2.9	8.8
Road transport	Index change	98.6	114.4	46.5	107.6	118.2	137.9
	The average annual rate of change	-0.1	6.9	-22.5	2.5	5.7	6.6
Railway transport	Index change	7.8	44.1	74.3	69.0	34.6	87.8
	The average annual rate of change	-12.0	-33.6	-9.4	-11.6	-29.8	-2.6
Air transport	Index change	911.3	57.4	184.1	132.1	127.0	274.1
	The average annual rate of change	11.7	-24.3	22.6	9.7	8.3	22.3
Ship transport	Index change	16.8	24.8	144.0	82.7	38.3	51.4
	The average annual rate of change	-8.5	-50.2	12.9	-6.1	-27.3	-12.5

Figure 1. The ratio between the number of arrivals and departures of tourists in Romania during 1990 - 2010



During the period 1990 - 2010 the two indicators, departures and arrivals of tourists have evolved quite different. Over the period 1990 - 2010 the number of arrivals of tourists in Romania recorded an increase of 14.8% with an average annual rate of 0.7%. For the same period, departures of tourists fell by 3.3% with an average annual rate of -0.2%. Figure 1 shows the evolution of ration between the annual number of arrivals and departures of tourists for Romania in the period 1990 to 2010. The values of this ratio for the entire period are subunit which shows that throughout the analyzed period, the annual number of tourists' arrivals in Romania was lower than the number of tourists' departures from Romania.

During the analyzed period, the data series of the number of departures and arrivals of foreign tourists in Romania are non-stationary, and they are integrated of order 1. Table 2 presents the results of applying the ADF (Dickey and Fuller, 1979) and Philips-Peron (Philips and Peron, 1988) tests used to determine the properties of stationarity and to determine the order of integration of the two data sets.

Table 2. Unit root tests

Variables	**Dickey-Fuller**			**Philips-Perron**	
		L	trend		trend
N_DEP_T	−1.6445 (0.74)	1	Yes	−1.7015 (0.71)	Yes
$\Delta(N\_DEP\_T)$	−3.9785 (0.00)	0	No	−3.9784 (0.00)	No
N_ARRIV_T	1.0243 (0.99)	3	Yes	−2.1632 (0.48)	Yes
$\Delta(N\_ARRIV\_T)$	−5.8229 (0.00)	2	Yes	−8.7793 (0.00)	Yes

The null hypothesis H0 is non-stationarity of the variable. For each case the statistics value is specified and statistical probability of a type I error in given between brackets.

Here, N_DEP_T means the number of departures during a time period and N_ARRIV_T designates the number of tourist arrivals during the same period.

The two tests indicate non-stationarity of the data series of the number of departures and arrivals of foreign tourists in Romania. These series are non-stationary in levels but are stationary in first difference which shows that the two series are I(1). Furthermore, arrivals are stationary around a deterministic trend, while departures don't have this property. These properties are confirmed by applying two statistical tests: ADF and PP.

In the following we mention some of the most plausible explanation of these evolutions. Firstly, political changes in 1989 caused an increase in the number of Romanian tourists who went abroad in the first years that followed. Secondly, the accession to the European Union caused a considerable increase in the number of Romanian tourists who went abroad, this

being an immediate consequence of the free movement within the European Union. The largest growth of Romanian tourists who went abroad occurred in the 2005-2010 period of time. During this period the average annual growth rate was 8.8%, this growth being the immediate result of the accession to EU starting on January 1, 2007. The number of Romanian tourists who went abroad in the first three years of accession was 23.8%, 46.78% and 31.6% higher compared with 2006.

Thirdly, the evolution of the number of Romanian tourists went abroad was caused by an increase in the average wage in the economy. During the period 1990 - 2010 the average annual growth rate of the average wage in the economy was 0.82%. The most significant increase occurred in the periods 2001 - 2004 and 2005 - 2010 for which the annual average increases were 7.85% and 11.37%. Table 3 presents the results of the Granger test applied to determine if there is a Granger causal relationship between the number of departures and the evolution of the average wage in the economy (N_NAW). The results confirm that the evolution of the average wage in the economy Granger causally determined the number of Romanian tourists who went abroad. By applying this statistical test we also established that there is no Granger causality between the number of tourists' departures and arrivals.

Table 3. Granger causality analysis between the number of departures, number of arrivals, and average net wage in the economy.

Hypothesis	F statistics	Decision
N_DEP_T does not Granger Cause N_NAW	0.09994	$N\_NAW \rightarrow N\_DEP\_T$
N_NAW does not Granger Cause N_DEP_T	5.68426	
N_DEP_T does not Granger Cause N_ARRIV_T	0.32140	There is no causal relationship between variables
N_ARRIV_T does not Granger Cause N_DEP_T	0.57462	

4. Features of regional tourism development

One of the main reasons of the unsatisfactory overall image of the Romanian tourism is the insufficiency and bad state of both general and tourism-specific infrastructure, unable to meet the requirements of a modern, internationally competitive tourism. Other disfavoring factors in the last fifteen years have envisaged the rigidity of tourism administrative structures, the social instability, the poverty which the majority of population is confronted with, the deficient supply of food, fuel and other goods absolutely necessary to a proper tourism, the low managerial competence and tourism personnel's behavior, the image of Romania abroad, various environmental damages.

Some of these drawbacks have been partially alleviated as a result of including tourism development as one of the priorities of the National Development Plan since 1999 (when the first plan was launched) and, consequently, of supporting it via national budget as well as EU pre-accession instruments (e.g. Phare).

The investment and management efforts in tourism made it possible to stop the decrease in the total activity volume of this sector recorded between 1990 and 2000 and an upward trend has been recorded starting from 2001. Table 4 shows the average annual rates of three important economic indicators used to characterize the tourism activity at national level and each of the eight development regions: accommodation capacity (AC), staying over night (SON) and arrivals (A). The annual average rates are calculated for 1990 – 2010 period of time, and the electoral cycles of this period: 1990-1996, 1997 - 2000, 2001 - 2004 and 2005 to 2010.

Table 4. The evolution of the main indicators of tourism between 1990 and 2010

Region	Accommodation Capacity (AC) (number of beds) 2010	Staying over night (SON) 2009	Arrivals (A) 2009	Indicator	Average annual growth rate				
					1990-2010	1990-1996	1997-2000	2001-2004	2005-2010
North-East	21279	1509550	1509550	AC	-0.80	-4.62	-2.42	0.41	2.60
				SON	-4.45	-10.88	-6.43	4.96	1.38
				A	-4.77	-11.05	-3.15	1.94	1.26
South-East	13687	4423728	4423728	AC	-0.86	-3.13	0.20	-0.30	0.58
				SON	-3.65	-9.43	-4.59	4.45	1.09
				A	-5.92	-10.79	-3.66	-1.23	-3.68
South	22625	1674366	1674366	AC	-0.86	-2.13	-1.88	1.80	0.30
				SON	-4.32	-9.95	-6.08	1.79	0.76
				A	-4.73	-10.19	-6.59	0.44	-1.89
South-West	16410	1441604	1441604	AC	-2.34	-7.05	-3.68	-3.12	2.26
				SON	-5.27	-11.09	-8.98	2.24	2.31
				A	-5.29	-12.69	-1.84	-1.90	-2.60
West	23257	1676496	1676496	AC	-0.56	-2.73	-0.85	-1.88	1.78
				SON	-4.48	-12.46	3.32	-0.33	1.82
				A	-4.58	-12.05	3.13	0.10	-2.24
North-West	26103	2098589	2098589	AC	-0.54	-1.55	-1.18	-0.83	0.06
				SON	-3.72	-10.36	-3.32	5.40	-0.03
				A	-4.38	-12.56	0.16	1.61	-2.16
Centre	42029	2665298	2665298	AC	-0.26	-3.15	-1.61	-0.27	3.45
				SON	-3.23	-7.74	-3.97	5.64	0.11
				A	-4.46	-10.14	-5.36	0.94	-1.07
Bucharest-Ilfov	23120	1835779	1835779	AC	2.99	-5.35	-3.84	7.49	15.55
				SON	-0.65	-8.67	-10.23	14.37	4.46
				A	-2.59	-11.97	-10.67	12.00	5.51
Romania	188510	17325410	17325410	AC	-0.61	-3.20	-0.83	-0.30	1.92
				SON	-3.59	-9.86	-4.94	4.97	1.42
				A	-4.85	-11.20	-3.46	0.69	-1.46

Data source: NIS TEMPO 2011 and the authors processing of data; for SON and A the rates are calculated for the period 1990 to 2009.

We highlighted the following aspects of the evolution of the considered indicators on national level and for the eight development regions for the 1990-2001 period:

- the average annual growth rate of the accommodation capacity of 2.99%, was recorded only in the Bucharest-Ilfov region. In all other regions it has declined: the minimum decrease of -0.26% annual average rate was recorded in the Central region and -2.34% in the South - West region; at national level the decline was -0.61% on average each year;
- in all development regions there have been an annual average decrease in the number of overnight stays over the whole period 1990 - 2009. The annual average decrease of this value among regions ranged between -5.27% in South-West and -0.65% in the Bucharest–Ilfov region. At national level there was a decrease in the annual average number of overnight stays of -3.59%;
- the number of arrivals over the 1990-2010 period decreased every year with an average of -4.85%. The annual average rate for the eight regions ranged from -5.92% in the South - East region to 2.59% in the Bucharest – Ilfov region;
- the most significant decrease for the three indicators in most regions were recorded during the first two election cycles between 1990 to 2000. Since the period 2001 - 2004 there is a noticeable stabilization and a relative increase of values for the three indicators both at national and regional level.

This tendency is correlated with the overall evolution of the Romanian economy, which has recorded an important economic growth during 2000-2008 period (annual growth rates were above 5%). During the 2001 - 2004 period the annual average GDP growth rate was 6.0% and for the next period, 2005 to 2010, it was 3.9%. The economic growth rate during

2005 - 2010 has been reduced significantly due to the economic crisis that affected the Romanian economy in 2009 and 2010. In the period following the political changes of 1989 a reduction of the values of the above mentioned indicators has been recorded at both national and regional levels because of the following reasons:

- the number of employees in the economy has significantly decreased and thus the number of employees who requested a ticket for rest and treatment through the unions decreased. In the planned economy era unions distributed a considerable number of tickets for rest and treatment to its members. Many times the employee's right to such a ticket turns into an obligation to accept it. Under these conditions a large number of spa resorts have completely closed their accommodation capacities;
- a significant number of Romanians have preferred spending the holiday in other countries, mostly in Greece and Turkey;
- public road infrastructure and railways has not been developed to the level required by Romanian and foreign tourists. The average annual increase in the length of public roads during 1990 - 2010 was only 0.62%, and the length of railways was reduced on average by -0.25% annually.

The accommodation capacity in use increased by 8.39% at national level as a result of the major increase in Bucharest-Ilfov region. Most of the other regions recorded smaller or bigger increases and only in the South region the accommodation capacity in use decreased. This is a result of the restructuring and modernization of the tourism capacity inherited from the communist period. The progress is visible in term of increase in the share of higher quality standard capacities (3-5 star capacities), especially after 2000 (Baleanu et. al., 2008) (Olteanu, 2011).

As far as the distribution of the accommodation capacity by region is concerned, an important disequilibrium can be easily noticed between the South-East region and the rest of the country, which is explained by the high concentration in the Black Sea area (Secara, 2010). However, the use of the accommodation capacity in this area is characterized by a big seasonality.

The number of arrivals and staying over night has recorded different evolutions: the number of arrivals increased whereas the number of staying over night decreased, especially in the seashore area. These figures not only reflect the increase of the weekend tourism but also the increase in the number of tourists who chose as seashore destinations other countries such as Bulgaria, Turkey, and Greece (Olteanu, 2011).

The index of using the accommodation capacity has a slightly overall increasing trend, as a result of combining important decreases (especially in the Black Sea area and Bucharest), but it has a relatively low overall level: only approximately one third of the accommodation capacity is used (Table 5).

Table 5. The index of utilization of the accommodation capacity in function in 2008 compared with 2000 (percentage)

Region	2000	2008
North-East	31.7	29.3
South-East	44.8	42.5
South	28.9	32.8
South-West	42.6	41.2
West	36.3	35.1
North-West	29.9	32.7
Centre	28.0	30.0
Bucharest-Ilfov	36.3	24.6
Romania	35.2	36.0

Source: Territorial Statistical Yearbook of Romania, 2009

Romanian tourism in general is still confronted with the outdated and insufficient infrastructure, unable to offer proper access to architecture monuments, archaeological sites, to meet the demand of parking lots, information points for cultural sites, belvedere points for

defense walls, medieval fortresses, churches, monasteries, camping lots for pilgrims, etc. Also the connected facilities – hotels, motels, restaurants, gas stations, car rental firms – are still behind the demand. The transportation infrastructure is particularly weak in all its forms – road, rail, naval and air, with an emphasis on road infrastructure: the highways are almost inexistent while the modernized roads are insufficient and concentrated especially around the Capital city (Table 6).

Table 6. The density of public roads and modernized public roads (Km/100sq Km) in 2008

Region	PR/100kmp	MPR /100kmp
North-East	36.6	9.34
South-East	30.7	6.64
South	36.5	11.79
South-West	36.5	12.56
West	32.1	9.17
North-West	35.4	8.39
Centre	31.4	8.17
Bucharest-Ilfov	48.9	36.37

Source: Territorial Statistical Yearbook of Romania, 2010

In almost all regions the public roads have a low density, whereas the modernized public roads represent less than one third out of total. The exception is the Bucharest-Ilfov region, where the density is higher than in the rest of Romania and the modernized public roads represent approximately 60% of the total length at country level. For comparison, in 2009, the density of public roads was 170 in Denmark, 180 in Germany, 129 in Sweden (World Bank).

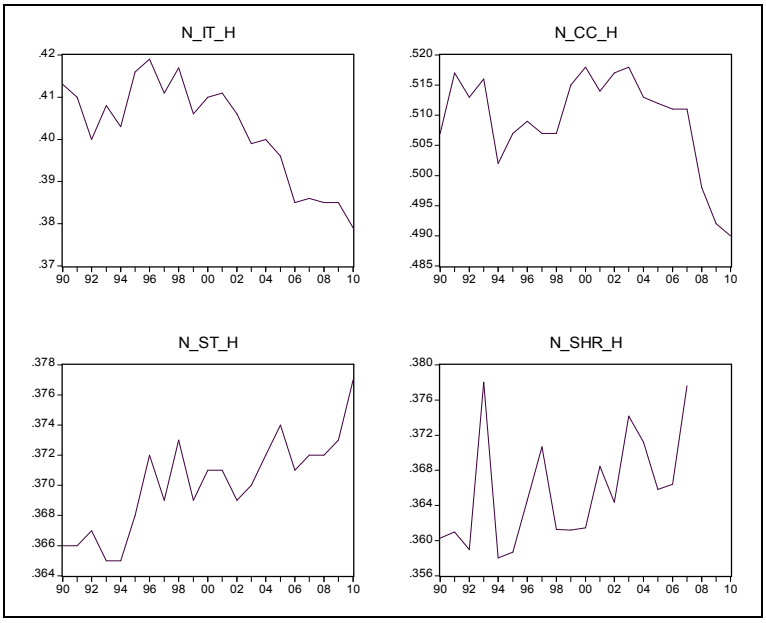
The importance of public roads is explained by the fact that a big share of tourist activity in Romania is supported by road transportation. Thus, according to NIS data, 74.46% of the total number of tourists leaving Romania in 1990 used the road transportation and this share rose up to 79.68% in 2000.

During the 1990 - 2010 period it has been recorded a significant decrease in the concentration of accommodation capacity in Romania on the eight development regions. We used the Herfindall (Herfindall, 1955) index to measure the concentration of accommodation capacities by regions. The graph in Figure 2 shows the index values calculated for the accommodation capacities (N_CC_H), number of over night stays (N_IT_H), the number of arrivals (N_ST_H) and number of employees in hotels and restaurants (N_SHR_H).

The analysis of four the data sets shows the decrease tendency of the concentration of accommodation capacity and number of nights spent on the eight development regions, an increase in the concentration degree of the number of tourists' arrivals and number of employees in hotels and restaurants for the eight development regions.

An analysis of the concentration degree must consider the above mentioned trends that took place while the following indicators' values at national level during the period 1990-2010 has decreased: accommodation capacity was reduced by an average annual rate of -0.61%, the number arrivals to -3.47%, the number of over night stays to -4.98, the number of employees in the hotels and restaurants to -2.8%. During 1993 - 2009 the GDP of Romania increased by an average annual rate of 3.24%.

Figure 2. Herfindall concentration indices for the four indicators used to characterize the statistics of tourism activity.



5. Econometric models used to analyze the number of arrivals of foreign tourists in Romania and the departures of Romanian tourists

We used two regression models to analyze the evolution of the number of Romanian tourists that went abroad and foreign tourists arrived in Romania. According to the results presented in table 3, the average net wages in the economy (N_NAW) determine the number of departures (N_DEP_T) in the sense of Granger causality (Granger, 1969). Under these conditions, taking into account the results presented in Table 2, we define a regression model to analyze N_DEP_T. The parameter estimations are presented in Table 7.

Table 7. Regression models of the number of foreign tourists' arrivals and departures of Romanian tourists abroad

Explanatory variables	Dependent variables	
	N_DEP_T	N_ARRIV_T
Constant	2370.36 (2.43)	44629.15 (4.51)
Trend	–377.96 (4.88)	48.10.96 (1.77)
N_NAW	4.03 (9.57)	
Δ(N_DEP_T)	0.40 (2.01)	
Δ(N_DEP_T(-1))	0.57 (2.39)	
Δ(N_ARRIV_T)		0.60 (2.55)
N_CC_H		–76883.00 (3.98)
R^2	0.85	0.68
Adjusted R^2	0.81	0.62
F statistics for restriction (1)	91.63 (<0.01)	
F statistics for restriction (2)		15.84 (<0.01)

For each variable the table indicates the estimated coefficient and the absolute value of Student statistics in parentheses. (1) H0: Net Average Wages don't cause the number of departures of foreign tourists in Granger sense; (2) H0: N_CC_H don't cause the number of foreign tourists' arrivals in the country in Granger sense.

In the first model that analysis the departures of Romanian tourists abroad, the net average wage in the economy significantly determine the number of Romanian tourists who went abroad. The F statistics value for testing the restriction (1) shows that there is causality relationship in Granger sense between the net average wages in the economy and the number of Romanian tourists who went abroad.

The second regression model highlights that reducing the concentration degree of the accommodation capacity negatively caused in Granger sense the number of foreign tourists arrived in Romania. In the second equation that explains the number of foreign tourists who arrived in Romania, if we omit the variable that measures the concentration of regional accommodation capacity this will significantly reduce the power of explanation of the model (F test restriction (2)).

6. Econometric models for evaluating the impact of infrastructure on tourism development. Regional variations

The econometric models developed here attempt to evaluate the effects of the infrastructure on the activity in tourism. In the econometric models considered the tourism activity is estimated by gross domestic product in tourism and the factors that are put in question refers to the use of tourism accommodation capacity (GRADCAP), tourism accommodation capacity (CAPT), public road density (DENS_DP) and density of the modernized public roads (DENS_DM). The model is defined by the relation:

$$PIB\_T_{it} = c + c_1 GRADCAP_{it} + c_2 CAPT_{it} + c_3 DENS\_DM_{it} + c_4 DENS\_DP_{it} + \varepsilon_{it} \quad [1]$$

This model is estimated using data from development regions recorded from 1998 to 2009. The parameters were estimated by means of the Pooled Least Squares method by three different methods: the common constant method, the fixed effects method and the random effects method (Baltagi, 2008). Table 8 summarizes the results.

Table 8. Classical model parameter estimation

	common constant method		fixed effects method		random effects method
Dependent Variable: GDP in tourism (PIB_T)					
C	-577.113^{*} (66.9108)	751.358^{*} (129.74210)	-747.2360 (387.6045)	-2929.659^{*} (774.6328)	-2020.356^{*} (453.253)
GRADCAP	-5.658^{*} (1.8656)	-8.861^{*} (1.4123)	-4.3273^{*} (3.7598)		
CAPT	0.003^{*} (0.0002)	0.002^{*} (0.0001)	0.0179^{**} (0.0104)	0.0117^{**} (0.0062)	0.006^{*} (0.0002)
DENS_DM		18.211^{*} (5.0758)	26.9770^{*} (6.9517)	12.3641^{**} (6.5721)	18.662^{*} (5.7550)
DENS_DP	28.687^{*} (3.0083)	40.631^{*} (4.7826)		77.0844^{*} (19.7282)	54.6090^{*} (13.2170)
R^2	0.53 (0.00)***	0.75 (0.00)***	0.86 (0.00)***	0.90 (0.00)***	0.61 (0.00)***

* - $\alpha = 0.00$, ** - $\alpha \leq 0.05$, *** - Prob(F-statistic)

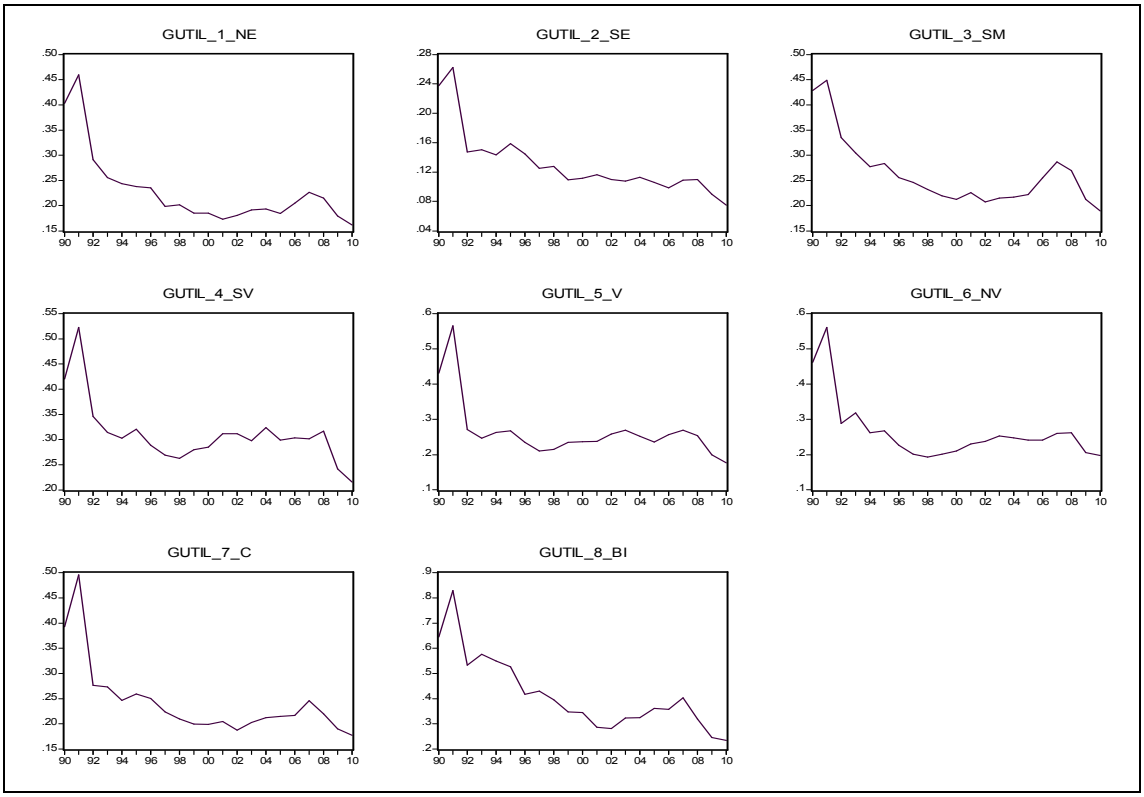
We applied Hausman test (Hausman, 1978) to choose between the fixed effects method and random effects method. The test statistic equal to 7.2 is greater than the chi-square statistic determined for the significance level of 5%. Under these conditions we reject the null hypothesis according to which the random effects model is consistent and we consider the fixed effects model. Table 9 presents the specific effects in the development regions estimated from the econometric model considered.

Table 9. Specific effects in the regions

The historical region	Development region	Specific effect of the development region	Specific effect of historical region
Muntenia	South-West	13.28140	86.22
	South	-36.26749	
	Bucharest-Ilfov	109.2080	
Moldova	North- East	-24.72293	-243.38
	South-East	-218.6521	
Transilvania	West	67.78855	157.15
	North-West	-25.93825	
	Centre	115.3028	

As results from the graphical representations in Figure 3 show, during the period 1990 to 2010 the utilization of touristic capacities has dropped. In 1990 the highest value of the utilization of hotel accommodation capacities was in the Bucharest – Ilfov (64.5%) and the lowest (23.8%) was in the South-West region. In 2010 the indicator was reduced considerably compared to 1990 both nationally and in each of the eight development regions. The largest decrease occurred in the South – East region – 68.5%, reductions in other development regions being equally significant (NE - 59.9%, SM - 55.8%, SW - 48.7%, W - 58.9%, NW-57.2% and C - 54.9%). This situation is due to various causes. The transition from planned economy to market economy resulted in a considerable reduction of the employed population nationwide and in seven of the eight development regions. During 1992 - 2008 the employed population in seven development regions decreased by 12.25% to 25.05% (S - 25.05%, SW - 23.04%, NE - 22.25%, SE - 20.43%, C - 15.58% , NW - 13.72% and W - 12.25%). The only region which saw an increase of the employed population with 6.72% was Bucharest - Ilfov. Under these conditions the number of employees who went on vacation in a resort or spa has decreased. Another important factor leading to lower capacity utilization was the inappropriate development of the privatization in tourism. The privatization process was conducted by the Ministry of Privatization and not by the Ministry of Tourism. Many touristic capacities, especially in spa tourism, have not been upgraded to improve the services offered to tourists.

Figure 3. Developments in the utilization of accommodation capacity in the eight development regions during 1990 - 2010



An important factor for tourism development is to increase the density of public roads and modernized public roads. The parameter values corresponding to the two variables that measure the quality of infrastructure are all positive.

There is heterogeneity between historical regions. Thus, the sign of the specific effects is positive for Transylvania and Muntenia and negative for Moldova. It should be noted that for Muntenia we obtain a positive value due to the contribution of Bucharest. There is heterogeneity for historical regions Muntenia and Transylvania. Only for Moldova both regions (North- East and South-East) have the same negative sign for the specific effects.

These findings are reflected by the Regional Operational Programme of Romania, which includes the sustainable development of regional and local tourism among its priorities, with important financial allocations for the North-East region.

7. Concluding remarks

As resulted from the above analysis, one of the major problems the Romanian tourism is confronted with is the outdated and insufficient infrastructure, unable to offer proper access to tourist attractions, to meet the demand of parking lots, information points for cultural sites, etc. Also the connected facilities – hotels, motels, restaurants, gas stations, car rental firms – are still behind the demand. Therefore many efforts should concentrate in the forthcoming years on infrastructure modernization, marketing development, service quality improvement, sustainability so as to make the tourism sector able to have the expected contribution to reducing intra and interregional disparities and increasing the overall economic development, in accordance with its major potential in Romania (Mitrut and Constantin, 2009).

During the transition in Romania there has been a significant reduction in tourism activity. Amid economic and social difficulties the domestic demand for tourism services in the country has reduced. During the period 1990 - 2010 the accommodation capacity in hotels has decreased with 11.45% and overnight stays in hotels with nearly 64%. During this period the concentration of accommodation capacities in the eight development regions also decreased with almost 3.5%. This situation is explained by the development of new smaller accommodation capacities in regions with high potential for tourism and abandonment of

accommodation capacities in spas as a result of the defective privatization process or problems of property restitution.

Table 10 shows the Pearson correlation coefficient calculated from data series values (values below the diagonal) and concentration indexes by regions (values above the main diagonal). These data show a significant linear dependence between the concentration of accommodation capacities by regions and the concentration of tourist arrivals by regions, overnight stays, GDP, railway utilization, hotel and restaurant employees and employees in economy. Instead, accommodation capacity development depends on tourist arrivals, overnight stays, number of employees in hotels and restaurants and the number of employees in the economy. Increasing the concentration of GDP in the development regions determined the increase of the concentration of the accommodation capacities. Development of road infrastructure (public roads and modernized public roads) was an important factor for concentration of the accommodation capacities. In future, the potential of the Romanian tourism will be significantly influenced by the development and modernization of public roads.

Table 10. Pearson correlation coefficient calculated from the data series values (values below the diagonal) and concentration indexes by regions (values above the main diagonal)

	1	2	3	4	5	6	7	8
Tourist accommodation capacity (1)	1.00	-0.44*	0.50*	-0.50*	0.13	-0.67*	-0.68*	-0.62*
Tourist arrivals (2)	0.87*	1.00	-0.51*	0.71*	-0.65*	0.11	0.51*	0.64*
Overnight stays (3)	0.73*	0.92*	1.00	-0.84*	0.74*	-0.46*	-0.65*	-0.93*
GDP (4)	-0.08	-0.20	-0.41*	1.00	-0.85*	0.26	0.62*	0.94*
Public roads length(5)	-0.25	-0.42*	-0.53*	0.84*	1.00	0.09	-0.53*	-0.76*
Railways length (6)	0.26	0.46*	0.56*	-0.77*	-0.88*	1.00	0.27	0.51*
Employees-Hotels and restaurants (7)	0.85*	0.91*	0.86*	-0.13	-0.41*	0.45*	1.00	0.68*
Employees - total in economy (8)	0.75*	0.89*	0.89*	-0.51*	-0.72*	0.76*	0.87*	1.00

* - values significantly different from zero for

Previous studies have revealed that the achievement of a good performance and position on tourism market “depends on the capacity of a destination area to manage and organize its resources according to an economic logic driven by competitiveness strategies” (Cracolici and Nijkamp, 2008, p. 338). A major challenge in this respect is to set up viable mechanisms able to improve the competitiveness and quality of tourism at national, regional and local level so as to ensure a balanced development and make touristic areas more competitive at national and international level (OECD, 1999).

Throughout the transition period Romania has "exported" more tourists than the number of "imported" tourists. During the period 1990 - 2010 the ratio of foreign tourists who visited Romania and the number of Romanian tourists who went abroad was below one. Romania's EU accession led on a short-term to a significant increase of foreign tourists who visited Romania. Econometric tests have shown that during the period 1990 - 2010 the number of Romanian tourists who went abroad was directly determined by the average net wage increase in the economy.

The current framework set up in Romania for tourism development gravitates around the strategy developed by the Ministry of Regional Development and Tourism, whose turning into practice is largely based on the EU-funded Regional Operational Programme 2007-2013. It contains as one of the basic priorities the sustainable development of regional and local tourism, with a share of 15% of total public expenditure (from European Regional Development Fund and state budget, Ministry of Development, Public Works and Housing, 2007 - Currently Ministry of Regional Development and Tourism). This priority is based on

measures focusing on: the restoration and sustainable use of cultural patrimony as well as the creation/development of related infrastructure; the creation/development/modernization of specific infrastructure for sustainable use of natural resources and the increase in the quality of tourist services; promotion of tourism potential and creating the infrastructure needed to raise Romania's attractiveness as tourist destination.

Other priority axes of the Regional Operational Programme can also provide supporting measures for tourism development, such as those regarding the improvement of the regional and local transportation infrastructure, the strengthening of the regional and local business environment or the sustainable development of cities as urban growth poles. In the implementation phase an important role belongs to the regional/local public administration, which is able to ensure the necessary operational convergence between the national level and local communities, between various public and private stakeholders involved in defining and creating the tourist supply (Galdini, 2005).

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THE REGIONAL BORDER EFFECT IN SPAIN*

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Summary

This work is an empirical study of the Spanish Autonomous Communities from 2000 to 2010 to quantify the so-called border effect, or in other words, how much more intense are flows of goods between regions and the rest of Spain than between these regions and other countries. For this, we use the gravity equation model of trade. The main conclusions are: One, the border effect exists: the dummy variable which quantifies it is always positive and statistically different from zero. Two, the border effect tends to diminish over time. Three, estimating all the regions together, the border effect is around a factor of 10.5. Four, estimating each Autonomous Community independently, the greatest border effect is found in the Canary Islands (factor of 58.36) and the Balearic Islands (factor of 29.81); meanwhile, the regions with the least border effect are the ones with the two largest cities in the country: Catalonia (factor of 8.11) and Madrid (5.17), with Aragon in third place (8.14). Five, if we distinguish between regions' imports and exports, the border effect is significantly higher for the former (factor of nearly 17, compared to one of nearly 10).

Keywords: Border effect, Spanish Autonomous Communities, gravity equation
JEL classification: F14, R11

1. Introduction

It is no easy task to define the historical origins of the concept of the border, at least as we understand it today. Its birth is undoubtedly connected to the emergence of the first empires and their geographical expansion: from the first urban agglomerations where the Tigris and Euphrates come together, to the development of the Macedonian empire under Alexander the great, via ancient Egypt and classical Imperial China, which left the first physical expression of what is a border, the construction of the Great Wall. In this context, perhaps we can all agree that the first culture to make clear, from a functional viewpoint, what a border is or means, is ancient Rome. In the centuries of its expansion, everyone knew which territories were under the pax romana and which were not, who enjoyed the status of a roman citizen and who did not, all within a legally and linguistically unified framework. Jumping ahead more than a thousand years, the other historical event that defines the concept of the border in a way we can accept as definitive, it the birth of the nation in the current sense of the word, which occurs chronologically at the start of the Modern Age. These are no longer the shifting borders between kingdoms, duchies and other sovereign political entities of various kinds, all with a considerable degree of internal heterogeneity. They are borders between well-established countries, with their own differentiated language, culture, history and legal and institutional framework, which confer on them a certain unity, and within their frontiers their inhabitants are aware that they share different ideas and roots to those of their neighbours beyond their borders.

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At present, borders separate different nations whose languages, history, legislation, currencies, economic policies and idiosyncrasies are also different. In this sense, borders act as a dividing element, representing an obstacle to the transit of people, factors of production, goods and services. But borders can also be understood as a factor which unites and puts into contact more than it separates; this approach is especially important in the modern, globalised world, with its proliferation of political, economic and trade agreements between countries. Which element has more weight, one which brings together and communicates, or one which splits and divides? Certainly this is an important, and open, question; in any case, finding the right answer requires rigorous empirical exercises, designed ad hoc for this purpose. At the same time, the analysis can use different approaches. Here we will refer exclusively to the economic approach. And it is precisely in this context that the seminal contribution by McCallum (1995) appears, leading to the emergence in the literature of the so-called border effect, later to be the object of numerous quantifications, and which clearly defines the subject and the goal of this work. It would therefore be worth our while to go into some detail on what exactly McCallum (1995) did, and what the border effect actually is.

McCallum wanted to evaluate how permeable the frontier was between the USA and Canada, or in other words, whether it represented an obstacle to the transit of goods and services between the countries, and to what degree. To do this, he took the fourteen provinces of Canada and a similar number of US states (all those bordering Canada and the most important in terms of GDP). He considered two types of monetary flow: on one hand, exchanges between one Canadian province and another (interregional); on the other, exchanges between a Canadian province and a US state (international). Next, he investigated whether both types of flow were statistically different, and if so, which were more intense, and quantify these divergences (these are 20%, 50% or 200% more intense). For this task, it was not enough to compare the two series of data directly. It is essential to postulate a model of trade which controls for other variables, as well as the border effect, which evidently influence the size of the flows. To put it another way, the flow between two Canadian provinces, for example, could be very large and have nothing to do with a high border effect, but rather, be explained by these two provinces being very close to each other (which certainly favours exchanges) or having high incomes (high purchasing power and production capacity). McCallum, and all the later literature, chose a classic model of trade with excellent performance, in the sense that it describes the flows very well, with high values of the coefficient of determination (R2). We are talking about the famous gravity equation, which we study in the third part of this work.

It is now time to present the results deduced by McCallum. After controlling for the other variables affecting flows, such as the distance between areas, the seller's income, the buyer's income, the flows between Canadian provinces were nearly twenty times more intense, that is, 1900% more than their equivalents between Canadian provinces and US states! Yes, borders matter a great deal, and at least in the case of the one between the US and Canada, represent a considerable obstacle to exchanges. Interpreted in other terms, McCallum's result can also be understood to mean that the field of potential growth of international trade is still very large, in the sense that international flows can still increase a great deal before their magnitude becomes similar to interregional flows (which, obviously, do not count as international trade); to put it another way, globalisation is nowhere near its upper limit, given that international trade may experience very significant positive growth rates.

This conclusion, completely unexpected, especially in its magnitude, typified the so-called "border effect" in the literature, given that it is indeed relevant, as we have seen, and it generated a series of later works which we analyse briefly in the next section.

This is the context in which this work must be understood. It is intended to quantify the border effect for the Spanish Autonomous Communities or regions, that is, how different are the flows in both directions that each region maintains with the rest of the Spanish state, compared to its import and export flows with other countries. There are three main novelties in the exercise. First, a recently constructed database is used, which estimates inter-regional flows specifically and directly, something which is very hard to obtain and often simply approximated due to the lack of alternatives; as far as we know this is the first time that this database has been used to estimate the border effect in Spanish regions. Second, a relatively long recent period is considered, from 2000 to 2010, inclusive, enabling us to analyse the

evolution over time of the magnitude of the border effect for each region. Finally, the degree of fit of the estimations made is very satisfactory, and the results relating to the quantification of the border effect are reasonable and largely corroborate those of other previous works, giving them robustness.

The main conclusions reached are: One, the border effect exists and is positive. Two, the border effect tends to diminish over time. Three, estimating all the regions together, the border effect is around a factor of 10.5. Four, estimating each region independently, the greatest border effect is found in the Canary Islands (factor of 58.36) and the Balearic Islands (29.81); meanwhile, the regions with the least border effect are Catalonia (8.11) and Madrid (5.17). Five, if we distinguish between imports and exports by the regions, the border effect is significantly higher for the former (factor of nearly 17, compared to one of nearly 10).

The rest of the work is articulated as follows. The second section is a selective review of the literature on the border effect. The third describes the methodology and the chosen model of trade, which is the gravity equation. The fourth section gives the details of the data used in this work, and their sources. The fifth section is the longest and describes the results of the empirical application. The next section is devoted to the conclusions, and finally, section seven closes the work with the bibliographic references.

2. The border effect: A brief review of the literature

This section is not exhaustive or highly detailed; we simply want to offer a brief selective review of the existing literature on the border effect, with a special emphasis on the Spanish case.

Helliwell (1998) is the first to return to the question after the pioneering article by McCallum (1995). Using the same data as the original work, he reviews the subject, trying to add econometric robustness to the original findings. He uses different specifications and approaches, but the result (the factor around twenty) is the same in all of them. In short, the work corroborates and gives solidity to the first unexpected conclusion.

The remaining works coincide in being based methodologically on the gravitational model. However, they differ in the geographical area studied. Feenstra (2002) again analyses the US-Canada border; Djankov and Freund (2002) use bilateral trade data between nine Russian regions and 14 former Soviet republics; Anderson and van Wincoop (2003) present a multilateral approach; Fukao and Okubo (2004) use data from Japan; Helble (2007) from France and Germany; finally, Head and Mayer (2010) study the case of the European union. As regards the qualitative and quantitative results reached, all these articles have one point of convergence: regardless of the different geographical areas analysed, they all conclude that the border effect exists.

For obvious reasons, we must refer particularly and in detail to the applications before this one which have considered the case of Spain or its regions as the geographical area for the empirical application. Minondo (2003) is the first to study a border effect which we could classify as regional, as he does not analyse the border between two countries, but rather quantifies how different the flows are between an Autonomous Community, in this case the Basque Country, and the rest of Spain, compared to the region's exchanges with other countries. Based on a rigorous standard use of the gravity equation, he deduces that from 1993 to 1999 the Basque Country had 20 to 26 times more trade with the rest of Spain than with other countries. Again using the gravitational model, Gil-Pareja et al. (2005) deduce that from 1995 to 1998 the Spanish regions traded with each other 21.8 times more than with other OECD countries; at the same time, in a clear forerunner of this work, they also estimate the border effect separately for each Autonomous Community ("region-specific gravity equations"), with their results oscillating between the lowest border effect in the Community of Madrid (factor in favour of the home bias of 8.5) and the largest, in the Balearic Islands (factor of 59.7).

3. The gravity equation and the border effect. Methodology

The gravity equation originates in work by economists from Finland (Pöyhönen, 1963, Pulliainen, 1963) and the Netherlands (Tinbergen, 1962). In fact, the merit of these authors is having been the first to use the gravity equation in the sphere of trade exchanges; gravitational

models designed to explain migratory and tourism flows or phone calls between cities had already been applied (see Glejser and Dramais, 1969). The origin of the equation is far from strict deductive processes or rigorous theoretical reasoning, and in any case, the attempts to justify its existence from a theoretical point of view (Anderson, 1979; Bergstrand, 1985 and 1989) were made after it appeared. However, nobody doubts its excellent empirical performance and its great capacity for explaining flows of any kind between an emitter i and a receiver j. Its name draws an analogy between economics and physics, so that the size of the trade flow between region i and region j depends positively on their incomes (economic mass) and negatively on the distance between them:

$$M_{ij} = AY_i^{\upsilon 1} Y_j^{\upsilon 2} D_{ij}^{\upsilon 3} e^{u_{ij}} \qquad \textbf{(1)}$$

where M_{ij} is the current value of sales from i to j, A is the constant, Y is the current value of income, D is the distance between i and j, u_{ij} is noise and υ1, υ2 and υ3 are the elasticities to be estimated. Linnemann (1966) added the populations (L) of both areas as explanatory variables, leading to what we might call the basic formulation of the gravity equation for a given period of time:

$$M_{ij} = AY_i^{\upsilon 1} Y_j^{\upsilon 2} D_{ij}^{\upsilon 3} L_i^{\upsilon 4} L_j^{\upsilon 5} e^{u_{ij}} \quad \textbf{(2)}$$

Expression (2) constitutes a double-log functional form in incomes, populations and distance. Sanso et al. (1993) demonstrate, through the definition of Box-Cox (1964) transformations, that this functional form may not be the best from a statistical viewpoint, but it is, however, a good approximation to the best, which together with the simplicity of its application, leads us to adopt this functional form for this document.

Incomes have a positive influence, given that they represent the potential offer of exports in area i and the potential demand for imports in area j, and consequently their effect on M_{ij} is positive. The direction of the influence of populations is variable. Its elasticities can adopt both signs, and quite often not even be significant. Distance is a proxy variable of the natural resistance to trade and includes issues relating to transport costs and time, negatively affecting M_{ij}.

We have classified the specification given in (2) as basic, as nearly all authors include the five explanatory variables which appear there. Absolutely equivalent specifications to (2) are in terms of income and per capita incomes, or in terms of populations and per capita incomes, with a double-log functional form all three are interchangeable. However, without a theoretical framework which sets out exactly which variables can be included, the gravity equation lets researchers add as many as they want multiplicatively to (2) without any justification needed other than economic common sense. Thus, the following additional variables appear in the literature: surface area of the two countries, adherence to preferential trade agreements dummy, neighbouring countries dummy, shared language between countries dummy, preferential trade agreements dummy multiplied by distance, preferential trade agreements dummy multiplied by the product of per capita incomes of the countries, tariff protection indicators, other trade resistance measures, per capita factor endowments, price indices of the countries, price indices of the trade flows, exchange rates and their variability, and differences in per capita incomes among regions. Thus, regardless of the advisability of considering one variable or another, which will largely depend on the goal of one's research, the gravity equation is undeniably a highly flexible tool for explaining bilateral trade flows.

We have seen in the above paragraph that many of the variables which can be added to the so-called basic ones are dummies. In fact, the inclusion of a dummy in (2) will enable us to quantify the border effect, which is the question this essay is attempting to answer. This dummy, which we shall call Spain (SP hereafter) takes the value of one if the flow of one Autonomous Community, in both directions, is with the rest of Spain, and the value of zero if the flow corresponds to exports or imports between this Autonomous Community and another country outside Spain. Thus, expression (2) now appears as follows:

$$M_{ij} = AY_i^{\upsilon 1} Y_j^{\upsilon 2} D_{ij}^{\upsilon 3} L_i^{\upsilon 4} L_j^{\upsilon 5} e^{\upsilon 6 xSP} e^{u_{ij}} \qquad \textbf{(3)}$$

when SP=1 (flow between an Autonomous Community and the rest of Spain), the equation (3) is:

$$M_{ij} = AY_i^{\upsilon 1} Y_j^{\upsilon 2} D_{ij}^{\upsilon 3} L_i^{\upsilon 4} L_j^{\upsilon 5} e^{\upsilon 6} e^{u_{ij}} \qquad \textbf{(4)}$$

and when SP=0 (flow between an Autonomous Community and another country) the equation (3) is as follows:

$$M_{ij} = AY_i^{\upsilon 1} Y_j^{\upsilon 2} D_{ij}^{\upsilon 3} L_i^{\upsilon 4} L_j^{\upsilon 5} e^{u_{ij}} \qquad \textbf{(5)}$$

so that the difference between both types of flow, expressions (4) and (5), is exactly $e^{\upsilon 6}$, which by definition represents the factor by which we must multiply the "normal" trade flow in (5) to change it to the "special" flow in (4) which it has with the rest of Spain. In short, the numerical value of $e^{\upsilon 6}$ defines, by construction, the magnitude of the border effect. And, fundamentally, all of this while discounting or controlling through the other variables affecting the flows (incomes, populations, distance, other dummies than SP), so that we can be reasonably sure that $e^{\upsilon 6}$ effectively gathers something that can be exclusively attributed to the border effect. Evidently, if υ6 is not statistically different to zero, $e^{\upsilon 6}=1$, there is no difference between both types of flow (the factor by which one type is multiplied to reach the other is one) and the border effect is null. At the same time, at least at the theoretical level, there is the possibility that υ6 is negative, in which case, $0< e^{\upsilon 6}<1$ and the most intense flows would be those between Autonomous Communities and other countries, not with the rest of Spain.

4. The databases

The goal of this work is to study the behaviour of the trade flows of Spanish Autonomous Communities or regions, and to quantify the so-called border effect in each of them for a relatively long recent period, such as the first decade of the 21st century, from 2000 to 2010 inclusive. The temporal horizon considered is the longest possible given the characteristics of the C-intereg database, which we will describe below.

The first step is to select the countries in the sample. In our case we decided to consider all the member states of the OECD (Germany, Australia, Austria, Belgium, Canada, Chile, South Korea, Denmark, Slovakia, Slovenia, the USA, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Iceland, Israel, Italy, Japan, Luxemburg, México, Norway, New Zealand, the Netherlands, Poland, Portugal, the UK, the Czech Republic, Sweden, Switzerland and Turkey), countries which are candidates to join it (Russia) and "enhanced engagement" countries (Brazil, China, India, Indonesia and South Africa). The trade flows of the Autonomous Communities with these forty countries represent on average 98% of all the trade flows of these Communities, leading us to assume that the sample of countries is sufficiently representative and will allow us to achieve our goal satisfactorily.

Now let's see the variables we need for this analysis. First, the endogenous variable, which is each Community's exports and imports to and from each of the 40 countries considered. This endogenous variable was obtained from two different sources. From C-intereg[†] we have taken the exports and imports of each Community to the other Communities, so that aggregating, we have the exports and imports of each Community with the rest of Spain. As far as we know, this is the first time this recently created database has been used for a study of the kind, which undoubtedly constitutes one of the contributions of this work.

[†] http://www.c-intereg.es. C-intereg is a project centred on the analysis of Spanish inter-regional trade, which began in 2004 as an initiative of the Centre for Economic Prediction, CEPREDE, sponsored by eight Autonomous Communities.

The second database used was Estacom[‡], from the ICEX (Institute of Foreign Trade), which is housed in the Ministry for the Economy and Competitiveness and uses data from the Tax Agency. This database enabled us to obtain the exports and imports between each Community and each of the countries considered except Spain.

The explanatory variables of the basic formulation of the gravity equation given in (2) and its sources are:

1. Gross Domestic Product (GDP) of the Autonomous Communities and the countries in the sample. Again, we used two different databases. The GDP of the Communities was obtained from the National Statistics Institute[§], INE, while for the GDP of countries, we used data provided by the World Bank[**]. When the country that the region's flow goes to and from is Spain, the Spanish GDP is calculated by subtracting the total for the region from the national total.

2. Population of the Autonomous Communities and the countries. The data sources are the same as for GDP. For the population of Spain, the same procedure was followed as for Spanish GDP.

3. Distance between the two areas involved in trade exchanges, i.e., the distance between an Autonomous Community and Spain, or between an Autonomous Community and each of the countries considered. The method for obtaining these distances is as follows.

The distance from Autonomous Community X to Spain is calculated in two phases. First we obtain the distance from each province of Community X to Spain, and in the second phase, the distance from Community X to Spain. First the distance is obtained[††], in a straight line, from the capital of each province of Community X to each Spanish provincial capital which is not in that Community. These distances are weighted by the population[‡‡] of each province in relation to the total population of Spain and added together, giving the distance from each province in Autonomous Community X to Spain. In the second phase we add together these provincial distances, now weighting them by the population represented by each province of Community X in relation to the total for Community X. This gives us the distance of each Spanish region from the rest of the Spanish state.

The distance from Autonomous Community X to a country Y was calculated in a similar way, also in two phases. First we obtain the distance (from the same source as before), in a straight line, from each province of Community X to the 5 largest cities in country Y. These distances are weighted by the weight of these cities[§§] and added together, giving the distance from each province of Autonomous Community X to country Y. In the second stage, we go from provincial distances to the distance from Community X to country Y in the same way as described above.

As the distance between each Autonomous Community and the rest of Spain or another country, calculated this way, vary very little from year to year, the distance variable is the same for the whole sample period. We used the populations of 2005, the central year of the range considered, for the weighting process described above.

5. Results for Spanish Autonomous Communities

The specification finally selected for the gravity equation is:

$$M_{ij} = AY_i^{\upsilon 1} Y_j^{\upsilon 2} D_{ij}^{\upsilon 3} L_i^{\upsilon 4} L_j^{\upsilon 5} e^{\upsilon 6 xSP} e^{\upsilon 7 xUE} e^{\upsilon 8 xCOSTA} e^{u_{ij}} \qquad \textbf{(6)}$$

or, taking logarithms:

[‡] http://www.icex.es
[§] http://www.ine.es
[**] http://www.bancomundial.org
[††] http://es.lasdistancias.com
[‡‡] http://www.ine.es
[§§] http://unstats.un.org

$$\ln M_{ij} = \ln A + \upsilon 1 \ln Y_i + \upsilon 2 \ln Y_j + \upsilon 3 \ln D_{ij} + \upsilon 4 \ln L_i + \upsilon 5 \ln L_j + \upsilon 6 SP + \upsilon 7 UE + \upsilon 8 COST \quad (7)$$

where EU (European Union) is a dummy variable which takes value one if the flow of each Autonomous Community is with a member state of the European Union and zero if not; COAST is another dummy variable which takes value one if the flow of each Autonomous Community is with a country on the coast, and zero if not. Given the flexibility of the gravity equation, as mentioned in section three, we tried a whole range of alternative dummy variables, but they were systematically found not to be significant, and thus were not included in the final specification.

Meanwhile, SP is always significant and positive in all the estimations carried out, which are described below. The same cannot be said of EU and COAST, but as they are significant on a reasonable number of occasions, especially EU, they have been kept in the specification finally chosen.

5.1. Year by year estimation

As the sample size permits it (80 observations in each cross-section for each of the Autonomous Communities: 40 of exports and 40 of imports) we will begin by estimating the gravity equation, with the monetary variables expressed in the current terms of each period, year by year and for each region independently. In total, 187 regressions (17 Communities for 11 years) by heteroscedasticity-robust ordinary least squares. This option has notable advantages but also a few problems. Among the advantages, it provides a great deal of information and allows us to quantify the border effect for eleven different years, giving the option of analyzing its evolution over time, and for each region considered individually, enabling us to study the possibility of geographically differentiated behaviours. Its main disadvantage is that it is an estimation method which does not consider the complete information (all the years and all the areas) simultaneously, and thus does not expressly value the temporal and spatial dimensions of the data in the estimation. Fortunately, this lack is resolved in section 5.2 of this document.

First, we will present the results when we estimate the gravity equation year by year, but taking all the Autonomous Communities together in a single model (80x17=1360 observations). This information is offered in Tables 1 and 2; the former shows the estimation of the dummies SP, EU and COAST, and exp{SP}, exp{EU} and exp{COAST}, which quantify the border effect, the European Union effect (EU) and the COAST effect; the second shows the estimated elasticities of the remaining explanatory variables (incomes, populations and distance).

Table 1. OLS estimation year by year for all the Communities together. Border effect, EU effect and COAST effect

YEAR	SP	BORDER EFFECT	EU	EU EFFECT	COAST	COAST EFFECT	R^2 ADJ.
2000	2.42***	11.29	0.79***	2.21	0.39***	1.47	0.67
2001	2.44***	11.46	0.70***	2.01	0.31**	1.36	0.69
2002	2.35***	10.46	0.73***	2.08	0.20	-	0.67
2003	2.32***	10.17	0.68***	1.98	0.21	-	0.67
2004	2.33***	10.32	0.77***	2.16	0.44***	1.55	0.67
2005	2.45***	11.55	0.71***	2.03	0.37***	1.45	0.68
2006	2.37***	10.66	0.73***	2.07	0.33***	1.39	0.68
2007	2.34***	10.35	0.77***	2.17	0.36***	1.43	0.68
2008	2.32***	10.14	0.77***	2.16	0.30**	1.36	0.69
2009	2.41***	11.12	0.73***	2.07	0.21*	1.24	0.69
2010	2.34***	10.35	0.66***	1.94	0.14	-	0.68

* Significant at 10 % ** Significant at 5 % *** Significant at 1 %

Table 2. OLS estimation year by year for all the Communities together. Elasticities of the continuous explanatory variables

	Elasticity Y_i	Elasticity Y_j	Elasticity D_{ij}	Elasticity L_i	Elasticity L_j
2000	0.94***	1.21***	-1.09***	0.10	-0.24**
2001	0.85***	1.13***	-1.11***	0.17***	-0.18**
2002	0.80***	1.08***	-1.13***	0.23***	-0.10
2003	0.78***	1.01***	-1.15***	0.24***	-0.05
2004	0.76***	1.03***	-1.11***	0.30***	-0.05
2005	0.84***	1.06***	-1.07***	0.23***	-0.06
2006	0.77***	1.04***	-1.08***	0.29***	-0.05
2007	0.75***	1.01***	-1.07***	0.32***	0.00
2008	0.77***	0.96***	-1.06***	0.30***	0.06
2009	0.73***	0.96***	-1.09***	0.33***	0.09
2010	0.74***	0.89***	-1.09***	0.31***	0.17**

* Significant at 10 % ** Significant at 5 % *** Significant at 1 %

Some important conclusions can already be drawn from Table 1. First, that the border effect is fairly stable over time and a figure can be assigned to it, according to the year, of a factor ranging from 10 to 11.5; the same can be said of the EU effect, which can be quantified as a factor close to 2. It should be taken into account that Spain is also obviously considered to be a country in the European Union, so that the border effect already discounts the influence Spain might yield as an EU member. Both dummy variables, SP and EU, are also significant to 1% and the degree of fit (R2 adjusted) is more than acceptable, at nearly 70% of the explanatory power. The COAST effect only appears in eight of the eleven years; it is smaller than the EU effect, and can be quantified around 1.3-1.5.

In relation to Table 2, incomes, distance and the population of the seller (except for 2000) are always significant at 1%; we cannot say the same about the purchaser's population, which is significant only in 2000, 2001 and 2010, at 5% in all three years. The income elasticities of the importer are always somewhat higher than those of the exporter, and the value of both is not far from one, which is normal in the literature: a 1% increase in one of the two incomes leads to a similar percentage growth in the flow; at the same time, the two elasticities present a slight tendency to decrease over time. Distance elasticity is always negative and it is very stable over the years, quantifiable around -1.1: a reduction in distance (transport costs, trade barriers) of 1% increases bilateral flow by nearly 1.1%. The elasticity of the seller's population is somewhat lower than the other elasticities (around 0.25), although its size grows gradually in the decade considered.

Table 3 presents information relating to one of the basic goals of this work, the quantification of the border effect of each Autonomous Community and for each year. Although not shown in Table 3, the variable SP is significant at 1% for all years and regions.

Table 3. Border effect (BE) by Autonomous Community and year. R2 adjusted

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	MEAN
Andalusia	e^{ESP}	14.92	13.21	14.10	12.81	11.78	11.03	11.45	12.91	12.51	17.35	15.33	13.40
	R^2_{ADJ}	0.78	0.81	0.79	0.80	0.79	0.74	0.74	0.77	0.77	0.77	0.78	0.78
Aragon	e^{ESP}	10.70	15.56	11.37	8.11	7.57	8.79	7.21	6.56	7.26	8.73	8.91	9.16
	R^2_{ADJ}	0.74	0.71	0.73	0.76	0.74	0.73	0.78	0.78	0.77	0.79	0.73	0.75
Asturias	e^{ESP}	19.07	26.06	18.13	21.68	21.23	22.43	20.58	17.07	22.16	20.28	14.17	20.26
	R^2_{ADJ}	0.72	0.73	0.72	0.70	0.65	0.69	0.65	0.71	0.65	0.65	0.71	0.69
Balearic Islands	e^{ESP}	43.91	37.93	24.48	23.24	19.77	35.64	42.52	42.45	29.14	24.01	32.11	32.29
	R^2_{ADJ}	0.65	0.59	0.67	0.54	0.61	0.63	0.58	0.53	0.62	0.61	0.67	0.61
Canary Islands	e^{ESP}	49.76	46.35	50.18	70.22	54.46	70.58	62.96	56.73	54.52	49.25	54.95	56.36
	R^2_{ADJ}	0.63	0.69	0.67	0.61	0.53	0.60	0.66	0.70	0.68	0.65	0.63	0.64
Cantabria	e^{ESP}	26.74	29.09	27.31	34.58	27.68	35.99	29.74	23.46	16.96	22.94	17.41	26.54
	R^2_{ADJ}	0.66	0.69	0.65	0.67	0.66	0.68	0.72	0.65	0.70	0.73	0.71	0.68
Castile and Leon	e^{ESP}	6.67	7.54	8.91	9.18	10.64	11.11	11.74	11.23	11.16	15.15	15.28	10.78
	R^2_{ADJ}	0.81	0.81	0.77	0.77	0.83	0.81	0.80	0.79	0.80	0.78	0.77	0.80
Castile–La Mancha	e^{ESP}	18.86	24.97	27.46	21.91	25.89	28.52	22.96	18.38	16.99	16.91	14.91	21.61
	R^2_{ADJ}	0.79	0.79	0.78	0.78	0.77	0.78	0.74	0.73	0.72	0.80	0.81	0.77
Catalonia	e^{ESP}	9.51	9.48	8.47	8.32	7.84	7.49	7.25	7.22	7.30	9.91	9.07	8.35
	R^2_{ADJ}	0.82	0.80	0.79	0.81	0.78	0.78	0.78	0.78	0.78	0.81	0.80	0.79
Valencian C.	e^{ESP}	11.76	11.19	9.95	9.35	9.05	10.43	9.56	8.79	9.24	8.94	8.64	9.72
	R^2_{ADJ}	0.82	0.82	0.81	0.82	0.84	0.83	0.82	0.83	0.82	0.84	0.85	0.83
Extremadura	e^{ESP}	49.50	41.17	41.68	27.76	34.76	30.95	21.05	28.46	21.36	18.97	22.24	30.72
	R^2_{ADJ}	0.65	0.69	0.62	0.67	0.66	0.72	0.71	0.63	0.69	0.57	0.62	0.66
Galicia	e^{ESP}	11.13	9.09	9.72	9.03	8.31	8.60	7.60	8.22	8.50	9.07	8.95	8.93
	R^2_{ADJ}	0.76	0.77	0.76	0.71	0.72	0.73	0.71	0.72	0.74	0.74	0.73	0.74
C. of Madrid	e^{ESP}	5.38	5.12	5.70	6.37	5.82	6.56	7.19	5.76	5.86	6.36	5.76	5.99
	R^2_{ADJ}	0.75	0.78	0.79	0.78	0.76	0.73	0.76	0.77	0.77	0.75	0.76	0.76
R. Murcia	e^{ESP}	21.65	16.45	16.61	13.27	16.53	15.60	16.27	11.68	11.65	13.78	13.53	15.18
	R^2_{ADJ}	0.76	0.76	0.78	0.80	0.80	0.78	0.74	0.68	0.70	0.68	0.55	0.73
Navarre	e^{ESP}	10.50	11.77	11.65	9.50	10.07	12.52	12.20	13.10	17.36	16.20	9.82	12.25
	R^2_{ADJ}	0.67	0.74	0.69	0.79	0.79	0.71	0.77	0.73	0.78	0.74	0.69	0.74
Basque Country	e^{ESP}	11.41	14.05	15.87	13.46	12.61	13.16	11.14	10.96	10.13	13.11	11.00	12.44
	R^2_{ADJ}	0.82	0.80	0.82	0.82	0.81	0.77	0.77	0.78	0.80	0.76	0.80	0.80
La Rioja	e^{ESP}	23.87	29.48	19.00	22.19	22.69	25.96	21.16	26.37	20.17	21.68	18.30	22.81
	R^2_{ADJ}	0.62	0.71	0.71	0.73	0.71	0.71	0.72	0.65	0.63	0.69	0.70	0.69
Average BE		20.32	20.50	18.86	18.88	18.04	20.90	18.98	18.20	16.60	17.21	16.49	
Average R^2_{ADJ}		0.73	0.75	0.74	0.74	0.73	0.73	0.73	0.72	0.73	0.73	0.72	

A number of important results can be extracted from Table 3. First, the goodness of fit is excellent: the adjusted coefficient of determination, according to years and regions, is around 0.75; it ranges between a minimum of 0.53 for the Canary Islands in 2004 and a maximum of 0.85 reached by the Valencian Community in 2010; this figure is reassuring, insofar as it demonstrates that the explanatory capacity of the gravity equation is high, and we can rely on the estimation of the border effect not being skewed by the omission of relevant variables. Second, the border effect differs widely among Autonomous Communities: the lowest in the Table is for the Community of Madrid in 2001 (5.12) and the highest in the Canary Islands in 2005 (70.58). If we look at the mean for the eleven years (last column of Table 3) we see that the greatest home bias appears in the island regions: the Canary Islands, and quite a lot lower, the Balearic Islands; possibly, their unique condition as islands makes them more dependent than other areas on transactions with the rest of the regions of Spain. In contrast, the

Communities with the lowest mean border effect are those with the two largest, most diversified and dynamic cities in the country, Barcelona and Madrid; their more cosmopolitan and heterogeneous nature means that the companies based there depend more on the exterior for their intermediate products, and at the same time, have a higher capacity and propensity for exporting.

There are two points to be made about these conclusions. One, they must be confirmed or refined by what is deduced in section 5.2, in which there is an estimation with panel data for each region, complementary to this one in section 5.1. Two, Table 1 shows that estimating all the Communities at the same time, the border effect, according to the year, is around 10-11; from Table 3 we deduce that the annual mean of the 17 border effects is noticeably higher, around 19. This is perfectly compatible because when finding the average in Table 3 each Autonomous Community enters with a weighting of one 17th, which does not occur in the estimation with all of them together, where the weight of each one is derived from its size and relative importance; remember that the Communities with the lowest border effect in Table 3, the Community of Madrid and Catalonia, are among the largest in the country, representing much more than (1/17) when estimated with all the areas at the same time, which undoubtedly results, as it does here, in a lower border effect in Table 1.

We will now analyse the evolution over time of the border effect: does it tend to increase or decrease? The penultimate row of Table 3 shows that on average, its magnitude in 2010 is lower than in 2000, indicating that the home bias decreases over time. Not surprisingly, the foreign sector has been the main support of our economy in these times of crisis, which appears to be corroborated by the reduction of dependence on domestic transactions which we can deduce from this row of the Table. But it is interesting to approach this question on a region by region basis, as their behaviours will not necessarily be the same. And in fact, they are not. Figures 1 to 6 represent the evolution of the border effect from 2000 to 2010 for the 17 Autonomous Communities, grouped in threes in the first five figures and in a pair in the last.

Figure 1. Evolution of the border effect from 2000 to 2010. Canary Islands, Balearic Islands and Extremadura

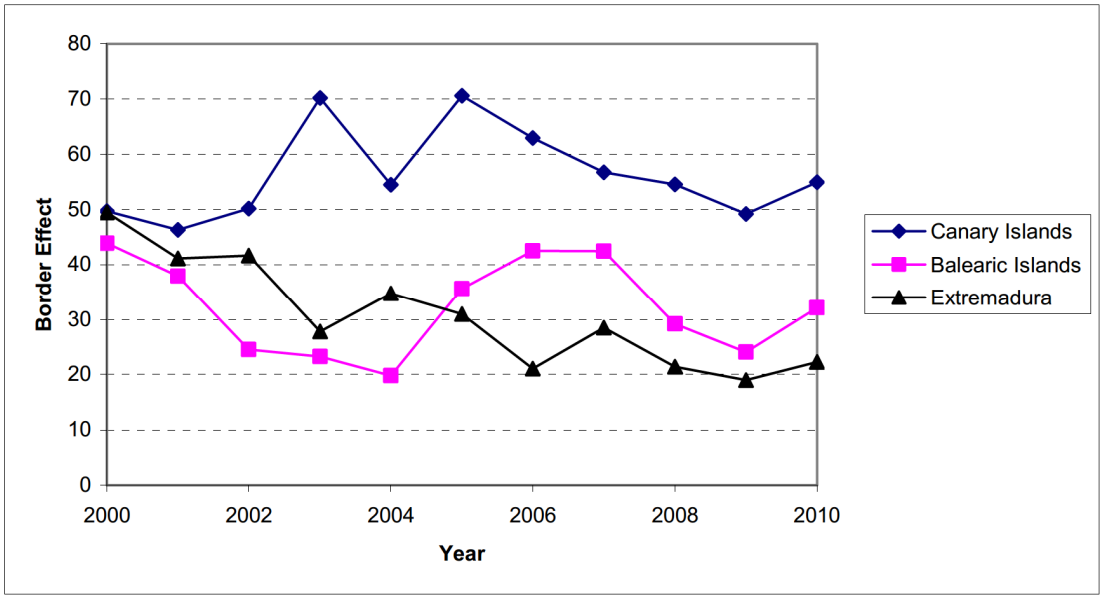


Figure 2. Evolution of the border effect from 2000 to 2010. Cantabria, La Rioja and Castile–La Mancha

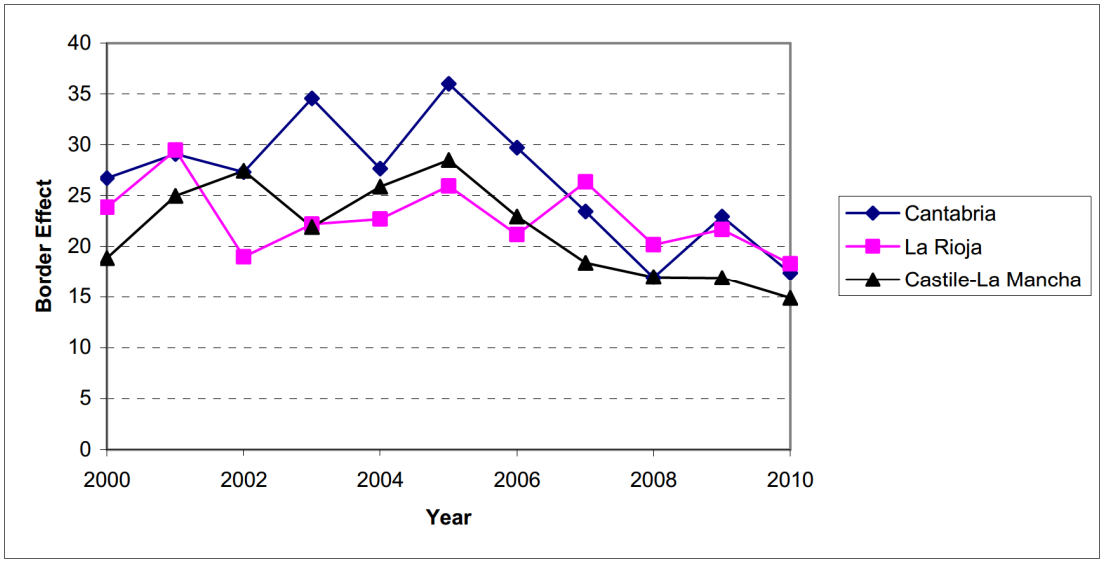


Figure 3. Evolution of the border effect from 2000 to 2010. Asturias, Region of Murcia and Andalusia

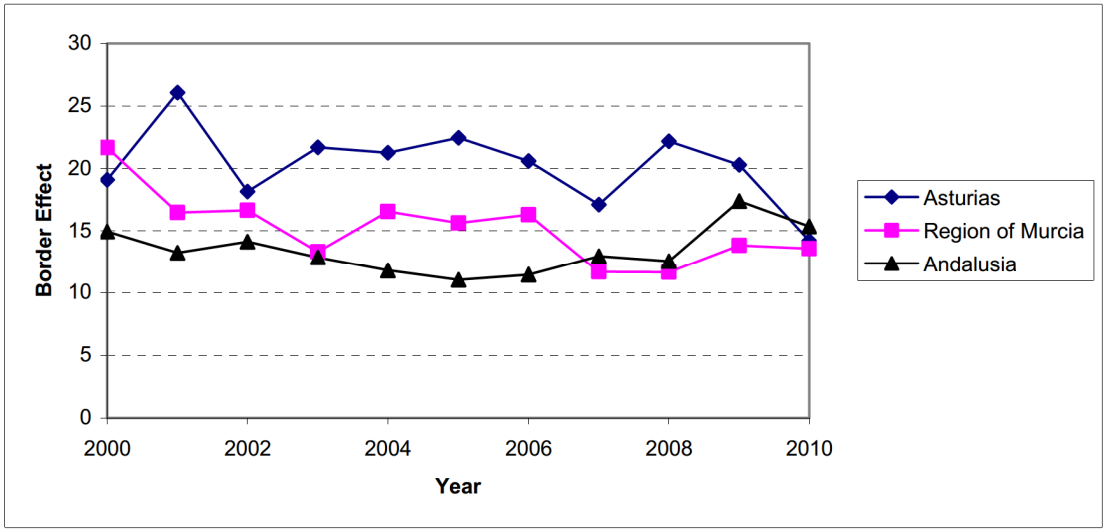


Figure 4. Evolution of the border effect from 2000 to 2010. Basque Country, Navarre and Castile and León

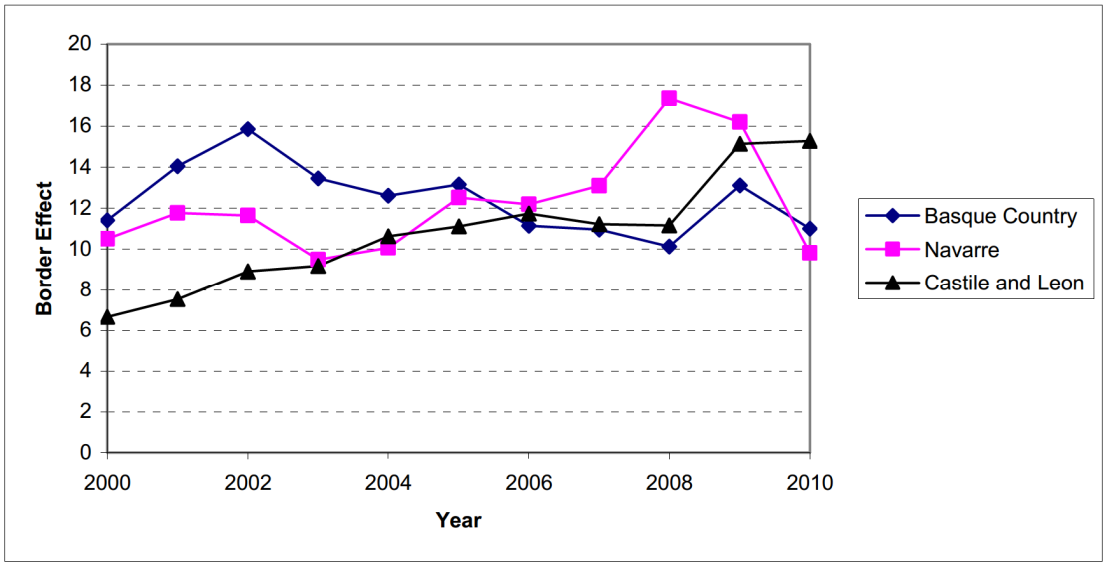


Figure 5. Evolution of the border effect from 2000 to 2010. Valencian Community, Aragon and Galicia

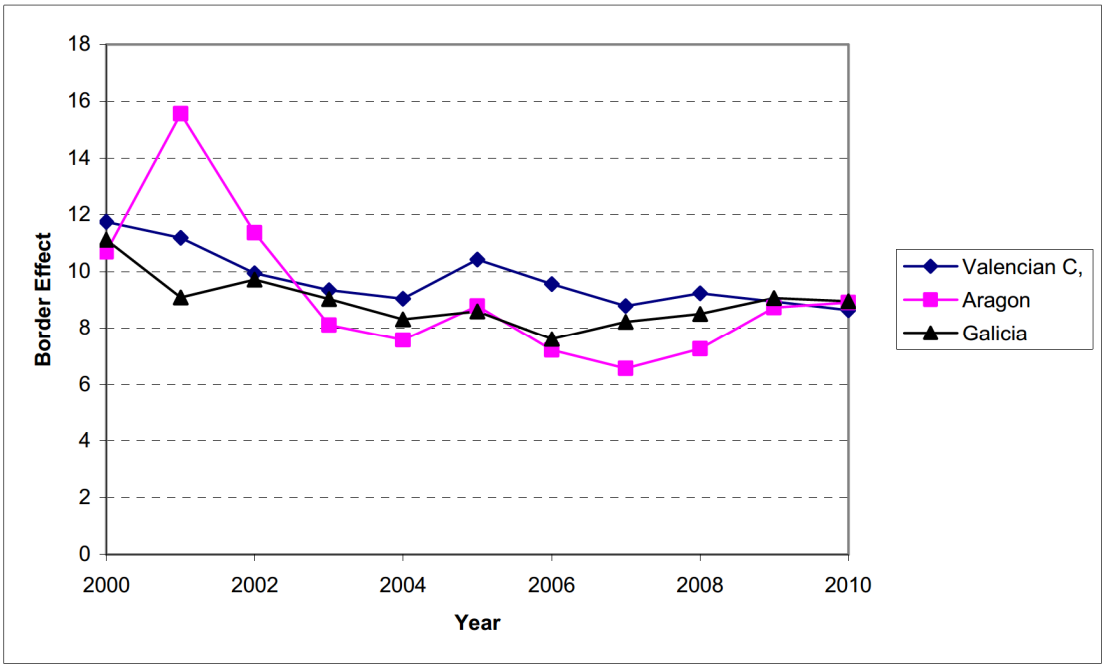
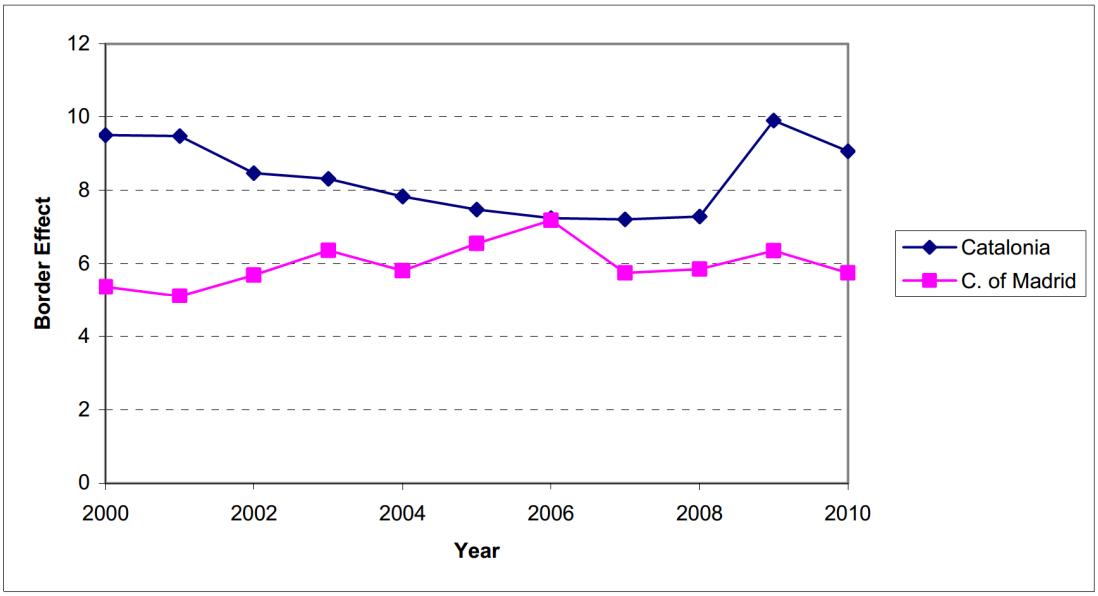


Figure 6. Evolution of the border effect from 2000 to 2010. Catalonia and the Community of Madrid



The predominant behaviour, with peaks and different intensities, is that the border effect tends to decrease over time. This happens in Extremadura, Cantabria, Castile–La Mancha, Asturias, Region of Murcia, Valencian Community and Aragon; it also decreases, albeit less so, in La Rioja, the Basque Country and Galicia. In five regions no trend of any kind is seen, so we cannot point to decrease or increase: the Canary Islands, the Balearic Islands, Andalusia, Catalonia and the Community of Madrid. Finally, Navarre evolves upwards, although it dips considerably in the last two years, and Castile and León go against the rule, with the magnitude of their home bias increasing steadily from 2000 to 2010.

5.2. Joint estimation

This section tries to exploit fully the temporal and spatial links and interrelations of our data pool. We have two alternatives for this: a panel estimation with fixed effects or a panel estimation with random effects. The Hausman test (1978) is used to determine which method is preferable. A key problem of the fixed effects estimator, given the characteristics and goal of this work, is that it is not compatible with the existence of time-invariant variables, such as our essential SP. Therefore, when the random effects procedure is not recommended by the Hausman test, we will use the SURE method (seemingly unrelated regressions). Both scenarios, i.e., the random effects panel and SURE, include temporal annual dummies.

Table 4 shows the joint estimation for the whole sample (11 years x 17 areas x 80 flows in both directions = 14960 observations). The first numerical column shows the results of the random effects panel estimator. The Hausman test accepts the null hypothesis that the random effects estimators are consistent, and therefore valid; however, despite this, and to give robustness, an alternative method is presented, the SURE in the second column.

Table 4. Estimations with the entire data pool. Random effects panel (RE PANEL) and SURE

	RE PANEL	SURE
SP	2.35***	2.37***
Border effect	10.44	10.72
Elasticity Y_i	0.96***	0.80***
Elasticity Y_j	0.98***	1.03***
Elasticity D_{ij}	-1.17***	-1.10***
Elasticity L_i	0.09**	0.25***
Elasticity L_j	0.00	-0.03
EU	0.46***	0.73***
EU effect	1.58	2.07
Coast	0.32***	0.30***
Coast effect	1.38	1.35
R^2 ADJ.	0.68	0.68
Hausman	24.53 (0.06)	

* Significant at 10 % ** Significant at 5 % *** Significant at 1 %

Both methods, random effects and SURE offer similar results, which is certainly reassuring and makes the results more robust and reliable. All the variables are significant and have the expected sign, except the purchaser population, which is not statistically different to zero. The magnitude of the border effect is around 10.5, very similar to that deduced from Table 1 year by year. At the same time, the EU effect and the COAST effect also present figures close to what appears in Table 1: 1.5 to 2 for the EU effect, according to the estimation method (random effects or SURE) and 1.35 to 1.38 for the COAST effect.

Table 5 shows the estimation by random effects and SURE of specific panels for each Autonomous Community, i.e., the sample size in each of the 17 rows is 880 (80 flows by 11 years).

Table 5. Random effects panel and SURE for each Autonomous Community. Border effect

	RANDOM EFFECTS PANEL ESTIMATION				SURE ESTIMATION		
	COEF SP	BORDER EFFECT	HAUSMAN TEST	R^2 ADJ.	COEF SP	BORDER EFFECT	R^2 ADJ.
Andalusia	2.61***	13.62	0.83 (0.99)	0.79	2.60***	13.45	0.79
Aragon	2.10***	8.14	9.20 (0.87)	0.75	2.18***	8.85	0.76
Asturias	2.98***	19.73	2.33 (0.99)	0.71	3.01***	20.21	0.71
Balearic Islands	3.39***	29.81	4.19 (0.99)	0.61	3.45***	31.48	0.62
Canary Islands	4.07***	58.36	28.56 (0.02)	0.60	4.03***	56.12	0.65
Cantabria	3.18***	24.02	4.01 (0.99)	0.70	3.25***	25.73	0.70
Castile and Leon	2.21***	9.15	4.69 (0.99)	0.80	2.32***	10.13	0.80
Castile–La Mancha	2.98***	19.77	9.95 (0.82)	0.78	3.05***	21.19	0.78
Catalonia	2.09***	8.11	7.29 (0.95)	0.80	2.12***	8.34	0.81
Valencian C.	2.23***	9.28	26.66 (0.03)	0.82	2.27***	9.65	0.84
Extremadura	3.31***	27.43	4.78 (0.99)	0.67	3.38***	29.31	0.67
Galicia	2.27***	9.71	9.23 (0.87)	0.73	2.21***	9.09	0.75
C. of Madrid	1.64**	5.17	5.99 (0.98)	0.77	1.77***	5.88	0.78
Region of Murcia	2.52***	12.46	8.00 (0.92)	0.71	2.67***	14.43	0.72
Navarre	2.40***	11.00	6.40 (0.97)	0.73	2.48***	12.00	0.74
Basque Country	2.48***	11.97	5.25 (0.99)	0.79	2.52***	12.42	0.81
La Rioja	3.11***	22.41	1.22 (0.99)	0.70	3.15***	23.32	0.71

* Significant at 10 % ** Significant at 5 % *** Significant at 1 %

The Hausman test indicates that the estimators of the positional parameters are consistent under the random effects panel specification (as opposed to that of fixed effects). We only reject this specification at 5% for the Canary Islands and the Valencian Community; because of this, we opted to also estimate the model using seemingly unrelated regressions, including a different constant for each period and imposing an equality restriction on the rest of the exogenous variables of the model for all years.

As for quantifying the border effect, both methods offer very similar figures. They are also very similar to those of the last column of Table 3, which showed the average border effect of the eleven years for each area, simply estimated by heteroscedasticity-robust ordinary least squares. It is very important to stress that the order of the Autonomous Communities deduced from the last column of Table 3 and derived from the second numerical column of Table 5 is practically the same. Effectively, the regions with the greatest border effect are still the islands (Canaries with 58.36 and Balearics with 29.81); at the other extreme, the lowest border effect is still found in the Community of Madrid (5.17), followed by Catalonia (8.11) and Aragon (8.14). Consequently, we can be reasonably sure that the magnitudes of the border effect for each region are being estimated correctly, as different methods lead to very similar estimations of the effect. Moreover, so if we compare the order of the regions according to the border effect found in Table 5 and that found in Table 3 of the Gil-Pareja et al. (2005) article, we conclude that the Spearman's rank correlation coefficient is 0.78, statistically different from zero and close to one. In short, the two orders referred to are similar, indicating the robustness of the results shown here.

Table 6. Elasticities of the continuous explanatory variables Random effects panel, except the Canary Islands and Valencian Community with SURE

	Elasticity Y_i	Elasticity Y_j	Elasticity D_{ij}	Elasticity L_i	Elasticity L_j
Andalusia	0.66***	0.90***	-0.84***	0.24**	-0.06
Aragon	0.65***	0.55***	-1.42***	0.22*	0.28**
Asturias	1.11***	0.76***	-0.99***	-0.02	0.15
Balearic Islands	0.79***	1.24***	-0.81***	0.24	-0.38**
Canary Islands	1.08***	1.22***	-1.28***	0.34	-0.73**
Cantabria	0.92***	0.58***	-0.69***	-0.01	0.28*
Castile and Leon	0.47***	0.52***	-1.47***	0.32***	0.34**
Castile–La Mancha	0.72***	1.00***	-1.11***	0.32**	-0.05
Catalonia	0.72***	0.72***	-0.80***	0.11	0.01
Valencian C.	0.38**	0.64***	-0.35***	0.48***	0.13
Extremadura	0.37*	1.11***	-1.40***	0.60***	-0.05
Galicia	0.68***	0.70***	-0.95***	0.10	-0.06
C. of Madrid	0.87***	0.76***	-0.99***	0.19*	-0.01
Region of Murcia	0.64***	0.88***	-1.10***	0.35**	0.10
Navarre	0.87***	0.77***	-1.24***	-0.04	0.16
Basque Country	0.67***	0.61***	-0.98***	0.06	0.13
La Rioja	0.49***	0.92***	-1.21***	0.23	-0.02

* Significant at 10 % ** Significant at 5 % *** Significant at 1 %

Once again, the magnitude and sign of the elasticities shown in Table 6 agree with the previous literature. Incomes are practically always significant at 1% and do not tend to be far from one. Distance elasticity, according to areas, is around -1. Finally, as we already know from previous results, populations are significant in notably fewer cases.

Table 7. EU and COAST effects. Random effects panel, except the Canary Islands and Valencian Community with SURE

	EU	EU EFFECT	COAST	COAST EFFECT
Andalusia	0.54***	1.71	0.90***	2.47
Aragon	0.36***	1.44	0.01	-
Asturias	0.41***	1.50	0.63	-
Balearic Islands	0.73***	2.08	0.46	-
Canary Islands	0.57	-	1.18*	3.25
Cantabria	0.93***	2.54	0.70**	2.01
Castile and Leon	0.54***	1.71	0.36	-
Castile–La Mancha	1.12***	3.07	-0.30	-
Catalonia	0.34***	1.40	-0.01	-
Valencian C.	0.66***	1.94	0.58*	1.79
Extremadura	0.89***	2.44	0.75*	2.12
Galicia	0.72***	2.06	1.27***	3.55
C. of Madrid	0.27***	1.32	-0.24	-
Region of Murcia	0.23*	1.26	0.40	-
Navarre	0.18	-	-0.38	-
Basque Country	0.03	-	0.52**	1.69
La Rioja	0.81***	2.25	0.49	-

* Significant at 10 % ** Significant at 5 % *** Significant at 1 %

The dummy variable EU is significant, and therefore gives an EU effect in fourteen of the seventeen Spanish regions. The factor by which trade with EU countries is multiplied compared to trade with non-EU countries ranges from 1.26 in the Region of Murcia (as EU is significant only at 10%) to 3.07 in Castile-La Mancha. As for the COAST effect, this is much less frequent and appears only in Andalusia, Canary Islands, Cantabria, Valencian Community, Galicia, Basque Country and Extremadura, this last being the only Community of this group without access to the sea. Its magnitude ranges from a factor of 1.69 for the Basque Country to a maximum of 3.55 for Galicia.

Once the joint estimation has been analysed in detail, either with a random effects panel or a SURE, for all the regions together and each one individually, it makes sense for us to wonder if the magnitude of the border effect is the same or not, depending on whether we are talking about the exports or the imports of each Autonomous Community. Table 8 offers some preliminary answers to this question. There are 7480 observations (11 years x 17 Communities x 40 flows). The Hausman test indicates that the positional parameter estimators are not consistent under the specification of the random effects panel for exports, so we also offer the SURE method estimation in the two columns to the right.

Table 8. Random effects panel and SURE estimators. Exports and imports separately

	RE PANEL		SURE	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS
SP	2.30***	2.83***	2.34***	2.87***
Border effect	9.97	16.95	10.33	17.61
EU	0.36***	0.57***	0.49***	0.95***
EU effect	1.43	1.77	1.63	2.58
COAST	0.68***	0.27**	0.66***	0.24*
COAST EFFECT	1.97	1.31	1.93	1.27
Elasticity Y_i	2.26***	0.75***	2.58***	0.67***
Elasticity Y_j	0.74***	2.89***	0.75***	2.95***
Elasticity D_{ij}	-1.33***	-0.97***	-1.28***	-0.86***
Elasticity L_i	-1.09***	0.20***	-1.40***	0.29***
Elasticity L_j	0.07*	-1.41***	0.07***	-1.47***
HAUSMAN TEST	28.50 (0.02)	19.28 (0.20)		
R^2 ADJ	0.70	0.74	0.70	0.74

* Significant at 10 % ** Significant at 5 % *** Significant at 1 %

We draw a series of interesting conclusions from Table 8. First, and this result is highly relevant, home bias is more intense in imports. In other words, dependence on national flows for all our regions is stronger in their respective purchases. The EU effect is also more intense in imports, while for the COAST effect the opposite happens. Regarding elasticities, the fact that only sales or only purchases are estimated introduces some special characteristics in how variables are incorporated in the gravity equation that leads to more extreme estimators, even changing sign in the case of populations when we talk about exports or imports.

We can repeat the exercise, i.e., differentiate between sales and purchases, but for each Autonomous Community in particular. This information is presented in Table 9. Each estimation has 440 observations (11 years x 40 flows). Only the border effect is shown for each region, and the corrected coefficient of determination. From the Hausman test, which is not given in this Table, we deduce that the random effects estimation is the right one.

Table 9. Exports and imports separately for each region. Random effects only

	EXPORTS		IMPORTS	
	BORDER EFFECT	R^2 ADJ.	BORDER EFFECT	R^2 ADJ.
Andalusia	9.52	0.84	19.66	0.77
Aragon	10.22	0.75	6.28	0.80
Asturias	13.13	0.79	30.07	0.66
Balearic Islands	17.71	0.61	49.52	0.61
Canary Islands	62.87	0.67	52.33	0.74
Cantabria	17.89	0.75	32.70	0.70
Castile and Leon	9.14	0.78	9.35	0.84
Castile–La Mancha	24.19	0.84	16.34	0.78
Catalonia	11.36	0.81	5.85	0.81
Valencian C.	5.93	0.84	14.56	0.85
Extremadura	16.77	0.71	45.83	0.65
Galicia	6.90	0.81	13.64	0.70
C. of Madrid	12.80	0.78	2.11	0.85
Region of Murcia	9.68	0.87	15.94	0.68
Navarre	8.58	0.80	14.02	0.70
Basque Country	11.41	0.82	12.45	0.79
La Rioja	13.87	0.80	35.89	0.65

It can be confirmed that the joint border effect (Table 5) is always in the middle of the border effect which distinguishes between purchases and sales (Table 9), which is perfectly reasonable. Meanwhile, the border effect in imports is larger than in exports in a majority of Autonomous Communities, in as many as twelve, as would be expected in the light of what we deduced from Table 8. The only regions where the home bias is higher in exports are Aragon, the Canary Islands, Castile-La Mancha, Catalonia, and the Community of Madrid. Finally, there are Autonomous Communities where the differences between border effects for purchases or sales are not appreciable; this is the case for Castile and Leon and the Basque Country. In contrast, for others the divergences are spectacular; in this group we can include the Balearic Islands, the Valencian Community, Extremadura, La Rioja, and above all, the Community of Madrid, which has a home bias for imports of 2.11 and for exports of 12.80, six times greater.

6. Conclusions

The border effect appears in the literature after the seminal work of McCallum (1995). Briefly, it concludes that after controlling for other variables which affect exchanges, the flows between Canadian provinces are twenty times higher than flows between a Canadian province and an American state. At first glance, few people would think the border between these two nations could represent such an obstacle to international transactions.

This is the context of the document presented here. Thus, it revisits the border effect, quantifying its magnitude for the 17 Autonomous Communities of Spain from 2000 to 2010. In brief, it attempts to answer this question: Are the flows between Spanish regions and the rest of Spain different to the flows between these regions and 40 other countries? And if so, what is the multiplying factor? To do this, it takes the specified gravity equation model of trade, in a standard form, in its double-logarithmic version and with incomes, populations and distances as continuous explanatory variables, to which it adds three dummy variables: the first one enables us to quantify the border effect precisely; the second discriminates between

flows of Spanish regions with European Union countries and with non-EU countries, and the third differentiates whether the flow is with a country with a coast or with one with no access to the sea.

There are three main novelties in the exercise. First, a recently constructed database is used, which estimates inter-regional flows specifically and directly, something which is very hard to obtain and often simply approximated due to the lack of alternatives; as far as we know this is the first time that this database has been used to estimate the border effect in Spanish regions. Second, a relatively long recent period is considered, from 2000 to 2010, inclusive, enabling us to analyse the evolution over time of the magnitude of the border effect for each region. Finally, the fit of the estimations is very satisfactory, and the results for the quantification of the border effect are robust for different estimation methods (year by year heteroscedasticity-corrected ordinary least squares regressions, random effects panel and seemingly unrelated regressions) and corroborate to a considerable degree those obtained for Spanish regions in previous works.

The main conclusions are:

- 1. The border effect exists: the dummy variable quantifying it is always positive and statistically different to zero at the 1% significance level in all the regressions carried out in this work.
- 2. The border effect tends to decrease over time from 2000 to 2010, both considering its average value for all the regions in this period, and when analysing each Autonomous Community separately (it grows clearly only for Castile and Leon in this decade). This is a very important result, given that it indicates that home bias, the dependence of Spanish regions on the rest of the state, gradually decreases. In other words, the difference between interior and international flows is gradually decreasing. In this context, the Spanish foreign sector has been one of the most dynamic elements, or perhaps the most dynamic, since the start of the crisis.
- 3. Estimating all the regions together, the border effect is at a factor of around 10.5; the European Unión effect around a factor of 1.5 to 2, and the Coast effect can be quantified by a factor of 1.36 (i.e., an increase in flows with coastal countries compared to inland countries of 36%).
- 4. Estimating a panel independently for each Autonomous Community, the greatest border effect is produced in the island regions: the Canary Islands (factor de 58.36), and quite a lot lower, the Balearic Islands (factor de 29.81); possibly, their unique condition as islands makes them more dependent than other areas on transactions with the rest of the regions of Spain. In contrast, the Communities with the lowest border effect are those with the two largest, most diversified and dynamic cities in the country, Barcelona (factor de 8.11) and Madrid (factor de 5.17); their more cosmopolitan and heterogeneous nature means that the companies based there depend more on the exterior for their intermediate products, and at the same time, have a higher capacity and propensity for exporting.
- 5. If we distinguish between Autonomous Communities' imports and exports, the border effect is significantly higher for imports (factor of nearly 17) than for exports (factor of nearly 10). In other words, dependence on national flows for all our regions is stronger in their respective purchases. Drilling down to the level of each region estimated independently, this result is maintained in twelve of them.

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Announcements, Conferences, News

Japanese Studies Association of Australia Conference 2015

Conference Overview[1]

The 19th Biennial Conference of the JSAA was organised at La Trobe University's Melbourne (Bundoora) Campus from 30 June to 3 July 2015, hosted by the Faculty of Humanities and Social Sciences with the support of La Trobe Asia.

The JSAA 2015 Conference venue was the Melbourne campus of La Trobe University, corner of Plenty Road and Kingsbury Drive, Bundoora, 3086.

Keynote speakers include Emeritus Professor Yoshio Sugimoto, Professor Bu Ping, Professor Eiji Oguma, Professor Polly Szatrowski and Professor Thang Leng Leng.

The Organizing Committee of the Conference was Professor Kaori Okano (Convenor), Dr Lidia Tanaka, Dr Elise Foxworth, from Asian Studies, School of Humanities and Social Sciences, La Trobe University. Also, Emeritus Professor Yoshio Sugimoto, School of Social Science and Communications, Faculty of Humanities and Social Sciences, La Trobe University, Dr Emiko Kashima, Associate Professor , School of Psychological Sciences, La Trobe University and Ms Tracy Lee, Conference organizer, Asian Studies, School of Humanities, Faculty of Humanities and Social Sciences, La Trobe University.

The theme of conference was: Japanese Studies and Japan in the Asia-Pacific: Rethinking 'Eurocentrism'?

In this conference explored what extent 'Eurocentrism' (as broadly conceived of in the social sciences and humanities) might exist in the research on, and perception of, Japan in the Asia-Pacific region.

The broad-ranging discussion of these and other issues in a Japanese context reached beyond the academic community and involve government, the corporate sector, NGOs and the wider community.

It is obvious that this conference raised a lot of problems, which found their answer during the presentation, or at least a serious attempt was made to answer them and that was the big success of JSAA Conference.

[1] Conference overview by Doc. Dr. Antoneta Polo, RSI – Journal Editor

54th Meeting of the Southern Regional Science Association

Conference Overview[1]

The 54th Meeting of the Southern Regional Science Association was organized by SRSA and sponsored by the Review of Regional Studies (the official journal of the Southern Regional Science Association), IMPLAN, C2ER and RUTGERS. The Southern Regional Science Association (SRSA) is an association for the advancement of regional analysis and related spatial and areal studies. It operates as an objective, scientific organization without political, social, financial, or nationalistic bias. Its main objectives are to foster the exchange of ideas and to promote studies focusing on regional topics and issues and utilizing tools, methods, and theoretical frameworks specifically designed for regional analysis as well as concepts, procedures, and analytical techniques of the various social and other sciences. The Association supports these objectives by promoting acquaintance and discussions among its members and with scholars in related fields, by stimulating research, by encouraging the publication of scholarly studies, and by performing services to aid the advancement of its members and the field of regional science. The 54th Meeting of the Southern Regional Science Association venue was the Battle House Renaissance Hotel Mobile, Alabama, from 26 to 28 March 2015.

The President of the conference was Steven Deller, University of Wisconsin, Madison. The President-elect and Program Chair was Santiago M. Pinto, Federal Reserve Bank of Richmond and the Immediate Past President Michael L. Lahr, Rutgers, The State University of New Jersey. Co-executive Directors were John Sporing, Jr., Secretary, Administrative Office of the United States Courtsand and Amanda Ross, Treasurer, West Virginia University. Nominations Chair was Dan Rickma, Oklahoma State University and Honors Chair and Graduate Student Papers was Douglas P. Woodward, University of South Carolina, and Columbia. Council Members were Tony Grubesic, Oregon State University; Carlianne Patrick, Georgia State University; Susane Leguizamon, Tulane University; William Bowen, Cleveland State University; Leslie Dunn, Washington and Jefferson College and Shaoming Cheng, Florida International University.

The Conference was separated into following special sessions: Local Foods And Community Economics; States Forecasts; Spatial Analysis Of Location Decisions; Economic Valuation Of Goods And Amenities; Education And Economic Development; Internal Migration, Mobility And Population Growth; Economic Development Policies; Issues In Political Economy; Issues In Education; State And Local Government; Interregional Models; Regional Economic Analysis I; Regional Economic Impact Of Shale Gas; Immigration; Applied Topics In Economic Development; Transportation Infrastructure; Economics Of Agglomeration; Spatial Analysis Of Flood Disasters And Water Environment; Innovation And Poverty; Regional Economics And Labor Markets; Regional Economic Analysis II; Publishing In Regional Economics; Health And Well-Being; Energy Economics; Social Sustainability And Economic Well-Being; Issues On Entrepreneurship And Voter Turnout and Growth And Economic Development

Many scientists and researchers from all around the world participated in the 54th Meeting of the Southern Regional Science Association who discussed about the issues facing the global economy and the new situations.

It is obvious that this Meeting raised a lot of problems, which found their answer during the presentations.

[1] Conference overview by Prof. Asoc. Dr. Enkela CACA, RSI – Journal Editor

Academic Profiles

Professor Dr Luis Lanaspa

Luis Lanaspa is a Professor of Economic Analysis at the University of Zaragoza (Economic Geography, Regional and Urban Economics). His international academic impact is 233 citations, 9 h-index, 9 i10-index.

He has published more than 20 articles concerning urban studies, core-periphery models, comparative economic analysis, regional- industrial development, including:

- R González-Val, L Lanaspa,Patterns in US Urban Growth, 1790–2000, Regional Studies, 1-21, 2014

- R González-Val, L Lanaspa, F Sanz-Gracia, New evidence on Gibrat's law for cities,
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- L Lanaspa, F Sanz, Regional policy and industrial location decisions, Investigaciones Económicas 28 (1), 67-87, 2004

Academic profile made by:
Maria Goula, critical survey editor of RSI, Teacher-Member of the Pedagogic Team of the Environmental Education Center of Makrinitsa

Professor Dr Yoshiro Higano

Yoshiro Higano is a Professor at the Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan and has a Ph.D. in Environmental Science. His research has a strong focus on Comprehensive Evaluation of Resources for Decision Science and Engineering. His research focuses on Simulation model for control of environmental quality; Evaluation of environmental remediation technologies; Integrated river (lake) basin management; Synthesized environmental policy. In general, his research interests include economic theory and policy, social systems engineering/ safety systems and area studies.

Yoshiro Higano is Councillor of the PRSCO (since 1998), Councillor of the Regional Science Association International (RSAI) (since 2003), President of The Japan Association of Human Symbiosis (since 2009) and President of the Regional Science Association International (since 2011). His also is Editorial Member of Papers in Regional Science (Wiley-Blackwell) (since 1998), Asia-Pacific-Editor of Australasian Journal of Regional Studies (ANZ Section RSAI) (since 1998), Associate Editor of Networks and Spatial Economics (Springer) (since 2001), Editor of Letters in Spatial and Resource Science (Springer) (since 2008), and Managing Editor of Studies in Regional Science (Japan Section RSAI) (since 1998). He was Executive Director of the Pacific Regional Science Conference Organization (PRSCO) of the RSAI (1998-2010) and Vice President of RSAI (2009-2010).

Since 1983, he is a member at more than 10 scientific bodies, such as The Japan Section of The Regional Science Association International, Japan Association for Human and Environmental Symbiosis, Assosiation for Regional Management in Japan etc. From 1984 until today, he has received 9 honors and awards concerning scientific performance in regional and environmental issues.

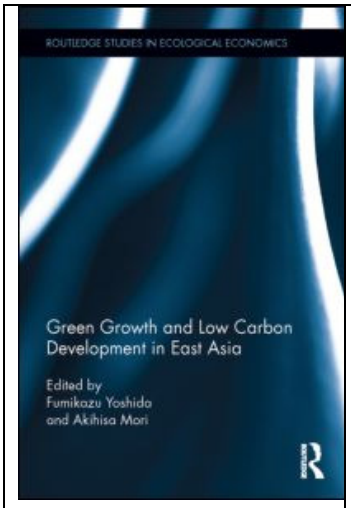
He has published more than 25 articles concerning environmental policy analysis, economics, energy, water management, bio-fuels, technology systems and industry impacts, evaluation of sustainability and regional development as well as 25 books and contributions, including:

- Transport and Land Use, 1997-01
- The Region in the New Economy (et al.), 2002-01

Academic profile made by:

Maria Goula, critical survey editor of RSI, Teacher-Member of the Pedagogic Team of the Environmental Education Center of Makrinitsa

Book Reviews



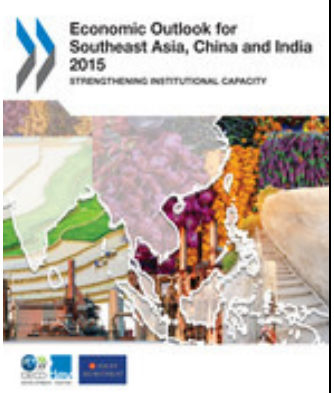
Green Growth and Low Carbon Development in East Asia

Fumikazu Yoshida, Akihisa Mori
ISBN: 978-1-13-883264-0

This is very interesting book which deals to explain the concept of green growth, coupled with one of green economy and low carbon development, that is a global concern especially in the face of the multiple crises that the world has faced in recent years - climate, oil, food, and financial crises, on the one hand and, on the other, how to assess in East Asia, this concept: is regarded as the key in transforming cheap-labour dependent, export-oriented industries towards a more sustainable development.The book is structured into three parts. The first one has the title "Energy Transition". The second part has the title "Trade and Industrial Structural Change" and the third part, is under the title "Perspectives". The book examines the beginnings of low carbon, green growth in practice in East Asia and how effectively it has directed East Asian nations, especially Korea, China and Japan, to put environment and climate challenges as the core target zone for investment and growth. Special focus is paid to energy and international trade - areas in which these nations compete with pioneered nations of Europe and the United States to develop renewable energy industries and enhance their international competitiveness.

In addition, the book extracts research material from original sources, not published before, to make those available to scholars and the general interested public. Finally, the book, discusses the applicability and limitations of this developmental approach taken by the developing nations and resource-rich emerging economies, including the conditions and contexts in which nations are able to transition into sustainable development through the use of low carbon, green growth strategies.

Book Review by Doc.Dr. Antoneta POLO,
RSI Journal editor



Economic Outlook for Southeast Asia, China and India 2015 Strengthening Institutional Capacity

OECD
ISBN: 9789264174412

The Economic Outlook for Southeast Asia, China and India is an annual publication on Asia's regional economic growth, development and regional integration process. It focuses on the economic conditions of the Association of Southeast Asian Nations (ASEAN) member countries – Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam –, and also addresses relevant economic issues in China and India to fully reflect economic developments in the region. The Outlook provides an annual update of regional economic trends and policy challenges, and a thematic focus, which is specific to each volume.

The 2015 edition of the Economic Outlook for Southeast Asia, China and India comprises two main parts, each highlighting a particular dimension of recent economic developments in the region. The first part presents the regional economic monitor, depicting the medium-term economic outlook and macroeconomic challenges in the region. The second part consists of three chapters on "institutional capacity", which is the special thematic focus of this edition.

Book Review by by Prof.Asoc.Dr. Enkela CACA, RSI Journal editor

THE REGIONAL SCIENCE INQUIRY JOURNAL (RSI J)
Instructions to authors

Review process

Each suitable article is blind-reviewed by two members of the editorial review board. A recommendation is then made by the Editor-in-Chief. The final decision is made by the Editor-in-Chief. If a revision is recommended, the revised article is sent for a final approval to one of the Editors.

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Style and Format of the Article

In order for a article to be submitted to the Regional Science Inquiry Journal (RSIJ) for publication, the following should be taken into consideration:

1. All submitted articles should report original work, previously unpublished and not under consideration for publication elsewhere and they are subject to both review and editing.
2. Articles should be in good technical English with a length normally between 6,500-8,000 words, while all other texts should not exceed 2,500 words, apart from the references, tables and illustrations.
3. The first page of the manuscripts should contain the article title, the name and the affiliation of the authors with sufficient contact details (the corres- ponding author should be properly identified here).
4. Articles should have a set of Keywords (up to 7) and an Abstract (under 250 words, without references), followed by the Introduction, Methodology and Data, Results, Discussion, Conclusions and References.
5. Manuscripts should be submitted in one single electronic file, an MS Word file, to the registered electronic address of the editors. It is also possible, for review purposes only, to submit the manuscript as a PDF file (or other similar format). The books for review are sent in two copies to the seat of the Journal.
6. Manuscripts should be typewritten with margins 2.5 cm x 2.5cm on A4 size article. Margins should be consistent on all pages.
7. All pages should be numbered consecutively.
8. Titles and subtitles should be short.
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13. Authors are encouraged to include a concise literature survey. References to published literature within the text should be cited by the name of the author followed by the consecutive number in square bracket, and should be presented in a numerical list at the end of the text.
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Author(s) (Name and Initials), “Title of Article”, in Title of Book or Title of Journal or Title and Place of Conference, Editor(s) (Name and Initials), Volume (Vol.) Nr/Issue Nr, Place of Publication, Publisher, Year, Pages (pp.).