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Opportunities and restrictions for the local-endogenous development in metropolitan areas of high industrial concentration: the case of Thriasio Pedio in Attica

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Abstract. This paper investigates the development pattern of the urban area of Thriasio Pedio in the metropolitan region of Attica, which is characterised by a high concentration of industrial activities. The local-endogenous development model is discussed in the theoretical review of the paper, in the sense of the local socio-economic system's capacity to transform, react to external challenges, promote awareness and import specific forms of social regulation at the local level. On this ground, the main question of the paper concerns the nature of the area's development and more specifically, whether or not this is defined by endogenous factors (i.e. the operation of locally embedded production systems) along with predetermined exogenous factors (i.e. the allocation of central/metropolitan activities in Thriasio Pedio). The study is supported by the results of a sampling research in representative economic units of the Thriasio Pedio area. The analysis helped us to see whether the various applications of the local-endogenous development pattern, as defined in the paper, are incorporated into the overall productive system of the area. The prerequisites for the reinforcement of the local endogenous capacity were also identified in this analysis.

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Contents:

1. Introduction: local-endogenous development

Regional economists believe that globalisation leads to 'localisation', in the sense that local economies are capable to resist marginalisation from sovereign models, such as international or supra-local polarisation (Barquero, 1991; Theveniaut-Muller, 1999). Local-endogenous development has emerged as the dominant developmental model after the global crisis of the early 1970s. Up to then, the growth poles strategy was prevailing along with Fordism, in a geography of national space which comprised the field of planning and structure of productive systems (Paniccia, 2002). Initialy, the growth poles (or polar) model was partially substituted by the local-endogenous development paradigm in order that crises' implications could be faced more effectively. This paradigm refers to integrated development (both in spatial and sectoral terms), based on the utilisation of the endogenous local potential, without the concentration of the population and economic activities in a few urban centres (Coffey, Polese, 1985; Theveniaut-Muller, 1999; Papadaskalopoulos, 2008).

The alternative impementation of these two models is considered as the best solution for the adaptation of local economies to various economic situations. Each model should be applied in specific periods: during periods of crisis which are characterised by structural changes and rising unemployment rates, the local-endogenous development model appears to be the solution; while during periods of a growing economy the polar model is more appropriate to boost regional development. However, in most cases, the two models are implemented parallelly in various combinations (Barquero, 1991). The successful implementation of the local-endogenous development model in many cases has led to its domination, along with the growth poles model. This new model led to significant re-adjustments and new theoretical approaches and finally to the formation of a new strategy of regional development (Bennett, Krebs, 1991). Such modifications concern the organisation of production, its interconnection with Research and Technological Development, distribution, vocational training, new relations between corporations and local organisations, etc. (Christofakis, 2010).

The main concept of the local-endogenous model draws on Industrial Districts (Italian School). It is based on the Marschallian idea that scale economies are not only a privilege of large enterprises. An Industrial District is defined as the spatial concentration of small and medium-sized enterprises (SMEs) which focus their activity on a specific sector, and they are specialised at different stages of the production process (Paniccia, 2002). These enterprises constitute a united team with common perceptions regarding the organisation of production and common (mainly economic) values. An important role is also played by social capital and the institutional framework (Amin, Thrift, 1995). The basic characteristics of an Industrial District are: the existence of a propulsive productive unit in the secondary or tertiary sector, a large number of SMEs which cooperate with the propulsive enterprise in the different productive stages, an industrial organisation based on the philosophy of competition-cooperation, 'entrepreneurial environment' which is strengthened by the accumulation of human capabilities, a local consensus and a synergy between enterprises and society (Beccatini, 1990; Brusco, 1990).

The answer to the Italian School for Industrial Districts was provided by the French as well as the American School of thought, mainly through the approaches regarding Local Productive Systems. These systems refer to the concentration of specialised enterprises, the spatial organisation of which does not depend on the final product, but on the production system (Scott, Storper, 1989; Harrison, Storper, 1991; Benko et al., 1997). Flexibility and spatial concentration economies are the basic characteristics of Local Productive Systems. Flexibility is based on the small size of local enterprises and refers to their fast adaptation to continuous changes in demand and technology. Spatial concentration economies are created by geographical continuity and they are strengthened by the production specialisation of Local Productive Systems. The adaptation of enterprises to changes in demand and technology, as well as productive specialisation, are supported by the new information technology systems and related applications and they are consolidated by a two-fold networking: among enterprises and between the enterprises and the local developmental and social organisations (Markusen, 1996).

The third implementation of the aforementioned policy refers to the Innovative Milieu Systems. According to this approach, local development results from innovative actions and synergy. The formulation of this policy was based on two points of view (Gouttebel, 2001). The first one refers to the geography of innovation, which is a more empirical approach. The number and the developmental importance of the innovative actions depend on the geographical concentration and, mostly, on the concentration of 'propulsive' enterprises as they are defined in the Industrial Districts theory. The spatial continuity and the concentration of enterprises create an entrepreneurial-industrial environment, which in turn promotes the diffusion and acceptance of innovation. The second point of view refers specifically to the Innovative Milieu System (Aydalot, 1986). According to this, it is not the enterprise that innovates but the 'environment' which is defined as a spatial sub-total, open to the external environment which incorporates basic know-how, operational rules and the system of relationships. More specifically, the know-how refers to the organisation of enterprises, production and distribution. The operational rules refer to the cooperation of enterprises, competition, solidarity, and mutuality. The relationships of system refers to the interaction of enterprises with institutions (Maillat, 1998; Gouttebel, 2001; Broecker et al., 2003; Palazuelos, 2005).

An alternative approach, closer to that of the Innovative Milieu System, is the perspective of the Creative Milieu. However, according to this concept, the region-developmental environment not only incorporates innovative actions and adapted technology. In addition, it supports local enterprises and institutions in producing innovative ideas. In a Creative Milieu, innovation is developed endogenously (Maier, Obermaier, 2001). The promotion of a Creative Milieu can be achieved only through the formulation of an effective and suitably-adapted policy. To this end, a lot of studies have promoted the importance of the institutional framework (Amin, Thrift, 1995), the collectivity and partnership in economy (Cooke, Morgan, 1998) and the crucial role of policy in strengthening local innovation systems (Pratt, 2010). A relevant piece of research (Malecki, 1997) has proved that most of the regions with powerful innovation systems are also characterised by a powerful institutional framework. The effective implementation of this policy requires the activation all of local partners (local government bodies, agencies, institutions, chambers, unions, enterprises, etc.) and ultimately, the cooperation of all the above. At a local level, productive structures are exploited – factors such as employment, entrepreneurship, natural resources, social and political structures, traditions and cultural heritage as well as activities to which economic growth and improving living standards may all be related. Each of these factors needs to be coordinated with the others, a prerequisite that indicates the significance of cooperation at local level (Coffey, Polese, 1985; Bennett, Krebs, 1991; Christofakis, 2010).

A common perception of the above applications of the local development model is that the development is produced mainly endogenously. The operation of a Local Productive System is characterised by a great degree of autonomy, which has three dimensions (Grosjean, Crevoisier, 2003): industrial (productive), spatial and institutional. The first one refers to sectoral specialisation, the development of subcontracts and innovative actions within a Local Productive System. Spatial concentration economies, local entrepreneurship and the synergy between the economic units define the spatial dimension. The institutional dimension refers to institutions and any local civic actions that support a Local Productive System. However, local-endogenous development does not mean a 'closed economy' (Bennett, Krebs, 1991). It means the ability to transform the socio-economic system, react to external challenges, promote awareness, and import specific forms of social regulation at a local level.

Within this framework, the main question of this paper concerns the origin of growth and more specifically, whether or not this type of development of the urban area of Thriasio Pedio in the Attica Region of Greece, which is characterised by a high concentration of industrial activities, is determined by endogenous factors along with specific factors exogenous to the area, which exist because of the supra-local polarisation due to the metropolitan character of the region (of the capital city of Athens).

2. Material and research methods

2.1. Development profile of the case-study area

The Thriasio Pedio area comprises four municipalities, namely Elefsina, Apsopyrgos, Mandra, and Nea Peramos, as well as the community of Magoula (Fig. 1). This area is part of the Prefecture of Western Attica, which totally consists of ten municipalities and two communities. Thriasio Pedio occupies 27.3% of the area and 52% of the population of Western Attica. It also contains 2.1% of the total population of the Region of Attica (which includes the capital city of Greece, Athens).

The population of the Thriasio Pedio area is 78,302 inhabitants and it has increased considerably (by 31.9%) between the last two censuses (1991–2001), according to available official data (NSSG, 1991, 2001). This increase by far exceeds the respective increase in the population of Western Attica (20.7%), and to a lesser degree, that of the Attica Region (6.6%). The

two large industrial centres of the area, Elefsina and Apropyrgos, house the largest proportion of the area's population (Table 1).

The main characteristic of Thriasio Pedio is the over-concentration of activities in the manufacturing sector and storage, coexisting with the shrinking sectors of agriculture and farming, residence, port, and commercial activities. The economically active population of the area constitutes 32% of the total population; 10% of it is occupied in the primary sector, 65% in the secondary (industry-manufacture) and 25% in the tertiary sector (services-commerce). The main branches are petroleum products, shipping construction, chemical, and storage industries.

The database of the Developmental Union of Thriasio Pedio was utilised in order to identify the sectoral specialisation of the area. The database details almost 2,200 local enterprises.

The sectoral specialisation of regions has been, for many decades now, a field of systematic exploration and use for special measuring methods (Tiebout, 1956; Mayer, Pleeter, 1975; Isserman, 1977). Thus, a group of special indices has been formed, with the most important being the Location Quotient (LQ). The LQ measures a sector's participation in a spatial unit, in relation to the respective participation of that sector in the country's total, in terms of a variant such as employment, production or income. For the needs of our analysis, the LQ is adjusted as follows:

$$LQ_{ir} = \frac{\frac{A_{ir}}{A_r}}{\frac{A_{in}}{A_n}},$$

where: i = sector; r = municipality or community; n = the Thriasio Pedio area; A_{ir} = number of enterprises of sector 'i' in municipality 'r'; A_{in} = number of enterprises of sector 'i' in Thriasio Pedio; A_r = total number of enterprises in municipality 'r'; A_n = total number of enterprises in Thriasio Pedio.

When $LQ_{ir}>1$, the municipality participates in the enterprises of the sector (A_{ir}/A_{in}) with a higher percentage than the one related to participation in the total number of enterprises in the Thriasio Pedio area (A_r/A_n); in other words, there is a relative specialisation of the municipality in a certain sector. We apply this approach in order to identify the production specialisation throughout Thriasio's municipalities. According to the LQ calculations (in the parentheses) the results are as follows: (a) Aspropyrgos specialises in: petroleum products (1.59), storages (1.19), garages (1.02), laboratories (1.03), fodder installations (1.36); (b) the areas of specialisation for Elefsina are as follows: services (1.48), cements (4.69), commerce (1.89), service stations for liquid fuels (1.56), building materials (1.87), garages (1.64), public services (1.99), shipping constructive factory (2.19); (c) Mandra has areas of specialisation in branches such as services (1.33), chemical tyres (1.48), metallurgic products (1.80), machines construction (1.40), service stations for liquid fuels (1.40), laboratories (1.08); (d) finally, Magoula specialises in: services (1.11), timber (1.39), chemical tyres (1.51), metallurgic products (1.48), machines construction (2.43), laboratories (1.50), public services (1.51), fodder installations (1.51), shipping construction factory (1.12).

Table 1. Territorial allocation and change of the population in the Thriasio Pedio area

Municipalities	A	B	C
Elefsina	22,793	25,950	13.9
Aspropyrgos	15,715	27,905	77.6
Mandra	11,343	12,756	12.5
Nea Peramos	6,869	7,689	11.9
Magoula (Community)	2,663	4,002	50.3
Thriasio Pedio	**59,383**	**78,302**	**31.9**
Western Attica	**125,177**	**151,038**	**20.7**
Region of Attica	**3,523,407**	**3,756,607**	**6.6**

Explanation: A – 1991; B – 2001; C – % change

Sources: National Statistical Service of Greece (NSSG), Population censuses 1991 and 2001, processed by authors

In conclusion, a basic characteristic of the area's industrial profile is that some of the largest industries of Greece (e.g. EL.D.A. – Hellenic Aspropyrgos Refinery SA, Petrola, Titan, Pyrkal, Halyvourgiki, Greek Shipyards, Elefsina Shipyards) are densely located in Thriasio Pedio. Moreover, the area constitutes a spatial sub-section, necessary and complementary to the metropolitan core of Athens. Its main function, as a centre of industrial activity and wholesale trade with a transit role and an important node of long distance transport, makes Thriasio Pedio one of the most productive areas in Greece despite the industrial decline of many other areas in the country (RDI, FEIR, 2008).

2.2. Methodological approach

In order to examine the characteristics of the local enterprises and thus, identify the general characteristics of the productive system of Thriasio, a sampling research was performed. This research enabled the systematic investigation of whether the development pattern of the area meets the local-endogenous development model, as previously discussed.

Prior to the selection of a sample of enterprises in Thriasio Pedio, there was an assessment of the economic units operating within the area. To this purpose, the authors initially contacted the Athens Chamber of Industry and Handicraft and traced 208 registered enterprises in the area. The data was supplemented with 599 more business units registered in the Piraeus Chamber of Industry.

However, the most detailed recording of local enterprises was provided by the database of the Developmental Union of Thriasio Pedio. Their data comes from the Enterprises Census of 2003 and covers a total number of 2,213 units in both public and private sectors. The available data concerns urban characteristics (covering area, number of buildings, floors, situation of buildings) as well as the environmental impact of the enterprises in the area (air pollution, water, soil pollution). Moreover, this database provides information regarding the brands, the production activities and communication details of all economic units in the area.

A total of 74 out of the 2,213 units were excluded from the research, because of unknown use. In the total amount of active economic units in Thriasio Pedio, the municipality of Aspropyrgos has 57%, the municipality of Mandra 18%, the municipality of Elefsina 16% and the community of Magoula 9%. There are no available data for the municipality of Nea Peramos, because of the very small number of enterprises in this area.

After recording the enterprises, the territorial and sectoral criteria of the sample selected for the primary research were outlined. In order to secure representativity, our sample amounted 15% of the total enterprises, that is to say 320 units from the total 2,139 recorded. It was then decided to have a proportionately larger representation of enterprises based in Aspropyrgos, as this is the municipality with the larger number of industrial enterprises which also have the most significant economic value (i.e. refineries, cement factories, metallurgies and steel factories, chemical and tyres industries, construction of instruments, but also many recently established storage-logistics and transport companies).

Another criterion for the formation of the research sample was to capture as well the proportionally high density of enterprises located in Elefsina; the high territorial concentration of manufacturing in this municipality, adjacent with dense residential areas, holds an important role in the history of both the local economy and the wider economy of Attica. The research sample also represented enterprises located in the municipalities of Mandra and Magoula, with focus on the sectors of metallurgy, chemicals and tyres, and the manufacture and marketing of timber.

Apart from the sectoral and locational dimensions of the sample, the legal status of enterprises (SA – Share Company, PLC – Public Limited Company, GP – General Partnership, Ltd – Limited Company) was also a selection criterion, in order to ensure a reliable degree of representativity of the various unit size of the local firms. The fieldwork was performed through the distribution of a closed questionnaire (30 graded multiple choice questions), which also formed the platform for interviews with many of the local entrepreneurs. The questionnaire focused mainly on the operational characteristics of the enterprises with regard to the nature of their contribution and interaction with the local economy and society.

Within this framework, the research questionnaire was arranged in four parts. The first, determined the identity of the enterprise (year of foundation, establishment or relocation in the area, products, size of employment, turnover). The second part investigated the functional integration of the enterprise in the area (residence of employers and employees, suppliers and markets, cooperation within and outside the area, subcontracting, etc.). The third part explored the dynamism of the enterprise and more specifically the evolution of sales, the strategy of competition (new activities, cooperations, merges, etc.), and the investments during the preceding five-year period. A number of questions focused specifically on the technological orientation of the investments, as well as the results of the investment strategy on efficiency (productivity, sales) and also on employment (demand for specialised personnel, labour costs). Finally, the fourth part of the questionnaire determined the role of the institutional framework in strengthening entrepreneurial activity in Thriasio Pedio (taking advantage of state subsidies, training programmes, EU funds for technological modernisation). The selected enterprises were also asked to evaluate the factors that block their attempt for technological upgrade and innovation.

3. Research results: entrepreneurial characteristics in the case-study area

The research fieldwork resulted in 50 questionnaires out of 320 that were distributed to the sample enterprises; this outcome covers more than 15% of the total

population and therefore is considered as representative of the case. Moreover, as the primary research was completed in 2007, 68 out of the 320 sample economic units – which was formed according to the SMEs census of 2003 – were found to be either abandoned or of a different use. Consequently, the 50 enterprises that responded to the questionnaire account in fact for approximately 20% of the active enterprises of the initial sample. With regard to the overal number of enterprises in the area, excluding the 68 false units, the research sample targeted more than 10%, while the final sample represents approximately 2.5% of the local enterpreneurial population. However, in terms of employees and turnover, the sample represents an even higher percentage. This is because large local enterprises have a significant presence in the final research sample.

The territorial distribution of the enterprises is as follows: 22 units are located in the municipality of Aspropyrgos, 15 in Elefsina, 12 in Mandra and 1 unit in the Magoula community. This distribution is considered to be reflecting the real situation of firms' territorial concentration. The sectoral distribution of the enterprises shows a numerical advantage in metallurgy, chemicals, tyres and machine construction. But in terms of turnover and employment, enterprises related to shipping construction, cement and petroleum products prevail (Table 2).

Table 2. Sectoral and territorial distribution of enterprises that responded to the questionnaire (number of enterprises)

Economic Sectors	A	B	C	D	E
Services		2			2
Timber (Manufacturing, Commerce)	1	1			2
Chemical Tyres	6	2	2		10
Petroleum Products	1	1			2
Cements	1	1			2
Metallurgic Products	2	5	3	1	11
Machine Construction	5		3		8
Commerce	2				2
Storage	1	1	1		3
Service Stations of Liquid Fuels	1				1
Building Materials	1	1			2
Laboratories			1		1
Shipping Construction Factory	1	2	1		4
Total	**22**	**16**	**11**	**1**	**50**

Explanation: A – Aspropyrgos; B – Elefsina; C – Mandra; D – Magoula; E – total

Source: RDI and FEIR 2008, processed by authors

The primary data analysis shows that the majority of enterprises were established in the area during the 1980s (46% of respondents). Among them, enterprises in chemicals and tyres, and metallurgy, outnumber the rest; they also outnumber the rest of the whole research sample in terms of period of establishment. The choice of business location reveals a preference in areas of high industrial activities concentration, such as Aspropyrgos (44% of enterprises) and Eleusina (31% of enterprises), despite high population density.

The analysis also focuses on the relocation of enterprises in Thriasio Pedio from other areas. Chronologically, most relocations are recorded during the 1980s (47% of respondents), which coincides with the general increase of business units in Thriasio Pedio in this period. Relocations continued – less intensively – during the 1990s as well. The main reason for business relocation into Thriasio, especially in the 1985–1995 period, appears to be the congestion of other areas in the capital city. Finally, for many enterprises that choose to be located in Thriasio Pedio even 20 years ago, the main criteria was the availability of cheap land – which was mostly rural, and the already existing industrial concentration.

One of the most important advantages considered by firms as a reason for locating in Thriasio Pedio is the direct access to the national transport network, as well as the existing industrial facilities. The proximity

Table 3. Evaluation of the advantages of the area (number of enterprises)

Area advantages	A	B	C	D	E
Local job market	4	4	9	6	6
Proximity to Athens		1	7	14	12
Direct access to the national (road, railway) transport network		1	9	9	14
Availability of land	1	3	5	5	9
Low cost of land	2	3	8	3	3
Industrial and environmental infrastructures	2	3	8	3	3
Natural resources	3		3		2
Industrial concentration	3	2	12	5	12
Local services for enterprises (credit units, consultants, etc)	1	5	2	4	1
Incentives/State aid	2	2	2	1	1

Explanation: A – no important; B – less important; C – important; D – very important; E – extremely important

Source: RDI and FEIR 2008, processed by authors

to Athens and the local labour market are considered to be less important advantages for the location choice. Finally, the availability and low cost of the land have been also location reasons for most enterprises in the area, though this has changed drastically over the last 20 years. It must be acknowledged that the appropriateness of the local workforce, as well as the existence of local services for enterprises are not deemed significant by the respondents, either as an advantage or disadvantage of the area (Table 3). This finding indicates the limited presence of local networks between enterprises, which would potentially contribute to the strengthening of the local productive base of Thriasio Pedio.

Regarding the size of enterprises, 45% of the examined units employ less than 10 workers, while 77% of them employ up to 50 workers. Applying this finding to the wider frame of economic activity in Thriasio Pedio, we can conclude that it is an area of small to medium-sized enterprises concentration. Even in the branches of metallurgy, chemicals and machine construction, which represent a large part of the sample, only a small number of enterprises employ 50–100 workers and there are only scarce cases of enterprises employing 100–200 workers – namely in the branches of petroleum products and cement industries.

After examining the significance of the work force in the process of production for the sample enterprises, the analysis of the primary data pursued to answer one of the major research questions: what is the contribution of the examined enterprises with regard to local employment. Regarding the place of residence of the workers, almost 57% of the units responded that more than 50% of their employees live in the area. As expected, these enterprises are mostly small units in terms of employment; while on the contrary, the largest units mainly employ their workforce from outside of the local market. This finding constitutes the first evidence regarding the pattern of development in the area; in other words, whether it is shaped endogenously or determined by exogenous factors.

Another decisive factor regarding the local development model is the size and frequency of cooperations between enterprises within the area and also between enterprises and local suppliers and markets (Aydalot, 1986; Gouttebel, 2001). The findings indicate that the majority of local enterprises have developed cooperation networks with suppliers that are located outside of the area (Table 4).

It is clearly illustrated that Thriasio Pedio, along with the industrial concentration of Viotia, forms the major industrial concentrations in Attica's urban-industrial region. There is evidence that a wider

Table 4. Suppliers' territorial networks

Suppliers' origin	A
Local enterprises in Thriasio Pedio	25.64
Enterprises in the rest of Attica Region	7.21
Enterprises in (neighbouring) Viotia Prefecture	29.91
Enterprises in (neighbouring) Korinthia Prefecture	4.27
Enterprises in the rest of Greece	14.53
Enterprises outside of Greece (EU and other countries)	18.80
Total	100.00

Explanation: A -% of enterprises

Source: RDI and FEIR 2008, processed by authors

Metropolitan or Polar Productive System exists, in which Thriasio Pedio's enterprises are functionally incorporated. In other words, a supra-local polarisation is identified, although on the local level there is also a degree of synergy (Fig. 1).

As far as the major sales destinations of the enterprises concerned, these are identified in the rest of Attica region. While the supra-local character of local enterprises is also evidenced, since the percentage of firms selling outside Attica is considerable. Also in sales, a small degree of synergy is evidenced at a local level (Table 5).

Table 5. The enterprises' markets

Destination of sales	A
Local market of Thriasio Pedio	14.60
Market of Attica (except Thriasio Pedio)	31.37
Rest of the country (except Attica)	29.20
EU countries	8.76
Countries of Central and Eastern Europe	8.76
Rest of internartional markets	7.30
Total	100.00

Explanation: A -% of enterprises

Source: RDI and FEIR 2008, processed by authors

Regarding the inter-entrepreneurial cooperation networks, which constitute a defining factor for the operation of Local Productive Systems (Harrison, Storper, 1991; Benko et al., 1997; Gouttebel, 2001), it is found that an important percentage of cooperations (33%) is developed at the local level. Nevertheless, 56% of cooperations are developed with partners located in the rest of Attica and neighbouring prefectures.

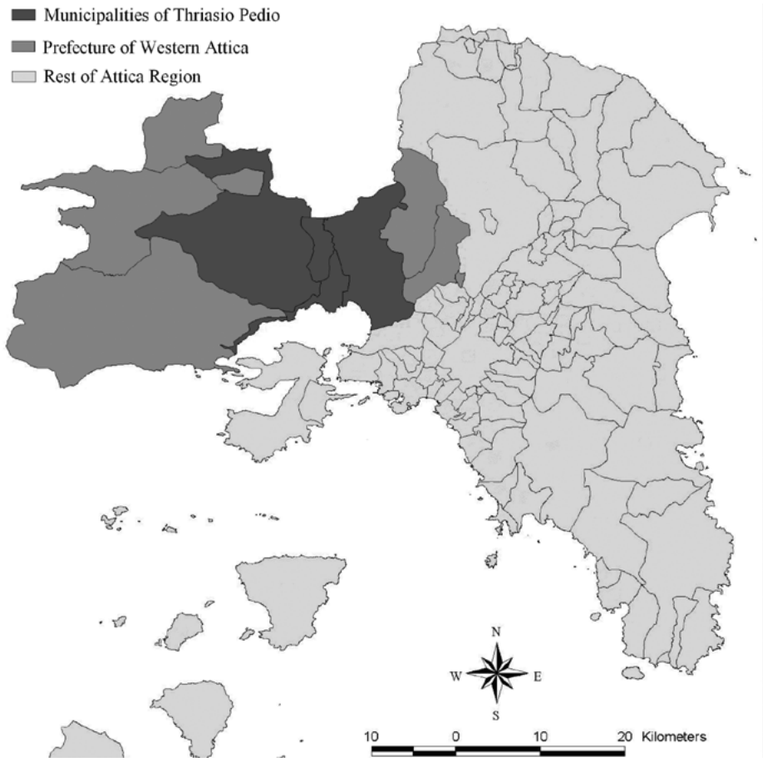

Fig. 1. The Thriasio Pedio area in the Region of Attica

Explanation: A – municipalities of Thriasio Pedio; B – prefecture of Western Attica; C – rest of Attica Region

Source: RDI and FEIR, 2008

One remarkable finding is the percentage of local (within the Thriasio Pedio area) inter-entrepreneurial cooperations, mainly through subcontracting relations and the supply of transport services or storage (Table 6).

This finding, limited though it may be in its extent, does not support the importance of having local enterprise networks of cooperation in the vertical integration of production or in the horizontal development of economic activities. The importance of innovation and technological modernisation of enterprises, i.e. the basic factors for increasing sales efforts on the part of the enterprises, shows satisfactory positive trends in the last 5 years. In particular, according to the 63% of enterprises that had an increase in their sales in the last 5 years (against 21.7% that presented stagnation and 15.2% that indicated a fall in sales), the main factor that affected the change in their sales was the development of new activities and new products, through technological modernisation.

Table 6. Type of inter-entrepreneurial cooperation

Main types of cooperation	A
Consortium with enterprises of the same branch	8.70
Consortium with enterprises of other branches	2.17
Subcontractings to local enterprises	28.26
Cooperations with suppliers of technological support	15.22
Cooperations with companies of storage and logistics	10.87
Cooperations with transit/transport companies	30.43
Cooperations with developmental institutions of local governmental bodies	4.35
Total	100.00

Explanation: A -% proportion

Source: RDI and FEIR 2008, processed by authors

The assumption of subcontracting is that it can often be a tactic for the enlargement of production, but in fact this does not significantly influence the amount of sales (according to cross tabulations results based on the primary data).

The investment strategy that enterprises adopt is mainly directed towards the renewal of mechanical equipment and, secondly, to the physical structure of the enterprises. It must be underlined that investments in new technologies, which many of the enterprises make, mainly concern the administrative computerisation of the company. These elements are also confirmed by the responses from enterprises regarding the most important technological changes made during the preceding five-year period (Table 7).

Table 7. Technological changes during the last 5 years

Types of change	A
Administrative computerisation	30.99
Automation of production	30.99
Research & Development of a product	15.49
Technological authorisations	5.63
Promotion and publicity through the Internet	16.90
Total	100.00

Explanation: A -% of enterprises

Source: RDI and FEIR 2008, processed by authors

The interpretation of the above data leads to the assumption that any possible Productive System of the area presents characteristics of the Innovative Mileu System. This is because many enterprises mainly direct their technological change towards the automation of production and the computerisation of administration, and a small percentage of them have turned to the area of technological authorisation. However, some evidence for the creation of the Creative Milieu System also exists through the promotion of research and development undertaken by enterprises, as well as their promotion and publicity through the use of the Internet.

In general terms though, it is evidenced that the majority of local enterprises react to changes in sales by adopting defensive strategies that are commensurate with the production of new and technology intensive products. Moreover, the sources of technological and technical knowledge used by the enterprises reflect their practice for technological upgrade. Their choices seem generally to be connected with procedures that promote know-how and in-house entrepreneurial training from the most specialist executives of the enterprise. Important know-how is also derived from the customers through the standards they set, as well as from suppliers through the ministration of equipment and raw material. These facts prove that the researched enterprises do not produce peak technologies.

The same conclusion is also reflected by the low demand of enterprises for specialised labour skills as the proportion of specialised personnel in the total employment is stagnant for 57% of the enterprise, while 38% of them show an increase of specialised personnel in the last five years.

4. Conclusions

From the previous analysis it can be seen that the development of Thriasio Pedio has been determined mainly by factors outside of the area. This fact has to do with the spatial attachment of Thriasio to the Athens Metropolitan Area, the greater region of the capital city of Athens. The absolute domination of this development pattern results in a low degree of endogenous entrepreneurial activity, shrinkage of traditional business activities, unfavourable impacts on the new human potential of the area, lack of local social capital and institutions, and finally weakness in the formation and operation of a Local Productive System.

At the same time, the absence of links with local developmental and social institutions and consequently, the lack of a powerful social consensus – as a major prerequisite for Local Productive Systems (Beccatini, 1990; Brusco, 1990; Markusen, 1996) leads to the rejection of the ongoing economic activity by the local society. This is a problem particularly intense in Thriasio Pedio and mainly concerns the largest production units, which for decades have operated in the area and attributed its historical developmental character. As it is shown from the research of the spatial networking of the enterprises vis-a-vis their suppliers, markets and other cooperators, the degree and type of their technological modernisation, and the place of residence of employees and specialised executives, the Thriasio Pedio area constitutes a productive sub-system that functions complementarily to the metropolitan productive system of Attica and not independently from it.

Despite the strong dependence on the Athens market, it seems that at the local level there exists a relatively high degree of synergy, indicative for a few Local Productive Systems. The Local Productive Systems of the area seem to have some Innovative Milieu characteristics, while there is also potential for

the creation of Creative Milieu Systems, as discussed in the theoretical section of the paper. For instance, an important percentage of inter-entrepreneurial cooperation exists (covering 1/3 of the units) and also, to a lesser degree there are efforts to develop subcontracts, while a serious lack regarding the links between the enterprises and the local developmental and social institutions are observed. At the same time, efforts are made towards developing new products and activities through technological modernisation. Of course, most of the enterprises have addressed their technological change in the automation of production and the computerisation of administration, while a low percentage have turned to the market of technological authorisations. Finally, any indications for Creative Milieu conditions are limited in the promotion of product research and development, as well as digital promotion through the Internet.

The prospect of the exploitation of new technology and innovation is positive for the area because of the high concentration of activities in the secondary and tertiary sector which could become recipients of innovative actions and programmes. As the theory on creativity suggests, the growth of industrialised urban regions is highly dependent on the regions' ability to transform into creative knowledge economies. Because of that, the formulation and promotion of a special policy to strengthen the Creative Milieu is of primary importance. This policy (Maier, Obermaier, 2001) will be supported by the use of traditional regional policy means, such as infrastructures (industrial and entrepreneurial infrastructures, transport and telecommunication infrastructures, etc.), incentives for investments etc., in combination with the adoption of special actions (Palazuelos, 2005) for the creation of Local Productive Systems and Innovative Mileu Systems (know-how diffusion, cooperation networks, venture and risk capital funds, etc.), along with the implementation of an integrated policy of social and cultural development. The institutional dimension of the Local Productive System should be also enhanced, as a factor recognised in the international bibliography (Amin, Thrift, 1995; Malecki, 1997; Cooke, Morgan, 1998; Broecker et. al., 2003; Christofakis, 2010; Pratt, 2010). Local supporting institutions must be developed and the local stakeholders must undertake public action, something that has not been undertaken up to now in the area.

In this way, the three dimensions that constitute the relative autonomy and armouring of the Local Productive System will be enforced (Grosjean, Crevoisier, 2003) and they will relate to the productive operation (subcontractings, specialisation, innovation), the spatial effect (local entrepreneurship, concentration economies, synergy) and the institutional formation (consensus, cooperation of enterprises with local institutions, local supporting organisations and local public civic action).

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