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Sustainable Urban Development in the Marche Region

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1. INTRODUCTION

If one looks at the Marche Region in light of the notion of 'local system', focusing not on the institutional organization of territory – that is, on administrative borders of municipalities – but rather on the relational densities observed in space, we find that its social and economic processes – as well as its evolutionary potential – are concentrated in a set of 'inter-municipal territorial systems' which have an unmistakable urban nature. These territorial systems, as suggested in this report, may be regarded as the Marche Region's 'new cities'.

The formation of inter-municipal systems, a phenomenon which characterizes the Marche Region (and almost all the Italian Regions), was brought about by processes of 'territorial coalescence': a progressive intensification of the relationships among agents operating in contiguous municipalities which, at a certain point, became so close as to transform the single municipalities into simple parts of an integrated territorial system. As discussed in Chapter 2, we should today regard each set of contiguous municipalities as one single 'relational field', since their territories have integrated themselves to the extent that they now constitute a single local system. According to the hypothesis proposed in this report, the territorial organization of the Marche Region is now characterized by eleven inter-municipal urban systems which qualify as cities – for a total number of 93 municipalities comprised in these urban systems.

Interpreting the territory of the Marche Region in terms of the eleven urban systems (cities in nuce) which have emerged from the coalescence process allows us to highlight the urban dimension of the Region, a feature which goes unnoticed under the standard conceptualisation of the regional territory based on the administrative borders of municipalities. Moreover, it highlights the importance of these urban systems for the economy of the Marche Region – an importance which appears even greater if we take, as we should, a dynamic perspective and look at the Region's evolutionary potential. Indeed, the eleven urban systems identified have played a major role in the economic development of the Marche Region in the past five decades and are its main urban nodes, where concentration of the economic process of the Region is expected to continue – as confirmed in the comparative analysis of their economic performances over the period 1991-2001 conducted in Chapter 4.

The new territorial configuration generated by territorial coalescence should have engendered an institutional alignment through the formation of new political-

administrative units corresponding to the local systems which had come into being. But since an institutional reform which grants fully institutional recognition to the new relational densities has not yet been accomplished, the distance between 'legal cities' and 'de facto cities' is very wide. Moreover Accordingly, the Marche Region's urban systems still lack a common system of governance and cannot be properly regarded as self-regulating systems.

As the outcome of processes of 'territorial coalescence', the Marche Region's urban systems are 'dispersed cities' and consist of urban systems formed by a constellation of urban agglomerations of markedly different sizes, social and economic functions, urban quality and economic value. On observing the settlement structures of most of the Marche Region's cities, one notes, firstly, that the pivot municipalities are spatially located in a central position – the municipalities which form the urban systems are located around the corresponding pivot municipality or in a semi-circle in the case of the cities located along the Adriatic coast – and, secondly, that they have a spatial organisation characterised by a large open spaces (mostly agricultural land) within their 'borders'. This is a recently-acquired feature of cities, where open spaces play a new role by functioning as connective tissue among settlements. These spaces, daily crossed by commuters as well as by people travelling to or from centres of consumption, culture and recreation, have become an integral part of cities. (For a description of the dispersed spatial configuration of the Marche Region's urban systems see Chapter 3.)

When highlighting the dispersed nature of the urban systems examined, two aspects should be borne in mind. Firstly, this feature has characterised their spatial organisation from the outset, in the sense that, by definition, the phenomenon itself of territorial coalescence gives rise to dispersed cities – at least in its first phases. Secondly, it has been the outcome of the extreme political-administrative fragmentation of the Marche Region's urban systems; in particular, it has been due to the fact that each urban system still devises its spatial development scheme independently. To be noted is that all the urban systems exhibit urban landscapes which have become more spatially dispersed over time.

If one looks at the Marche Region's urban systems from the perspective of the 'European model of city' as it is expressed in the European Union's documents and assumed as the benchmark for analysis of the state of the European cities, a set of relevant current (and potential) disequilibria emerge. Some of them are the outcome of inadequate rules in public space uses – if compared with the new standards of urban quality – and can therefore be tackled by designing new criteria

for the management of the public realm. But most of the current disequilibria are the result of a remarkable under-capitalization of the Marche Region's urban systems. Because the formation of the urban systems was neither pursued nor planned by policy makers and no consideration was given to the economic, social and environmental importance of this phenomenon, the Marche Region's new cities were not sustained by adequate levels of public and private investment during their development process. With the consequence that the gap which has been accumulating between the equilibrium capital stock – that is, the capital level which would provide an adequate level of urban quality – and the actual capital stock is rather wide.

As discussed in the final chapter of this report, the issue of the under-capitalization of the Marche Region's urban systems may be analysed assuming the following perspectives:

a) the spatial organization of the urban systems;

b) the functional organization of the dispersed urban systems;

c) the quality and the environmental performance of the built environment.

This analysis arises the question of the most effective strategy to speed up capital accumulation and fill the capital gap which sharply reduces the competitiveness of the Marche Region's urban systems. As stated in Chapter 5, the governance mechanism of urban development schemes is a key question.

2. THE URBAN SYSTEMS IN THE MARCHE REGION

2.1. The 'territorial revolution' in the Marche Region

In the 1950s the Marche Region began a sustained process of industrialization and expansion which continued with similar intensity until the 1980s. In the decades between 1951 and 1981 manufacturing employment increased by 212%, from 62,645 workers in 1951 to 195,338 workers in 1981. This process gave rise to profound change in the spatial organization of economic and social processes in the Marche Region, a transformation which led to the formation of new cities.

During of the 1950s – and, particularly, in the subsequent three decades – strong demographic growth occurred in a very limited number of municipalities (42 out of 246 in the period 1951-1961) and, at the same time, an equally significant demographic decline in the remaining majority of the region's municipalities – 204 units (Table 2.1). In subsequent decades, the number of municipalities in demographic decline (in each decade examined) diminished, but 92 municipalities continued to lose population between 1991 and 2001. One of the outcomes of these demographic trajectories was an increase in the degree of the population concentration. In 1951 the ten largest municipalities in terms of population in the Marche Region comprised 29% of regional population whereas they comprised 37% in 2001. If we consider the twenty largest municipalities in terms of population in 1951, we find that their share amounted to 42% of regional population in 1951 and to 51% in 2001 (in the period examined, the Marche Region's population increased only by 7.8%.)

Similarly, analysis of the distribution of employment in the 'private sector' (industry and private services employment) and in the manufacturing sub-sector shows a concentration process.

Table 2.1 – Municipalities by class of population growth rates

Growth rates	1951-61	1961-71	1971-81	1981-91	1991-2001
(-100%) - (-30%)	10	38	1	0	0
(-30%) - 0%	194	155	133	130	92
0% - 20%	30	38	99	107	143
20% - 40%	10	9	10	8	11
40% - 80%	1	6	2	1	0
80% - 110%	1	0	1	0	0

Source: ISTAT - Population Census, various years.

The demographic situation of the Marche Region has stabilized since 1981. It was therefore in the period 1951-1981 that the most significant changes in population occurred. For this reason one may state that, during the first decades of industrialization, the Marche Region experienced a 'territorial revolution' in the sense that it underwent remarkable territorial redistribution of its economic and social processes.

2.2. The polarization of economic growth

The demographic dynamics of the municipalities in the Marche Region after 1950 gave rise to the formation and consolidation of eleven growth poles, each of them made up of a set of contiguous municipalities arranged around pivot municipalities (the latter being the largest municipalities in demographic terms in 1951) (Table 2.2). These growth poles consolidated over the subsequent two decades (1981-2001), further increasing their shares of population and total employment with respect to the Marche Region, and extending their territories as new municipalities became part of the various poles. These eleven growth poles, which have become the new cities in the Marche Region, today comprise 93 municipalities (Map 2.1).

One aspect to stress is that the number of these growth poles is sufficiently high if compared with the regional scale and, moreover, that they are rather evenly distributed across the regional space. The Marche Region, therefore, emerged from the 'territorial revolution' of the period 1951-1981 with large areas of social and economic decline but also with a certain number of (strong) growth areas rather evenly distributed across the regional territory. In conclusion, from a territorial perspective, the Marche Region's economic development in the period 1951-1981 can be defined as:

a) 'polarized' because it gave rise to inter-municipal poles which achieved economic performances far better than those in the remaining territory of the region; more precisely, growth manifested itself only in these inter-municipal poles, which comprise a limited share of the regional territory;

b) 'polycentric' because, as already noted, these inter-municipal poles, although limited in number, are nevertheless numerous for a region like the Marche and rather evenly distributed across the regional territory.

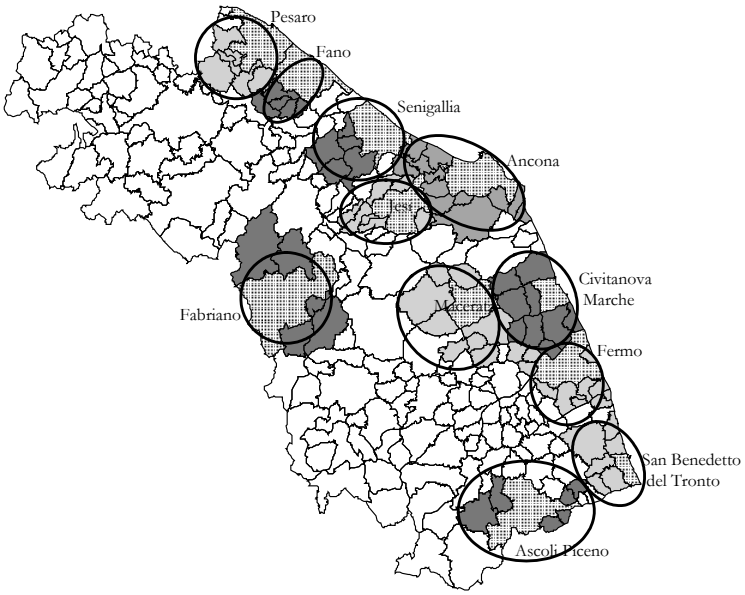
The territorial development of the Marche Region exhibits two interdependent features:

Table 2.2 – Pivots and growing municipalities associated with the corresponding pivots in the period 1951-1981

Municipalities	Number of the growing municipalities associated to the pivot municipality
Pesaro	3
San Benedetto del Tronto	3
Ancona	7
Fano	2
Civitanova Marche	8
Macerata	3
Ascoli Piceno	3
Jesi	2
Senigallia	0
Fabriano	1
Fermo	3
Total municipalities in the urban systems	46

Source: ISTAT - Population Census, various years.

Map 2.1 – Urban systems in the Marche Region



1) it has been driven by a process of territorial self-organization;

2) it has been path-dependent.

The formation of the new urban agglomerations has been the outcome of choices made independently by individuals and private organizations (mostly business firms) which have determined the spatial pattern of the territorial distribution of economies/diseconomies. It has not been pursued or anticipated by policy makers.

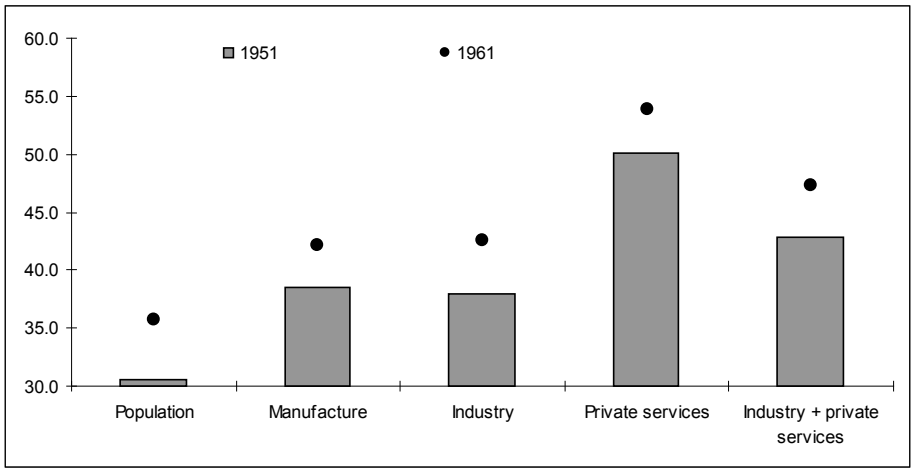
As regards the path-dependent feature of the Marche Region's industrialization process, to be observed is that almost all its major municipalities endowed with a substantial 'industrial core' were able to 'harness' themselves to Italian industrial take-off in the decade 1951-1961. The eleven pivot municipalities of the above-mentioned urban agglomerations were able to begin an accelerated process of accumulation in the manufacturing sector already in the 1950s: in the period 1951-1961, their weights in terms of employment in the various sectors and in terms of resident population increased significantly (Figure 2.1). Their evolutionary potential was sufficiently high to involve the contiguous municipalities from the outset, as regards both the industrial process and urban diffusion. In the decade 1961-1971, the pivot municipalities continued to concentrate population but the industry sector mainly localized in municipalities other than the pivots and contiguous to them (Figure 2.2) – according to a rather common pattern of city construction. Because of this settlement pattern, the urban inter-municipal systems began to take shape and consolidate in the subsequent decade (Figure 2.3), when economic growth expanded into the municipalities different from the pivots in terms of population as well, and, consequently, in terms of employment in private services – which, owing to the importance of private services most closely related to everyday life organization, are more evenly distributed across the territory.

The Marche Region is today characterized by eleven inter-municipal urban systems where most of the regional population and employment is concentrated – 70.9% and 74.4% respectively – and which have achieved high performances in the long run in terms of both demographic and employment growth (Table 2.3).

2.3. The process of territorial coalescence and the formation of new cities

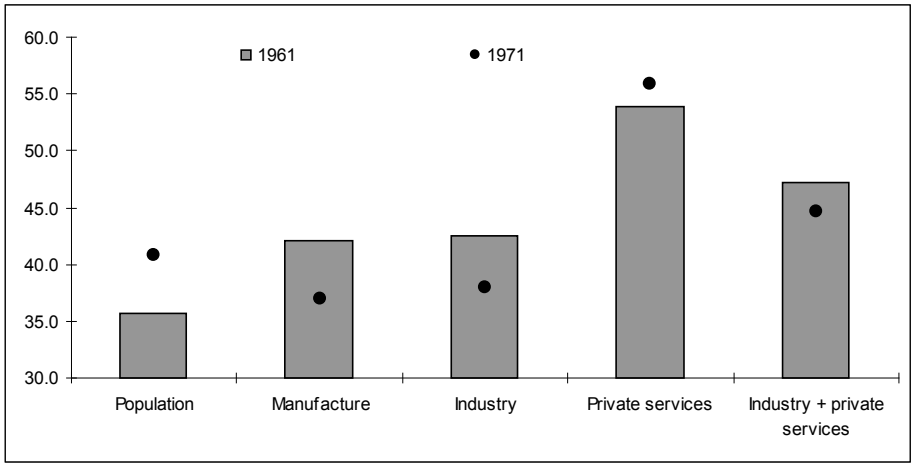
In Italy, the territorial organization of the economic process in the past decades has been deeply characterized by the phenomenon denoted with the expression 'territorial coalescence': the possibility that two contiguous territorial units (municipalities in this case) can increase their interdependence until they are not

Figure 2.1 – Shares of resident population and employment of the pivot municipalities in the Marche Region. Comparison 1951-1961



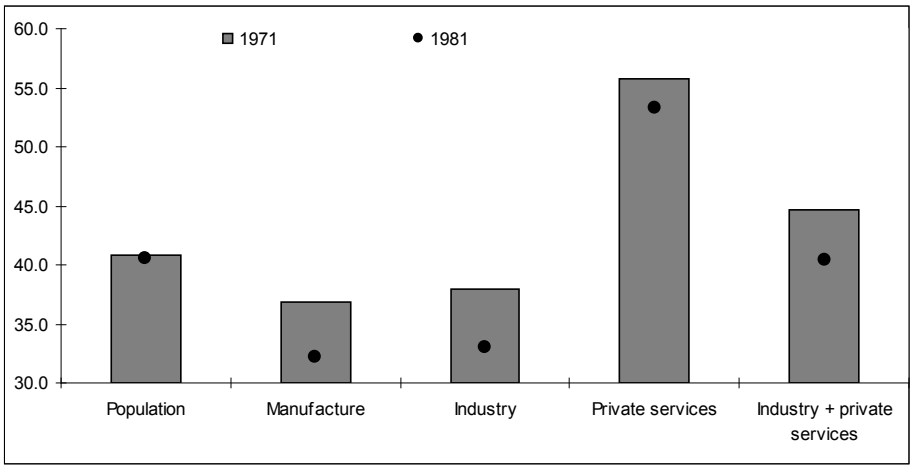
Source: ISTAT - Population Census 1951, 1961; Industry and services Census 1951, 1961.

Figure 2.2 – Shares of resident population and employment of the pivot municipalities in the Marche Region. Comparison 1961-1971



Source: ISTAT - Population Census 1961, 1971; Industry and services Census 1961, 1971.

Figure 2.3 – Shares of resident population and employment of the pivot municipalities in the Marche Region. Comparison 1971-1981



Source: ISTAT - Population Census 1971, 1981; Industry and services Census 1971, 1981.

Table 2.3 – Population and employment growth rates of the urban systems, 1951-2001

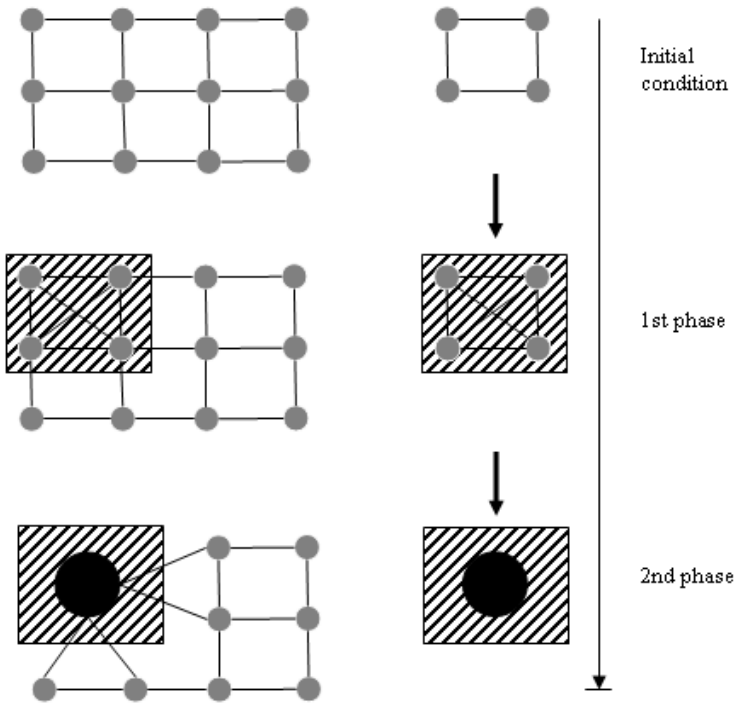
Urban systems	Population	Industrial employment	Manufacturing employment	Private services employment
Ancona	31.6	60.7	54.0	223.1
Ascoli Piceno	21.8	208.7	203.3	279.3
Civitanova Marche	80.4	404.4	411.7	580.1
Fabriano	-8.8	179.4	339.6	204.2
Fano	53.5	375.4	360.6	474.8
Fermo	17.7	282.1	297.1	291.4
Jesi	18.0	136.4	126.2	319.0
Macerata	16.6	196.1	204.6	323.1
Pesaro	59.1	453.0	509.8	482.7
S. Benedetto del Tronto	57.3	251.8	227.8	449.2
Senigallia	7.6	193.1	184.9	313.4

Source: ISTAT - Population Census, various years; Industry and services Census, various years.

functionally autonomous but have become parts of a larger unit – the local system – which has been generated by the integration of the two original units. Figure 2.4 schematically illustrates the territorial coalescence process in the Marche Region.

Given the initial territorial organization, the first phase of territorial coalescence consists in the intensification of the relationships among agents operating in contiguous municipalities. At this stage, synergies and complementarities among contiguous territorial units play a crucial role in determining the function and evolution of those units. Each unit, however, is still autonomous. In the second phase, relational densities among the set of contiguous municipalities become so high as to transform the single units in simple parts of an integrated system and the single municipalities lose their functional autonomy. Each urban agglomeration should be interpreted as a single relational field because agents operating in the various municipalities establish relationships which extend beyond the municipality

Figure 2.4 – The process of territorial coalescence



of residence and comprise agents which operate in the other municipalities belonging to the same urban system.

Territories which underwent the territorial coalescence process that led to the formation of integrated urban systems had a hierarchical spatial organization from the outset. A pivot municipality was clearly recognizable within each growth pole, and this was the predominant hierarchy before the integration that determined the spatial organization of the focal points of the new city. In all the cases examined, processes of territorial integration were oriented toward a municipality (pivot municipality) much larger than the others and whose territory progressively become a place where the major local points of the urban system localized.

An interesting aspect of the territorial organization of Marche is that urban systems of limited scale also seem to exhibit the distinctive feature of cities. They are progressive local systems: that is, they possess the endogenous capacity to generate innovation and investment. It is evident that the urban systems depicted in Map 2.1 displayed high capacities for innovation and investment over the period examined. Indeed, they were able to reproduce and transform their structures over a long period of time, and thereby maintain their competitiveness and economic viability.

In the Marche Region the formation of complex structures in cities of limited scale has been a spontaneous process indubitably sustained by the region's distinctive territorial organization. Already in the 1950s, pivot municipalities displayed the features of the city as regards, for example, size, variety of private services, social composition, and presence of an industrial core. Consequently, the local systems which emerged around these municipalities could not help but retain the urban features that their pivot municipalities displayed before the integration. The urban systems certainly lost the compactness of the physical settlement – but dispersion is a common feature of contemporary cities. They also lost unitariness of government and functions, both strategic and administrative – and for this reason one may apply the concept of 'cities in nuce' (that is, 'cities in formation') to them.

APPENDIX TO CHAPTER 2

Table A – Municipalities in the Marche Region's urban systems: some basic data, 2001

Urban systems	Population	*Population %*	Employment	*Employment %*	Population density	Territory (kmq)
Agugliano	4,163	*2.0*	950	*1.1*	192	22
Ancona	100,507	*47.7*	53,433	*59.7*	812	124
Camerano	6,523	*3.1*	3,846	*4.3*	329	20
Camerata Picena	1,700	*0.8*	929	*1.0*	146	12
Chiaravalle	14,040	*6.7*	2,936	*3.3*	807	17
Falconara Marittima	28,349	*13.5*	7,919	*8.9*	1113	25
Montemarciano	9,173	*4.4*	1,766	*2.0*	415	22
Monte SanVito	5,530	*2.6*	1,787	*2.0*	256	22
Numana	3,293	*1.6*	1,529	*1.7*	307	11
Offagna	1,692	*0.8*	205	*0.2*	161	11
Osimo	29,431	*14.0*	12,321	*13.8*	279	105
Polverigi	3,015	*1.4*	901	*1.0*	122	25
Sirolo	3,313	*1.6*	927	*1.0*	199	17
Ancona	**210,729**	***100.0***	**89,449**	***100.0***	**488**	**431**
Ascoli Piceno	51,375	*67.3*	22,893	*86.1*	320	161
Castel di Lama	7,216	*9.5*	988	*3.7*	658	11
Castorano	2,036	*2.7*	292	*1.1*	145	14
Folignano	8,844	*11.6*	1,017	*3.8*	599	15
Maltignano	2,357	*3.1*	787	*3.0*	289	8
Roccafluvione	2,195	*2.9*	269	*1.0*	36	61
Venarotta	2,270	*3.0*	353	*1.3*	76	30
Ascoli Piceno	**76,293**	***100.0***	**26,599**	***100.0***	**255**	**299**
Civitanova Marche	38,299	*28.1*	16,994	*28.1*	836	46
Montecosaro	5,198	*3.8*	2,538	*4.2*	240	22
Montegranaro	12,860	*9.4*	6,278	*10.4*	412	31
Montelupone	3,221	*2.4*	1,830	*3.0*	98	33
Monte San Giusto	7,324	*5.4*	3,154	*5.2*	366	20
Monte Urano	7,802	*5.7*	4,438	*7.3*	467	17
Morrovalle	9,226	*6.8*	3,799	*6.3*	217	43
Porto Sant'Elpidio	22,752	*16.7*	9,991	*16.5*	1254	18
Potenza Picena	14,524	*10.6*	4,929	*8.1*	305	48
Sant'Elpidio a Mare	15,332	*11.2*	6,602	*10.9*	304	50
Civitanova Marche	**136,538**	***100.0***	**60,553**	***100.0***	**418**	**327**
Cerreto d'Esi	3,308	*6.0*	1,799	*6.6*	199	17
Fabriano	30,019	*54.6*	18,521	*67.5*	111	270
Genga	1,981	*3.6*	757	*2.8*	27	72
Esanatoglia	2,099	*3.8*	723	*2.6*	44	48
Matelica	10,155	*18.5*	3,223	*11.7*	125	81
Sassoferrato	7,419	*13.5*	2,421	*8.8*	55	135
Fabriano	**54,981**	***100.0***	**27,444**	***100.0***	**88**	**623**
Cartoceto	6,490	*8.7*	1,901	*6.5*	280	23
Fano	57,529	*77.3*	23,396	*79.6*	474	121
Montemaggiore al Metauro	2,123	*2.9*	530	*1.8*	163	13
Piagge	970	*1.3*	239	*0.8*	112	9
Saltara	5,101	*6.9*	2,667	*9.1*	512	10
Serrungarina	2,200	*3.0*	658	*2.2*	96	23
Fano	**74,413**	***100.0***	**29,391**	***100.0***	**374**	**199**

Table A – Municipalities in the Marche Region's urban systems: some basic data, 2001 (continued)

Urban systems	Population	*Population %*	Employment	*Employment %*	Population density	Territory (kmq)
Altidona	2,292	*3.1*	761	*2.9*	177	13
Campofilone	1,803	*2.5*	586	*2.3*	149	12
Fermo	35,502	*48.5*	13,647	*52.5*	286	124
Francavilla d'Ete	963	*1.3*	265	*1.0*	94	10
Lapedona	1,148	*1.6*	223	*0.9*	78	15
Monterubbiano	2,387	*3.3*	648	*2.5*	74	32
Monte San Pietrangeli	2,545	*3.5*	1,163	*4.5*	139	18
Moresco	608	*0.8*	137	*0.5*	96	6
Pedaso	1,968	*2.7*	652	*2.5*	539	4
Petritoli	2529	*3.5*	813	*3.1*	106	24
Ponzano di Fermo	1,581	*2.2*	597	*2.3*	110	14
Porto San Giorgio	15,869	*21.7*	5,168	*19.9*	1,850	9
Rapagnano	1,877	*2.6*	675	*2.6*	150	12
Torre San Patrizio	2,132	*2.9*	679	*2.6*	179	12
Fermo	**73,204**	***100.0***	**26,014**	***100.0***	**239**	**306**
Castelbellino	3,618	*5.8*	970	*3.6*	611	6
Castelplanio	3,223	*5.1*	1,267	*4.7*	214	15
Jesi	39,224	*62.4*	18,035	*66.9*	364	108
Maiolati Spontini	5,733	*9.1*	1,883	*7.0*	268	21
Monsano	2,760	*4.4*	2,187	*8.1*	193	14
Monte Roberto	2,446	*3.9*	895	*3.3*	181	14
San Marcello	1,931	*3.1*	499	*1.9*	76	26
Santa Maria Nuova	3,914	*6.2*	1,220	*4.5*	217	18
Jesi	**62,849**	***100.0***	**26,956**	***100.0***	**284**	**221**
Appignano	3,904	*4.3*	1,625	*4.6*	172	23
Corridonia	13,696	*15.2*	5,202	*14.6*	221	62
Macerata	40,875	*45.4*	18,706	*52.7*	441	93
Mogliano	4,831	*5.4*	1,286	*3.6*	165	29
Montecassiano	6,577	*7.3*	2,393	*6.7*	199	33
Petriolo	2,049	*2.3*	621	*1.7*	131	16
Pollenza	5,823	*6.5*	1,698	*4.8*	148	39
Treia	9,449	*10.5*	3,244	*9.1*	102	93
Urbisaglia	2,760	*3.1*	736	*2.1*	121	23
Macerata	**89,964**	***100.0***	**35,511**	***100.0***	**219**	**411**
Colbordolo	5,087	*4.4*	2,673	*4.8*	185	27
Mombaroccio	1,755	*1.5*	751	*1.4*	62	28
Montecicccardo	1,296	*1.1*	233	*0.4*	50	26
Montelabbate	5,345	*4.6*	4,892	*8.8*	273	20
Pesaro	91,086	*78.4*	41,488	*74.8*	720	127
Sant'angelo in lizzola	6,810	*5.9*	3,362	*6.1*	577	12
Tavullia	4,800	*4.1*	2,042	*3.7*	113	42
Pesaro	**116,179**	***100.0***	**55,441**	***100.0***	**412**	**282**
Acquaviva Picena	3,409	*3.9*	1,400	*4.5*	163	21
Cupra Marittima	5,017	*5.8*	1,223	*3.9*	292	17
Grottammare	14,278	*16.5*	4,286	*13.7*	808	18
Monsampolo del Tronto	3,995	*4.6*	1,884	*6.0*	258	15
Monteprandone	10,354	*12.0*	4,003	*12.8*	392	26
Ripatransone	4,356	*5.0*	1,320	*4.2*	59	74
San Benedetto del Tronto	45,054	*52.1*	17,240	*55.0*	1780	25
San Benedetto del Tronto	**86,463**	***100.0***	**31,356**	***100.0***	**439**	**197**

Table A – Municipalities in the Marche Region's urban systems: some basic data, 2001 (continued)

Urban systems	Population	*Population %*	Employment	*Employment %*	Population density	Territory (kmq)
Castel Colonna	961	*1.6*	194	*0.9*	72	13
Corinaldo	5,170	*8.5*	1,763	*8.1*	107	48
Ostra	6,028	*9.9*	1,852	*8.5*	129	47
Ostra vetere	3,536	*5.8*	1,363	*6.3*	118	30
Ripe	3,575	*5.9*	1,592	*7.3*	238	15
Senigallia	41,550	*68.3*	15,007	*68.9*	359	116
Senigallia	**60,820**	***100.0***	**21,771**	***100.0***	**226**	**269**

Source: ISTAT - Population Census 2001; Industry and services Census 2001.

3. THE URBAN SYSTEMS IN THE MARCHE REGION AS ‘DISPERSED CITIES’

3.1. The concept of ‘dispersed city’

A city can grow through the outward expansion of a settlement. In this case, it retains compactness in all phases of its development – that is, it does not lose the archetypical feature whereby relational density is associated with spatial density. But a city can also be the outcome of the ‘territorial coalescence’ of settlements: different settlements, sometimes of very small size, merge over time to form a single system.

Territorial coalescence gives rise, by definition, to dispersed cities – at least in its initial phases. It generates territorial configurations which exhibit the physical form of dispersed cities. Nevertheless, although a city does not display the formal feature of physical compactness, it can express itself as a ‘relational density’, that is, in terms of the intensity and extension of the relationships among agents (individuals and firms), as well as in terms of the knowledge that agents possess about the relational opportunities offered by the local community.

An urban system has a dispersed physical configuration when its urban sub-systems are located at a distance which can be covered by car or by other public means of transport in a short time – in some cases, also by bicycle. In perceptive terms, these urban sub-systems are ‘linked’ by a connective tissue which is constituted by the so-called ‘urban countryside’, and they belong to the same local system because they are ‘stations’ (or ‘legs’) of the same circadian cycles (these being the daily movements made by individuals across space to exchange matter and information).

In the case of the Marche Region – but also in those of the other Italian regions – the interest of the dispersed city derives from the fact that territorial dispersion seems to be a stable territorial configuration – a configuration which must be governed because it is a new form of the manifestation of the urban dimension.

3.2. Urban systems and sub-urban systems in the Marche Region

The eleven urban systems in the Marche Region, indicated here with the names of the corresponding pivot municipalities, are dispersed cities because: a) they have low average population density; b) they are made up of urban settlements, each

of them relatively compact, which are separated by large open spaces (mostly agricultural land) – which have acquired the nature of 'urban countryside'.

A distinctive feature of the Marche Region's settlement structure is the large number of its urban settlements. When analysed in terms of the four settlement types recorded by ISTAT (Census of the Population), the urban systems considered comprise 93 urban centres which are the seats of municipal government, 253 urban centres which do not host any institutional function, 655 small settlements and 37,469 scattered dwellings. In demographic terms, 85.5% of the total urban-system population lives in the urban centres (here considered jointly), whilst 3.6% lives in the small urban settlements, and 11% in the scattered dwellings (Figure 3.1).

3.3. Spatial organization: the position of the pivot municipalities

Better understanding of the settlement dispersion of the Marche Region's urban systems can be gained by considering the weights of the pivot municipalities in terms of the ratio between the population of the pivot municipality and the total population of the corresponding urban system (see the histograms in Figure 3.2).

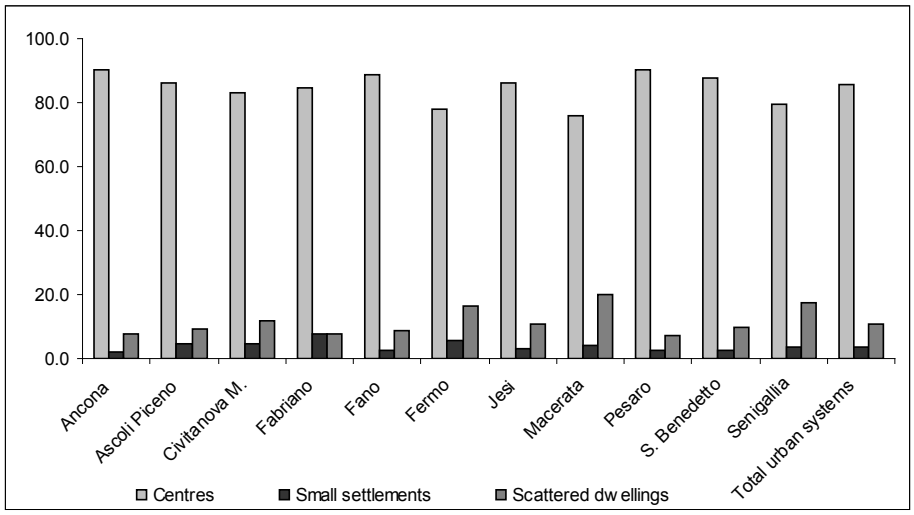
Comparative analysis of these ratios shows a wide differentiation among urban systems. The extreme cases are those of 'Civitanova Marche' – the urban system with the highest degree of settlement dispersion (28.1% of its total population lives in the pivot municipality) – and 'Pesaro' – the urban system with the lowest degree of settlement dispersion (78.4% of its total population lives in the pivot municipality).

On considering the weight of the pivot municipalities in terms of the ratio between the manufacturing employment of the pivot municipality and the manufacturing employment of the corresponding urban system, one notes a wider differentiation among urban systems (see the points in Figure 3.2): the minimum value is 18.2% for 'Macerata' and the maximum value is 87.6% for 'Ascoli Piceno'.

If we compare the weights of the pivot municipalities in terms of population and manufacturing employment, we find that only three urban systems – 'Ascoli Piceno', 'Fabriano' and 'Fermo' – have pivot municipalities with manufacturing employment shares higher than their population shares. Among the remaining urban systems, to be noted are the cases of 'Macerata', 'Pesaro', 'San Benedetto del Tronto' and 'Senigallia', where manufacturing production seems to be sited mainly in the municipalities different from the pivots.

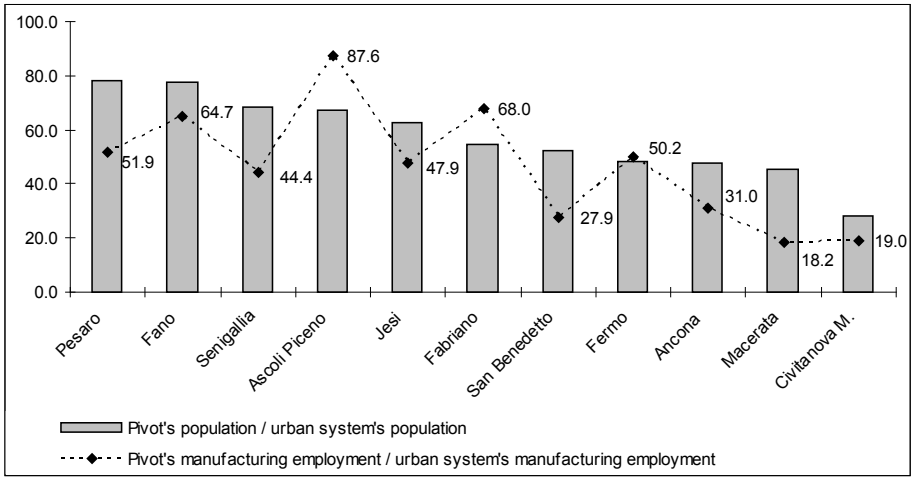
Since all the pivot municipalities of the urban systems considered are located in a

Figure 3.1 – Settlement structures of the urban systems: resident population by settlement type, 2001



Source: ISTAT - Population Census 2001.

Figure 3.2 – Distribution of the resident population and manufacturing employment in the pivot municipalities of the urban systems, 2001



Source: ISTAT - Population Census 2001; Industry and services Census 2001.

central position – and, therefore, the other municipalities comprised in the urban system are located around the corresponding pivot municipality or in a semi-circle in the case of those located along the Adriatic coast – territorial coalescence has given rise to urban systems with a distinctive spatial organization – which, indeed, is typical of urban systems that are the outcome of coalescence processes – where numerous industrial areas are located within the settlement system of the urban system (and not on its outskirts).

Demographic growth in the period 2001-2007 slightly changed the weights of the pivot municipalities, which therefore continued to concentrate very high shares of the total population of the corresponding urban systems. However, in some urban systems more than others there is a tendency towards settlement diffusion in the territories of the municipalities contiguous to the pivots.

3.4. Spatial organization: the presence of several polarities

Another aspect to analyze is the presence of other strong polarities, besides the pivots, and especially in those urban systems where pivots do not concentrate very high shares of population and employment. On examining population distribution among the municipalities comprised in each urban system (Figure 3.3) one finds that the most interesting case is that of 'Civitanova Marche', whose pivot displays a share of population not much higher than that of the second largest municipality (Porto Sant'Elpidio). This finding indicates the presence of another polarity – Porto Sant'Elpidio (see the corresponding chart in Figure 3.3). In the case of 'Fermo', instead, the municipality of Porto San Giorgio, which is significantly larger than the

Figure 3.3 – Distribution of the resident population in the municipalities of the urban systems, 2007

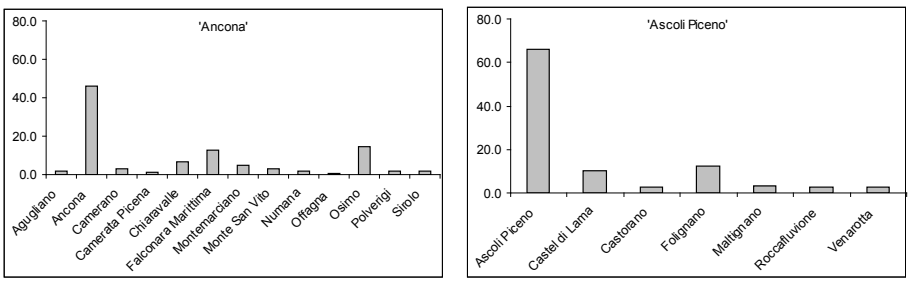
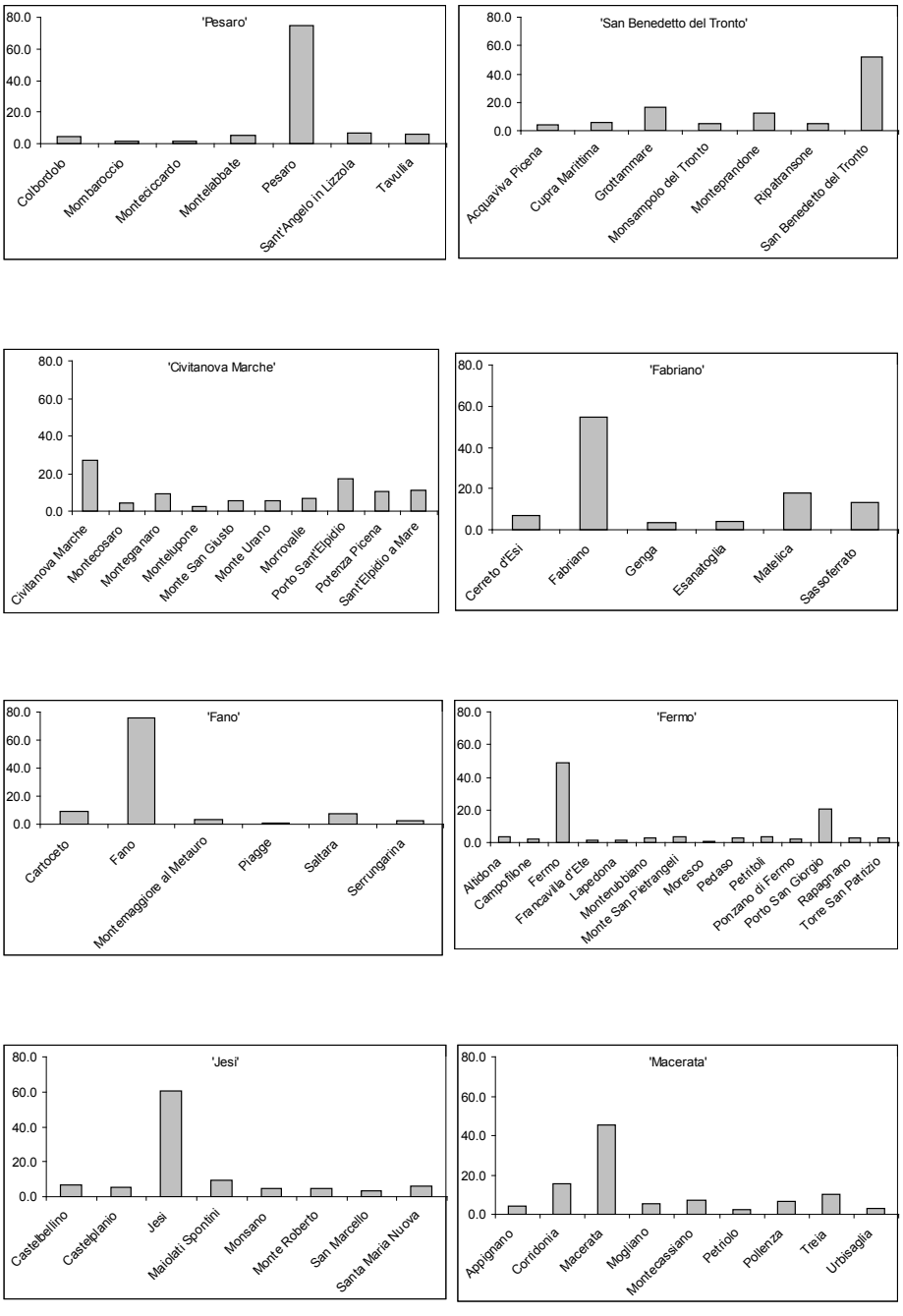


Figure 3.3 – Distribution of the resident population in the municipalities of the urban systems, 2007 (continued)



Source: ISTAT - .www.demo-istat.it

other municipalities, does not constitute another strong polarity in this urban system since its share of population is far lower than that of the pivot.

3.5. Spatial organization: some synthetic indexes

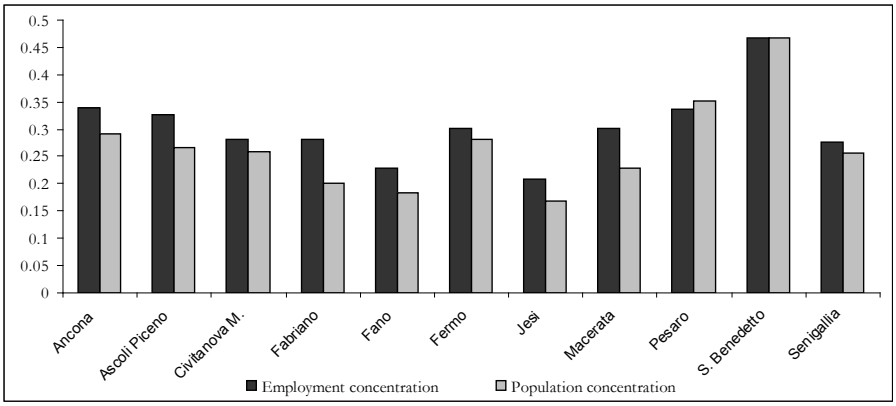
The distributions of population and employment among the municipalities of each urban system can be analyzed using synthetic indexes like the Gini coefficient and the index of distance-weighted average of human activities from the pivot, which allows approximation with a number of the degree of population (or employment) concentration within each urban system.

The Gini coefficient is given by the ratio between the share of population (or employment) and the share of territory of each municipality with respect to the corresponding urban system. It can range from 0 to 1. The more its value approximates 1 the higher the degree of concentration of human activities – which means that human activities are not dispersed across the territory but largely concentrated in one or more settlements.

Examination of the values of the Gini coefficient applied to the Marche Region's urban systems (Figure 3.4) reveals remarkable differences among the urban systems. 'Jesi' and 'Fano' are the least concentrated urban systems in terms of human activities, whilst 'San Benedetto del Tronto', 'Pesaro' and 'Ancona' are the most concentrated ones. Another aspect to highlight, although it is to be expected, is that in all urban systems – with the sole exception of 'Pesaro' – employment is more concentrated than population. This means that, in those cases, pivot municipalities assume more significant roles as productive centres rather than residential centres. 'Pesaro', instead, shows a situation in which its pivot is equally significant in terms of both employment and resident population.

More information about the distribution of human activities within each urban system can be gained by introducing a strictly spatial factor into the analysis: the physical distance among the single municipalities of each urban system. Distances – measured in kilometers – enable determination of the relevance in dimensional terms of the share of human activities localized in the pivot municipality or in its proximity. To this end, we may use indexes of centralization which, unlike concentration indexes, also consider spatial elements by weighting concentrations of human activity on the basis of their localization at a greater or lesser distance from the centre. High values of the centralization index suggest settlement or occupational patterns which tend to be compact or monocentric, whilst low values

Figure 3.4 – Concentration of population and employment: the Gini coefficient, 2001*



* *The Gini coefficient is defined as follows:

$$G_{add} = \frac{1}{2}\left|\frac{add_i}{add_{tot}} - \frac{area_i}{area_{tot}}\right|$$

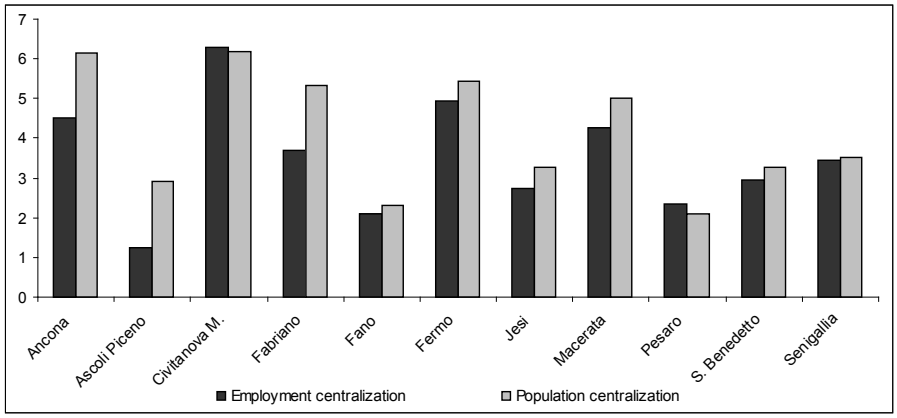
where add_i and $area_i$ are, respectively, the individuals and the territory of the municipality *i* belonging to a given urban system. E and A are, respectively, the individuals and the territory of the urban system. The Gini coefficient ranges between 0 and 1; the higher its value, the greater the degree of concentration of employment (or population) in each urban system.

Source: ISTAT - Population Census and CIS 2001.

suggest dispersed or, alternatively, polycentric urban configurations where the various centres are at a certain distance one from another.

Figure 3.5 shows the levels of centralization of the Marche Region's urban systems obtained by using the index of distance-weighted average of human activities from the pivot. Compared with the picture outlined previously when analyzing the concentration of human activities, we find that spatial configurations are even more differentiated. To be noted are the urban systems of 'Fano', 'Ascoli Piceno' and 'Pesaro', which display the highest levels of centralization: that is, population and employment are mainly concentrated in the pivots or in their contiguous municipalities. Conversely, 'Ancona', 'Civitanova Marche', 'Fermo' and 'Fabriano' show the lowest levels of centralization: that is, high weighted average distances of human activities from the pivot. As previously stressed, a low degree of centralization suggests a high degree or dispersion or, alternatively, a 'concentrated decentralization', this being the expression commonly used to denote polycentric systems.

*Figure 3.5 – Levels of centralization of population and employment: ADC index *, 2001*



* The index of the weighted average distance of human activities from the pivot is given by the following expression:

$$ADC = \sum_{i=1}^{n} add_i * dist\_c_i / add_{tot}$$

where add_i is the number of individuals in municipality i, $dist\_c_i$ is the distance between the pivot and municipality i; add_{tot} is the total number of individuals in the urban system. The lower the value of the index, the higher the degree of urban centralization.

Source: ISTAT - Population Census 2001; Industry and services Census 2001.

Another aspect to be noted is the difference between the degree of centralization of the population and the degree of centralization of employment among the urban systems of the Marche Region. With regard to the centralization of employment, the urban systems are almost always more centralized – less distant from the centres – than they are in terms of population, although the intensities differ from one urban system to another. 'Ascoli Piceno' and 'Ancona' are the cases where it is most evident that employment is, on average, more centralized than population. The sole exception is 'Civitanova Marche, where population is more centralized than employment – a feature due to its polycentric nature and the fact that manufacturing employment (55% of total employment) is diffused across the territory – and its pivot takes the form of a residential, commercial and recreational centre.

3.6. Dynamics of spatial organization

As already highlighted, the Marche Region’s urban systems have followed a strongly path-dependent trajectory of spatial development. Since the 1950s, eleven growth poles made up of sets of contiguous municipalities have come into being – and have enlarged and consolidated over time. Within each growth pole, a municipality which is considerably larger and economically stronger than the other municipalities can be clearly recognised. Subsequently, these municipalities have become the pivots of the corresponding urban systems. The evolutionary potential of these eleven hierarchically high-ranking municipalities – which, it should be stressed, were the Marche Region’s municipalities to be first on the list expressed in terms of employment in 1951 – has been such to involve their contiguous municipalities in both the process of industrial accumulation and the trajectories of spatial development (settlement dynamics).

Although with some differences – and the cases of ‘Civitanova Marche’, ‘Pesaro’ and ‘Ancona’ are the most remarkable ones – the diffusion of human activities from the pivots to their contiguous municipalities has moved through the following phases:

a) in the period 1951-1961 – the beginning of the industrialization process – employment and population increased significantly in the pivot municipalities;

b) during the decade 1961-1971 the pivots continued to concentrate population but manufacturing employment increased mainly – urban system by urban system – in the municipalities different from the pivots and contiguous to them;

c) in the subsequent decade 1971-1981, instead, municipalities different from the pivots increased total employment.

3.7. Functional organization

A city comprises a set of focal points where the circadian cycles of individuals intersect. The types of focal points that circadian cycles must connect can be clustered into the following four groups: residence, work/education, recreation, exchange. The distances among these types of focal points are among the factors that most influence the functioning of a city. For instance, the location of new commercial poles in a spatially barycentric position – the outcome of which has been the loss of importance of local markets – has significantly enlarged the circadian cycles of the urban systems’ dwellers and has determined extremely high

car dependence for exchange purposes. Similarly, distances between places of residence and the major recreational focal points have increased as sub-systems have lost their recreational function.

Since no field study on the functional organization of the Marche Region's urban systems has been conducted to date, we may draw on data concerning home-to-work and home-to-school commuting flows (ISTAT, population census). These data yield a more accurate description of the features of some of circadian cycles, whilst further information can be gained by looking at the location in space of fund elements (infrastructures, buildings, factories, houses, schools, commercial places).

On observing home-to-work and home-to-school commuting flows of the urban systems considered, one notes two main features: a) their high degree of self-containment; b) the importance of the pivot municipalities. As regards the former feature, Figure 3.6 – in which the urban systems have been arranged in decreasing order in terms of their self-containment degree with respect to the flows of commuters who leave their municipality's boundaries for work/school each day – shows that:

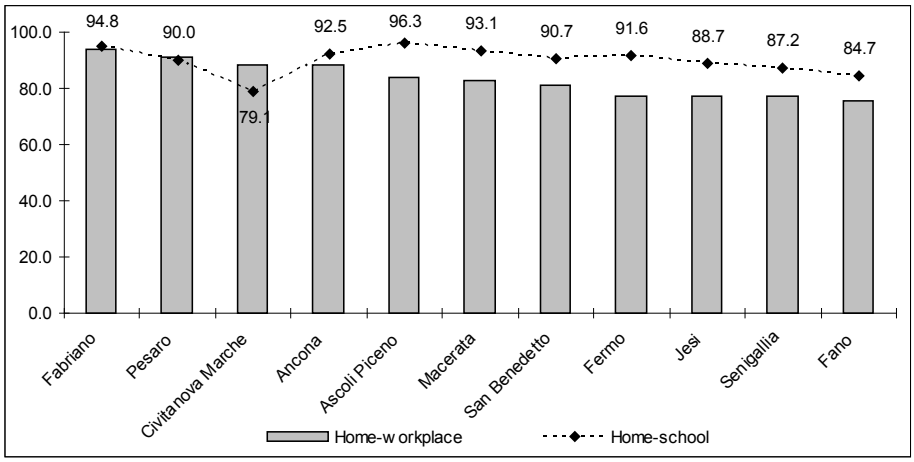
a) all the Marche Region's urban systems display high values of home-to-work commuting flows (minimum value of 75.4% for 'Fano' and maximum value of 94% for 'Fabriano');

b) with the exceptions of 'Civitanova Marche' and 'Pesaro', the values of home-to-school commuting flows are always greater than the values of home-to-work commuting flows.

The values of home-to-work commuting flows and home-to-school commuting flows both seem to corroborate the hypothesis that the urban systems are strongly integrated from a functional point of view.

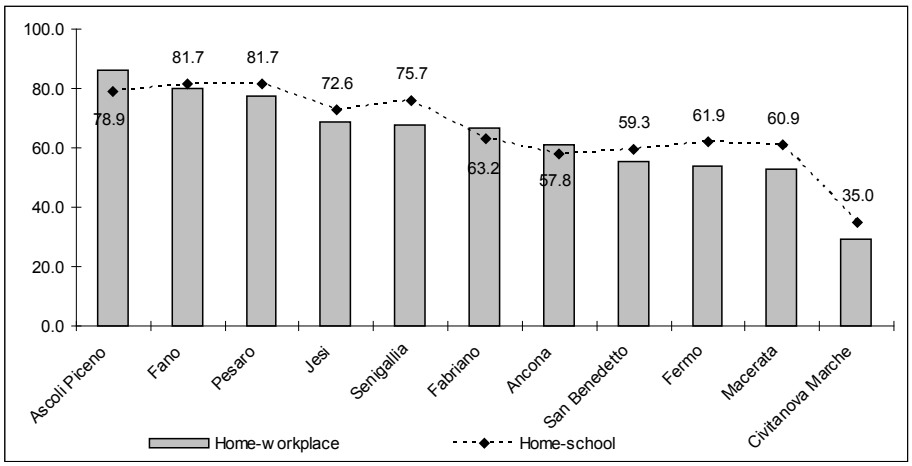
An idea of the importance of the pivot with respect to the corresponding urban system as the destination of commuter flows can be gained by considering the intensity of the flows of home-to-work commuters who leave their municipality's boundaries for the other municipalities in the same urban system. As evidenced by Figure 3.7, with the sole exception of 'Civitanova Marche', which is characterized by a clear polycentric functional organization, all pivot municipalities are the destinations of very high home-to-work commuting flows, never lower than 53% and, in some cases, close to or greater than 80%. If we consider home-to-school commuting flows, the degree of gravitation of the municipalities belonging to the urban systems considered with respect to the corresponding pivots increases further. The sole exceptions are 'Ascoli Piceno', 'Fabriano' and 'Ancona'.

Figure 3.6 – Home-to-work and home-to-school flows of commuters who leave their municipality's boundaries: self-containment of the urban systems, 2001



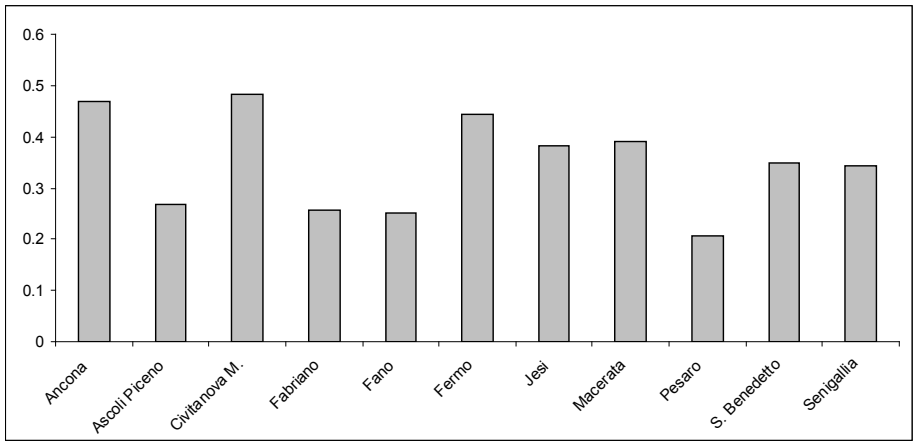
Source: ISTAT - Population Census 2001.

Figure 3.7 – Home-to-work and home-to-school flows of commuters who leave their municipality's boundaries: weights of the pivots with respect to the corresponding urban systems, 2001



Source: ISTAT - Population Census 2001.

Figure 3.8 – Degree of functional polycentrism in the urban systems: index of ordinary polycentrism, 2001*



*The index of ordinary polycentrism is given by the following expression:

$OP = 1 - \sigma F/\sigma F_{max}$

where σF is the standard deviation calculated on the values of the degree of entry (in-degree) for each municipality in each urban system, using commuting flows for reasons of work; σF_{max} is the standard deviation of a hypothetical network with only two nodes in which n_1=0 and n_2=the maximum value of the *in-degree* within urban system. The OP index varies from 0 to 1, where 0 denotes complete monocentrism and 1 denotes complete polycentrism. The logic behind construction of this indicator is the idea that an urban system can be considered more polycentric, the more uniformly the nodes of the network are connected together.

Source: ISTAT - Population Census 2001.

Accurate description of the functional organization of the Marche Region's urban systems can be made by examining their degrees of polycentrism in terms of home-to-work commuting flows and applying the index of ordinary polycentrism (Figure 3.8). In fact, comparative analysis of the urban systems on the basis of their functional structures expressed in terms of commuter flows is of interest because it may highlight functional organizational forms similar to monocentric or polycentric models. The form taken by commuter flows within a given urban system can provide further information on hierarchies among municipalities which cannot always be obtained by considering only the number of residents (or employers) or other morphological characteristics.

The urban systems with higher degrees of polycentrism are those with more sub-centres on their territories, which, in this case, is to be interpreted as a ‘thickening’ of commuter flows and therefore, of relations. A relational ‘thickening’ usually pertains to places qualified as ‘central’ on the basis of the movements of individuals which they are able to attract. In this case, the movements of individuals are associated with the production of goods and services.

The results of the analysis conducted coherently with the above analysis of the weights of the pivots in terms of their attractiveness to commuter flows are shown in Figure 3.8. ‘Civitanova Marche’ is the most polycentric system, followed by ‘Ancona’ and ‘Fermo’. At the other extreme stands ‘Pesaro’, which is the most monocentric urban system, in that it contains only one centre which attracts most of the commuter flows and comprises most of the central functions of the urban system. Substantially monocentric, too, are the functional structures of ‘Fano’, ‘Fabriano’ and ‘Ascoli Piceno’.

4. THE URBAN SYSTEMS IN THE MARCHE REGION: STRUCTURES AND PERFORMANCES

4.1. Urban dimension in the Marche Region

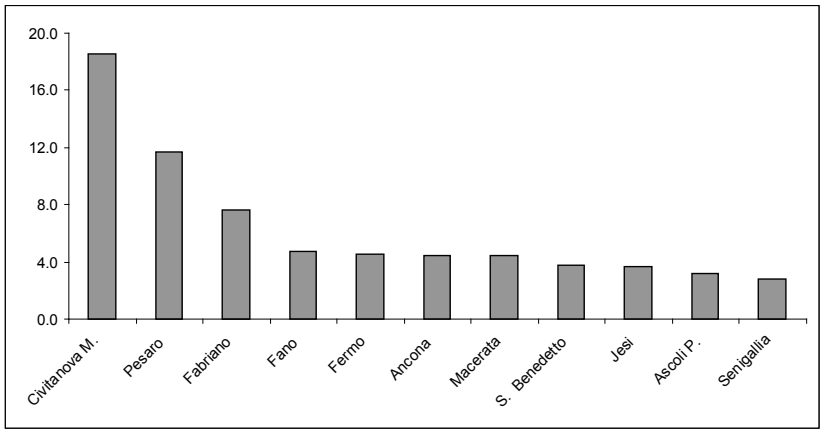
The eleven urban systems considered comprise a large share of the regional population (70.9%) and employment (74.4%). In 2001 their total resident population amounted to 1,042,433 inhabitants and total employment to 430,485 workers. These urban systems differ greatly in scale (resident population and employment) (Table 4.1) and their contributions to the growth of the regional employment in the manufacturing sector – a crucial sector for the region's economic development in the period 1951-2001 – have been highly differentiated (Figure 4.1). The three urban systems of key importance for the region's manufacturing growth have been 'Civitanova Marche', 'Pesaro' and 'Fabriano'. These have contributed to total annual change in manufacturing employment of the Region to the amount of 18.5%, 11.7% and 7.7% respectively. Contributions by other urban systems have been slightly more or slightly less than 4%.

Table 4.1 – The urban systems in the Marche Region: some basic data, 2001

Urban systems	Population	*Population %*	Employment	*Employment %*	Population density	Territory (kmq)	Municipalities (n.)
Ancona	210,729	*14.3*	89,449	*15.5*	488	431	13
Civitanova Marche	136,538	*9.3*	60,553	*10.5*	255	299	10
Pesaro	116,179	*7.9*	55,441	*9.6*	418	327	7
Macerata	89,964	*6.1*	35,511	*6.1*	88	623	9
S. Benedetto del Tronto	86,463	*5.9*	31,356	*5.4*	374	199	7
Ascoli Piceno	76,293	*5.2*	26,599	*4.6*	239	306	7
Fano	74,413	*5.1*	29,391	*5.1*	284	221	6
Fermo	73,204	*5.0*	26,014	*4.5*	219	411	14
Jesi	62,849	*4.3*	26,956	*4.7*	412	282	8
Senigallia	60,820	*4.1*	21,771	*3.8*	439	197	6
Fabriano	54,981	*3.7*	27,444	*4.7*	226	269	6
Total urban systems	1,042,433	*70.9*	430,485	*74.4*	292	3,565	93
Marche Region	1,470,581	*100.0*	578,273	*100.0*	151	9,750	246
Total urban systems / Marche Region	*70.9*		*74.4*			*36.6*	*37.8*

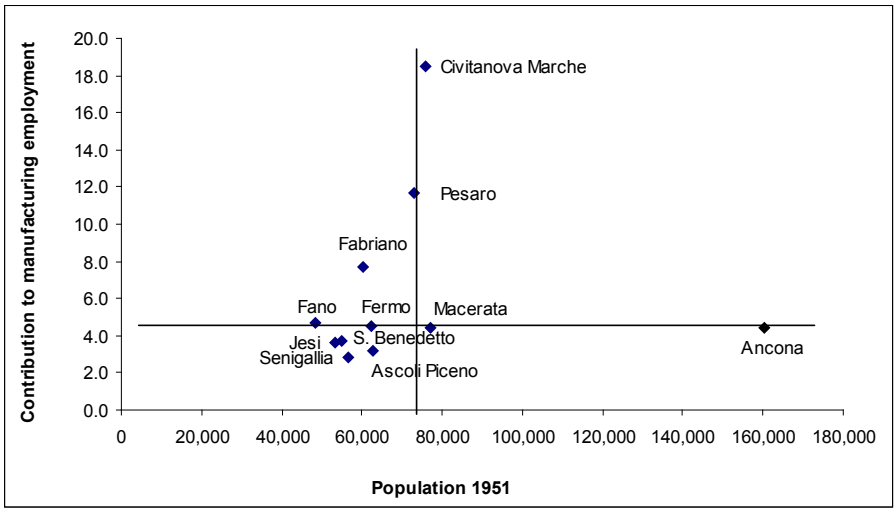
Source: ISTAT - Population Census 2001; Industry and services Census 2001.

Figure 4. 1 – Contribution of the urban systems to regional growth of manufacturing employment, 1951-2001, % values



Source: ISTAT - Industry and services Census, various years.

Figure 4. 2 – Contribution of the urban systems to regional growth of manufacturing employment, 1951-2001, % changes



Source: ISTAT - Population Census 1951; Industry and services Census, various years.

However, the contributions to the region's manufacturing growth by the individual urban systems do not wholly reflect their scales (Figure 4.2). 'Fabriano', the smallest urban system in terms of population, has contributed significantly, whereas 'Ancona', the largest one – four times the scale of 'Fabriano' – has contributed less than 'Fabriano'. Among the three urban systems, a role of key importance in the region's manufacturing growth has been played by 'Civitanova Marche' – that is, the 'footwear industrial district'.

The hierarchy changes, though not significantly, when considering the private sector (industry and private services). 'Civitanova Marche' and 'Pesaro' continue to be first on the list, but 'Ancona' moves into a more prominent position.

4.2. Trajectories of economic growth

4.2.1. Demographic dynamics

In the period 1951-2001 all the urban systems in the Marche region, with the sole exception of 'Fabriano', whose population decreased by 8.8%, displayed positive or very positive demographic trends (Table 4.2). Yet they differed greatly in terms

Table 4.2 – The urban systems in the Marche Region: evolution of the resident population

Urban systems	1951	1961	1971	1981	1991	2001	1951-2001 absolute changes	1951-2001 *% changes*
Ancona	160,141	179,424	197,356	205,160	206,194	210,729	50,588	*31.6*
Ascoli Piceno	62,632	65,882	68,801	73,251	76,973	76,293	13,661	*21.8*
Civitanova Marche	75,672	89,815	112,852	125,711	130,767	136,538	60,866	*80.4*
Fabriano	60,289	52,574	49,520	52,957	52,583	54,981	-5,308	*-8.8*
Fano	48,488	52,939	60,355	66,611	69,545	74,413	25,925	*53.5*
Fermo	62,186	65,825	69,241	70,702	71,723	73,204	11,018	*17.7*
Jesi	53,245	54,502	57,219	60,295	61,615	62,849	9,604	*18.0*
Macerata	77,138	81,504	86,158	88,471	89,580	89,964	12,826	*16.6*
Pesaro	73,041	82,282	100,003	107,997	108,878	116,179	43,138	*59.1*
San Benedetto	54,959	61,018	71,589	77,478	80,260	86,463	31,504	*57.3*
Senigallia	56,529	56,000	56,301	58,567	59,740	60,820	4,291	*7.6*
Total urban systems	784,320	841,765	929,395	987,200	1,007,858	1,042,433	258,113	*32.9*
Marche Region	1,364,030	1,347,489	1,359,907	1,412,404	1,429,205	1,470,581	106,551	*7.8*
Total urban systems / Marche Region	*57.5*	*62.5*	*68.3*	*69.9*	*70.5*	*70.9*		

Source: ISTAT - Population Census, various years.

of growth rates, which varied from the maximum value of 80.4% ('Civitanova Marche') to the minimum value of 7.6% ('Senigallia'). The urban systems with the best demographic performances were: 'Civitanova Marche' (80.4%), 'Pesaro' (59.1%), 'San Benedetto del Tronto' (57.3%) and 'Fano' (53.5%). 'Ancona' stood at an intermediate level (31.6%), while the remaining urban systems recorded performances below 22%. In absolute terms, 'Civitanova Marche', 'Ancona' and 'Pesaro' were the urban systems with the largest population growths – about 61,000 units, 51,000 units and 43,000 units, respectively.

To gain better understanding of the demographic growth of the Marche's urban systems, one must consider that at the beginning of the 1950s – that is, at the beginning of the industrialization process – the territories considered had large shares of their active populations still employed in the primary sector (the maximum value was 64%). Such a high share of the active population in agriculture was due either to the low capitalization of the traditional share-cropping farms or to their family structures, factors which generated a high share of 'hidden unemployment' – that is, of labour with a very low marginal productivity. This explains why in the 1950s and 1960s employment in the primary sector fell very rapidly under the joint effect of capital investment and the reduction of 'hidden unemployment'. At the level of the individual local systems, the restructuring process which began in the 1950s caused a mass exodus of labour from the primary sector. The region's urban systems were able to absorb these flows of labour and showed very positive demographic trends, which were also boosted by immigration flows.

The urban systems which experienced very positive demographic trends until the 1970s continued to grow thereafter, displaying high growth rates, although lower than those recorded in the previous decade, and they saw modest increases – with some cases of population stagnation – in the 1980s. To be observed since the 1990s is a modest demographic growth which becomes stronger over the period 2001-2007, when the urban systems considered increased their populations by 60,698 units. This is striking demographic growth if we consider that only in the 1960s – the decade of the highest demographic increases in the urban systems – did they experience better population performances (about 87,000 units).

The trend towards concentration of the population in the Marche's urban systems continues: 73.6% of the region's total demographic growth has occurred in the urban systems. Consequently, their weight in terms of resident population peaked at 71% in 2007 (in 1951 the value was 57.5%). Not all the urban systems considered have achieved remarkable demographic performances. 'Fano', 'Pesaro' and 'Civitanova

Marche' have recorded much higher performances in terms of both growth rates and absolute values. To be noted in particular is the performance of 'Ancona', which is the lowest in terms of growth rates.

Examining the temporal profile of the demographic growth of the urban cities in the various sub-periods and over the entire period examined (Figure 4.3) shows that:

a) urban systems have experienced very different demographic growth rates, especially during the first two decades;

b) no urban system has displayed constant demographic growth rates over time;

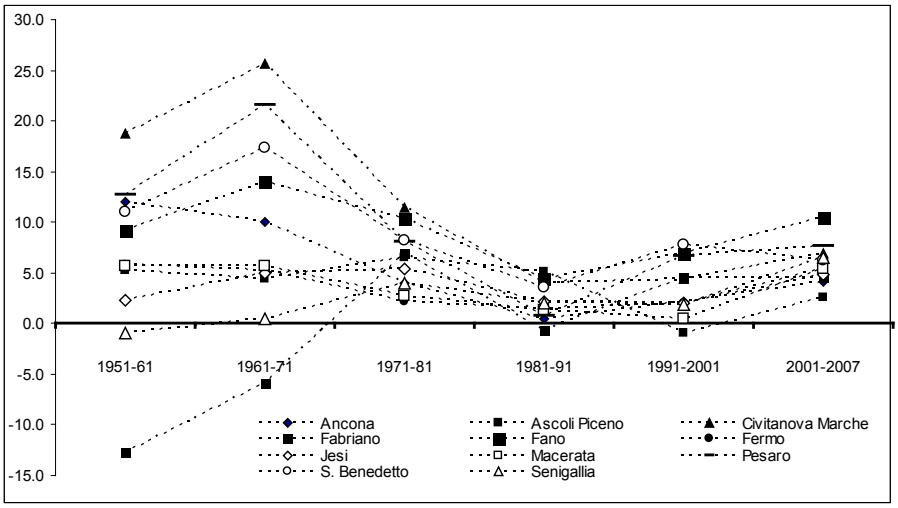
c) demographic trends have not been synchronized;

d) from 1961 to 1991 demographic growth rates progressively aligned downwards;

e) since 1991 demographic growth rates have tended to be more differentiated and have all again become positive.

Population performances can be taken as proxies for economic performances – particularly with regard to the evolution of an urban system's size. Indeed, population growth has been driven by a constant disequilibrium between labour demand and labour supply, which has always given rise to positive net migration flows – mainly

Figure 4.3 – Population growth rates of the urban systems – various decades



Source: ISTAT - Population Census, various years; www.demo-istat.it

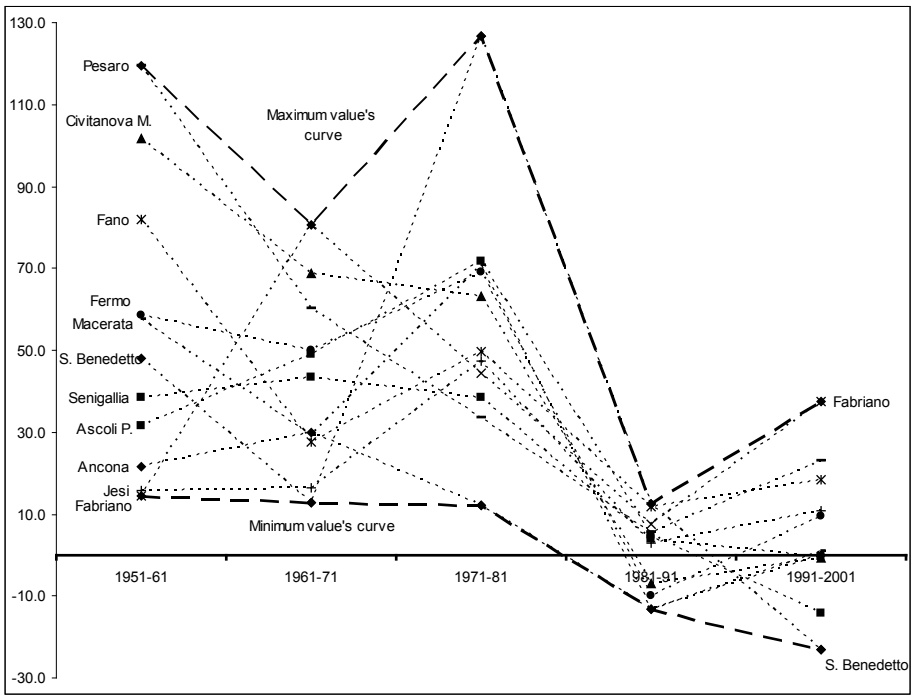
in the years when the Marche Region's urban systems grew to the greatest extent. On comparing their demographic and industrial performances (see Figures 4.3 and 4.4), a symmetry can be observed. Although in those years employment in the primary sector was still high, the labour that this sector could free – and did so – could satisfy only a minor part of the increase in the labour demand manifest in each urban system.

4.2.2. Industrial and manufacturing employment

The Marche Region has been a case of 'accelerated industrialization' which has manifested itself in polycentric patterns: its evolutionary potential has been comprised mainly in the 'inter-municipal poles' which later became 'cities in nuce'.

In the period 1950-1980 all the territories which integrated and gave rise to the urban

Figure 4.4 – Manufacturing employment growth rates of the urban systems – various decades



Source: ISTAT - Industry and services Census, various years.

systems considered began sustained industrialization, albeit at different intensities. Some of them achieved particularly high performances, whilst others experienced much lower ones. Figure 4.4 highlights certain features of the industrial dynamics of the Marche Region's urban systems:

a) growth rates in manufacturing employment have been remarkable, and their dispersion was already high during the first two decades (1951-1971), the decisive decades in consolidation of the urban systems' structures and sizes;

b) there was a progressive downward alignment of growth rates until 1991 – with the sole exception of 'Fabriano';

c) already in the period 1981-1991 some of the urban systems recorded negative performances in terms of manufacturing employment – performances which were continued in the next decade (1991-2001);

d) in the period 1991-2001 the variability of growth rates once again increased;

e) growth rates have not been synchronized, and this seems to confirm that the urban systems considered possess different structures and different self-regulating mechanisms. To be noted, for example, is that 'Pesaro' and 'Civitanova Marche' achieved high performances already at the beginning of the industrialization process (1951-1961) – and in the next decade as well – whereas 'Fabriano', after a slow start, increased its manufacturing employment in the period 1961-1971 to a striking extent. Moreover, 'Ascoli Piceno' and 'San Benedetto del Tronto' achieved high performances two decades later, in the 1970s.

On observing Figure 4.5, where urban systems are arranged in decreasing order with respect to their occupational dimension in 1991, urban-system performances can be compared with the corresponding potential performances achieved if all of them had followed the same total employment growth rate, in this case given by the weighted average growth rates of the urban systems considered in the period 1991-2001 (+11.7%).

'Pesaro', 'Fabriano' and 'Fano' are the urban systems with the most remarkable performances. The worst are those recorded by 'San Benedetto del Tronto' and 'Ascoli Piceno'. More interesting is that, with the sole exception of 'Pesaro', the largest urban systems in terms of employment are those achieving performances below – and significantly so – the benchmark value.

Comparison among absolute changes in total employment and absolute changes in manufacturing employment (Figure 4.6), private services (Figure 4.7) and public

services (Figure 4.8) in the decade 1991-2001 highlights, more clearly for some urban systems than others, some interesting stylized facts:

- 'Pesaro' and 'Fabriano' are the two urban systems whose economies have grown substantially and in a balanced way: not only did manufacturing employment increase – and significantly so – but private services grew as well (mainly the sub-sector of 'real estate services, computer, and related services, research and other business services';

- 'Ancona' displays economic dynamics which indicate that its economy is expanding into the service industry: on the one hand, it has experienced remarkable employment growth in private services (and in public services too), on the other it has undergone a reduction in manufacturing employment;

- 'Ascoli Piceno' and 'San Benedetto del Tronto' – the two urban systems that in the 1990s underwent economic stagnation – has had high employment increases in public services; this factor has prevented employment reduction in manufacturing activities (and in the industrial sector) – one of the highest among the region's urban systems – from giving rise to a reduction of total employment;

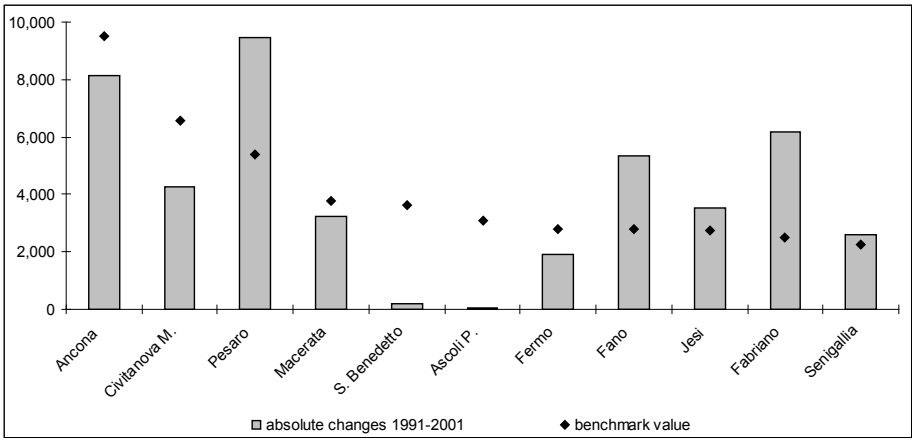
- 'Civitanova Marche', the second urban system in the Marche Region in terms of employment after 'Ancona', and which has contributed most to the growth of the region's manufacturing sector since the 1950s, seems to be entering a transition phase (in the period 1991-2001 its economy experienced a low growth rate of total employment): the negative dynamic of manufacturing activities combined with the positive dynamic of private services suggest that its economy is expanding into the service industry (all sub-sectors of private services have grown as much as, or more than, the corresponding sub-sectors of the other urban systems).

In the period 1991-2001, the Marche Region's total employment increase of 56,008 units (10.7% growth rate) evidences a tendency towards concentration of the service industry in the urban systems: the weight of the urban systems' employment as far as the industry sector is concerned has slightly fallen – from 70.2% to 68.8% – but the weight of employment in private services has increased – from 78.2% to 79.8% – and so has the weight of employment in public services – from 75.3% to 77.3%.

This trend can be analysed more accurately if we consider employment growth recorded in the industrial sector and in private and public services associated with the following two territorial areas: 'urban systems' and 'rest of the regional territory' (Table 4.3).

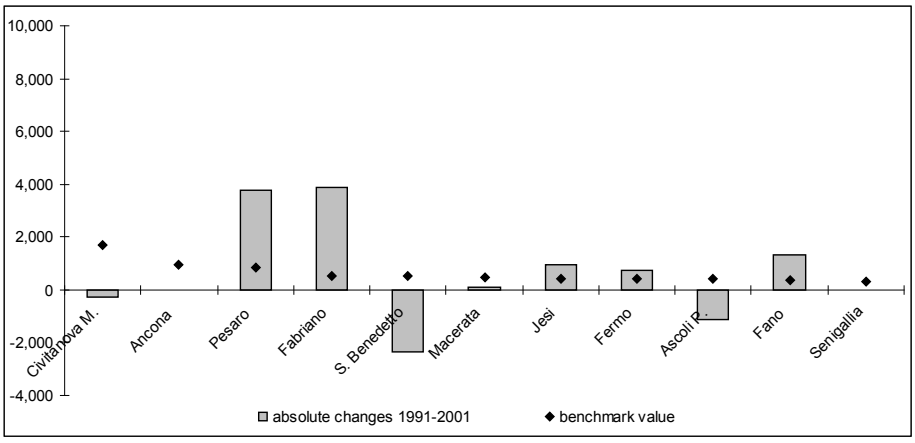
Whereas in the case of the industrial sector 51% of the employment growth has

Figure 4.5 – Total employment, 1991-2001, absolute values



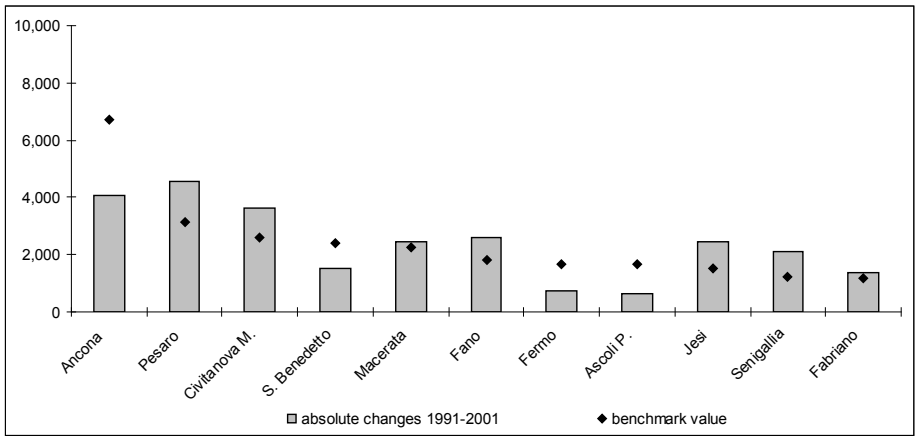
Source: ISTAT - Industry and services Census 1991, 2001.

Figure 4.6 – Manufacturing employment, 1991-2001, absolute values



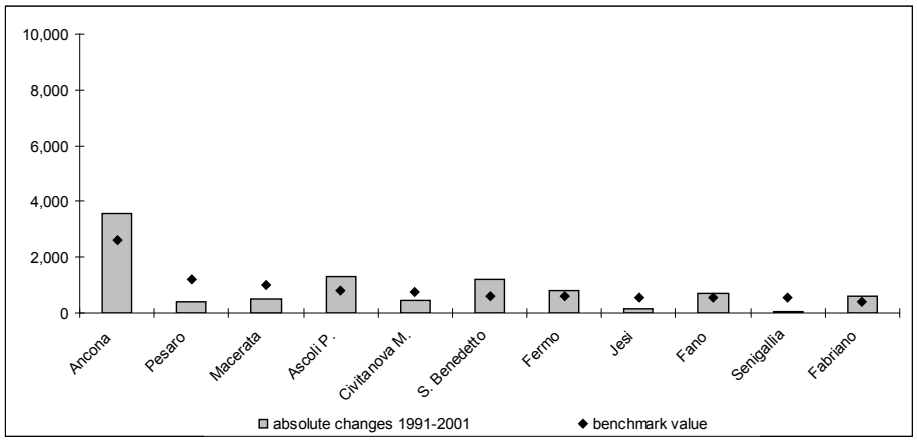
Source: ISTAT - Industry and services Census 1991, 2001.

Figure 4.7 – Employment in private services, 1991-2001, absolute values



Source: ISTAT - Industry and services Census 1991, 2001.

Figure 4.8 – Employment in public services, 1991-2001, absolute values



Source: ISTAT - Industry and services Census 1991, 2001.

been experienced by the urban systems – and also, in absolute terms, urban system industrial employment has increased more or less equally with that in the rest of the regional territory – in private and public services, employment growth in the urban systems accounts respectively for 89.7% and 99.7% of the total regional growth. Private and public services employment increases in the urban systems have been consistently higher in absolute values than those displayed by the rest of the regional territory. We would stress that the modest increase in private and public services employment relative to the rest of the regional territory – that is, the regional territory not comprised in that of the urban systems considered – concerns an area which accounts for 63.4% of the total regional territory and comprises 29.1% of the total regional population. Another important aspect to highlight is that private services have experienced much higher employment growth than that recorded by the other two sectors. With regard to employment growth rates of the industry sector and of private and public services, the striking differences between performances achieved by the urban systems and by the remaining territory of the region are evident on observing Figure 4.9.

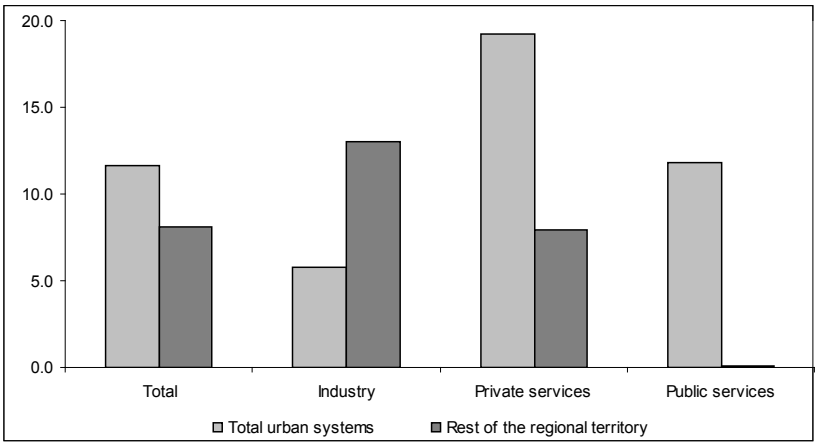
This trend towards concentration of the service industry in the Marche Region's urban systems requires careful analysis. Most of the regional territory not comprised in the urban systems considered has undergone demographic and social decline. Most of this territory articulates into small and very small scale local systems which emerged from 'weak' processes of coalescence mainly driven by the integration of relational systems with respect to transaction processes. If the concentration of the service industry in the urban systems continues – and all the conditions are in place for it to do so – it is very likely that a situation of 'territorial depauperation' and an

Table 4.3 – Absolute and percentage employment changes, 1991-2001

Employment	Total	Industry	Private services	Public services
Absolute changes 1991-2001				
Total urban systems	44,928	9,464	26,131	9,717
Rest of the regional territory	11,080	9,075	3,004	26
Percentage changes 1991-2001				
Total urban systems	*11.7*	*5.8*	*19.3*	*11.8*
Rest of the regional territory	*8.1*	*13.0*	*7.9*	*0.1*

Source: ISTAT - Industry and services Census 1991, 2001.

Figure 4.9 – Growth rates of employment in the urban systems and in the rest of the regional territory: a comparison, 1991-2001



Source: ISTAT - Industry and services Census 1991, 2001.

increase in the dependence of 'non-urban' territories on 'urban' ones will occur. This will have obvious consequences for the welfare of the local populations and their demographic trends. But the relative proximity of the 'non-urban' territories to one of the poles of the polycentric system of the Marche Region made possible by the use of the car allows this dependence to be maintained.

Stressing the features of the Marche Region's urban polycentrism on the basis of the model put forward here highlights a potential territorial dis-equilibrium now developing in the region and caused by local systems that grow by appropriating functions which would be better left diffused across the territory. From this perspective, these urban systems seem unable, with some exceptions, to perform their progressive function of previous decades. All of them seem to have entered a structural transition phase whose outcomes are uncertain.

4.3. Economic structures of the Marche Region's urban systems

On analyzing the economic structures of the region's urban systems one notes striking differences among some of their basic structural features, such as the sector and sub-sector composition of their economies – features which are crucial to understanding (although preliminary way) of the effects on their development

trajectories exerted by changes in the international division of labour (Figure 4.10).

The urban systems considered are very much differentiated in terms of industrial employment, with shares ranging from a minimum of 27% ('Ancona') to a maximum of 59.3% ('Civitanova Marche'). They also differ, though to a lesser extent, in terms of employment in private services: the range is between 27% ('Fabriano') and 44.9% ('San Benedetto del Tronto'), whereas in the case of public services the minimum value is 11.4% ('Civitanova Marche') and the maximum is 30.5% ('Ascoli Piceno'). To be stressed is that public services significantly characterize the economies of ''Macerata', 'Ancona', 'Ascoli Piceno' and 'Fermo' which are seats of provincial governments and high-ranking public services (health, education, justice, etc.). 'Pesaro', which also is a seat of provincial government, is an exception, in that it has one of the lowest shares of employment in public services (19.2%). This urban system is, in fact, a peculiar case in the regional landscape because:

- although its economic structure does not have an evidently industrial characterization, employment in the industrial sector is lower than employment in the industrial sector of 'Civitanova Marche' and 'Ancona';

- it has a high share of employment in private services (37.4% of total employment) – much higher that the share of employment in the private services of an industrial city like 'Civitanova Marche' (28.4%) – and also very high employment in this sector in absolute value – only slightly less than industrial employment and the second highest level after that of 'Ancona'.

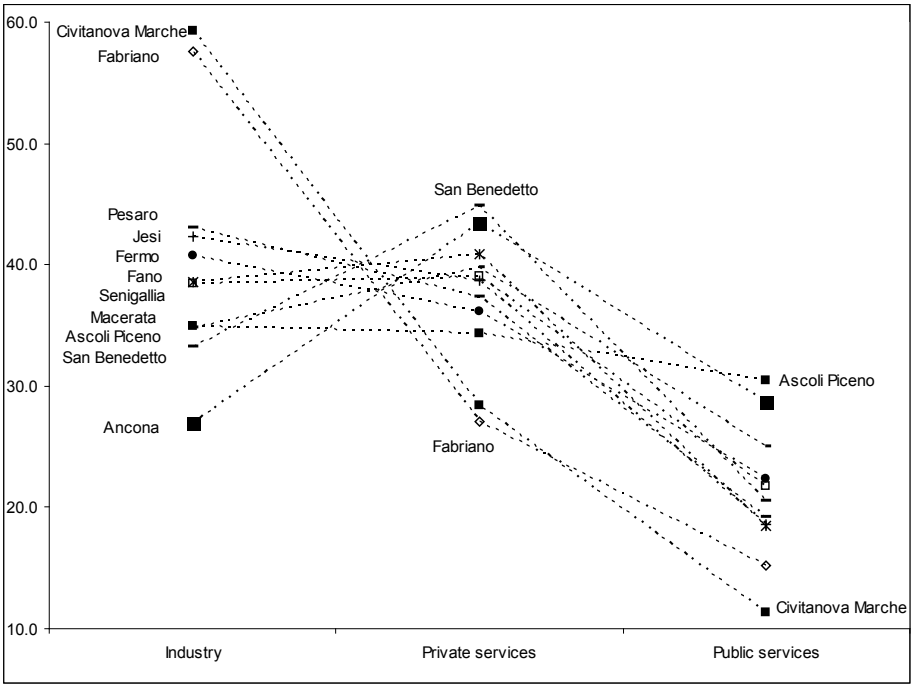
The urban systems in the Marche Region may be clustered into three groups according to the size of their industrial sector and service sector – in this case private and public services are considered jointly (Table 4.4):

1. the urban systems with a marked industrial characterization not only when compared with the other urban systems but also in absolute terms: 'Civitanova Marche' and 'Fabriano', respectively with 59.3% and 57.6% of total workers employed in the industrial sector;

2. the urban systems with a marked characterization in the private and public services: in decreasing order, 'Ancona', 'San Benedetto del Tronto', 'Ascoli Piceno' and 'Macerata', with values of the ratios between employment in the private and public services and total employment ranging from 72% to 65%;

3. the urban systems without a specific characterization, although their shares of employment in the service industry are greater than those in the industrial sector: in decreasing order, 'Senigallia', 'Fano', 'Fermo', 'Jesi' and 'Pesaro', with values of the

Figure 4.10 – Shares of employment in the industrial sector, in private and public services, 2001, % values



Source: ISTAT - Industry and services Census 2001.

ratios between employment in the private and public services and total employment ranging from 56% and 61%.

4.4. Specialization of the manufacturing sector

Among the Marche Region's urban systems, four can be classified as 'industrial urban systems': 'Civitanova Marche', 'Fabriano', 'Pesaro' and 'Jesi' – and particularly the first two. One may observe the following features:

a) their degrees of manufacturing specialization differ;

b) they are specialized in different sub-sectors, although in three of them the mechanical sub-sector plays a significant role (Figure 4.11 and Table 4.5).

Table 4.4 – Shares of employment in the industrial sector, in private and public services, 1991 and 2001

Urban systems	Activity sectors	1991	2001	1991 %	2001 %	Total services
Ancona	Industry	23,710	24,127	*29.2*	*27.0*	
	Private services	34,738	38,803	*42.7*	*43.4*	
	Public services	22,062	25,626	*27.1*	*28.6*	*72.0*
	Total*	81,334	89,449	*100.0*	*100.0*	
Ascoli Piceno	Industry	11,077	9,302	*41.7*	*35.0*	
	Private services	8,511	9,144	*32.1*	*34.4*	
	Public services	6,833	8,116	*25.8*	*30.5*	*64.9*
	Total*	26,534	26,599	*100.0*	*100.0*	
Civitanova Marche	Industry	35,740	35,912	*63.5*	*59.3*	
	Private services	13,539	17,173	*24.1*	*28.4*	
	Public services	6,436	6,879	*11.4*	*11.4*	*39.7*
	Total*	56,283	60,553	*100.0*	*100.0*	
Fabriano	Industry	11,531	15,797	*54.2*	*57.6*	
	Private services	6,050	7,413	*28.4*	*27.0*	
	Public services	3,587	4,179	*16.8*	*15.2*	*42.2*
	Total*	21,288	27,444	*100.0*	*100.0*	
Fano	Industry	9,511	11,333	*39.5*	*38.6*	
	Private services	9,429	12,025	*39.2*	*40.9*	
	Public services	4,721	5,426	*19.6*	*18.5*	*59.4*
	Total*	24,051	29,391	*100.0*	*100.0*	
Fermo	Industry	10,070	10,589	*41.8*	*40.7*	
	Private services	8,652	9,409	*35.9*	*36.2*	
	Public services	5,017	5,813	*20.8*	*22.3*	*58.5*
	Total*	24,082	26,014	*100.0*	*100.0*	
Jesi	Industry	10,267	11,403	*43.8*	*42.3*	
	Private services	7,973	10,445	*34.0*	*38.7*	
	Public services	4,862	5,006	*20.8*	*18.6*	*57.3*
	Total*	23,417	26,956	*100.0*	*100.0*	
Macerata	Industry	11,977	12,355	*37.1*	*34.8*	
	Private services	11,650	14,116	*36.1*	*39.8*	
	Public services	8,394	8,899	*26.0*	*25.1*	*64.8*
	Total*	32,258	35,511	*100.0*	*100.0*	
Pesaro	Industry	19,421	23,835	*42.2*	*43.0*	
	Private services	16,197	20,737	*35.2*	*37.4*	
	Public services	10,228	10,629	*22.2*	*19.2*	*56.6*
	Total*	45,995	55,441	*100.0*	*100.0*	
San Benedetto del Tronto	Industry	12,776	10,425	*41.0*	*33.2*	
	Private services	12,572	14,070	*40.4*	*44.9*	
	Public services	5,226	6,451	*16.8*	*20.6*	*65.4*
	Total*	31,154	31,356	*100.0*	*100.0*	
Senigallia	Industry	7,894	8,360	*41.2*	*38.4*	
	Private services	6,385	8,492	*33.3*	*39.0*	
	Public services	4,676	4,735	*24.4*	*21.7*	*60.8*
	Total*	19,161	21,771	*100.0*	*100.0*	

* Total employment comprises employment in the agriculture, hunting and fishery sector

Source: ISTAT - Industry and services Census 1991, 2001.

'Civitanova Marche' has a particularly high degree of specialization in footwear production (77% of total manufacturing employment). This fact qualifies its productive system as 'mono-productive'. Its degree of specialization in footwear production was already high in 1961 (64%).

'Fabriano' too has a manufacturing sector with a very high degree of specialization (51%) in mechanical production. Its productive system was not at all specialized at the beginning of the industrialization process and the mechanical sub-sector was not the manufacturing activity with the largest share of employees (this being instead the traditional manufacture of paper and cardboard articles).

In the case of 'Pesaro', its manufacturing specialization encompasses two sub-sectors – 'furniture' and 'wood and production of wood' – which together account for 44% of total manufacturing employment. In the period considered, the manufacturing specialization of 'Pesaro' has not increased as much as in 'Civitanova Marche' and 'Fabriano'. During the 1990s, the 'machinery and equipment n.e.c.' sub-sector developed to become another major manufacturing activity.

Compared to the manufacturing productive systems analyzed above, 'Jesi' has two distinctive features: a) it is the least specialized; b) its degree of manufacturing specialization has increased less markedly over time. Its manufacturing specialization encompasses two mechanical sub-sectors, which together account for 41% of total manufacturing employment.

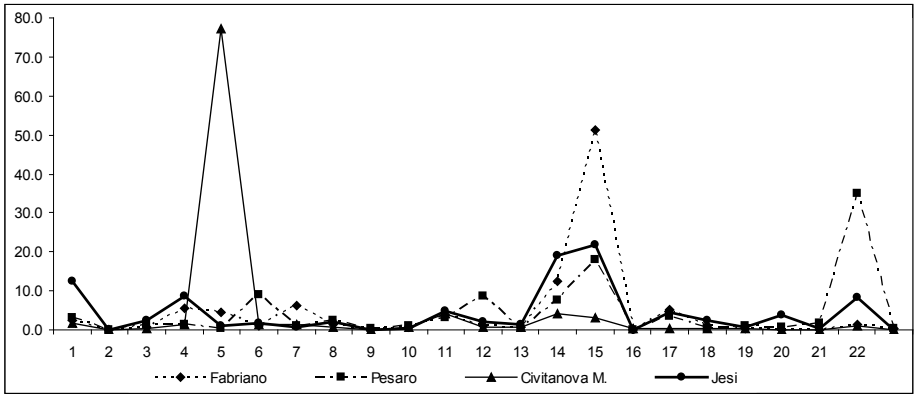
With the sole exception of 'Fermo', all other urban systems in the Marche Region where manufacturing production does not play a crucial role have more differentiated manufacturing sectors. None of them have sub-sectors whose shares of total employment are above 27%.

The above-mentioned structural differences, combined with those previously examined (sector and sub-sector composition), may explain why, against the background of the exogenous shocks of the decade 1991-2001, the urban systems experienced marked differences in the temporal profiles of their performances and, in general, throughout the period considered.

4.5. Organization of the productive structure

In order to explain the economic performances of the region's urban systems and to explore their evolutionary trajectories, one of the key factors to be examined is the productive structures of firms. Since the Marche Region's economic

Figure 4.11 – Specialization of the manufacturing sectors of 'Civitanova Marche', 'Fabriano', 'Pesaro' and 'Jesi', shares of employment, 2001



Source: ISTAT - Industry and services Census 2001.

Table 4.5 – Structures of the manufacturing sectors of 'Civitanova Marche', 'Fabriano', 'Pesaro' and 'Jesi', shares of employment, 2001

	Manufacturing sectors	Fabriano	Pesaro	Civitanova M.	Jesi
1	Food products and beverages	2.5	3.2	1.9	12.5
2	Tobacco products	0.0	0.0	0.0	0.0
3	Textiles	0.7	1.3	0.4	2.6
4	Wearing apparel; furs	5.5	1.2	1.3	8.8
5	Leather and leather product; footwear	4.5	0.2	77.2	1.2
6	Wood and products of wood and cork (except furniture)	1.0	9.0	1.2	1.9
7	Pulp, paper and paper products	6.3	1.0	1.2	0.8
8	Printed matter and recorded media	1.3	2.4	0.6	1.9
9	Coke, refined petroleum products and man-made fibres	0.0	0.4	0.0	0.1
10	Chemical, chemical products and man-made fibres	0.7	1.0	0.6	0.4
11	Rubber and plastic products	3.7	3.1	4.1	4.9
12	Other non-metallic mineral products	0.9	8.6	0.7	2.0
13	Basic metals	0.7	0.2	0.6	1.4
14	Fabricated metal products, except machinery and equipment	12.4	7.7	4.2	19.1
15	Machinery and equipment n.e.c.	51.4	18.1	3.1	21.7
16	Office machinery and computer	0.1	0.0	0.3	0.1
17	Electrical machinery and computers n.e.c	5.1	3.5	0.5	4.6
18	Radio, television and communication equipment and apparatus	1.1	0.4	0.5	2.6
19	Medical, precision and optical communication equipment	0.5	1.1	0.3	0.7
20	Motor vehicals, trailers and semi-trailers	0.0	0.7	0.0	3.9
21	Other transport equipments	0.0	1.7	0.1	0.3
22	Furniture; other manufactured goods n.e.c	1.4	34.9	1.1	8.4
23	Recovered secondary raw materials	0.2	0.2	0.0	0.1
	Total	100.0	100.0	100.0	100.0

Source: ISTAT - Industry and services Census 2001.

development in the period 1951-2001 was mainly driven by accumulation in the manufacturing sector, the size structure of firms will be analysed with regard to manufacturing activities and to the urban systems of Pesaro', 'Civitanova Marche', 'Jesi', 'Fabriano', the main industrial systems in the Marche Region, and to that of 'Ancona' which, although it has a marked tertiary characterization, employs a number of workers in the manufacturing sector lower only than that of 'Civitanova Marche' and 'Pesaro'. Their productive manufacturing systems by size class are shown in Figures 4.12 and 4.13.

Analysis of the urban systems' manufacturing productive structures in terms of firms (Figure 4.12) reveals the dominance of small enterprises (1-9 units size class) in all urban systems, with values ranging from 70% for 'Fabriano' and 80% for 'Ancona'. The second size class in terms of shares of employment comprises firms in the 10-49 units size class and displays rather low values, between 16% for 'Ancona' and 23% for 'Fabriano'. Only a modest number of firms belong in the 200-499 units size class. The number of firms in the last size class considered (500 units and over) is very small.

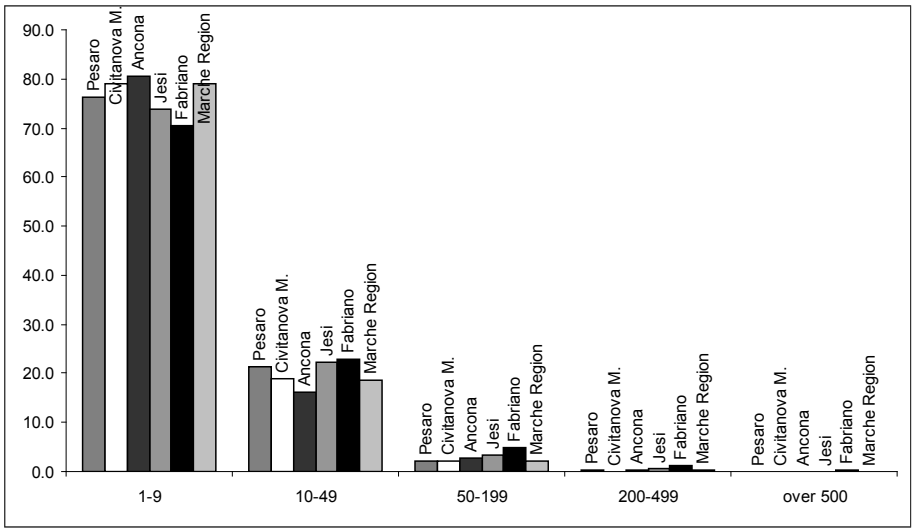
The urban systems' productive structures of manufacturing enterprises in terms of employment (Figure 4.13) show the following features:

a) a significantly less importance of small firms (1-9 units size class), mainly if compared with the extremely high number of firms, as above outlined;

b) the employment importance of medium-sized firms (10-49 units and 50-199 units size classes);

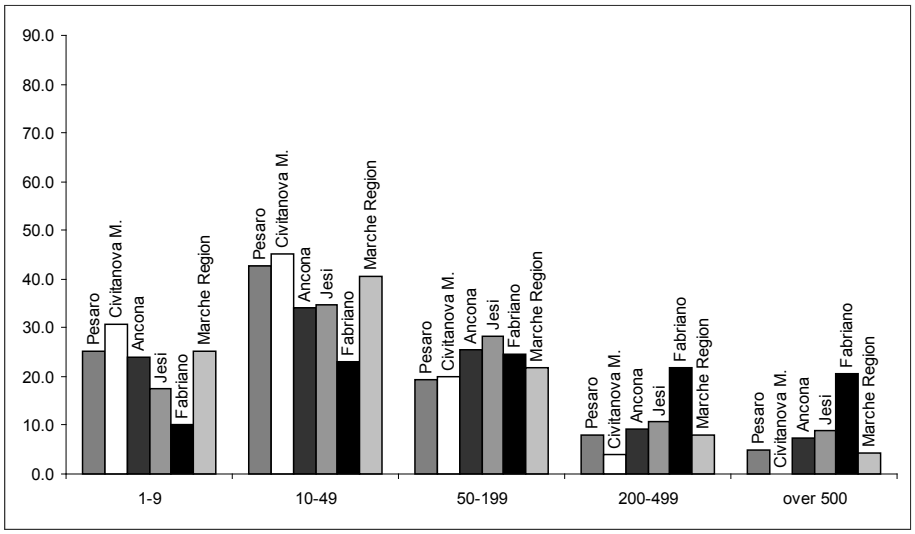
c) the difference between the productive manufacturing structures of Fabriano' and 'Civitanova Marche', on the one hand, and the productive manufacturing structures of the other urban systems, on the other; in the case of 'Fabriano' the employment importance grows progressively with the size of firms (the first two size classes display lower shares of employment whilst the last two classes show higher shares of employment); in the case of 'Civitanova Marche', instead, the employment importance progressively diminishes with the size of firms (76% of total manufacturing employment is associated with the first two classes of firms – that is, firms with a number of workers up to 49 units).

Figure 4.12 – Manufacturing firms by classes of employment: 'Pesaro', 'Civitanova Marche', 'Ancona', 'Jesi', 'Fabriano' and the Marche Region, 2001, % values



Source: ISTAT - Industry and services Census 2001.

Figure 4.13 – Manufacturing employment by classes of employment: 'Pesaro', 'Civitanova Marche', 'Ancona', 'Jesi', 'Fabriano' and the Marche Region, 2001, % values



Source: ISTAT - Industry and services Census 2001.

4.6. Human capital

4.6.1. Population age structure

When considered all together, the urban systems considered display an age structure of the resident population which differs slightly from that of the Marche Region (Table 4.6). One may note, however, that the urban systems have a population relatively younger than that of the entire region. Marked differences are apparent, instead, when the age structure of the resident population in the urban systems is compared with the Italian population's age structure. In this case, the Marche Region's urban systems have a significantly less young population, mainly due to the component related to the elderly population (21.1% in the urban systems and 18.7 % in Italy).

Comparing the urban systems' age structures shows that the largest variability concerns values related to the elderly population (65 years and over) (from a maximum of 23.2% to a minimum of 19.6%); there follows the age group of individuals aged 25 to 34. Decreasingly lower differences can be observed in the case of the other age groups. It is interesting that if the central age groups (population

Table 4.6 – Age structures of the urban systems' resident populations, 2001, % values

Urban systems	<14	15-24	25-34	35-44	45-54	55-64	>=65	Total
Ancona	12.5	10.0	15.2	14.9	13.6	12.5	21.4	100.0
Ascoli Piceno	13.7	11.2	14.4	15.0	13.4	12.3	20.0	100.0
Civitanova Marche	13.4	11.1	15.2	15.2	13.4	12.1	19.6	100.0
Fabriano	12.3	10.4	14.9	14.0	13.3	11.9	23.2	100.0
Fano	13.1	10.3	15.7	15.4	12.6	12.4	20.5	100.0
Fermo	12.8	10.2	13.8	14.9	13.3	11.8	23.1	100.0
Jesi	12.2	10.4	14.9	14.9	13.2	12.5	21.8	100.0
Macerata	13.0	10.3	14.2	14.6	13.1	12.5	22.3	100.0
Pesaro	13.1	9.9	16.2	15.7	13.0	12.5	19.6	100.0
S. Benedetto	13.8	10.8	15.1	15.2	13.1	12.0	19.9	100.0
Senigallia	12.3	10.3	14.4	14.5	13.3	12.4	22.8	100.0
Total urban systems	12.9	10.4	15.0	15.0	13.3	12.3	21.1	100.0
Marche Region	12.9	10.5	14.7	14.8	13.2	12.1	21.8	100.0
Italy	14,2	11,2	15,4	15,2	13,3	11,9	18,7	100.0

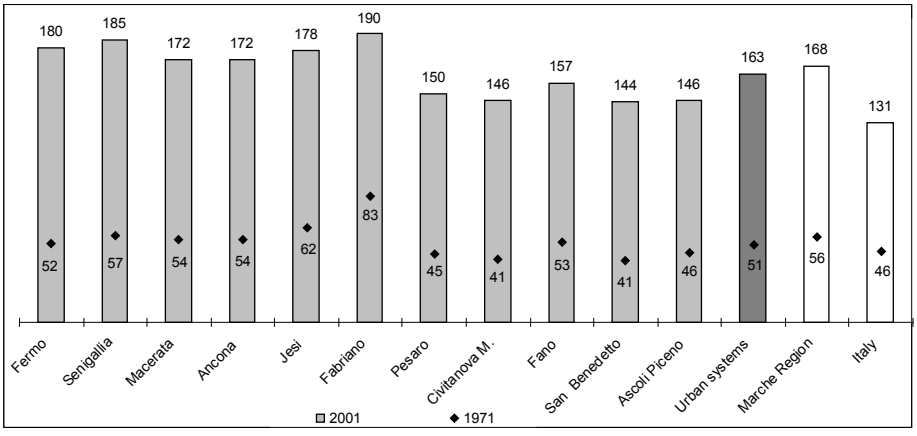
Source: ISTAT - Population Census 2001.

age between 25 and 64) are considered together, they also have a high variability, as high as the variability of the elderly population (from a maximum of 57.4% to a minimum of 53.9%). This means that, as far as the working-age population is concerned, the Marche Region's urban systems are highly differentiated. Also to be noted is that 'Pesaro' and 'Civitanova Marche' have the most favourable population age structures and that these are similar to the Italian population's age structure.

Among the population indexes which allow analysis of changes in demographic features over time, the old-age index (ratio between the population aged over 65 and population aged under 14) is of interest. In 2001, with respect to the Marche Region's urban systems considered as a whole, this index accounted for 163%: on average, the number of elderly people per 100 young people was 163 (Figure 4.14). This value was slightly lower than the average regional value (168%) but significantly higher than the average national value (131%).

All the urban systems considered display population structures where elderly people outnumber the young population (individuals aged under 14) but they differ according to their degrees of ageing. In that 'Fabriano' is very close to the situation in which there are twice as many elderly people as young people, it can be regarded as the most negative case.

Figure 4.14 – Values of the urban systems' old-age indexes, 1971 and 2001, % values



Source: ISTAT - Population Census 1971, 2001.

Comparing values of the urban systems' old-age indexes in 2001 and 1971 yields two stylized facts (Figure 4.14):

a) all the urban systems have undergone ageing processes – following the general trend of both the Marche Region and Italy;

b) some of them have become much 'older' than the others, with the consequence that differences among their ageing degrees have become greater over time.

4.6.2. Education

All urban systems have undergone a process of human capital accumulation which has increased their educational level. With the exception of 'Civitanova Marche', 'Macerata' and 'Fermo', all of them have reached the situation in which the component with the greatest share consists of individuals with secondary-school diplomas.

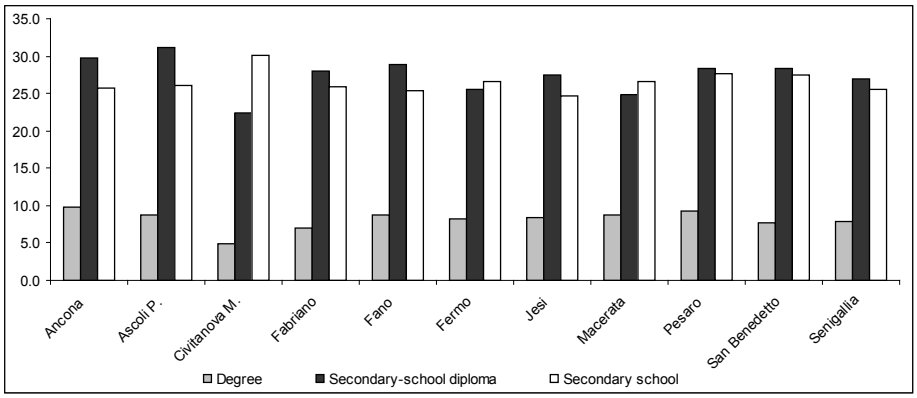
The Marche Region's urban systems do not display structures of education attainment which differ greatly in terms of graduates, people with secondary-school diplomas, and people without secondary-school diplomas (licenza media inferiore) (Figure 4.15). 'Civitanova Marche' is an exception and is distinguished by a very low educational level – the lowest among the Marches' urban systems.

In the decade 1991-2001, almost all urban systems improved the educational levels of their population – the number of graduates doubled – and especially those that displayed the lowest shares of graduates in 1991. Among these urban systems, 'Civitanova Marche' has achieved the best performance by increasing its number of graduates by 138.6%. Among the urban systems with the highest number of graduates in 1991, to be stressed the very good performance of 'Pesaro' (105.5%), which in 2001 became the second urban system in the Marche Region, after 'Ancona', with the highest value of graduates both in absolute and percentage terms.

4.6.3. Foreign component of the resident population

The Marche Region experienced a strong population increase of 82,482 inhabitants in the period 2001-2007. 73.6% of this growth occurred in its urban systems. A crucial role in the region's demographic growth has been played by the foreign component. In the period examined, the resident foreign population in the Marche Region increased by 68,625 units (Table 4.7). 67.1% of this growth – 46,017 units

Figure 4.15 – Structures of education attainment of the urban systems' resident populations: a comparison, 2001, % values



Source: ISTAT - Population Census 2001.

– came about in the urban systems. The foreign component has contributed by 75.8% to the demographic growth of the urban systems considered as a whole. 'Ancona', 'Civitanova Marche', 'Pesaro' and 'Macerata' display the largest increases in absolute terms – from about 9,000 units to 5,000 units – with growth rates in the cases of 'Pesaro' and 'Macerata' much higher than the average growth rate of the urban systems (146.1%).

More accurate analysis of the contribution paid by foreigners to the demographic evolution of each urban systems can be made by looking at Table 4.8, which indicates absolute changes in the resident population and in the foreign population, and, more importantly, absolute changes in the Italian component (differences between the native population and foreigners: see column 'A-B' in Table 4.8). The values related to absolute changes in the native population can be used to cluster the Marche Region's urban systems into two groups:

a) the urban systems where the Italian component, as well as the foreign component, has positively contributed to their demographic growth;

b) the urban systems where the Italian component has negatively contributed to their demographic growth whereas the foreign component has made a positive contribution.

Table 4.7 – Foreign resident population in the Marche Region's urban systems, 2001 and 2007

Urban systems	2001	2007	2001-2007 absolute changes	2001-2007 % changes
Ancona	6,265	14,962	8,697	*138.8*
Civitanova Marche	5,353	12,387	7,034	*131.4*
Pesaro	3,537	9,309	5,772	*163.2*
Macerata	2,859	7,780	4,921	*172.1*
Fabriano	2,664	5,684	3,020	*113.4*
Fermo	2,016	5,472	3,456	*171.4*
Fano	1,936	5,153	3,217	*166.2*
San Benedetto	2,253	4,916	2,663	*118.2*
Jesi	1,981	4,398	2,417	*122.0*
Senigallia	1,555	4,077	2,522	*162.2*
Ascoli Piceno	1,076	3,374	2,298	*213.6*
Total urban systems	31,495	77,512	46,017	*146.1*
Marche Region	46,674	115,299	68,625	*147.0*

Source: ISTAT - www.demo-istat.it

Table 4.8 – Resident population and foreign resident population in the Marche Region's urban systems, 2001-2007, absolute changes

Urban systems	Population **A**	Foreigners **B**	**A-B**
Fano	7,829	3,217	4,612
Pesaro	8,923	5,772	3,151
San Benedetto	5,422	2,663	2,759
Civitanova Marche	9,530	7,034	2,496
Senigallia	3,941	2,522	1,419
Jesi	3,003	2,417	586
Fermo	3,965	3,456	509
Ancona	8,706	8,697	9
Macerata	4,834	4,921	-87
Ascoli Piceno	2,013	2,298	-285
Fabriano	2,532	3,020	-488
Total urban systems	60,698	46,017	14,681
Marche Region	82,482	68,625	13,857

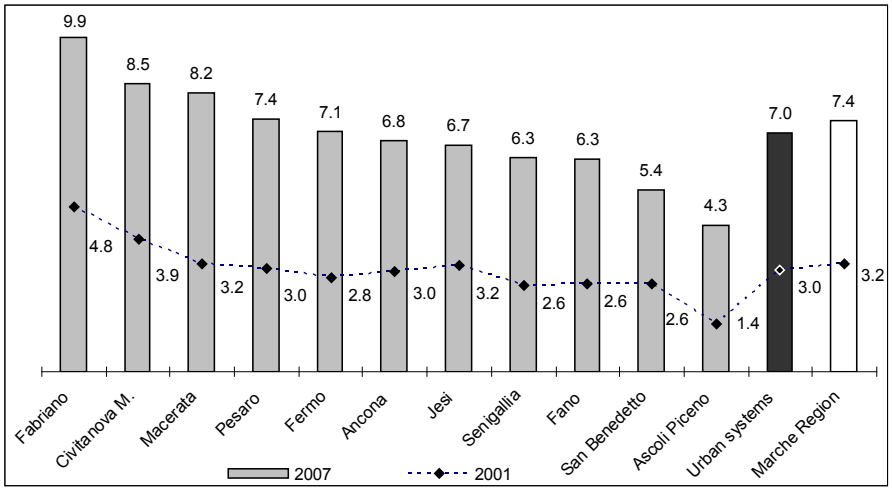
Source: ISTAT - Population Census 2001; www.demo-istat.it

Among the urban systems clustered in the first group 'Fano', 'Pesaro', 'San Benedetto del Tronto' and 'Civitanova Marche' are distinguished by their high positive values in column 'A-B', which denote the good attractiveness of these urban systems not only to foreigners but also to Italians (against the background of the facts that, in the past two decades, all the urban systems considered have experienced negative net demographic balances or, in same cases and for some years, net demographic balances ranging around zero).

Fabriano' is an interesting case among the urban systems in the second group, 'since: a) Italians have decreased much more than foreigners have increased; b) it is the urban system with the highest share of foreigners with respect to the total population (9.9%) and where – as well as in 'Macerata'– the value of this ratio has increased more than in the other urban systems over the period considered (Figure 4.16).

Foreigners resident in the Marche Region's urban systems belong to 177 different nationalities (in Italy the number of nationalities recorded amounts to 191). The nationalities first on the list of the largest nationalities are Albanian and Romanian. With respect to each urban system, Table 4.9 reports the first three largest nationalities

Figure 4.16 – Shares of the foreign population with respect to total population of the urban systems and of the Marche Region



Source: ISTAT - Population Census 2001; www.demo-istat.it

in the resident foreign population. Like Albanian and Romanian immigrants, individuals from China, Morocco, Tunisia and Macedonia account for shares of total immigration not lower than 40% in only three urban systems ('Civitanova Marche', 'Jesi' and 'Macerata') – the maximum value is 60% for 'Fabriano'. If one considers the first ten largest nationalities (Table 4.10), one finds shares of total immigration not lower than 70% – the maximum value is 85% for 'Fabriano' and 'Ascoli Piceno'.

The Marche Region's urban systems are differentiated in terms of their ethnic composition. This feature is highlighted by the values of the index of ethnic completeness (Table 4.11). This being ratio between the number of different nationalities of foreigners in a given urban system and the number of nationalities with more than 50 immigrants recorded in all urban systems in the Marche Region (121 nationalities in this case). As to be expected, 'Ancona', as the seat of regional government, shows the highest value for the index of ethnic completeness (0.95). On examining the values of this index, the Region's urban systems can be classified as in Table 4.12. 'Ancona' is the only urban system with a 'high' value for the index of ethnic completeness, whereas three of them ('San Benedetto del Tronto', 'Pesaro' and 'Macerata') display a 'medium' value and seven a 'low' level of the index – in other words, the above-mentioned urban systems show, respectively, high, medium and low attractiveness with respect to given nationalities.

On comparing the values of the index of ethic completeness with the values of the

Table 4.9 – First three nationalities in the urban systems' resident foreign population, 2007, % values

Urban systems	First	% values	Second	% values	Third	% values	Total
Ancona	Albania	16.0	Romania	15.3	Tunisia	8.7	40.0
Ascoli Piceno	Albania	24.4	Romania	14.4	Cina	14.2	53.0
Civitanova Marche	Cina	14.3	Albania	12.4	Romania	10.5	37.2
Fabriano	Albania	24.0	Macedonia	24.0	Romania	11.7	59.7
Fano	Albania	26.3	Morocco	14.3	Romania	10.1	50.7
Fermo	Albania	19.0	Romania	16.7	Morocco	12.4	48.1
Jesi	Romania	16.0	Albania	9.1	Tunisia	8.4	33.5
Macerata	Macedonia	16.6	Romania	11.7	Albania	10.3	38.6
Pesaro	Albania	16.3	Morocco	12.8	Romania	12.6	41.7
San Benedetto del Tronto	Albania	31.0	Cina	10.8	Romania	10.7	52.5
Senigallia	Albania	18.7	Romania	12.8	Macedonia	8.7	40.2

Source: ISTAT - www.demo-istat.it

Table 4.10 – First ten nationalities in the urban systems' resident foreign population, 2007, % values

Urban systems	1	3	5	10
Ancona	16.0	40.0	51.3	70.2
Ascoli Piceno	24.4	53.0	71.5	85.5
Civitanova Marche	14.3	37.2	54.5	77.3
Fabriano	24.0	59.8	73.6	85.3
Fano	26.3	50.7	61.9	78.9
Fermo	19.0	48.1	62.7	77.8
Jesi	16.0	33.5	47.5	75.4
Macerata	16.6	38.7	53.5	70.9
Pesaro	16.3	41.8	57.2	75.6
San Benedetto del Tronto	31.0	52.5	64.0	79.2
Senigallia	18.7	40.2	53.3	72.8

Source: ISTAT - www.demo-istat.it

Table 4.11 – Index of ethnic completeness, 2007, % values

Urban systems	ICE 121
Ancona	0.95
Pesaro	0.88
Fano	0.81
San Benedetto del Tronto	0.80
Macerata	0.79
Fermo	0.79
Jesi	0.74
Fabriano	0.71
Ascoli Piceno	0.71
Civitanova Marche	0.69
Senigallia	0.65

Source: ISTAT - www.demo-istat.it

Table 4.12 – Index of ethic completeness and shares of the foreign population with respect to the total population, 2007, % values

I C E	SHARES OF FOREIGN POPULATION		
	Low	**Medium**	**High**
Low	Jesi Fano Ascoli Piceno Senigallia	Civitanova Marche Fermo	Fabriano
Medium	S. Benedetto del Tronto	Pesaro Macerata	
High	Ancona		

Source: ISTAT - www.demo-istat.it

share of the foreigners in the resident total population (Table 4.12) one notes that there is no correspondence between the two indexes. By way of example, in the cases of 'Civitanova Marche' and ' Fermo', a 'medium' share of foreigners in the total population corresponds to a 'low' share of the index of ethnic completeness. The most significant differences concern 'Ancona' – the urban system with a low share of foreigners in the total population and a high number of different nationalities – and, conversely, 'Fabriano' – which displays a high share of foreigners in the total population and a low number of different nationalities.

Demographic growth, combined with foreign immigration – which, as said, is the main component of the urban systems' population growth – has significantly changed the urban systems. It has given rise to a marked expansion in housing – probably over-dimensioned, however – in the past decade which, owing to a lack of supra-municipal spatial planning, has increased urban dispersion and has made the urban systems' spatial organization more disordered.

The effects exerted by both phenomena will be greater in the years to come, when changes in the social structure of local communities driven by population growth and immigration will consolidate. On one hand, as an outcome of the fact that the foreign population is employed mainly in the industrial sector and that this sector has been decreasing its employment, a problem of economic integration – besides a problem of social integration – will arise. On the other hand, the phenomenon

of foreign entrepreneurship will generate new economic and social dynamics. Current demographic changes in the Region's urban systems are among the phenomena which deserve careful consideration if their development trajectories are to be forecast.

5. UNDER-CAPITALIZATION OF THE URBAN SYSTEMS IN THE MARCHE REGION: TOWARDS A LONG TERM INVESTMENT STRATEGY

5.1 Towards a new framework for urban policy in the Marche Region

Since the 1960s, important scientific contributions have provided critical accounts of the outcomes of the territorial dynamics which accompanied the accelerated industrialization of the Italian economy after the Second World War, and they have established categorial systems able to interpret the phenomena observed. These contributions, put forward by diverse disciplines, have laid the bases for a critical appraisal of the Italian trajectory of territorial development – and it seems they could open the way to social and political awareness of the disequilibria of the new urban systems. However, these contributions have never been able to come up with an integrated interpretation, nor to question the supremacy of the 'territorial paradigm' in the public discourse and choices, when interpreting the relationships between spatial organization and economic development.

Within the 'territorial paradigm' that has long prevailed in interpretation of Italian economic development, the dissolution of cities in the territory – and the ensuing formation of a polyarchy in the governance of territorial dynamics – has been seen as an element of what can be called the 'social construction of the territory'; that is, the spontaneous formation of concentrations of 'external economies' in space consequent on the territorialisation actions (investments) of individuals. The 'social construction of the territory' has been conceptualised as a process of self-organization – and self-organization has been interpreted as spontaneously able to generate states of the world close to a state of equilibrium. Nevertheless, the economic and institutional contexts within which the trajectory of economic development of the European countries – and, therefore, of Italy and the Marche Region – has taken shape have undergone profound change over the past ten years. The 'radical internationalization' of the European economy and the shift to the 'territorial paradigm' as the basis of the EU's regional policies have transformed the low static efficiency – the capacity to transform income into welfare – and the low dynamic efficiency – the capacity to generate innovation and investment – of urban systems into factors of economic decline.

The profound changes undergone by the 'European project' because of globalization processes have highlighted how the Marche Region's model of territorialisation of

the economic process is strongly inadequate and a shift in the policy paradigm seems necessary to identify new strategies for sustainable development in the main urban systems, which are the engines of the regional economy.

5.2 'Territorial competition'

Globalization processes are inducing most firms to set about revising their territorialisation strategies. And firms (as well as individuals) seem to be in search of cities with high static and dynamic efficiency. Firms are interested in constellations of externalities and interdependencies which only efficient cities can provide. Moreover, they are seeking cities able to represent themselves in global space – each on its own scale – and transform themselves over time so that they offer urban externalities which match the configuration of products and technologies in evolution. Firms are searching for cities with which they can explicitly or implicitly negotiate their birth, localization and expansion.

The importance of looking at the territorialisation of the investment process from the perspective of 'economies in search of cities' derives from the fact that firms – and entrepreneurial projects – 'in movement' have increased to a spectacular extent. The new configuration of relative prices and the new information and communication technologies – but also the new types of relations among firms – have significantly increased the vertical dis-integration of the production process (already high in productive systems, like the Italian one, which display the typical organization of 'industrial districts') opening the way to a large variety of independent localisation strategies – that is, ones no longer constrained by institutional barriers. A decisive factor in the localisation strategies of economic activities is that both the economic context of firms and the social context of the individuals employed by those firms have become fundamental for the territorialisation of investment. Advanced societies are faced with a new scenario in which the 'urban quality' enjoyed by individuals (as agents intent on the fulfilment and development of their own meta-preferences) is the key factor in the localisation choices of firms.

From the point of view of individuals (or their families), the static efficiency of a city is of paramount importance because, conditions being equal, it is the parameter which links income to welfare. Given the same income, the lower the transaction costs, the higher the welfare generated by that income. Equally, the lesser the negative externalities, the higher the welfare associated with a given income (and the higher the positive externalities, the higher the welfare). Since the final objective

of individuals is their welfare, and not their income, the static efficiency of a city has become a crucial factor for the localisation choices taken by individuals wanting to move to other cities in order to fulfil their preference functions.

5.3 The urban systems' under-capitalization

From an economic perspective, the most effective way to express the dis-equilibria of the Marche Region's urban systems is to use the concept of 'under-capitalisation'; that is, by referring to the low level of urban capital of the cities. When observed on the appropriate scale, all the urban systems considered exhibit a low level of urban capital. For example, they do not possess sufficiently developed public transport systems (especially when judged in light of the objective of environmental sustainability); moreover, they are not endowed with adequate levels of micro-infrastructural capital for pedestrian and bicycle mobility and for recreational activities.

The under-capitalisation of the Marche Region's urban systems raises the issue of its causes. That is to say, it is necessary to explain why they have experienced some decades of insufficient investment in public urban capital (but also in private urban capital). The simplest explanation is that under-capitalisation has been brought about by a low (social) return on the urban capital which, in turn, may be driven by individuals' meta-preferences. Meta-preferences have indubitably played an important role, but they have only done so during the first phase of the Italian industrial development.

Already in the 1980s Italian society – and the Marche Region's society was no different in this respect – began to express a demand for 'urban quality'. Accordingly, the main causes of the urban systems' under-capitalisation should be identified by investigating other explanatory factors. In particular, it should be borne in mind that, since territorial coalescence has given rise to the formation of inter-municipal local systems, analyses of the return to (value of) public urban capital have been conducted with regard to inappropriate territorial partitions, referring to the territory of the municipalities instead of the territory of the inter-municipal local systems. This evidently concerns strikingly different territorial scales. By way of example, Ancona is a municipality with 100,000 inhabitants but its urban system has about 230,000 inhabitants. To be noted is that these two scales differ significantly not only in size but also in terms of social morphology and economic structures and, consequently, in terms of the functions of collective preferences. Obviously, cost-

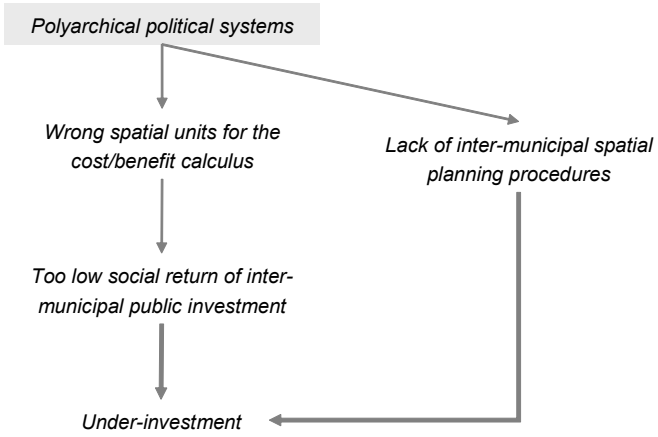
benefit analysis of a mega (or micro)-infrastructure conducted on the basis of the two above-mentioned different scales gives very different results.

From this perspective, the under-capitalisation of the urban systems considered would be the direct consequence of their polyarchic governance systems (the polyarchy which governs them), which generate policy-making processes that assess the effects exerted by investment on the basis of inappropriate territorial scales. A public investment which exhibited a low social value when evaluated at the municipal territorial scale – and for this reason would not be made – would show, instead, a high social value if evaluated adopting the scale of the pertinent urban system. Figure 5.1 schematically illustrates the relationship between polyarchy and the under-capitalisation of the Marche Region's urban systems.

The current standstill of investments in the Marche Region's urban systems – and, therefore, their persistent under-capitalisation – has become critical as a consequence of the changes in the localisation strategies of economic activities – and against the background of the establishment of the paradigm of 'territorial competition'.

A further factor – one deeply rooted in the 'European model of city' today – which highlights the under-capitalisation of the Marche Region's urban systems is the constraint of environmental sustainability. As recent analysis has shown, these urban systems can be qualified as highly under-capitalised by taking account of

Figure 5.1 – From polyarchy to under-capitalization

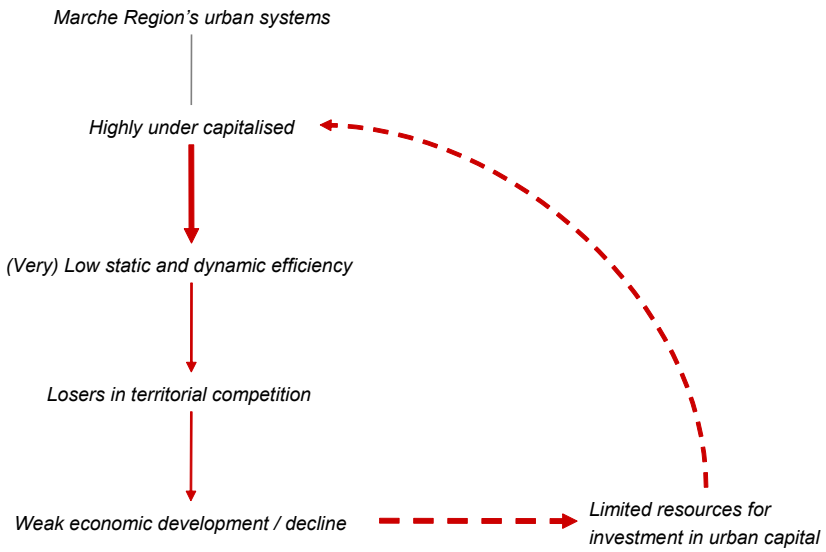


their high settlement dispersion and by assessing this feature with regard to the sustainability of the environmental implications of such dispersion.

Most of the main urban systems in the Marche Region underwent strong demographic growth – in some cases particularly strong – during the years of Italy's industrial take-off (1951-1971). In the subsequent decades demographic growth was modest but nevertheless continued until the past decade, mainly as result of large foreign immigration flows. To be noted is that the current level of under-capitalisation of the urban systems considered is so high – if assessed with regard to the 'European model of city' – that devising an investment strategy for these urban systems does not need to take account of their demographic trends – also because a strong reduction in their populations in the next two decades is highly unlikely.

In this respect, comparison with East Germany's cities is of interest. After Reunification, East Germany's cities proved to be strongly under-capitalised in terms of urban capital if judged from the West German perspective. The massive urban investment plan devised and implemented in the East German cities after Reunification was not questioned by the marked reduction in population experienced by almost all of them precisely because the 'initial conditions' – the amount of their

Figure 5.2 – Urban capital and dynamic efficiency of the Marche Regions's urban systems



urban capital stock – justified it regardless of their demographic dynamics. The Marche Region's urban systems display a similar situation. From the perspective of the paradigms of environmental sustainability and territorial competition, these urban systems show such a high level of under-capitalisation as to require major investment even if the population were to decrease over the next two decades. Of course, this situation does not apply to the many European cities endowed with a stock of urban capital close to the equilibrium level, and which, therefore, must carefully consider their demographic dynamics in order not to oversize their investment.

5.4 Spatial organization of the urban systems

The under-capitalization of the Marche Region's urban systems may be analysed assuming the following perspectives:

a) the spatial organization of the urban systems;

b) the functional organization of the dispersed urban systems;

c) the quality and the environmental performance of the built environment.

From the perspective of the spatial organization of the Marche Region's urban systems one may stress that. the Marche Region's 'new cities' are 'dispersed cities'. They display very high degrees of settlement dispersion and, as will be examined later, are made up of a high number of settlements which often lack the core social and commercial institutions that sustain urban life. In this regard, one aspect to highlight is the impact of their dispersed spatial organisations on the 'circadian cycles' of their inhabitants, these being the daily movements made by individuals across space to organise the set of activities and transactions necessary to their social and economic processes. The radically fragmented settlement pattern has generated more intense and longer individual circadian cycles and, consequently, higher amount of resources (and time, too) to be allocated to transport. But, against the background of urban systems lacking the transportation infrastructures which provide the various modes of transport capable of meeting the different needs of the residents and their rising mobility demand, this has brought about strikingly intense car mobility – a phenomenon which markedly contrasts with the constraint of the environmental sustainability.

To gain better understanding of this phenomenon one may take into account the number of home-to-work commuters travelling by car – although this explains only

part of the phenomenon because all the movements of individuals associated with exchange, cultural and recreational purposes are not considered – and the motorization rate (ratio of vehicles to population). Driving to work is the favoured means to commute of nearly eight out of ten workers in most of the Marche Region's urban systems – a value which is significantly higher than the average Italian one of nearly six out of 10 workers – with most people driving alone (nearly seven out 10 workers). As regards the motorization rate, the number of vehicles per 1,000 inhabitants in the Marche Region is 628 units (2007) – data are not available at municipal level and, consequently, at urban system level. The corresponding values for Italy and the European countries are 598 units (2007) and 463 units (2004) respectively. To be noted is that in the period 2002-2007 the motorization rate in the Marche Region grew more than in Italy (respectively 2.5% and 1.8%) (Regione Marche, RSA Marche 2009 - Terzo rapporto sullo stato dell'ambiente, 2009).

When dealing with the issue of urban mobility in the Marche Region's urban systems, one has to bear two fundamental aspects in mind:

a) mobility among the various sub-settlements comprising the single urban system;

b) mobility within the single sub-settlements.

As regards both aspects one may note that all the settlements are very badly or not at all connected by public transport to the 'focal points' of their urban systems. None of the urban systems examined is endowed with a tramway system, and even the major ones do not display a functional organization of their railway stations which meets the demand for sustainable mobility. Probably with the sole exception of 'Macerata', they do not possess car parking systems functional to the needs of pedestrians as far as the fruition of the focal points is concerned, whilst none of them is endowed with an integrated network of bicycle and pedestrian ways.

Mobility is greatly hampered in the Marche Region's urban systems. This may well be detrimental for that large part of the population which cannot rely on car transport (because of age, income, health constraints), considerably reducing social interaction, social learning and occasions to explore social networks in search of new economic opportunities.

Against this background, one may affirm that the Marche Region's urban systems may have to pay a heavy toll for their radically fragmented spatial organisation, which is only partly reversible by means of major public investment in transport infrastructures.

When analysing the spatial organization of the Marche Region's urban systems a

crucial aspect to consider is the consumption of land. A recent survey conducted by the Marche Region (Environment and Consumption of Land in the Marche Region's Urban Systems, 2009) highlights the strikingly high consumption of land in the territories of the urban system examined over the period 1954-2007. Land being converted from rural to urban uses (housing, shopping, parking, transportation and other built uses) grew 4.2 times – from about 7,000 hectares in 1954 to about 29,000 hectares in 2007. During the period considered, consumption of land amounted to 1.152 hectares per day (that is, 421 hectares per year). It is perhaps more important to stress that land development increased at greater rate than the population, the latter having increased only by 1,37 times from 1954 to 2007. Comparison between changes in population and in land development suffices to state that largely inefficient use was being made of land.

Given that too much land is still being converted to development, generating negative impacts on natural and agricultural environment, making better use of urban land should become an issue of utmost importance. Increasing building densities should be encouraged, instead of the building of new scattered housing developments; re-using brownfield land should be prioritised over greenfield development; building anew should be rebalanced in favour of restoring and upgrading the current housing stock: all these actions should be established as core principles of a new urban development strategy.

5.5 Re-configuration of the functional organization of the dispersed urban systems

One of the key disequilibria of the Marche Region's urban systems is the loss of the commercial and recreational functions of their small settlements – these being fundamental components of the Region's settlement structure. To be stresses is that both the new settlements and the historical ones have been affected by this phenomenon. The historic settlements, especially, which spatially and formally exhibit very distinctive features, are undergoing social and economic decline due, among other causes, to their rapidly decreasing functional role as places of exchange and recreation.

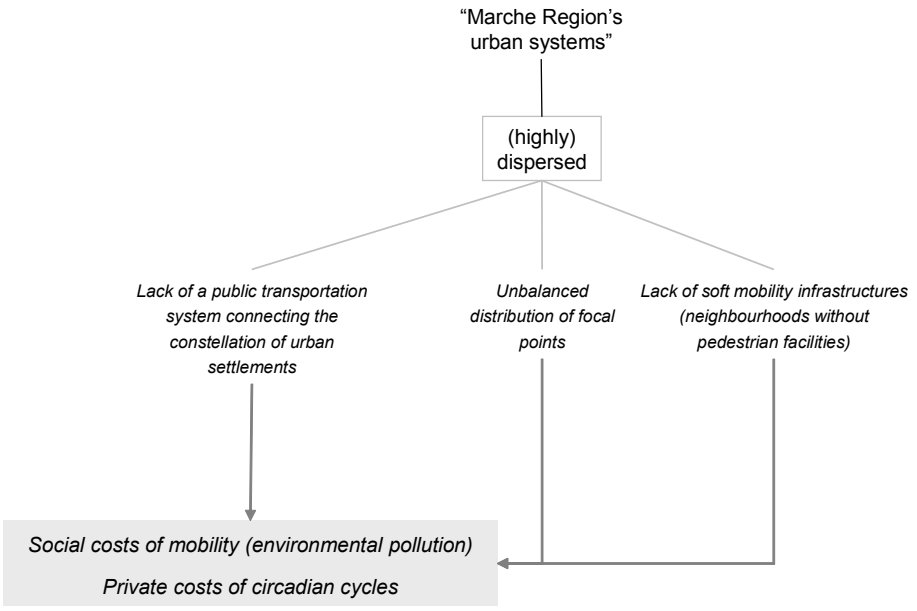
The loss of commercial and recreational functions by the small settlements has resulted from the construction of highly competitive out–of-town shopping centres located in positions central with respect to the territory of the entire urban system. But as far as the new settlements are concerned, also significant is the role played

by their modest sizes, which do not generate demand levels sufficient to foster and sustain basic commercial activities. Equally detrimental is the poor planning layouts of the settlements themselves, which lack well-designed public spaces (we refer especially to their focal points), which constitute a central component of the built environment in creating fertile ground where activities – and consequently communities – can flourish.

The loss of commercial and recreational functions by the small settlements is one of the causes of the above-mentioned high level of car mobility characteristic of these urban systems – as well as of the ensuing forms of social segregation – and it makes their dwellers car-dependent in most of their everyday actions, since these settlements are not well-served (or even not served at all) by public transport (Figure 5.3).

Creating focal points in the small settlements able to accommodate the core social and commercial institutions that sustain urban life and provide a sense of place requires, firstly, significant public investment in urban requalification interventions.

Figure 5.3 – The social costs of the Marche Regions's dispersed cities



In these cases, public investment is of utmost importance as a pre-requisite to the private investment which would be stimulated by its positive externalities. Tackling the loss of commercial and recreational functions by the historical settlements – and ultimately their economic decline – requires locally devised comprehensive regeneration projects where priority is given to making them more attractive by restoring existing properties, adding new high quality buildings to older neighbourhoods, improving city conditions, and involving residents more directly. Moreover, when housing development is required, care must be taken to ensure that the new neighbourhoods do not undermine the existing communities.

5.6 Quality and environmental performances of the built environment

The third perspective from which to look at the under-capitalization of the Marche Region's urban systems is the quality and environmental performances of the built environment. This can be analysed with regard to the following issues:

a) design quality and maintenance of buildings and public spaces;

b) well-designed and integrated urban neighbourhoods;

c) environmental performances of the built environment.

The design quality of the built environment is regarded as one of the key components of vital and attractive urban neighbourhoods, and it has become a crucial factor in the economic development of cities. Most urban systems display a poor quality as far as the design quality and maintenance of buildings and public spaces are concerned. This is due to various factors: buildings constructed during the years of the most intense housing development are generally poorly designed; historical settlements comprise numerous decaying buildings because the loss of the social and economic functions of such settlements has discouraged private investment in the restoration of existing properties; too often public spaces are not fully recognised as fundamental linkages between people and places with the consequence that they are poorly designed, maintained and managed (inappropriate rule uses); negative externalities generated by car traffic (congestion and the ensuing air and noise pollution) and impacting on specific areas have affected the quality of the built environment and determined situations of urban disruption in the inner city neighbourhoods as well; brown-fields located in some inner city areas have persisted over time notwithstanding their vital importance for the regeneration of those areas. These situations, which are recurrent in the Marche Region's urban systems, need significant public and private investment.

Another aspect to consider is that the urban settlements built over the past decades were not designed around the principles of compactness, density, quality design and accessibility to public transport services which are prerequisites for sustainable settlements. These would allow dwellers to benefit from local facilities – made viable by compact and high density urban structures combined with well designed patterns of public spaces and streets which sustain people mobility within urban neighbourhoods – and to have access to the wider range of activities and services supplied by higher hierarchical urban centres thanks to good accessibility of public transport and well integrated public transport infrastructures. With this respect most of the existing Marche Region's urban settlements should be analysed in terms of the urban design principles mentioned above and re-shaped in order to create liveable neighbourhoods which function as economic and social units. This aim requires relevant public investment both to deliver visions and strategies of urban renewal and to turn the existing inefficient and strongly under-capitalised urban settlements into more sustainable ones.

Here the issue of the environmental performance of the built environment concerns buildings and urban sprawl as major sources of energy consumption – and of carbon emissions. It follows that policies designed to meet the target for reducing carbon emissions must be oriented to improving the environmental performance of these two components in terms of energy efficiency.

To be stressed is that here the concept of 'energy efficiency' refers not only to environmental performances by buildings as regards their carbon emissions (energy consumed for space and water heating, appliances and lighting, cooking, waste) but also to energy consumption associated with the functioning of neighbourhoods which are badly-connected and car-dependent because they lack the core social and commercial institutions. From this perspective, energy efficiency pertains to another crucial area in which the under-capitalization of the Marche Region's urban systems is extremely strong. Improvements in this disequilibrium require not only engineering projects to convert and upgrade existing buildings to the (highest) eco-standards in order to improve their environmental performance, but also high-quality overall urban planning processes able to create sustainable urban neighbourhoods well served by basic public services and endowed with commercial activities, play spaces and other amenities.

Of course, it is of utmost importance that sustainable building codes should be attached to new buildings in order to reduce their environmental impact and that the core principle of delivering compact, well-designed and well-connected settlements

should be applied to new developments in order to minimize their dependency on driving.

5.7 The funding of investment in urban capital

Expressing the disequilibria of the Marche Region's urban systems in terms of under-capitalisation enables us to stress two aspects of great importance from an economic perspective:

1. the time span necessary to increase urban capital up to the level regarded as sufficient with respect to the following three interdependent factors: territorial competitiveness, meta-preferences of the local community, and environmental sustainability;

2. the funding of the investment in urban capital in the urban systems considered.

Given the amount and type of the urban capital to accumulate, the problem of the under-capitalisation of the Marche Region's urban systems can only be solved by medium-long term investment programmes which may require ten to twenty years to be delivered. On assuming a medium-long term perspective, the first implication is the coherence of the investment over time – and also the efficiency of its temporal scansion. Such coherence requires urban systems – their communities – to converge on a shared strategy of spatial and relational development – and, therefore, on a shared strategy of economic development.

Achievement of this objective cannot rely on self-organization processes. It requires the construction of a regulation system aimed at devising that specific public good called 'strategy for local development'. Being endowed with an appropriate decision system is of utmost importance for delivering efficient and efficacious long-term investment projects, and the polyarchy which governs the Marche Region's urban systems is totally inadequate. On the other hand, institutional coalescence would be only a necessary condition for achieving the formation of urban governments able to define and deliver long-term investment strategies.

The funding of capital accumulation is a more complex issue than the previous one. It can be partly tackled by re-allocating public resources on the basis of a newly redefined hierarchy of importance among the diverse realms of investment. But the decisive factor for a long-term strategy for urban capital accumulation is re-allocation of the surplus generated by the city through the following three classic mechanisms: command, incentives, and moral suasion. This gives rise to

unavoidable issues pertaining to:

1. re-allocation of given resources;

2. re-allocation of the urban surplus between public and private sector;

3. re-orientation of private investment towards a configuration which generates more positive externalities.

Moving to a phase of over-investment – in order to compensate for the long phase of under-investment – raises complex problems of economic regulation which can only be solved by establishing effective mechanisms of governance.

5.8 The crucial role of urban transformation projects

The institutionalization of the Marche Region's urban systems is the first step to accomplish – however difficult it may be, and however long the delay with which it is achieved. Only afterwards can a project be devised; a project that should have a fundamental planning and architectural nature and that should lead to a spatial re-organization of the urban systems which arose from processes of territorial coalescence. By means of coherently managed long-term investment processes, the Marche Region's urban systems should be transformed into cities from the physical point of view.

Tackling the disequilibria of the Marche Region's urban systems requires a project for their physical reconfiguration which declines their settlement dispersion in modern terms; that is, makes it possible to achieve the objective of environmental sustainability and to consolidate relational systems within each urban system. The urban systems considered need infrastructural projects (micro and macro-infrastructures) coherent with their settlement dispersion by:

a) creating 'structures' which connect the set of sub-settlements comprised in each urban system;

b) reshaping the fragmented, poor designed and bad connected sub-settlements in more sustainable and vital communities.

They must be 'capitalised' – they must become the space of investment projects – with the aim of decreasing the individual and social costs associated with the circadian cycles of their inhabitants on which the functioning of a city is based.

Urban planners and policy makers must learn to view the Marche Region's urban systems as cities in nuce and consequently to devise projects of spatial development

aimed at completing them. Delivering single and isolated regeneration projects or focusing on the design quality of single buildings and public spaces is today no longer sufficient.

The Marche Region's urban systems require encopassing projects of physical re-configuration able to give them the typical spatial organisation of a modern, environmentally sustainable city: a (hierarchical) organization of their focal points must be established; an infrastructural system which connects these focal points to each other and with the rest of the settlement structure must be implemented; and a design quality and management of the built environment which meet the standards of the 'European model of city' must be given greater priority.

Figure 5.4 – Increasing the investment rate in the Marche Region's urban systems