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INSULARITY AND ECONOMIC DEVELOPMENT: A SURVEY

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Insularity and economic development: a survey

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Abstract

This survey reviews theoretical and empirical evidence on the impact of insularity on regional economic development. Far from being a mere geographical condition, insularity can be regarded as a permanent phenomenon of economic and social peripheralization that prevents islands to reach the goals of sustainable development that are reached by the mainland. Even if the issue of the consequences of insularity on economic development is garnering greater interest in light of the growing recognition of the significant economic disadvantage faced by islands, both the theoretical and empirical literature in this regard are fragmented. More importantly, the effects of insularity on economic development are not disentangled from similar conditions such as remoteness, smallness and peripherality. The survey focus as well on the two-sided nature of insularity, since if it is true that islands suffer from permanent handicaps, adequate policy interventions may not only mitigate insularity effect, but also transform insularity into an asset leading a great potential for growth. Finally, some policy suggestions are drawn, highlighting the need for custom-tailored policy measures.

Keywords: Insularity, islands, regional development.
Jel classification: R12, O50, F63.

1. Introduction

The effect of insularity on economic development remains a relatively unexplored area in both theoretical and empirical research. On one hand islands, especially small ones, are characterized by a disadvantage both respect to the mainland as well as the peripheral regions. Being a geographical permanent condition, the economic consequences of insularity cannot be completely eliminated, but only mitigated through adequate policy interventions. In line with the definition of Eurisles (2002) insularity can be regarded as a "permanent phenomenon of physical discontinuity".

On the other hand insularity- like other "geographic specificities"- can be regarded as an asset, rather than a disadvantage. The traditional view of insularity as a mere disadvantage may stem indeed from unexploited opportunities deriving from a "lack of local coherence between natural resources, human capital and the institutional context" (Gloersen et al., 2012).

Indeed, insularity is more than a mere geographical status, being the combination between a geographical condition and the reactions of political[1], social, economic and cultural peripheralization affecting islands' attractiveness, thus influencing their economic and social development (Hache, 1987). Geographical permanent features such as low accessibility and small size strongly affect the economic and social development of islands (Eurisles, 1998; Planistat, 2002; CEC, 1994), thus raising the need to weight the main socio-economic indicators for the degree of insularity. The small size of market and lower competition affect the potentiality in production, as well as working and living conditions.

The topography of islands has critical economic growth effects as well as geographical characteristics, (Briguglio, 1995; Dolman, 1985). On one hand, islands peculiarity in terms of environmental characteristics often makes them attractive as touristic destinations. On the other hand, they are particularly exposed to a set of external economic fluctuations that are usually beyond their control: strong seasonality and the vulnerability to climatic disasters represent indeed a threat for the tourism industry. Smallness, remoteness and vulnerability, together with inadequate policies at both national and EU level, affect indeed islands' attractiveness, causing islands to stay far beyond the level of development of the mainland. From this perspective, the existence of special traits inherent to islands (Read, 2004), raises the need for a separate analysis of islands and their challenges with respect to similar territories such as peripheral and remote areas.

So far, the debate regarding the nature of the economic challenges facing island economies is relatively recent. During the first twenty years of the European Community existence, the problems related to insularity had not been taken into appropriate account, neither from a legal nor from the political point of view. It was in 1992 that the Amsterdam Treaty (art. 158[2]) first addressed the issue of insularity, emphasizing the necessity to develop appropriate policies that would offset islands' lower accessibility. The Treaty of Maastricht

[1] Even if islands may have some degree of self-administration, they do not benefit from high political autonomy (Gloersen et al., 2012).

[2] "In order to promote its overall harmonious development, the Community shall develop and pursue its actions leading to the strengthening of its economic and social cohesion. In particular, the Community shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions or islands, including rural areas".

(art. 154) as well focuses on the necessity to link islands, landlocked and peripheral regions with the central regions of the European Community, in order to guarantee a homogeneous development within the EU. Moreover, particular types of island economies (the "Outermost Regions") have been granted with a special status.

After the introduction in the EU of two small island states, Cyprus and Malta, the economic challenges facing island economies and the determinants of islands' relatively poor economic performance become a key issue within the EU legislation. As far as most of the key development indicators are concerned, European island are indeed far from the achievement of EU-27[3] goals; furthermore, Lisbon's strategy goals have not been met in islands (percentage of employment, R&D expenditure, education attainment, ITC penetration, resource efficiency etc). As ESPON (2010) point out, islands' unattractiveness for establishing competitive economic activities and for active population will led to a progressive reduction of its socioeconomic base and its overall viability, increasing the discrepancy from EU and national goals for sustainable development.

While the early debate focus on insularity as a mere disadvantage, more recently geographical peculiarities such as insularity are started to be considered as a source for territorial development challenges. On this regard, the European Commission Green paper on Territorial Cohesion (EUROMONTANA, 2009) propose a definition of territorial cohesion as "a means of transforming diversity into an asset that contributes to sustainable development of the entire EU". From this perspective, insularity can be considered as an asset and a source of potential development if adequate policies are implemented.

The double nature of islands – threat and opportunity - make them an interesting case study as well as a target for policy interventions. The peculiarity of the economic challenges faced by islands, together with a considerable variability in terms of islands' economic performance, fosters a debate among economist and policy makers regarding the nature of the difficulties faced by islands and their consequences in terms of economic performance.

On one hand, theoretical models do not tackle explicitly with the issue of insularity. However, they represent a good starting point for the analysis of insularity, providing an analysis of the mechanisms through which distinctive features of insularity such as smallness, remoteness and peripherality impact on trade, firms localization and firm economic performance, thus affecting regional economic development. Theorethical models developed from the New Economic Geography[4] and the New Trade Theories[5] provide interesting hints regarding the impact of remoteness and smallness on economic development of disadvantaged territories; however, they do not consider explicitly the issue of an additional disadvantage due to insularity.

On the other hand, empirical literature regarding the impact of insularity on economic performance is fragmented, and empirical evidence casts a dubious note on the impact of insularity on economic performance. Particularly, a debate exists regarding whether adverse

[3] The report by ESPON (2010) identifies two indexes that have been used in order to summarize the main findings about the islands regions: a "state index", for the situation of the islands in comparison with the member states they are located in; and a "change index", capturing changes that have taken place approximately during the last decade.
[4] NEG, henceforth.
[5] NTT henceforth.

effects on growth are caused by insularity per se rather than small size. According to one strand of literature, smallness per se does not represent a challenge, since there is evidence regarding some small states performing well. Rather, is the combination of smallness with other geographical characteristics such as being an island, landlocked or mountainous that matters. However, according to another strand of literature (i.e. Armstrong and Read, 1995), the adverse effect of insularity on small size is negligible; on this perspective, is smallness, rather than insularity per se that affects growth[6].

This paper aims at addressing the problem of insularity analyzing this issue as far as its economic consequences are concerned. First of all, a definition of insularity as presented by the EU legislator is presented. In particular, insularity will be defined in its components: smallness, remoteness and peripherality. In the third section, the theoretical framework of the NEG and NNT, useful to derive potential implications of the consequences of insularity will be briefly described, whereas a review of the main empirical literature contributes that have tackled the economic consequences of insularity will be presented in the following paragraph. Section 6 presents policy implications, with a particular focus on the double nature of insularity as a disadvantage and a potential opportunity. The last section includes concluding remarks and directions for future research.

2. Definition of insularity

2.1 Insularity according to EU legislation

According to the definition provided by Eurostat (1994), an island is a piece of land with specific characteristics: a) a surface area of at least 1 km²; b) permanently inhabited by a statistically significant population (more than 50 inhabitants); c) not linked to the mainland by permanent structures[7]; d) separated from the European continent by a stretch of water at least 1 km wide; e) not containing a capital city of one of the Member-States.

Three different categories of islands are identified by EU legislation: 1) islands that are whole or part of the "overseas countries and territories" (i.e. Greenland, French Polynesia, Bermuda); 2) the so called "most remote regions", which are recognized under various sectoral policies such as transport and cohesion policies (the French overseas department, the Azores, Madeira and the Canary Islands); 3) Continental EU islands, which are considered by EU as deserving of special sectoral policies in the field of agriculture and fisheries. Eurisles (1998), analyzing 125 islands in the 20 island authorities, acknowledges that despite islands of the EU present a wide variety of situations, they share very specific social, environmental and economic problems[8].

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[7] The existence of fixed links can be associated, to some extent, to regular ferry (Gloersen et al, 2012). However, as Armstrong et al. (2006) point out, excluding island with fixed links is not as clear as it appear. Indeed, there may be limits (i.e. tools, bad weather) preventing the usage of such linkages, so that they remain barriers to integration.

[8] As Musotto (2007) pointed out, one should look at others indicators besides per capita GDP and unemployment when exploring the socio-economic situation of island region. The fact that GDP is broken down on the basis of NUTs categories discriminates against the smallest regions and it does not consider heterogeneity among different territories. This may lead to significant distortions,

First of all, EU islands lag behind their national entities as far as GDP is concerned. Only three out of all the island regions considered in the Eurisles study have a GDP per capita equal or greater than the GDP average. Furthermore, in a significant number of islands (Nordic Islands, Corse, Sicilia and Sardegna), an important public sector is sustaining GDP level as well as employment[9], leading to an higher per capita costs of essential services and hindering the development of the private sector.
As far as the sectoral structure of economic activity is concerned, low value added activities seem to be predominant. In particular, services, especially in the tourism sector, are prevailing[10].

In almost all the islands considered in the study, the share of the population employed in the primary sector is higher than the EU average, whereas the share of the secondary sector is lower. The unemployment rate is higher than the EU average, especially for young and female. Furthermore, in more than half of the sample, islands score a lower employment rate than the EU average.
Five island regions have populations exceeding 500.000 (Sicily, Sardinia, Canary Islands, Balearic Islands and Reunion) accounting for 75% of the European Island population (Musotto, 2007). The islands considered in the Eurisles study show, on average, a population increase since the 2000s, mostly because of migration flows, whereas no significant pattern in the population density can be detected among islands. Finally, islands present some peculiarities as far as the environment is concerned. Despite human activity, desertification and sea pollution represent a challenge for islands, islands are characterized by a very rich natural environment.

2.2 Three dimensions of insularity: smallness remoteness and vulnerability.

Three interconnected dimensions concur to define insularity: smallness, remoteness and isolation, vulnerable natural and cultural environment. In what follows, we will first define the three dimensions concurring to define islands: smallness, remoteness and vulnerability, describing to what extent each of them give rise to economic challenges. Then, the consequences of insularity per se will be distinguished from the one caused by the sole smallness and remoteness, looking whereas any reinforcing effect does exists.

2.2.1 Smallness

The major implication regarding smallness regards the limited size of domestic markets. First of all, smallness implies a low domestic demand, thus leading a production which is at less than minimum efficiency scale. As a result, input prices in the production process will be relatively higher. Secondly, a small domestic market adversely affects research and development, threatening both the development of indigenous technologies as well as the emergence of fast growth sectors. Finally, additional challenges arise from their limited, and often diversified, natural resource base, often coupled with scarce domestic capital.

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penalizing territories which experience significant migration, public transfers and transfers of private funds.

[9] In over half the islands the public sector accounts for over 25% of jobs (Musotto, 2007).

[10] The highest share of employees in tourism can be found in medium-sized islands with populations of 100,000 to 1 million (Gloersen et al, 2012)

However, smallness may represents an asset as well as a disadvantage. Indeed, some characteristics arising from smallness have been identified as being advantageous: greater social homogeneity and cohesion; a consequent greater flexibility and decision-making efficiency; greater openness to change; and the gains from international trade (Ashoff, 1989; Streeten, 1993).

2.2.2 Remoteness

Remoteness can be defined as the average weighted distance between two countries with weights reflecting the absorptive capacity of the partner country (Borgatti , 2007). According to this definition, two countries which are remote will tend to have a higher bilateral trade, having less commercial relationship with the rest of the world so that the negative effect of being remote could be partially offset by an increased trade with a "partner" country[11]. Given that remoteness mainly affects trade, is straightforward noticing that the main effect of remoteness is connected with difficulties regarding transport and communication. The effects of remoteness are strengthened by the specific geographical constraints that are faced by island economy[12]. Indeed, islands are constrained to use air and sea transport[13], which often operate in a monopoly condition, thus leading to an increase in per unit transport costs.

The effect of remoteness, in the case of islands, is enhanced by smallness. A small economy would require relatively small and fragmented cargoes, with higher per unit costs. Moreover, it is likely that small islands would be excluded from the major sea and air transport routes, which may give rise to delays and make it difficult for islands to exploit the advantages of the more technologically advanced means of transport.

Moreover, the provision of supplies may be characterized by a higher degree of uncertainty than the mainland. The distance from the main commercial centres may give rise to additional problems such as time delays and unreliability in transport services. Last but not least, an island face additional costs besides cost of transport per se, such as storage costs[14], transhipment costs, higher freight insurance costs and damage in transit costs an import/export freights.

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[11] Borgatti (2007) using an augmented gravity model, analyze the Pacific islands' bilateral trade between 1980 and 2004. She eventually found that trade is negatively affected by distance, since the positive effect of remoteness is not big enough to compensate for distance.

[12] As Briguglio (1995) point out, the role of remoteness in the definition of islands needs to be tackled with care, since not all islands are situated in remote areas. However, since insularity and remoteness give rise to similar problems associated with transport and communication, these two issues can be analyzed together.

[13] Dependency from maritime and air transport cause an agglomeration of firms nearby airport and port zones, where there is the concentration of all the logistical services for stocking, trading and distributing goods.

[14] Keeping large stocks is the only way to face unexpected changes in demand in the case transport is not frequent or regular. In the case of archipelagos, internal geographic fragmentation may exacerbate these problems. (Armstrong et al, 1998)

2.2.3 Vulnerability

Islands' higher exposure to economic and environmental exogenous shocks (i.e. excessively high temperatures, sea level rise, storms and flooding) make them more vulnerable than the mainland. Vulnerability is the potential attribute of a system to be damaged by exogenous impacts (Briguglio, 1995) and it stems from a number of inherent and permanent economic features such as remoteness and isolation, volatile economic growth, investor perceptions, high poverty (Adrianto, Matsuda, 2004). Geographical features characterizing islands constrain their economy to be strictly dependent on environmental resources. The environmental and cultural heritage of islands (i.e. existence of protected areas, biodiversity) increases their attractiveness as touristic destination, making often islands at the same time dependent on a seasonal tourism industry (Gloersen et al., 2012). On the other hand, activities such as tourism, fisheries, farming, often constitute a mono-activity without alternatives, thus increasing islands fragility. Last but not least, vulnerability stems from islands' dependence on a narrow range of exports (with the risk associated to the lack of diversification) as well as from dependence on strategic imports, in particular energy and industrial supplies, exacerbated by limited import substitution possibilities.

As for remoteness, vulnerability is accentuated by smallness (Eurisles, 2002). Limiting islands' ability to benefit from the economies of scale smallness leads to high infrastructural, administrative and other overhead costs, and to the prevalence of natural monopolies and oligopolistic structures which are the cause of high consumer costs.

2.3 Insularity, remoteness and ultra-peripherality

The existence of a special category of regions ("ultraperipheral" or "outermost"), that needs special treatment by the EU legislator, is declared in a special section of the Maastricht Treaty, the "Declaration of the Ultra Peripherality". Article 299(2) of the EC Treaty refers to the "structural social and economic situation of the French overseas department, the Azores, Madeira and the Canary islands which is compounded by their remoteness, insularity, small size, difficult topography and climate, economic dependence on a few products, the permanence and combination of which severely restrain their development".

The condition of ultraperipherality share some common features with insularity: remoteness, small size, as well as economic vulnerability. Even if six out of the seven ultraperipheral regions are islands, in the case of ultrapheripheric territories the consequences of islands' geographical constraints are exacerbated. On one hand, the small size makes the outermost regions totally dependent on external resources, markets and services[15]. Factors such as an imbalanced local economic fabric, the poor absorption capacity of the local market, financial fragility of companies and an economy which relies on a mono-activity strongly affects the outermost regions. The lack of economies of scale and high transport cost makes competition in the European market unbearable, so that trade is highly unbalanced in favour of imports.

On the other hand, the conditions of remoteness, vulnerability and limited accessibility become stronger in the case of the outermost regions, limiting their accessibility, with a

[15] "First contribution to the future of social and economic cohesion", Conference of the presidents of the RUP, Las Palmas, February 2002.

consequent increase of their overall cost. The fact that these regions are located several hundred kilometres from any major industrialized and developed area enhance the condition of isolation.

2.4 Insularity as self-enforcing condition

The insularity condition represents per se a further disadvantage besides small size and distance from the more heavily populated mainland, giving rise to a double and reinforcing challenge (Armstrong et al., 1998; Armstrong and Read, 2000, 2002). The difficulties in reaching certain production scale levels caused by smallness are enhanced by high transport costs caused by insularity (Armstrong et. al., 2006). The reliance on a few means of transport may lead to transport monopolies (e.g. a single ferry company), poorer transport reliability, increased stockholding costs, higher insurance costs, greater danger of damage to goods in transit, and diseconomies in loads and routings. Moreover, islands over reliance on imports, and the fact that exports are often low bulk and high value makes return trips underutilized, increasing transport costs (Armstrong et al., 1993).

Remoteness, defined as distance from export and import markets further aggravates the economic consequences of insularity. However, the consequences of remoteness have consequences for the level of local prices, rather than for unemployment and GDP level.
Finally, the consequences of insularity are exacerbated in the case of archipelagoes since fragmentation of the domestic market exacerbates the constraints faced by islands, giving rise to the so called "double insularity". Furthermore, shipment costs are even higher, because of the trade within archipelago. Finally the benefit related to social capital, are likely to be weaker among the different islands.

3. Theoretical framework

So far, empirical and theoretical contributes have analyzed to what extent each of the distinguishing features of insularity (smallness, remoteness and vulnerability) affect economic development. In this section we will briefly revise the main theoretical contributions and provide a brief description of the ways these models can be used in order to derive potential implications to analyse the consequences of insularity. In particular, we will focus on three kinds of model that could be used to derive potentially interesting insights: the Trade Gravity Model, the NEG and the NTT. Instead of providing an exhaustive review of these models, we will rather concentrate on testable implications that can be drawn in order to disentangle the effect of insularity from the one of similar conditions.

The trade gravity model focuses on the effect of remoteness in the amount of trade, which represents a key development channel. The gravity equation, first developed by Tinbergen (1962) and Poyhonen (1963) explains the trade flow between a pair of countries as being proportional to their economic mass (usually national GDP) and inversely proportional to the distance between them[16].

[16] In Tinbergen (1962) original formulation of the gravity equation, the size of the trade flow between any pair of countries is estimated by an OLS regression, where the explanatory variables are the

For our purpose, one of the main advantage of the gravity model is related to the fact that distance plays a key role in determining the size of trade. Indeed, distance is a proxy for transport cost as well as an indicator of the time elapsed during transit. Distance plays a key role especially when perishable goods are concerned, given that the probability of surviving is a decreasing function of time in transit. Further, increasing distance may increase the probability of bottlenecks in the case the production implies multiple inputs that need to be synchronized. Last but not least, a greater distance often imply a greater cultural distance, thus lowering the likelihood that the trade deals will be completed as well as the volume of transactions[17].

Given that the gravity model identifies size and distance as key determinants of the amount of trade, it is straightforward noticing that remoteness and smallness that are key features of island territories will negatively affect the amount of trade, thus lowering islands economic performance with respect to central regions.

As the gravity model, the New Economic Geography (NEG) identifies transport costs and distance from the main economic centres as key determinants of economic development since they affect firms' localization choices. In a nutshell, the theoretical model described by Krugman (1991) describes an economy characterized by two countries (identical in size, technology, preference), two sectors, and two production factors, one mobile and one immobile[18]. The economy produces two types of goods: a traditional low-tech good, produced under CRS and perfect competition and a high tech industrial and differentiated good produced under IRS and monopolistic competition.

Since Krugman (1991) seminal contribution, the NEG models aims at explaining how the dynamics of spatial allocation of population and economic activities is driven by two main forces: increasing returns to scale and costly trade, which generate agglomeration and dispersion forces whose balance shape the geography of economic activities in equilibrium. When increasing returns to scale are in place, firms choose to locate close to bigger markets (market-seeking attraction), with higher variety and endowments of inputs (cost-seeking attraction). Last but not least, accessibility plays a key role in the localization choices, since central areas are more accessible from national and international networks (Krugman, 1991; Venables, 1996; Krugman and Venables, 1995; Ottaviano and Thisse, 2005; Ottaviano et al, 2002; Cerina and Pigliaru, 2007).

The balancing of agglomeration and dispersion forces determinates the allocation of the mobile factor. A symmetric equilibrium is stable if – after an exogenous shift - agglomeration forces in a region becomes stronger than dispersion ones. The main result is

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import of exports, the size of the importing market and the geographical distance between the two countries, used as a proxy of the transport costs.

[17] In order to ensure a proper conduct of transactions and to prevent opportunistic behaviour, international trade requires some level of trust and degree of commitment between the involved parties (Elsass and Viega, 1994). Furthermore, pronounced cultural differences can complicate interactions and hinder development of the rapport and trust necessary to complete transactions (Doz and Hamel, 1998).

[18] These production factors are differ depending on the model taken into consideration. In Krugman (1991),Krugman and Venables (1995), Ottaviano (2002), Baldwin and Forslid (2003) these are unskilled workers (immobile) and skilled workers (mobile). Other models consider instead labor (immobile across regions but mobile across sectors) and capital.

that both forces decrease as trade gets freer but dispersion forces are stronger when transport costs are high and vice-versa.

On these basis, Ottaviano (2003) identifies three categories of regions. Ultra-peripheral regions are characterized by both low accessibility and weak attraction. Central regions have bad accessibility and strong attraction, while peripheral regions are characterized by high attraction but low accessibility.

From this perspective, islands are not regions that occupy a central place within the trade network. Given their low accessibility firms tend to not locate in islands, thus restraining their economic development.

Island's economic performance has in common with other peripheral areas the distance from the main population centres. However, island face special disadvantages associated with their condition of physical discontinuity. This has non negligible consequences in terms of affecting regional concentration of economic activities. The proximity to the main population centres, plays a non negligible role in determining islands' economic performance, by affecting the regional concentration of economic activities through a balance between centrifugal and centripetal forces (Krugman, 1991, 1998). On one hand, centripetal forces, including market size, co-operative and functional linkages between firms, dense labour markets with a diversity of available skills and external economies of scale (i.e. knowledge spillovers), tend towards spatial concentration. On the other hand, centrifugal forces tend towards spatial de-concentration and include labour immobility, lower land and property prices and rents, and external diseconomies of various sorts such as congestion. Centripetal and centrifugal forces can be measured by transport costs and economies of scale, respectively. While the first tend to be negatively correlated with spatial clustering, a positive linkage exists between economies of scale and the creation of clusters. However, because of the relatively small size of their market, islands find it difficult to exploit economies of scale, thus not benefiting from the agglomeration advantages related to clusters[19]. Furthermore, because of remoteness and insularity economic exchanges are strongly dependent from maritime and air transport, thus leading to higher transport costs. In the case of islands the burden given by peripherality is exacerbated by the insularity condition. While the distance from the main population centres and from the market affects both the nature of trade and human mobility, the condition of insularity exacerbates the disadvantages caused by distance, constraining economic exchanges to maritime and air transport, with consequences in terms of increased transport costs.

Similar to NEG, the New Trade Theory approach suggests that economies of scale and network effects are key determinants of trade (Bernard et al., 2003, Melitz, 2003, Melitz and Ottaviano, 2008). Assuming heterogeneity in productivity Melitz (2003) constructed a model where only highly productive firms are able to be profitable enough to compete in the international market. Melitz and Ottaviano (2008) presented a model that incorporates heterogeneous firms and endogenous markups that are affected by the degree of competition

[19] Besides traditional agglomeration advantages related to clusters there are other two agglomeration forces which affect the relocation of economic activities. On one hand, agglomeration may help reducing innovation costs, so that relocating in the agglomerated region may be cost-saving for R&D performing firms. On the other hand, a firm might be attracted in the agglomerated area because it will find a wider variety of inputs at a lower cost.

in the market. In such a model, market size is able to affect industry performance measures: larger markets exhibit tougher competition resulting in lower average markups and higher aggregate productivity. Given that market size affects the possibility to operate realizing economies of scale, it is straightforward noticing that the small size of domestic market that characterize islands increases producing costs, thus diminishing productivity. Moreover, network effects depend negatively from transport costs, that are higher in island economies. From this perspective, the New Trade Theory as well provides a linkage between aggregate productivity and the degree of territorial accessibility. From this perspective, one can notice that the inner disadvantage due to insularity strongly affects firms survival probability as well as their economic performance.

These approaches identify the main mechanisms according to which remoteness, smallness and vulnerability affect economic development. However, they do not consider insularity as a specific condition to be distinguished from smallness, remoteness and vulnerability. Further, they do not take into proper account the fact that these conditions are self-enforcing. From this perspective, one should not separate the effect of smallness, remoteness and vulnerability, but rather consider insularity as a condition which is more than the mere sum of its components.

4. Economic consequences of insularity

Once the main features of islands are defined, the mechanism behind the way these characteristics influence the economy of islands territory needs to be adequately tackled. Armstrong and Read (2004a, 2004b) identify several economic challenges facing islands. The authors highlight the condition of being small, rather than insularity per se. However, given that the majority of territories in their sample are also island, their analysis can be extended in order to analyse the effect of insularity.

As indicated in the above section smallness is one of the most preponderant feature of islands. The small size of the domestic market, together with limited accessibility, make it difficult to exploit economies of scale in manufacturing and service sectors, including retailing and wholesaling. Indeed, inadequate domestic demand causes firms to operate at less than minimum efficient scale (MSE)[20], causing high production costs in the manufacturing sector as well as in the service sector and for the major utilities. This has important implications for their sectoral structures, the potential for local R&D[21] and domestic competition policy, since local business would find it difficult to be competitive in the exports in regional and global markets. (i.e. water and electricity), thus increasing not only firms production costs but also living costs for residents. Problems related to the small size of the domestic market are often exacerbated by the limited access to capital (Armstrong et al. 1993).

As Dimou (2006) observe, smallness and insularity imply a lack of critical mass as far as the size of local market, the stock of human and natural resources and an energy dependence

[20] Bhaduri et al. (1982) and Kuznets (1960) first address the minimum efficient scale argument (MES).
[21] R&D is made more difficult to fund as a result of a small domestic market, weakening the development of indigenous technologies and restricting the emergence of high-tech industrial sectors (Briguglio 1995; Kuznets 1960; Thomas 1982).

on the exterior are concerned. Because of an exacerbated structural mismatch between demand and supply islands face a lack of specialization, low confidence, lack of job security, an over rigid system of work training and weaknesses in positive, financial or technological externalities.

Furthermore, the consequences of a small domestic market regard not only island global and regional, but they also affect the competitive environment within island. On one hand, it may be that it is impossible to develop a critical mass of competitors, so that some sectors will be characterized by monopoly or oligopoly. On the other hand, the possibility to develop clusters – thus exploiting externalities and agglomeration benefits- will be severely limited[22].

The limited resource base that characterizes islands not only regards capital and natural resources but also local labor supply[23]. A limited labour supply has non negligible consequences for the economic performance of islands, and it can only be partially offset by encouraging immigration flows (Armstrong et. al., 2006). Island and small states are often characterized by a strong migrating phenomenon, with a consequent dependence of the economy on remittances and external aid. Indeed, even though the environmental-cultural heritage and social capital endowment (preserved traditions, tightly-knit communities) are important determinants of the choice of residence, they cannot compensate for a lack of job opportunities and of access to services characterizing islands (Gloersen et al., 2012).

Besides being limited, the amount of resources in an island is often undiversified. This leads to an over-reliance on a single export-earning resource, which is often being shipped to a single country market, causing a double exposure to vulnerability. On one hand, firms which have been working in a certain niche sector will find it difficult to change sector of activity in case sudden supply shocks occur. On the other hand, over specialization combined with an extremely small share of external export markets makes many island economies to be price takers, thus increasing their vulnerability in case of changes in the trading conditions.

Islands are characterized by a narrow domestic output, exports and import market. On one hand, because of production capacity constraints and deliberate niche market strategies, islands, especially small ones, produce a highly specialized and relatively undiversified array of goods, thus being highly dependent upon imports[24]. On the other hand, the markets towards these good can be exported is relatively limited, mainly because of constraints in terms of transports[25].

Besides smallness of external market, the domestic sector in islands tend to be extremely small. This cause a strong dependency from imports, enhancing vulnerability problems of islands. The limited scope for import substitution has two main consequences. First of all, it makes domestic price levels to be determined by the prices of imported goods in the 'basket'

[22] There are only few cases of clusters created with adjacent countries, i.e. Malaysia with Indonesia and Singapore.

[23] A limited land area, combined with a small labour force, may prevent a process of transition from an agriculture-based economy to an economy based on higher value manufacturing activities and services.

[24] This is due not only to economies of scale constraints, but also to a limited labor supply.

[25] In particular, trade often happens with adjacent states, with the main ferry terminals.

of goods and services consumed locally. Secondly, it makes exchange rate devaluation as an almost totally ineffective policy option[26].

Islands' vulnerability implies exposure to political, social and environmental external forces with non neutral consequences for their economies (Briguglio, 1995; Atkins et al., 2000). Particularly, limited human and capital resources may be the cause of a substantial volatility of price of goods and earnings, increasing the exposure to the phenomena of "Dutch disease".

Finally, in islands, especially small ones, the consequences of trade and fiscal policies may be exacerbated. For example, the effect of fiscal policies tends to be negligible, because of a negligible multiplier effect; further, an increase of taxes would cause a migration of both entrepreneurs and residents.

5. Empirical literature

Unlike theoretical literature, empirical contributes do consider explicitly the role of insularity. However, literature regarding insularity is scarce and fragmented and do not lead to a unambiguous conclusion regarding the effects of insularity on islands economic performance. Indeed, even if island performance is far below EU average, especially in terms of unemployment and GDP per capita, empirical evidence at macro level does not find a clear negative effect of being an island on several indicators of performance.

Armstrong and Read (2004) compare the performance of 127 small states and dependent territories, analyzing the effect of being an island, landlocked and remote on GNI per capita. Limiting the analysis to states with less than 5 million inhabitants, they eventually found that insularity affect positively, rather than negatively, the performance of small states[27]. Finally the authors consider the effect of sovereignty on island performance. However, they do not find that sovereignty lead to significant differences in countries performance, while non sovereign island that belong to the Mediterranean area seem to perform better. Finally, the authors find that neither remoteness nor insularity act as self-enforcing challenges.

Armstrong et al. (2006), rather than comparing islands with small states, focus on a sample of UE islands. In particular, they compare the performance of two states having the highest number of islands in the UK: Greece and UK. The reason why the comparison is of interest relies on the fact that, even if they belong to two states with a different social and economic environment, they share some similarities, in terms of remoteness from EU markets and tourism-based economies. On this perspective, one may detect whether insularity per se, regardless to the institutional and political environmental of a certain country. As for the definition of island, they rely upon three out of the five criteria identified

[27] The authors also found that neither being an archipelago nor a mountainous territory negatively affects GDP levels. However, states which are remote from global markets or landlocked are shown to have weaker levels of economic performance. The authors do not explain the reason behind such result. Furthermore, they show that the significance of the coefficient associated to being landlocked is not robust to the inclusion of other regressors in the multivariate analysis.

by PLANISTAT (2003)[28]: permanent resident population of at least 50 people, no EU capital and a land area of at least 1 sq mt. Using cluster analysis, the authors use geographical (land area, population, population density, distance to the main capital, distance to Brussels, a peripherality indices) as well as economic factors (rate of activity, measures of unemployment, unemployment rates, sectoral breakdown and occupancy level) to describe island performance and identifying its key determinants. In line with previous research, land area and population size are not systematically correlated with economic performance. In both countries, relatively small, with an agriculture-based economy island tend to perform badly. Indeed, accessibility, allowing islands to develop successful and diversified economy plays a key role in island economic development.

Finally, according to a wide strand of literature, (Armstrong et al, 1998; Armstrong and Read 2000, 2003a, 2003b; Bertarm and Karagediki, 2004) insularity does not really represent a disadvantage. Indeed smallness and homogeneity correlated to insularity may facilitate the creation of social capital (in terms of social cohesion and network of trust), thus leading to higher growth (Baldacchino, 2006). Furthermore, pursuing a niche sectoral growth strategy, relying on human capital intensive activities, or activities based on the country natural resource endowment, such as tourism and financial activities may lead to high standards of living as well as soon as adequate policies take place[29] (Armstrong and Read, 1995, 2002; Armstrong et al., 1998)[30]. Finally, the high degree of structural openness of islands may lead to export-based growth strategies, thus reducing the negative impact of scale economies. From this perspective, different policy responses may have lead to a substantial heterogeneity in island performance.

6. Policy implications

So far, insularity has been described as a phenomenon encompassing economic and social issues, focusing on the concept of insularity as a permanent disadvantage. However, as we argue throughout the paper, the geographic peculiarity of islands may also represent an asset if adequate policy interventions are in place.

From an economic perspective, the lack of employment opportunities deriving from limited accessibility to means of transport and services of general interest can be mitigated by policy interventions directed towards subsidization of transport costs. Indeed, even if imports are mainly related to islanders' taste and behaviour, transport cost related to imports can be mitigated to some extent, by encouraging substitution between high and low cost value imported goods, or, rarely, between imported goods and homemade ones. From this perspective, technological progress as well may help in reducing transport cost. Promoting ICT usage (i.e. telemedicine, teleworking) should be also envisaged, since it may help reducing distance from markets and economic activities, as well as centres of service

[28] Planistat study for the European Commission identified 286 EU15 islands using other objective criteria: a) being at least one kilometre from the continent; b) have no permanent link with the continent.

[29] These policies support the key export sector as soon as things go well, moving to another niche sector when the first one has been exploited.

[30] This is subject to the condition that adequate fiscal policies are implemented.

provision, thus mitigating the adverse effects due to remoteness. Particularly, the policy maker should design incentives for private investors in the telecommunication area, who may find not attractive investing in areas which are not densely populated (Gloersen et al., 2012).

Furthermore, policies fostering integration with employment opportunities across multiple sectors and informal economies can help to avoid risks related to dependency upon seasonality in employment.

On a social point of view, a high social capital endowment may not compensate the lack of educational and employment opportunities for younger people. On this regard, specific policy measures should be implemented to foster the return of graduates, stem outmigration and generally contribute to enhancing the quality of life (Gloersen et al., 2012).

Last but not least, on the environmental point of view, disadvantages connected to vulnerability are often compensated by the abundance of natural resources, as well as renewable energy resources. On this regard, policies environmental-oriented such as investment in local small- or medium-scale renewable energy production, would represent a valuable economic opportunity for islands.

Given the two-sided nature of insularity, there is the need to go beyond those traditional compensation policies considering "geographic specificity as an obstacle to be overcome, rather than an opportunity to be harnessed" (ADE, 2012). On this regard, traditional reactive strategies, mainly directed towards compensating for islands structural disadvantages (i.e. offsetting higher transport costs) need to be gradually replaced by proactive or sustainability strategies. While the first are directed towards gradually diversifying economic activity, replacing traditional economic activities with more remunerative ones, the latter focus on long term interventions directed towards protecting the natural environment (ADE, 2012).

Moreover, policy interventions should be custom tailored, taking regional specificity into proper account. On this regard, adequate policies should promote those assets which can generate a more robust internal economy, hampering at the same time those disadvantages that prevent the region from exploiting its full potential. As stressed by Bohme et al. (2011), territorial specificity needs to be considered as a key point in the definition of adequate policy interventions, rather than implementing general interventions towards reducing disadvantages related to insularity, uncritically based upon economic theories (i.e. NEG, NTT). Furthermore, recent development projects (i.e. Gloersen et al.) claim that European and national targets should not be taken as a benchmark for development achievements of islands, which should be measured against specific-custom-tailored targets- possibly defined in relation to adjacent regions, rather than EU average values.

In particular, policy interventions should take the specificity of the insularity condition into account on one hand, and the three dimensions concurring in defining insularity on the other[31]. In this regard, focusing on the idea that the removal of insularity would definitely help island to reach the development gap with the mainland can be misleading. Problems related to insularity would indeed stem from smallness, peripherality and dependence on outside influences. On this regard, policies directed towards removing or

mitigating insularity increasing efficiency of infrastructure such as airports is likely to affect islands socio-economic patterns and trends, but do not guarantee alone economic or social development. Further, they may lead to undesirable consequences. As Baldacchino (2004) points out, intensifying connectedness through the construction of fixed links (i.e. bridge) may improve accessibility to islands, thus hampering the negative effects of remoteness. However, the construction of fixed links might foster the migration of islanders closer to metropolitan areas, causing a decline in overall population. This migration process would make islands a place for secondary houses, thus pushing up the price of real estate. Further, an increased island accessibility due to the existence of fixed links may be counteracted by a reduction in the length of stay.

In a broader perspective, the policy maker should promote multiple interventions in several areas, rather than simply focusing on structural interventions directed towards improving islands accessibility. On this regard, proactive or sustainability strategies that improve island development exploit existing resources might be more effective than traditional compensation policy. In other words, taking advantage of islands geographic and cultural environment might be preferable than compensating for islands disadvantages.

On an institutional point of view, these interventions can be carried on taking strategic interaction between different levels (regional, national and EU level) into account, and guaranteeing various levels of dependency from the central government[32].

7. Summary and conclusion

As a consequence of their geographical, topographic and socio-economic characteristics, islands face a condition of substantial backwardness that can be only partially offset by adequate policy interventions (Baldacchino, 2006; Moncada et al., 2010). The Gross Domestic Product (GDP) is below the EU average. Higher costs of living due to insularity affect both resident and business. The small size of markets and weaker competition result in low wages and reflect in lower living standards. Moreover, seasonality as well as seismic and climatic events makes them particularly vulnerable. Given the growing importance of the issues related to economic consequences of insularity, there is an increasing need to properly analyze this phenomenon. In this paper we have provided a comprehensive review of the main theoretical and empirical contributes regarding insularity and its effect on economic development. After having defined the phenomenon of insularity for the EU legislator as well as for the economic theory, we have described each of the three dimensions that concur to define insularity: smallness, remoteness and vulnerability, highlighting to what extent each dimension that concur to define insularity affects islands' economic performance as well as the challenges posed by each of them. In particular we highlighted that disentangling the effect of insularity to the one of similar conditions (i.e. remoteness, smallness and peripherality), looking at the mutually reinforcing effect of insularity compared to similar

[32] The ADE report (2009) identifies three types of governance arrangements to deal with island problems: 1) high degree of political autonomy 2) local government with no overlap with the mainland 3) local government areas shared with the mainland.

geographical conditions is a key point for the economic analysis as well as for the policy maker.

Further, we have briefly revised some theoretical contributes that are able to provide some useful insights to analyze the effects of remoteness and smallness: the Trade Gravity Model, the New Economic Theory and the New Trade Theory. Albeit these contributions provide some useful implication, none of these works is able to capture the specific implications of insularity.

Further, the double nature of insularity has been highlighted, since distinctive features of islands can be seen as an asset as well as an opportunity. On this regard, the environmental assets increases islands' attractiveness as a touristic destination, but it may cause tourism to be a mono-activity in islands' economy. Similarly, small communities are often characterized by a strong sense of identity and strong ties between local actors, which can be considered as an asset for local development (Gloersen et al., 2012). However smallness also implies a low domestic demand, leading to scale inefficiencies in production.

Given the physical nature of islands' constraints, policy interventions as multi-level governance (vertical, horizontal integration and territorial cooperation) directed at promoting accessibility, improving competitiveness and prioritizing regional integration cannot eliminate those constraints, but only mitigate their effects (Armstrong and Read, 2004a). Furthermore, the survey has highlighted the need to go beyond traditional compensation policies directed towards offsetting islands disadvantages. On this regard, compensation policies aiming at intensifying islands connectedness reducing transport costs or constructing fixed links may not be enough to guarantee island development.

Thus, the policy maker should look for a line of intervention through permanent adjustments, in order to allow islands endogenous development, offsetting structural problem and guaranteeing equal opportunities with respect to those living in the mainland. From this perspective, interventions carried out by the policy maker should be pursued in the legal framework as well as by the action of the regional policy and by interventions of the structural funds.

Future research should better disentangle the effect of insularity on economic development. Eventually, one should look whether a self-enforcing effect exists with respect to smallness, remoteness and vulnerability. Future developments on theoretical grounds should capture explicitly the issue of insularity in a NEG context, by evaluating how being an island affects localization of firms when high transport costs are in place. On the other hand, empirical development should use micro data at firm level, rather than performing analysis on growth rates or levels of economic performance. Thus, it would be possible to perform comparative analysis and to analyze productivity differentials among firms belonging to different areas, assessing whether insularity per se represents a further barrier to economic growth and regional integration.

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