

UNIVERSITY OF THESSALY
DEPARTMENT OF PLANNING AND REGIONAL DEVELOPMENT
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Dissertation:
Marshall versus Jacobs: The localization and urbanization debate in Greece

Student: Sokratis Basiakoulis
Supervisor: Dr. Paschalis Arvanitidis

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ABSTRACT

Agglomeration economies play a key role in the process of economic development. The usual distinction is between urbanization and localization economies. The former express the Jacobian aspect that externalities are more intense within an area with a diversified economic based whereas the latter adopt the Marshallian view that industrial concentration and specialization are more important for economic growth. This thesis evaluates the validity of each of the two hypotheses in the growth of the Greek prefectures and big urban centers using regression modeling, for the period between 1991 and 2001. The analysis is made for each 1-digit NACE (STAKOD) classification and the results reveal that specialization had negative impact upon employment growth over the examined period. In contrast, diversification, whenever it had a contribution, was found to have positive effects. Although diversification was found to affect few cases, it can be said that these findings support the Jacobian view that externalities are more intense in a diversified economic environment.

Keywords: Agglomerations, localization economies, urbanization economies, diversification, specialization, Greece.

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ACRONYMS

AIC:	Akaike Information Criterion
ELSTAT:	Hellenic Statistical Authority
HHI:	Herfindahl – Hirshman - Index
KSI:	Krugman Specialization Index
LQ:	Location Quotient
LM:	Lagrange Multiplier
MAR:	Marshall – Arrow – Romer
NACE:	Statistical Classification of Economic Activities in the European Community (in French: Nomenclature statistique des activités économiques dans la Communauté européenne)
NUTS:	Nomenclature of Territorial Units for Statistic
OLS:	Ordinary Least Squares
SAR:	Spatial Autoregressive
SIC:	Schwarz Information Criterion
STAKOD:	Statistical Classification of Branches of Economic Activity
VIF:	Variance Inflation Factor
WLS:	Weighted Least Squares

CHAPTER 1: Introduction

1.1 Research area

Cities and metropolitan areas are the main places where economic growth occurs and their performance is crucial as regards economic development in rich and poor countries (Quigley, 2008). That is why, in all developed world economic activity is disproportionately concentrated in cities (UN-Habitat, 2007). Despite the problems that arise due to such high concentrations, the benefits that accrue in cities more than offset the associated costs. This has urged researchers in studying the advantages and disadvantages of urban agglomerations, exploring the locational decisions of the economic activities and the impact of such choices in space and the economy.

Increased urbanization over the years poses the question of why cities are able to attract population and enterprises. A simple answer is because the disadvantages of concentration are less compared to advantages of living in a city. As regards firms, the benefits that accrue from being situated in such areas are known as agglomeration economies. These are mainly external economies arise due the locational proximity and are more intense as the level of concentration increases. Externalities occur due to the sharing of a pool of skilled labor, the presence of other industries that act as suppliers and supporters of inputs and the circulation of information within the industry (Marshall, 1890) and affect decisively employment growth, innovation and productivity rates. The role of knowledge is dominant over the agglomeration literature and holds an important position in many developmental theories such as the endogenous growth theory (Romer, 1986; Lucas, 1988).

The usual classification of the agglomeration economies made by Hoover (1937) is in localization and urbanization economies. The former emerge due to geographical concentration of firms in the same industry and according to many scholars (Marshall, 1890; Arrow, 1962; Romer, 1986) this kind of specialization (known as MAR externalities) is the main cause of economic development. As regards the latter, it refers to the concentration of firms of various industries interacting with each other and is connected with the Jacobs' (1969) view highlighting that diversification of activities is more favorable for economic development. The debate concerning which of the two (specialization or diversification) is more conducive to economic growth and therefore should be encouraged by developmental policies has been the focus of many pieces of

research in many countries. However, there is no conclusive answer with regard to the most appropriate policy choice as it depends on the very specific economic features of each country.

1.2. Aim and objectives

The aim of this dissertation is to explore whether specialization or diversification is more conducive for economic growth in Greece. In other words, it is expected to provide an answer to the debate between Marshall and Jacobs as regards the most favorable conditions for economic growth. This aim will be addressed through the following objectives:

1. To examine to what extent MAR and Jacobian externalities affect the different branches of the economy.
2. To assess the importance of Marshallian and Jacobian externalities in different spatial levels, namely prefectures (NUTS-III level) and urban centers.
3. To explore whether the relation between specialization/diversification and economic growth is in essence non linear, on the grounds that the benefits peak at a certain point and after that diseconomies grow disproportionately.
4. To explore the effect of space in the growth of the branches of the economy. To that end, spatial econometrics will be used, whereas the existence of spatial autocorrelation is expected to reveal whether economic performance is influenced by the performance of neighboring areas.

The results of this research are expected to be useful to both the academics and the policy makers. As regards the former, findings will shed light to the academic debate between Marshall and Jacobs revealing whether specialization or diversification is more important for Greece. In addition, it will add a new dimension to the debate, that of non linear relations, assessing whether specialization/diversification or both are conducive to growth but up to a certain point. If it is proved that diversification rather than specialization is more conducive to economic growth this can provide a rational for supporting the creation of a diversified local economic structure. This could be achieved by the establishment of different kind of economic activities in an area. The opposite stands if the findings reveal that specialization is more important. In this case, focusing on certain kind of economic activities would be the rational choice. Whatever the case, the results will inform policymaking whether the creation of more urbanized or localized economic structures within the regions are preferable.

The originality of the dissertation is that, to my knowledge, this is the first time which such a study is conducted for Greece, aiming to shed light on whether specialization or diversification causes economic growth to the Greek regions. Moreover, the level of analysis used means that analytical conclusion can be reached for every branch of the sectors. Original is also the use of spatial econometrics for exploring the impact of space in the growth of the various branches of the economy.

1.3 Structure of the dissertation

This dissertation is comprised of four parts. In the first part, the role of externalities and increasing returns is stressed as the main cause that lead to the development of cities. The usual distinction between localization and urbanization economies is made and the reasons why these agglomeration exist is further discussed. Moreover, other reasons of agglomeration economies are examined as well as the diseconomies that arise due to city size. Finally, the role of the dynamic externalities in urban growth is discussed. The second part, presents a review of the literature containing six key studies. In this section, the variables that are used are examined and the problems and findings are discussed. The third part contains the methodological approach of this study. The data that are used are presented, the regression model to be used is described and the choice of the used variables is justified. This part is followed by the analysis made and the subsequent discussion of the findings as regards the contribution of localization and urbanization economies in employment in each sector and branch of the economy. This analysis concerns both Greek prefectures (NUTS-III) and urban centers. Finally, the conclusions of the study are presented.

CHAPTER 2: The agglomeration economies: theoretical perspectives

This chapter covers the theoretical context of agglomeration economies. More specifically, it underlines the crucial role of agglomeration economies in the formation of cities, it presents their classification and clarifies their basic concepts. Among the different types of agglomeration economies localization and urbanization economies are explained in a greater detail, since the Marshall/Jacobs debate is the main focus of this dissertation. However, in order to have a more comprehensive view of the causes of agglomerations other, less explored, sources are also discussed. Furthermore, the chapter discusses the connection of increasing returns and agglomeration economies with theories of economic growth as explored in recent studies. Finally, the three theories of dynamic externalities of MAR, Jacobs and Porter are presented.

2.1. Cities and agglomeration economies

From the dawn of the twentieth century, the rates of urbanization in the developed world have risen dramatically. In Europe, according to data of the United Nations for 1994, it was estimated that approximately 75% of the population lived in cities (Huriot and Thisse, 2002). A similar situation is evident in the United States and Japan where urban population comprise about 77% and 78% of the total population respectively (Huriot and Thisse, 2002). The trend is the same as regards very big cities as well. In 1995, the cities that gathered population over 10 million was 15 and the prediction of the United Nations for 2025 is that this number will rise to 26 (Huriot and Thisse, 2002). In 2007, it has been estimated that for the first time more than half of the population lived in cities and this trend was expected to continue, especially in the developing countries (Quigley, 2008). From these figures it becomes obvious that cities despite their problems still attract people and economic activities and they are recognized as the main places where economic development, innovation and growth take place. That is why they are at the heart of contemporary economic analysis.

2.1.1. Why cities exist

Although cultural and social factors are important for the development of cities, it is widely claimed that cities are mainly an economic phenomenon and their existence is due to economies of scale in production (O' Sullivan, 2007). Indeed, for most goods

production is more cost effective when they are produced in big than in small quantities. The reduction of transportation cost related to the distribution of products is also mentioned as an important factor that led to the creation of cities since it gives strong incentive for the production units to locate in areas of high population density (Quigley, 2008).

Despite all the positive effects concentration gives rise to a series of negative effects, like pollution, congestion or high rents, which both firms and city dwellers would prefer to avoid. Therefore, a more balanced distribution across space might be more preferable for all economic units. However, this is not what we observe in reality, perhaps due to a number of benefits stemming from concentration which more than offset the related disadvantages.

The most important determinants of city development is considered to be the internal or external economies caused by concentration of business and population. This leads to increasing returns in production. Therefore, the existence and growth of cities can be explained because the benefits of high densities outdo the associated costs and firms do not have intensives to relocate outside the urban fabric. Thus, cities exist due to increasing returns and this tradeoff between agglomeration costs and benefits is fundamental for the study for the formation of urban centres.

2.1.2. Classification of agglomeration economies

In contemporary urban economics, the concept of agglomeration economies is central and it means the cost reduction that occurs due to spatial concentration of economic activities (McDonald and McMillen, 2007). The first who discussed such benefits is considered to be Adam Smith in his famous work “An inquiry into the causes and nature of the wealth of Nations” in 1776, even if he adopted a more narrow perspective focusing on the division of labor (Duranton and Puga, 2004). Further extensions of the model were made by von Thunen (1826, cited in Duranton and Puga, 2004) who tried to explain the pattern of agricultural activities which surrounded preindustrial German cities (Fujita and Thisse, 2000).

These issues have occupied many economists ever since but undoubtedly it was Alfred Marshall who made the concepts of agglomeration economies well known to the economics discipline. Interestingly, Marshall never used the term “agglomeration economies”; instead he talked only about “localized industries”. With this term, he referred to the cost reduction opportunities that arise due to spatial proximity between

economic activities of the same industry. However, in his analysis he did not discriminate factors that lead to temporal (static) or continuous (dynamic) economies (McDonald and McMillen, 2007). The former imply that benefits blow out after some time whereas the latter can lead to continuous growth.

The standard classification system of agglomeration economies which is still accepted was proposed by Ohlin (1933) and concerned economies within the firm, economies which are external to the firm and derive from the activity of local industry, economies that are external to the firm and depend on the size of the local economy and economies arising from inter-industry linkages which are connected with the savings in transportation costs when purchasing intermediate inputs. Few years later, Hoover (1937) referred to the second and third categories of Ohlin's classification using the terms localization and urbanization economies, respectively. These terms are nowadays widely used but it should be noticed that Ohlin's categories are characterized as static (i.e. not dynamic) agglomeration economies, which means that the benefits that arise for the firms are exhausted within a certain limit.

Recent research of Rosenthal and Strange (2003) revealed new dimensions of agglomeration economies and they proposed a new classification in four categories from which, the first three have to do with technological externalities. The first category, which they called industrial scope, includes the localization and urbanization economies. The second category places emphasis on geographical proximity. They found evidence that the effects of agglomeration economies are diminishing as the distance between the economic agents becomes bigger since their interaction becomes more difficult. Moreover, they mentioned the temporal character of agglomeration effects. Externalities can be potent even if the interaction between the economic actors took place in the past. It would not be strange if knowledge that was firstly exchanged and created in the past, took some time in order to accumulate and affect the present performance of a firm or industry. Thus, this category separates static from dynamic externalities as the former have a temporal character whereas the latter are permanent. Finally, the fourth category they proposed had to do with the organization of industry where productivity is seriously affected by the level of competition. In this case, following Porter (1990) it is argued that local competition favors development.

2.1.3. Basic concepts of agglomeration economies

A fundamental distinction of scale economies as regards an individual firm is between internal and external ones. The former refer to the reduction of the production cost as the output of the individual firm increases (Rosenthal and Strange, 2006). Internal economies can be caused by better organization and management within the firm. External economies emerge when productivity increase is induced by the increase of the size of a city or industry in a city (Rosenthal and Strange, 2006). They refer to benefits accruing from the operation of a variety of firms located in proximity and affect each one separately. Individual firms reap the benefits created from the function of other firms without compensating them and in this sense the beneficial effects are characterized as externalities. Obviously, externalities can also affect negatively the performance of a firm without the latter being compensated for the harm that it sustains and in this case we talk about diseconomies. The study of urban agglomeration focuses mainly on these positive and negative externalities in order to detect the incentives given to economic units to locate close to each other, usually within cities.

Another point that should be mentioned is that the notion of externalities had been employed for many years without distinction between technological and pecuniary externalities. This distinction, made in 1954 by Scitovsky (Holcombe et al, 2001) was unknown to Marshall (Fujita and Thisse, 2000) who used the term in his analysis without separating one from another. As a result, the externalities that Marshall described can emerge either due to the one, the other or both types of external economies. Technological externalities emerge due to non-market interactions and lead to the reduction of the cost function of a firm. Such externalities take place when the output of a firm is influenced by actions of other firms. They are based on knowledge spillovers which affect the innovation and productivity levels of the firms. On the other hand, pecuniary externalities concern benefits that occur due to market mechanisms through the mediation of prices. They take place when the profits of a firm are affected by the behavior of other firms. This can affect either the revenue or the cost side. For example, firm competition may lead to the reduction of price affecting the profits of a firm, causing pecuniary externalities. Obviously, both types lead to spatial agglomerations and they have a prominent place in new location theory models (Fujita and Thisse, 2000).

The previous distinction is related to the classification between static and dynamic external economies. Static externalities, imply that the reduction of the cost of a firm can reach a certain limit when all the benefits are exhausted. It becomes clear that such kind of externalities cannot lead to continuous growth. This notion focuses mainly on the pecuniary benefits that occur due to economies of scale and specialization of the intermediate suppliers and more effective workforce (McDonald and McMillen, 2007).

On the other hand, dynamic externalities imply that continuous reduction of the cost of the firm is feasible. This aspect, stresses the role of knowledge spillovers (that is technological externalities) which encourage innovation and improvements in the production methods resulting in the creation of continuous benefits for the firms and allowing continuous cost reduction. Krugman (1991) claims that dynamic externalities can also be associated with intermediate input markets effects and labor market. However, knowledge spillovers are considered fundamental in the study of dynamic externalities and their study is crucial in modern location theory models.

2.2. Localization economies

Localization economies are another key concept employed by this study. It refers to positive externalities that arise between firms of a specific industry that is economies which are external to the firm, but internal to the industry. An individual firm cannot affect them but it can benefit from their existence: the bigger the industry, the more the benefits afforded to the firms.

The term “localization” is used to indicate that the benefits are accrued only for the “local” firms that are concentrated in an area. Marshall (1919) describes three sources of localization economies, namely the sharing of a pool of skilled labor, the presence of other industries that act as suppliers and supporters of inputs and the circulation of information within the industry. All these factors lead to the reduction of the production cost as the output of the industrial cluster increases.

When firms of an industry use the same intermediate input, they have incentives to cluster around the same supplier. This happens if the demand for the intermediate input is not large enough in order to exploit the economies of scale for production, thus it has to purchase it from specialized suppliers. Moreover, clustering depends on the level of transportation costs as well. When they are relatively high, proximity of the demanders to a supplier is very important to suppress them. Finally, the importance of proximity increases the more bulky or fragile an input is or the shorter the time it needs

to be delivered (O'Sullivan, 2007). In addition, Scott and Storper (2009) underline that when firms compete through product differentiation and when the demand of the market is uncertain, the clustering of suppliers allows them to change their production in the appropriate levels each time. This happens because since firms have cheap access to all necessary resources they can easily change the production of their final goods. All these reasons provide strong incentive for the firms to cluster around suppliers and reap the benefits of this proximity.

Labor market aspects also affect the locational behavior of firms. There are cases where firms need to easily change their specialized personnel so they strive to locate where big labor pools exist, so as to avoid any delays in finding the appropriate employees. Uncertainty concerning present and future production directions creates difficulties on behalf of the firms as regards finding the appropriate number and quality of the staff needed. Such problems are more easily handled where clusters of similar firms already exist because in this way they can all tap of the existing workforce and achieve better matching. On the other hand, specialized workers have incentive to gather around industrial clusters to have high employment opportunities. Furthermore, the risk of staying unemployed would be less once a wide range of firms exists in an area. These facts encourage geographical concentration and both firms and workers benefit from the agglomerations since transactional costs are minimized and the equilibrium between demand and supply is more easily achieved.

The sharing of information (or, in other words, the knowledge spillovers) among the firms of an industry is considered crucial for innovation and productivity. Spatial proximity of firms of the same industry offers the opportunity for interaction among the workers in formal or informal social meetings. This contributes to the exchange of experience, as regards products and production methods, and encourages creative thought and implementation of new ideas. Managers in particular, share information for the market environment that allows them to form a more conclusive picture of the market needs and trends which, in final analysis, renders firm more competitive (McCann, 1991). Consequently, spatial clustering gives firms a comparative advantage against the more isolated ones. It is believed that the structure of industry affects the strength of these knowledge spillovers, where the existence of a large number of small and competitive firms in an industry leads to more intense knowledge spillover (Rosenthal and Strange, 2000). These spillovers are considered crucial for the study of

agglomerations, however, since in most cases knowledge is not bought and sold, the measuring of these externalities is very difficult.

2.3. Urbanization economies and diseconomies

The second category of agglomeration economies that is considered by the current study is urbanization externalities. In contrast to localization economies which concern a specific industry, urbanization externalities refer to the whole urban area. The external effects can be either positive or negative, so in the former case we talk about urbanization economies whereas in the latter for diseconomies. The existence of diseconomies is explained because after a certain city size problems (eg. congestion, pollution, etc) emerge that reduce the economic performance of the economic units.

2.3.1. Urbanization economies

Urbanization economies are positive externalities arising from the activity of the overall urban economy and affect all firms and industries even if they are unrelated (O'Sullivan, 2007). Yet, despite the differences with the localization economies the sources that lead to their creation are almost the same (O'Sullivan, 2007). These are intermediate inputs, the sharing of a common labor pool and knowledge spillovers.

As regards the intermediate inputs, firms of different industries can share the same suppliers. On these grounds, the production such inputs, can exhibit economies of scale. A series of business services such as banking, accounting, insurance, real estate, hotels, building maintenance or transportation are examples of services that are shared by firms of all industries and exhibit scale economies (O'Sullivan, 2007). Transportation or public infrastructure (such as schools) which can be public or private, are classical examples where scale economies appear. In addition, the diversity of goods and services that cities provide, renders them more attractive as places for establishment since firms are able to find exactly what fits better to their needs.

As in the case of localization economies, the existence of a substantial pool of labor is another reason for the emergence of urbanization economies. Firms have more choices when they want to find workers and it is easier and less costly for them to arrange their demand for labour. The movement of workers from one industry to another is feasible in big cities provided that the demand of workforce does not show the same pattern for all industries. When this happens, some industries release workers

and others employ them leading to a constant equilibrium in the urban labor market (O'Sullivan, 2007).

Finally, the knowledge spillovers among different industries are considered crucial to the creation of urbanization economies. The benefits of the exchange of information that takes place within an industry can become broader to include different industries leading to the rise of innovation and productivity. In this way, the proximity of firms belonging to different sectors can be proved beneficial. Whether these cross-industrial spillovers are more efficient than those created within a specific industry is an issue of debate, which will be discussed later.

2.3.2. Urbanization diseconomies

Beyond a certain city size, the high population densities lead to the rise of a series of negative effects that act as centrifugal forces for firms and people at the specific location. These problems impose a limit to the city size and when it is exceeded, cities are not considered attractive places any more. Such negative externalities arise due to high rent prices and transportation costs, the degradation of natural and built environment and social problems like criminality. Obviously, some of these problems can be tackled efficiently but on the extent that they still exist undermine the economic performance of a city (Glaeser, 1998).

The high concentration of population and economic activities raises the price of land leading to high rents. Thus, the cost of establishing within an urban area increases both for producers and consumers, consisting a centrifugal force of urbanization. Firms have to pay more for the land they occupy and they should also provide bigger wages to their workers since they will have to pay higher rents. Living cost is also affected because transportation is becoming much more difficult as the size of the city expands. Congestion is a problem incurred by big cities and the cost that it entails affects the locational decisions of population and firms. All of these problems raise the living cost of cities and make them less desirable places for the establishment of economic units (Glaeser, 1998).

The degradation of the natural and built environment undermines the quality of life and damages the picture of the city and its attractiveness. National governments and local authorities alike have realized how serious these problems are and with the help of technology they have taken a number of measures to improve urban environment. As a result, there are nowadays large cities with less acute environmental problems, even

compared to small towns (Glaeser, 1998). In the same context, cities try to enhance their image and exploit it as a factor of development that will attract firms and population.

One of the most discussed social problems connected to urbanization is criminality (Glaeser, 1998). Big cities are the ideal place for illegal and criminal behavior for a series of reasons. Anonymity and a bigger market of potential victims are factors that encourage criminal behavior. Furthermore, the risk of been arrested is much lower than in smaller towns. Criminality may not have a direct impact on the locational decisions of firms but it affects the number of the potential residents. In this way, it contributes to a smaller labor pool that ultimately discourages firms from being established in that place (Glaeser, 1998).

The existence of economies and diseconomies within the cities raises the question of the efficient urban size. This is very difficult to be defined. First because urbanization benefits and costs are rather subjective and second because there are substantial difficulties in accurately measuring urbanization economies and diseconomies. As a result, cities rarely achieve an optimal size.

2.4. Othe sources of agglomeration economies

The well known localization and urbanization externalities constitute factors of major importance for the formation of agglomerations and have been extensively studied. None the less, researches have also underlined a series of other reasons that also contribute to the concentration of economic activities. The most important of them are discussed below, in order to provide a comprehensive picture with regard to the sources of urban agglomerations.

Several studies have shown that the “Home Market Effect” is another factor explaining the formation of agglomerations (Rosenthal and Strange, 2003). This effect is connected with the existence of increasing returns and oligopolistic competition and implies that large markets with large local demand will attract more than proportionate number of firms. Besides, the presence of transportation facilities renders big cities more attractive places for firms since the distribution cost of their products is minimized (Ottaviano and Thisse, 2003). In this way, spatial concentration becomes a self enforcing procedure where home market effects and cities consequently increasing in size. The importance of the Home Market Effect is recognized in many models of New Economic Geography (Krieger-Boden, 2002).

The consumption opportunities in cities are another reason that explains the formation of urban agglomeration. Glaeser et al (2001) observe that in the study of cities, much attention has been given in the causes that lead to the rise of productivity and almost none in the consumption possibilities that they provide and render them attractive places for living and working. They found four main types of amenities that are available in cities and affect their growth. First is the variety of services and of consumer goods, whereas studies have shown that cities with more restaurants or theaters, for instance, have grown more quickly. Second, both aesthetics (i.e. architecture) and physical amenities (i.e. weather) affect the locational decisions of population. Good public services, such as good schools, are positively connected with urban growth. Finally, the improvement of transportation is also mentioned as a factor that attracts population, as distance has shrunk in terms of commuting time and people can have access in many activities within a city, no matter its size. All these amenities are considered crucial aspects of quality of urban life and can explain at some extend the existence of agglomerations.

Some alternative causes for the explanation of urban giants are given by Ales and Glaeser (1995) who used case studies and cross-country evidence. They suggest that trade and commerce conditions play a role in urban concentrations. More specifically, they argue that protectionism favors urbanization, while low tariffs promote a more balanced distribution. This happens because if the imports are expensive, the population substitutes them with locally produced products which are cheaper in cities since most firms are established there. Thus, there is incentive to locate within cities. On the contrary, when tariffs are low, people tend to consume many imported goods which are available across all country and tend to avoid big cities where living costs are relatively high. However, their study does not provide clear answers in causality terms, namely whether low trade invokes high concentration or vice versa.

Moreover, the same study (Ales and Glaeser, 1995) the relationship between political status and urban concentration, to find some interesting results. Democracy seems to go hand in hand with a much more balanced distribution of population in contrast to dictatorship. Concentration of power is argued to lead to extraordinary big capital cities in many countries for several reasons. The dictators extract wealth from the hinterland to the capital to intensify their position and have better control over the population. Consequently, capitals become wealthy and have greater growth rates than the rural areas, encouraging immigration of rural population. Moreover, a further

incentive is that capitals appear to be safer than hinterland and that capital city dwellers have more opportunities to influence the leadership. In contrast with their findings in trade, as regards the political regime Ades and Glaeser (1995) found sound evidence that causality runs from dictatorship to urban concentration.

Finally, a frequently neglected aspect stresses that agglomerations can also arise due to natural endowments of a place. Immobile factors, like climate or natural resources are main reasons for the establishment of industries in a specific area. These findings indicate that many times the role of the increasing returns in the formation of agglomerations is overstated since the role of natural resources cannot be separated (Rosenthal and Strange, 2003).

2.5. Agglomerations and growth

As most economists and geographers agree the most important factor in the development of cities, is the existence of increasing returns (Hurriot and Thisse, 2002). This means a more than proportionate increase in the output than an increase in the input of the production process. Such results can be achieved as the economy becomes more efficient and therefore more productive. Specialization is imperative to achieve these goals and can be achieved only in high levels of population since it requires the division of labor. However, besides these internal economies, the role of externalities in the existence of increasing returns is also crucial, with knowledge spillovers considered to be the most important determinant for growth (Romer, 1986; Lucas, 1988).

2.5.1. Increasing returns and economic theories

In the field of spatial economics and regional science, several development theories have been developed from the mid of the twentieth century. Theories such as “big push” by Rosenstein –Rodan, “growth poles” of Perroux, “circular and cumulative causation” by Myrdal and “backward and forward linkages” by Hirschman prevailed during the 1940s and 1950s. Keynes and Kaldor also argued that the rise of the exports would also lead to increasing returns through faster productivity growth (Sunley, 2003). All of them recognized the existence of increasing returns which are observed in agglomerations and tried to explain the patterns of economic development under this perspective.

The focus changed during the 1960s when these approaches were overshadowed by neoclassical interpretations based on comparative advantage and the use of models

of decreasing marginal returns (Sunley, 2003). One of the reasons why neoclassical theories dominated economic thought in this period, is due to the formalized economic models that they used, in contrast to the descriptive analysis employed by the previous ones. Nevertheless, their inability to incorporate increasing returns left no room for agglomeration economies in theories. Moreover, the neoclassical growth model was criticized to contradict reality.

Over the last 2-3 decades, the role of agglomerations in economic development was extensively recognized and new, formalized approaches were developed and incorporated in the mainstream economics. In this way, the problems that the very first theories faced have been eliminated. The three emerging schools, these of urban economics, endogenous growth and new economic geography, underline that urban agglomerations are responsible for uneven economic development, a pattern which is observed in most countries, leading to economic divergence (Petrakos and Psyharris, 2004). As a consequence, the concepts of increasing return and agglomeration economies were revived and attracted the interest of many scholars.

2.5.2. Theories of dynamic externalities.

In the context of this dissertation, the external economies that contribute to the formation of agglomerations and more specifically the dynamic (technological) ones are examined. The related theories try to explain the formation and growth of cities, stressing the fundamental role of knowledge spillovers. In addition, the role of competition in the local market as a factor that encourages or discourages knowledge diffusion is also examined. According to these theories, city growth is attributed to spatial proximity of people which allows them to exchange ideas, learn from each other and become more innovative and effective. High densities are a prerequisite for this kind of interactions and this constitutes the very reason why growth is much less in rural areas where people do not reside close to each other and the flow of information is restricted. Within the cities, spillover externalities emerge since people and firms benefit from the created knowledge without having to pay in return. These can have temporal (static) or continuous (dynamic) effects. To explain the dynamic externalities in urban centers, three theories are discussed, each one providing a different explanation for the creation of externalities. These theories deal with technological externalities which emerge due to non-market interactions and allow firms to benefit from the rise of productivity of other firms without compensating them.

The theory of Marshall (1920) – Arrow (1962) – Romer (1986) (MAR) states that knowledge is better diffused and exploited within firms of the same industry. Glaeser et al (1992) mention the examples of Silicon Valley, the industry of fashion design in New York and the shirt industry in Bangladeshi where spatial proximity of firms of the same industry resulted in the emergence of dynamic clusters. According to this view, the regions and cities which are expected to have higher levels of development are the ones which are specialized in a specific industrial sector. Moreover, according to the MAR theory, local competition has a negative effect in growth (Glaeser et al, 1992). Firms hesitate to innovate due to fear that the others will copy them, and the benefits of their findings, sooner or later, will be spread to the whole industry. Thus, if they do not have the exclusive property rights of their research, they are more reluctant to invest money on this direction. In short, MAR theory supports industry specialization and local monopoly as the latter is a prerequisite for the internalization of the created knowledge spillovers.

A second theory of dynamic externalities was developed by Porter (1990). In accordance with the MAR view, it claims that industrial specialization is imperative for growth. However, as regards local competition Porter disagrees with MAR arguing that a competitive environment is expected to boost development of the sector. This is because firms are pressed to be more innovative against their competitors because if they just wait passively to adopt the innovations of the others, sooner or later they will be outperformed by their competitors. The higher the degree of competition, the higher the pressure on firms is, not only to adopt as quickly as possible the technological externalities that are created, but also to innovate themselves. In this way, higher growth rates are expected, as compared to a monopolistic market where the dominant firm does not have strong incentive to innovate. To support his view, Porter (1990) mentions examples such as the ceramics and gold jewelry industries in Italy or the printmaking industry in Germany.

An opposite view to MAR and Porter, as regards the source of knowledge spillovers, is expressed by Jacobs (1969). She argued that in fact urban variety, and not specialization, is more important for growth. Once the number of different industries located in a city is high, the possibility for the creation of new ideas through the interaction of people increases. Knowledge exchange among different lines of work is expected to give birth to more innovative actions that would be created in a specialized environment. As an example, she mentions the New York's brassiere industry which did

not evolve from the lingerie industry but from dressmakers' innovations. Moreover, she mentions Manchester which although it was highly specialized in textile industry it eventually declined, and Birmingham which exhibited a much more diversified economic profile and its economy flourished. As regards the consumers, she claimed that the variety of products and services compensates city dwellers for the diseconomies that the urban environment creates and make cities more appealing location. As far as the structure of the local market is concerned, she favored competition as she believed that it promoted innovation.

2.6. Conclusions

In this chapter certain issues of agglomeration externalities were highlighted in order to provide the appropriate theoretical context for the empirical analysis that will follow. Studies indicate that urbanization trends all over the world are evident and this fact keeps vivid the interest of economists and other social scientists for the study of urban agglomerations. Increasing returns are crucial for the creation and expansion of cities and their existence is to a great extent attributed to the technological externalities, and more specifically to the knowledge spillovers, that spatial proximity entails. From the different categories of agglomeration economies that have been proposed, the localization and urbanization externalities are the most prominent and more extensively studied. The benefits and costs that urbanization and localization economies entail, act as centripetal and centrifugal forces determining the pattern of the distribution of economic activities across space. The importance of agglomeration economies and increasing returns in theories of economic development is evident and dates back to the 1940s and 1950s. Over the last two decades, more sophisticated approaches have been developed emphasizing the crucial role agglomerations play for economic development. As for dynamic externalities, the debate over whether specialization or diversification promotes economic development remains open. These aspects reflect the theories of MAR and Jacobs respectively and the degree of their existence in Greek economy is the central question that the current work intends to study.

CHAPTER 3: Literature review

During the last two decades much research has focused on the study of urban agglomerations, the externalities that are created and the way they affect urban and regional economic growth. In this chapter some key articles are reviewed which examine agglomeration externalities and employment growth. Glaeser et al (1992), were the first to use employment as a proxy for growth and their work is considered to be path-breaking in this field of research. A study of Henderson (1997) is also cited in the literature as well as the presented and one by Combes (2000), who was the first to include in his analysis the service sector, in contrast to previous ones which focused mainly on manufacturing. His work was widely imitated ever after. The rest three articles presented are inspired from the work of Combes (2000) and either reveal methodological difficulties or incorporate new elements, like spatial econometrics or other sets of variables, in the analysis. This dissertation has adopted many of the ideas examined in the last studies and that is why they are discussed in detail here.

3.1. From Glaeser to Combes

The first study that examined agglomeration dynamics at urban level and used employment as a proxy for growth and was of Glaeser et al (1992). Assuming that the main cause of dynamic externalities are knowledge spillovers, Glaeser et al searched whether these derive from specialized or diversified local structures and what impact local market competition has upon them. In particular, they used employment and payroll data for the six largest industries in each one of the 170 largest cities of the United States from 1956 to 1987, to run cross-sectional regressions of city-industries in order to examine which of cities the same industry had higher growth rates. The six largest industries were chosen in order to examine the dynamic aspect of agglomeration economies which are crucial for growth. As mentioned above, dynamic externalities, do not have a temporary character and can lead to a continuous reduction of the production cost of a firm. Since static externalities are met in the early stages of the development of an industry and after some period they are exhausted, focusing on mature industries allowed for the estimation of the dynamic ones.

The main variables that they used in his analysis were specialization, diversification and competition indexes testing for externality types of MAR, Jacobs

and Porter respectively. Additionally, as control variables they used wage, city-industry employment, national employment growth on the industries and a dummy variable for geographical distinction of the South.

The results showed that diversification economies have positive impact on employment growth whereas specialization negative. Industries grew faster in cities where they were not overrepresented. The same stood for cities where the size of firms was smaller compared to country average and for cities which were less specialized. As far as local competition is concerned, they found that it affects positively employment growth. These results seem to support Jacob's hypothesis and not MAR. Mixed results were provided as regards Porter's theory since only competition and not specialization was found to favor growth.

Perhaps the most interesting findings were that high levels of employment in an industry are associated with its future growth and that initial wage levels in a city do not affect the future growth of an industry.

When the data were split into manufacturing and non manufacturing industries (services) it was found that significant explanation variables were all but urban variety in manufacturing and all in non manufacturing sector. Moreover, a test was made for MAR effects between industries which were more specialized and export oriented, and industries which were ubiquitous and covered local demand. Again, the results were negative for both cases showing that specialization do not favor growth.

As they mention, a possible objection to the findings could be that during the time period examined, the intense international competition affected negatively the performance of the traditional US industries and this fact had impacts on the results of the analysis. In addition, the sample consisted of mature cities which might be declining and did not include the most growing ones. In the last case, static externalities which could support the MAR aspect might be of utmost importance. Considering that the research was made in mature cities it becomes clear that the same analysis in a different period might had provided different results.

Finally, it should be stressed that as the research team claimed, the findings could be interpreted as a manifestation of the neoclassical model and not as evidence for the existence of externalities. Firms simply move to more diversified areas where they are underrepresented and this can be explained as a locational choice where land and labor are cheaper.

Criticism on the work of Glaeser et al (1992) was made by Henderson (1997) in the light of his older study (Henderson et al, 1995), which had found that MAR and Jacobian externalities matter for high tech industries whilst for the mature ones only the former were important. Criticism was made upon two aspects. Henderson (1997) claimed that the models that have been used failed to isolate externality effects due to agglomerations. Those models might also incorporate fixed or random effects such as local culture, resource endowments, business climate or workforce skills that lead to the rise of employment which are falsely attributed only to agglomeration effects. Secondly, the models do not provide answers as regards the time it takes for the emergence of the externalities.

Henderson (1997), tried to overcome these problems building a panel model and using panel data of employment from 1977-1990, for five two-digit capital-good industries for 742 urban counties. The time lag that was used allowed to look back up to 8 years. To examine the employment growth in the specific industries, were used two groups of explanatory variables. The first group was connected with industrial environment and was expected to explain the existence of MAR and Jacobian externalities. The second one contained two control variables that reflected the local demand for the product.

Henderson investigated for MAR effects using as independent variables the own industry employment and the location quotient as a concentration index. He found intense MAR economies which had a time lag of about 4-6 years. Such changes on the employment of the industry appeared to have greater influence in current employment, as compared to employment changes of the recent past (previous 1-2 years). The same stood for changes in concentration levels. An increase of concentration levels (LQ index) in previous years was found to have greater impact in current employment levels than changes occurred in last 1-2 years. The intensity of MAR effect was justified as he observed that a series of shocks in employment or concentration during the past years would have significant effects in present employment levels. These results were not anticipated since knowledge seems to depreciate as time passes and the newly created one is expected to be more beneficial compared to older one. An explanation that he gave was that possibly, an amount of time was needed in order some ideas to mature and be appropriately exploited by the firms.

To measure diversification economies, Henderson used the Herfindahl - Hirshman-Index (HHI). He found that for all industries this index was statistically

significant, but changes in past diversification levels have less impact in employment changes compared to changes in concentration levels. As regards the time lag of diversification effects, he argued that more time was needed as compared to the specialization ones. The years that were required were more than 7 or 8.

As regards market conditions, the control variables provided interesting results. Market scale, measured by state population or employment in metropolitan area, had a positive effect on immediate employment growth. On the contrary, the wage level of all the other industries affected negatively employment growth in most cases and had a time lag up to 5 years.

In conclusion, Henderson found that both types of externalities mattered for the specific capital good branches that he examined, with the specialization effects being more important to diversification ones. Moreover, the former presented a shorter time lag before they appear. Whatever the case, such lags proved the existence of dynamic externalities when fixed affects are removed through appropriate econometric techniques.

Making a step further from Glaeser et al (1992) and Henderson (1997), Combes (2000) stressed the role of services in modern economies and the different effects that agglomeration externalities may have in this sector. Applying cross sectional regression analysis, he used employment data for 52 industrial and 42 service sectors for 341 employment areas of France from 1984 to 1993. As depended variable, he used employment growth for the years 1993 and 1984. The independent variables concerned diversity, specialization, local competition, the average size of the plants and the size of local economy, all estimated in year 1984.

In this study, Combes estimated two kinds of regressions. Firstly, “global” ones that concerned the totality of the industrial and service sector and secondly, individual regressions for each branch of the sectors. In the period that he examined, the general trend was a reduction in industrial employment at about 15% and an increase in services at about 10%.

Specialization was found to have a negative impact on growth especially for the service sector. For those branches showed an increase in national employment, such results can be interpreted by the product’s life cycle theory, indicating that over the examined period industries matured their production was diffused in space. Thus, low employment growth in concentration areas was explained. As regards branches where national employment decreased (with the most traditional sectors included in this

group), high specialization was considered as an obstacle to firm flexibility and its ability to adapt efficiently in the economic decline.

Diversification had positive effects on services but negative on the industrial sector. However, urbanization effects were weaker compared to localization ones. The positive effects on services can be attributed to the benefits accrued due to the diversified environment, as a result of demand and supply linkages with the other branches. The services that benefit more were the high tech ones which were rather new. The positive, though not significant, effect on some industries revealed the importance of knowledge spillovers among different branches.

Local competition had negative influence in industry and was insignificant for services. Combes argued that this finding indicated that price competition for outputs has dispersive effects upon the firms. The same explanation was given also for the inputs, as competition lead to high wages and rents which push firms out off the cities.

For the density variable, the negative results were interpreted as diseconomies of concentration. The positive relationship on growth that was revealed in some traditional industrial sectors – though not significant - can be attributed to information spillovers that high density induces. Moreover, the few service branches that showed positive relationship were the ones that were not susceptible to high transportation costs or they were non tradable.

Both sectors were affected negatively by the average plant size. Only few service branches had a positive relationship whereas all industrial had negative or insignificant. However, as Combes stated, these results cannot be interpreted as absence of internal economies in firms, since their production function had not been studied. Firm's life-cycle effect could provide some explanations, as was the case of mature firms where employments stabilized and diffusion over space was observed. Consequently, size and employment growth are negatively connected, and this was the case for many industries in the examined period. Moreover, this negative relation can be explained by the fact that small high tech firms, are more flexible and adaptable and so they can save employment in periods of decline as was that time for the industrial sector.

Combes also found that the two sectors examined are very differently affected by the existence of agglomeration externalities. He also saw differences in comparison to studies of US agglomerations and he attributed this fact in the lower factor mobility in France. He also stated that advice on policy issues was difficult to give because the

impact of the externalities depends on the time period examined. Moreover, the elasticities that were calculated revealed that there is not a single variable that has strong effects on employment growth for all sectors. Finally, he claimed that his findings support the convergence hypothesis since concentration was proved to have negative effects in most cases.

3.2 Following Combes

Applying almost the same model as Combes (2000), Suedekum and Blien (2005) estimated the impact of local economic structure upon employment growth in 438 NUTS-3 districts in Germany. The data concerned 15 different manufacturing and 10 service industries from 1993 to 2001. Since they used data for 8 years, the externalities that they revealed can be characterized as dynamic rather than static. The contribution of their work is that they realized that a cross-section analysis using OLS method is not appropriate since the model suffers from inherent heteroscedasticity. The so called “shipbuilding in the midlands” problem is encountered in the data which means that small changes in absolute numbers in branches with relatively low employment may look very big in relative terms and this can give misleading results in the analysis as the distribution of the standard errors is not constant. As a solution to this problem they proposed the use of Weighted Least Square method. The variable that they used to weight the equation was a factor that equals to the employment level of every local industry divided by the aggregate employment in all manufacturing or service industries. The econometric approach that they used is equivalent to a standard GLS-procedure and the variables that they used were almost the same to Combes (2000).

They ran two kinds of regressions, using both the unweighted version of the equation and the weighted one. In the first case the results indicated that MAR externalities had negative effects upon growth in both sectors being more intense in services. The impact of the diversification was insignificant for both sectors. In general, the unweighted model indicated that local economic structure did not affect employment growth. However, when they ran the weighted equation, the results were very different and the influence of local structure upon growth became clear. Jacobian externalities were significant for both sectors, especially for the manufacture. In contrast, MAR externalities were negatively related to manufacture growth but positively to the service sector. Density was found to have negative impact, implying possible congestion problems, as Combes (2000) also had reported, as well as

competition and firm size were also found to have negative impact upon employment growth.

The important point came out of this research was that the choice of the econometric method (OLS or WLS) had a profound impact on the results. It was also revealed that the WLS approach had provided more accurate and safer results.

In a study concerning Italy, Paci and Usai (2005) noticed that few studies on agglomerations, like this of Combes (2000), examined both to manufacture and the service sectors. Even fewer ones use spatial analysis. Trying to fill in this gap, they used data for 784 Local Labour Systems to examine the role of local market structure on employment growth. The analysis was conducted upon 34 sectors, 21 of which were manufacturing and 13 were services, in a two digit aggregation level. The time period of the analysis covered 10 years, from 1991 to 2001 and during this period, overall employment had slightly increased in the country at about 0,7%. The use of spatial econometric analysis was expected to reveal whether the performance of a sector was related to the performance of the sector of the nearby areas.

The depended variable used was employment growth on two digit branches. The independent ones were classified in three categories namely local industry, local level and industry level. The first group contained indexes of specialization (MAR hypothesis), diversification (Jacobian hypothesis) competition (Porter hypothesis) and scale economies. As usual, for the first variable, a specialization index was used and in the other two, the HHI. Scale effects were considered through the number of employees per firm. The second group of variables tried to capture employment changes that were attributed to network externalities, human capital, social capital and labor supply. Network externalities were measured by population density and number of small firms, whereas the quality of human capital was assessed by the level of population with university education. The proxy for the social capital was the number of inter-firm agreements and their participation in consortia, and labor supply was estimated by the workforce proportion in the age 15-65.

The research team tried to include local fixed effects like natural endowments in the panel regression but they finally removed them from other regressions due to the high level of collinearity that they appeared with the variables of the local level indicators.

The industrial level was proxied by the fixed effects in the panel regression and it was used to take under consideration factors that were very important for some sectors but common in all areas.

In the aggregate panel regression in the regional level, which included the country and the macro-regions of North-centre and the South, they found that specialization economies were statistically significant but negative. That could be explained by the life of product theory, as was proposed by Combes (2000), because many of the specialized systems in Italy were in mature and traditional sectors which tend to disperse towards low wages areas, even if they relocated in other countries. Moreover, another explanation could be the economic stagnation of the '90s which led to the reorganization of many sectors. This reorganization resulted to substitution of labor with other factors. On the other hand, diversification effects were important and the same was the case for local competition. Scale effects were not significant for the whole economy but they were proved positive in the North-centre region and negative in the South. Network effects were positive for growth but population density has found insignificant. Human capital was positive and the same stood for labor supply. As regards social capital it was significant in all geographical areas except for the South.

In the sectoral cross section regressions, the use of spatial econometric modeling revealed positive and significant spatial autocorellation in 24 of the 34 sectors. More specifically, in manufacturing spatial dependence was observed in 14 of the 20 examined sectors and in services in 9 of the 13.

Specialization effects were found negative for employment growth in all cases but one. In contrast to aggregate regressions, diversification economies were found to be negative in 19 cases and positive only in 5. The competition coefficient was found negative and significant showing that a competitive environment promotes employment growth. As far as the size of the economy is concerned, it was found significant and negative in 12 sectors and positive in 5. Highly educated human capital was positive in services but negative in many manufacturing branches maybe because they are rather traditional. Finally, social capital was mainly not significant and labour supply was mostly positive especially in services.

In conclusion, localization economies seemed to discourage employment growth and this can be attributed to the time period examined and the restructuring of the industries. On the contrary, growth was caused by diversification and local market

competition. The existence of spatial autocorrelation in most cases showed that the performance of a specific area is affected by the performance of its neighbors.

In a study focusing in 116 German cities, Illy et al (2009) examined the impact of agglomeration economies and city size in employment growth. Their data concerned employment in each firm and the classification used was of this of NACE at NUTS-3 level. In their econometric analysis, they also tested for non linear effects of both specialization and city size variables using quadratic models. Following Suedekum and Blien (2005), they stressed that the model suffers from inherent heteroscedasticity and instead of the OLS method they used a weighed version (WLS). The variable that they used as weight was the employment of the specific region. Trying to include the role of special contiguity in growth they tested for spatial autocorrelation using the Moran's I statistic. For the creation of the weighted matrix the common border criterion was planning regions.

For both sectors, as well as for each one, the unweighted and the weighted models were estimated in order to reveal differences. White test confirmed the existence of heteroscedasticity in the unweighted model. Moreover, the size and the sign of the variables differed showing that the use of each model can lead to different results. Except very few cases, the test for spatial autocorrelation was proved negative meaning lack of spatial interdependencies.

For the sum of the sectors, as regards cities, diversification externalities were proved to be insignificant for employment growth. Interesting results emerged concerning the specialization hypothesis. Although the specialization coefficient was found negative its square was positive providing evidence for the existence of U-shape MAR externalities. City size was found to be insignificant but its square was significant with a negative sign. The sign of density was also negative but this was not the case for competition. The results were almost the same for the upper spatial levels, namely the counties and planning regions.

The regression in the manufacturing sector gave almost the same results with the aggregate regression (of manufacture and services). Diversification was not significant at any spatial level. Specialization mattered only for planning regions but with a negative sign and at positive square form. In cities, only specialization was significant. City size was significant for counties and planning regions and had a positive sign with its square being negative at the same time, providing evidence for an inverted U-shape relationship.

The results in the service sector showed that diversification did not affect employment growth at any spatial level. Specialization showed an inverted U relationship in the cities and remained insignificant for all other spatial levels. Finally, city size was significant and positive only for the counties.

In a third regression model, the authors investigated the differences in the specialization and diversification indexes that occur due to different city size. Using dummy variables, they split their sample into small and big cities, counties and planning regions, keeping as base group for comparisons the middle sized ones. In cities, the agglomeration variables remained insignificant except of the case of the smaller ones, where specialization appeared to have negative impact upon growth. In big planning regions, diversification was found to have positive effect upon employment growth.

To sum up, this study, in contrast to the previous one, found non linear relationships between specialization and employment growth that concerned mainly manufacturing. However, specialization effects concerned cities and regions and not counties. Overall, Jacobian externalities were not observed but their presence could not be rejected for some specific industries. In accordance with the literature, city size was found to have positive impact upon growth but it cannot be claimed that it affects the agglomeration effects as the regression with dummy variables did not show significant differences.

3.2. Conclusions

This selection of six key articles highlights some of the basic issues that concern this research. In all cases economic growth were measured by employment growth. Moreover, localization and urbanization economies were not examined alone but along with other variables that reflect local economic structure. As regards its measuring, the most common indexes were the location quotient and the HHI. The level of the analysis varied from cities to regions and from sectoral to two digit branches employment. The results of the findings varied in each case but generally, specialization was found to have negative effect upon growth whereas the impact of diversification was positive. However, the former were shown to affect growth more than the latter. The inclusion of the service sector as well as the use of spatial econometric techniques, were important breakthroughs in the analysis which are incorporated in this study. Concerning some of the conclusions, the time period examined and the economic structure of each economy were mentioned as important factors that affect the results of the study.

CHAPTER 4: Methodology

The aim of this study is to examine whether specialization or diversification economies are more conducive for economic growth in Greece. In order to achieve this, three kind of econometric models are to be developed. The first concerns linear relationships between variables, where the relative weight of specialization or diversification will be estimated. The second will use polynomial (quadratic) regressions in order to detect for non linear relationships. Finally, spatial econometric models will also be applied.

The analysis can be divided in two parts as regards the level of the spatial units: the Greek prefectures (NUTS–III) and urban areas. In each case, economic activity will be studied at three levels of aggregation. Firstly, at national level, where the overall importance of localization and urbanization economies will be assessed for the whole economy. Second at sectoral level where the three sectors of the economy will be examined and finally at industry level examining the 19 1-digit sections of the NACE classification. However, for the branch D – manufacturing a further division in 2-digit categories will be examined. Manufacturing consists a branch of crucial importance for the economy thus, a more detailed analysis would be useful.

This chapter discusses the data that are used, the specification of the econometric models and the variables employed. Moreover, the need of spatial econometrics is justified and the different models that are used are explained.

4.1. Data

The analysis is based upon employment data from the censuses of 1991 and 2001. The data were provided by the Hellenic Statistical Authority (ELSTAT) and concern permanent employment in the respective years. It should be mentioned that the administrative division of municipalities was not the same in 1991 and 2001 due to the implementation of Kapodistrias Plan in 1997 which merged the 1991 communities into larger municipalities. However, all the available data that were used on the level of urban areas refer to the cities as defined in 2001 including the same settlements for 1991 as well.

The analysis is divided in two segments as regards the spatial level of reference, namely the 51 Greek prefectures (NUTS–III) and cities. The latter was defined as urban settlements of a certain size and economic scope that enable them to exhibit

agglomeration economies. Thus, the sample used contains 60 observations (Table 1 of the appendix) which are:

- the capitals of the prefectures,
- all cities with size that exceeds the capital of the prefecture they belong (in terms of permanent employment level), something that adds into the sample the agglomeration of Agrinio (Aitolokarnanias Prefecture), the municipality of Argos (Argolidos Prefecture), the municipality of Thivaion (Voiotias Prefecture), the municipality of Ierapetra (Lasithiou Prefecture), the municipality of Giannitsa (Pellas Prefecture) and the municipality of Moudania (Chalkidiki Prefecture).
- any other cities that have employment more than 60% of the largest city in the prefecture and a population above 10.000 inhabitants so as they are characterized as urban centers. This adds three more municipalities: Ptolemaidas (Kozanis Prefecture), Amaliadas (Ilias Prefecture) and Aridaias (Pellas Prefecture). It was found that if the employment threshold was set in 50% of the biggest city, 7 more observations would be added.

It should be mentioned that there were considerable difficulties in determining urban agglomerations mainly due to the substantial changes in urban areas caused by the reorganization of Kapodistrias plan.

4.2. Specification of variables

As dependent variable we use employment growth. This is defined as the quotient between the employment growth of sector/branch s in spatial unit z between 1991 and 2001 and the national employment growth of this sector in Greece during the same period.

$$y_{zs} = \frac{emp_{z,s,2001} / emp_{z,s,1991}}{emp_{s,2001} / emp_{s,1991}}$$

Employment growth is the most commonly used dependent variable mainly due to the availability of such data (Beaudry and Schiffauerova, 2008). Other depended variables used as proxy for economic growth are the number of new firms, wage growth, plant size, number of employees per firm, number of plants or number of employees per area (Beaudry and Schiffauerova, 2008). The use of this proxy is based on the assumption

that labour is a homogenous input and it is free to move across the country. However, as Almeida (2006) argues this assumption is far from reality. Moreover she stresses that in order employment growth to reflect growth in productivity, these two variables should covary across regions, something that is not always the case due to migration effects, for instance.

The normalization with the national employment growth is used in order to indicate how much higher or lower is the growth of the sector compared to the national. In regressions on each branch, this normalization only changes the intercept, but differences are important as regards sectoral regressions (Combes, 2000). Naturally, regarding the analysis at national level, employment growth was not normalized.

As a measure of MAR externalities the Location Quotient index is used for the analysis at the level of sector or branch. Glaesser et al. (1992) indicated that this index is the most appropriate to reflect the degree of interaction among firms. Although this is the most widely used index in related studies (Beaudry and Schiffauerova, 2008) it does not lack criticism. As Ejermo (2005) argues, this index depends on the size of the region. The second most commonly used index is own industry employment, meaning the absolute size of the industry. It is claimed that this index can be more appropriate, as localization externalities depend on the absolute and not the relative size of an industry (Beaudry and Schiffauerova, 2008).

The LQ index is the ratio of the employment share of sector/branch s in spatial unit z divided by this ratio at the national level. Prices above the unit indicate that the spatial unit is relatively specialized in the specific sector.

$$spe_{z,s} = \frac{emp_{z,s}/emp_z}{emp_s/emp}$$

As regards MAR externalities at national level, the Krugman Specialization Index (KSI) was used. The KSI of a spatial unit z arises from the sum of the absolute values of the differences of the share of employment of an industry s in the specific spatial unit ($Emp_{z,s}/Emp_z$) and the share of employment of the industry s in overall country (Emp_s/emp). The values of KSI range from 0 to 2. A high KSI indicates a strong deviation from the overall economic structure (Greece). A KSI of zero corresponds to an identical

industry structure of the spatial unit and Greece. The index is calculated from the formula:

$$KSI_z = \sum_{s=1}^S \left| \frac{Emp_{z,s}}{Emp_z} \frac{Emp_s}{Emp} \right|$$

The Jacobian externalities are examined with the use of inversed Herfindahl – Hirshman - Index (HHI). This is the most commonly used index in related studies (Beaudry and Schiffauerova, 2008). Other indicators used are industry employment, Gini index, total urban area population or total local employment. Criticism on the HHI index concerns that it considers all that branches of the economy affect each other equally and does not considers possible complementarities or differences (Beaudry and Schiffauerova, 2008).

This HHI index increases with local diversity thus, a positive sign is expected as economic growth depends on local demand and the more diversified the environment is, the higher the expected demand (Beaudry and Schiffauerova, 2008). If all surrounding industries account for an identical employment the index reaches its maximum (Suedecum and Blien, 2005). Again, this variable is normalized by the same variable calculated for Greece.

$$div_{z,s} = \frac{1/\sum_{s'=1, s' \neq s}^S [emp_{z,s'}/(emp_z - emp_{z,s})]^2}{1/\sum_{s'=1, s' \neq s}^S [emp_{s'}/(emp - emp_s)]^2}$$

As regards analysis in national level, the inversed HHI index is used but this time it is not normalized.

An additional variable that is used is density which signifies the impact of the size of local economy on employment growth.

$$den_z = \frac{emp_z}{area_z}$$

In the case of urban centers the area under consideration is the total area of settlements comprising the city as defined in the 1991 census. The size of the economy affects the locational choices of firms and therefore it represent another type of urbanization economies, complementary to diversification (Combes, 2000). High densities induce better quality and higher levels of knowledge spillovers since they guarantee a sufficient

size of local economy and indicate proximity of economic units. Large markets attract firms since they provide a variety of suppliers and customers. Furthermore, the higher the densities observed, the lower the product distribution cost on behalf of the firms are. On the other hand, the size of the market is connected with a series of negative effects, such as land rents, pollution, congestion that act as centripetal forces. It is expected that this variable is positive up to a certain level.

4.3. Linear model

In all regressions, the depended variable, which is the rate of employment growth, is estimated for the period 1991 -2001. The independent variables of specialization, diversification and density are estimated for the base year, 1991. The econometric model that is used for the following:

$$\log(y_{z,s}) = c + \alpha_1 \log(\text{spe}_{z,s}) + \alpha_2 \log(\text{div}_{z,s}) + \alpha_3 \log(\text{den}_{z,s}) + \varepsilon_{z,s}$$

All the values of the variables are in logarithms so that the estimated coefficients represent elasticities.

The econometric model can be estimated with the use of the standard Ordinary Least Square method (OLS). However, as Suedecum and Blien (2005) have shown, such an approach suffers from inherent heteroskedasticity. As a result, the estimated coefficients are not efficient even though they remain unbiased and consistent. The so called “shipbuilding in the midlands” problem is encountered since in branches with low employment in absolute values, small changes will appear too big in relative values. This fact leads to a non constant variance of the error term. To deal with this problem a Weighted Least Square (WLS) method was applied each time that heteroskedasticity problems were encountered. The weighting is achieved if all coefficients are multiplied by a factor $g_{z,s}$ which equals to the employment of each branch of the spatial unit divided by aggregate employment in the respective sector emp_{aggr} .

Consequently, the model that is estimated is the following:

$$g_{z,s} \cdot \log(y_{z,s}) = g_{z,s} \cdot c + g_{z,s} \cdot \alpha_1 \cdot \log(\text{spe}_{z,s}) + g_{z,s} \cdot \alpha_2 \cdot \log(\text{div}_{z,s}) + g_{z,s} \cdot \alpha_3 \cdot \log(\text{den}_{z,s}) + e_{z,s}$$

Where $g_{z,s} = \text{emp}_{z,s} / \text{emp}_{\text{aggr}}$ is the weight factor and $e_{z,s} = g_{z,s} \cdot \varepsilon_{z,s}$ is the error term.

However, it is possible that heteroskedasticity is still present leading to erroneous estimates, even after the use of a weighted model. This is likely to happen when the form of heteroskedasticity is not known. In this case, EViews software allows the correction of the estimations with the use of White heteroskedasticity consistent covariances correction method instead of the OLS formula.

4.4. Quadratic model

Apart from the linear regressions, this study searched for the existence of U-shape relations in the examined independent variables. This would happen when a negative coefficient of a variable is combined with a positive one of its quadratic form. In this case, low levels of the examined variable affect growth negatively but in high levels the influence becomes positive. If the inverse happens, the relation is of an inverted U. Thus, the models used in order to detect such phenomena are the following:

$$\log(y_{z,s}) = c + \alpha_1 \log(\text{spe}_{z,s}) + \alpha_2 \log(\text{spe}_{z,s})^2 + e_{s,z}$$

$$\log(y_{z,s}) = c + \alpha_3 \log(\text{div}_{z,s}) + \alpha_4 \log(\text{div}_{z,s})^2 + e_{s,z}$$

$$\log(y_{z,s}) = c + \alpha_5 \log(\text{den}_{z,s}) + \alpha_6 \log(\text{den}_{z,s})^2 + e_{s,z}$$

where $e_{s,z}$ is the error term.

4.5. Spatial econometrics

Luc Anselin (1988) defined spatial econometrics as “the collection of techniques that deal with the peculiarities caused by space in the statistical analysis of regional science models”. These techniques are different from the traditional econometric analysis which does not deal with the problems that arise once space is incorporated in the analysis (LeSage, 1999). Indeed, traditional econometric analysis has focused on the temporal rather spatial dimensions of economic phenomena (Anselin και Bera, 1998). However, spatial interconnection is more complex compared to time interconnection as, for instance, it can imply a two-way interrelation (place A affects place B and vice versa) whereas temporal data imply a one way interrelation (time point t_n is affected by t_{n-1}).

Although the first studies of Moran, Geary, and Whittle date back to the 1940s and 1950s, this field of analysis started to develop no sooner than the 1990s (Florax and Van Der Vlist, 2003). Classical and neoclassical economists have neglected the

influence of space in their analysis and as Israd stated (1956) they are confined to analyzing a “wonderland of no spatial dimensions”. Moreover, the unavailability of spatial data as well as the few software programs that allowed the calculation of spatial techniques, hindered the development of spatial economic analysis (Florax and Van Der Vlist, 2003). Nowadays, the advances in the software concerning spatial econometric analysis render such analysis much more feasible than in the past (Florax and Van Der Vlist, 2003).

4.5.1. Spatial effects

Spatial data are different from non-spatial due to the “spatial effects” that they entail. These are “spatial autocorrelation” or “spatial dependence” and “spatial heterogeneity” (Anselin, 1988). The traditional econometric analysis had ignored these elements maybe because the violated the assumptions of the Gauss-Markov regression model (LeSage, 1999). The very existence of these “peculiarities” of space renders the development of spatial econometric modeling imperative for the study of regional economic analysis.

The concept of spatial dependence means that the observation at location i depend on other observation at location $j \neq i$. Alternatively, it can be stated as:

$$y_i = f(y_j), i = 1, \dots, n \quad j \neq i$$

Spatial dependence violates the Gauss - Markov assumption that the explanatory variables are fixed in repeated sampling, thus it renders the application of traditional econometric analysis problematic (LeSage, 1999). Its existence can be explained by two reasons. First, it can be caused by measurement fallacies, as administrative boundaries, where data are available, cut space into pieces and this artificial segmentation might influence the analysis of the economic phenomena. For instance, if some people live in region A and work in region B the employment rate of the former region will be overestimated. The second is that, as regional science argues, economic activity is influenced by distance and location and this generates spatial interactions, diffusion effects and spatial spillovers which lead to the existence of spatial dependency (LeSage, 1999). In general, it can be claimed that the concept of spatial dependence is based on Tobler’s 1st law of geography which states that “everything is related to everything else but nearby things are more related than distant things (Tobler, 1979).

The concept of spatial heterogeneity is less clear and less frequently used compared to spatial dependence (Artelaris, 2009). It refers to variation in relationships

across space (LeSage, 1999) and implies the existence of heteroskedasticity or non constant variable coefficients (Anselin, 1999). The reason can be the different behavior of spatial units as it happens in the case of the North-South or centre-periphery model (Artelaris, 2009). This violates the Gauss - Markov assumption that a single linear relationship with constant variance exists across the sample data observations. These problems could be dealt with the use of traditional econometric techniques however there are reasons why they should be treated in the context of spatial econometrics. First, because the causes of these instabilities are spatial, meaning that the data have a reference in different locations and second because many times spatial heterogeneity is observed along with spatial dependence something that makes the use of spatial econometric techniques imperative (Anselin, 1999).

4.5.2. Spatial weighting

In order to deal with the problems that “spatial effects” generate, the influence of space should be incorporated in the econometric analysis. This is achieved with the creation of a spatial weights matrix (W) that specifies the degree of interdependence among observations. This matrix represents the assumed spatial relations of the different points or areas across space. These relations are not estimated but taken as known and this could be a point of criticism upon the various models. However, even if this is a strong assumption with a degree of arbitrariness, it is better than assuming non spatial relation among the data. This matrix is used as a variable in the econometric modeling which tries to capture the “spatial effects” of the data.

The spatial weights matrix has dimension $N \times N$, where N is the number of observations. Each element of the matrix represents the spatial relationship between a spatial unit i and the rest (j). There are two possibilities: j is regarded as “neighbor” of i and the respective element of the matrix takes the value 1, or j is not considered as a “neighbor” and the value in the matrix is 0. Obviously, the elements of the diagonal equal to zero since a spatial unit cannot have as neighbor itself. It can be expressed as:

$$w_{ij} = \begin{cases} 1 & \text{for } i \in J \\ 0 & \text{for } i \notin J \end{cases}, w_{ii} = 0, \forall i$$

Various criteria of contiguity exist that determine which spatial units will be considered as neighbors according to LeSage (1999). The two types that GeoDa software uses are:

1. Rook contiguity: $w_{ij}=1$ for counties that share a common side with the spatial unit of interest.

2. Queen contiguity: $w_{ij}=1$ for counties that share a common side or vertex with the spatial unit of interest.

Apart from contiguity, neighboring can be judged on the basis of the distance between spatial units. In these matrixes, the spatial units are taken as points and they are considered neighbors if the distance between them is less than a maximum value $d_i(k)$ determined by the researcher. These matrixes take the form:

$$w_{ij}(k) = \begin{cases} 0 & i = j, \forall k \\ 1 & \text{if } d_{ij} \leq d_i(k) \\ 0 & d_{ij} > d_i(k) \end{cases}$$

Both the contiguity and distance matrixes should be row standardized in order to provide reasonable results.

However, apart from these main two criteria, many other can be applied. The a priori determination of the number of neighbors can be another choice. Moreover, the concept of distance does not have to refer only to geographical distance but it may concern other social or economic criteria which determine how close or far are two spatial units (Artelaris, 2009).

4.5.3. Detection of spatial autocorrelation

A commonly used test for the detection of spatial dependence is the value of the index of Moran's I. The values of the index range between -1 and 1 whereas its expected value is:

$$E(I) = -\frac{1}{(n-1)}$$

Where n the sum of the examined observations. The null hypothesis $H_0 = E(I)$ (Cliff και Ord, 1981, Anselin, 1988) is tested against the alternative H_1 . If the null hypothesis is not rejected, then spatial autocorrelation does not exist. On the contrary if $I > E(I)$ then there exists positive spatial autocorrelation implying the clustering of similar spatial units. If $I < E(I)$ then negative spatial autocorrelation exists meaning that dissimilar spatial units tend to cluster.

The Moran's I belongs to the category of indexes that test for spatial autocorrelation on the residuals of the model. Its use is not without problems. Its main disadvantage is that its results vary on which criterion is used (Artelaris, 2009). If another assumption is made, giving another W, different results may emerge. Moreover,

it does not indicate any kind of spatial dependence, and so it does not show which econometric model is more suitable to deal with spatial autocorrelation (Artelaris, 2009). In addition, it assumes a normal distribution of the residuals something that is not always the case, especially for small samples (Artelaris, 2009).

The most widely test was proposed by Anselin (1988) and tests for spatial autocorrelation on the spatial lagged variable, based upon the principle of Lagrange Multiplier (LM test). Its main advantage is that it reveals the structure of autocorrelation and leads to the choice of the most appropriate model, (that is the spatial lag or the spatial error model), to deal with spatial dependence. Compared to Moran's I, it provides better results in medium and big samples, whereas in small ones, the Moran's I is expected to perform better (Artelaris, 2009). However, of the assumption of normal distribution of the residuals restricts its explanatory ability. To overcome this problem, a test of Kelejian and Robinson (1992) has been proposed that is not based on this assumption but this test is not included in the analysis of this dissertation as it is not calculated by GeoDa software.

4.5.4. Spatial regression models

Spatial dependence can be incorporated in the standard linear regression model in two ways: adding an explanatory variable in the form of a spatially lagged dependent variable, or in the error structure (Anselin, 1988). The first deals with the spatial interaction of the variable of interest, e.g. the dependent variable of the regression model. This model assumes that dependencies exist directly among the levels of the dependent variable. A new independent variable is added which is connected with the dependent one through the spatial weight matrix. This model is called spatial autoregressive model (SAR) or spatial lag model and it takes the following form:

$$Y = \rho W y + X\beta + u,$$

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

Where Y is a $n \times 1$ vector of the dependent variable, Wy is a spatially lagged dependent variable for spatial weights matrix W , ρ is the scalar for spatial lag coefficient, β is the $k \times 1$ parameter vector, X is the $n \times k$ matrix of exogenous explanatory variables, u is an $n \times 1$ vector of normally distributed error terms with zero mean and variance σ^2 . The spatial lag Wy can be considered as a spatially weighted average of the dependent variable at neighboring counties. The sign of ρ determines the kind of spatial

dependence: for $\rho > 0$ there is positive spatial autocorrelation, $\rho < 0$ implies negative and no correlation exists if $\rho = 0$. It should be noticed that if the spatial lag is not included in the model the parameters of the model will be biased and inconsistent (Anselin, 1998).

The second model implies that spatial dependence exists between the ignored variables in the model. It incorporates spatial effects through the error term. This model is called spatial error model and takes the following form:

$$Y = X\beta + u,$$

$$u = \lambda Wu + \varepsilon$$

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

If $\lambda > 0$ the error terms are positively correlated, if $\lambda < 0$ the correlation is negative and for $\lambda = 0$ there is no spatial correlation. In contrast to the previous model, if spatial dependence is ignored, the coefficient estimation will not be biased but they will not be consistent. This will lead to erroneous interpretations and wrong conclusions (Anselin et al, 1998).

4.5.5. Estimation of the spatial econometric models

If the OLS method is used, the ignorance of spatial effects will lead to erroneous interpretations of the coefficients, as already mentioned. That is why such models are estimated with the maximum likelihood method. This way, the coefficients will be consistent, asymptotically effective and most of the times unbiased (Artelaris, 2009).

4.6. Conclusions

In this part, were presented the data and the econometric models that that will be used in the analysis. The data concern permanent employment up to a 2-digit classification of NACE (STAKOD) for the years 1991 and 2001. The econometric models include linear, quadratic and spatial forms according the objectives specified in chapter 1: comparison of the relative impact of localization and urbanization economies upon growth, detection for U-shape relations and possible existence of spatial autocorrelation. The variables that were chosen are the most commonly used in related studies. Economic growth, the dependent variable, is proxied by as employment growth, specialization (localization economies) by the location quotient index, diversification

(urbanization economies) by the Herfindahl-Hirschman Index and city size with density. The results of the analysis are presented in the following chapter.

CHAPTER 5: Specialization and diversification in Greece

In this chapter, is made the analysis regarding the intensity of localization and urbanization economies in Greece. The chapter is divided in four sections. The first two, present the results for the 51 Greek prefectures and 60 selected urban centers in three levels; the whole economy each sector of the economy and each industry (1-digit and 2-digit branches).

The number of the 1-digit branches according to classifications by NACE (STAKOD) is 17. The first three refer to the primary sector, next three to the secondary and the rest to the tertiary. As regards secondary sector, a further division is made in 14 2-digit branches. In each case, the results indicate the impact of localization and urbanization economies upon employment growth. In the third section, the findings of the quadratic regressions are discussed. The objective of this section is to detect for U-shape relations between the examined variables and growth in Greek prefectures and urban centers. Finally, the spatial econometric analysis is presented only as regards Greek prefectures¹.

5.1. Analysis of Greek Prefectures

The permanent population and employment data for the Greek Prefectures in 1991 and 2001 are presented in table 2 and table 3 on the appendix. Over the decade, the percentage of permanent employment compared to permanent population rose from 34,7% to 37,5% something that implies the growth of the Greek economy. In this section, the analysis of Greek prefectures is made as regards the three levels of economy: national sectoral and 1-digit branch. Table 1 presents the 1-2 digit branches according to NACE (STAKOD) classification. Table 2 contains the totality of the regressions concerning the 51 Greek Prefectures where statistical significant relations were observed and table 4 on the appendix presents some descriptive statistics of employment.

¹ A similar analysis for urban centers was not made since there would be problems of defining the neighboring criterion. In urban centers, the most appropriate would concern distance instead of the “common border” that is used in the “queen contiguity” criterion in the case of the prefectures. The unavailability of such data rendered the analysis unfeasible.

Table 1: STAKOD classification

STAKO D - 03	HEADING
A	AGRICULTURE, ANIMAL HUSBANDRY, HUNTING AND FORESTRY
B	FISHING
C	MINING AND QUARRYING
D	MANUFACTURING
DA	MANUFACTURE OF FOOD PRODUCTS, BEVERAGES AND TOBACCO
DB	MANUFACTURE OF TEXTILES AND TEXTILE PRODUCTS
DC	MANUFACTURE OF LEATHER AND LEATHER PRODUCTS
DD	MANUFACTURE OF WOOD AND WOOD PRODUCTS
DE	MANUFACTURE OF PULP, PAPER AND PAPER PRODUCTS; PUBLISHING AND PRINTING
DST	MANUFACTURE OF COKE, REFINED PETROLEUM PRODUCTS AND NUCLEAR FUEL
DZ	MANUFACTURE OF CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
DH	MANUFACTURE OF RUBBER AND PLASTIC PRODUCTS
DU	MANUFACTURE OF OTHER NON-METALLIC MINERAL PRODUCTS
DI	MANUFACTURE OF BASIC METALS AND FABRICATED METAL PRODUCTS
DK	MANUFACTURE OF MACHINERY AND EQUIPMENT N.E.C.
DL	MANUFACTURE OF ELECTRICAL AND OPTICAL EQUIPMENT
DM	MANUFACTURE OF TRANSPORT EQUIPMENT
DN	MANUFACTURING N.E.C.
E	ELECTRICITY, GAS AND WATER SUPPLY
ST	CONSTRUCTION
Z	WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES, MOTORCYCLES AND PERSONAL AND HOUSEHOLD GOODS
H	HOTELS AND RESTAURANTS
U	TRANSPORT, STORAGE AND COMMUNICATION
I	FINANCIAL INTERMEDIATION
K	REAL ESTATE, RENTING AND BUSINESS ACTIVITIES
L	PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY
M	EDUCATION
N	HEALTH AND SOCIAL WORK
J	OTHER COMMUNITY, SOCIAL AND PERSONAL SERVICE ACTIVITIES
O	PRIVATE HOUSEHOLDS EMPLOYING DOMESTIC STAFF AND UNDIFFERENTIATED PRODUCTION ACTIVITIES OF HOUSEHOLDS FOR OWN USE
P	EXTRA-TERRITORIAL ORGANIZATIONS AND BODIES

Source: ELSTAT

Table 2: Regression results for the Greek prefectures

Level of analysis	Significant variables			Adjusted R ²
	Specialization	Diversification	Density	
Whole economy	-0.0546 **		0.0160 *	0.1274
Whole economy		0.0491 ***		0.1438
Sectors				
primary	-0.0839 **			0.0862
primary			0.0721 **	0.0671
secondary ¹	-0.3038 ***			0.2784
tertiary				
Branches				
A	-0.0810 **			0.0653
B ¹	-0.1425 **	0.3114 **	-0.2480 *	0.2080
C	-0.1833 ***			0.1496
D	-0.0631 ***	-0.1757 ***		0.2030
DA	-0.1653 **			0.0976
DB ¹	-0.5710 ***	-0.4310 **	0.2773 **	0.1425
DC	-0.2123 **			0.0478
DD	-0.4343 ***			0.3007
DE	-0.2330 ***	0.2398 **		0.3052
DST				-
DZ	-0.3056 ***			0.1601
DH				-
DU	-0.2889 ***			0.2842
DI				-
DK	-0.0211 *	-0.2268 ***		0.0516
DL	-0.1074 **			0.0764
DM	-0.3714 ***	-0.0802 *		0.4440
DN	-0.1790 **			0.0774
E	-0.1373 **	-0.2687 ***		0.1254
ST ¹	-0.2191 ***	0.0881 ***		0.1423
Z	-0.2540 **	0.1051 **		0.1089
H	-0.1160 **			0.0985
U			0.0517 ***	0.1253
U		0.0615 *		0.0341
I				-
K	-0.2533 ***	0.1532 ***		0.2764
L				-
M ¹		0.0508 **	0.0121 **	0.0963
N	-0.1403 ***			0.0682
J	-0.3922 ***	0.1930 ***		0.1660
O				-

Source: Author's calculations.

* significant at 10%.

** significant at 5%.

*** significant at 1%.

¹ The results after the correction with White heteroskedasticity consistent covariances method.

5.1.1. Employment analysis for the economy as a whole

As regards employment growth of the economy as a whole, it was risen by 15,35%. All but four prefectures (Aitolokarnanias, Kastorias, Serron, Arkadias) presented positive employment growth over the examined period as shown in table 5 on the appendix. However, compared to the national employment growth, only 13 prefectures performed above average. It is noteworthy that 9 out of these 13 prefectures, were islands, (the 4 in mainland were of Attikis, Thessalonikis, Magnisias and Korinthias).

Employment growth can be explained by two models. In a model including the specialization and density variable, the adjusted R^2 is about 12%, implying that there are other variables that explain employment growth. The specialization variable was found to have a negative impact upon employment growth, whereas density was found positive. At the second model only diversification was significant giving an adjusted R^2 of about 14% and a positive elasticity. These findings indicate the localization economies have a negative impact on growth whereas the size of the total economy as well as diversification have positive. However, the absolute values of the elasticities were low indicating than changes in the respective variables are not expected to have much influence upon employment growth.

5.1.2. Sectoral employment analysis

In this section, are examined the three sectors of the economy. Growth rates are presented in table 6 in the appendix and in table 7 are the values of specialization and diversification indexes.

Primary Sector

The employment of primary sector in the country shrank by 12% in the period examined and by 23% as compared to the national growth rate. Only 8 prefectures increased their employment in absolute terms whereas in other 14 prefectures the reduction was less than the national one. In all other cases the reduction was more than the national reduction of the sector. As regards specialization, 44 out of the 51 prefectures were found to be specialized in the primary sector something the shows the dominance of agriculture upon the Greek economy.

Two separate regressions provided significant results but both exhibited low R^2 values. The first contained the specification variable which was found to have negative impact upon growth ($R^2 = 8,6\%$) and the other contained the density variable which was found to have positive coefficient ($R^2 = 6,7\%$). As a result, it can be claimed that the

localization economies have a negative impact on employment growth whereas size of local economy has positive but they do not affect growth at great extend it in a big extend as the elasticities show.

Secondary sector

Over the examined decade, the employment of the secondary sector grew by 6%. However, compared to the national average it showed a relative decline of 9%. The number of prefectures that had a positive growth was 31 but only in 24 of them this growth was above the national average. Concerning the degree of specialization, 13 prefectures had the location quotient index above 1.

The unweighted data presented significant heteroskedasticity which did not disappear even after weighting the variables. The problem was solved using the White heteroskedasticity consistent covariances correction method. The only model which provided significant coefficients was a simple regression including only the variable of specialization. The R^2 was 27,8% and the elasticity of specialization had a negative sign with an absolute value of 0,3. This result shows that localization economies have an important negative effect upon the growth of the sector.

Tertiary sector

The tertiary sector raised its employment at about 33% over the period examined. In comparison to the national sectoral growth this rise was about 13%. All prefectures had positive growth, but in less than half (22) the growth was over the national average. Only 6 prefectures were found to be specialized in the tertiary sector.

For this sector, none of the variables was found significant. This means that it is not affected by localization and urbanization economies or size.

5.1.3. Analysis of the employment of the branches

In this section the 17 branches of the economy according to the STAKOD classification are examined. Furthermore, as regards the 4th branch, manufacturing, the data are further divided providing 14 more categories. Growth rates are presented in tables 8-11 of the appendix and the values of specialization and diversification indexes are shown in tables 12-15.

Branch A – Agriculture animal husbandry, hunting and forestry.

In this branch, employment declined by 15% over the examined period. However, compared to the national employment growth there was a relative reduction of 24%. Employment rose in 8 prefectures and in 24 of them the decline was less than the

national average. Regarding the degree of specialization, 43 prefectures were found specialized in this branch.

In this branch, the only significant independent variable was specialization which had a negative sign. However, the regression presented a low R^2 about 6,5%. This means that to the low degree that localization economies can explain employment growth, they have a negative influence.

Branch B – Fishing

The employment growth of fishing was approximately 27% over the examined period. Compared to the national employment growth, the rise was about 10%. In 38 prefectures there was a positive growth rate but compared to the national growth of the branch, only 26 prefectures had a positive performance. As regards specialization, 26 prefectures were found specialized in this branch.

The data presented heteroskedasticity which was not solved even with the weighted regression model. After the correction with the White heteroskedasticity consistent covariances method all the variables were found significant providing an adjusted R^2 about 20%. The elasticity of specialization was found negative whereas diversification was found to have a positive influence. Density had also a negative elasticity. These results indicate negative influence of localization economies and economy size but positive as regards urbanization economies.

Branch C – Mining and quarrying

In this branch, employment shrank at 25% over the examined period. Compared to national employment growth, the relative reduction was higher, approximately 35%. In 17 prefectures employment rose whereas in other 15 the relative reduction was less than national decline of the branch. Fifteen prefectures were found to be specialized in mining and quarrying.

The regression that provided significant results was a simple model with specialization being the only independent variable. The elasticity had a negative sign implying a negative influence of localization economies. The R^2 was about 14%.

Branch D – Manufacturing

From 1991 to 2001, manufacturing presented a small decline in employment, approximately 5%. Compared to national employment growth rate this decline was higher, about 20%. In 20 prefectures positive growth was observed and in 29 the decline was less than national average of the branch. In manufacturing there were 12 prefectures specialized.

The regressions revealed that both specialization and diversification have negative impact upon employment growth. What is more, the absolute value of the diversification coefficient was much higher than the specialization one, implying that urbanization economies affect manufacturing growth more than the localization ones. The adjusted R^2 of the regression was 20% showing that these variables can explain a significant portion of employment growth.

Branch DA – Manufacturing of food products, beverages and tobacco

In this branch, employment grew by 21% and compared to national growth rate about 5%. In 45 prefectures employment was increased and in 26 cases this rise was above the national rate of the branch. It was found that 21 prefectures were specialized in this branch.

Specialization was found to be the only significant variable that could explain employment growth, having an R^2 of about 10%. The negative sign of the coefficient implies that localization economies have negative impact on employment growth.

Branch DB – Manufacture of textiles and textile products

In this branch was observed a decline in employment by 41%, which compared to the national employment growth was even higher, at 49%. Only in one prefecture employment grew and in other 15 the decline was less than national rate of the branch. It was found that 15 prefectures were specialized in this branch.

The original model presented heteroskedasticity which did not disappear after using the weighted version. The problem was solved with the use of the White heteroskedasticity consistent covariances method. All variables were found significant for the explanation of employment growth. The coefficient of specialization and diversification were negative implying negative impact of localization and urbanization economies. The size of the local economy was found to have a positive effect as the coefficient of density was positive. The most important of the three was specialization and the least was density as the absolute values of the coefficients revealed. The adjusted R^2 of the regression was about 14%.

Branch DC – Manufacture of leather and leather products

Employment growth rate in this branch was reduced by 41% and compared to the national level the reduction was about 49%. Employment grew in 5 prefectures and in 13 the decline was less than national rate of the branch. Two prefectures were found to be specialized in this branch.

Specialization was the only significant variable and its negative elasticity indicates that localization economies have negative impact on growth. The estimated R^2 was quite low, about 5%.

Branch DD – Manufacture of wood and wood products

Employment growth in this branch coincided with national employment growth rate of the branch, at 16%. Growth was observed in 35 cases and in 27 it exceeded national rate of the branch. It was found that 26 prefectures were specialized in this branch.

The specialization coefficient was the only significant one. It had a negative coefficient and its high absolute value indicates the great impact of localization economies on growth. The R^2 of the regression was about 30%.

Branch DE – Manufacture of pulp, paper and paper products; publishing and printing

Employment in this branch grew by 40% but this figure is reduced to the half compared with the national employment growth. In 48 cases employment rose and in 37 of them it was above national rate of the branch. Four prefectures were found to be specialized in this branch.

Both the specialization and diversification variables were found significant and they had almost the same absolute values. This means that localization and urbanization economies had almost the same influence on growth but the former affect it negatively whereas the latter positively. The adjusted R^2 of the regression was about 30%.

Branch DST – Manufacture of coke, refined petroleum products and nuclear fuel

In this case, employment grew by 23%. Compared to the national employment rate, growth was about 7%. In 33 prefectures employment rose and in 31 of them the increase was higher than national growth rate of the branch. It was found that 4 prefectures were specialized in this branch.

None of the variables was found significant for the explanation of employment growth. This means that this branch is affected neither by localization and urbanization economies nor city size.

Branch DZ – Manufacture of chemicals, chemical products and man-made fibres

This branch presented employment growth of about 20%. Compared to national employment growth rate, the growth was 4%. In 39 prefectures employment grew and in 34 of them it was above national growth rate of the branch. Five prefectures were found to be specialized in this branch.

Localization economies were significant and had a negative impact on growth as elasticity of specialization coefficient implies. Its high absolute value indicates a strong influence and the R^2 of the regression is about 16%.

Branch DH – Manufacture of rubber and plastic products

Growth in this sector was at 16% but compared to national employment growth it was only 1%. Employment rose in 28 prefectures and in 23 of them the increase was above national growth rate of the branch. It was found that 8 prefectures were specialized in this branch.

None of the variables was found significant for the explanation of employment growth. As a result, it can be claimed that localization economies, urbanization economies and city size do not affect growth.

Branch DU – Manufacture of other non-metallic mineral products

Employment grew marginally in this branch, by 2%. This low growth results in negative rise of 12% as compared to national employment growth rate. Employment grew in 32 cases and in 31 of them it was above national growth rate of the branch. It was found that 10 prefectures were specialized in this branch.

Specialization was the only variable that was found significant giving an R^2 of 28%. The negative sign of the coefficient implies negative impact of localization economies and its high absolute value reveals a strong influence.

Branch DI – Manufacture of basic metals and fabricated metal products

The rise of employment in this sector was 13% but compared to national growth rate there was a reduction by 2%. In 35 prefectures employment grew and in 25 of them the increase was above national rate of the branch. It was found that 9 prefectures were specialized in this branch.

Neither localization and urbanization economies, nor the size of the local economy were shown to affect employment growth, since none of the specialization, diversification and density variables were found significant.

Branch DK – Manufacture of machinery and equipment NEC

In this sector, employment grew by 14% but compared to national employment growth was observed a marginal decline by 1%. In 38 prefectures employment grew and in 30 of them, the rise exceeded national growth rate of the branch. Six prefectures were found to be specialized in this branch.

Both specialization and diversification variables were found significant in the explanation of employment growth. However, the adjusted R^2 of the regression was

very low, at about 4%. Both had negative coefficients and the impact of diversification was much higher than specialization.

Branch DL – Manufacture of electrical and optical equipment

The rise of employment in this branch was 24% but compared to national employment growth rate it was 7%. In 39 cases employment growth was positive and in 29 of them it was higher than national growth rate of the branch. It was found that 5 prefectures were specialized in this branch.

The only variable that could explain employment growth was specialization but at a minor degree ($R^2 = 7\%$). The negative coefficient means that the impact of localization economies on growth was negative.

Branch DM – Manufacture of transport equipment

In this branch, employment shrunk by 15% and compared to national employment growth the reduction was 27%. Employment grew in 36 prefectures and in other 4 the decline was less than the national employment reduction rate of the branch. Five prefectures were found to be specialized in this branch.

Both specialization and diversification variables were found to affect significantly employment growth giving a high adjusted R^2 of about 44%. The negative coefficients mean that the impact of localization and urbanization economies on growth was negative. Regarding their absolute values it is apparent that the former have much bigger effect than the latter.

Branch DN – Manufacturing NEC

Employment in this branch was reduced by 12% and compared to national employment growth the reduction was estimated at 24%. Employment grew in 12 cases and in other 11 the decline was less the national reduction rate of the branch. It was found that 8 prefectures were specialized in this branch.

The regression model acquired includes only specialization as significant independent variable. However its explanatory value is very low as the R^2 is about 8%. The impact of localization economies is negative as the sign of the coefficient of specialization is negative as well.

Branch E – Electricity, gas and water supply

This branch presented a positive growth by 12%. However, compared to national employment growth rate, it presented a marginal decline about 3%. In 46 prefectures positive growth was observed and in 45 the growth was higher compared to the national growth of the branch. It was found that 7 prefectures were specialized in this branch.

The regression of the branch contained both the specialization and diversification variables with an adjusted R^2 of 12,5%. The coefficients of both variables were negative implying a negative impact of localization and urbanization economies upon employment growth. Moreover, the impact of the urbanization economies was found to be higher, since the absolute value of the respective coefficient was double.

Branch ST - Construction

In construction, the growth of employment was about 25%. This percentage was 9% compared to national employment growth rate. In 42 prefectures positive growth was observed but only in 16 this percentage exceeded the national growth rate of the branch. The location quotient index was more than 1 in 34 prefectures implying a relative specialization in this branch.

The original model presented heteroskedasticity which was not solved even with the weighted method. Correction was achieved with the White heteroskedasticity consistent covariances method. Both specialization and diversification were significant and the coefficient were found negative and positive respectively. The absolute value of specialization was higher meaning that localization economies affect employment growth more than the urbanization ones. The value of the adjusted R^2 was 15%.

Branch Z – Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods

This branch raised its employment about 25% over the period examined but compared to national employment growth this was 9%. The absolute growth was positive in 50 prefectures but only in 16 it was more than the national growth of the branch. It was found that 5 prefectures were specialized in this branch.

The regression on this branch revealed that both specialization and diversification can explain almost 11% of the variability of employment growth. The coefficients were found negative for the former and positive for the latter. Localization economies were found to have a bigger impact upon employment growth as the coefficient of the specialization variable was higher than that of diversification.

Branch H - Hotels and restaurant

In hotels and restaurants the employment growth over the examined period was 57%. This percentage was estimated in 36% if compared to the national employment growth rate of the branch. In 50 prefectures the growth was positive whereas in 16 it was higher

than the national growth of the branch. Nineteen prefectures were found to be relatively specialized in this branch.

The most suitable regression to explain the growth of this sector included only specialization as an independent variable and had a value of R^2 was approximately 10%. The coefficient of specialization had a negative sign implying that localization economies have negative impact upon employment growth.

Branch U – Transport, storage and communication

The employment of transport, storage and communication grew by 10% from 1991 to 2001. However, compared to the national growth rate, the branch presented a little decline about 3%. The number of prefectures that raised employment was 27 and in all of them, this growth was above the national level of the branch. It was observed that 11 prefectures had a relative specialization on this branch.

The best model that explained employment growth included only density as significant variable. This result indicates that neither localization nor urbanization economies could explain employment growth. The value of R^2 was 12,5% and the coefficients had a positive sign meaning that the size of the economy can induce growth. However, the low value of the coefficient does not imply a major impact of this variable.

Branch I – Financial intermediation

The branch of financial intermediation presented a growth of 44%. However, compared to the national growth rate, this percentage is reduced in 24%. In 44 prefectures employment risen and in 24 of them, the increase was above the national growth of the branch. Only 1 prefecture was found to be specialized in this branch.

In this case was not found any significant regression model to explain employment growth. This means that none of the independent variables affects employment growth.

Branch K – Real estate, renting and business activities

In this branch a high employment growth was observed, about 82%. However, compared to the national average growth this figure is reduced to 58%. All prefectures raised employment but only in 16 this growth was found higher than national employment growth of the branch. Despite the tremendous growth, only one prefecture was specialized in this branch.

The regressions showed both specialization and diversification as significant variables. The value of the adjusted R^2 (27,6%) implies that these variables have a good

explanatory value. The coefficient of specialization was negative and that of diversification positive. Localization economies were found to affect employment more since the coefficient of specialization was higher than that of diversification.

Branch L – Public administration and defence, compulsory social security

The employment of this branch grew by 10% during the examined period but compared to the national employment growth it presented a marginal decline, about 0,5%. Employment was increased in 47 prefectures but only in 33 this growth was above the national growth of the sector. It was found that 10 prefectures were specialized in this branch.

None model was found significant for this branch implying that none of the examined variables affects its growth.

Branch M – Education

In education, employment growth was about 35%. Compared to the national employment growth this percentage was reduced by 17%. All prefectures raised employment on this branch however, this percentage was above the national growth of the branch in 31 cases. Sixteen prefectures were found to be specialized in this education.

The original model presented heteroskedasticity a problem that was solved only after using the White heteroskedasticity consistent covariances correction method. The variables whose coefficients were significant were diversification and density and the value of adjusted R^2 was about 10%. Both coefficients were positive implying that urbanization economies and size of local economy have a positively influence upon employment growth. However, the low absolute values of the coefficients imply that the impact upon growth was rather small.

Branch N – Health and social work

This branch raised its employment about 33% during the examined period. However, compared to national employment growth this increase was half. Employment grew in all country but this percentage was higher than the national growth of the branch in 27 prefectures. Only 6 prefectures were found to be specialized in this branch.

The regressions provided only specialization as significant variable but gave a low R^2 of about 7%. The coefficient of specialization was negative implying a negative effect of localization economies.

Branch J – Other community, social and personal service activities

In this branch, was observed a rise of 27% in employment. Compared to national employment growth this percentage was reduced at 10%. In 49 prefectures employment was increased and in 37 this rise was above the national growth of the branch. Five prefectures were found to be specialized in this branch.

The model with significant results included both specialization and diversification variables. The sign of the former was negative whereas that of the latter was positive implying a negative effect of localization economies and a positive of the urbanization ones on growth. The absolute values of the coefficients revealed that specialization affected employment growth more than diversification. The adjusted R^2 of the regression was almost 17%.

Branch O – Private households employing domestic staff and undifferentiated production activities of households for own use.

This branch of the economy had the highest growth, about 261%. Compared to national employment growth this percentage is slightly reduced to 213%. The rise of employment concerned 50 prefectures but only in 23 this rise was above the national growth of the sector. Two prefectures were found to be specialized in this branch.

None of the examined variables was significant implying that this sector is affected neither by localization/urbanization economies nor by prefecture size.

Branch P – Extra territorial organizations and bodies

In this branch, employment declined by 43% and compared to national growth the reduction was 51%. However this branch was not examined as employment is concentrated in the Prefecture of Attikis (48%) and the Prefecture of Chania (33%) and Irakleio (8,5%) with most of the other prefectures having employment less than 10 people.

5.2. Analysis of urban centers

As in the section of the prefectures, the analysis of urban centers is made on three levels, at economy as a whole, at the sectoral and at the 1-digit branch. The results of the regression are presented in table 3. The sample of urban centers consists of 60 observations (Table 1 of the appendix) as described in the methodology section. Employment growth is presented in tables 2 and 3 of the appendix and the employment of urban centers is presented in table 16 of the appendix. Table 17 has some descriptive statistics.

Table 3: Regression results of the Greek urban centers

Level of analysis	Significant variables			Adjusted R ²
	Specialization	Diversification	Density	
Whole economy	-0,0709 ***	0.0207 **		0.0935
Sectors				
primary	-0.1496 ***	0.5559 **		0.3153
secondary	-0.3287 ***			0.2494
tertiary	-0.0966 **			0.0602
Branches				
A	-0.1580 ***			0.3291
B				-
C				-
D	-0.1722 ***			0.1062
DA	-0.2090 **	0.2748 **		0.1134
DB			0.1781 **	0.0900
DC			2.0185 *	0.0350
DD	-0.2605 ***			0.1427
DE	-0.2513 ***			0.2680
DST	0.1638 **	1.1434 **		0.1290
DZ			1.7108 **	0.0527
DH	0.8229 **	2.1636 ***		0.4047
DU ¹	-0.4122 ***			0.3820
DI				-
DK			1.0349 *	0.0333
DL				-
DM				-
DN	-0.1576 **			0.0696
E	-0.2320 ***			0.2391
ST	-0.2711 ***			0.2376
Z	-0.2607 ***	0.0780 *		0.1312
H	-0.1982 ***			0.2398
U				-
I	-0.0129 ***			0.0353
K	-0.4557 ***	0.1619 **		0.4393
L		-0.1702 ***		0.0820
	-0.1061 **			0.0408
M				-
N ¹	-0.1395 ***	0.0117 ***		0.0853
J	-0.4893 ***	0.1765 **	0.0501 **	0.2444
O ¹	-0.2152 **			0.0580

Source: Author's calculations

* significant at 10%.

** significant at 5%.

*** significant at 1%.

¹ The results after the correction with White heteroskedasticity consistent covariances method.

5.2.1. Employment analysis of the whole economic activity

Total employment in the examined urban centers grew by 19% from 1991 to 2001 (see table 18 in the appendix), however, compared to the national employment growth this percentage was marginally positive at 3%. In 56 out of the 60 urban centers was observed positive employment growth but only in 41 this increase was above national employment growth.

One model had significant values indicating that specialization and diversification can explain employment growth. The value of R^2 was approximately 9%. The coefficient of specialization was negative and that of diversification positive. The effect of localization economies is more intense as the coefficient of specialization is higher than that of diversification.

5.2.2. Sectoral employment Analysis

In this section, the three sectors of the economy are examined. Sectoral growth is presented in table 19 of the appendix and table 20 shows the values of the specialization and diversification index.

Primary Sector

The employment of the primary sector in urban centers was increased by 3% from 1991 to 2001. However compared to the national employment growth of the sector, which declined, it presented a rise of 17%. These figures indicate that the municipalities of the urban centers reduced their employment in this sector less than national rate. In 33 urban centers the employment increased and in other 14 the decline of the sector was less than the national decline. These facts manifest the intense presence of the primary sector in Greek economy, even in urban areas. Interestingly, a quarter of the examined urban centers were specialized in the primary sector.

The employment growth of the sector was partially explained by the variables of specialization and diversification. The adjusted R^2 was about 31% and the coefficients were negative for specialization and positive for diversification. This means that the primary sector was negatively affected by localization economies and positively by the urbanization ones. The absolute values of the elasticities indicate that the impact of diversification upon growth was much higher than that of specialization.

Secondary sector

As regards the secondary sector, employment growth was estimated at 3%. However, compared to the national growth of the sector, the urban centers present reduction of

2%. Growth was observed in 37 urban municipalities however, only in 11 this was higher than the national growth of the sector. The location quotient index revealed that 28 urban centers were specialized in this sector.

The regression model with significant values contained only specialization and had an R^2 of about 25%. The coefficient was negative implying that localization economies had negative impact upon sectoral growth. Its value of 0,33 indicating a strong influence of the variable.

Tertiary sector

Over the examined period, the growth rate of the tertiary sector was 28% but compared to the national growth of the sector, it presented reduction of 2%. In 59 centers was observed growth but only in 34 this was higher than the national average of the sector.

The regression models revealed only specialization as significant variable but gave a poor R^2 of 6%. The estimated coefficient had a negative sign.

5.2.3. Analysis of the employment of the branches

The analysis in this section is made for the 19 1-digit branches of NACE (STAKOD) classification. Moreover, as regards the 4th branch, manufacturing, a further division of 14 2-digit categories was examined. Employment growth is presented in tables 21-24 of the appendix and the values of the specialization and diversification index in tables 25-28.

Branch A – Agriculture animal husbandry, hunting and forestry

Although this branch declined in national level, urban centers show an increase of 4%. Compared to the national growth of the branch this rise was much higher, at 18%. Growth took place in 34 cases and in 11 more the reduction was less than national level. Fourteen urban centers were found to be specialized in this branch.

The regression model includes only specialization as significant variable and has a R^2 of about 33%. The coefficient is negative implying negative impact of localization economies.

Branch B – Fishing

Urban centers raised employment in this branch by 33%, a magnitude that was 5% higher compared to national growth of the branch. Growth was realized in 43 cases but in 9 of them it did not exceed the national rate of the branch. Fishing was a branch of specialization for 17 urban centers.

In this case, none of the examined variables was found statistically significant. This means that neither localization/urbanization economies nor city size have some impact upon its development.

Branch C – Mining and quarrying

Following the trend in the country, the employment in mining and quarrying in urban centers was reduced by 11%. However, this change was less than the national performance of the branch. As a result, in relative terms the branch shows an increase of 20%. In 21 cases was observed increase and in 12 more the reduction was less than the national rate of the sector. Seventeen urban centers were found to be specialized in this branch.

None of the examined variables was found to have significant impact upon the growth of the branch. Consequently, it can be said that localization economies, urbanization economies and city size do not affect employment growth.

Branch D – Manufacturing

The decline of manufacturing branch in urban centers was about 9%. Since the reduction in national was higher, this percentage was estimated at 4% in relative terms. Growth took place in 19 cases and in other 11 the decline was less than the national rate of the branch. The location quotient index showed that 21 urban centers were specialized in manufacturing.

Specialization was found to be the only variable that can explain employment growth at a significant level. The R^2 of the regression is approximately 10% and the coefficient of the variable has a negative sign. This means that localization economies have negative impact upon employment growth of manufacturing.

Branch DA – Manufacturing of food products, beverages and tobacco

Employment in this branch was increased by 13%. However it was lower than the national rate and in relative terms there was a reduction by 7%. In 44 urban centers employment grew and in 30 of them the rate was above national. It was found that 27 urban centers were specialized in this branch.

Both specialization and diversification variables were found significant giving a model which had an adjusted R^2 of 11%. The relative influence of diversification was slightly higher compared to specialization as the absolute values of the elasticities revealed. Localization economies were found to have negative impact upon growth, whereas the urbanization ones positive.

Branch DB – Manufacture of textiles and textile products

In this branch, the reduction of the employment was 40% and it was slightly less than the decline of the branch at the national level. In relative terms this gives a rise by 2%. Employment grew only in 1 prefecture and in other 18 the reduction was less than national rate. It was found that 18 prefectures were specialized in this branch.

Density was the only significant variable with positive elasticity giving a rather low R^2 of 9%. These results mean that localization and urbanization economies do not affect growth and city size of local economy has positive influence.

Branch DC – Manufacture of leather and leather products

The reduction in employment in this branch was 40% and it was higher than the national rate. Thus, in relative terms there was still a reduction of 4%. Employment was increased in 7 cases and in other 6 the reduction was less than national rate. Five urban centers were found to be specialized in this branch.

Employment growth was not affected by localization or urbanization economies. Only the elasticity of density was found significant and positive but the R^2 was quite low of about 3,5%.

Branch DD – Manufacture of wood and wood products

The increase of employment in this branch was 12% but it was less than the national rate of the branch resulting to a decline of 3% in relative terms. In 39 cases employment grew and in 29 of them the rate exceeded the national growth rate of the sector. It was found that 37 urban centers were specialized in this branch.

A model including specialization variable is the only one that can explain employment growth giving a R^2 of 14%. The negative sign of the revealed indicates that localization economies affect growth negatively.

Branch DE – Manufacture of pulp, paper and paper products; publishing and printing

Employment grew in this branch by 35%. However, compared to the national rate of the branch there was a reduction by 3%. In 54 cases, employment was increased and in 38 of them the rate was above the national one. As regards specialization, 8 urban centers were found to be specialized in this branch.

Specialization was the only significant variable having a R^2 of 27%. The negative value of its elasticity implies that localization economies affect negatively growth.

Branch DST – Manufacture of coke, refined petroleum products and nuclear fuel

In this case, employment was increased by 16%. The national growth rate of the branch was higher and this resulted to a relative reduction of 4%. In 26 urban centers employment grew and in 22 of them growth was above national rate. Four urban centers were found to be specialized in this branch.

Both specialization and diversification were found to affect employment growth significantly giving an R^2 of 13%. Both coefficients were positive and the value of diversification was much higher implying a relatively stronger influence of urbanization economies on employment growth.

Branch DZ – Manufacture of chemicals, chemical products and man-made fibres

In this branch employment growth in urban centers was less than national rate. As a result, although there was an increase by 11% in relative terms a reduction by 7% was observed. In 38 cases employment rose and in 36 it was higher than national rate. It was found that 8 urban centers were specialized in this branch.

Only the size of local economy was found to have impact upon growth since only the density variable was significant and positive with a high absolute value. However, the R^2 of the regression was very low, of about 5%.

Branch DH – Manufacture of rubber and plastic products

The growth of this branch was about 3%. Since it was much lower than the national rate, a reduction of 1% in relative terms was observed. Employment rose in 27 cases and in 24 of them the increase was above national growth rate. It was found that 15 urban centers were specialized in this branch.

In this case, both specialization and diversification indexes were found significant and positive having an adjusted R^2 of 40%. The positive elasticities imply positive influence of localization and urbanization economies and the impact of the latter is much stronger than that of the former.

Branch DU – Manufacture of other non-metallic mineral products

In this branch, employment shrank by 2%. Compared to national growth of the branch the reduction was even higher, at 4%. In 35 cases employment increased and in 34 of them the rise was above national rate. It was estimated that 26 urban centers were specialized in this branch.

The unweighted data presented significant heteroskedasticity which did not disappear even after the variables have been weighted. The problem was solved using

the White heteroskedasticity consistent covariances correction method and the only significant variable was specialization having an R^2 of 38%. The negative elasticity implies negative effect of localization economies on growth and the high absolute value indicates a strong influence.

Branch DI – Manufacture of basic metals and fabricated metal products

Employment in this branch was decreased by 2% compared to national growth of the branch. However, as regards its own employment a rise of 11% was observed. This increase took place in 42 cases and in 30 of them it was above the national rate of the branch. It was estimated that 12 urban centers were specialized in this branch.

None of the variables was significant in explaining employment growth, so it can be claimed that neither localization and urbanization economies nor city size affect the growth of the branch.

Branch DK – Manufacture of machinery and equipment NEC

In this branch, employment was increased by 12% but compared to national growth of the branch there was a decline of 2%. Growth was observed in 38 cases and in 32 of them it was above national rate of the branch. Twelve urban centers were found to be specialized in this branch.

Density was the only significant variable with a positive elasticity. However, the R^2 of the regression was very low at 3% meaning that employment growth was affected marginally by other factors.

Branch DL – Manufacture of electrical and optical equipment

Employment in this branch grew by 18% but it was lower than the national rate of the sector. As a result, reduction of 4% was observed in relative terms. Growth took place in 42 cases and in 31 it was higher than national rate. It was found that 11 urban centers were specialized in this branch.

None of the variables could significantly explain employment growth. Consequently, it can be claimed that neither localization and urbanization economies nor city size affect the growth of the branch.

Branch DM – Manufacture of transport equipment

In this case, employment declined by 19% a reduction that was higher than that observed in national rate. As a result, in relative terms the reduction was at 4%. None the less, employment grew in 13 cases and in other 28 the reduction was less than national rate. It was estimated that 6 urban centers were specialized in this branch.

The growth of the branch was not affected by localization and urbanization economies nor city size as none of the examined variables was found significant.

Branch DN – Manufacturing NEC

The decline of employment this branch was by 16%. Since it was higher than that in national rate the relative reduction was 5%. Employment grew in 29 cases and in 11 more the reduction was less than national rate. It was found that 16 urban centers were specialized in this branch.

The only variable that was significant to explain employment rate was specialization, which was found to have negative influence but the estimated R^2 of the regression was very low at 7%.

Branch E – Electricity, gas and water supply

The employment of this branch rose by 5%. However, this increase was less than national rate resulting is a reduction of 6% in relative terms. Growth was observed in 52 cases and in 45 it was higher than national level. Out of the 60 examined urban centers, 24 were specialized in this branch.

The regression model achieved included only specialization as significant variable. The R^2 was about 24% and the elasticity was negative implying that localization economies did not favor the growth of the sector. The absolute value of the elasticity was approximately 0,23 indicating a strong influence of localization economies.

Branch ST – Construction

The branch of construction raised its employment by 30%, a magnitude that was higher by 4 units compared to national growth of the sector. In 52 cases employment growth was realized and in 45 it was higher than the national rate of the branch. About three quarters of the urban centers were specialized in this branch.

The only variable that was found to explain the growth of the sector was specialization. The negative coefficient implies negative impact upon growth whereas its rather high absolute value means an important influence. The R^2 of the regression was about 24%.

Branch Z – Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods

In this branch, employment grew by 30% over the examined period. Since this growth was less than the national rate of the branch, in relative terms it resulted in a reduction of 3%. In 56 urban centers employment was increased but only in half of them this was

above the national rate of this branch. In 42 cases the urban centers were specialized in this branch.

A model including both specialization and diversification variables was found significant. The adjusted R^2 was about 13% and the elasticities of specialization and diversification were negative and positive respectively. This means that localization economies have negative influence on growth in contrast to the urbanization ones. Moreover, the impact of specialization is much more important as indicated by the much higher value of its coefficient.

Branch H - Hotels and restaurant

The employment growth in hotels and restaurants was very high, more than 60%. This percentage was 2% higher compared to the national rate of the sector. Employment grew in almost all cases (59) and in 40 of them it exceeded the national growth of the branch. One quarter of the urban centers was found to be specialized in this branch.

Only the specialization variable was found to affect employment growth at a statistically significant level, giving an R^2 of about 24%. The negative elasticity implies that localization economies did not favor the growth of the branch and its high absolute value indicates that they had a considerable influence.

Branch U – Transport, storage and communication

In this branch, the employment growth coincided with the national rate of 10%. In 32 cases an increase of employment was observed and in half of them it was higher than the national rate. Less than a quarter of the urban centers (23) were found to be specialized in this branch.

In this case, none of the variables was found to have significant impact upon employment growth. As a result, it can be argued that neither localization/urbanization economies nor city size did to affect the growth of the branch.

Branch I – Financial intermediation

In financial intermediation branch, the rise of employment was about 42%. This percentage was slightly less than national growth of the sector resulting in a marginal decline of 1% in relative terms. Employment grew in almost all cases (58) but only in 17 it exceeded national growth rate. About one third of the urban centers were found to be specialized in this branch.

Specialization variable was the only one which could explain employment growth but to a very low degree since the R^2 of the regression was only 3,5%. The

elasticity was negative and its low absolute value indicates that localization economies had a negative but not important impact upon growth.

Branch K – Real estate, renting and business activities

In this branch, the highest rate of growth was observed, which was about 73%. However, as the respective national rate was higher, in relative terms there was a reduction of 5%. Employment rose in all examined urban centers but in less than half (27) it was more than the national rate of the branch. Less than a quarter of urban centers were found to be specialized in this branch.

Both the specialization and diversification variables were significant to explain employment growth in a regression with an R^2 about 44%. Localization economies were found to have negative impact on growth while the impact of the diversification ones was positive. However, the former affected growth much more than the latter as the higher absolute value of the specialization elasticity revealed.

Branch L – Public administration and defence, compulsory social security

In this branch, employment growth was estimated at 5%. However, as this was less than national rate of the branch, in relative terms there is a reduction of 4%. Employment was increased in 52 cases and in 38 of them it was higher than national rate. It was found that 46 urban centers were specialized in this branch.

In this case, two simple regression provided significant results. The first including only the diversification variable and the second only the specialization one. Both gave poor fit with R^2 of 8% and 4% respectively. The signs of the elasticities mean that localization and urbanization affect negatively the growth of the branch.

Branch M – Education

Employment in education at urban centers was increased by 34% over the examined period but compared to the national average there was a decline about 1%. Growth took place in all cases and in 44 of them it was higher than the national rate. It was found that 51 urban centers were specialized in this branch.

Trying to explain employment growth in education, none of the examined variables was found significant. As a result, it can be claimed that the employment of this branch was not affected by localization economies, urbanization economies and city size.

Branch N – Health and social work

In health and social work, a rise of employment about 29% was observed. However, compared to national rate of the branch, a reduction of 3% was revealed. Employment

grew almost in all cases and in 41 this increase was above national rate. It was found that 42 urban centers were specialized in this branch.

In this case, the unweighted data presented significant heteroskedasticity which did not disappear even after weighting the variables. The problem was solved using the White heteroskedasticity consistent covariances correction method. The adjusted R^2 of the regression, including both the specialization and diversification variables, was 8,5%. The elasticities were negative and positive respectively. This means that the impact of localization economies was negative and the urbanization was positive. As regards the relative importance of the two, comparing the absolute values of the coefficients it becomes evident that localization economies affected growth in a much higher degree.

Branch J – Other community, social and personal service activities

This branch raised its employment by 24% over the examined period. Since this rise was less than national average, in relative terms it means a reduction by 3%. Growth was revealed in 57 cases but only in 25 it was higher than national rate. It was found that 26 urban centers were specialized in this branch.

The growth of this branch can be explained by all variables employed giving an adjusted R^2 of 24%. The coefficient of specialization is negative but the other two, of diversification and of density, are positive. These results mean that localization economies affected negatively employment growth whereas urbanization economies and city size had positive impact. Comparing the absolute values, we find that specialization had the biggest impact and density had the least.

Branch O – Private households employing domestic staff and undifferentiated production activities of households for own use.

In this case is observed an enormous growth of 249%, which compared to national rate corresponds to a reduction of 3%. Employment was increased in 59 cases but in less than the half it was more than national rate of the sector. It was estimated that 6 urban centers were specialized in this branch.

The unweighted data presented significant heteroskedasticity which did not disappear even after weighting the variables. The problem was solved using the White heteroskedasticity consistent covariances correction method. The R^2 was very low (5%) and the elasticity of specialization (the only significant variable) was negative implying a negative impact of localization economies on growth.

Branch P – Extra territorial organizations and bodies

This branch presented a reduction by 43%. However, since most of its employment was concentrated in three urban centers Agglomeration of Athinas (78%), Agglomeration of Irakleiou (11%) and Agglomeration of Thessaloniki (5%) it is not examined in this study.

5.3. Quadratic forms

Apart from the linear regressions, this study searched for the existence of U-shape relations in the examined independent variables. This would happen when a negative coefficient of a variable is combined with a positive one of its quadratic form. If the inverse happens, the relation is of an inverted U. A usual problem that was encountered was multicollinearity between the variables and its squares something that does not allow for safe results. The high correlation between density and its quadratic form led to the exclusion of these models. As regards specialization and diversification multicollinearity was detected but its low variance inflation factor (VIF) was less than 5. The 4 cases with significant results are presented in table 4 in the next page.

5.3.1 Prefectures

Primary sector

In the primary sector it was found an inverted U – relation as regards diversification. This implies that after a certain point the impact of diversification upon growth becomes negative. However, the very low R^2 of the regression (3%) implies the limited explanatory value of the model. The estimated turning point correspond to diversification of $2,53 \times 10^{-7}$ and growth rate $6,88 \times 10^{-8}$.

Branch DM - Manufacture of transport equipment

In this case a U shape relationship was revealed for specialization. The coefficient of the quadratic form was significant at 11% and the R^2 of the regression was 49%. The estimated turning point corresponded to specialization value of 9,92 and a growth rate of 59,2%.

Branch DH – Manufacture of rubber and plastic products

A U shape relationship was detected in this branch with regard to specialization. The R^2 of the regression was 31% and the turning point corresponded to specialization level of 3,24 and growth rate of 87%.

Branch ST – Construction

In construction, an U-shape relationship was detected with regard to specialization giving an adjusted R^2 value of 17,2%. This implies that although specialization in low levels deter employment growth, after a certain point its influence is positive. The turning point was estimated in 1,32 specialization level which corresponds to a growth rate of 89,2%.

5.3.2. Urban centers

Branch DU - Manufacture of other non-metallic mineral products

In this branch a U shape relationship was detected concerning the specialization variable. The R^2 value of the model was 48% and the turning point corresponds to specialization level of 3,66 and 82% growth rate.

Branch E – Electricity, gas and water supply

In this branch, a quadratic model regarding specialization was found giving a low R^2 of 5%. The coefficient of the quadratic variable is positive indicating a U-shape relationship. The turning point was estimated for specialization level of 8,79 which corresponds to an employment rate of 68%.

Table 4: Regression results of quadratic forms

Level of analysis	Significant variables				R square
	specialization	specialization^2	diversity	diversity^2	
	Prefectures				
Sectors					
primary			0.5431 *	-1.0711 *	0.0356
Branches					
DM	-0.2344 *	0.1176			0.4681
DU	-0.2374 ***	0.2327 **			0.3283
ST	-0.1527 **	0.6350 *			0.1728
	Urban centers				
Branches					
DU	-0.2974 ***	0.2636 ***			0.4825
E	-0.3590 ***	0.1902 **			0.0474

Source: Author's calculations

* significant at 10%

** significant at 5%

*** significant at 1%

5.4. Spatial econometric analysis

The objective of this analysis was to investigate the existence of spatial dependence between the prefectures, for every sector and branch of the economy. The contiguity criterion that was used was “queen” contiguity and the results of the analysis are presented in table 5. The decision regarding the presence of spatial autocorrelation was based on LM test rather than Moran’s I. Since the latter presents several problems as explained in the methodology section, LM test is the most common in the detection of spatial dependence (Artelaris, 2009). The confidence interval was 95% and spatial dependence was revealed only in three cases.

Branch DU – Manufacture of other non-metallic mineral products

In this case, the LM test suggests that the LM error model is significant. This means that spatial clustering can be explained by other variables that are not included in the model. The spatial autoregressive coefficient is positive implying that prefectures with similar attributes are gathered. The only significant variable was specialization. Its elasticity remained negative and its absolute value was a bit higher than that of the OLS model.

Branch ST – Construction

In construction, the LM lag model was found to be significant and the spatial autoregressive coefficient positive. Therefore, prefectures with similar growth rates cluster. Specialization was the only significant variable was negative. However, in the regression that was corrected with White heteroskedasticity consistent covariances method (due to heteroskedasticity problems) diversification was also significant. The important in this case is that the spatial model solved the problem of heteroskedasticity.

Branch N – Health and social work

In this branch, the LM test showed that the best model specification is LM lag. The only significant variable is specialization and its elasticity remains negative but with lower absolute value compared to the OLS model. The spatial autoregressive coefficient is positive with value of 0,33 implying that there is clustering of prefectures with similar employment growth levels.

Table 5: Regressions of spatial econometric models

Branch	Method	Significant variables		Heteroskedasticity	Diagnostics for spatial dependence					Criteria		
		spatial coefficient	specialization		Moran's I	LM lag	Robust LM lag	LM error	Robust LM error	Log likelyhood	AIC	Schwarz
DU	OLS		-0.289 ***	No	0.037	0.094	0.741	0.046	0.257	31.471	-60.943	-59.011
	LM error	0.508 ***	-0.317 ***	No						33.854	-65.709	-63.777
ST	OLS		-0.169 ***	Yes	0.026	0.010	0.030	0.055	0.188	71.512	-139.026	-135.162
	LM lag	0.580 ***	-0.138 **	No						75.540	-145.08	-139.285
N	OLS		-0.140 ***	No	0.106	0.041	0.139	0.139	0.651	95.954	-189.909	-187.977
	LM lag	0.330 **	-0.104 **	No						98.171	-190.343	-184.548

Source: Author's calculations

* significant at 10%.

** significant at 5%.

*** significant at 1%.

5.5 Conclusions

In Greek prefectures, as regards the whole economy, specialization and size of local economy were found to affect employment growth negatively. In a different regression, the impact of diversification was positive. In primary and secondary sector, specialization was found to have negative influence, which was more intense in the secondary sector. Tertiary sector was not affected by any variable.

Tables 6 and 7 in page 81 summarize the findings of the regressions in the branches of economy. In the analysis of the 31 1-digit and 2-digit branches, the variables that were used explained a part of employment growth in 25 cases. In 15 of them, the estimated R^2 was more than 10%.

The three 1-digit branches of the primary sector had negative specialization coefficients indicating that localization economies deter growth. Only in fishing the diversification was found positive implying that a diversified economy favors growth.

In the three 1-digit branches that comprise secondary sector, both specialization and diversification were found significant. In two branches (branch D – manufacturing and branch E – electricity, gas and water supply), the coefficients were negative implying that localization and urbanization economies harm growth. In both cases, the absolute value of diversification was higher meaning that the (negative) impact of a diversified economy is higher than that of specialization. In contrast, in branch ST - construction, specialization was negative but the impact of diversification was found positive.

The 2-digit analysis of the secondary sector included 14 branches. In 11 cases, the variables that were used explained part of employment growth. In all these, the coefficient of specialization was negative implying that localization economies deter growth. The branches which were harmed most were: DB – manufacture of textile and textile products, DD – manufacture of wood and wood products, DM – manufacture of transport equipment, DZ – manufacture of chemicals, chemical products and manmade fibres and DU – manufacture of other non metallic mineral products. In three cases (DB - manufacture of textile and textile products , DK – manufacture of machinery and equipment NEC and DM - manufacture of transport equipment), diversification coefficient was found negative (always followed by negative specialization) and in only one (DE - manufacture of pulp, paper and paper products; publishing and printing) it was positive. Consequently, for the totality of the

secondary sector (1-2-digit analysis) it can be said that specialization harms growth and diversification either does not effect it or it has a (mainly) negative influence.

In the tertiary sector 10 1-digit branches were examined. The variables that were used achieved to explain employment growth in 7 cases. Localization economies were found to harm growth in 5 cases (branch Z – wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods, branch H - hotels and restaurant, branch K – real estate, renting and business activities, branch N – health and social work and branch J – other community, social and personal service activities). In four of these cases (branches Z, K, M and J), urbanization economies were found to have positive impact. This influence was more intense in branches J, K and Z. In other two (branch Branch U – Transport, storage and communication and M – education), growth was only positively affected by a diversified economic base. As a result, it can be said that specialization harms growth in the service sector but diversification favors it.

In the analysis of urban centers as regards the whole economy, diversification was found to affect growth positively and the impact of specialization was negative. Thus, in general, it can be said that localization economies harm growth in urban centers whereas urbanization economies promote it.

The three sectors of the economy of the urban centers, revealed negative impact of localization economies. This was more intense in the secondary sector. Diversification was found to have positive influence on growth only in the primary sector and its influence was higher than the impact of specialization. As regards the tertiary sector, although in the analysis of prefectures it was not affected by any variable, in this case specialization appears to harm its growth.

As regards the 1-digit branches of the primary sector, only the growth of branch A – Agriculture animal husbandry, hunting and forestry was partially explained by specialization. The negative coefficient showed that specialization deters growth.

In the 1-digit branches of the secondary sector, only specialization was found to affect employment growth, always negatively. In contrast to the analysis of the prefectures, diversification did not appear in any regressions implying that it does not have any influence on the growth of these branches.

In the one digit analysis, in 11 out of the 14 branches, employment growth was explained by the variables used. Specialization was found negative in 7 branches (DA,

DD, DE, DST, DH, DU and DN). The ones that were harmed most were: branch DH – manufacture of rubber and plastic products, branch DU - manufacture of other non metallic mineral products, DD - manufacture of wood and wood products, DM – manufacture of transport equipment and DE - manufacture of pulp, paper and paper products, publishing and printing.

In three cases (DA - Manufacturing of food products, beverages and tobacco, DST - manufacture of coke, refined petroleum products and nuclear fuel, DH - Manufacture of rubber and plastic products) diversification was found positive (always followed by negative specialization). Its influence was very intense in branches DH and DST. Compared to the analysis of the prefectures, diversification has a positive influence (even in few cases). However, in none case the two variables appear both to the analysis of prefectures and urban centers.

The size of local economy is the only variable that explains growth in four branches (DB – manufacture of textiles and textile products, DC – manufacture of leather and leather products, DZ – manufacture of chemicals, chemical products and man-made fibres and DK – manufacture of machinery and equipment NEC). The influence is always positive and the coefficients very high in 3 cases (DC, DZ, DK). This means that a big local economy favors the growth of these branches.

Regarding the tertiary sector, in 8 (branches Z, H, I, K, L, N, J and O) out of the 10 1-digit branches examined, employment growth could be explained by the variables that were used. Specialization was found to have negative impact upon growth in all 8 cases. The branches that were the most harmed were: J – other community, social and personal service activities, K – real estate, renting and business activities and Z – wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods.

Diversification was found to have positive influence in the previous three branches (J, K, Z) as well as in branch N – Health and social work. This means that a diversified economic base favors the growth. The only case that it was negative is in branch L -public administration and defence, compulsory social security. In general, it can be said that as regards the economy of the urban centers, specialization has negative impact upon growth whereas diversification (whenever it has an influence) has positive.

In general, the 1-digit analysis provided better R^2 in urban centers compared to the prefectures. This means that specialization and diversification can explain

employment growth of urban centers to a greater extent than for prefectures. This was something, since expected since localization and urbanization economies concern mainly the urban areas. In contrast, as regards the 2-digit analysis in manufacturing the R^2 values were much higher in the prefectures. Again, this did not surprise us since the disaggregation of the data in this spatial level raises the variance among urban centers and lowers the explanatory value of the models.

The investigation of non linear relations between growth and specialization, diversification and density revealed that both in urban centers and prefectures only in five branches such relations were statistically present. In all cases, only one variable was significant. i.e. specialization and the estimated R^2 were high. These findings are very important since they imply that although specialization appears to be negative, after a certain level its impact becomes positive.

As regards the prefectures, U shape relationships were found in branches DM – manufacture of transport equipment, DU – manufacture of other non metallic mineral products and DST - manufacture of coke, refined petroleum products and nuclear fuel. In all cases, the coefficient of specialization was lower in absolute terms compared to the coefficient of the linear model.

In urban centers, such relationships were found in two branches, namely DU - manufacture of other non metallic mineral products and E - electricity, gas and water supply. The coefficient of specialization in DU was lower than that of the linear regression whereas that of branch E was higher.

As regards spatial autocorrelation, it was explored only for Greek prefectures because in the urban level there is no spatial contiguity. Autocorrelation was detected at one 2-digit branch (DU - manufacture of other non metallic mineral products) and 2 1-digit branches (ST- construction and N - health and social work). The use of spatial modeling solved the problem of heteroskedasticity in branch ST. In the non-spatial regression, the problem was confronted using the White heteroskedasticity consistent covariances correction method. The spatial model had only specialization as significant variable, in contrast to the non-spatial where diversification was also significant. Moreover, although the sign did not change, its absolute value was quite lower. Lower absolute values of the specialization coefficient were found in the other two cases as well. In all cases, the spatial autoregressive coefficient was positive and significant implying that there is clustering of spatial units.

Table 6: Significant variables in the regressions of 1-2 digit branches

Variables	Prefectures			Urban centers		
	All	1-digit	2-digit	All	1-digit	2-digit
Only specialization	11 (4)	4 (1)	7 (3)	12 (8)	8 (5)	4 (3)
Only diversification	1	1	-	1	1	-
Only density	1 (1)	1 (1)	-	4	-	4
Specialization & diversification	9 (8)	6 (6)	3 (2)	6 (5)	3 (2)	3 (3)
Specialization & density		-		-	-	-
Diversification & density	1	1		-	-	-
All	2 (2)	1 (1)	1 (1)	1 (1)	1 (1)	-
None	6	3	3	7	4	3

Source: Author's calculations

* The numbers in the brackets are the number of cases where the R^2 of the regression was more than 10%.

Table 7: Signs of the significant variables in the regressions of branches

Variables	Prefectures			Urban centers		
	All	1-digit	2-digit	All	1-digit	2-digit
Only specialization (-)	11 (4)	4 (1)	7 (3)	12 (8)	8 (5)	4 (3)
Only specialization (+)	-	-	-	-	-	-
Only diversification (-)	-	-	-	1	1	-
Only diversification (+)	1	1	-	-	-	-
Specialization (-) diversification (+)	6 (6)	5 (5)	1 (1)	5 (4)	4 (3)	1 (1)
Specialization (-) diversification (-)	-	-	-	-	-	-
Specialization (+) diversification (+)	-	-	-	2 (2)	-	2 (2)
Specialization (-) diversification (-)	5 (4)	2 (2)	3 (2)	-	-	-

Source: Author's calculations

* The numbers in the brackets are the number of cases where the R^2 of the regression was more than 10%.

CHAPTER 6: Conclusions

The aim of this study was to examine if a specialized or diversified environment is more conducive for economic growth in Greece. In other words, it was attempted to give an answer to the Marshallian – Jacobian debate whether localization or urbanization economies promote growth. As explained in the theoretical part, the sources of such economies are various. This study focused on the dynamic externalities which are mainly connected to knowledge spillovers and can lead to continuous growth (Glaeser et al, 1992). Moreover, non linear relations between employment growth and specialization and diversification of the economy were examined as well as the impact space (proximity) has in these relations.

Economic growth was measured by permanent employment growth in three levels, namely total employment, sectoral employment and employment at 1-digit NACE (STAKOD) classification branches. As regards manufacturing, a further division in 14 2-digit branches was made. The examined period was from 1991 until 2001 and the analysis was made in two spatial levels, namely the Greek prefectures and the major urban centers. For each level of the economy, a regression model was estimated in which the independent variable was employment growth, and the dependents were specialization (assessing localization economies) and diversification (assessing urbanization economies) which were measured by location quotient and Herfindahl-Hirschman index, respectively. Density was added into the model in order to capture size effects which are another form of urbanization economies (Combes, 2000).

Over the examined period, total employment grew about 2,7% whereas the respective rate of the employment of urban centers was 3,8%. The results from the linear models concerning the sectors and the branches of the economy revealed that almost in all cases, both in prefectures and in urban centers, specialization was found to have negative impact upon growth. This means increases in specialization would deter economic growth. In a few cases, a U shape relation between growth and specialization was found indicating that after a threshold point increase in specialization would increase growth.

In urban centers, the branches that were more harmed by specialization were: J – other community, social and personal service activities, K – Real estate, renting and

business activities, Branch DU – manufacture of other non-metallic mineral products, ST – construction, Z – wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods, DD – manufacture of wood and wood products, DE – manufacture of pulp, paper and paper products; publishing and printing and E – electricity, gas and water supply. All these belong both to the secondary and tertiary sector implying that specialization is harmful for both.

However, in the analysis of prefectures, negative influence was more intense in branches of the secondary sector. More specifically, the ones that were affected more were: branch DB – manufacture of textiles and textile products, DC – manufacture of leather and leather products, DD – manufacture of wood and wood products, J – other community, social and personal service activities, DM – manufacture of transport equipment, DZ – manufacture of chemicals, chemical products and man-made fibres and branch DU – manufacture of other non-metallic mineral products.

Various explanations have been given in the literature with the regard to the negative effect of specialization on growth. Paci and Usai (2005), attribute the negative signs of specialization to the negative turn of the economic cycle of that period as well as to the restructure of the economy which led to substitution of labor. Combes (2000) attributes negative signs to possible demand shocks in some branches would result to a reduction of employment in specialized areas. Another explanation that he gives concerns product's life cycle theory. In the first stages of a product, its production takes place in few specific places. Afterwards, it is diffused across space and the initially specialized areas are expected to reduce employment levels. As regards Greece, a possible explanation might be the structure of its economy. Its basis is small/medium family firms where workers make multiple tasks. As specialization increases, the enterprises become less viable.

One would also wonder why specialization is so prevalent once its effect upon growth is negative. It should not be ignored that under the scope of this study, the negative impact concerns mainly the dynamic externalities (mainly knowledge spillovers) that specialization induces. There are other forces that can explain the existence of specialized areas like the share of common suppliers, the existence of natural resources or transport advantages (Glaeser et al, 1992). Moreover, once firms share inputs that are not costlessly mobile, they have incentive to cluster (Glaeser et

al, 1992). However, all these factors comprise static externalities which after some time run out.

In contrast to specialization, diversification was found to affect positively employment growth even if its influence was significant in few cases. Diversification affected mainly the tertiary sector and its influence was positive both in prefectures and urban centers. As regards manufacturing, its impact was positive in few branches at urban level but mainly negative in prefectures. These findings support the Jacobian view that urbanization rather localization economies are more conducive to growth. The inter-industry flow of ideas and knowledge appears to be more effective than the intra-industry dispersion.

In urban centers, the branches that were benefited more from urbanization belong mainly to the branch manufacturing. More specifically these branches were: DH – manufacture of rubber and plastic products, DST – manufacture of coke, refined petroleum products and nuclear fuel, DA – manufacturing of food products, beverages and tobacco, J – other community, social and personal service activities and branch K – Real estate, renting and business activities.

In prefectures, urbanization economies favored growth most the following branches: B – fishing, DE – manufacture of pulp, paper and paper products; publishing and printing, J – other community, social and personal service activities, K – real estate, renting and business activities and Z – wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods

However, in secondary sector there were some branches that were harmed from a diversified environment. These were: DB – manufacture of textiles and textile products, E – electricity, gas and water supply, DK – manufacture of machinery and equipment NEC, D – manufacturing and DM – manufacture of transport equipment.

As regards regional policy suggestions, Suedekum and Blien (2005) question whether industrial clusters should be created where specialization is found to have a negative relation with growth. Although objections are naturally raised, the non linear relationships indicate that this could be effective for certain industries.

Moreover, when the effects of urbanization economies are positive, a rational policy suggestion would be to support a diversified local economic base. However, a relative specialization of an area in some branches where it presents comparative advantage was always considered a desirable choice as it raises efficiency and is the basis for trade. On the other hand, a diversified economy is better protected against

demand shocks. Thus, it can be claimed that although under the scope of dynamic externalities diversification seems to favor growth, a degree of specialization is always considered beneficial.

The size of local economy was not found to affect employment growth as in most cases density was excluded from regression models due to the presence of the other two variables. In the few cases that it was significant, the positive sign indicated that size of local economy has a positive effect upon growth. Interestingly, as regards urban centers, the absence of negative signs could be interpreted as that problems such as congestion, pollution or high rents induced by high densities induce are not present.

In urban level, density was found to favor growth in branches DB - manufacture of textiles and textile products, DZ - manufacture of chemicals, chemical products and man-made fibres and DK - manufacture of machinery and equipment NEC. In prefectures, positive influence was again for branch DB.

Finally, spatial econometric analysis did not reveal the existence of spatial autocorrelation except very few cases (branches DU - manufacture of other non metallic mineral products, ST- construction and N - health and social work). This means that the growth of a branch in an area is not affected significantly by the performance of nearby areas. These findings show that during the examined period, the growth of the branches took place in rather isolated spatial units.

This study could be repeated for the period 2001-2011 when those data become available. The results will indicate possible changes in the effects of localization and urbanization economies compared to the previous decade. In this case, the use of better indicators, like productivity as the depended one would be preferred if the appropriate data exist. Moreover, the study could be further improved by considering the effect of local competition upon employment growth. In this way, Porter's theory of dynamic externalities would also be considered. The unavailability of such data (number of firms and employees per branch) for this period rendered such analysis impossible. This study examined the existence of quadratic relations. However, more general non linear relations can be examined, like cubic or exponential. Finally, spatial autocorrelation among urban centers could be detected using the distance criterion.

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Table 1: Municipalities of urban agglomerations.

Agglomerations	Municipalities	Agglomerations	Municipalities	Municipalities
Agrinio	Agrinio	Athinas	Athineon	Imittou
	Neapolis		Agias Varvaras	Filotheis
Chiou	Chiou		Agias Paraskevis	Haidariou
	Omiroupolis		Agiou Dimitriou	Halandriou
	Agiau Mina		Agion Anargiron	Holargou
Chalkidas	Chalkideon		Aigaleo	Psihikou
	Neas Artakis		Alimou	Ekalis
	Anthidonos		Amarousiou	Neas Pentelis
Chanion	Chanion		Argyroupolis	Pentelis
	Soudas		Vrillision	Varis
	Neas Kydonias		Vironos	Voulas
	Therissou		Galatsiou	Vouliagmenis
	El. Venizelou		Glifadas	Geraka
Ioanninon	Ioanniton		Dafnis	Peiraios
	Anatolis		Ellinikou	Agiau Ioannou Renti
Irakleiou	Irakleiou		Zografou	Drapetsonas
	Neas Alikarnassou		Ilioupolis	Keratsiniou
Patras	Patron		Irakleiou	Koridallou
	Vrahnaikon		Iliou (Neon Liosion)	Nikaia
	Paralias		Kaisarianis	Peramatos
Thessalonikis	Thessalonikis		Kallitheatas	
	Agiau Pavlou		Kamaterou	
	Ampelokipon		Kifisias	
	Eleftheriou		Likobriseos	
	Evosmou		Melission	
	Kalamarias		Metamorfoseos	
	Menemenis		Moshatou	
	Neapoleos		Neas Erithreas	
	Panoramatos		Neas Ionias	
	Polihnis		Neas Smirnis	
	Pileas		Neas Filadelfias	
	Stavroupoleos		Neas Halkidonos	
	Sikeon		Neou Psihikou	
	Triandrias		Palaiau Falirou	
	Efkarpas		Papagou	
Volou	Volou		Peristeriou	
	Agrias		Petroupolis	
	Neas Ionias		Pefkis	
	Aisonias		Tavrou	

Table 2: Permanent population and employment in prefectures, municipalities and agglomerations in 1991.

Prefectures	Population	Employment	Employment (%)	Agglomerations and Municipalities	Population	Employment	Employment (%)
Country	10.223.392	3556017	34.8%	Urban centers	6015390	2178713	36.2%
Ahaia	296.775	97.925	33.0%	Agglom. Patras	171.612	55.501	32.3%
Aitolokarnanias	223.982	75.217	33.6%	Agglom. Agrinio	59.325	18.924	31.9%
				Iera Polis Messologiou	17.034	5.284	31.0%
Argolidas	94.755	35.893	37.9%	Argos	26.897	9.779	36.4%
				Nafpliou	14.406	5.186	36.0%
Arkadias	95.941	32.413	33.8%	Tripolis	28.345	8.953	31.6%
Artas	75.594	23.396	30.9%	Arteon	25.955	8.250	31.8%
Attikis	3.594.817	1.277.872	35.5%	Agglom. Athinas	2.982.676	1.138.884	38.2%
Chalkidikis	85.426	28.291	33.1%	Moudanion	12.780	4.539	35.5%
				Polygyrou	9.988	3.498	35.0%
Chanion	131.939	46.189	35.0%	Agglom. Chanion	76.309	25.873	33.9%
Chiou	52.703	13.161	25.0%	Agglom. Chiou	34.928	8.732	25.0%
Dodekanisou	161.870	56.994	35.2%	Rodou	47.527	18.431	38.8%
Dramas	95.142	31.652	33.3%	Dramas	51.315	17.125	33.4%
Euvoias	202.131	63.706	31.5%	Agglom. Chalkidas	57.489	17.790	30.9%
Evrou	144.464	47.964	33.2%	Alexandroupolis	42.794	13.784	32.2%
Evrytanas	20.390	5.931	29.1%	Karpenisiou	7.631	2.425	31.8%
Fhiotidas	163.395	53.299	32.6%	Lamieon	58.394	18.444	31.6%
Florinas	52.367	16.267	31.1%	Florinas	15.354	4.924	32.1%
Fokidas	36.766	11.108	30.2%	Amfissas	9.294	2.852	30.7%
Grevenon	32.793	10.097	30.8%	Grevenon	15.656	5.016	32.0%
Ilias	174.287	57.444	33.0%	Pyrgou	39.710	12.657	31.9%
				Amaliados	26.652	8.857	33.2%
Imathias	138.046	49.066	35.5%	Verias	43.679	15.242	34.9%
Ioanninon	152.759	48.297	31.6%	Agglom. Ioanninon	74.798	24.012	32.1%
Irakleiou	265.336	97.530	36.8%	Agglom. Irakleiou	138.229	49.528	35.8%
Karditsas	123.202	40.084	32.5%	Karditsas	38.940	12.407	31.9%
Kastorias	53.284	18.330	34.4%	Kastorias	17.094	6.233	36.5%
Kavalas	134.300	46.271	34.5%	Kavalas	60.784	20.428	33.6%
Kefalonias	32.352	11.436	35.3%	Argostoliou	10.082	3.548	35.2%
Kerkyras	103.461	38.608	37.3%	Kerkyraion	40.221	14.443	35.9%
Kilkis	75.747	27.782	36.7%	Kilkis	18.850	7.066	37.5%
Korinthias	132.139	46.027	34.8%	Korinthou	33.690	11.734	34.8%
Kozanis	150.051	44.344	29.6%	Kozanis	45.379	14.112	31.1%
				Ptolemaidas	33.810	9.365	27.7%
Kykladon	93.322	30.206	32.4%	Ermoupolis	14.189	4.073	28.7%
Lakonias	90.522	33.317	36.8%	Spartis	17.392	6.206	35.7%
Lasithiou	70.253	27.602	39.3%	Ierapetras	20.960	8.824	42.1%
				Agiou Nikolaou	16.661	6.709	40.3%
Lesbou	106.150	29.104	27.4%	Mitilinis	33.789	9.909	29.3%
Magnisias	196.252	61.791	31.5%	Agglom. Volou	119.275	37.458	31.4%
Messinias	160.601	55.798	34.7%	Kalamatas	53.589	18.706	34.9%
Pellas	136.726	51.512	37.7%	Giannitson	27.592	9.540	34.6%
				Edessas	24.938	8.358	33.5%
				Aridaia	19.288	7.982	41.4%
Pierias	113.502	41.660	36.7%	Katerinis	49.571	17.681	35.7%
Prevezas	57.068	19.783	34.7%	Prevezis	17.566	6.438	36.7%
Rethimnou	68.905	25.227	36.6%	Rethimnis	27.918	10.233	36.7%
Rodopis	104.073	40.955	39.4%	Komotinis	47.336	16.244	34.3%
Samou	42.510	12.839	30.2%	Vatheos	12.182	3.889	31.9%
Serron	185.824	69.649	37.5%	Serron	53.129	18.226	34.3%
Thesprotias	41.755	13.465	32.2%	Igoumenitsas	12.013	4.128	34.4%
Thessalonikis	971.067	355.841	36.6%	Agglom. Thessalonikis	777.456	284.367	36.6%
Triakalon	138.028	44.502	32.2%	Triakkaion	52.034	16.780	32.2%
Voiotias	125.419	42.921	34.2%	Thivaion	23.155	7.951	34.3%
				Levadeon	20.675	7.110	34.4%
Xanthi	92.218	33.350	36.2%	Xanthi	43.266	14.525	33.6%
Zakinthou	32.582	11.203	34.4%	Zakynthion	14.147	5046	35.7%

Source: ELSTAT

Table 3: Permanent population and employment in prefectures, municipalities and agglomerations in 2001.

Prefectures	Population	Employment	Employment (%)	Agglomerations and Municipalities	Population	Employment	Employment (%)
Country	10.934.097	4.101.715	37.5%	Urban centers	6.473.052	2.592.691	40.1%
Ahaías	318.928	106.709	33.5%	Agglom. Patras	185.574	63.602	34.3%
Aitolokarnanias	219.092	73509	33.6%	Agglom. Agrinio	62.359	21.237	34.1%
				Ieras Polis Messologiou	18.354	5.897	32.1%
Argolidas	102.392	40.275	39.3%	Argous	29.505	11.817	40.1%
				Nafpliou	16.113	6.591	40.9%
Arkadias	91.326	29.695	32.5%	Tripolis	32.167	11.710	36.4%
Artas	73.620	24.164	32.8%	Arteon	27.026	9.282	34.3%
Attikis	3.894.573	1.579.189	40.5%	Agglom. Athinas	3.161.802	1.371.650	43.4%
Chalkidikis	96.849	34.450	35.6%	Moudanion	16.236	3.977	24.5%
				Polygyrou	10.444	6.377	61.1%
Chanion	148.450	56.419	38.0%	Agglom. Chanion	87.104	33.530	38.5%
Chiou	53.106	15.514	29.2%	Agglom. Chiou	35.820	11.127	31.1%
Dodekanisou	188.506	66.997	35.5%	Rodou	55.086	21.788	39.6%
Dramas	102.184	31.797	31.1%	Dramas	57.033	18.489	32.4%
Euvoias	207.305	70.752	34.1%	Agglom. Chalkidas	61.135	24.049	39.3%
Evrou	149.283	52.323	35.0%	Alexandroupolis	53.459	19.610	36.7%
Evrytanas	19.518	6.284	32.2%	Karpenisiou	8.736	2.962	33.9%
Fhiotidas	169.542	61.208	36.1%	Lamieon	62.452	22.208	35.6%
Fokidas	37.866	11.497	30.4%	Amfissas	8.864	2.831	31.9%
Florinas	54.109	17.795	32.9%	Florinas	17.500	6.143	35.1%
Grevenon	32.567	10.497	32.2%	Grevenon	16.421	5.646	34.4%
Ilias	183.521	58.613	31.9%	Pyrrou	35.620	11.822	33.2%
				Amaliados	31.542	10.498	33.3%
Imathias	142.471	51.560	36.2%	Verias	47.677	17.314	36.3%
Ioanninon	161.027	54.496	33.8%	Agglom. Ioanninon	83.284	30.766	36.9%
Irakleiou	291.225	115.228	39.6%	Agglom. Irakleiou	154.671	62.077	40.1%
Karditsas	120.265	41.357	34.4%	Karditsas	41.411	14.455	34.9%
Kastorias	53.702	17.188	32.0%	Kastorias	17.038	5.899	34.6%
Kavalas	141.499	49.466	35.0%	Kavalas	63.572	22.419	35.3%
Kefalonias	37.756	12.232	32.4%	Argostoliou	12.503	4.442	35.5%
Kerkyras	111.081	38.532	34.7%	Kerkyraion	41.532	15.516	37.4%
Kilkis	86.424	28.461	32.9%	Kilkis	24.874	8.882	35.7%
Korinthias	144.527	57.681	39.9%	Korinthou	36.991	14.593	39.5%
Kozanis	153.939	48.501	31.5%	Kozanis	49.812	17.080	34.3%
				Ptolemaidas	36.393	11.478	31.5%
Kykladon	109.956	39.848	36.2%	Ermoupolis	13.496	4.825	35.8%
Lakonias	92.811	36.091	38.9%	Spartis	19.102	7.792	40.8%
Larisas	282.156	106.431	37.7%	Larisas	132.779	49.624	37.4%
Lasithiou	75.736	30.006	39.6%	Ierapetras	23.729	10.598	44.7%
				Agiou Nikolaou	19.593	7.720	39.4%
Lesbou	108.288	36.035	33.3%	Mitilinis	37.881	13.053	34.5%
Magnisias	205.005	71.495	34.9%	Agglom. Volou	128.955	44.015	34.1%
Messinias	166.566	59.663	35.8%	Kalamatas	61.373	21.878	35.6%
Pellas	143.957	53.782	37.4%	Giannitson	31.782	11.277	35.5%
				Edessas	25.729	8.844	34.4%
				Aridaia	19.970	7.306	36.6%
Pierias	126.412	45.915	36.3%	Katerinis	57.098	20.188	35.4%
Prevezas	58.144	20.390	35.1%	Prevezis	19.984	7.761	38.8%
Rethimnou	78.957	29.680	37.6%	Rethimnis	32.694	12.940	39.6%
Rodopis	111.237	44.505	40.0%	Komotinis	53.719	18.980	35.3%
Samou	43.841	14.249	32.5%	Vatheos	12.525	4.629	37.0%
Serron	194.483	65.181	33.5%	Serron	57.867	19.974	34.5%
Thesprotias	43.601	15.375	35.3%	Igoumenitsas	15.250	5.647	37.0%
Thessalonikis	1.084.001	416.342	38.4%	Agglom. Thessalonikis	823.913	319.869	38.8%
Trikalon	132.689	47.177	35.6%	Trikkaion	57.914	20.925	36.1%
Voiotias	123.913	48.373	39.0%	Thivaion	24.443	9.741	39.9%
				Levadeon	22.072	8.364	37.9%
Xanthi	102.959	36.907	35.8%	Xanthis	53.598	18.742	35.0%
Zakinthou	38.883	14.558	37.4%	Zakynthion	16.382	6.159	37.6%

Source: ELSTAT

Table 4: Descriptive statistics of employment in prefectures, 1991.

	Descriptive statistics					
	mean	st.dev.	min	max	Skewness	Kurtosis
Total	69725.82	179558.68	5931	1277872	6.41	43.18
Sectors						
primary	13372.76	8433.43	2040.00	35560.00	0.76	0.02
secondday	16366.80	46368.44	1179.00	321974.00	6.14	39.80
tertiary	36036.43	117427.19	2419.00	835444.00	6.61	45.33
Branches						
A	12797.45	8437.19	1894	34778	0.82	0.06
B	277.20	358.93	2	1563	2.04	3.98
C	298.12	503.43	1	2297	2.50	5.96
DA	1543.16	3625.53	30	23720	5.34	30.36
DB	3051.75	8675.81	46	51737	4.85	24.16
DC	337.35	1550.23	2	10467	6.08	38.63
DD	350.39	716.24	35	5049	5.97	38.78
DE	668.59	3257.71	8	23186	6.89	48.30
DST	93.02	450.72	0	3115	6.37	42.55
DZ	357.39	1752.69	1	12436	6.82	47.69
DH	234.27	872.89	0	5981	6.11	39.56
DU	514.82	1220.55	10	8034	5.16	29.95
DI	1026.41	3002.93	38	20629	5.97	38.20
DK	319.08	1272.77	0	8860	6.38	42.73
DL	247.76	1012.02	3	7114	6.55	44.69
DM	393.90	2160.05	1	15449	7.04	50.03
DN	1089.37	3691.84	31	25058	5.98	37.64
E	653.80	1928.43	30	12629	5.49	32.00
ST	5485.73	12364.90	682	88510	6.35	42.76
Z	9803.18	31173.02	426	219079	6.40	42.83
H	2926.43	6405.39	291	44563	5.82	37.26
U	4766.20	16509.11	329	118258	6.78	47.21
I	1446.51	6004.43	57	42903	6.86	48.08
K	2568.57	10356.26	78	73451	6.71	46.36
L	5745.18	19065.43	585	137250	6.84	47.87
M	3625.08	10193.57	308	71563	6.28	41.56
N	2715.90	9286.99	179	65474	6.50	43.99
J	2092.98	7230.05	98	51487	6.67	46.00
O	309.55	1478.52	3	10514	6.86	48.01
P	36.86	152.40	0	902	4.98	25.11

Source: Data from ELSTAT elaborated by the author

Table 5: Total employment growth of prefectures, overall specialization and diversification indexes in 1991.

Prefectures	Employment 1991	Employment 2001	Employment growth 1991-2001	Normalized employment growth	Specialization index (KSI)	Diversification Index (HHI)
Country	3.556.017	4.101.715	15.35%	-	-	-
Attikis	1.277.872	1.579.189	23.58%	0.07	0.382	0.071
Ahaia	97.925	106.709	8.97%	-0.06	0.125	0.086
Aitolokarnanias	75.217	73.509	-2.27%	-0.15	0.568	0.239
Argolidas	35.893	40.275	12.21%	-0.03	0.454	0.190
Arkadias	32.413	29.695	-8.39%	-0.21	0.494	0.180
Artas	23.396	24.164	3.28%	-0.10	0.496	0.189
Chalkidiki	28.291	34.450	21.77%	0.06	0.441	0.114
Chanion	46.189	56.419	22.15%	0.06	0.292	0.121
Chios	13.161	15.514	17.88%	0.02	0.310	0.098
Dodekanisos	56.994	66.997	17.55%	0.02	0.478	0.101
Dramas	31.652	31.797	0.46%	-0.13	0.314	0.100
Evvoias	63.706	70.752	11.06%	-0.04	0.289	0.076
Evros	47.964	52.323	9.09%	-0.05	0.456	0.186
Evrytanias	5.931	6.284	5.95%	-0.08	0.467	0.159
Fthiotidas	53.299	61.208	14.84%	0.00	0.338	0.146
Florinas	16.267	17.795	9.39%	-0.05	0.473	0.175
Fokidas	11.108	11.497	3.50%	-0.10	0.372	0.111
Grevenon	10.097	10.497	3.96%	-0.10	0.487	0.198
Ilias	57.444	58.613	2.04%	-0.12	0.468	0.198
Imathias	49.066	51.560	5.08%	-0.09	0.441	0.162
Ioannina	48.297	54.496	12.84%	-0.02	0.263	0.105
Iraklio	97.530	115.228	18.15%	0.02	0.331	0.138
Karditsas	40.084	41.357	3.18%	-0.11	0.583	0.271
Kastoria	18.330	17.188	-6.23%	-0.19	0.680	0.216
Kavala	46.271	49.466	6.90%	-0.07	0.229	0.096
Kefalonias	11.436	12.232	6.96%	-0.07	0.486	0.157
Kerkiras	38.608	38.532	-0.20%	-0.13	0.382	0.115
Kilkis	27.782	28.461	2.44%	-0.11	0.525	0.162
Korinthias	46.027	57.681	25.32%	0.09	0.367	0.150
Kozanis	44.344	48.501	9.37%	-0.05	0.389	0.093
Kykladon	30.206	39.848	31.92%	0.14	0.392	0.093
Lakonias	33.317	36.091	8.33%	-0.06	0.715	0.327
Larisa	95.596	106.431	11.33%	-0.03	0.318	0.146
Lasithi	27.602	30.006	8.71%	-0.06	0.547	0.191
Lefkada	7.102	7.323	3.11%	-0.11	0.401	0.159
Lesbos	29.104	36.035	23.81%	0.07	0.311	0.115
Magnisias	61.791	71.495	15.70%	0.00	0.157	0.079
Messinias	55.798	59.663	6.93%	-0.07	0.431	0.187
Pellis	51.512	53.782	4.41%	-0.09	0.650	0.273
Pierias	41.660	45.915	10.21%	-0.04	0.405	0.169
Prevezas	19.783	20.390	3.07%	-0.11	0.430	0.183
Rethimno	25.227	29.680	17.65%	0.02	0.480	0.170
Rodopis	40.955	44.505	8.67%	-0.06	0.762	0.353
Samos	12.839	14.249	10.98%	-0.04	0.350	0.109
Serron	69.649	65.181	-6.42%	-0.19	0.528	0.231
Thesprotias	13.465	15.375	14.18%	-0.01	0.432	0.167
Thessalonikis	355.841	416.342	17.00%	0.01	0.359	0.073
Trikala	44.502	47.177	6.01%	-0.08	0.404	0.164
Voitias	42.921	48.373	12.70%	-0.02	0.356	0.101
Xanthi	33.350	36.907	10.67%	-0.04	0.500	0.192
Zakynthos	11.203	14.558	29.95%	0.13	0.458	0.177

Source: Data from ELSTAT elaborated by the author

Table 6: Sectoral employment growth of prefectures.

Prefectures	Growth rate				Normalized growth rate			
	Total economy	Primary	Secondary	Tertiary	Total economy	Primary	Secondary	Tertiary
Country	15.35%	-11.59%	5.50%	30.65%	0.00%	-23.35%	-8.54%	13.26%
Ahaïas	8.97%	-28.08%	-10.03%	31.59%	-5.53%	-18.65%	-14.72%	0.73%
Aitolokarnanias	-2.27%	-23.70%	10.17%	24.84%	-15.27%	-13.70%	4.42%	-4.45%
Argolidas	12.21%	-15.31%	14.00%	32.63%	-2.72%	-4.21%	8.06%	1.52%
Arkadias	-8.39%	-43.73%	7.18%	20.34%	-20.57%	-36.36%	1.59%	-7.89%
Artas	3.28%	-17.97%	4.53%	24.86%	-10.46%	-7.22%	-0.92%	-4.43%
Attikis	23.58%	19.08%	12.26%	31.74%	7.14%	34.68%	6.41%	0.84%
Chalkidikis	21.77%	0.40%	29.96%	40.70%	5.57%	13.56%	23.19%	7.70%
Chanion	22.15%	-11.16%	17.17%	36.97%	5.90%	0.48%	11.06%	4.84%
Chiou	17.88%	-15.12%	-2.88%	30.20%	2.20%	-4.00%	-7.94%	-0.34%
Dodekanisou	17.55%	-0.89%	-2.80%	24.65%	1.91%	12.10%	-7.87%	-4.59%
Dramas	0.46%	-14.77%	-24.79%	23.52%	-12.91%	-3.60%	-28.71%	-5.45%
Euvoias	11.06%	-13.53%	10.29%	29.48%	-3.72%	-2.19%	4.54%	-0.89%
Evrou	9.09%	-23.39%	21.73%	34.75%	-5.43%	-13.35%	15.38%	3.15%
Evrytanias	5.95%	-9.36%	-10.39%	22.90%	-8.14%	2.52%	-15.06%	-5.93%
Fhiotidas	14.84%	4.99%	14.07%	21.52%	-0.44%	18.75%	8.12%	-6.98%
Florinas	9.39%	-22.67%	31.50%	34.30%	-5.16%	-12.53%	24.65%	2.80%
Fokidas	3.50%	-41.14%	10.81%	20.43%	-10.27%	-33.42%	5.04%	-7.82%
Grevenon	3.96%	-15.34%	7.55%	24.74%	-9.87%	-4.25%	1.94%	-4.52%
Ilias	2.04%	-11.67%	5.63%	10.51%	-11.54%	-0.10%	0.12%	-15.41%
Imathias	5.08%	-13.58%	-3.58%	30.55%	-8.90%	-2.25%	-8.61%	-0.07%
Ioaninon	12.84%	-38.01%	3.42%	32.24%	-2.18%	-29.89%	-1.97%	1.22%
Irakleiou	18.15%	-11.75%	8.12%	38.40%	2.43%	-0.18%	2.48%	5.94%
Karditsas	3.18%	-11.77%	-2.67%	26.43%	-10.55%	-0.20%	-7.74%	-3.23%
Kastorias	-6.23%	1.73%	-43.03%	34.48%	-18.71%	15.06%	-46.00%	2.93%
Kavalas	6.90%	-13.95%	-3.10%	25.28%	-7.32%	-2.67%	-8.15%	-4.10%
Kefalonias	6.96%	-46.58%	23.53%	31.48%	-7.27%	-39.58%	17.09%	0.64%
Kerkiras	-0.20%	-27.53%	-11.02%	9.08%	-13.47%	-18.03%	-15.66%	-16.51%
Kilkis	2.44%	-29.10%	7.45%	31.32%	-11.19%	-19.81%	1.85%	0.51%
Korinthias	25.32%	17.92%	22.65%	36.35%	8.65%	33.37%	16.26%	4.37%
Kozanis	9.37%	-8.80%	-10.31%	36.53%	-5.18%	3.15%	-14.98%	4.50%
Kykladon	31.92%	-16.97%	31.03%	57.62%	14.37%	-6.09%	24.20%	20.65%
Lakonias	8.33%	-7.56%	27.68%	22.77%	-6.09%	4.55%	21.02%	-6.03%
Larissas	11.33%	-2.48%	-0.27%	33.52%	-3.48%	10.31%	-5.47%	2.20%
Lasithiou	8.71%	-11.68%	3.86%	21.50%	-5.75%	-0.11%	-1.56%	-7.00%
Lefkadas	3.11%	-43.17%	10.52%	39.28%	-10.61%	-35.72%	4.76%	6.61%
Lesbou	23.81%	23.93%	3.32%	26.91%	7.34%	40.18%	-2.06%	-2.86%
Magnisias	15.70%	13.65%	-2.67%	24.66%	0.31%	28.55%	-7.75%	-4.58%
Messinias	6.93%	-5.34%	-7.05%	24.70%	-7.30%	7.07%	-11.89%	-4.55%
Pellias	4.41%	-7.68%	1.70%	28.97%	-9.48%	4.43%	-3.60%	-1.28%
Pierias	10.21%	-8.61%	-13.56%	37.33%	-4.45%	3.37%	-18.07%	5.12%
Prevezas	3.07%	-18.39%	-6.28%	22.83%	-10.64%	-7.69%	-11.17%	-5.98%
Rethimnou	17.65%	-19.38%	27.62%	36.68%	2.00%	-8.81%	20.97%	4.62%
Rodopis	8.67%	-7.57%	46.94%	23.35%	-5.79%	4.55%	39.28%	-5.58%
Samou	10.98%	-15.06%	-4.92%	32.44%	-3.78%	-3.93%	-9.88%	1.37%
Serron	-6.42%	-24.81%	-18.80%	17.37%	-18.87%	-14.96%	-23.03%	-10.16%
Thesprotias	14.18%	-8.75%	0.07%	45.21%	-1.01%	3.22%	-5.15%	11.15%
Thessalonikis	17.00%	-5.06%	-2.58%	32.43%	1.44%	7.38%	-7.66%	1.37%
Trikalon	6.01%	-9.29%	0.22%	30.27%	-8.09%	2.60%	-5.00%	-0.29%
Voiotias	12.70%	9.07%	-2.26%	20.81%	-2.29%	23.36%	-7.36%	-7.53%
Xanthis	10.67%	-22.57%	28.39%	33.27%	-4.06%	-12.42%	21.70%	2.01%
Zakinthou	29.95%	-2.04%	32.99%	50.78%	12.66%	10.80%	26.05%	15.41%

Source: Data from ELSTAT elaborated by the author

Table 7: Sectoral specialization and diversification of prefectures, 1991.

Prefectures	Specialization (LQ)			Diversification (HHI)		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Ahaïas	1.00	1.03	0.97	0.47	0.50	0.38
Aitolokarnanias	2.47	0.62	0.64	0.47	0.46	0.55
Argolidas	2.15	0.70	0.74	0.50	0.45	0.52
Arkadias	2.04	0.78	0.73	0.47	0.44	0.48
Artas	2.14	0.76	0.72	0.49	0.45	0.50
Attikis	0.08	1.41	1.26	0.55	0.96	0.92
Chalkidikis	1.79	0.90	0.77	0.47	0.44	0.45
Chanion	1.41	0.76	1.01	0.57	0.51	0.46
Chiou	0.85	0.97	1.13	0.56	0.62	0.45
Dodekanisou	0.41	0.94	1.27	0.56	0.72	0.46
Dramas	1.27	1.30	0.79	0.45	0.47	0.43
Euvoias	1.12	1.23	0.81	0.42	0.44	0.39
Evrou	2.06	0.64	0.83	0.57	0.47	0.55
Evrytánias	1.79	0.89	0.79	0.49	0.46	0.46
Fhiotidas	1.82	0.76	0.80	0.48	0.44	0.45
Florinas	2.09	0.73	0.73	0.48	0.44	0.49
Fokidas	1.74	0.83	0.87	0.54	0.48	0.49
Grevenon	2.15	0.75	0.73	0.50	0.46	0.52
Ilias	2.13	0.62	0.73	0.47	0.42	0.49
Imathias	1.88	1.03	0.71	0.47	0.46	0.47
Ioaninon	1.23	0.99	0.99	0.54	0.54	0.46
Irakleïou	1.58	0.74	0.94	0.54	0.48	0.46
Karditsas	2.59	0.60	0.67	0.55	0.50	0.62
Kastorias	0.95	2.02	0.64	0.50	0.52	0.58
Kavalas	1.37	1.08	0.87	0.49	0.49	0.44
Kefalonias	1.79	0.77	0.89	0.57	0.49	0.52
Kerkyras	1.14	0.74	1.09	0.57	0.54	0.41
Kilkis	1.86	1.12	0.61	0.41	0.42	0.42
Korinthias	1.80	0.85	0.77	0.46	0.43	0.44
Kozanis	1.18	1.52	0.77	0.47	0.50	0.49
Kykladon	1.15	1.15	0.88	0.46	0.48	0.41
Lakonias	2.93	0.42	0.61	0.57	0.51	0.70
Larissas	1.73	0.93	0.79	0.48	0.46	0.45
Lasithiou	2.09	0.57	0.85	0.58	0.47	0.56
Lefkadas	1.95	0.71	0.85	0.56	0.48	0.53
Lesbou	1.46	0.82	0.95	0.54	0.49	0.45
Magnisias	0.90	1.13	0.98	0.48	0.53	0.41
Messinias	2.06	0.77	0.76	0.51	0.46	0.51
Pellas	2.63	0.74	0.57	0.47	0.50	0.57
Pierias	1.95	0.93	0.74	0.49	0.47	0.49
Prevezas	2.04	0.79	0.78	0.53	0.47	0.52
Rethimnou	1.89	0.69	0.88	0.57	0.48	0.53
Rodopis	3.05	0.48	0.54	0.53	0.53	0.68
Samou	1.33	0.90	0.96	0.52	0.50	0.43
Serron	2.37	0.80	0.66	0.51	0.49	0.56
Thesprotias	1.90	0.90	0.77	0.50	0.46	0.48
Thessalonikis	0.33	1.36	1.07	0.47	0.67	0.53
Trikalon	1.86	0.85	0.77	0.48	0.45	0.46
Voiotias	1.41	1.34	0.71	0.44	0.44	0.43
Xanthi	2.13	0.98	0.63	0.45	0.46	0.48
Zakinthou	1.96	0.73	0.81	0.53	0.46	0.51

Source: Data from ELSTAT elaborated by the author

Table 8: Employment growth of prefectures in 1-digid classification.

Prefectures	BRANCHES																
	Total	A	B	C	D	E	ST	Z	H	U	I	K	L	M	N	J	O
Total	1.15	0.88	1.27	0.75	0.94	1.12	1.25	1.21	1.57	1.10	1.44	1.82	1.10	1.35	1.33	1.27	3.61
Ahaia	1.09	0.71	1.22	0.87	0.72	1.30	1.17	1.16	1.69	1.25	1.30	1.93	1.11	1.41	1.42	1.24	3.21
Aitolokarnanias	0.98	0.75	1.44	0.72	1.04	1.13	1.14	1.19	1.63	1.01	1.34	1.79	1.01	1.31	1.65	1.16	2.80
Argolidas	1.12	0.84	1.53	0.54	1.04	1.55	1.23	1.18	1.38	1.11	1.44	2.12	1.17	1.40	1.57	1.26	5.23
Arkadias	0.92	0.55	1.95	1.08	1.06	1.23	1.01	1.14	1.45	0.95	1.38	2.14	1.05	1.27	1.22	1.13	6.20
Artas	1.03	0.82	0.84	1.86	1.13	1.61	0.95	1.22	1.38	0.94	1.56	1.71	1.11	1.28	1.72	1.08	2.00
Attikis	1.24	1.24	1.48	0.67	0.99	0.99	1.46	1.24	1.67	1.16	1.50	1.77	1.04	1.31	1.28	1.25	3.68
Chalkidikis	1.22	1.11	1.14	0.46	1.15	0.88	1.43	1.29	1.72	1.05	1.57	2.60	1.19	1.21	1.27	1.59	4.54
Chanion	1.22	0.89	1.14	0.44	0.95	2.13	1.30	1.26	1.87	1.19	1.50	1.99	1.15	1.47	1.42	1.48	5.43
Chiou	1.18	0.74	1.88	0.88	0.80	1.47	1.04	1.20	1.77	1.01	1.42	1.84	1.41	1.42	1.36	1.17	3.02
Dodekanisou	1.18	0.93	1.21	0.90	0.89	1.69	0.97	1.18	1.14	1.17	1.37	1.68	1.35	1.40	1.24	1.30	3.51
Dramas	1.00	0.86	1.75	0.75	0.63	1.58	1.06	1.20	1.56	0.92	1.19	1.85	1.06	1.40	1.30	1.08	3.62
Evvoias	1.11	0.89	1.53	0.28	1.14	0.99	1.06	1.28	1.49	0.91	1.48	2.04	1.15	1.35	1.41	1.28	5.48
Evrou	1.09	0.76	1.29	1.06	1.08	1.35	1.42	1.29	1.43	0.93	1.11	2.10	1.46	1.34	1.42	1.29	1.73
Evrytanias	1.06	0.90	1.80	3.00	0.53	3.35	1.07	1.31	1.57	0.88	1.47	2.00	0.93	1.04	1.76	1.39	5.33
Phiotidas	1.15	1.04	2.45	0.82	1.19	1.10	1.09	1.12	1.42	0.98	1.41	1.90	1.06	1.28	1.35	1.21	5.40
Florinas	1.09	0.76	0.72	1.02	1.01	2.12	1.28	1.32	1.77	0.97	1.48	2.32	1.30	1.30	1.27	1.24	5.57
Fokidas	1.04	0.61	2.26	0.25	0.83	1.44	1.31	1.01	1.21	1.08	1.64	1.97	1.20	1.19	1.32	1.15	2.97
Grevenon	1.04	0.85	19.00	0.26	0.94	1.25	1.18	1.11	1.52	1.06	1.60	2.32	1.11	1.28	1.40	1.10	1.00
Ilias	1.02	0.88	1.61	0.39	0.96	1.65	1.10	0.89	1.29	1.03	1.27	1.90	0.98	1.21	1.35	1.23	3.67
Imathias	1.05	0.86	1.50	0.75	0.91	1.40	1.09	1.29	1.42	1.01	1.49	1.68	1.31	1.40	1.34	0.98	1.99
Ioanninon	1.13	0.61	1.16	0.69	1.02	1.23	1.03	1.24	1.61	1.01	1.41	1.69	1.27	1.38	1.45	1.12	2.47
Irakleiou	1.18	0.88	1.41	0.52	1.19	1.31	0.99	1.23	1.63	1.20	1.51	2.04	1.07	1.39	1.60	1.40	3.56
Karditsas	1.03	0.88	1.17	0.65	0.98	1.51	0.93	1.17	1.65	0.93	1.41	1.74	1.16	1.32	1.52	1.10	2.62
Kastorias	0.94	1.01	0.85	2.18	0.49	2.27	1.40	1.32	1.73	1.04	1.15	1.51	1.40	1.30	1.34	1.17	2.33
Kavalas	1.07	0.88	0.89	0.67	0.85	1.56	1.25	1.19	1.66	1.08	1.25	1.85	0.95	1.34	1.24	1.26	2.80
Kefalonias	1.07	0.49	1.47	1.04	1.18	1.72	1.24	1.29	1.76	0.85	1.21	2.16	1.23	1.52	1.34	1.47	4.06
Kerkiras	1.00	0.72	0.86	0.87	0.89	1.43	0.87	1.08	0.89	0.93	1.34	1.43	1.14	1.47	1.40	1.12	2.99
Kilkis	1.02	0.71	0.70	1.57	0.99	1.27	1.42	1.12	1.52	1.02	1.33	2.66	1.38	1.45	1.31	1.25	1.97
Korinthias	1.25	1.17	2.35	0.99	1.28	1.27	1.16	1.23	1.65	1.05	1.37	1.87	1.04	1.34	1.45	2.09	5.30
Kozanis	1.09	0.77	2.33	1.62	0.78	0.78	1.24	1.39	1.71	0.86	1.34	2.08	1.23	1.39	1.41	1.39	3.88
Kykladon	1.32	0.76	1.09	1.34	0.95	1.23	1.53	1.55	2.10	1.08	1.51	2.20	1.29	1.60	1.57	1.53	4.18
Lakonias	1.08	0.92	0.92	1.27	1.25	1.20	1.30	1.12	1.48	0.84	1.42	1.84	1.12	1.30	1.43	1.32	6.33
Larisas	1.11	0.98	1.32	0.40	0.95	1.36	1.07	1.25	1.62	0.95	1.34	1.72	1.31	1.46	1.60	1.11	3.82
Lasithiou	1.09	0.88	1.13	0.87	1.00	1.88	1.02	1.08	1.16	1.05	1.46	1.73	1.05	1.38	1.45	1.34	5.34
Lefkadas	1.03	0.53	1.03	0.25	0.85	1.00	1.29	1.18	2.59	0.99	1.58	1.89	1.20	1.33	1.36	1.91	4.67
Lesbou	1.24	1.28	0.88	0.76	1.05	1.20	1.01	1.23	1.48	0.96	0.99	1.79	1.24	1.40	1.51	1.17	2.63
Magnisias	1.16	1.15	0.98	1.15	0.86	1.90	1.14	1.10	1.76	0.92	1.21	1.64	1.16	1.45	1.40	1.21	3.52
Messinias	1.07	0.94	1.30	0.82	0.81	1.46	0.98	1.14	1.63	0.93	1.20	1.80	1.07	1.29	1.42	1.40	6.83
Pellas	1.04	0.92	0.92	1.47	0.95	1.13	1.19	1.25	1.53	0.97	1.27	2.11	1.07	1.44	1.34	1.30	3.10
Pierias	1.10	0.91	1.23	0.59	0.75	1.61	1.03	1.31	1.75	1.05	1.28	1.74	1.16	1.44	1.54	1.38	3.69
Prevezas	1.03	0.80	1.66	0.89	0.88	1.15	0.97	1.13	1.37	1.08	1.34	2.07	1.04	1.27	1.23	1.67	3.95
Rethimnou	1.18	0.81	1.29	0.56	1.16	1.40	1.34	1.27	1.51	1.10	1.33	2.00	1.04	1.41	1.44	1.24	9.00
Rodopis	1.09	0.92	1.59	0.98	1.36	2.52	1.62	1.20	1.65	0.96	1.15	2.08	1.10	1.27	1.23	1.10	1.82
Samou	1.11	0.84	0.88	1.02	0.84	1.28	0.99	1.34	1.41	0.95	1.36	1.78	1.31	1.51	1.49	1.16	3.41
Serron	0.94	0.75	0.76	0.76	0.70	1.66	1.03	1.05	1.48	0.99	1.26	1.72	1.06	1.35	1.24	0.97	2.69
Thesprotias	1.14	0.88	2.84	3.42	0.76	1.13	1.16	1.40	1.72	1.19	1.35	1.89	1.58	1.25	1.51	1.24	2.78
Thessalonikis	1.17	0.94	1.16	0.82	0.87	1.26	1.35	1.16	1.82	1.18	1.39	1.87	1.05	1.41	1.27	1.37	2.97
Trikalon	1.06	0.91	4.00	0.88	1.01	1.39	0.98	1.28	1.68	0.82	1.50	1.66	1.05	1.43	1.49	1.45	3.39
Voiotias	1.13	1.14	2.08	0.38	0.92	1.13	1.10	1.10	1.42	0.97	1.23	1.96	1.02	1.25	1.50	1.29	4.98
Xanthi	1.11	0.77	0.63	1.26	1.19	2.01	1.44	1.26	1.59	1.13	1.13	2.19	1.14	1.40	1.47	1.44	1.18
Zakinthou	1.30	0.97	1.10	2.24	1.11	1.65	1.42	1.37	2.65	1.22	1.31	1.89	0.93	1.40	1.32	1.39	5.85

Source: Data from ELSTAT elaborated by the author

Table 9: Employment growth of prefectures in 2-digid classification in manufacturing.

Prefectures	BRANCHES															
	Total	D	DA	DB	DC	DD	DE	DST	DZ	DH	DU	DI	DK	DL	DM	DN
Total	1.15	0.94	1.21	0.59	0.59	1.16	1.40	1.23	1.20	1.16	1.02	1.13	1.14	1.24	0.85	0.88
Ahaia	1.09	0.72	1.04	0.33	0.55	1.06	1.13	0.85	1.85	0.39	0.76	1.02	1.13	1.73	1.19	0.73
Aitolokarnanias	0.98	1.04	1.17	0.69	0.41	1.61	1.80	3.50	1.73	1.01	1.38	0.97	1.37	0.56	1.83	0.88
Argolidas	1.12	1.04	1.58	0.51	0.33	1.43	1.51	1.50	1.52	1.24	0.74	0.85	0.99	1.68	1.07	1.00
Arkadias	0.92	1.06	1.19	0.43	1.33	1.58	1.53	3.67	3.89	0.94	0.87	1.07	0.74	2.00	0.50	0.77
Artas	1.03	1.13	1.38	0.53	0.25	1.54	1.46	3.00	4.25	0.90	1.19	0.84	4.17	1.63	4.00	0.75
Attikis	1.24	0.99	1.22	0.68	0.62	1.21	1.41	1.16	1.16	1.06	1.07	1.13	1.13	1.26	0.81	0.88
Chalkidikis	1.22	1.15	1.30	0.75	0.81	1.66	2.36	0.86	0.61	1.25	1.78	1.17	1.64	1.35	1.53	0.71
Chanion	1.22	0.95	1.15	0.31	0.55	1.18	1.38	0.50	1.91	0.64	1.21	1.18	1.04	1.12	0.15	1.00
Chiou	1.18	0.80	1.08	0.11	0.10	0.84	1.79	1.00	2.00	0.50	0.93	0.97	0.83	1.69	1.22	0.52
Dodekanisou	1.18	0.89	1.10	0.50	0.64	0.98	1.34	1.73	1.10	1.63	0.63	0.97	0.83	1.01	0.73	0.98
Dramas	1.00	0.63	1.04	0.28	0.57	1.19	0.68	0.50	1.30	1.39	1.28	1.18	1.65	1.80	2.10	0.94
Evvoias	1.11	1.14	1.73	0.51	0.61	1.16	1.23	3.44	2.02	2.21	0.83	1.28	1.44	1.04	0.73	1.29
Evrou	1.09	1.08	1.47	0.41	0.48	1.31	2.01	2.83	4.52	4.44	1.86	1.52	1.92	2.36	2.15	0.68
Evrytanias	1.06	0.53	2.40	0.07	0.50	0.52	0.93	0.00	9.00	0.38	1.50	1.29	3.00	2.33	1.67	0.81
Phiotidas	1.15	1.19	1.81	0.53	0.36	1.32	1.53	1.40	2.06	1.08	1.00	0.94	1.57	1.33	1.44	0.76
Florinas	1.09	1.01	1.46	0.39	0.23	0.53	1.45	1.00	0.38	1.00	0.88	1.30	1.10	0.82	2.00	1.67
Fokidas	1.04	0.83	0.71	0.61	0.24	0.64	1.59	0.33	1.22	6.50	1.40	0.85	2.40	1.33	1.07	1.40
Grevenon	1.04	0.94	1.08	0.59	0.80	0.83	1.44	2.00	0.17	0.20	2.36	1.30	1.00	5.60	18.00	0.78
Ilias	1.02	0.96	1.22	0.65	0.58	1.01	1.71	5.50	1.53	0.80	0.66	0.90	1.20	1.23	1.09	0.78
Imathias	1.05	0.91	1.21	0.68	1.08	0.69	1.15	2.57	1.26	0.95	0.88	1.06	1.20	1.18	1.38	0.88
Ioanninon	1.13	1.02	1.67	0.57	0.30	0.82	1.64	0.80	1.90	2.32	0.44	1.17	1.53	1.28	4.50	0.73
Irakleiou	1.18	1.19	1.30	0.60	0.45	1.89	1.75	2.80	2.16	1.85	1.11	1.15	1.17	1.42	0.88	1.07
Karditsas	1.03	0.98	0.96	0.39	0.58	1.54	1.96	5.00	0.97	1.17	1.26	0.93	2.26	2.19	1.71	0.73
Kastorias	0.94	0.49	1.20	0.43	3.51	1.35	2.00	1.00	2.67	2.00	1.04	0.90	2.50	0.93	5.50	0.98
Kavalas	1.07	0.85	1.08	0.43	0.61	1.05	1.41	1.87	1.12	0.68	1.16	1.52	0.99	1.59	0.67	0.85
Kefalonias	1.07	1.18	0.92	0.61	3.50	1.60	2.80	0.00	2.67	0.33	1.24	1.27	0.90	1.67	1.11	1.69
Kerkiras	1.00	0.89	1.16	0.54	0.48	1.27	1.15	0.80	1.09	1.60	0.82	0.79	1.42	1.08	1.19	0.63
Kilkis	1.02	0.99	1.75	0.62	0.44	0.68	3.67	2.67	1.50	1.45	1.05	2.23	2.46	1.02	3.67	0.78
Korinthias	1.25	1.28	1.55	0.67	0.43	1.17	1.50	1.08	1.26	1.03	1.08	1.41	0.74	1.83	0.98	1.16
Kozanis	1.09	0.78	1.34	0.56	1.08	1.19	1.74	2.50	0.07	1.68	0.97	1.60	2.24	0.80	2.00	0.89
Kykladon	1.32	0.95	1.15	0.30	0.42	2.59	2.83	2.50	0.38	0.50	1.37	1.17	4.63	2.23	0.61	0.68
Lakonias	1.08	1.25	1.95	0.48	0.33	0.84	1.58	1.00	1.13	0.23	1.80	1.04	1.12	1.41	3.00	0.79
Larissas	1.11	0.95	1.22	0.57	0.55	1.38	0.84	1.44	1.91	1.41	1.25	1.34	1.74	1.77	0.98	1.04
Lasithiou	1.09	1.00	0.99	0.40	0.70	0.96	1.53	2.00	0.43	0.27	0.70	1.32	0.37	0.83	0.75	1.20
Lefkadas	1.03	0.85	1.24	0.16	0.25	1.03	3.25	0.00	5.00	0.50	1.09	1.42	2.00	0.83	0.79	0.59
Lesbou	1.24	1.05	1.23	0.33	0.22	2.10	1.44	9.00	0.65	1.00	0.88	0.97	2.27	1.13	1.05	0.56
Magnisias	1.16	0.86	1.18	0.25	0.41	1.24	1.18	0.63	1.54	1.61	0.82	1.24	1.07	0.72	0.34	0.77
Messinias	1.07	0.81	0.81	0.33	0.31	1.05	1.70	0.81	2.25	0.74	1.10	1.03	1.09	1.04	1.18	0.80
Pellias	1.04	0.95	1.43	0.57	0.35	1.11	1.43	2.00	4.09	1.64	1.35	1.21	1.37	1.33	1.95	0.92
Pierias	1.10	0.75	1.20	0.39	0.56	1.02	1.74	1.86	2.50	1.24	1.10	1.10	1.33	1.37	4.00	0.95
Prevezas	1.03	0.88	1.26	0.75	0.35	0.60	1.48	5.00	0.69	0.73	0.66	0.71	1.90	0.94	1.43	0.80
Rethimnou	1.18	1.16	1.47	0.24	0.74	1.64	1.87	6.00	1.35	1.27	1.32	1.11	1.31	1.75	4.00	1.04
Rodopis	1.09	1.36	1.19	1.30	0.23	1.30	1.09	16.00	5.00	2.64	2.14	1.54	3.00	2.06	1.54	1.12
Samou	1.11	0.84	1.30	0.37	0.29	0.71	1.40	4.00	1.00	0.38	0.79	1.28	1.50	1.20	0.64	0.83
Serron	0.94	0.70	0.88	0.43	0.60	0.79	1.53	3.67	2.96	0.99	0.85	0.90	1.03	2.04	1.20	0.75
Thesprotias	1.14	0.76	1.29	0.13	1.00	1.19	1.19	3.00	2.40	0.16	1.43	1.38	0.75	1.00	1.40	0.95
Thessalonikis	1.17	0.87	1.06	0.66	0.53	1.00	1.38	1.34	1.41	1.04	0.99	1.08	0.89	0.96	1.46	0.86
Trikalon	1.06	1.01	1.31	0.37	0.32	0.93	2.78	1.00	1.92	0.81	1.11	0.96	1.17	1.28	1.31	0.99
Voiotias	1.13	0.92	1.12	0.31	0.94	1.19	1.81	1.25	0.95	1.56	1.74	1.03	0.64	0.80	0.94	0.95
Xanthi	1.11	1.19	1.11	0.70	0.80	1.06	1.10	1.40	1.21	4.24	2.28	1.51	0.94	2.38	6.75	1.54
Zakinthou	1.30	1.11	1.34	0.70	0.67	2.89	2.25	1.00	1.00	1.25	2.37	0.98	7.00	1.00	1.83	0.45

Source: Data from ELSTAT elaborated by the author

Table 10: Normalized employment growth of prefectures in 1-digit classification.

Prefectures	BRANCHES																
	Total	A	B	C	D	E	ST	Z	H	U	I	K	L	M	N	J	O
Total	1	0.76	1.10	0.65	0.82	0.97	1.09	1.05	1.36	0.96	1.24	1.58	0.95	1.17	1.16	1.10	3.13
Ahaïas	0.94	0.81	0.96	1.16	0.77	1.16	0.94	0.94	0.95	1.08	1.14	0.90	1.06	1.01	1.04	1.07	0.97
Aitolokarnanias	0.85	0.85	1.14	0.96	1.10	1.01	0.91	0.91	0.98	1.04	0.91	0.93	0.98	0.92	0.97	1.24	0.91
Argolidas	0.97	0.95	1.21	0.72	1.10	1.39	0.98	0.98	0.97	0.88	1.00	1.00	1.16	1.06	1.04	1.18	0.99
Arkadias	0.79	0.63	1.53	1.45	1.12	1.10	0.80	0.80	0.94	0.92	0.86	0.96	1.17	0.96	0.94	0.92	0.89
Artas	0.90	0.93	0.66	2.50	1.19	1.44	0.76	0.76	1.01	0.88	0.85	1.09	0.94	1.01	0.94	1.29	0.85
Attikis	1.07	1.41	1.16	0.90	1.05	0.89	1.17	1.17	1.02	1.06	1.05	1.04	0.98	0.95	0.97	0.96	0.98
Chalkidikis	1.06	1.26	0.90	0.62	1.22	0.79	1.14	1.14	1.06	1.10	0.95	1.09	1.43	1.08	0.90	0.96	1.25
Chanion	1.06	1.01	0.90	0.59	1.00	1.90	1.04	1.04	1.04	1.19	1.08	1.05	1.09	1.05	1.09	1.07	1.16
Chiou	1.02	0.84	1.48	1.18	0.85	1.32	0.83	0.83	0.99	1.13	0.92	0.99	1.01	1.28	1.05	1.02	0.92
Dodekanisou	1.02	1.06	0.95	1.21	0.95	1.51	0.77	0.77	0.97	0.73	1.07	0.96	0.93	1.23	1.03	0.93	1.02
Dramas	0.87	0.98	1.38	1.01	0.66	1.42	0.85	0.85	0.99	0.99	0.84	0.83	1.02	0.97	1.03	0.97	0.85
Euvoias	0.96	1.01	1.20	0.37	1.20	0.89	0.85	0.85	1.05	0.95	0.83	1.03	1.12	1.05	1.00	1.05	1.01
Evrou	0.95	0.86	1.01	1.42	1.14	1.21	1.14	1.14	1.07	0.91	0.84	0.77	1.16	1.33	0.99	1.06	1.02
Evrytanias	0.92	1.03	1.42	4.02	0.56	3.00	0.85	0.85	1.08	1.00	0.80	1.03	1.10	0.85	0.77	1.32	1.09
Fhiotidas	1.00	1.18	1.93	1.10	1.26	0.99	0.87	0.87	0.92	0.90	0.89	0.98	1.05	0.97	0.95	1.02	0.95
Florinas	0.95	0.87	0.57	1.37	1.07	1.90	1.02	1.02	1.09	1.13	0.88	1.03	1.27	1.19	0.96	0.95	0.97
Fokidas	0.90	0.70	1.78	0.33	0.88	1.29	1.05	1.05	0.83	0.77	0.98	1.14	1.08	1.10	0.88	0.99	0.90
Grevenon	0.90	0.96	14.96	0.35	1.00	1.12	0.94	0.94	0.91	0.97	0.96	1.12	1.28	1.01	0.94	1.05	0.87
Ilias	0.88	1.00	1.27	0.52	1.01	1.48	0.87	0.87	0.74	0.82	0.93	0.88	1.04	0.89	0.89	1.02	0.96
Imathias	0.91	0.98	1.18	1.00	0.96	1.25	0.87	0.87	1.06	0.91	0.92	1.03	0.93	1.20	1.04	1.01	0.77
Ioaninon	0.98	0.70	0.92	0.93	1.08	1.10	0.83	0.83	1.02	1.03	0.91	0.98	0.93	1.16	1.02	1.09	0.88
Irakleiou	1.02	1.00	1.11	0.70	1.26	1.17	0.79	0.79	1.02	1.04	1.09	1.05	1.12	0.98	1.03	1.20	1.10
Karditsas	0.89	1.00	0.92	0.87	1.04	1.35	0.74	0.74	0.96	1.05	0.84	0.98	0.96	1.06	0.98	1.14	0.86
Kastorias	0.81	1.15	0.67	2.92	0.52	2.04	1.11	1.11	1.09	1.10	0.94	0.80	0.83	1.28	0.97	1.00	0.92
Kavalas	0.93	1.00	0.70	0.90	0.89	1.40	1.00	1.00	0.98	1.06	0.98	0.87	1.02	0.86	0.99	0.93	0.99
Kefalonias	0.93	0.55	1.15	1.40	1.25	1.54	0.99	0.99	1.06	1.12	0.77	0.84	1.19	1.12	1.13	1.00	1.16
Kerkiras	0.87	0.82	0.67	1.17	0.95	1.28	0.70	0.70	0.90	0.57	0.85	0.93	0.79	1.04	1.09	1.05	0.88
Kilkis	0.89	0.81	0.55	2.11	1.05	1.14	1.13	1.13	0.93	0.97	0.92	0.93	1.46	1.26	1.07	0.98	0.98
Korinthias	1.09	1.33	1.85	1.33	1.35	1.14	0.92	0.92	1.02	1.05	0.95	0.95	1.03	0.95	0.99	1.09	1.64
Kozanis	0.95	0.87	1.84	2.16	0.82	0.70	0.99	0.99	1.15	1.09	0.78	0.93	1.14	1.12	1.03	1.05	1.09
Kykladon	1.14	0.86	0.86	1.80	1.01	1.11	1.22	1.22	1.28	1.34	0.98	1.05	1.21	1.18	1.18	1.18	1.20
Lakonias	0.94	1.05	0.72	1.70	1.32	1.08	1.04	1.04	0.93	0.94	0.76	0.99	1.01	1.02	0.97	1.07	1.04
Larissas	0.97	1.11	1.04	0.53	1.01	1.22	0.85	0.85	1.03	1.03	0.86	0.94	0.94	1.19	1.08	1.20	0.87
Lasithiou	0.94	1.00	0.89	1.16	1.05	1.68	0.81	0.81	0.89	0.74	0.95	1.02	0.95	0.96	1.02	1.08	1.05
Lefkadas	0.89	0.60	0.81	0.34	0.90	0.90	1.03	1.03	0.98	1.65	0.90	1.10	1.04	1.10	0.99	1.02	1.50
Lesbou	1.07	1.46	0.69	1.02	1.11	1.07	0.81	0.81	1.01	0.94	0.87	0.69	0.98	1.13	1.04	1.13	0.92
Magnisias	1.00	1.30	0.77	1.54	0.91	1.70	0.91	0.91	0.91	1.12	0.84	0.84	0.90	1.06	1.07	1.05	0.95
Messinias	0.93	1.07	1.02	1.10	0.86	1.31	0.79	0.79	0.94	1.04	0.84	0.84	0.99	0.98	0.95	1.07	1.10
Pellias	0.91	1.05	0.73	1.97	1.01	1.02	0.95	0.95	1.04	0.98	0.88	0.88	1.16	0.98	1.07	1.00	1.02
Pierias	0.96	1.03	0.97	0.80	0.80	1.44	0.82	0.82	1.08	1.11	0.95	0.89	0.96	1.06	1.06	1.16	1.09
Prevezas	0.89	0.91	1.31	1.19	0.93	1.03	0.78	0.78	0.93	0.87	0.98	0.94	1.14	0.95	0.94	0.92	1.31
Rethimnou	1.02	0.92	1.01	0.76	1.23	1.26	1.07	1.07	1.05	0.96	1.00	0.92	1.10	0.95	1.04	1.08	0.98
Rodopis	0.94	1.05	1.26	1.31	1.44	2.26	1.29	1.29	0.99	1.05	0.88	0.80	1.14	1.01	0.94	0.93	0.87
Samou	0.96	0.96	0.69	1.36	0.89	1.15	0.79	0.79	1.11	0.90	0.86	0.95	0.98	1.19	1.12	1.12	0.91
Serron	0.81	0.86	0.60	1.02	0.74	1.49	0.82	0.82	0.87	0.94	0.90	0.88	0.94	0.97	1.00	0.93	0.76
Thesprotias	0.99	1.00	2.23	4.58	0.81	1.01	0.92	0.92	1.15	1.10	1.08	0.94	1.04	1.44	0.93	1.14	0.97
Thessalonikis	1.01	1.07	0.91	1.10	0.92	1.13	1.08	1.08	0.96	1.16	1.07	0.97	1.03	0.96	1.05	0.96	1.07
Trikalon	0.92	1.03	3.15	1.18	1.06	1.24	0.78	0.78	1.06	1.07	0.74	1.04	0.91	0.95	1.06	1.12	1.14
Voiotias	0.98	1.30	1.64	0.51	0.98	1.01	0.88	0.88	0.91	0.91	0.88	0.85	1.08	0.93	0.92	1.13	1.01
Xanthis	0.96	0.88	0.49	1.69	1.26	1.80	1.15	1.15	1.04	1.01	1.02	0.78	1.20	1.04	1.03	1.10	1.13
Zakinthou	1.13	1.11	0.87	3.00	1.18	1.48	1.13	1.13	1.13	1.69	1.10	0.91	1.04	0.85	1.04	0.99	1.09

Source: Data from ELSTAT elaborated by the author

Table 11: Normalized employment growth of prefectures in 2-digit classification in manufacturing.

Prefectures	BRANCHES															
	Total	D	DA	DB	DC	DD	DE	DST	DZ	DH	DU	DI	DK	DL	DM	DN
Total	1	0.82	1.05	0.51	0.51	1.00	1.21	1.07	1.04	1.01	0.88	0.98	0.99	1.07	0.733	0.76
Ahaías	0.94	0.77	0.86	0.56	0.93	0.91	0.81	0.69	1.54	0.34	0.74	0.90	1	1.4	1.411	0.83
Aitolokarnanias	0.85	1.10	0.97	1.16	0.70	1.40	1.29	2.85	1.45	0.87	1.35	0.86	1.21	0.45	2.169	1
Argolidas	0.97	1.10	1.31	0.86	0.57	1.24	1.08	1.22	1.27	1.07	0.73	0.75	0.87	1.36	1.267	1.14
Arkadias	0.79	1.12	0.99	0.73	2.27	1.37	1.09	2.98	3.25	0.81	0.86	0.94	0.65	1.62	0.591	0.88
Artas	0.9	1.19	1.14	0.91	0.43	1.33	1.05	2.44	3.55	0.77	1.17	0.74	3.66	1.31	4.731	0.85
Attikis	1.07	1.05	1.01	1.16	1.05	1.05	1.01	0.94	0.97	0.91	1.05	0.99	1	1.02	0.961	1
Chalkidikis	1.06	1.22	1.07	1.27	1.38	1.44	1.69	0.70	0.51	1.08	1.75	1.03	1.44	1.09	1.809	0.8
Chanion	1.06	1.00	0.95	0.52	0.94	1.02	0.99	0.41	1.60	0.55	1.18	1.04	0.91	0.9	0.18	1.14
Chiou	1.02	0.85	0.89	0.19	0.17	0.73	1.28	0.81	1.67	0.43	0.92	0.86	0.73	1.36	1.446	0.59
Dodekanisou	1.02	0.95	0.91	0.84	1.10	0.85	0.96	1.41	0.92	1.40	0.62	0.86	0.73	0.82	0.866	1.11
Dramas	0.87	0.66	0.86	0.48	0.97	1.03	0.49	0.41	1.09	1.19	1.26	1.04	1.45	1.45	2.484	1.07
Euvoias	0.96	1.20	1.43	0.86	1.04	1.01	0.88	2.80	1.69	1.90	0.81	1.13	1.27	0.84	0.86	1.46
Evrou	0.95	1.14	1.22	0.70	0.81	1.14	1.44	2.31	3.78	3.82	1.82	1.34	1.69	1.9	2.54	0.78
Evrytánias	0.92	0.56	1.98	0.12	0.85	0.45	0.67	0.00	7.53	0.32	1.47	1.14	2.64	1.88	1.971	0.92
Fhiotidas	1	1.26	1.50	0.89	0.61	1.14	1.10	1.14	1.73	0.93	0.98	0.83	1.38	1.07	1.709	0.86
Florinas	0.95	1.07	1.21	0.67	0.39	0.46	1.04	0.81	0.32	0.86	0.86	1.15	0.97	0.67	2.366	1.89
Fokidas	0.9	0.88	0.59	1.04	0.41	0.55	1.14	0.27	1.02	5.59	1.37	0.75	2.11	1.08	1.262	1.59
Grevenon	0.9	1.00	0.89	1.01	1.36	0.72	1.03	1.63	0.14	0.17	2.32	1.15	0.88	4.52	21.29	0.89
Ilias	0.88	1.01	1.01	1.10	0.99	0.88	1.22	4.48	1.28	0.69	0.65	0.79	1.06	0.99	1.294	0.89
Imathias	0.91	0.96	1.00	1.16	1.84	0.59	0.83	2.09	1.06	0.81	0.86	0.94	1.05	0.95	1.626	0.99
Ioaninon	0.98	1.08	1.38	0.96	0.51	0.71	1.18	0.65	1.59	2.00	0.43	1.03	1.35	1.03	5.323	0.83
Irakleiou	1.02	1.26	1.07	1.03	0.76	1.63	1.25	2.28	1.80	1.59	1.09	1.01	1.03	1.15	1.045	1.22
Karditsas	0.89	1.04	0.79	0.67	0.99	1.33	1.40	4.07	0.81	1.01	1.23	0.82	1.99	1.77	2.028	0.83
Kastorias	0.81	0.52	0.99	0.73	5.98	1.17	1.43	0.81	2.23	1.72	1.02	0.79	2.2	0.75	6.506	1.11
Kavalas	0.93	0.89	0.89	0.73	1.03	0.91	1.01	1.52	0.94	0.59	1.14	1.34	0.87	1.28	0.796	0.97
Kefalonias	0.93	1.25	0.76	1.03	5.96	1.39	2.01	0.00	2.23	0.29	1.22	1.12	0.79	1.35	1.314	1.91
Kerkiras	0.87	0.95	0.95	0.92	0.82	1.10	0.82	0.65	0.91	1.38	0.80	0.70	1.25	0.88	1.413	0.72
Kilkis	0.89	1.05	1.45	1.06	0.75	0.59	2.63	2.17	1.25	1.25	1.03	1.97	2.16	0.83	4.337	0.89
Korinthias	1.09	1.35	1.28	1.13	0.73	1.02	1.08	0.88	1.06	0.89	1.06	1.25	0.65	1.48	1.161	1.32
Kozanis	0.95	0.82	1.11	0.96	1.83	1.03	1.25	2.03	0.06	1.44	0.95	1.42	1.97	0.65	2.366	1.01
Kykladon	1.14	1.01	0.95	0.51	0.71	2.24	2.03	2.03	0.32	0.43	1.34	1.03	4.07	1.8	0.719	0.77
Lakonias	0.94	1.32	1.61	0.82	0.57	0.72	1.13	0.81	0.94	0.20	1.77	0.91	0.99	1.14	3.548	0.89
Larissas	0.97	1.01	1.00	0.97	0.94	1.19	0.60	1.18	1.60	1.21	1.23	1.18	1.53	1.43	1.155	1.18
Lasithiou	0.94	1.05	0.82	0.67	1.19	0.83	1.10	1.63	0.36	0.23	0.69	1.16	0.32	0.67	0.887	1.36
Lefkadas	0.89	0.90	1.02	0.27	0.43	0.89	2.33	0.00	4.18	0.43	1.07	1.26	1.76	0.67	0.94	0.67
Lesbou	1.07	1.11	1.01	0.57	0.38	1.81	1.03	7.32	0.54	0.86	0.86	0.85	1.99	0.91	1.239	0.64
Magnisias	1	0.91	0.98	0.42	0.70	1.07	0.84	0.51	1.29	1.38	0.81	1.10	0.94	0.58	0.398	0.87
Messinias	0.93	0.86	0.67	0.55	0.52	0.91	1.22	0.66	1.88	0.64	1.08	0.91	0.96	0.84	1.39	0.91
Pellás	0.91	1.01	1.18	0.97	0.60	0.96	1.02	1.63	3.42	1.41	1.32	1.07	1.21	1.07	2.312	1.04
Pierias	0.96	0.80	0.99	0.66	0.95	0.88	1.25	1.51	2.09	1.07	1.08	0.97	1.17	1.1	4.731	1.08
Prevezas	0.89	0.93	1.04	1.27	0.60	0.52	1.06	4.07	0.58	0.63	0.65	0.63	1.67	0.76	1.69	0.91
Rethimnou	1.02	1.23	1.21	0.41	1.25	1.42	1.34	4.88	1.13	1.10	1.29	0.98	1.15	1.41	4.731	1.18
Rodopis	0.94	1.44	0.99	2.21	0.39	1.13	0.78	13.02	4.18	2.27	2.10	1.36	2.64	1.66	1.816	1.27
Samou	0.96	0.89	1.07	0.63	0.49	0.61	1.00	3.26	0.84	0.32	0.77	1.13	1.32	0.97	0.757	0.95
Serron	0.81	0.74	0.72	0.72	1.02	0.69	1.10	2.98	2.48	0.85	0.83	0.80	0.9	1.65	1.419	0.85
Thesprotias	0.99	0.81	1.07	0.22	1.70	1.03	0.85	2.44	2.01	0.14	1.40	1.22	0.66	0.81	1.656	1.08
Thessalonikis	1.01	0.92	0.88	1.13	0.89	0.86	0.99	1.09	1.18	0.89	0.97	0.96	0.78	0.77	1.728	0.98
Trikalon	0.92	1.06	1.08	0.62	0.54	0.81	1.99	0.81	1.61	0.70	1.09	0.85	1.03	1.03	1.552	1.12
Voiotias	0.98	0.98	0.93	0.52	1.60	1.03	1.30	1.02	0.79	1.34	1.71	0.91	0.57	0.65	1.114	1.08
Xanthis	0.96	1.26	0.92	1.19	1.37	0.92	0.78	1.14	1.01	3.65	2.23	1.33	0.83	1.93	7.984	1.76
Zakinthou	1.13	1.18	1.11	1.19	1.13	2.50	1.61	0.81	0.84	1.08	2.32	0.87	6.16	0.81	2.169	0.51

Source: Data from ELSTAT elaborated by the author

Table 12: Specialization of prefectures in each 1-digit branch, 1991 (LQ Index).

Prefectures	BRANCHES															
	A	B	C	D	E	ST	Z	H	U	I	K	L	M	N	J	O
Ahaïas	1.03	0.44	0.21	1.01	0.55	1.11	0.94	0.78	0.97	0.84	0.78	1.05	1.20	1.07	0.96	0.70
Aitolokarnanias	2.52	2.15	0.43	0.38	0.71	1.04	0.66	0.63	0.69	0.45	0.42	0.69	0.86	0.50	0.59	0.31
Argolidas	2.18	2.08	1.21	0.58	0.49	0.95	0.80	1.30	0.70	0.55	0.61	0.63	0.73	0.50	0.77	0.45
Arkadias	2.09	0.43	1.02	0.31	4.67	1.18	0.63	0.67	0.88	0.58	0.40	0.85	0.83	1.02	0.65	0.28
Artas	2.15	3.54	0.29	0.44	0.99	1.34	0.69	0.75	0.67	0.44	0.46	0.82	1.08	0.68	0.62	0.26
Attikis	0.06	0.31	0.42	1.18	1.05	0.88	1.22	0.83	1.35	1.62	1.56	1.30	1.08	1.32	1.34	1.85
Chalkidikis	1.42	6.87	13.1	0.58	0.63	1.53	0.83	1.68	0.64	0.39	0.49	0.70	0.73	0.56	0.69	0.29
Chanion	1.44	1.03	0.49	0.52	0.53	1.22	0.88	1.30	0.82	0.64	0.74	1.41	0.99	1.03	0.77	0.63
Chiou	0.78	3.98	0.60	0.54	0.89	1.78	1.04	0.92	1.95	0.83	0.65	1.16	1.16	0.82	1.10	0.80
Dodekanisou	0.32	4.43	0.50	0.52	0.95	1.72	1.03	4.76	1.08	0.66	0.82	0.96	0.77	0.99	1.14	0.53
Dramas	1.23	0.06	4.01	1.53	0.59	0.96	0.84	0.82	0.72	0.63	0.55	0.80	0.89	0.89	0.80	0.26
Euvoias	0.96	3.85	5.84	1.16	1.58	1.32	0.89	0.93	1.05	0.50	0.64	0.73	0.86	0.55	0.74	0.36
Evrou	2.11	1.55	0.39	0.6	0.41	0.74	0.68	0.90	0.73	0.65	0.42	1.42	0.85	0.91	0.63	0.39
Evrytanas	1.87	0.21	0.04	0.61	0.56	1.46	0.51	1.33	0.81	0.46	0.36	1.20	1.00	0.77	0.69	0.11
Fhiotidas	1.81	1.18	2.89	0.57	0.74	1.12	0.77	0.79	0.91	0.72	0.58	0.92	1.02	0.62	0.75	0.31
Florinas	2.08	0.94	3.70	0.45	3.01	0.99	0.60	0.74	0.67	0.45	0.31	0.94	1.23	0.84	0.69	0.19
Fokidas	1.40	2.49	15.7	0.58	1.14	1.25	0.72	1.46	0.89	0.62	0.55	1.04	0.86	0.80	0.96	0.63
Grevenon	2.22	0.05	1.25	0.53	0.62	1.18	0.62	0.79	0.49	0.44	0.44	1.10	0.98	0.74	0.83	0.22
Ilias	2.22	0.44	0.09	0.4	0.45	1.07	0.84	0.80	0.66	0.57	0.46	0.86	0.73	0.53	0.69	0.35
Imathias	1.95	0.07	0.52	1.18	0.68	0.78	0.83	0.71	0.56	0.58	0.68	0.59	0.83	0.67	0.86	0.33
Ioaninon	1.24	0.58	1.38	0.74	0.78	1.47	0.88	1.01	0.77	0.64	0.74	1.00	1.53	1.50	1.00	0.55
Irakleiou	1.64	0.25	0.29	0.46	0.70	1.28	0.96	1.78	0.83	0.63	0.78	0.72	1.01	0.89	0.84	0.55
Karditsas	2.70	0.04	0.27	0.4	0.59	0.98	0.73	0.65	0.51	0.45	0.45	0.67	0.97	0.67	0.71	0.26
Kastorias	0.98	0.36	0.22	2.96	0.32	0.48	0.64	0.70	0.42	0.64	0.63	0.69	0.85	0.59	0.73	0.22
Kavalas	1.24	2.99	5.31	1.22	0.40	0.89	0.95	0.96	0.80	0.79	0.71	0.83	0.91	0.94	0.86	0.51
Kefalonias	1.78	3.83	0.47	0.32	0.53	1.64	0.68	1.30	1.68	0.62	0.59	0.74	0.72	0.95	0.72	0.65
Kerkiras	1.15	1.68	0.38	0.4	0.36	1.44	0.92	4.00	1.11	0.57	0.88	0.67	0.71	0.60	0.96	0.83
Kilkis	1.94	0.18	0.12	1.45	0.34	0.61	0.66	0.65	0.62	0.42	0.37	0.69	0.50	0.77	0.65	0.24
Korinthias	1.85	0.69	0.49	0.73	0.69	1.09	0.84	0.95	0.79	0.72	0.65	0.71	0.79	0.51	0.82	0.51
Kozanis	1.02	0.05	8.99	0.85	15.1	1.13	0.77	0.77	0.74	0.60	0.59	0.74	1.10	0.78	0.72	0.13
Kykladon	0.99	6.44	3.10	0.64	1.79	2.03	0.81	1.80	1.21	0.64	0.63	0.72	0.75	0.45	0.94	0.72
Lakonias	3.02	1.75	0.18	0.24	0.47	0.76	0.62	0.74	0.75	0.51	0.42	0.59	0.64	0.51	0.55	0.31
Larissas	1.79	0.14	0.54	0.98	0.49	0.90	0.88	0.68	0.63	0.61	0.60	0.94	1.06	0.64	0.75	0.37
Lasithiou	2.13	1.95	0.58	0.29	0.48	1.10	0.73	2.65	0.61	0.57	0.58	0.70	0.73	0.83	0.63	0.36
Lefkadas	1.87	7.19	0.26	0.45	0.45	1.22	0.74	0.98	1.06	0.41	0.60	1.05	1.00	0.90	0.46	0.38
Lesbou	1.37	6.91	0.53	0.48	0.96	1.45	0.81	1.09	1.02	0.78	0.52	1.37	1.01	0.84	0.86	0.53
Magnisias	0.86	2.45	0.97	1.16	0.42	1.15	1.03	0.95	1.01	0.74	0.79	1.10	1.07	0.81	0.91	0.55
Messinias	2.13	0.90	0.30	0.55	0.96	1.15	0.75	0.72	0.81	0.74	0.59	0.87	0.87	0.64	0.62	0.42
Pellias	2.74	0.06	0.29	0.85	0.66	0.56	0.64	0.59	0.55	0.46	0.38	0.54	0.65	0.57	0.53	0.18
Pierias	1.99	2.10	0.21	0.93	0.32	1.01	0.80	1.07	0.78	0.51	0.62	0.55	0.83	0.63	0.72	0.29
Prevezas	2.08	1.64	0.53	0.55	0.57	1.27	0.71	1.12	0.73	0.48	0.43	0.98	1.06	0.78	0.48	0.23
Rethimnou	1.95	0.45	0.72	0.42	0.59	1.21	0.70	2.58	0.61	0.66	0.64	0.78	0.96	0.71	0.83	0.30
Rodopis	3.17	0.49	0.24	0.51	0.28	0.45	0.51	0.49	0.45	0.37	0.34	0.75	0.70	0.56	0.49	0.24
Samou	1.27	4.25	1.11	0.51	0.94	1.64	0.74	1.80	1.26	0.57	0.56	1.17	0.82	0.80	0.79	0.65
Serron	2.46	0.31	0.42	0.88	0.30	0.72	0.77	0.69	0.48	0.46	0.47	0.64	0.80	0.73	0.72	0.23
Thesprotias	1.95	1.36	0.21	0.57	0.49	1.57	0.60	1.22	0.79	0.55	0.49	0.84	0.97	0.80	0.79	0.45
Thessalonikis	0.32	1.01	0.28	1.7	0.44	0.84	1.28	0.83	0.92	0.98	1.21	0.77	1.20	1.27	1.07	1.14
Trikalon	1.93	0.01	0.36	0.62	0.62	1.32	0.79	0.92	0.67	0.49	0.55	0.81	1.10	0.69	0.68	0.30
Voiotias	1.36	0.46	4.76	1.49	0.96	1.09	0.80	0.73	0.75	0.59	0.55	0.75	0.71	0.46	0.64	0.34
Xanthis	2.21	0.59	0.27	1.02	0.34	0.97	0.60	0.62	0.45	0.47	0.44	0.85	0.83	0.60	0.69	0.41
Zakinthou	2.01	1.35	0.35	0.35	0.51	1.46	0.77	1.38	0.80	0.52	0.71	0.81	0.84	0.69	0.76	0.40

Source: Data from ELSTAT elaborated by the author

Table 13: Specialization of prefectures in each 2-digit branch, 1991 (LQ Index).

Prefectures	BRANCHES														
	D	DA	DB	DC	DD	DE	DST	DZ	DH	DU	DI	DK	DL	DM	DN
Ahaïas	1.01	1.20	1.31	0.74	1.14	0.82	0.26	0.28	1.53	1.20	0.77	1.90	0.51	0.22	0.53
Aitolokarnanias	0.38	0.69	0.30	0.16	0.67	0.15	0.08	0.10	0.33	0.45	0.54	0.20	0.52	0.08	0.36
Argolidas	0.58	0.99	0.45	0.14	0.83	0.27	0.13	0.15	0.68	1.25	0.83	0.66	0.30	0.21	0.39
Arkadias	0.31	0.47	0.14	0.11	0.95	0.23	0.07	0.05	0.17	0.52	0.62	0.34	0.16	0.09	0.35
Artas	0.44	1.17	0.20	0.14	0.83	0.18	0.03	0.03	0.13	0.69	0.71	0.06	0.19	0.01	0.39
Attikis	1.18	0.84	0.93	1.69	0.79	1.89	1.83	1.90	1.39	0.85	1.10	1.52	1.57	2.14	1.26
Chalkidikis	0.58	1.03	0.37	0.23	1.32	0.14	0.37	0.57	0.50	0.56	0.79	0.65	0.26	0.21	0.72
Chanion	0.52	0.91	0.20	0.67	0.91	0.32	0.13	0.14	0.29	0.79	0.52	0.26	0.31	0.93	0.87
Chiou	0.54	0.90	0.26	0.63	1.33	0.38	0.17	0.07	0.23	0.77	0.70	0.38	0.34	0.12	0.82
Dodekanisou	0.52	0.71	0.27	0.21	1.53	0.26	0.14	0.10	0.10	1.10	0.64	0.36	0.33	0.27	0.88
Dramas	1.53	0.92	2.81	0.14	1.24	2.18	0.05	0.12	0.29	2.96	0.69	0.30	0.31	0.06	1.06
Euvoias	1.16	1.15	0.37	0.21	3.14	0.56	0.11	0.84	0.47	5.52	1.77	0.99	2.56	1.78	0.62
Evrou	0.6	1.10	0.77	0.10	1.08	0.16	0.09	0.09	0.32	0.37	0.45	0.34	0.26	0.13	0.56
Evrytánias	0.61	0.23	1.09	0.07	3.49	0.25	0.00	0.03	0.40	0.23	0.47	0.00	0.14	0.09	0.33
Fhiotidas	0.57	0.91	0.34	0.14	0.77	0.72	0.14	0.41	0.44	0.72	1.11	0.42	0.95	0.12	0.41
Florinas	0.45	0.84	0.43	0.17	0.94	0.14	0.00	0.16	0.11	0.62	0.56	0.13	0.29	0.01	0.40
Fokidas	0.58	1.24	0.27	0.39	2.08	0.21	0.20	0.16	0.11	0.30	1.50	0.10	0.23	0.24	0.25
Grevenon	0.53	0.86	0.48	0.10	2.48	0.17	0.00	0.12	0.44	0.15	0.49	0.78	0.14	0.02	0.58
Ilias	0.4	0.68	0.25	0.17	0.94	0.23	0.03	0.12	0.21	0.66	0.65	0.25	0.24	0.10	0.43
Imathias	1.18	2.10	1.68	0.11	2.07	0.33	0.11	0.17	0.89	0.70	0.70	0.90	0.45	0.09	0.92
Ioaninon	0.74	1.06	0.34	0.18	2.02	0.26	0.16	0.31	0.35	1.87	1.02	0.38	0.38	0.03	1.36
Irakleiou	0.46	0.74	0.17	0.35	0.47	0.34	0.08	0.17	0.78	0.72	0.59	0.47	0.33	0.08	0.90
Karditsas	0.4	0.61	0.21	0.22	0.74	0.20	0.02	0.16	0.22	0.57	0.74	0.46	0.18	0.06	0.59
Kastorias	2.96	0.35	9.29	0.42	0.55	0.10	0.00	0.03	0.00	0.38	0.29	0.05	0.21	0.02	0.36
Kavalas	1.22	1.49	1.54	0.52	1.05	0.44	1.47	3.01	1.76	1.98	0.63	0.48	0.44	0.21	0.94
Kefalonias	0.32	0.87	0.09	0.04	0.70	0.14	0.07	0.05	0.08	0.54	0.50	0.19	0.15	0.14	0.30
Kerkyras	0.4	0.59	0.17	0.18	1.20	0.25	0.10	0.06	0.04	0.52	0.57	0.18	0.26	0.17	0.81
Kilkis	1.45	1.11	2.87	0.39	1.51	0.22	0.16	0.22	1.11	0.93	1.04	1.01	0.85	0.04	1.03
Korinthias	0.73	1.04	0.24	0.20	1.57	0.57	7.49	0.61	1.01	1.00	0.95	0.58	3.00	0.20	0.45
Kozanis	0.85	0.61	1.29	0.19	0.72	0.21	0.03	3.64	0.19	0.90	0.72	0.31	0.41	0.04	0.59
Kykladon	0.64	0.72	0.22	0.16	1.40	0.10	0.05	0.08	0.18	0.76	0.43	0.06	0.12	5.94	0.74
Lakonias	0.24	0.45	0.08	0.17	0.94	0.12	0.02	0.09	0.20	0.27	0.40	0.16	0.24	0.06	0.23
Larisas	0.98	1.17	1.34	0.46	0.69	0.59	0.07	0.16	0.81	0.97	0.92	0.80	0.52	0.16	1.07
Lasithiou	0.29	0.53	0.08	0.15	0.98	0.26	0.00	0.05	0.16	0.53	0.47	0.15	0.18	0.05	0.38
Lefkadas	0.45	0.59	0.36	0.47	2.21	0.12	0.00	0.03	0.08	0.42	0.36	0.00	0.24	0.97	0.46
Lesbou	0.48	1.11	0.14	0.26	1.28	0.23	0.00	0.11	0.11	0.71	0.71	0.11	0.23	0.13	0.73
Magnisias	1.16	1.14	0.83	0.31	1.01	0.79	0.23	0.61	0.68	3.61	2.20	1.35	0.92	1.36	0.84
Messinias	0.55	1.36	0.40	0.14	1.20	0.26	0.21	0.11	0.19	0.60	0.63	0.29	0.38	0.18	0.36
Pellas	0.85	1.28	1.32	0.32	0.96	0.23	0.04	0.04	0.42	0.59	0.65	0.52	0.23	0.08	0.65
Pierias	0.93	0.96	1.64	0.26	0.87	0.24	0.13	0.12	0.35	0.66	0.72	0.59	0.76	0.04	0.83
Prevezas	0.55	0.82	0.59	0.18	1.51	0.17	0.11	0.13	0.23	0.81	0.62	0.11	0.26	0.13	0.46
Rethimnou	0.42	0.75	0.22	0.31	0.84	0.22	0.03	0.13	0.13	0.71	0.57	0.25	0.18	0.04	0.69
Rodopis	0.51	0.78	0.52	0.48	0.86	0.54	0.00	0.10	0.62	0.35	0.55	0.18	0.23	0.12	0.47
Samou	0.51	0.72	0.37	0.72	2.15	0.20	0.06	0.08	0.19	0.85	0.39	0.17	0.22	0.34	0.59
Serron	0.88	1.20	1.19	0.52	1.31	0.24	0.06	0.08	0.41	0.64	0.75	0.48	0.20	0.06	1.12
Thesprotias	0.57	0.65	0.81	0.11	1.03	0.16	0.06	0.07	0.42	0.94	0.64	0.26	0.17	0.07	0.40
Thessalonikis	1.7	1.60	2.34	2.33	0.87	1.07	1.73	1.08	1.68	1.18	1.40	1.52	1.32	0.40	1.80
Trikalon	0.62	1.02	0.40	0.23	2.12	0.19	0.05	0.44	0.31	0.82	0.70	0.32	0.43	0.06	0.88
Voiotias	1.49	1.24	1.14	0.23	0.80	0.50	0.21	1.70	4.77	0.86	4.59	2.27	2.15	1.28	0.49
Xanthis	1.02	2.19	1.22	0.38	0.69	1.18	0.22	0.14	1.37	0.41	0.68	0.34	0.77	0.19	0.45
Zakinthou	0.35	0.42	0.11	0.11	0.62	0.19	0.13	0.07	0.11	0.36	0.70	0.06	0.20	0.09	1.10

Source: Data from ELSTAT elaborated by the author

Table 14: Diversification of prefectures in each 1-digit STAKOD branch, 1991 (HHI index).

Prefectures	BRANCHES															
	A	B	C	D	E	ST	Z	H	U	I	K	L	M	N	J	O
Ahaïas	0.076	0.086	0.086	0.112	0.087	0.094	0.091	0.091	0.093	0.089	0.090	0.094	0.093	0.092	0.090	0.086
Aitolokarnanias	0.087	0.243	0.240	0.268	0.242	0.276	0.280	0.251	0.261	0.243	0.246	0.265	0.260	0.248	0.247	0.240
Argolidas	0.085	0.193	0.192	0.226	0.192	0.216	0.225	0.209	0.207	0.194	0.198	0.209	0.204	0.197	0.199	0.191
Arkadias	0.085	0.181	0.182	0.197	0.195	0.208	0.207	0.190	0.200	0.184	0.185	0.202	0.195	0.193	0.187	0.180
Artas	0.092	0.195	0.190	0.215	0.193	0.223	0.221	0.201	0.206	0.193	0.196	0.213	0.209	0.199	0.196	0.190
Attikis	0.073	0.071	0.071	0.099	0.072	0.076	0.061	0.075	0.076	0.075	0.076	0.075	0.076	0.076	0.075	0.072
Chalkidikis	0.084	0.120	0.124	0.135	0.115	0.128	0.129	0.126	0.122	0.116	0.118	0.125	0.122	0.119	0.118	0.114
Chanion	0.094	0.122	0.121	0.141	0.122	0.137	0.137	0.132	0.132	0.124	0.127	0.137	0.131	0.129	0.126	0.121
Chiou	0.106	0.101	0.099	0.114	0.100	0.106	0.105	0.104	0.107	0.101	0.102	0.109	0.107	0.104	0.104	0.099
Dodekanisou	0.110	0.104	0.101	0.117	0.102	0.110	0.109	0.095	0.111	0.103	0.106	0.111	0.108	0.107	0.107	0.101
Dramas	0.082	0.100	0.104	0.139	0.101	0.111	0.111	0.106	0.108	0.103	0.104	0.110	0.108	0.106	0.105	0.101
Euvoias	0.066	0.078	0.079	0.105	0.078	0.081	0.079	0.081	0.082	0.077	0.079	0.082	0.081	0.079	0.079	0.076
Evrou	0.096	0.189	0.187	0.222	0.188	0.206	0.217	0.200	0.204	0.191	0.192	0.222	0.202	0.199	0.193	0.187
Evrytanias	0.096	0.159	0.159	0.188	0.161	0.186	0.178	0.175	0.175	0.162	0.163	0.184	0.174	0.168	0.165	0.159
Fhiotidas	0.080	0.148	0.150	0.173	0.148	0.167	0.169	0.155	0.162	0.151	0.152	0.165	0.160	0.153	0.153	0.147
Florinas	0.078	0.177	0.181	0.2	0.185	0.199	0.201	0.186	0.190	0.179	0.179	0.199	0.195	0.186	0.182	0.176
Fokidas	0.082	0.113	0.123	0.131	0.113	0.125	0.125	0.122	0.122	0.114	0.115	0.124	0.120	0.117	0.117	0.112
Grevenon	0.092	0.198	0.200	0.232	0.201	0.231	0.229	0.211	0.211	0.202	0.205	0.230	0.217	0.209	0.208	0.199
Ilias	0.092	0.199	0.198	0.223	0.199	0.227	0.236	0.211	0.215	0.202	0.204	0.223	0.212	0.206	0.206	0.198
Imathias	0.083	0.162	0.163	0.226	0.164	0.180	0.191	0.172	0.174	0.166	0.170	0.177	0.175	0.170	0.170	0.163
Ioaninon	0.089	0.105	0.106	0.13	0.106	0.117	0.117	0.112	0.114	0.108	0.110	0.117	0.116	0.114	0.111	0.105
Irakleiou	0.096	0.138	0.138	0.157	0.139	0.158	0.160	0.154	0.151	0.141	0.145	0.152	0.150	0.146	0.144	0.138
Karditsas	0.103	0.271	0.272	0.305	0.274	0.311	0.323	0.286	0.290	0.276	0.280	0.300	0.298	0.285	0.282	0.272
Kastorias	0.274	0.217	0.217	0.159	0.218	0.232	0.252	0.229	0.228	0.222	0.226	0.240	0.235	0.226	0.226	0.217
Kavalas	0.074	0.099	0.100	0.134	0.097	0.106	0.105	0.103	0.105	0.099	0.101	0.106	0.104	0.102	0.101	0.097
Kefalonias	0.111	0.162	0.158	0.173	0.159	0.185	0.181	0.173	0.184	0.161	0.164	0.174	0.168	0.168	0.164	0.158
Kerkiras	0.114	0.117	0.116	0.129	0.116	0.130	0.130	0.126	0.128	0.118	0.122	0.126	0.123	0.120	0.121	0.116
Kilkis	0.086	0.162	0.162	0.234	0.163	0.176	0.186	0.170	0.175	0.165	0.166	0.179	0.170	0.171	0.168	0.162
Korinthias	0.078	0.151	0.150	0.186	0.152	0.170	0.175	0.161	0.164	0.154	0.157	0.165	0.161	0.156	0.157	0.151
Kozanis	0.088	0.093	0.099	0.116	0.099	0.103	0.102	0.098	0.100	0.095	0.097	0.101	0.101	0.098	0.097	0.093
Kykladon	0.090	0.098	0.096	0.111	0.096	0.096	0.102	0.103	0.103	0.096	0.097	0.102	0.099	0.096	0.098	0.094
Lakonias	0.098	0.332	0.328	0.351	0.330	0.367	0.384	0.348	0.361	0.334	0.338	0.359	0.349	0.340	0.338	0.328
Larissas	0.085	0.146	0.147	0.193	0.148	0.164	0.170	0.154	0.158	0.150	0.152	0.165	0.160	0.153	0.152	0.147
Lasithiou	0.106	0.194	0.192	0.208	0.193	0.220	0.225	0.227	0.207	0.196	0.199	0.212	0.205	0.203	0.199	0.192
Lefkadas	0.095	0.167	0.159	0.181	0.160	0.183	0.184	0.171	0.178	0.161	0.165	0.181	0.174	0.169	0.163	0.159
Lesbou	0.093	0.121	0.116	0.132	0.117	0.130	0.130	0.124	0.128	0.119	0.119	0.130	0.125	0.122	0.121	0.116
Magnisias	0.076	0.080	0.080	0.109	0.080	0.086	0.079	0.084	0.086	0.081	0.083	0.086	0.085	0.083	0.083	0.079
Messinias	0.091	0.188	0.187	0.22	0.190	0.216	0.220	0.198	0.206	0.192	0.195	0.211	0.203	0.196	0.194	0.187
Pellas	0.083	0.273	0.273	0.35	0.276	0.296	0.320	0.286	0.293	0.278	0.280	0.297	0.291	0.285	0.281	0.273
Pierias	0.088	0.172	0.169	0.219	0.170	0.192	0.198	0.183	0.185	0.173	0.176	0.183	0.183	0.177	0.176	0.169
Prevezas	0.096	0.185	0.184	0.214	0.185	0.213	0.213	0.199	0.200	0.186	0.188	0.208	0.201	0.193	0.188	0.183
Rethimnou	0.101	0.171	0.171	0.192	0.172	0.197	0.197	0.199	0.183	0.174	0.178	0.189	0.186	0.179	0.178	0.170
Rodopis	0.085	0.354	0.353	0.411	0.355	0.378	0.404	0.367	0.375	0.358	0.362	0.396	0.378	0.368	0.363	0.354
Samou	0.093	0.113	0.110	0.126	0.111	0.122	0.122	0.121	0.122	0.112	0.113	0.122	0.117	0.115	0.114	0.110
Serron	0.090	0.232	0.232	0.299	0.232	0.256	0.276	0.244	0.246	0.235	0.239	0.254	0.250	0.244	0.241	0.231
Thesprotias	0.094	0.168	0.167	0.196	0.168	0.197	0.190	0.182	0.183	0.170	0.172	0.187	0.182	0.176	0.174	0.167
Thessalonikis	0.078	0.073	0.073	0.105	0.073	0.078	0.060	0.077	0.078	0.075	0.077	0.078	0.078	0.078	0.076	0.073
Trikalon	0.090	0.164	0.164	0.196	0.165	0.190	0.191	0.175	0.177	0.167	0.170	0.183	0.180	0.172	0.170	0.164
Voiotias	0.069	0.102	0.105	0.152	0.103	0.112	0.112	0.107	0.110	0.104	0.105	0.111	0.108	0.105	0.105	0.101
Xanthis	0.080	0.193	0.193	0.258	0.193	0.218	0.221	0.202	0.204	0.196	0.198	0.216	0.208	0.201	0.200	0.193
Zakinthou	0.101	0.179	0.177	0.196	0.179	0.209	0.208	0.195	0.195	0.181	0.186	0.198	0.191	0.186	0.185	0.177

Source: Data from ELSTAT elaborated by the author

Table 15: Diversification of prefectures in each 2-digit STAKOD branch, 1991 (HHI index).

Prefecture	BRANCHES														
	D	DA	DB	DC	DD	DE	DST	DZ	DH	DU	DI	DK	DL	DM	DN
Ahaïas	0.112	0.090	0.093	0.086	0.087	0.087	0.086	0.086	0.087	0.087	0.088	0.087	0.086	0.086	0.087
Aitolokarnanias	0.268	0.246	0.245	0.239	0.241	0.240	0.239	0.239	0.240	0.241	0.243	0.239	0.240	0.239	0.242
Argolidas	0.226	0.198	0.197	0.190	0.192	0.191	0.190	0.190	0.191	0.194	0.195	0.191	0.191	0.191	0.192
Arkadias	0.197	0.184	0.182	0.180	0.182	0.181	0.180	0.180	0.180	0.181	0.183	0.181	0.180	0.180	0.182
Artas	0.215	0.199	0.193	0.190	0.191	0.190	0.190	0.190	0.190	0.191	0.193	0.190	0.190	0.190	0.192
Attikis	0.099	0.073	0.075	0.072	0.072	0.073	0.071	0.072	0.072	0.072	0.073	0.072	0.072	0.073	0.074
Chalkidikis	0.135	0.119	0.117	0.114	0.115	0.114	0.114	0.115	0.114	0.115	0.116	0.115	0.114	0.114	0.116
Chanion	0.141	0.125	0.123	0.122	0.122	0.122	0.121	0.121	0.121	0.122	0.123	0.121	0.121	0.122	0.124
Chiou	0.114	0.102	0.100	0.099	0.099	0.099	0.098	0.098	0.098	0.099	0.100	0.098	0.098	0.098	0.100
Dodekanisou	0.117	0.104	0.103	0.101	0.102	0.101	0.101	0.101	0.101	0.102	0.103	0.101	0.101	0.101	0.103
Dramas	0.139	0.104	0.111	0.101	0.102	0.104	0.100	0.101	0.101	0.104	0.102	0.101	0.101	0.100	0.104
Euvoias	0.105	0.079	0.078	0.076	0.078	0.077	0.076	0.077	0.076	0.081	0.079	0.077	0.077	0.077	0.077
Evrou	0.222	0.195	0.198	0.187	0.188	0.187	0.186	0.187	0.187	0.187	0.189	0.187	0.187	0.187	0.190
Evrytianas	0.188	0.161	0.173	0.159	0.164	0.160	0.159	0.159	0.159	0.159	0.161	0.159	0.159	0.159	0.161
Fhiotidas	0.173	0.152	0.151	0.147	0.148	0.148	0.146	0.147	0.147	0.148	0.151	0.147	0.147	0.147	0.148
Florinas	0.2	0.182	0.182	0.176	0.177	0.176	0.175	0.176	0.175	0.177	0.178	0.176	0.176	0.175	0.177
Fokidas	0.131	0.117	0.114	0.112	0.113	0.112	0.111	0.111	0.111	0.112	0.116	0.111	0.111	0.111	0.112
Grevenon	0.232	0.206	0.207	0.199	0.203	0.199	0.198	0.199	0.199	0.199	0.201	0.200	0.199	0.198	0.202
Ilias	0.223	0.204	0.202	0.198	0.200	0.199	0.198	0.198	0.198	0.200	0.202	0.198	0.198	0.198	0.200
Imathias	0.226	0.176	0.183	0.163	0.166	0.163	0.162	0.163	0.163	0.164	0.166	0.164	0.163	0.163	0.167
Ioaninon	0.13	0.109	0.108	0.105	0.107	0.105	0.105	0.105	0.105	0.108	0.108	0.105	0.105	0.105	0.109
Irakleiou	0.157	0.142	0.140	0.138	0.138	0.139	0.138	0.138	0.138	0.139	0.140	0.138	0.138	0.138	0.141
Karditsas	0.305	0.278	0.276	0.272	0.273	0.272	0.271	0.271	0.271	0.273	0.277	0.272	0.271	0.271	0.276
Kastorias	0.159	0.220	0.145	0.217	0.218	0.217	0.216	0.216	0.216	0.218	0.218	0.216	0.217	0.216	0.219
Kavalas	0.134	0.102	0.106	0.097	0.097	0.097	0.097	0.099	0.098	0.099	0.098	0.097	0.097	0.097	0.099
Kefalonias	0.173	0.163	0.158	0.157	0.158	0.158	0.157	0.157	0.157	0.158	0.160	0.158	0.157	0.157	0.159
Kerkiras	0.129	0.118	0.117	0.115	0.117	0.116	0.115	0.115	0.115	0.116	0.117	0.115	0.115	0.115	0.118
Kilkis	0.234	0.170	0.191	0.163	0.164	0.163	0.162	0.162	0.163	0.164	0.167	0.163	0.163	0.162	0.167
Korinthias	0.186	0.156	0.153	0.150	0.152	0.151	0.153	0.151	0.151	0.152	0.154	0.151	0.153	0.150	0.152
Kozanis	0.116	0.095	0.101	0.093	0.094	0.093	0.093	0.096	0.093	0.094	0.095	0.093	0.093	0.093	0.095
Kykladon	0.111	0.096	0.095	0.094	0.095	0.094	0.093	0.093	0.093	0.094	0.095	0.093	0.093	0.099	0.095
Lakonias	0.351	0.334	0.330	0.328	0.331	0.328	0.327	0.328	0.328	0.329	0.331	0.328	0.328	0.328	0.330
Larissas	0.193	0.153	0.161	0.147	0.147	0.148	0.146	0.146	0.147	0.148	0.150	0.147	0.147	0.146	0.151
Lasithiou	0.208	0.196	0.193	0.192	0.193	0.192	0.191	0.192	0.192	0.193	0.194	0.192	0.192	0.192	0.194
Lefkadas	0.181	0.163	0.164	0.159	0.162	0.159	0.159	0.159	0.159	0.160	0.160	0.159	0.159	0.160	0.161
Lesbou	0.132	0.121	0.117	0.116	0.117	0.116	0.115	0.115	0.115	0.117	0.118	0.115	0.116	0.115	0.118
Magnisias	0.109	0.082	0.084	0.079	0.080	0.080	0.079	0.079	0.079	0.083	0.083	0.080	0.080	0.080	0.081
Messinias	0.22	0.198	0.193	0.187	0.189	0.188	0.187	0.187	0.187	0.188	0.190	0.187	0.187	0.187	0.189
Pellas	0.35	0.288	0.304	0.274	0.275	0.274	0.273	0.273	0.274	0.275	0.278	0.274	0.273	0.273	0.278
Pierias	0.219	0.176	0.190	0.169	0.170	0.170	0.169	0.169	0.169	0.171	0.173	0.170	0.170	0.169	0.173
Prevezas	0.214	0.189	0.192	0.183	0.185	0.183	0.183	0.183	0.183	0.185	0.186	0.183	0.183	0.183	0.185
Rethimnou	0.192	0.175	0.173	0.170	0.171	0.171	0.170	0.170	0.170	0.172	0.173	0.170	0.170	0.170	0.174
Rodopis	0.411	0.365	0.369	0.354	0.356	0.356	0.353	0.353	0.354	0.355	0.359	0.353	0.353	0.353	0.358
Samou	0.126	0.112	0.113	0.110	0.111	0.110	0.109	0.109	0.109	0.111	0.110	0.109	0.109	0.110	0.111
Serron	0.299	0.243	0.254	0.232	0.234	0.232	0.231	0.231	0.232	0.233	0.236	0.232	0.231	0.231	0.239
Thesprotias	0.196	0.171	0.178	0.167	0.168	0.167	0.167	0.167	0.167	0.169	0.170	0.167	0.167	0.167	0.169
Thessalonikis	0.105	0.077	0.077	0.074	0.073	0.074	0.073	0.073	0.073	0.074	0.075	0.074	0.073	0.073	0.076
Trikalon	0.196	0.171	0.169	0.164	0.167	0.164	0.164	0.164	0.164	0.166	0.167	0.164	0.164	0.164	0.168
Voiotias	0.152	0.106	0.109	0.101	0.102	0.102	0.101	0.103	0.104	0.102	0.111	0.103	0.103	0.103	0.103
Xanthis	0.258	0.210	0.211	0.193	0.193	0.196	0.192	0.192	0.194	0.193	0.196	0.193	0.193	0.192	0.195
Zakinthou	0.196	0.180	0.179	0.177	0.178	0.177	0.177	0.177	0.177	0.178	0.180	0.177	0.177	0.177	0.183

Source: Data from ELSTAT elaborated by the author

Table 16: Percentage of permanent population and employment of the examined urban centers in each prefecture, 1991.

Prefectures	Agglomerations and Municipalities	(%) population of urban centers	(%) employment of urban centers
Ahaïas	Agglom. Patras	57.8%	56.7%
Aitolokarnanias	Agglom. Agrinio	26.5%	25.2%
	Ieras Polis Messologiou		
Argolidas	Argous	28.4%	27.2%
	Nafpliou		
Arkadias	Tripolis	29.5%	27.6%
Artas	Arteon	34.3%	35.3%
Attikis	Agglom. Athinas	83.0%	89.1%
Chalkidikis	Moudanion	15.0%	16.0%
	Polygyrou		
Chanion	Agglom. Chanion	57.8%	56.0%
Chiou	Agglom. Chiou	66.3%	66.3%
Dodekanisou	Rodou	29.4%	32.3%
Dramas	Dramas	53.9%	54.1%
Euvoias	Agglom. Chalkidas	28.4%	27.9%
Evrou	Alexandroupolis	29.6%	28.7%
Evrytanias	Karpenisiou	37.4%	40.9%
Phiotidas	Lamieon	35.7%	34.6%
Florinas	Florinas	29.3%	30.3%
Fokidas	Amfissas	25.3%	25.7%
Grevenon	Grevenon	47.7%	49.7%
Ilias	Pyrgou	22.8%	22.0%
	Amaliados		
Imathias	Verias	31.6%	31.1%
Ioanninon	Agglom. Ioanninon	49.0%	49.7%
Irakleiou	Agglom. Irakleiou	52.1%	50.8%
Karditsas	Karditsas	31.6%	31.0%
Kastorias	Kastorias	32.1%	34.0%
Kavalas	Kavalas	45.3%	44.1%
Kefalonias	Argostoliou	31.2%	31.0%
Kerkyras	Kerkyraion	38.9%	37.4%
Kilkis	Kilkis	24.9%	25.4%
Kozanis	Kozanis	30.2%	31.8%
	Ptolemaidas		
Korinthias	Korinthou	25.5%	25.5%
Kykladon	Ermoupolis	15.2%	13.5%
Lakonias	Spartis	19.2%	18.6%
Larisas	Larisas	44.0%	43.1%
Lasithiou	Ierapetras	29.8%	32.0%
	Agiou Nikolaou		
Lefkadas	Lefkados	47.7%	46.8%
Lesbou	Mitilinis	31.8%	34.0%
Magnisias	Agglom. Volou	60.8%	60.6%
Messinias	Kalamatas	33.4%	33.5%
Pellas	Giannitson	20.2%	18.5%
	Edessas		
	Aridaias		
Pierias	Katerinis	43.7%	42.4%
Prevezas	Prevezis	30.8%	32.5%
Rethimnou	Rethimnis	40.5%	40.6%
Rodopis	Komotinis	45.5%	39.7%
Samou	Vatheos	28.7%	30.3%
Serron	Serron	28.6%	26.2%
Thesprotias	Igoumenitsas	28.8%	30.7%
Thessalonikis	Agglom. Thessalonikis	80.1%	79.9%
Trikalon	Trikkiaion	37.7%	37.7%
Voiotias	Thivaion	18.5%	18.5%
	Levadeon		
Xanthi	Xanthis	46.9%	43.6%
Zakinthou	Zakynthion	43.4%	45.0%

Source: Data from ELSTAT elaborated by the author

Table 17: Descriptive statistics of employment of urban centers

	mean	St.dev.	min	max	Skewness	Kurtosis
Total	36878.00	149287.87	2425.00	1138884.00	7.13	52.70
Sectors						
primary	1450.55	1131.35	57.00	5470.00	1.75	3.49
secondary	9325.97	37096.54	493.00	277536.00	6.81	48.55
tertiary	23198.40	100135.35	1429.00	766546.00	7.23	53.92
Branches						
A	1276.75	1048.36	30.00	5126.00	1.61	2.84
B	60.70	116.66	0.00	585.00	3.25	11.44
C	102.57	247.01	0.00	1772.00	5.57	36.27
D	837.22	2897.73	19.00	20761.00	6.18	40.36
DA	1831.72	7102.75	17.00	47220.00	5.63	32.61
DB	247.92	1332.19	0.00	9762.00	6.66	46.41
DC	165.43	554.92	4.00	4226.00	6.96	50.83
DD	492.62	2825.77	2.00	21799.00	7.53	57.50
DE	67.40	345.75	0.00	2573.00	6.82	48.92
DST	258.48	1432.93	0.00	11023.00	7.45	56.62
DZ	151.13	686.06	0.00	5131.00	6.85	49.25
DH	275.57	881.42	2.00	6418.00	6.15	41.59
DU	558.27	2279.86	6.00	16956.00	6.72	47.55
DI	206.75	1004.53	0.00	7606.00	7.09	52.25
DK	171.37	842.94	0.00	6418.00	7.20	53.54
DL	338.82	1745.00	0.00	13196.00	7.08	52.26
DM	776.77	3068.92	7.00	22411.00	6.39	43.81
DN	433.32	1518.99	15.00	11364.00	6.63	47.33
E	2669.92	9255.69	150.00	70672.00	7.03	51.66
ST	6173.22	26184.17	191.00	198242.00	7.03	51.39
Z	1487.80	5195.93	89.00	39499.00	6.94	50.74
H	2983.00	13892.50	174.00	107067.00	7.40	56.00
U	1067.52	5289.62	41.00	40807.00	7.45	56.64
I	1857.38	8999.03	54.00	68895.00	7.29	54.70
K	3642.28	16190.01	231.00	125281.00	7.45	56.65
L	2371.85	8903.08	38.00	67084.00	6.87	49.52
M	1868.23	8129.17	1.00	61716.00	7.08	52.14
N	1341.47	6164.81	61.00	47254.00	7.29	54.64
J	234.66	1299.44	1.00	9823.00	7.32	54.65
O	19.17	116.10	0.00	878.00	7.36	55.22
P	2441.69	11863.68	54.00	89332.00	7.18	52.99

Source: Data from ELSTAT elaborated by the author

Table 18: Total employment growth of urban centers, overall specialization and diversification indexes.

Prefectures	Agglomerations and Municipalities	Employment (1991)	Employment (2001)	Employment growth 1991-2001	Normalized employment growth	Specialization (KSI)	Diversification (HHI)
Country		3.556.017	4.101.715	15.3%	-	-	-
Ahaïas	Agglom. Patras	55.501	63.602	14.6%	-6.1%	0.372	0.075
Aitolokarnanias	Agglom. Agrinio	18.924	21.237	12.2%	-8.1%	0.217	0.097
	Ieras Polis Messologiou	5.284	5.897	11.6%	-8.6%	0.266	0.094
Argolidas	Argous	9.779	11.817	20.8%	-1.0%	0.247	0.112
	Nafpliou	5.186	6.591	27.1%	4.1%	0.368	0.084
Arkadias	Tripolis	8.953	11.710	30.8%	7.2%	0.485	0.086
Artas	Arteon	8.250	9.282	12.5%	-7.8%	0.359	0.091
Attikis	Agglom. Athinas	1.138.884	1.371.650	20.4%	-1.3%	0.419	0.073
Chalkidikis	Moudanion	4.539	3.977	-12.4%	-28.2%	0.310	0.113
	Polygyrou	3.498	6.377	82.3%	49.4%	0.434	0.110
Chanion	Agglom. Chanion	25.873	33.530	29.6%	6.2%	0.400	0.090
Chiou	Agglom. Chiou	8.732	11.127	27.4%	4.4%	0.451	0.099
Dodekanisou	Rodou	18.431	21.788	18.2%	-3.1%	0.521	0.106
Dramas	Dramas	17.125	18.489	8.0%	-11.5%	0.363	0.074
Euvoias	Agglom. Chalkidas	17.790	24.049	35.2%	10.8%	0.371	0.065
Evrou	Alexandroupolis	13.784	19.610	42.3%	16.6%	0.353	0.089
Evrytanias	Karpenisiou	2.425	2.962	22.1%	0.1%	0.453	0.088
Fhiotidas	Lamieon	18.444	22.208	20.4%	-1.4%	0.293	0.081
Florinas	Florinas	4.924	6.143	24.8%	2.2%	0.413	0.090
Fokidas	Amfissas	2.852	2.831	-0.7%	-18.7%	0.448	0.087
Grevenon	Grevenon	5.016	5.646	12.6%	-7.8%	0.289	0.111
Ilias	Pyrgou	12657	11822	-6.6%	-23.5%	0.255	0.101
	Amaliados	8.857	10.498	18.5%	-2.9%	0.392	0.164
Imathias	Verias	15.242	17.314	13.6%	-6.9%	0.212	0.079
Ioaninon	Agglom. Ioanninon	24.012	30.766	28.1%	5.0%	0.455	0.089
Irakleiou	Agglom. Irakleiou	49.528	62.077	25.3%	2.7%	0.422	0.089
Karditsas	Karditsas	12.407	14.455	16.5%	-4.5%	0.315	0.093
Kastorias	Kastorias	6.233	5.899	-5.4%	-22.5%	0.858	0.266
Kavalas	Kavalas	20.428	22.419	9.7%	-10.1%	0.426	0.075
Kefalonias	Argostoliou	3.548	4.442	25.2%	2.6%	0.313	0.098
Kerkyras	Kerkyraion	14.443	15.516	7.4%	-12.0%	0.522	0.100
Kilkis	Kilkis	7.066	8.882	25.7%	3.0%	0.272	0.080
Korinthias	Korinthou	11.734	14.593	24.4%	1.9%	0.282	0.069
	Ptolemaidas	9.365	11.478	22.6%	0.4%	0.751	0.140
Kykladon	Ermoupolis	4.073	4.825	18.5%	-2.9%	0.564	0.093
Lakonias	Spartis	6.206	7.792	25.6%	2.9%	0.223	0.103
Larisas	Larisas	41.181	49.624	20.5%	-1.3%	0.348	0.081
Lasithiou	Ierapetras	8.824	10.598	20.1%	-1.6%	0.581	0.256
	Agiou Nikolaou	6.709	7.720	15.1%	-5.7%	0.495	0.122
Lefkadas	Lefkados	3.323	4.076	22.7%	0.5%	0.341	0.091
Lesbou	Mitilinis	9.909	13.053	31.7%	7.9%	0.430	0.089
Magnisias	Agglom. Volou	37.458	44.015	17.5%	-3.7%	0.326	0.073
Messinias	Kalamatas	18.706	21.878	17.0%	-4.2%	0.345	0.085
Pellas	Giannitson	9.540	11.277	18.2%	-3.2%	0.250	0.105
	Edessas	8.358	8.844	5.8%	-13.3%	0.274	0.103
	Aridaïas	7.982	7.306	-8.5%	-25.0%	0.901	0.423
Pierias	Katerinis	17.681	20.188	14.2%	-6.5%	0.267	0.086
Prevezas	Prevezis	6.438	7.761	20.5%	-1.2%	0.235	0.102
Rethimnou	Rethimnis	10.233	12.940	26.5%	3.6%	0.452	0.095
Rodopis	Komotinis	16.244	18.980	16.8%	-4.3%	0.218	0.103
Samou	Vatheos	3.889	4.629	19.0%	-2.5%	0.392	0.088
Serron	Serron	18.226	19.974	9.6%	-10.2%	0.443	0.088
Thesprotias	Igoumenitsas	4.128	5.647	36.8%	12.1%	0.281	0.089
Thessalonikis	Agglom. Thessalonikis	284.367	319.869	12.5%	-7.8%	0.447	0.078
Trikalon	Trikkaiou	16.780	20.925	24.7%	2.2%	0.348	0.088
Voiotias	Thivaion	7.951	9.741	22.5%	0.4%	0.216	0.074
	Levadeon	7.110	8.364	17.6%	-3.6%	0.351	0.085
Xanthi	Xanthis	14.525	18.742	29.0%	5.7%	0.405	0.078
Zakinthou	Zakynthion	5046	6159	22.1%	0.0%	0.312	0.091

Source: Data from ELSTAT elaborated by the author

Table 19: Sectoral employment growth of urban centers.

Urban centers	Growth rate				Normalized growth rate			
	Total economy	Primary	Secondary	Tertiary	Total economy	Primary	Secondary	Tertiary
Country	0.15	-0.12	0.06	0.31	1.00	-0.23	-0.09	0.13
Urban centers	0.19	0.04	0.03	0.28	0.03	0.17	-0.02	-0.02
Agg Agrinio	0.12	-0.18	0.06	0.32	-0.06	-0.07	-0.14	0.01
Agg Athinas	0.20	0.49	0.08	0.28	0.01	0.68	-0.12	-0.02
Agg Ioanninon	0.28	-0.10	0.06	0.33	0.07	0.02	-0.13	0.01
Agg Irakleiou	0.25	0.18	0.05	0.32	0.05	0.33	-0.14	0.01
Agg Patras	0.15	-0.05	-0.17	0.32	-0.04	0.07	-0.32	0.01
Agg Thessalonikis	0.12	0.42	-0.08	0.25	-0.06	0.60	-0.25	-0.05
Agg Volou	0.18	0.12	-0.03	0.27	-0.02	0.27	-0.21	-0.02
Agiou Nicolaou	0.15	-0.14	0.02	0.16	-0.04	-0.02	-0.17	-0.11
Alexandroupolis	0.42	0.15	0.53	0.44	0.19	0.30	0.25	0.10
Amaliadas	0.19	-0.04	0.23	0.24	-0.01	0.08	0.00	-0.05
Amfissas	-0.01	-0.62	-0.01	0.08	-0.17	-0.57	-0.20	-0.17
Argostoliou	0.25	-0.34	0.27	0.34	0.05	-0.25	0.04	0.03
Argous	0.21	-0.08	0.02	0.36	0.01	0.04	-0.17	0.04
Aridaia	-0.08	-0.26	0.07	0.41	-0.23	-0.16	-0.13	0.08
Artas	0.13	0.07	-0.04	0.19	-0.06	0.22	-0.22	-0.09
Chalkidas	0.18	0.06	0.15	0.29	-0.01	0.20	-0.07	-0.02
Chanion	0.30	0.12	0.13	0.33	0.09	0.27	-0.08	0.02
Chiou	0.27	0.21	0.01	0.32	0.07	0.37	-0.18	0.01
Dramas	0.08	-0.05	-0.22	0.25	-0.10	0.08	-0.36	-0.04
Edessa	0.06	0.05	-0.13	0.15	-0.11	0.19	-0.29	-0.12
Ermoupolis	0.18	0.60	-0.08	0.38	-0.01	0.81	-0.25	0.05
Florinas	0.25	-0.10	0.32	0.31	0.05	0.02	0.08	0.00
Giannitson	0.18	-0.02	0.01	0.40	-0.01	0.11	-0.17	0.07
Grevenon	0.13	-0.20	0.19	0.25	-0.06	-0.09	-0.03	-0.04
Ierapetras	0.20	0.06	0.04	0.35	0.01	0.20	-0.15	0.03
Igoumenitsas	0.37	-0.16	0.16	0.54	0.15	-0.05	-0.06	0.18
Kabalas	0.10	-0.15	-0.05	0.20	-0.08	-0.04	-0.23	-0.08
kalamatas	0.17	0.08	-0.18	0.34	-0.02	0.22	-0.33	0.03
Karditsas	0.17	0.06	-0.02	0.25	-0.02	0.20	-0.20	-0.04
Karpenisiou	0.22	0.05	-0.23	0.36	0.02	0.19	-0.37	0.04
Kastorias	-0.05	0.57	-0.43	0.35	-0.21	0.77	-0.53	0.03
Katerinis	0.14	-0.06	-0.22	0.34	-0.04	0.06	-0.36	0.03
Kerkyras	0.07	0.03	-0.12	0.07	-0.10	0.16	-0.28	-0.18
Kilkis	0.26	-0.39	0.40	0.41	0.05	-0.31	0.15	0.08
Komotinis	0.17	-0.17	0.34	0.20	-0.02	-0.06	0.10	-0.08
Korinthou	0.24	0.26	0.29	0.34	0.04	0.42	0.05	0.02
Kozanis	0.21	0.04	0.01	0.35	0.01	0.18	-0.17	0.03
Lamieon	0.20	-0.01	0.16	0.24	0.01	0.12	-0.06	-0.05
Larissas	0.21	0.28	0.00	0.35	0.01	0.44	-0.19	0.04
Lebadias	0.18	0.15	-0.10	0.30	-0.01	0.30	-0.27	-0.01
Lefkadas	0.23	-0.26	0.16	0.36	0.03	-0.16	-0.06	0.04
Messologiou	0.12	-0.02	0.18	0.22	-0.06	0.10	-0.04	-0.06
Moudanion	0.40	0.27	0.47	0.50	0.18	0.44	0.20	0.15
Mytilinis	0.32	0.42	0.04	0.32	0.10	0.61	-0.15	0.01
Nafpliou	0.27	0.00	0.22	0.33	0.06	0.13	0.00	0.02
Polygyrou	0.14	-0.01	0.07	0.29	-0.05	0.13	-0.13	-0.01
Prevezas	0.21	-0.11	0.06	0.34	0.01	0.00	-0.14	0.03
Ptolemaidas	0.23	1.20	-0.19	0.56	0.03	1.48	-0.34	0.19
Pyrgou	-0.07	-0.21	-0.15	-0.02	-0.22	-0.11	-0.31	-0.25
Rethymnou	0.26	-0.06	0.29	0.24	0.06	0.07	0.05	-0.05
Rodou	0.18	0.57	-0.01	0.21	-0.01	0.77	-0.19	-0.07
Serron	0.10	0.07	-0.18	0.16	-0.08	0.21	-0.33	-0.11
Spartis	0.26	0.14	0.19	0.34	0.05	0.29	-0.03	0.02
Thibas	0.23	0.26	0.14	0.22	0.03	0.42	-0.07	-0.07
Trikkiaion	0.25	0.12	0.05	0.38	0.04	0.27	-0.14	0.05
Tripolis	0.31	0.35	0.33	0.30	0.10	0.53	0.08	-0.01
Vatheos	0.19	0.13	-0.08	0.31	0.00	0.27	-0.25	0.00
Veroias	0.14	-0.13	-0.06	0.31	-0.05	-0.01	-0.23	0.01
Xanthi	0.29	0.27	0.18	0.31	0.08	0.43	-0.04	0.00
Zakynthou	0.22	0.01	0.24	0.20	0.02	0.14	0.01	-0.08

Source: Data from ELSTAT elaborated by the author

Table 20: Sectoral specialization and diversification of Greek urban centers, 1991

Urban centers	Specialization (LQ)			Diversification (HHI)		
	primary	secondary	tertiary	primary	secondary	tertiary
Agg Agrinio	0.97	0.98	1.02	0.503	0.531	0.394
Agg Athinas	0.03	1.04	1.30	0.517	0.792	0.556
Agg Ioanninon	0.19	0.97	1.38	0.604	0.854	0.644
Agg Irakleiou	0.25	0.97	1.31	0.561	0.769	0.513
Agg Patras	0.13	1.22	1.19	0.484	0.743	0.555
Agg Thessalonikis	0.04	1.36	1.18	0.479	0.797	0.662
Agg Volou	0.23	1.28	1.14	0.481	0.719	0.552
Agiou Nicolaou	0.69	0.69	1.31	0.641	0.676	0.418
Alexandroupolis	0.50	0.81	1.32	0.617	0.728	0.455
Amaliadas	1.82	0.67	0.81	0.472	0.419	0.435
Amfissas	1.28	0.74	1.09	0.608	0.550	0.472
Argostoliou	0.79	0.93	1.18	0.585	0.650	0.468
Argous	1.24	1.03	0.93	0.500	0.502	0.427
Aridaia	3.35	0.52	0.41	0.472	0.595	0.691
Artas	0.56	0.99	1.19	0.541	0.659	0.438
Chalkidas	0.28	1.35	1.04	0.436	0.628	0.486
Chanion	0.30	0.96	1.31	0.576	0.772	0.522
Chiou	0.32	1.05	1.30	0.579	0.796	0.592
Dramas	0.51	1.40	1.02	0.473	0.636	0.525
Edessa	1.23	1.08	0.93	0.505	0.514	0.445
Ermoupolis	0.07	1.57	1.09	0.467	0.797	0.713
Florinas	0.58	0.70	1.32	0.621	0.680	0.384
Giannitson	1.20	1.14	0.88	0.468	0.482	0.417
Grevenon	1.20	0.85	1.02	0.542	0.521	0.421
Ierapetras	2.53	0.57	0.68	0.533	0.479	0.602
Igoumenitsas	0.72	0.95	1.18	0.571	0.652	0.455
Kabalas	0.26	1.15	1.24	0.533	0.771	0.579
kalamatas	0.43	1.28	1.13	0.509	0.705	0.553
Karditsas	0.60	0.89	1.26	0.595	0.697	0.467
Karpenisiou	0.57	1.18	1.14	0.534	0.688	0.527
Kastorias	0.15	2.28	0.82	0.495	0.838	0.868
Katerinis	0.64	1.26	1.07	0.512	0.649	0.517
Kerkiras	0.12	0.77	1.47	0.635	0.856	0.565
Kilkis	0.84	1.13	0.96	0.447	0.500	0.375
Komotinis	1.15	0.85	1.06	0.556	0.540	0.428
Korinthou	0.51	1.22	1.04	0.456	0.588	0.431
Kozanis	0.53	1.27	1.11	0.519	0.694	0.552
Lamieon	0.58	0.95	1.17	0.522	0.621	0.393
Larisas	0.26	1.18	1.19	0.506	0.733	0.541
Lebadias	0.42	1.44	1.08	0.506	0.731	0.625
Lefkadas	0.83	0.80	1.22	0.610	0.638	0.440
Messologiou	1.27	0.69	1.00	0.515	0.467	0.368
Moudanion	1.39	1.01	0.89	0.500	0.488	0.439
Mytilinis	0.36	0.87	1.32	0.589	0.748	0.469
Nafpliou	0.60	0.71	1.30	0.615	0.671	0.384
Polygyrou	1.69	0.67	0.92	0.547	0.465	0.471
Prevezas	1.08	0.85	1.11	0.583	0.578	0.451
Ptolemaidas	0.37	2.12	0.79	0.480	0.680	0.722
Pyrkou	0.86	0.88	1.08	0.512	0.542	0.362
Rethymnou	0.38	0.88	1.35	0.616	0.784	0.529
Rodou	0.06	0.85	1.43	0.602	0.859	0.601
Serron	0.27	1.08	1.31	0.577	0.823	0.635
Spartis	1.04	0.79	1.13	0.587	0.576	0.431
Thibas	0.96	1.30	0.83	0.416	0.451	0.388
Trikkiaion	0.42	1.06	1.22	0.544	0.717	0.502
Tripolis	0.31	0.93	1.31	0.571	0.754	0.487
Vatheos	0.57	0.89	1.25	0.586	0.692	0.453
Veroias	0.73	1.11	1.09	0.521	0.616	0.458
Xanthis	0.28	1.34	1.13	0.492	0.735	0.593
Zakynthou	0.73	0.92	1.17	0.558	0.628	0.425

Source: Data from ELSTAT elaborated by the author

Table 21: Employment growth of urban centers in 1-digid classification

	SECTORS																
Urban centers	Total	A	B	C	D	E	ST	Z	H	U	I	K	L	M	N	J	O
Total	0.19	0.04	0.33	-0.11	-0.09	0.05	0.30	0.18	0.61	0.10	0.42	0.73	0.05	0.34	0.29	0.24	2.49
Agg Agriniou	0.12	-0.18	0.67	-0.18	-0.04	0.04	0.14	0.23	0.62	0.02	0.38	0.73	0.17	0.43	0.79	0.08	1.58
Agg Athinas	0.20	0.94	0.71	-0.38	-0.05	-0.03	0.46	0.20	0.63	0.13	0.47	0.72	0.01	0.27	0.24	0.23	2.65
Agg Ioanninon	0.28	-0.05	0.24	-0.40	0.03	0.15	0.09	0.22	0.79	-0.02	0.37	0.50	0.30	0.36	0.45	0.22	1.54
Agg Irakleiou	0.25	0.19	0.48	-0.50	0.16	0.21	-0.04	0.16	0.57	0.16	0.50	0.83	0.02	0.39	0.53	0.35	2.01
Agg Patras	0.15	-0.06	0.06	-0.05	-0.33	0.23	0.13	0.18	0.78	0.31	0.28	0.84	0.10	0.39	0.40	0.17	2.32
Agg Thessalonikis	0.12	0.69	0.00	-0.35	-0.18	0.14	0.32	0.08	0.76	0.11	0.30	0.73	-0.02	0.32	0.20	0.30	1.89
Agg Volou	0.18	0.12	0.17	0.05	-0.13	0.78	0.19	0.11	0.94	-0.04	0.28	0.60	0.18	0.47	0.43	0.22	2.07
Agiou Nicolaou	0.15	-0.15	-0.02	0.44	-0.01	0.31	0.00	0.07	0.03	-0.01	0.68	0.41	0.13	0.63	0.34	0.45	5.54
Alexandroupolis	0.42	0.10	0.32	0.60	0.36	0.60	0.76	0.46	0.76	0.02	0.44	1.21	0.30	0.59	0.56	0.29	0.69
Amaliadas	0.19	-0.05	1.00	-1.00	0.10	1.61	0.26	-0.03	0.75	0.18	0.40	0.95	0.28	0.34	0.56	0.08	0.85
Amfissas	-0.01	-0.40	3.00	-0.82	-0.28	0.00	0.22	-0.09	0.25	0.05	0.31	0.46	0.02	0.16	0.12	0.18	0.38
Argostoliou	0.25	-0.39	0.88	0.29	0.23	0.59	0.27	0.24	0.81	-0.05	0.21	1.01	0.11	0.53	0.33	0.67	3.00
Argous	0.21	-0.08	0.14	-0.45	-0.05	0.88	0.07	0.17	0.56	0.19	0.57	1.14	0.14	0.43	0.58	0.26	3.93
Aridaia	-0.08	-0.26	0.00	-0.38	-0.10	0.33	0.53	0.28	0.92	-0.01	0.29	1.29	0.48	0.39	0.40	0.40	0.17
Artas	0.13	0.05	0.80	2.20	-0.02	0.55	-0.12	0.05	0.28	-0.12	0.50	0.74	0.06	0.29	0.64	0.01	0.74
Chalkidas	0.18	0.13	0.21	-0.41	0.16	0.11	0.11	0.23	0.58	-0.03	0.48	0.91	0.05	0.39	0.40	0.21	3.24
Chanion	0.30	0.14	0.09	-0.53	-0.13	0.98	0.30	0.24	0.86	0.13	0.47	0.83	0.00	0.44	0.35	0.34	3.58
Chiou	0.27	-0.05	1.42	-0.24	-0.20	0.33	0.11	0.22	0.78	0.04	0.32	0.77	0.45	0.48	0.38	0.12	1.89
Dramas	0.08	0.00	3.50	-0.22	-0.35	0.80	0.13	0.21	0.64	-0.11	0.27	0.73	0.10	0.41	0.28	0.09	2.89
Edessa	0.06	0.05	-0.38	0.17	-0.26	-0.10	0.16	0.18	0.41	-0.14	0.33	0.85	-0.23	0.38	0.13	0.41	4.33
Ermoupolis	0.18	0.40	0.95	0.43	-0.33	0.07	0.67	0.33	1.26	-0.09	0.69	1.23	0.20	0.38	0.38	0.74	1.07
Florinas	0.25	-0.15	1.00	0.61	-0.02	1.06	0.45	0.25	0.58	-0.07	0.34	0.89	0.33	0.30	0.28	0.18	5.30
Giannitson	0.18	-0.02	0.50	-0.17	-0.05	0.64	0.15	0.35	0.53	0.16	0.55	0.91	0.23	0.60	0.45	0.14	1.88
Grevenon	0.13	-0.23	34.00	0.60	0.03	-0.07	0.36	0.00	0.56	0.09	0.53	1.43	0.12	0.36	0.39	0.22	0.00
Ierapetras	0.20	0.06	0.11	0.00	-0.17	1.45	0.11	0.09	0.64	0.23	0.28	1.11	0.10	0.37	0.71	0.23	13.67
Igoumenitsas	0.37	-0.26	2.17	-0.33	-0.14	0.54	0.34	0.42	0.78	0.46	0.34	0.90	0.55	0.43	0.75	0.46	1.67
Kabalas	0.10	0.26	-0.02	-0.60	-0.18	0.44	0.32	0.12	0.72	0.04	0.25	0.67	-0.12	0.32	0.19	0.27	1.63
kalamatas	0.17	0.08	0.25	-0.26	-0.29	0.44	-0.14	0.20	0.89	0.02	0.21	0.76	0.20	0.44	0.64	0.33	2.34
Karditsas	0.17	0.07	2.00	-0.35	-0.05	0.59	-0.06	0.11	0.68	-0.13	0.30	0.63	0.21	0.35	0.53	0.07	0.93
Karpenisiou	0.22	0.03	4.00	0.00	-0.61	2.72	0.09	0.37	0.49	-0.04	0.58	1.28	0.02	0.34	1.18	0.58	5.00
Kastorias	-0.05	0.61	-0.43	6.00	-0.49	1.50	0.64	0.19	0.76	0.06	0.35	0.36	0.41	0.46	0.32	0.32	2.13
Katerinis	0.14	-0.06	1.00	-0.55	-0.35	0.52	0.02	0.27	0.81	0.03	0.30	0.71	0.14	0.45	0.49	0.14	2.65
Kerkyras	0.07	0.06	0.00	-0.47	-0.23	0.19	-0.06	0.00	-0.11	-0.03	0.20	0.28	0.05	0.45	0.26	-0.03	1.55
Kilkis	0.26	-0.40	2.00	-0.17	0.30	0.18	0.83	0.21	0.79	0.16	0.39	1.75	0.42	0.59	0.20	0.35	1.21
Komotinis	0.17	-0.17	1.90	0.17	0.27	1.29	0.41	0.17	0.71	-0.09	0.18	0.90	0.02	0.30	0.24	0.08	0.65
Korinthou	0.24	0.24	0.55	0.45	0.34	0.28	0.20	0.26	0.69	0.08	0.33	0.48	0.01	0.30	0.33	1.04	4.53
Kozanis	0.21	-0.30	0.00	0.65	-0.11	-0.07	0.32	0.39	0.74	-0.13	0.27	1.19	0.14	0.47	0.32	0.26	2.07
Lamieon	0.20	0.03	0.19	-0.64	0.38	0.06	-0.01	0.12	0.39	-0.04	0.33	0.81	0.13	0.37	0.45	0.21	3.08
Larissas	0.21	0.30	0.57	-0.48	-0.06	0.27	0.11	0.29	0.72	-0.12	0.46	0.65	0.28	0.52	0.65	0.11	2.83
Lebadias	0.18	0.17	8.00	-0.29	-0.18	0.04	0.01	0.15	0.50	0.07	0.33	0.48	0.31	0.52	0.72	0.02	2.47
Lefkadas	0.23	-0.33	0.11	-0.71	-0.15	0.10	0.38	0.14	1.43	-0.02	0.39	0.57	0.22	0.41	0.38	1.05	3.38
Messologiou	0.12	-0.02	0.00	-0.11	0.00	0.59	0.27	0.18	0.42	0.08	0.34	0.64	0.05	0.26	0.51	0.11	0.77
Moudanion	0.40	0.31	0.94	-0.50	0.17	0.00	0.78	0.29	1.44	0.25	0.35	2.06	0.08	0.31	0.42	0.47	2.33
Mytilinis	0.32	0.56	-0.08	-0.06	-0.06	0.12	0.11	0.26	0.70	0.06	-0.03	0.75	0.20	0.56	0.48	0.28	1.42
Nafpliou	0.27	-0.01	1.58	-0.26	0.26	0.19	0.19	0.24	0.27	0.17	0.29	0.75	0.18	0.42	0.62	0.34	5.23
Polygyrou	0.14	0.13	-0.67	-0.41	0.01	-0.74	0.27	0.40	0.88	-0.18	0.46	1.32	0.18	0.21	-0.08	0.22	6.50
Prevezas	0.21	-0.16	0.67	-0.29	-0.06	0.39	0.15	0.20	0.90	0.24	0.34	1.08	0.06	0.42	0.34	0.82	4.89
Ptolemaidas	0.23	-0.30	-1.00	3.66	-0.28	-0.38	0.67	0.47	0.92	-0.12	0.34	1.18	0.92	0.49	0.65	0.62	4.50
Pyrgou	-0.07	-0.22	0.64	-1.00	-0.27	0.76	-0.12	-0.28	0.20	-0.13	0.20	0.42	-0.07	0.30	0.29	0.04	2.62
Rethymnou	0.26	-0.07	0.47	-0.07	0.16	0.39	0.36	0.14	0.30	0.06	0.12	0.68	-0.04	0.35	0.36	0.20	6.63
Rodou	0.18	0.77	0.20	-0.13	-0.14	0.67	0.04	0.15	0.06	0.24	0.24	0.49	0.26	0.43	0.41	0.16	2.60
Serron	0.10	0.10	-0.29	-0.30	-0.30	0.93	0.07	0.05	0.41	-0.04	0.14	0.39	-0.01	0.40	0.22	-0.01	2.05
Spartis	0.26	0.14	0.00	0.50	0.41	0.19	0.04	0.22	0.74	-0.01	0.41	0.79	0.15	0.50	0.35	0.35	2.36
Thibas	0.23	0.27	-0.40	0.09	0.13	0.37	0.11	0.17	0.38	0.01	0.23	0.86	-0.07	0.36	0.43	0.40	2.11
Trikkiaion	0.25	0.12	2.00	0.10	-0.03	0.86	0.09	0.25	1.02	-0.15	0.62	0.66	0.24	0.55	0.54	0.48	2.21
Tripolis	0.31	0.33	4.00	0.47	0.34	0.39	0.28	0.26	0.72	0.09	0.58	1.11	0.09	0.42	0.19	0.24	3.48
Vatheos	0.19	0.16	-0.11	0.07	-0.23	0.43	-0.04	0.37	0.37	-0.08	0.28	0.80	0.20	0.51	0.41	0.13	1.93
Veroias	0.14	-0.11	0.67	-0.50	-0.13	0.03	0.09	0.32	0.45	-0.12	0.55	0.51	0.32	0.51	0.38	-0.09	0.73
Xanthis	0.29	0.25	2.13	0.10	0.12	0.77	0.27	0.19	0.63	0.12	0.08	1.05	0.13	0.40	0.44	0.44	0.20
Zakynthou	0.22	0.01	-0.33	0.55	-0.05	0.50	0.38	0.15	1.11	-0.10	-0.03	0.35	-0.24	0.24	0.03	0.20	4.69

Source: Data from ELSTAT elaborated by the author

Table 22: Employment growth of urban centers in 2-digid classification in manufacturing.

Urban centers	BRANCHES															
	Total	D	DA	DB	DC	DD	DE	DST	DZ	DH	DU	DI	DK	DL	DM	DN
Total	0.19	-0.09	0.13	-0.40	-0.43	0.12	0.35	0.16	0.11	0.03	-0.02	0.11	0.12	0.18	-0.19	-0.16
Aggl. Agriniou	0.12	-0.04	-0.07	-0.21	-0.73	0.29	0.48	9.00	1.18	0.10	0.28	-0.16	0.05	-0.11	0.50	-0.08
Aggl. Athinas	0.20	-0.05	0.15	-0.32	-0.40	0.14	0.37	0.12	0.09	-0.09	0.01	0.06	0.12	0.20	-0.21	-0.17
Aggl. Ioanninon	0.28	0.03	0.61	-0.40	-0.80	0.04	0.59	-0.14	0.73	1.17	-0.55	0.28	0.22	0.38	3.67	-0.30
Aggl. Irakleiou	0.25	0.16	0.35	-0.38	-0.54	0.63	0.65	1.22	1.19	0.89	-0.07	0.18	0.01	0.41	-0.35	0.03
Aggl. Patras	0.15	-0.33	-0.06	-0.68	-0.48	0.09	0.13	-0.09	0.73	-0.73	-0.28	0.08	0.48	0.86	0.23	-0.26
Aggl. Thessalonikis	0.12	-0.18	-0.03	-0.35	-0.50	-0.07	0.35	0.20	0.31	-0.03	-0.07	0.01	-0.14	-0.11	0.38	-0.21
Aggl. Volou	0.18	-0.13	0.28	-0.75	-0.61	0.25	0.20	-0.33	0.44	0.64	-0.17	0.31	0.30	-0.46	-0.64	-0.21
Agiou Nicolaou	0.15	-0.01	-0.12	-0.45	-0.60	-0.19	0.50	0.00	0.00	-0.67	-0.48	0.41	-0.60	0.20	0.00	0.90
Alexandroupolis	0.42	0.36	1.03	-0.45	-0.50	0.70	1.56	1.80	3.43	9.20	1.37	0.75	2.80	2.76	0.58	-0.08
Amaliadas	0.19	0.10	0.48	-0.50	-0.71	-0.14	1.36	0.00	-0.40	-0.50	-0.39	0.07	1.80	0.10	-0.33	0.26
Amfissas	-0.01	-0.28	-0.43	-0.37	-0.85	-0.33	1.50	-0.67	-1.00	-1.00	0.38	0.02	-1.00	1.00	-0.67	0.57
Argostoliou	0.25	0.23	0.09	-0.47	1.00	1.14	2.13	-1.00	1.50	-1.00	0.47	-0.13	-0.25	-0.20	-0.80	0.56
Argous	0.21	-0.05	0.56	-0.53	-0.56	0.48	0.38	0.00	1.14	0.07	-0.35	-0.30	-0.17	-0.31	1.13	0.00
Aridaias	-0.08	-0.10	-0.18	-0.38	-0.64	0.09	0.67	-1.00	2.00	1.00	0.71	0.11	0.33	0.71	1.00	0.33
Artas	0.13	-0.02	0.19	-0.34	-0.73	-0.25	0.17	0.00	2.00	-0.67	0.22	-0.36	0.25	0.75	-1.00	-0.29
Chalkidas	0.18	0.16	0.64	-0.58	-0.56	0.47	0.32	0.75	0.65	1.29	-0.11	0.37	0.70	0.29	-0.29	0.34
Chanion	0.30	-0.13	0.07	-0.70	-0.53	0.11	0.27	-0.60	0.76	-0.32	0.15	0.16	-0.04	0.23	-0.88	-0.06
Chiou	0.27	-0.20	0.09	-0.87	-0.89	-0.42	0.95	0.00	0.00	-0.50	-0.11	0.10	-0.26	0.50	0.67	-0.46
Dramas	0.08	-0.35	-0.05	-0.71	-0.43	0.36	-0.31	-0.50	0.80	0.17	0.30	0.28	0.58	1.09	0.60	-0.11
Edessa	0.06	-0.26	0.41	-0.63	-0.85	-0.23	0.23	0.00	1.00	1.00	-0.10	-0.07	0.63	1.00	-1.00	-0.20
Ermoupolis	0.18	-0.33	-0.08	-0.70	-0.50	0.50	0.60	0.00	0.00	-0.25	1.33	-0.09	2.00	-0.75	-0.41	0.32
Florinas	0.25	-0.02	0.32	-0.63	-1.00	-0.40	0.42	0.00	-0.67	1.00	0.30	0.36	-0.38	0.30	0.00	0.76
Giannitson	0.18	-0.05	0.63	-0.40	-0.45	0.26	0.00	2.00	1.00	0.48	0.41	0.43	-0.11	0.20	0.44	-0.06
Grevenon	0.13	0.03	0.27	-0.60	0.33	0.00	0.38	-1.00	-1.00	-0.92	1.00	0.50	-0.03	6.00	12.00	-0.07
Ierapetras	0.20	-0.17	-0.42	-0.67	-0.50	0.23	0.43	-1.00	1.00	-0.67	-0.39	0.14	-0.67	0.25	-0.33	-0.26
Igoumenitsas	0.37	-0.14	0.36	-0.83	0.50	0.43	-0.16	0.00	-0.75	-0.67	0.26	0.26	1.33	-0.33	2.00	0.11
Kabalas	0.10	-0.18	-0.01	-0.58	-0.46	0.10	0.43	0.75	0.11	-0.62	0.06	0.49	0.11	0.16	-0.39	-0.28
kalamatas	0.17	-0.29	-0.38	-0.75	-0.46	0.25	0.77	-0.11	1.24	-0.32	-0.01	0.02	-0.38	-0.02	0.88	-0.16
Karditsas	0.17	-0.05	-0.17	-0.61	-0.57	0.03	1.13	1.00	-0.36	1.00	0.23	-0.18	2.19	1.40	1.40	-0.20
Karpenisiou	0.22	-0.61	0.47	-0.97	-1.00	-0.37	0.50	-1.00	1.00	-1.00	0.33	0.50	0.00	0.33	-0.50	-0.17
Kastorias	-0.05	-0.49	0.24	-0.53	1.67	-0.31	0.64	0.00	3.00	-1.00	6.50	-0.25	4.00	0.20	1.00	0.17
Katerinis	0.14	-0.35	0.13	-0.66	-0.47	0.18	0.62	-0.17	1.08	-0.08	-0.02	0.03	0.53	0.42	0.86	-0.21
Kerkyras	0.07	-0.23	0.10	-0.49	-0.60	-0.09	0.11	-0.33	-0.17	0.00	-0.35	-0.36	0.25	0.08	0.53	-0.40
Kilkis	0.26	0.30	0.98	-0.27	-0.70	-0.56	4.26	0.00	0.22	0.53	-0.06	2.81	2.21	0.21	6.00	-0.20
Komotinis	0.17	0.27	0.10	0.33	-0.82	0.19	-0.01	10.00	3.00	1.32	0.95	0.46	1.23	0.61	-0.06	0.00
Korinthou	0.24	0.34	0.82	-0.35	-0.80	0.30	0.50	0.00	0.26	0.19	0.13	0.47	-0.11	0.75	0.27	0.02
Kozanis	0.21	-0.11	0.21	-0.46	0.40	0.61	0.58	0.00	-0.82	0.00	-0.12	0.43	0.66	-0.26	0.00	-0.28
Lamieon	0.20	0.38	1.55	-0.48	-0.61	0.31	0.56	0.50	1.79	-0.24	-0.01	0.11	0.36	0.28	0.70	-0.18
Larissas	0.21	-0.06	0.18	-0.46	-0.44	0.36	-0.14	0.33	0.93	0.47	0.22	0.50	0.53	0.71	-0.16	0.04
Lebadias	0.18	-0.18	0.80	-0.74	0.00	0.03	0.74	-1.00	-0.58	2.19	1.26	-0.08	-0.33	-0.12	0.32	0.11
Lefkadas	0.23	-0.15	0.00	-0.80	-0.60	0.47	0.83	-1.00	0.00	-0.50	0.15	0.23	1.00	-0.33	2.25	-0.58
Messologiou	0.12	0.00	0.23	-0.60	-0.50	0.14	0.76	0.00	-0.83	0.00	0.47	0.16	3.00	-0.58	0.20	-0.21
Moudanion	0.40	0.17	0.09	-0.35	0.00	0.81	0.58	-0.50	3.50	-0.05	1.07	0.29	0.47	0.56	0.56	-0.25
Mytilinis	0.32	-0.06	0.01	-0.68	-0.82	0.68	0.33	1.00	0.00	0.00	-0.33	-0.10	1.78	0.46	0.60	-0.37
Nafpliou	0.27	0.26	0.44	-0.20	-0.83	1.40	0.47	1.00	2.00	1.67	-0.06	0.48	0.38	1.67	-0.67	-0.08
Polygyrou	0.14	0.01	0.24	-0.55	-0.50	1.57	1.50	1.00	0.50	-0.80	0.07	0.00	-0.33	0.00	-0.50	-0.64
Prevezas	0.21	-0.06	0.25	-0.11	-0.86	-0.28	0.42	11.00	-0.57	0.20	-0.27	-0.30	0.67	1.00	0.45	-0.21
Ptolemaidas	0.23	-0.28	0.90	-0.52	-1.00	-0.10	0.79	0.00	-0.99	0.86	2.00	1.06	1.42	-0.20	-0.25	-0.21
Pyrgou	-0.07	-0.27	-0.10	-0.69	-0.53	0.33	0.52	2.00	-0.25	-0.50	-0.58	-0.09	-0.51	-0.53	0.75	-0.46
Rethymnou	0.26	0.16	0.48	-0.63	-0.31	0.47	0.76	3.00	-0.21	0.50	0.38	0.03	0.07	0.64	3.33	-0.01
Rodou	0.18	-0.14	-0.02	-0.35	-0.32	-0.13	0.25	0.67	-0.24	-0.08	-0.31	-0.04	-0.24	-0.14	-0.14	-0.16
Serron	0.10	-0.30	-0.18	-0.59	-0.54	-0.11	0.30	10.00	0.88	0.00	-0.27	-0.10	0.24	1.48	0.00	-0.34
Spartis	0.26	0.41	1.28	-0.50	-0.56	-0.09	0.68	-1.00	3.00	-0.83	0.48	0.14	-0.20	0.08	5.00	0.06
Thibas	0.23	0.13	0.14	-0.67	-0.61	0.64	-0.38	3.00	-0.17	0.60	0.95	1.11	-0.18	-0.73	0.04	0.43
Trikkaion	0.25	-0.03	0.20	-0.58	-0.73	-0.29	0.97	0.00	1.26	0.05	0.03	-0.04	0.11	0.24	0.40	-0.03
Tripolis	0.31	0.34	0.43	-0.37	0.63	0.81	0.46	4.00	2.75	0.20	0.18	0.51	0.17	1.00	2.00	-0.08
Vatheos	0.19	-0.23	0.27	-0.59	-1.00	-0.20	0.60	2.00	1.00	-1.00	0.30	0.17	-0.75	0.00	-0.25	-0.56
Veroias	0.14	-0.13	0.24	-0.44	0.29	-0.16	0.06	1.00	0.56	-0.30	-0.14	-0.09	0.42	0.33	0.43	-0.21
Xanthi	0.29	0.12	0.12	-0.32	-0.13	0.14	0.31	0.14	1.38	3.57	0.72	0.59	-0.19	1.84	1.77	0.38
Zakynthou	0.22	-0.05	0.22	-0.22	-0.50	1.16	0.87	-1.00	-0.75	0.50	0.95	0.05	1.67	-0.50	0.67	-0.64

Source: Data from ELSTAT elaborated by the author

Table 23: Normalized employment growth of urban centers in 1 digit classification.

Urban centers	BRANCHES																
	Total	A	B	C	D	E	ST	Z	H	U	I	K	L	M	N	J	O
Total	0.03	0.18	0.05	0.20	-0.03	-0.06	0.04	-0.03	0.02	0.00	-0.01	-0.05	-0.04	-0.01	-0.03	-0.03	-0.03
Aggl. Agriniou	-0.03	-0.07	0.31	0.10	0.02	-0.07	-0.09	0.01	0.03	-0.08	-0.04	-0.05	0.07	0.06	0.34	-0.15	-0.29
Aggl. Athinas	0.04	1.21	0.35	-0.16	0.00	-0.14	0.17	-0.01	0.04	0.02	0.02	-0.06	-0.08	-0.06	-0.07	-0.04	0.01
Aggl. Ioanninon	0.11	0.08	-0.03	-0.20	0.09	0.03	-0.13	0.00	0.14	-0.11	-0.05	-0.17	0.19	0.01	0.08	-0.04	-0.30
Aggl. Irakleiou	0.09	0.36	0.17	-0.33	0.22	0.08	-0.23	-0.04	0.00	0.05	0.05	0.01	-0.07	0.03	0.15	0.06	-0.17
Aggl. Patras	-0.01	0.07	-0.17	0.27	-0.30	0.10	-0.10	-0.02	0.13	0.19	-0.11	0.01	0.00	0.03	0.05	-0.08	-0.08
Aggl. Thessalonikis	-0.02	0.92	-0.21	-0.13	-0.13	0.02	0.06	-0.10	0.12	0.01	-0.09	-0.05	-0.11	-0.02	-0.10	0.02	-0.20
Aggl. Volou	0.02	0.27	-0.08	0.40	-0.08	0.60	-0.05	-0.08	0.23	-0.13	-0.11	-0.12	0.08	0.09	0.07	-0.04	-0.15
Agiou Nicolaou	0.00	-0.03	-0.23	0.94	0.05	0.18	-0.20	-0.12	-0.35	-0.10	0.17	-0.23	0.03	0.21	0.01	0.14	0.81
Alexandroupolis	0.23	0.26	0.04	1.14	0.44	0.43	0.40	0.20	0.12	-0.07	0.01	0.21	0.19	0.17	0.17	0.02	-0.53
Amaliadas	0.03	0.09	0.57	-1.00	0.17	1.33	0.00	-0.20	0.12	0.07	-0.02	0.07	0.17	-0.01	0.17	-0.15	-0.49
Amfissas	-0.14	-0.32	2.15	-0.75	-0.24	-0.10	-0.03	-0.25	-0.21	-0.05	-0.09	-0.20	-0.07	-0.14	-0.16	-0.07	-0.62
Argostoliou	0.09	-0.30	0.48	0.72	0.30	0.42	0.02	0.02	0.16	-0.14	-0.15	0.10	0.02	0.13	-0.01	0.31	0.11
Argous	0.05	0.05	-0.10	-0.27	0.01	0.69	-0.15	-0.03	-0.01	0.08	0.10	0.17	0.04	0.06	0.19	-0.01	0.36
Aridaias	-0.21	-0.16	-0.21	-0.16	-0.05	0.19	0.22	0.05	0.22	-0.10	-0.10	0.26	0.35	0.03	0.05	0.10	-0.68
Artas	-0.02	0.20	0.42	3.29	0.04	0.39	-0.30	-0.13	-0.19	-0.20	0.04	-0.04	-0.03	-0.04	0.23	-0.21	-0.52
Chalkidas	0.02	0.29	-0.04	-0.21	0.23	0.00	-0.11	0.02	0.01	-0.12	0.03	0.05	-0.04	0.03	0.05	-0.05	0.17
Chanion	0.12	0.29	-0.14	-0.37	-0.08	0.77	0.04	0.02	0.19	0.03	0.02	0.01	-0.09	0.07	0.01	0.06	0.27
Chiou	0.10	0.09	0.91	0.02	-0.15	0.19	-0.11	0.00	0.13	-0.06	-0.08	-0.03	0.33	0.09	0.04	-0.12	-0.20
Dramas	-0.06	0.14	2.54	0.05	-0.31	0.61	-0.10	0.00	0.05	-0.19	-0.11	-0.05	0.01	0.05	-0.04	-0.14	0.08
Edessa	-0.08	0.20	-0.51	0.56	-0.22	-0.19	-0.07	-0.03	-0.10	-0.22	-0.08	0.01	-0.30	0.02	-0.15	0.10	0.48
Ermoupolis	0.03	0.59	0.54	0.91	-0.30	-0.05	0.33	0.10	0.44	-0.17	0.18	0.23	0.09	0.02	0.03	0.37	-0.43
Florinas	0.08	-0.04	0.57	1.15	0.03	0.84	0.16	0.03	0.00	-0.16	-0.07	0.04	0.22	-0.04	-0.04	-0.07	0.74
Giannitson	0.02	0.11	0.18	0.12	0.00	0.47	-0.08	0.12	-0.03	0.05	0.08	0.05	0.13	0.19	0.09	-0.10	-0.20
Grevenon	-0.02	-0.12	26.56	1.14	0.09	-0.17	0.09	-0.17	0.00	-0.01	0.06	0.34	0.03	0.01	0.04	-0.04	-0.72
Ierapetras	0.04	0.21	-0.13	0.34	-0.12	1.19	-0.11	-0.10	0.04	0.11	-0.11	0.16	0.00	0.02	0.28	-0.03	3.06
Igoumenitsas	0.19	-0.16	1.50	-0.11	-0.09	0.38	0.07	0.17	0.14	0.33	-0.06	0.04	0.41	0.06	0.31	0.14	-0.26
Kabalas	-0.05	0.44	-0.23	-0.46	-0.13	0.29	0.05	-0.07	0.10	-0.06	-0.13	-0.08	-0.19	-0.02	-0.11	0.00	-0.27
kalamatas	0.01	0.23	-0.02	-0.01	-0.25	0.29	-0.32	-0.01	0.20	-0.07	-0.16	-0.03	0.09	0.07	0.23	0.04	-0.07
Karditsas	0.01	0.21	1.36	-0.13	0.00	0.42	-0.25	-0.09	0.07	-0.21	-0.09	-0.11	0.10	0.00	0.15	-0.16	-0.47
Karpenisiou	0.06	0.17	2.94	0.34	-0.59	2.33	-0.13	0.13	-0.05	-0.13	0.10	0.25	-0.07	0.00	0.63	0.24	0.66
Kastorias	-0.18	0.83	-0.55	8.38	-0.46	1.24	0.31	-0.02	0.12	-0.04	-0.06	-0.25	0.29	0.08	-0.01	0.04	-0.14
Katerinis	-0.01	0.07	0.57	-0.39	-0.31	0.36	-0.19	0.05	0.15	-0.06	-0.09	-0.06	0.04	0.07	0.12	-0.11	0.01
Kerkiras	-0.07	0.21	-0.21	-0.29	-0.19	0.06	-0.25	-0.17	-0.43	-0.12	-0.16	-0.30	-0.05	0.08	-0.06	-0.24	-0.30
Kilkis	0.09	-0.31	1.36	0.12	0.37	0.06	0.46	0.00	0.14	0.05	-0.03	0.51	0.30	0.17	-0.10	0.06	-0.39
Komotinis	0.01	-0.06	1.28	0.56	0.34	1.05	0.13	-0.04	0.09	-0.17	-0.18	0.04	-0.07	-0.04	-0.07	-0.15	-0.54
Korinthou	0.08	0.41	0.22	0.95	0.42	0.15	-0.04	0.04	0.08	-0.02	-0.07	-0.19	-0.08	-0.04	0.00	0.60	0.53
Kozanis	0.05	-0.20	-0.21	1.22	-0.05	-0.17	0.05	0.15	0.11	-0.21	-0.12	0.21	0.04	0.09	-0.01	-0.01	-0.15
Lamieon	0.04	0.17	-0.06	-0.52	0.46	-0.05	-0.21	-0.08	-0.12	-0.13	-0.07	-0.01	0.03	0.01	0.09	-0.05	0.13
Larissas	0.04	0.48	0.24	-0.31	-0.01	0.13	-0.11	0.06	0.10	-0.20	0.02	-0.09	0.17	0.13	0.23	-0.13	0.06
Lebadias	0.02	0.33	6.09	-0.05	-0.14	-0.07	-0.19	-0.05	-0.05	-0.03	-0.08	-0.19	0.19	0.13	0.29	-0.20	-0.04
Lefkadas	0.06	-0.24	-0.13	-0.62	-0.10	-0.02	0.10	-0.06	0.55	-0.11	-0.03	-0.14	0.11	0.04	0.04	0.61	0.21
Messologiou	-0.03	0.11	-0.21	0.19	0.06	0.42	0.01	-0.03	-0.10	-0.02	-0.07	-0.10	-0.04	-0.07	0.13	-0.13	-0.51
Moudanion	0.22	0.49	0.52	-0.33	0.24	-0.10	0.42	0.07	0.55	0.13	-0.06	0.68	-0.01	-0.03	0.07	0.15	-0.08
Mytilinis	0.14	0.78	-0.28	0.26	0.00	0.00	-0.11	0.04	0.08	-0.04	-0.33	-0.04	0.09	0.15	0.11	0.00	-0.33
Nafpliou	0.10	0.12	1.03	-0.01	0.34	0.06	-0.05	0.02	-0.19	0.06	-0.10	-0.04	0.08	0.05	0.21	0.05	0.72
Polygyrou	-0.01	0.29	-0.74	-0.21	0.07	-0.77	0.02	0.16	0.19	-0.26	0.02	0.28	0.07	-0.10	-0.31	-0.04	1.07
Prevezas	0.05	-0.05	0.32	-0.04	0.00	0.25	-0.08	-0.01	0.21	0.12	-0.07	0.14	-0.03	0.05	0.01	0.43	0.63
Ptolemaidas	0.06	-0.21	-1.00	5.24	-0.24	-0.44	0.33	0.22	0.23	-0.20	-0.07	0.20	0.76	0.11	0.24	0.27	0.52
Pyrgou	-0.19	-0.11	0.29	-1.00	-0.23	0.58	-0.30	-0.41	-0.24	-0.21	-0.17	-0.22	-0.15	-0.04	-0.03	-0.18	0.00
Rethymnou	0.10	0.06	0.15	0.25	0.22	0.24	0.08	-0.06	-0.17	-0.04	-0.22	-0.08	-0.13	0.00	0.02	-0.06	1.11
Rodou	0.02	1.02	-0.06	0.17	-0.09	0.49	-0.17	-0.05	-0.33	0.13	-0.13	-0.18	0.15	0.06	0.05	-0.09	0.00
Serron	-0.05	0.26	-0.44	-0.06	-0.26	0.73	-0.15	-0.14	-0.10	-0.13	-0.21	-0.23	-0.09	0.04	-0.08	-0.22	-0.16
Spartis	0.09	0.30	-0.21	1.01	0.49	0.07	-0.17	0.01	0.11	-0.10	-0.02	-0.02	0.05	0.11	0.02	0.06	-0.07
Thibas	0.06	0.44	-0.53	0.46	0.20	0.23	-0.12	-0.03	-0.12	-0.09	-0.14	0.02	-0.15	0.01	0.07	0.10	-0.14
Trikkaion	0.08	0.27	1.36	0.47	0.03	0.67	-0.13	0.03	0.28	-0.22	0.13	-0.09	0.13	0.15	0.15	0.16	-0.11
Tripolis	0.13	0.52	2.94	0.96	0.42	0.24	0.03	0.04	0.10	-0.01	0.10	0.16	-0.01	0.05	-0.10	-0.02	0.24
Vatheos	0.03	0.32	-0.30	0.44	-0.18	0.28	-0.23	0.13	-0.12	-0.16	-0.11	-0.01	0.10	0.11	0.06	-0.11	-0.19
Veroias	-0.02	0.01	0.31	-0.33	-0.08	-0.08	-0.13	0.09	-0.08	-0.20	0.08	-0.17	0.20	0.12	0.04	-0.29	-0.52
Xanthi	0.12	0.42	1.46	0.47	0.19	0.59	0.02	-0.01	0.04	0.02	-0.25	0.12	0.03	0.04	0.08	0.13	-0.67
Zakynthou	0.06	0.15	-0.48	1.07	0.01	0.34	0.10	-0.05	0.35	-0.19	-0.33	-0.26	-0.30	-0.08	-0.23	-0.06	0.57

Source: Data from ELSTAT elaborated by the author

Table 24: Normalized employment growth of urban centers in 2 digit classification in manufacturing.

Urban centers	BRANCHES															
	Total	D	DA	DB	DC	DD	DE	DST	DZ	DH	DU	DI	DK	DL	DM	DN
Total	0.03	-0.03	-0.07	0.02	-0.04	-0.03	-0.03	-0.06	-0.07	-0.11	-0.04	-0.02	-0.02	-0.04	-0.04	-0.05
Aggl. Agrinio	-0.03	0.02	-0.24	0.35	-0.54	0.11	0.06	7.14	0.82	-0.05	0.25	-0.26	-0.08	-0.28	0.77	0.04
Aggl. Athinas	0.04	0.00	-0.05	0.15	0.03	-0.01	-0.02	-0.09	-0.09	-0.22	-0.01	-0.06	-0.02	-0.03	-0.06	-0.06
Aggl. Ioanninon	0.11	0.09	0.33	0.02	-0.66	-0.10	0.14	-0.30	0.45	0.86	-0.56	0.13	0.07	0.11	4.52	-0.20
Aggl. Irakleiou	0.09	0.22	0.12	0.05	-0.23	0.41	0.18	0.81	0.83	0.62	-0.09	0.04	-0.11	0.14	-0.23	0.17
Aggl. Patras	-0.01	-0.30	-0.22	-0.45	-0.11	-0.06	-0.19	-0.26	0.45	-0.77	-0.29	-0.04	0.31	0.50	0.46	-0.16
Aggl. Thessalonikis	-0.02	-0.13	-0.20	0.10	-0.15	-0.20	-0.03	-0.03	0.09	-0.16	-0.09	-0.11	-0.25	-0.28	0.63	-0.10
Aggl. Volou	0.02	-0.08	0.06	-0.57	-0.34	0.08	-0.14	-0.46	0.21	0.42	-0.18	0.15	0.14	-0.56	-0.57	-0.10
Agiou Nicolaou	0.00	0.05	-0.27	-0.06	-0.32	-0.29	0.07	-0.19	-0.16	-0.71	-0.49	0.24	-0.65	-0.03	0.18	1.16
Alexandroupolis	0.23	0.44	0.67	-0.07	-0.15	0.47	0.84	1.28	2.70	7.78	1.33	0.54	2.34	2.04	0.87	0.04
Amaliadas	0.03	0.17	0.22	-0.15	-0.51	-0.25	0.69	-0.19	-0.50	-0.57	-0.40	-0.05	1.46	-0.11	-0.21	0.44
Amfissas	-0.14	-0.24	-0.53	0.07	-0.74	-0.42	0.79	-0.73	-1.00	-1.00	0.35	-0.09	-1.00	0.62	-0.61	0.79
Argostoliou	0.09	0.30	-0.10	-0.10	2.40	0.86	1.24	-1.00	1.09	-1.00	0.44	-0.23	-0.34	-0.35	-0.76	0.78
Argous	0.05	0.01	0.29	-0.21	-0.24	0.28	-0.01	-0.19	0.79	-0.08	-0.36	-0.38	-0.27	-0.44	1.51	0.14
Aridaias	-0.21	-0.05	-0.33	0.06	-0.38	-0.05	0.19	-1.00	1.51	0.72	0.68	-0.02	0.17	0.38	1.37	0.52
Artas	-0.02	0.04	-0.02	0.12	-0.54	-0.35	-0.16	-0.19	1.51	-0.71	0.19	-0.44	0.10	0.41	-1.00	-0.19
Chalkidas	0.02	0.23	0.35	-0.28	-0.25	0.27	-0.05	0.42	0.38	0.97	-0.12	0.21	0.50	0.04	-0.15	0.53
Chanion	0.12	-0.08	-0.12	-0.50	-0.21	-0.04	-0.09	-0.67	0.47	-0.42	0.13	0.03	-0.16	-0.01	-0.86	0.07
Chiou	0.10	-0.15	-0.10	-0.77	-0.82	-0.50	0.39	-0.19	-0.16	-0.57	-0.13	-0.03	-0.35	0.21	0.97	-0.38
Dramas	-0.06	-0.31	-0.22	-0.51	-0.03	0.18	-0.51	-0.59	0.51	0.00	0.27	0.13	0.39	0.69	0.89	0.01
Edessa	-0.08	-0.22	0.17	-0.36	-0.74	-0.33	-0.12	-0.19	0.67	0.72	-0.12	-0.17	0.43	0.62	-1.00	-0.09
Ermoupolis	0.03	-0.30	-0.24	-0.49	-0.15	0.30	0.15	-0.19	-0.16	-0.35	1.29	-0.19	1.64	-0.80	-0.30	0.50
Florinas	0.08	0.03	0.09	-0.38	-1.00	-0.48	0.01	-0.19	-0.72	0.72	0.28	0.20	-0.45	0.05	0.18	1.00
Giannitson	-0.02	0.00	0.35	0.03	-0.07	0.09	-0.28	1.44	0.67	0.28	0.38	0.27	-0.22	-0.03	0.71	0.07
Grevenon	-0.02	0.09	0.05	-0.32	1.27	-0.13	-0.01	-1.00	-1.00	-0.93	0.96	0.33	-0.15	4.65	14.38	0.05
Ierapetra	0.04	-0.12	-0.52	-0.43	-0.15	0.07	0.02	-1.00	0.67	-0.71	-0.40	0.01	-0.71	0.01	-0.21	-0.16
Igoumenitsas	0.19	-0.09	0.12	-0.72	1.55	0.24	-0.40	-0.19	-0.79	-0.71	0.24	0.11	1.05	-0.46	2.55	0.26
Kabalas	-0.05	-0.13	-0.19	-0.28	-0.09	-0.05	0.02	0.42	-0.07	-0.67	0.04	0.31	-0.02	-0.06	-0.28	-0.18
kalamatas	0.01	-0.25	-0.48	-0.58	-0.08	0.09	0.27	-0.28	0.87	-0.41	-0.03	-0.10	-0.46	-0.21	1.22	-0.05
Karditsas	0.01	0.00	-0.31	-0.35	-0.26	-0.11	0.53	0.63	-0.47	0.72	0.20	-0.28	1.80	0.94	1.84	-0.10
Karpenisiou	0.06	-0.59	0.22	-0.94	-1.00	-0.46	0.07	-1.00	0.67	-1.00	0.31	0.33	-0.12	0.08	-0.41	-0.06
Kastorias	-0.18	-0.46	0.02	-0.20	3.54	-0.40	0.18	-0.19	2.35	-1.00	6.36	-0.34	3.40	-0.03	1.37	0.33
Katerinis	-0.01	-0.31	-0.07	-0.42	-0.10	0.02	0.16	-0.32	0.74	-0.21	-0.04	-0.09	0.34	0.15	1.20	-0.10
Kerkiras	-0.07	-0.19	-0.09	-0.13	-0.32	-0.21	-0.20	-0.46	-0.30	-0.14	-0.37	-0.43	0.10	-0.12	0.81	-0.31
Kilkis	0.09	0.37	0.64	0.24	-0.49	-0.62	2.77	-0.19	0.02	0.32	-0.08	2.37	1.82	-0.03	7.28	-0.09
Komotinis	0.01	0.34	-0.09	1.25	-0.69	0.03	-0.29	7.95	2.35	1.00	0.91	0.29	0.96	0.30	0.12	0.14
Korinthou	0.08	0.42	0.50	0.10	-0.66	0.13	0.08	-0.18	0.06	0.02	0.10	0.30	-0.22	0.42	0.51	0.15
Kozanis	0.05	-0.05	0.00	-0.09	1.38	0.39	0.14	-0.19	-0.85	-0.14	-0.14	0.26	0.46	-0.40	0.18	-0.19
Lamieon	0.04	0.46	1.10	-0.12	-0.33	0.14	0.12	0.22	1.33	-0.35	-0.03	-0.02	0.20	0.03	1.01	-0.07
Larissas	0.04	-0.01	-0.03	-0.09	-0.04	0.18	-0.39	0.09	0.61	0.27	0.20	0.33	0.35	0.38	-0.01	0.18
Lebadias	0.02	-0.14	0.48	-0.56	0.70	-0.11	0.25	-1.00	-0.65	1.75	1.21	-0.19	-0.41	-0.29	0.56	0.26
Lefkadas	0.06	-0.10	-0.17	-0.66	-0.32	0.27	0.31	-1.00	-0.16	-0.57	0.13	0.08	0.76	-0.46	2.84	-0.52
Messologiou	-0.03	0.06	0.01	-0.33	-0.15	-0.01	0.26	-0.19	-0.86	-0.14	0.45	0.02	2.52	-0.66	0.42	-0.11
Moudanion	0.22	0.24	-0.10	0.11	0.70	0.57	0.13	-0.59	2.76	-0.18	1.03	0.14	0.29	0.26	0.84	-0.14
Mytilinis	0.14	0.00	-0.17	-0.45	-0.69	0.45	-0.05	0.63	-0.16	-0.14	-0.35	-0.21	1.44	0.18	0.89	-0.28
Nafpliou	0.10	0.34	0.19	0.35	-0.72	1.08	0.05	0.63	1.51	1.29	-0.08	0.30	0.21	1.15	-0.61	0.04
Polygyrou	-0.01	0.07	0.03	-0.24	-0.15	1.23	0.79	0.63	0.25	-0.83	0.05	-0.12	-0.41	-0.19	-0.41	-0.59
Prevezas	0.05	0.00	0.03	0.52	-0.76	-0.38	0.01	8.77	-0.64	0.03	-0.29	-0.38	0.47	0.62	0.72	-0.10
Ptolemaidas	0.06	-0.24	0.57	-0.19	-1.00	-0.22	0.28	-0.19	-0.99	0.60	1.94	0.82	1.13	-0.35	-0.11	-0.11
Pyrgou	-0.19	-0.23	-0.26	-0.47	-0.20	0.15	0.09	1.44	-0.37	-0.57	-0.59	-0.20	-0.57	-0.62	1.07	-0.38
Rethymnou	0.10	0.22	0.22	-0.37	0.17	0.28	0.26	2.26	-0.34	0.29	0.35	-0.09	-0.06	0.32	4.13	0.13
Rodou	0.02	-0.09	-0.19	0.11	0.16	-0.25	-0.10	0.36	-0.36	-0.21	-0.33	-0.16	-0.33	-0.30	0.02	-0.04
Serron	-0.05	-0.26	-0.33	-0.31	-0.21	-0.23	-0.07	7.95	0.57	-0.14	-0.28	-0.20	0.09	1.00	0.18	-0.25
Spartis	0.09	0.49	0.88	-0.15	-0.24	-0.21	0.21	-1.00	2.35	-0.86	0.45	0.01	-0.30	-0.12	6.10	0.21
Thibas	0.06	0.20	-0.06	-0.44	-0.34	0.42	-0.56	2.26	-0.30	0.38	0.91	0.87	-0.28	-0.78	0.22	0.62
Trikkiaion	0.08	0.03	-0.01	-0.29	-0.54	-0.38	0.41	-0.19	0.89	-0.10	0.01	-0.15	-0.03	0.00	0.66	0.11
Tripolis	0.13	0.42	0.18	0.08	1.76	0.57	0.04	3.07	2.14	0.03	0.16	0.34	0.03	0.62	2.55	0.05
Vatheos	0.03	-0.18	0.05	-0.31	-1.00	-0.31	0.15	1.44	0.67	-1.00	0.27	0.03	-0.78	-0.19	-0.11	-0.49
Veroias	-0.02	-0.08	0.02	-0.05	1.19	-0.27	-0.24	0.63	0.31	-0.40	-0.16	-0.20	0.25	0.07	0.69	-0.10
Xanthi	0.12	0.19	-0.08	0.15	0.48	-0.01	-0.07	-0.07	0.99	2.93	0.69	0.41	-0.29	1.29	2.28	0.56
Zakynthou	0.06	0.01	0.00	0.32	-0.15	0.87	0.34	-1.00	-0.79	0.29	0.91	-0.07	1.35	-0.60	0.97	-0.59

Source: Data from ELSTAT elaborated by the author

Table 25: Specialization of prefectures in each 1-digit branch, 1991 (LO Index).

Urban centers	BRANCHES															
	A	B	C	D	E	ST	Z	H	U	I	K	L	M	N	J	O
Aggl. Agrinio	1.00	0.20	0.27	0.66	1.50	1.50	1.17	0.79	0.86	0.86	0.74	0.92	1.64	0.93	0.97	0.51
Aggl. Athinas	0.01	0.13	0.36	1.17	1.06	0.79	1.24	0.83	1.38	1.73	1.64	1.34	1.13	1.39	1.38	1.94
Aggl. Ioanninon	0.16	0.18	1.35	0.76	1.10	1.34	1.19	1.05	0.99	1.02	1.21	1.33	2.48	2.31	1.19	0.84
Aggl. Irakleiou	0.24	0.30	0.36	0.62	1.06	1.60	1.36	2.10	1.17	0.94	1.25	0.99	1.48	1.38	1.09	0.93
Aggl. Patras	0.12	0.49	0.25	1.25	0.69	1.21	1.13	0.83	1.14	1.04	1.03	1.29	1.62	1.43	1.17	0.90
Aggl. Thessalonikis	0.03	0.49	0.21	1.71	0.50	0.81	1.37	0.86	0.98	1.12	1.39	0.85	1.37	1.45	1.17	1.32
Aggl. Volou	0.20	1.01	0.52	1.45	0.52	1.06	1.24	0.89	1.10	0.91	1.03	1.24	1.37	1.04	1.02	0.71
Agiou Nicolaou	0.67	1.95	0.31	0.29	0.81	1.43	0.88	6.00	0.87	0.63	0.95	0.92	0.83	1.28	0.70	0.44
Alexandroupolis	0.43	3.69	0.59	0.72	0.70	0.99	1.00	1.15	1.27	0.99	0.85	2.13	1.46	1.88	0.96	0.85
Amaliadas	1.90	0.28	0.03	0.46	0.46	1.09	1.09	0.65	0.65	0.66	0.51	0.79	0.86	0.63	0.78	0.66
Amfissas	0.60	0.18	31.66	0.50	1.87	1.05	0.86	0.74	0.95	0.98	0.79	1.66	1.17	1.68	0.97	1.03
Argostoliou	0.79	1.13	0.46	0.41	0.87	1.92	1.00	1.52	1.48	1.02	0.93	1.17	1.06	1.79	0.87	0.83
Argous	1.28	0.18	0.53	0.92	0.56	1.27	1.23	0.85	0.76	0.73	0.85	0.71	1.07	0.75	0.96	0.67
Aridaia	3.50	0.00	0.23	0.61	0.20	0.39	0.51	0.43	0.32	0.34	0.27	0.35	0.57	0.37	0.38	0.17
Artas	0.57	0.30	0.14	0.60	1.56	1.63	1.21	0.99	0.99	0.87	0.85	1.26	2.02	1.20	0.90	0.52
Chalkidas	0.19	2.43	2.00	1.56	0.84	1.02	1.22	0.81	1.02	0.77	1.01	1.01	1.21	0.87	0.92	0.54
Chanion	0.29	0.83	0.33	0.67	1.51	1.16	1.49	1.02	0.88	1.09	1.92	1.37	1.55	1.03	0.93	0.44
Chiou	0.26	2.85	0.67	0.62	1.86	1.26	1.03	2.09	1.05	0.80	1.28	1.32	0.94	1.32	0.98	0.22
Dramas	0.41	0.03	5.45	1.69	0.72	0.94	1.08	0.90	0.85	0.87	0.81	1.03	1.28	1.26	0.95	0.36
Edessa	1.27	0.24	0.50	1.07	2.93	0.89	0.82	0.87	0.85	0.67	0.61	1.22	1.20	1.25	0.68	0.24
Ermoupolis	0.04	1.24	0.40	1.77	2.41	1.09	0.93	1.04	1.66	0.53	0.67	1.26	1.09	1.20	1.01	0.77
Florinas	0.56	0.00	1.80	0.53	2.73	0.76	1.04	1.10	0.83	1.11	0.60	1.77	2.68	1.64	1.19	0.46
Giannitson	1.25	0.05	0.29	1.31	0.40	0.91	1.06	0.89	0.70	0.79	0.64	0.71	1.08	0.97	0.85	0.38
Grevenon	1.25	0.05	0.23	0.63	0.89	1.26	0.92	0.96	0.68	0.71	0.65	1.62	1.33	1.12	0.92	0.40
Ierapetra	2.60	1.82	0.24	0.36	0.35	0.99	0.83	1.17	0.46	0.71	0.56	0.47	0.74	0.55	0.60	0.15
Igoumenitsas	0.71	1.40	0.34	0.60	0.90	1.60	0.99	1.56	1.14	1.09	0.97	1.46	1.57	1.00	0.94	0.65
Kabalas	0.10	2.75	4.75	1.39	0.58	0.76	1.30	0.99	1.01	1.30	1.14	1.24	1.47	1.62	1.06	0.88
kalamatas	0.43	0.54	0.48	1.00	1.63	1.76	1.17	0.92	0.99	1.19	1.05	1.28	1.40	0.96	0.95	0.77
Karditsas	0.62	0.00	0.32	0.66	1.30	1.28	1.32	0.97	0.94	0.98	1.02	1.19	2.18	1.43	1.04	0.54
Karpenisiou	0.59	0.00	0.00	1.06	0.79	1.46	0.75	1.87	1.05	0.85	0.60	1.81	1.38	1.21	0.85	0.09
Kastorias	0.15	0.56	0.00	3.47	0.31	0.31	0.82	0.90	0.42	0.99	1.07	0.80	1.11	0.84	0.84	0.29
Katerinis	0.66	0.10	0.29	1.37	0.54	1.15	1.17	1.14	1.06	0.90	1.05	0.81	1.36	1.06	1.01	0.47
Kerkiras	0.10	0.66	0.24	0.48	0.59	1.33	1.40	3.53	1.32	1.07	1.56	1.10	1.20	1.10	1.35	1.68
Kilkis	0.87	0.04	0.20	1.38	0.75	0.70	0.88	0.76	0.69	0.80	0.64	1.21	1.00	1.76	0.91	0.45
Komotinis	1.19	0.15	0.26	0.88	0.59	0.81	0.97	0.82	0.80	0.80	0.79	1.55	1.42	1.15	0.90	0.47
Korinthou	0.50	0.71	0.84	1.24	0.86	1.24	1.18	1.07	0.89	0.87	0.99	1.01	1.10	0.89	1.11	0.69
Kozanis	0.35	0.00	8.35	0.64	14.41	0.90	1.04	0.85	1.01	1.00	0.91	1.27	1.62	1.29	0.98	0.24
Lamieon	0.56	0.22	1.75	0.64	1.28	1.49	1.09	0.92	1.28	1.06	0.97	1.29	1.67	1.07	0.96	0.44
Larissas	0.26	0.04	0.32	1.29	0.72	1.05	1.23	0.80	0.92	0.94	1.04	1.58	1.63	1.05	1.01	0.66
Lebadias	0.41	0.04	1.25	1.38	1.59	1.54	1.33	0.95	0.96	1.10	0.97	0.93	1.14	0.94	1.11	0.60
Lefkadas	0.70	7.12	0.49	0.52	0.67	1.33	1.03	1.14	1.15	0.78	1.05	1.68	1.61	1.52	0.61	0.54
Messologiou	1.12	6.66	2.70	0.45	0.83	1.13	0.86	0.88	0.80	0.75	0.84	1.47	1.42	0.93	0.78	0.94
Moudanion	1.29	2.60	4.64	0.73	1.25	1.52	1.19	1.22	0.68	0.80	0.65	0.74	0.91	0.59	0.76	0.30
Mytilinis	0.30	3.33	0.40	0.58	1.44	1.35	1.14	0.98	1.30	1.40	0.88	1.91	1.59	1.37	1.14	1.09
Nafpliou	0.57	0.58	2.25	0.53	0.99	1.01	1.01	2.80	0.79	1.18	1.26	1.58	1.49	1.07	1.18	0.56
Polygyrou	1.33	0.43	18.32	0.35	1.98	1.10	0.66	1.04	0.74	0.56	0.61	1.51	0.74	1.68	0.77	0.26
Prevezas	1.05	3.09	0.25	0.67	0.76	1.19	1.01	0.93	0.82	0.83	0.78	1.63	1.61	1.31	0.62	0.31
Ptolemaidas	0.24	0.11	6.32	0.71	33.61	1.00	0.92	0.80	0.65	0.69	0.68	0.48	1.31	0.83	0.68	0.10
Pyrrou	0.89	0.28	0.06	0.55	0.64	1.52	1.38	1.05	0.85	0.85	0.85	1.18	1.10	0.78	0.93	0.52
Rethymnou	0.37	0.37	0.69	0.52	0.89	1.57	1.09	3.77	0.80	1.10	1.19	1.16	1.69	1.18	1.08	0.53
Rodou	0.04	0.63	0.20	0.60	0.85	1.32	1.35	4.49	1.08	0.95	1.20	1.11	0.94	0.82	1.62	0.86
Serron	0.25	0.10	0.86	1.22	0.58	0.89	1.42	0.99	0.69	1.18	1.29	1.34	1.95	1.66	1.22	0.53
Spartis	1.08	0.04	0.38	0.47	1.15	1.35	1.15	1.11	0.91	1.28	0.91	1.17	1.35	1.34	1.01	1.02
Thibas	0.97	0.16	1.32	1.46	1.74	0.93	0.91	0.69	0.79	0.80	0.78	1.04	0.83	0.54	0.68	0.51
Trikaion	0.43	0.01	0.29	0.88	0.92	1.41	1.35	0.91	1.00	0.88	1.05	1.21	1.92	1.21	0.97	0.64
Tripolis	0.29	0.03	1.12	0.40	5.92	1.32	1.04	0.91	1.32	1.02	0.80	1.64	1.63	2.56	0.95	0.68
Vatheos	0.52	2.85	0.84	0.56	1.29	1.47	0.89	2.29	1.14	0.97	0.84	1.90	0.95	1.54	0.95	0.87
Veroias	0.73	0.05	1.29	1.13	1.25	1.05	1.12	0.93	0.85	1.10	1.24	1.04	1.37	1.11	1.20	0.72
Xanthi	0.28	0.14	0.32	1.50	0.64	1.14	1.05	0.91	0.70	0.97	0.87	1.57	1.67	1.15	1.15	0.68
Zakynthou	0.71	1.65	0.51	0.50	0.76	1.72	1.10	1.77	1.03	0.89	1.22	1.24	1.20	1.10	1.08	0.58

Source: Data from ELSTAT elaborated by the author

Table 26: Specialization of prefectures in each 2-digit branch, 1991 (LQ Index).

Urban centers	BRANCHES														
	D	DA	DB	DC	DD	DE	DST	DZ	DH	DU	DI	DK	DL	DM	DN
Aggl. Agrinio	0.66	1.34	0.50	0.45	1.10	0.32	0.00	0.18	0.93	0.85	0.81	0.47	0.68	0.13	0.49
Aggl. Athinas	1.17	0.82	0.95	1.77	0.74	2.00	1.69	1.89	1.34	0.76	1.01	1.46	1.59	2.05	1.26
Aggl. Ioanninon	0.76	1.02	0.35	0.22	1.27	0.41	0.22	0.51	0.45	2.06	0.99	0.54	0.56	0.02	1.48
Aggl. Irakleiou	0.62	0.89	0.24	0.56	0.65	0.56	0.14	0.27	1.00	1.01	0.74	0.77	0.55	0.13	1.32
Aggl. Patras	1.25	1.33	1.89	1.00	1.17	1.09	0.30	0.42	1.92	1.37	0.81	0.98	0.65	0.29	0.67
Aggl. Thessalonikis	1.71	1.53	2.39	2.62	0.81	1.12	2.04	1.17	1.62	1.05	1.36	1.49	1.47	0.43	1.82
Aggl. Volou	1.45	1.21	1.15	0.41	0.86	1.03	0.24	0.90	0.96	4.86	2.66	1.34	1.31	1.65	0.98
Agiou Nicolaou	0.29	0.52	0.10	0.15	1.60	0.09	0.00	0.03	0.13	0.63	0.32	0.16	0.21	0.08	0.37
Alexandroupolis	0.72	0.99	1.08	0.03	1.05	0.36	0.27	0.20	0.22	0.42	0.56	0.24	0.35	0.31	0.62
Amaliadas	0.46	0.87	0.22	0.16	1.46	0.16	0.17	0.22	0.13	0.55	0.74	0.12	0.32	0.18	0.63
Amfissas	0.50	1.31	0.15	0.94	1.67	0.07	0.79	0.07	0.00	0.38	0.95	0.08	0.10	0.37	0.16
Argostoliou	0.41	0.87	0.11	0.00	0.79	0.24	0.00	0.11	0.17	0.57	0.77	0.25	0.40	0.25	0.58
Argous	0.92	1.44	0.77	0.19	0.98	0.36	0.23	0.14	1.70	1.40	1.43	1.41	0.75	0.14	0.81
Aridaias	0.61	0.77	0.70	1.14	2.72	0.08	0.00	0.00	0.04	0.53	0.60	0.41	0.25	0.02	0.38
Artas	0.60	1.69	0.21	0.28	1.35	0.37	0.09	0.07	0.22	0.98	0.84	0.11	0.41	0.02	0.48
Chalkidas	1.56	1.44	0.59	0.25	2.66	0.73	0.15	1.64	0.85	7.40	2.50	1.29	3.37	3.20	0.71
Chania	0.67	0.31	1.05	1.01	0.51	0.14	0.22	0.43	1.06	0.67	0.38	0.44	1.35	1.05	0.73
Chiou	0.62	0.27	0.90	1.78	0.44	0.26	0.09	0.27	0.96	0.70	0.48	0.52	0.12	0.93	1.00
Dramas	1.69	1.08	2.90	0.17	1.43	3.12	0.09	0.11	0.42	3.46	0.65	0.24	0.38	0.05	1.25
Edessa	1.07	1.30	1.84	0.32	1.14	0.32	0.18	0.12	0.18	0.99	0.74	0.42	0.24	0.00	0.94
Ermoupolis	1.77	0.97	0.58	0.10	1.47	0.26	0.00	0.00	0.29	0.20	0.57	0.00	0.28	32.68	0.39
Florinas	0.53	0.88	0.54	0.38	1.01	0.25	0.00	0.24	0.06	0.63	0.46	0.36	0.57	0.04	0.53
Giannitson	1.31	1.42	2.31	0.24	0.73	0.46	0.00	0.08	0.97	0.97	0.84	1.01	0.44	0.17	1.25
Grevenon	0.63	1.00	0.44	0.12	3.29	0.27	0.00	0.16	0.71	0.27	0.49	1.44	0.17	0.04	0.70
Ierapetras	0.36	0.67	0.07	0.09	0.88	0.58	0.00	0.02	0.30	0.68	0.61	0.15	0.13	0.06	0.50
Igoumenitsas	0.60	0.67	0.73	0.20	1.45	0.48	0.00	0.19	0.22	1.12	0.69	0.16	0.20	0.04	0.42
Kabalas	1.39	1.82	1.49	0.83	0.68	0.74	2.64	5.08	2.97	1.64	0.68	0.65	0.68	0.31	1.00
kalamatas	1.00	2.85	0.71	0.14	1.38	0.52	0.36	0.18	0.30	1.05	0.91	0.49	0.71	0.24	0.62
Karditsas	0.66	1.05	0.30	0.50	1.67	0.44	0.06	0.35	0.26	1.16	1.14	0.48	0.34	0.07	0.91
Karpenisiou	1.06	0.35	2.19	0.09	5.09	0.17	0.00	0.08	0.37	0.50	0.50	0.00	0.35	0.15	0.61
Kastorias	3.47	0.30	11.14	0.40	0.42	0.23	0.00	0.00	0.00	0.04	0.13	0.04	0.23	0.03	0.30
Katerinis	1.37	1.24	2.64	0.44	0.77	0.42	0.25	0.13	0.40	1.00	0.91	0.73	0.91	0.07	1.14
Kerkiras	0.48	0.48	0.27	0.36	1.28	0.45	0.16	0.08	0.04	0.77	0.69	0.30	0.47	0.18	0.90
Kilkis	1.38	0.98	2.52	0.29	1.21	0.34	0.00	0.25	1.81	1.28	1.02	1.48	1.35	0.03	1.05
Komotinis	0.88	1.43	0.88	0.84	1.35	1.07	0.00	0.20	1.08	0.61	0.81	0.35	0.49	0.20	0.80
Korinthou	1.24	1.43	0.40	0.35	2.53	1.16	14.95	1.08	1.90	1.56	1.60	0.86	6.84	0.17	0.70
Kozanis	0.64	0.81	0.37	0.15	0.58	0.39	0.11	2.79	0.30	1.12	0.73	0.59	0.76	0.05	0.77
Lamieon	0.64	0.95	0.28	0.26	0.97	0.88	0.08	0.15	0.74	1.22	1.09	0.59	1.36	0.10	0.61
Larissas	1.29	1.32	1.77	0.75	0.79	1.00	0.11	0.26	1.34	1.24	1.13	1.28	0.81	0.27	1.46
Lebadias	1.38	0.65	1.71	0.17	1.09	0.45	0.53	0.71	0.88	0.59	4.34	1.41	1.66	0.70	0.68
Lefkadas	0.52	0.76	0.41	0.62	2.16	0.19	0.00	0.00	0.18	0.53	0.45	0.00	0.51	0.21	0.73
Messologiou	0.45	0.86	0.25	0.08	1.05	0.41	0.00	0.22	0.06	0.49	0.57	0.04	1.28	0.17	0.51
Moudanion	0.73	1.16	0.38	0.27	1.40	0.28	0.33	0.09	1.31	0.81	0.94	2.17	0.56	0.35	0.92
Mytilinis	0.58	1.34	0.15	0.46	1.18	0.55	0.00	0.18	0.09	0.90	0.87	0.20	0.37	0.18	0.76
Nafpliou	0.53	1.23	0.22	0.24	0.38	0.60	0.00	0.11	0.17	1.80	0.52	0.34	0.16	0.10	0.46
Polygyrou	0.35	0.80	0.25	0.12	0.40	0.18	0.21	0.11	0.43	0.54	0.49	0.19	0.00	0.10	0.26
Prevezas	0.67	0.67	0.90	0.22	1.89	0.39	0.00	0.21	0.23	0.69	0.64	0.10	0.26	0.30	0.68
Ptolemaidas	0.71	0.45	0.15	0.13	0.45	0.21	0.00	10.23	0.22	0.13	0.93	0.28	0.30	0.08	0.74
Pyrgou	0.55	0.77	0.33	0.28	0.99	0.53	0.00	0.12	0.14	1.61	0.82	0.60	0.38	0.06	0.55
Rethymnou	0.52	0.72	0.20	0.65	1.11	0.43	0.07	0.27	0.06	1.02	0.70	0.32	0.30	0.05	1.01
Rodou	0.60	0.94	0.33	0.25	1.13	0.42	0.12	0.18	0.19	1.01	0.67	0.40	0.55	0.21	1.14
Serron	1.22	2.00	1.32	0.59	1.45	0.46	0.04	0.18	0.33	1.09	0.90	0.65	0.36	0.09	2.15
Spartis	0.47	0.90	0.16	0.30	1.80	0.32	0.00	0.03	0.29	1.00	0.62	0.35	0.54	0.00	0.48
Thibas	1.46	1.09	0.94	0.47	0.83	1.00	0.00	2.65	13.96	1.40	1.56	2.91	3.19	1.27	0.49
Trikkaion	0.88	1.53	0.55	0.41	3.00	0.42	0.09	0.71	0.39	1.15	0.81	0.61	0.69	0.11	1.19
Tripolis	0.40	0.64	0.13	0.18	1.20	0.41	0.00	0.09	0.33	0.67	0.65	0.44	0.31	0.02	0.54
Vatheos	0.56	0.85	0.68	0.05	1.54	0.27	0.00	0.00	0.31	0.35	0.31	0.22	0.36	0.18	0.74
Veroias	1.13	1.95	1.41	0.09	2.17	0.55	0.10	0.20	1.37	1.00	0.60	0.52	0.74	0.08	1.10
Xanthis	1.50	3.33	1.90	0.54	0.89	1.44	0.36	0.11	1.62	0.63	0.78	0.63	0.72	0.16	0.82
Zakynthou	0.50	0.58	0.12	0.16	0.99	0.31	0.15	0.15	0.12	0.54	0.78	0.13	0.22	0.11	1.78

Source: Data from ELSTAT elaborated by the author

Table 27: Diversification of urban centers in each 1-digit STAKOD branch, 1991 (HHI index).

Urban centers	BRANCHES															
	A	B	C	D	E	ST	Z	H	U	I	K	L	M	N	J	O
Aggl. Agrinio	0.095	0.098	0.098	0.118	0.100	0.107	0.101	0.103	0.106	0.101	0.102	0.107	0.108	0.103	0.102	0.098
Aggl. Athinas	0.073	0.073	0.073	0.101	0.074	0.079	0.063	0.077	0.078	0.077	0.079	0.077	0.079	0.078	0.078	0.074
Aggl. Ioanninon	0.094	0.089	0.090	0.111	0.091	0.097	0.088	0.095	0.097	0.093	0.095	0.097	0.096	0.098	0.094	0.090
Aggl. Irakleiou	0.095	0.089	0.089	0.106	0.091	0.096	0.080	0.097	0.097	0.092	0.095	0.097	0.097	0.096	0.094	0.090
Aggl. Patras	0.078	0.075	0.075	0.1	0.076	0.080	0.070	0.079	0.081	0.078	0.079	0.080	0.081	0.080	0.079	0.075
Aggl. Thessalonikis	0.079	0.078	0.078	0.114	0.079	0.084	0.063	0.083	0.085	0.081	0.084	0.085	0.085	0.084	0.083	0.079
Aggl. Volou	0.077	0.073	0.073	0.106	0.073	0.078	0.062	0.077	0.078	0.075	0.077	0.077	0.078	0.077	0.076	0.073
Aggl. Nicolaou	0.139	0.124	0.123	0.133	0.124	0.139	0.139	0.105	0.134	0.125	0.130	0.137	0.132	0.133	0.127	0.123
Alexandroupolis	0.098	0.092	0.090	0.108	0.090	0.098	0.094	0.096	0.098	0.093	0.094	0.086	0.098	0.098	0.094	0.090
Amaliadas	0.100	0.164	0.164	0.188	0.165	0.187	0.196	0.172	0.177	0.168	0.170	0.182	0.177	0.172	0.171	0.165
Amfissas	0.095	0.087	0.092	0.1	0.090	0.095	0.094	0.092	0.095	0.090	0.091	0.092	0.095	0.095	0.091	0.088
Argostoliou	0.105	0.099	0.098	0.11	0.099	0.104	0.106	0.107	0.108	0.102	0.104	0.108	0.106	0.107	0.102	0.099
Argous	0.096	0.112	0.112	0.145	0.113	0.125	0.119	0.119	0.121	0.115	0.118	0.122	0.122	0.118	0.117	0.112
Aridaia	0.083	0.423	0.424	0.508	0.425	0.449	0.485	0.438	0.442	0.429	0.431	0.448	0.448	0.435	0.433	0.424
Artas	0.100	0.091	0.091	0.107	0.094	0.098	0.090	0.097	0.099	0.094	0.096	0.100	0.100	0.098	0.095	0.091
Chalkidas	0.068	0.066	0.066	0.097	0.066	0.069	0.052	0.068	0.069	0.067	0.068	0.069	0.069	0.068	0.068	0.065
Chanion	0.098	0.091	0.091	0.11	0.091	0.098	0.091	0.098	0.099	0.093	0.096	0.092	0.099	0.098	0.095	0.091
Chiou	0.106	0.101	0.099	0.12	0.101	0.106	0.100	0.106	0.107	0.103	0.104	0.110	0.108	0.105	0.105	0.100
Dramas	0.080	0.074	0.077	0.098	0.075	0.080	0.071	0.079	0.080	0.077	0.078	0.080	0.080	0.079	0.078	0.074
Edessa	0.083	0.104	0.104	0.135	0.109	0.114	0.115	0.110	0.113	0.106	0.108	0.115	0.113	0.112	0.107	0.104
Ermoupolis	0.094	0.094	0.093	0.105	0.097	0.102	0.100	0.100	0.102	0.095	0.097	0.102	0.101	0.100	0.098	0.094
Florinas	0.099	0.090	0.091	0.1	0.094	0.098	0.094	0.096	0.097	0.094	0.094	0.094	0.095	0.098	0.095	0.090
Giannitson	0.088	0.105	0.105	0.142	0.106	0.116	0.114	0.112	0.113	0.108	0.109	0.114	0.114	0.112	0.110	0.105
Grevenon	0.097	0.111	0.111	0.132	0.112	0.124	0.124	0.118	0.119	0.114	0.115	0.123	0.122	0.119	0.116	0.111
Ierapetras	0.103	0.260	0.256	0.285	0.258	0.294	0.311	0.280	0.272	0.263	0.266	0.275	0.275	0.267	0.265	0.256
Igoumenitsas	0.096	0.090	0.090	0.106	0.091	0.096	0.095	0.097	0.098	0.093	0.095	0.097	0.098	0.095	0.094	0.090
Kabalas	0.078	0.077	0.078	0.108	0.076	0.081	0.063	0.080	0.081	0.079	0.080	0.081	0.081	0.081	0.079	0.076
kalamatas	0.093	0.085	0.085	0.109	0.087	0.088	0.083	0.090	0.092	0.089	0.090	0.092	0.093	0.090	0.089	0.085
Karditsas	0.102	0.093	0.094	0.113	0.095	0.103	0.089	0.100	0.102	0.097	0.099	0.103	0.102	0.101	0.098	0.094
Karpenisiou	0.097	0.088	0.088	0.11	0.090	0.096	0.097	0.097	0.097	0.091	0.092	0.092	0.097	0.095	0.093	0.089
Kastorias	0.280	0.267	0.266	0.116	0.267	0.278	0.322	0.285	0.281	0.277	0.286	0.300	0.296	0.283	0.279	0.266
Katerinis	0.093	0.086	0.086	0.112	0.087	0.094	0.085	0.093	0.094	0.089	0.092	0.094	0.094	0.092	0.091	0.087
Kerkiras	0.104	0.101	0.100	0.115	0.101	0.111	0.095	0.108	0.111	0.104	0.109	0.111	0.109	0.107	0.107	0.102
Kilkis	0.077	0.080	0.080	0.104	0.081	0.086	0.084	0.084	0.085	0.082	0.083	0.086	0.086	0.087	0.083	0.080
Komotinis	0.091	0.103	0.103	0.13	0.104	0.113	0.113	0.109	0.112	0.106	0.109	0.114	0.114	0.111	0.108	0.104
Korinthou	0.073	0.069	0.069	0.097	0.070	0.073	0.059	0.073	0.074	0.071	0.073	0.074	0.074	0.072	0.072	0.069
Kozanis	0.087	0.080	0.085	0.096	0.083	0.087	0.081	0.085	0.087	0.083	0.085	0.087	0.087	0.086	0.084	0.080
Lamieon	0.088	0.082	0.083	0.1	0.083	0.087	0.081	0.086	0.089	0.085	0.086	0.088	0.089	0.087	0.085	0.082
Larissas	0.086	0.081	0.081	0.11	0.082	0.088	0.074	0.085	0.087	0.083	0.086	0.084	0.088	0.086	0.085	0.081
Lebadias	0.093	0.085	0.086	0.118	0.088	0.091	0.076	0.091	0.093	0.089	0.090	0.093	0.092	0.090	0.090	0.086
Lefkadas	0.098	0.095	0.091	0.105	0.092	0.100	0.095	0.098	0.100	0.094	0.097	0.096	0.100	0.099	0.094	0.091
Messologiou	0.082	0.098	0.096	0.107	0.095	0.103	0.102	0.100	0.101	0.096	0.099	0.102	0.103	0.099	0.098	0.094
Moudanion	0.098	0.115	0.117	0.14	0.116	0.127	0.123	0.123	0.122	0.117	0.118	0.124	0.122	0.118	0.118	0.113
Mytilinis	0.096	0.091	0.089	0.105	0.091	0.097	0.089	0.095	0.097	0.093	0.094	0.090	0.097	0.096	0.094	0.090
Nafpliou	0.092	0.085	0.086	0.098	0.086	0.092	0.087	0.091	0.091	0.088	0.090	0.089	0.092	0.090	0.089	0.085
Polygyrou	0.088	0.110	0.122	0.12	0.114	0.123	0.123	0.118	0.119	0.113	0.115	0.123	0.117	0.121	0.115	0.110
Prevezas	0.100	0.105	0.103	0.124	0.104	0.114	0.112	0.109	0.111	0.106	0.108	0.113	0.114	0.111	0.106	0.103
Ptolemaidas	0.151	0.140	0.147	0.17	0.086	0.157	0.162	0.148	0.151	0.144	0.146	0.150	0.156	0.148	0.145	0.140
Pyrgou	0.106	0.101	0.101	0.118	0.102	0.112	0.097	0.108	0.110	0.104	0.106	0.112	0.110	0.106	0.106	0.101
Rethymnou	0.104	0.095	0.095	0.11	0.096	0.104	0.100	0.099	0.103	0.099	0.102	0.105	0.105	0.102	0.100	0.095
Rodou	0.107	0.106	0.106	0.126	0.107	0.118	0.106	0.107	0.117	0.110	0.114	0.118	0.114	0.112	0.114	0.107
Serron	0.095	0.088	0.089	0.12	0.089	0.096	0.076	0.094	0.095	0.092	0.095	0.096	0.097	0.096	0.094	0.089
Spartis	0.099	0.103	0.103	0.118	0.105	0.115	0.110	0.111	0.113	0.108	0.109	0.115	0.114	0.112	0.109	0.104
Thibas	0.063	0.075	0.075	0.111	0.077	0.080	0.076	0.078	0.080	0.077	0.078	0.080	0.079	0.077	0.077	0.075
Trikkiaion	0.096	0.088	0.088	0.11	0.089	0.096	0.079	0.094	0.096	0.091	0.094	0.096	0.096	0.094	0.092	0.089
Tripolis	0.093	0.086	0.087	0.096	0.093	0.094	0.088	0.091	0.094	0.089	0.090	0.090	0.094	0.094	0.090	0.086
Vatheos	0.096	0.090	0.088	0.1	0.090	0.095	0.094	0.096	0.096	0.091	0.092	0.089	0.094	0.095	0.092	0.088
Veroias	0.082	0.079	0.080	0.105	0.081	0.086	0.077	0.084	0.086	0.083	0.085	0.086	0.086	0.085	0.084	0.080
Xanthi	0.084	0.078	0.078	0.107	0.079	0.085	0.078	0.083	0.084	0.081	0.082	0.081	0.085	0.083	0.083	0.079
Zakynthou	0.098	0.092	0.091	0.105	0.092	0.097	0.094	0.100	0.099	0.094	0.097	0.100	0.099	0.097	0.096	0.091

Source: Data from ELSTAT elaborated by the author

Table 28: Diversification of urban centers in each 2-digit STAKOD branch, 1991 (HHI index).

Urban centers	BRANCHES														
	D	DA	DB	DC	DD	DE	DST	DZ	DH	DU	DI	DK	DL	DM	DN
Aggl. Agrinio	0.118	0.103	0.101	0.098	0.098	0.098	0.097	0.098	0.098	0.099	0.100	0.098	0.098	0.098	0.099
Aggl. Athinas	0.101	0.075	0.078	0.074	0.074	0.076	0.073	0.074	0.074	0.074	0.075	0.074	0.074	0.075	0.076
Aggl. Ioanninon	0.111	0.093	0.092	0.089	0.090	0.090	0.089	0.090	0.089	0.092	0.092	0.090	0.089	0.089	0.093
Aggl. Irakleiou	0.106	0.092	0.091	0.089	0.089	0.090	0.089	0.089	0.089	0.090	0.091	0.089	0.089	0.089	0.092
Aggl. Patras	0.1	0.079	0.081	0.076	0.076	0.076	0.075	0.075	0.076	0.076	0.077	0.076	0.075	0.075	0.076
Aggl. Thessalonikis	0.114	0.082	0.084	0.080	0.079	0.080	0.078	0.079	0.079	0.079	0.081	0.079	0.079	0.078	0.082
Aggl. Volou	0.106	0.076	0.078	0.073	0.073	0.074	0.073	0.073	0.073	0.077	0.077	0.073	0.073	0.074	0.075
Agiou Nicolaou	0.133	0.125	0.123	0.123	0.124	0.123	0.122	0.122	0.122	0.123	0.123	0.123	0.123	0.122	0.124
Alexandroupolis	0.108	0.093	0.096	0.089	0.090	0.090	0.089	0.089	0.089	0.090	0.091	0.089	0.089	0.090	0.091
Amaliadas	0.188	0.170	0.167	0.164	0.166	0.164	0.164	0.164	0.164	0.165	0.167	0.164	0.164	0.164	0.167
Amfissas	0.1	0.091	0.088	0.088	0.089	0.087	0.087	0.087	0.087	0.088	0.089	0.087	0.087	0.087	0.088
Argostoliou	0.11	0.101	0.099	0.098	0.099	0.098	0.098	0.098	0.098	0.099	0.100	0.098	0.098	0.098	0.100
Argous	0.145	0.118	0.118	0.112	0.113	0.112	0.112	0.112	0.113	0.114	0.116	0.113	0.112	0.112	0.114
Aridaias	0.508	0.438	0.449	0.428	0.435	0.424	0.423	0.423	0.423	0.426	0.430	0.425	0.424	0.423	0.428
Artas	0.107	0.097	0.093	0.091	0.092	0.092	0.091	0.091	0.091	0.092	0.093	0.091	0.091	0.091	0.092
Chalkidas	0.097	0.068	0.067	0.065	0.066	0.066	0.065	0.066	0.065	0.069	0.068	0.065	0.066	0.067	0.066
Chanion	0.11	0.094	0.093	0.091	0.091	0.091	0.090	0.090	0.091	0.092	0.092	0.091	0.091	0.092	0.093
Chiou	0.12	0.103	0.101	0.100	0.100	0.100	0.099	0.099	0.099	0.100	0.101	0.099	0.099	0.099	0.101
Dramas	0.098	0.077	0.076	0.074	0.075	0.078	0.074	0.074	0.074	0.077	0.076	0.074	0.074	0.074	0.077
Edessa	0.135	0.109	0.115	0.104	0.105	0.104	0.103	0.104	0.104	0.105	0.106	0.104	0.104	0.103	0.106
Ermoupolis	0.105	0.097	0.097	0.093	0.094	0.093	0.093	0.093	0.093	0.093	0.094	0.093	0.093	0.089	0.094
Florinas	0.1	0.093	0.094	0.090	0.091	0.090	0.090	0.090	0.090	0.091	0.091	0.090	0.090	0.090	0.091
Giannitsos	0.142	0.111	0.117	0.105	0.106	0.106	0.105	0.105	0.106	0.106	0.107	0.106	0.105	0.105	0.109
Grevenon	0.132	0.115	0.115	0.111	0.114	0.111	0.111	0.111	0.111	0.111	0.112	0.112	0.111	0.111	0.113
Ierapetras	0.285	0.263	0.258	0.256	0.258	0.259	0.256	0.256	0.256	0.258	0.261	0.256	0.256	0.256	0.260
Igoumenitsas	0.106	0.092	0.094	0.090	0.091	0.090	0.089	0.090	0.089	0.091	0.091	0.089	0.089	0.089	0.090
Kabalas	0.108	0.080	0.081	0.076	0.076	0.076	0.076	0.079	0.077	0.077	0.077	0.076	0.076	0.076	0.077
Kalamatas	0.109	0.092	0.089	0.085	0.086	0.086	0.085	0.085	0.085	0.086	0.087	0.085	0.085	0.085	0.086
Karditsas	0.113	0.097	0.096	0.094	0.095	0.094	0.093	0.094	0.093	0.095	0.096	0.094	0.094	0.093	0.096
Karpenisiou	0.11	0.090	0.097	0.089	0.093	0.089	0.088	0.089	0.089	0.089	0.090	0.088	0.089	0.089	0.090
Kastorias	0.116	0.269	0.107	0.267	0.267	0.267	0.266	0.266	0.266	0.266	0.267	0.266	0.266	0.266	0.268
Katerinis	0.112	0.090	0.093	0.087	0.087	0.087	0.086	0.086	0.086	0.087	0.088	0.087	0.087	0.086	0.089
Kerkiras	0.115	0.102	0.102	0.100	0.101	0.101	0.100	0.100	0.100	0.101	0.102	0.100	0.100	0.100	0.103
Kilkis	0.104	0.083	0.085	0.080	0.081	0.080	0.080	0.080	0.081	0.081	0.082	0.081	0.081	0.080	0.082
Komotinis	0.13	0.109	0.110	0.104	0.105	0.105	0.103	0.103	0.104	0.104	0.106	0.104	0.104	0.103	0.106
Korinthou	0.097	0.072	0.071	0.069	0.070	0.070	0.071	0.069	0.070	0.070	0.072	0.069	0.072	0.069	0.070
Kozanis	0.096	0.083	0.083	0.080	0.081	0.081	0.080	0.082	0.080	0.082	0.082	0.081	0.081	0.080	0.082
Lamieon	0.1	0.084	0.083	0.082	0.082	0.083	0.081	0.082	0.082	0.083	0.084	0.082	0.082	0.081	0.083
Larissas	0.11	0.085	0.088	0.081	0.081	0.082	0.081	0.081	0.081	0.082	0.083	0.082	0.081	0.081	0.084
Lebadias	0.118	0.088	0.093	0.085	0.086	0.086	0.085	0.086	0.086	0.086	0.093	0.086	0.086	0.086	0.087
Lefkadas	0.105	0.094	0.094	0.091	0.093	0.091	0.091	0.091	0.091	0.091	0.092	0.091	0.091	0.091	0.093
Messologiou	0.107	0.097	0.096	0.094	0.095	0.094	0.094	0.094	0.094	0.094	0.095	0.094	0.095	0.094	0.095
Moudanion	0.14	0.118	0.117	0.113	0.115	0.114	0.113	0.113	0.114	0.114	0.116	0.115	0.113	0.113	0.116
Mytilinis	0.105	0.093	0.090	0.089	0.090	0.090	0.089	0.089	0.089	0.090	0.091	0.089	0.089	0.089	0.091
Nafpliou	0.098	0.088	0.086	0.085	0.085	0.085	0.084	0.084	0.084	0.086	0.086	0.085	0.084	0.084	0.085
Polygyrou	0.12	0.114	0.112	0.110	0.110	0.110	0.110	0.110	0.110	0.111	0.112	0.110	0.110	0.110	0.111
Prevezas	0.124	0.105	0.109	0.103	0.104	0.103	0.102	0.103	0.103	0.103	0.104	0.103	0.103	0.103	0.105
Ptolemaidas	0.17	0.143	0.142	0.140	0.140	0.140	0.140	0.153	0.140	0.140	0.143	0.140	0.140	0.140	0.143
Pyrgou	0.118	0.104	0.104	0.101	0.102	0.102	0.101	0.101	0.101	0.103	0.103	0.101	0.101	0.101	0.103
Rethymnou	0.11	0.098	0.097	0.096	0.096	0.096	0.095	0.095	0.095	0.096	0.097	0.095	0.095	0.095	0.098
Rodou	0.126	0.110	0.109	0.106	0.107	0.107	0.106	0.106	0.106	0.107	0.108	0.106	0.106	0.106	0.109
Serron	0.12	0.095	0.096	0.089	0.090	0.089	0.088	0.088	0.088	0.090	0.090	0.089	0.089	0.088	0.093
Spartis	0.118	0.107	0.105	0.103	0.105	0.104	0.103	0.103	0.103	0.105	0.105	0.103	0.104	0.103	0.105
Thibas	0.111	0.078	0.079	0.075	0.075	0.076	0.074	0.076	0.080	0.076	0.077	0.076	0.076	0.075	0.076
Trikkaion	0.11	0.093	0.092	0.088	0.091	0.089	0.088	0.089	0.088	0.089	0.090	0.089	0.088	0.088	0.091
Tripolis	0.096	0.088	0.087	0.086	0.087	0.087	0.086	0.086	0.086	0.087	0.088	0.086	0.086	0.086	0.087
Vatheos	0.1	0.091	0.092	0.088	0.089	0.088	0.088	0.088	0.088	0.088	0.089	0.088	0.088	0.088	0.090
Veroias	0.105	0.085	0.086	0.079	0.081	0.080	0.079	0.080	0.080	0.080	0.081	0.080	0.080	0.079	0.082
Xanthi	0.107	0.085	0.085	0.079	0.079	0.080	0.078	0.078	0.079	0.079	0.080	0.079	0.079	0.078	0.080
Zakynthou	0.105	0.093	0.092	0.091	0.092	0.091	0.091	0.091	0.091	0.092	0.093	0.091	0.091	0.091	0.095

Source: Data from ELSTAT elaborated by the author