

Hinterlands delimitation of *Lisboa e Vale do Tejo* cities

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Abstract

For a long time that regional and urban science has interpreted territory through a systemic analysis where cities network are the fundamentals of spatial organization. Differentiation established between cities results from distinct levels of centrality, which allows setting an urban hierarchy.

The present discussion aims to study *Lisboa e Vale do Tejo* urban structure through cities rank position as well as defining theirs hinterlands and understanding the interactions between them.

The empirical application of this study is supported by information about services provided to the population that was compiled in Inventário Municipal (INE, 1998). City delimitation at level of *freguesia* (minimum territorial unit of *Inventário Municipal* information) was a necessary previous step for this analysis.

1 Theoretical Framework

The main purpose of present work is to study the system of *Lisboa e Vale do Tejo* (LVT) cities, through definition of cities hierarchy and analysis of flows between them. The Central Place Theory (CPT), developed by Christaller (1933) and Lössch (1940)¹, provides the theoretical fundamentals to this analysis.

In Portugal, there are few works on this area, which can be explained by the lack of information sources that allow empirical applications². The delimitation of Évora influence area by Gaspar (Gaspar, 1981) represents one of the most important investigation in this area.

Before a brief presentation of Central Place Theory it's necessary to explain the meaning of following terms, that will be used during this work:

¹ Lopes (Lopes, 1987) and Alves et al (Alves et al, 1999) present a detailed version of this theory.

² Gaspar (Gaspar, 1981) presents a survey of international studies on Central Place Theory applications.

Central function - activity that provides goods or services, located on central position within its market area (e.g. hospital, driving school, video club)³. As more specialised and rare is the function, more central it will be.

As explained by Polèse (Polèse, 1998) the more specialised functions, located on the top of functions hierarchy, have the following features:

- Important scale economies that implies high minimum dimension of demand;
- Low frequency of consumption and, as a consequence, low transport costs associated with consumers movements;
- Its consumption implies larger movements by the population.

Functional Unit – each unit that provides a central function. Several functional units can provide the same central function.

Central Place – urban place that provides central functions for its peripheral region, that represents its **area of influence** or its hinterland.

Centrality – represents the level of central functions supplied by a certain urban place.

Area of influence (hinterland) of central function (for a certain urban place) – geometric place where the consumers of central function are.

The central place theory was developed with the purpose to explain why cities arise and was centred on the study of economic activity location, more specifically the activities of services sector. This theory tries to explain the size and the spatial distribution of urban places and also the relation between them.

According to this theory the centrality of an urban place is proportional to the specialisation of functions that are supplied and, as a consequence, is also proportional to the dimension of its area of influence. The more central urban places area, more population they have.

The centrality of urban place depends on the level of specialisation of the functions that it provides. As a result of this direct relation between hierarchy of functions and hierarchy of urban places, the relation among urban places strictly happens in a hierarchic way. The flows between urban places only happen in a vertical/upward way.

2 The Lisboa e Vale do Tejo cities

City delimitation is part of a greater INE project – “Urban Statistics” – which has dissemination of statistical information at city level as the main goal. This new statistical spatial unit - the city – will be the support of compilation and dissemination of statistical information in the near future.

This study only considers the agglomerations that were legally created as cities under the terms of Law nº11/82, second of June. This law defines “the rules for creation and extinction of local governments, and designation and determination of settlements category”. On its 13rd article establishes that: “a village can only get a city title when has 8000 inhabitants living on a continuous built area, and with, at least,

³ At this work we will make no difference between central function and central good or service, for instance between hospital (the function) and several specialities provided by it (the central services). This option is due to the limitation of information that will be analysed.

half of the following public equipment: a) hospital with 24 hours service; b) pharmacy; c) fireman corporation; d) theatre and cultural centre; e) museum and library; f) Tourist accommodation; g) Preparatory and secondary Schools; h) Kindergartens; urban and suburban public transports; Public gardens.”

In spite the dimension and functional criteria, article 14th defines a wide exception possibilities: “important historical, cultural and architectonic may justify a different weight of the eligibility criteria’s”.

However, neither this law, nor recent laws which establish a specific city elevation, present precise spatial limits of cities.

The *Lisboa e Vale do Tejo* Region accounts a total of 30 cities, from which 16 are located on Lisbon Metropolitan Area (LMA).

City delimitation was based on three main principles:

1 – City delimitation should be taken with the smallest territory level – *subsecção estatística* (a block of houses in urban areas);

2 – Local Governments should be involved on delimitation process, as they are the most important space actors on space management and transformation;

3 – Delimited cities should represent the city at the present time.

The delimitation criteria followed was:

- Morphological criteria – analysis of population and dwellings density at *subsecção* territorial desegregation and analysis of topographic and aerophotography⁴;
- Planning criteria – analysis of local governments physical planning instruments, specially Urban, Urban Growth, Existent Industry, Projected Industry, Projected Equipment, Urban Green Area⁵ and urban perimeter⁶;
- Functional. Employment areas, specially industrial areas, as these areas tend to assume peripheral locations and may represent an important part of city labour market.

Due to diversity of city appearance at a national level (from historical cities to those that result of post-suburbanization evolutions), local authorities end up playing a major role on delimitation process, not only by the legal planning instruments provided, but also by meetings with planning technicians.

Globally city limits are a compromise between local government definitions and *subsecções* territorial division.

Inventário Municipal information structure led to city definition at level of *freguesia*⁷.

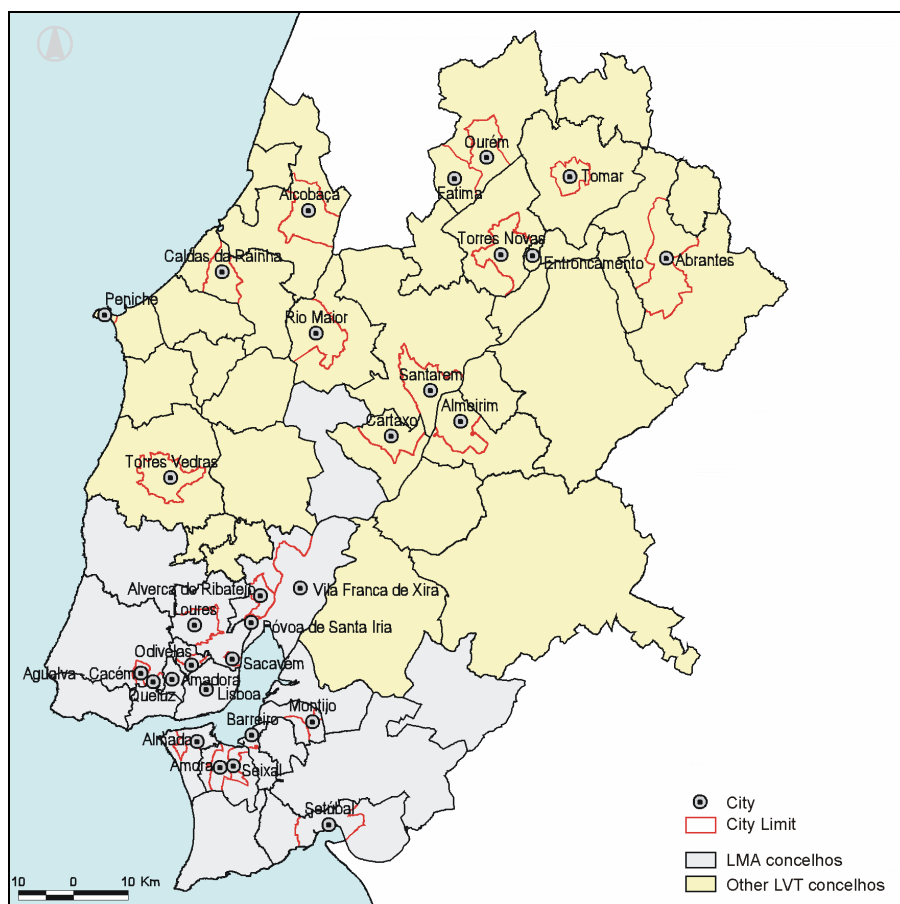
⁴ Ortofotografia from Instituto Português da Cartografia e Cadastro, série 1:10 000, 1998; Vector Cartography from Associação de Municípios do Oeste., 1:10 000, 2000; Vector Cartography from Instituto Geográfico do Exército, 1:25 000; other vector high scale Cartography from Câmaras Municipais.

⁵ The Space Classes denomination presented corresponds to the Class/Category Type defined by Direcção Geral do Ordenamento do Território e Desenvolvimento Urbano (1998).

⁶ The geographical information used for this analysis were digitised by Direcção Geral do Ordenamento do Território e Desenvolvimento Urbano and Local governments cartography from legal planning instruments.

⁷ *Freguesia* represents the Portuguese NUTS V. NUTS IV – *Concelho* – is formed by a group of *freguesias*.

Figure 1 – The cities of Lisboa e Vale do Tejo



3 The functions hierarchy

The current empirical application is based on a set of 126 central functions that cover the following areas: trade and service, health, education and social security. For these functions we have information from Inventário Municipal⁸, not only about availability of the functions, but also about where population goes to consume a specific function if it isn't available in the inquired *freguesia*.

So, the sources of information are the five Inventários Municipais 1998 for each Portuguese NUTS II (*Norte, Centro, Lisboa e Vale do Tejo, Alentejo and Algarve*). They have information about what are the functions provided by cities and what are the interactions among cities and among them and their hinterlands. In this survey is

⁸ Inventário Municipal is a Portuguese survey about functions available in *freguesias* and is answered by the presidents of the *freguesias*.

asked the number of functional units available to provide each function and if function is unavailable it is asked where⁹ population goes to consume.

The hierarchy of functions is supported by the diversity of goods and services provided by central functions. On the top of it, representing the most central functions, are placed the most specialised functions with lowest demand frequencies.

Hierarchy is based on the number of functional units for each central function, at a national level. This variable is used as a proxy of function rarity. Therefore the function *hospital* is in a higher position of the hierarchy than the function *video club*, because there are 89 functional units for the former and 1446 for the other.

Thus, in the first position of the central functions hierarchy is the *alcoholism treatment clinic* (42 functional units) and in the last position is the *café, bar tavern* (34606 functional units) (see appendix 1).

There is a need of grouping the 126 functions in a limited number of classes, because the hierarchy will be used for segmentation of forthcoming analysis output.

The construction of specialisation classes of functions was done according to the following steps:

- i. Application of statistical method – natural breaks – to the variable number of functional units. This method identifies breakpoints between classes using a statistical formula (Jenk’s optimization). Jenk’s method is rather complex, but basically it minimizes the sum of the variance within each of the classes.

This method was used in an iterative way increasing in each step the number of classes. The iteration was stopped when the good segmentation on the top of hierarchy was achieved (happened with 11 classes). This process allowed getting a first class with a small number of functions.

- ii. Afterwards, a casuistic grouping of sequential classes was done. The goal of this grouping was to get a small number of classes with an equilibrated number of functions among them and fewer functions in the first and the last classes.

So the result is the following five classes of central functions hierarchy:

More specialisation ↑	Class	Class name	Number of functions	Original class(es)
	1	Highly specialised functions	12	1
	2	Specialised functions	33	2+3
	3	Medially specialised functions	42	4+5+6
	4	Lowly specialised functions	31	7+8
	5	Not specialised functions	8	9+10+11

⁹ By *freguesia*.

4 The cities hierarchy – centrality

The centrality represents the functions range provided by central places. Central places that provide more specialised functions will have higher centrality indexes.

In the theory, the most central place will be the one that provides more functions¹⁰. However, empirically this assumption is not valid: a city that provides a function of n level (degree of specialisation) does not always provide all functions of lower levels; there is no city that provides all the 126 functions (Lisboa provides the maximum number of functions – 122).

The construction of a centrality index is based on an essential assumption - cities that provide more functions will be more central. In addition, functions will be weighted according to the following principles:

- More central functions located in higher positions of hierarchy will be considered more important. So functions will be weighted by their degree of specialisation (S).
- Cities with more functional units providing a specific function will be considered more relevant. Between two cities that supply the function *hospital*, will be considered more important the one that has more functional units. So the number of functional units (FU) will weight functions in cities.

The centrality index (CI) will be calculated according to the next formula:

$$CI_j = \sum_{i=1}^{126} \left[\exists F_{ij} * \left(\frac{S_i + FU_{ij}}{2} \right) \right], \text{ where:}$$

- i represents the central functions and j the cities.
- $\exists F_{ij}$ represents a binary variable (0,1) that assumes the value 1 when the city j provides the function i and 0 in the opposite situation.
- S_i means the degree of specialisation of function i and it is inversely proportional to the number of functional units that exist in Portugal. It is equal to the inverse of number of functional units of the function i .
- FU_{ij} represents the dimension of function i in city j and it is equal to the number of functional units.
- E_i and UF_{ij} were normalised, making their maximums equal to one. In UF_{ij} this normalisation is made by function. By this way, both factors have the same weight on centrality index construction.

Table 1 shows the cities hierarchy resulting from the methodology presented above.

¹⁰ For Christaller one central place that provides a function of n level (degree of specialisation) also provides all functions of lower levels.

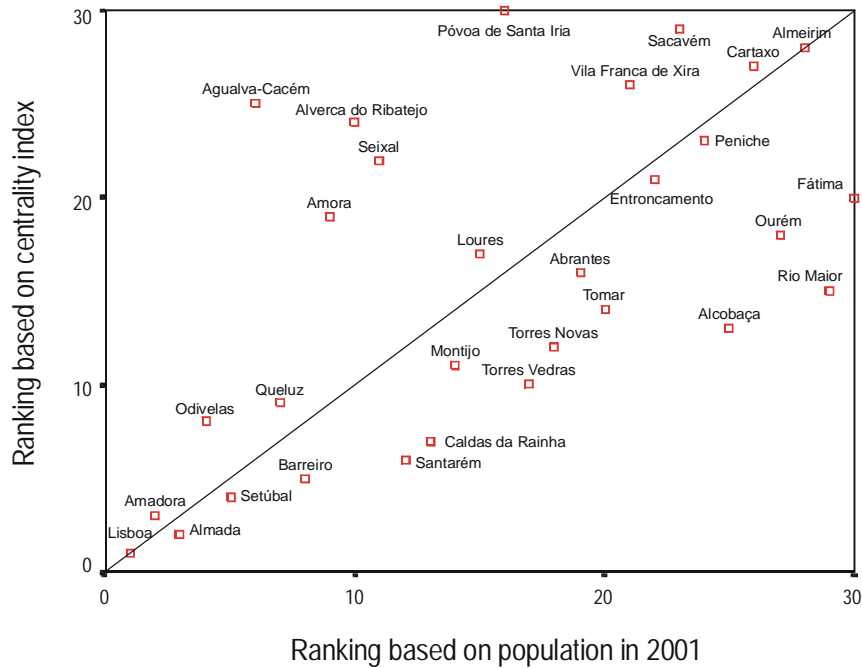
Table 1 – Cities hierarchy

Cities	Centrality Index	N ^{er} of functions	Population 2001	Area (km ²) 2001	Cities	Centrality Index	N ^{er} of functions	Population 2001	Area (km ²) 2001
Lisboa	64,93	122	564 657	84,6	Abrantes	7,34	104	22 028	121,3
Almada	16,08	117	111 933	25,0	Loures	6,60	103	28 429	47,9
Amadora	15,85	114	175 872	23,8	Ourém	6,46	103	11 919	61,3
Setúbal	12,48	114	91 319	53,3	Amora	6,26	93	50 991	24,5
Barreiro	11,18	112	53 909	8,3	Fátima	6,26	95	10 302	71,9
Santarém	10,60	116	30 537	78,7	Entroncamento	6,21	106	18 173	13,8
Caldas da Rainha	9,50	113	29 511	46,7	Seixal	6,03	96	31 116	13,7
Odivelas	9,22	104	92 175	10,9	Peniche	6,03	103	15 595	7,7
Queluz	9,14	108	78 123	6,7	Alverca do Ribatejo	5,98	97	40 065	23,4
Torres Vedras	8,70	109	23 831	62,5	Agualva-Cacém	5,78	98	81 843	10,4
Montijo	8,38	111	29 173	41,2	Vila Franca de Xira	5,45	98	18 442	212,1
Torres Novas	8,34	112	22 405	72,8	Cartaxo	5,05	96	14 501	61,6
Alcobça	8,22	108	15 451	82,2	Almeirim	4,83	95	11 607	68,9
Tomar	7,95	108	18 904	31,2	Sacavém	3,93	84	17 659	3,8
Rio Maior	7,45	107	11 532	90,0	Póvoa de Santa Iria	3,76	82	24 277	4,8

cities of LMA

As it was concluded by Central Place Theory it is possible to find a strong relation between centrality of cities and their number of inhabitants (Figure 2). Exceptions of this rule are the cities Agualva-Cacém, Alverca do Ribatejo, Póvoa de Santa Iria, Amora and Seixal. These cities are located in the periphery of Lisboa. The intense growth of their population, as a result of suburbanisation process, was not kept up with decentralisation of functions from Lisboa city.

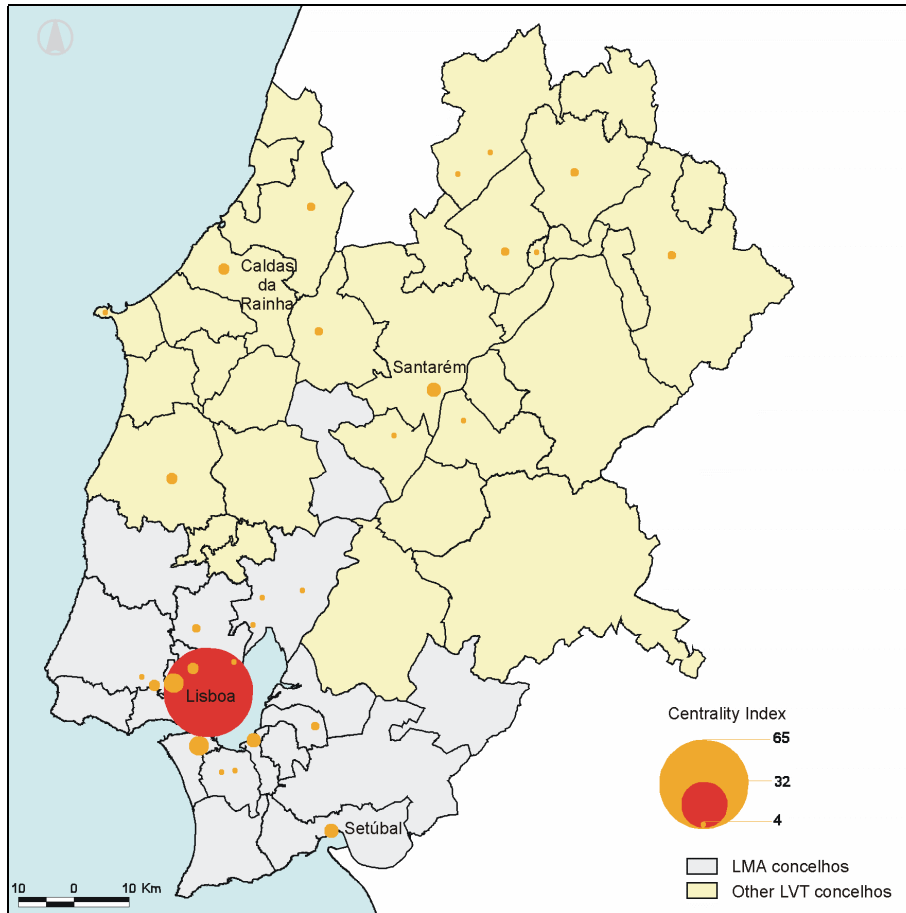
Figure 2 – Cities according to their position in ranking based on centrality index and ranking based on population in 2001



Analysing the cities network of *Lisboa e Vale do Tejo* (Figure 3) it is possible to identify the following features:

- There is a set of important cities located in the core of LMA – Lisboa, Almada, Amadora and Barreiro – with high geographic proximity and solid integration, that can be observed through the high commuting movements among them.
- Also in the LMA we found less important cities – Odivelas, Agualva-Cacém, Queluz, Loures, Sacavém, Póvoa de Santa Iria, Alverca do Ribatejo, Vila Franca de Xira, Seixal, Amora e Montijo - forming an external ring of the LMA core.
- Setúbal appears as a city with high centrality index (4th in the ranking) and represents an important centre of the South area of LMA;
- Outside LMA, Santarém and Caldas da Rainha are the most central cities. Santarém appears as the most important city of the urban subsystem of *Tejo* region (NUTS III of *Lezíria do Tejo* and *Médio Tejo*) and Caldas da Rainha as the most important of the *Oeste* region subsystem.

Figure 3 – Centrality index of *Lisboa e Vale do Tejo* cities



5 The cities hinterlands

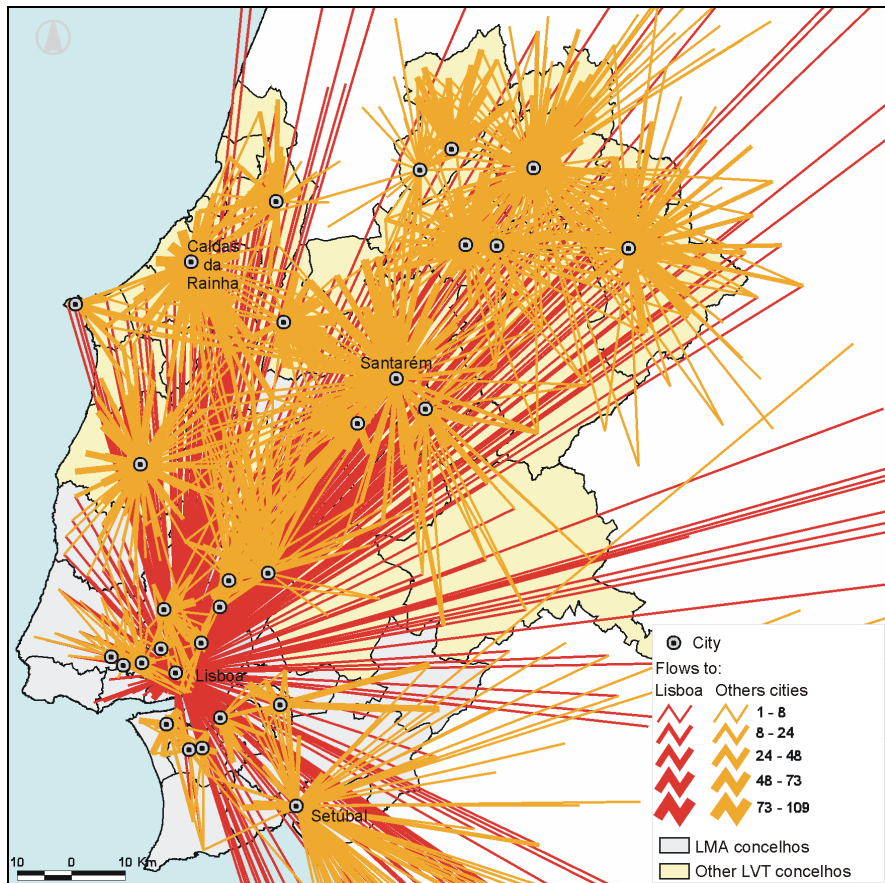
Cities hinterlands analysis allows a better understanding of how urban system of *Lisboa e Vale do Tejo* works. City hinterland is formed by the set of *freguesias* whose population goes that city to consume central functions.

Based on presentation of flows due to central functions consumption (all 126 functions) (Figure 4) we can observe the following features of urban system of *Lisboa e Vale do Tejo*:

- The huge hinterland of its major city – Lisboa – that goes beyond LVT borders;
- The importance of Setúbal as destination for Alentejo region;
- The intense interaction among cities located around Lisboa, that makes their hinterlands extremely diffuses;

- Santarém and Caldas da Rainha are the cities located outside LMA with the greatest hinterlands.

Figure 4 – Flows of central functions consumption in LVT cities (all functions)



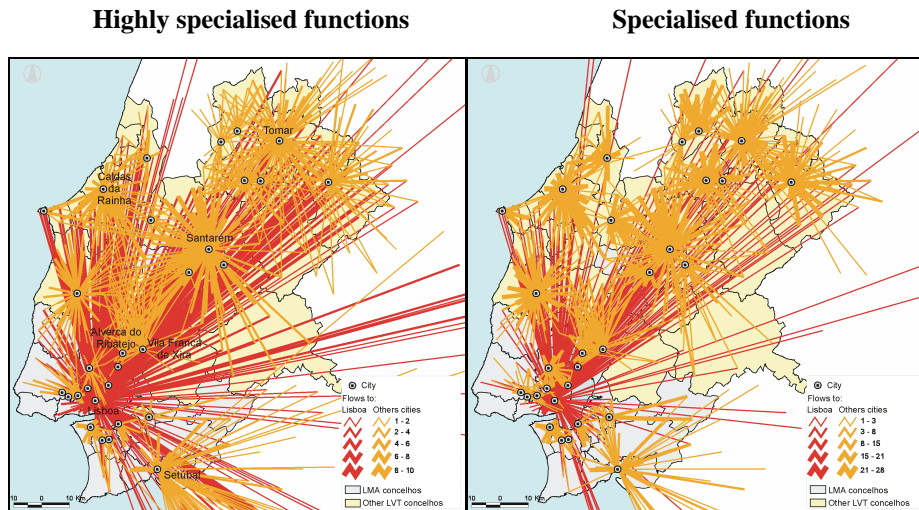
The less specialised functions are available in most of the cities and, as a consequence, their consumption flows are less and with smaller extensions (Figure 5).

Due to their rarity, the most specialised functions (both highly specialised and specialised functions) tend to resume the most important flows. Hinterlands based on this sort of functions go beyond *concelho* borders (Figure 5).

The analysis of Figure 5 emphasises the features of LVT urban system described above and allows to add the following characteristics:

- Cities of Vila Franca de Xira *concelho*, mainly Alverca do Ribatejo and Vila Franca de Xira, have important hinterlands, specially towards North.
- Tomar appears as the principal city of Médio Tejo region, mainly in highly specialised functions;

Figure 5 – Flows of central functions consumption in LVT cities

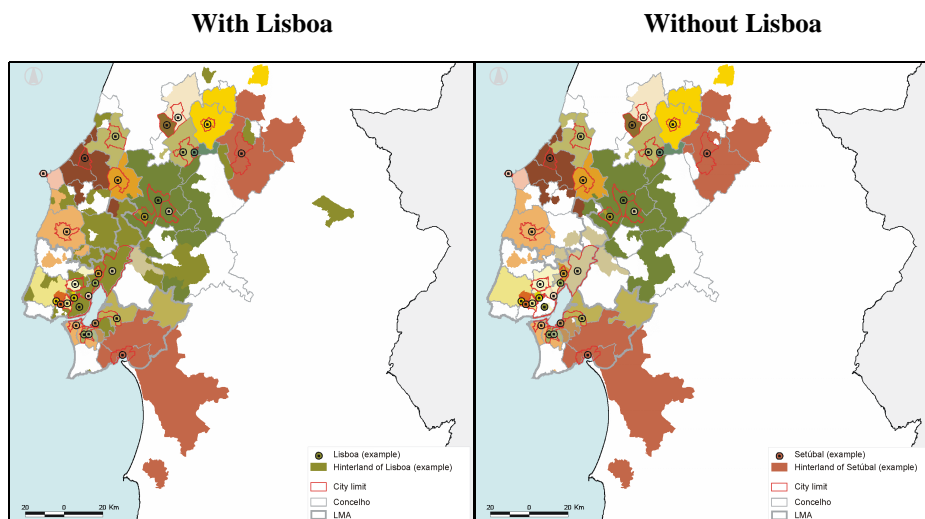


In order to measure the dimension of hinterlands, for example based on its population, it is necessary to link each *freguesia* to just one city. The most frequent destination for each *freguesia* was the base of this linkage process.

The next analysis will be segmented by the inclusion (or not) of Lisboa in the system. This procedure leads to a better understanding of the dimension of each city hinterland, because Lisboa, due to its high centrality, hides other cities hinterlands. Therefore, hinterland dimension is calculated without Lisboa, as a possible destination, for all cities, excepted for Lisboa itself. By this way, in Table 2, the population of Lisboa hinterland may be also part of other city hinterland.

Freguesias without a link to any city may have two different meanings: they provide most of the functions in analysis or the flow patterns are so diffuse that *freguesia* itself becomes the most frequent destination.

Figure 6 – Hinterlands of LVT cities (most frequent destination for highly specialised and specialised functions)



The cities with bigger hinterlands, measured by population, area mainly located inside LMA. Outside LMA, Santarém, Torres Vedras and Caldas da Rainha have the bigger hinterlands.

Table 2 – Dimension of LVT cities hinterlands

City	Population 2001	Area (km ²) 2001	Dwellings 2001
Lisboa	1 225 580	2 167	599 722
Amadora	348 610	301	162 385
Almada	223 847	114	124 646
Loures	215 519	168	98 520
Setúbal	196 157	2 080	96 017
Barreiro	145 408	83	67 860
Santarém	143 598	1 995	69 123
Odivelas	116 953	19	51 109
Torres Vedras	110 805	600	58 138
Queluz	109 159	32	48 169
Vila Franca de Xira	108 506	584	49 636
Caldas da Rainha	82 774	582	45 701
Agualva-Cacém	81 843	10	36 765
Sacavém	58 891	14	24 150

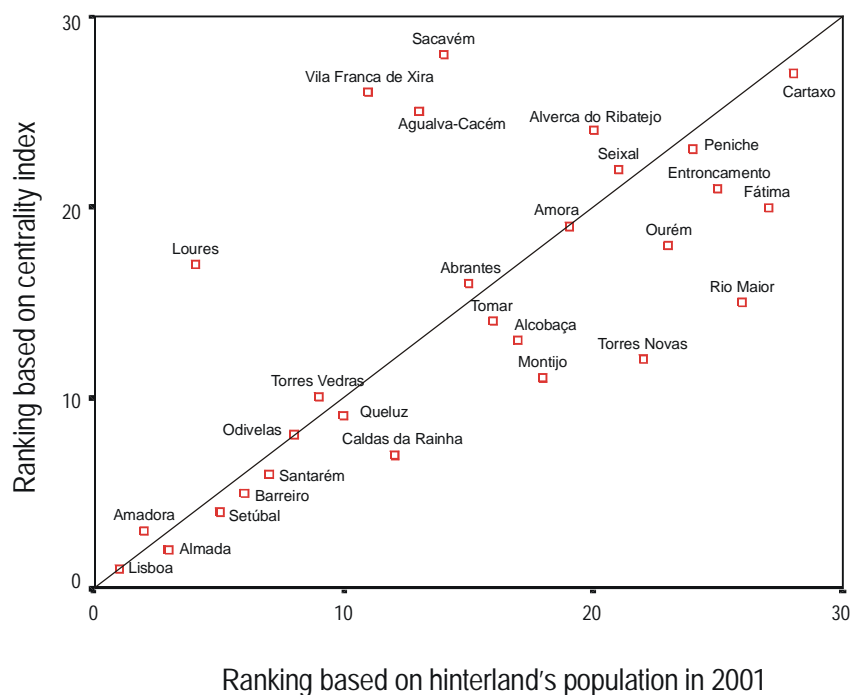
LMA cities

City	Population 2001	Area (km ²) 2001	Dwellings 2001
Abrantes	57 720	1 302	33 499
Tomar	56 818	607	33 035
Alcobaça	56 320	347	29 257
Montijo	52 178	474	25 827
Amora	50 991	24	22 259
Alverca do Ribatejo	45 077	35	19 454
Seixal	42 053	30	19 344
Torres Novas	41 247	280	20 195
Ourém	33 587	311	19 260
Peniche	27 316	78	16 729
Entroncamento	25 783	64	12 494
Rio Maior	20 686	266	10 159
Fátima	10 302	72	5 068
Cartaxo	10 115	19	4 854

6 Conclusion

Despite of *Lisboa e Vale do Tejo* urban system does not present a strict hierarchical organisation, its structure can be substantially explained by Central Place Theory. The more central cities have more population either in city limits (Figure 2) or in its hinterlands (Figure 7).

Figure 7 – Cities according to their position in ranking based on centrality index and ranking based on its hinterland's population in 2001

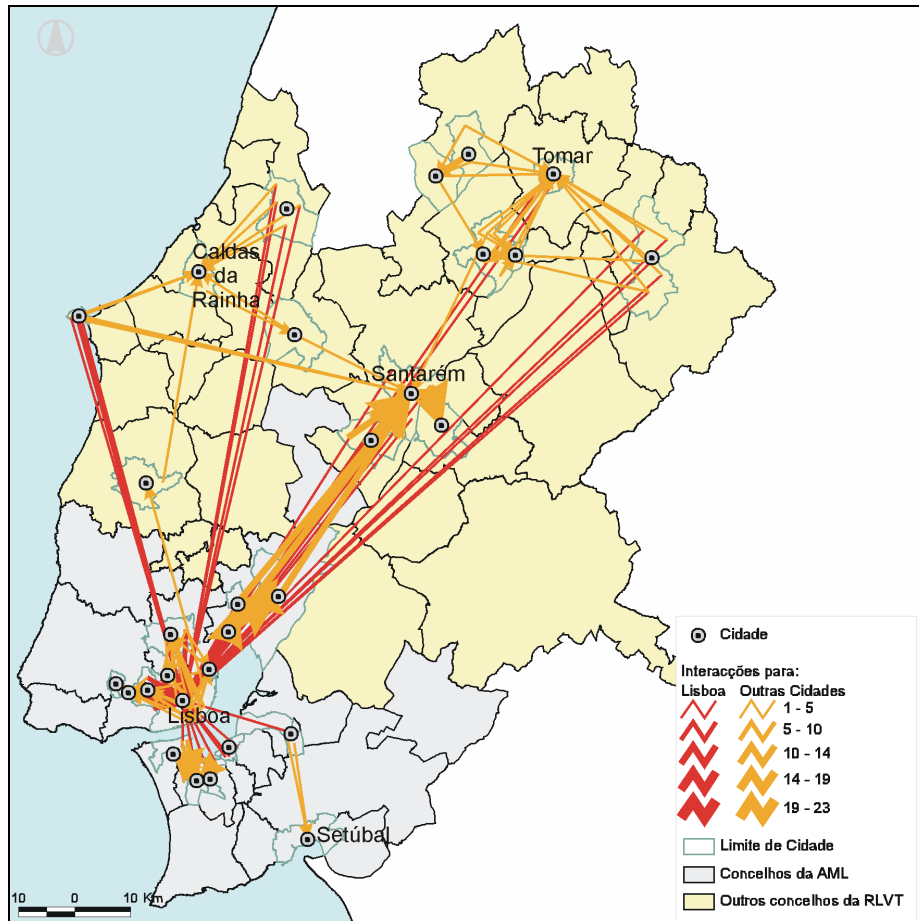


- One can identify four distinct city levels on LVT region:
- Lisboa as the main city, not only of LVT region, but also of Portugal, with a hinterland that covers almost all of the Portuguese territory;
 - A group of cities located around Lisboa, with high centrality indexes but smaller hinterlands. This contrast can be explained by high geographic proximity among them;
 - Setúbal, Santarém, Caldas da Rainha, Tomar and Torres Vedras are the principal cities at a regional level. They work as important destinations, principally at the level of most specialised functions;
 - The rest of the cities are located in hinterlands of the former cities. However these cities provided a great part of 126 functions analysed in this study.

The flows of central functions consumption (only) between cities (Figure 8) are mainly from less central cities to higher central cities. Again, Lisboa, Santarém, Caldas da Rainha and Tomar appear as the cities that have bigger flows. Setúbal role

in this node approach is quite low, because territory outside LVT region represents a major part of its hinterland (Figure 6).

Figure 8 – Flows of central functions consumption between LVT cities (all functions)



7 References

1. Alves, M. Brandão et AL: *Formação de Centros e Sistemas Urbanos (Tópicos)*. CIRIUS, série didática, documento de trabalho nº 5/98-99 (1999)
2. Benko, Georges: *A Ciência Regional*. Celta (1999)
3. Gaspar, Jorge: *A área de Influência de Évora: sistema de funções e lugares centrais*, 2ª edição. Centro de Estudos Geográficos (1981)
4. INE e DGOTDU: *Tipologia de Áreas Urbanas*. INE (1998)

5. Lopes, A. Simões: *Desenvolvimento Regional*, 4ª edição. Fundação Calouste Gulbenkian (1995)

6. Polèse, Mario: *Economia Urbana e Regional: Lógica espacial das transformações económicas*. APDR (1998)

8 Appendix - Central function hierarchy

Function	Nº of functional units	Ranking	Classes	
			with natural breaks (11)	Final (5)
Alcoholism treatment clinic	42	1	1	1
Health care centers with interning service	84	2	1	1
Slaughter house	85	3	1	1
Hospital	89	4	1	1
Drug addict treatment clinic	97	5	1	1
Secondary school - private	101	6	1	1
Hypomarket	112	7	1	1
Clinic with interning service	114	8	1	1
Health care center to AIDS	117	9	1	1
TAC service	126	10	1	1
Employment agency	130	11	1	1
Kennel	178	12	1	1
Professional formation center	196	14	2	2
Car inspection center	196	15	2	2
Rehabilitation center for locomotion handicap	196	13	2	2
Lower secondary school - private	201	16	2	2
Health care center to drugs addict	218	17	2	2
Primary school (5-6 years) - private	227	18	2	2
Commercial registry office	231	20	2	2
Autonomous service of ambulances	231	19	2	2
Tribunal	250	21	2	2
Professional school	256	22	2	2
Pretrial registry office	292	23	2	2
Civil registry office	295	24	2	2
Bi-weekly market	305	25	2	2
Weekly market	320	26	2	2
Tourism office	322	27	2	2
Secondary school - public	330	28	2	2
Notary's office	347	29	2	2
Treasury	348	30	2	2
Finance bureau	356	31	2	2
Health care centers without interning service	357	32	2	2
Echography service	370	33	2	2
Radiology service	405	34	3	2
Musical equipment store	413	35	3	2
School by TV	451	36	3	2
Monthly market	467	37	3	2
Car rent	471	38	3	2
Primary school (4 years) - private	515	39	3	2
Children's boarding homes	522	40	3	2
Fire corporation	524	41	3	2
Fire corporation with ambulance service	533	43	3	2
Fuel station (24hours)	533	42	3	2
Veterinary clinic	592	44	3	2
Police-station	642	45	3	2
Pets shop	701	46	4	3
Sweet herbs store	735	47	4	3
Travel agency	753	48	4	3
Market	753	49	4	3
Driving school	765	50	4	3
Exchange office	837	51	4	3
Shopping center	860	52	4	3
Primary school (5-6 years) - public	863	53	4	3
Annual market	892	54	4	3
Consultancy office	936	55	4	3
Lower secondary school - public	951	56	4	3
Nursing center	995	57	4	3
Record store	1001	58	4	3
Keys store	1070	59	4	3
Scrap dealer	1141	60	5	3
Free times occupation for young people	1189	61	5	3
Homes for the elderly people	1279	62	5	3
Copy center	1332	63	5	3

Function	Nº of functional units	Ranking	Classes	
			with natural breaks (11)	Final (5)
Optician	1370	64	5	3
Video Club	1446	65	5	3
Funeral agency	1449	66	5	3
Dye-house/Laundry	1480	67	5	3
Computing equipment store	1485	68	5	3
Homes for the elderly people (only day)	1528	69	5	3
Clinical analysis service	1562	70	5	3
Perfume's shop	1626	71	6	3
Free times occupation for children	1635	72	6	3
Transport agency	1650	73	6	3
Haberdasher's shop	1654	74	6	3
Parochial center	1676	75	6	3
Bicycle stand	1687	76	6	3
Nursery - baby unit	1713	77	6	3
Sport goods store	1731	78	6	3
Health care center delegation	1747	79	6	3
Motorcycle stand	1765	80	6	3
Estate agent's	1873	81	6	3
Nursery - private	1881	82	6	3
Tyre store	1916	83	6	3
Supermarket	1940	84	6	3
Building office	1986	85	6	3
Photographic goods store	2051	86	6	3
News stand	2113	87	6	3
Wholesale dealer	2276	88	7	4
Fuel station	2410	89	7	4
Beauty institute	2413	90	7	4
Fish shop	2468	91	7	4
Jewellery/Watch-maker's	2551	92	7	4
Pharmacy	2558	93	7	4
Repair-shop for agriculture equipment	2749	94	7	4
Farmer goods store	2813	95	7	4
Insurance broker	2834	96	7	4
Florist	2872	97	7	4
Drugstore	3056	98	7	4
Electric material store	3147	99	7	4
Trucks	3438	100	8	4
Motorcycle/bicycle garage	3512	101	8	4
ATM	3544	102	8	4
Bank	3545	103	8	4
Accounting office	3547	104	8	4
Lawyer office	3646	105	8	4
Bookshop/Stationer's	3661	106	8	4
Repair-shop for domestic equipment	3892	107	8	4
Car stand	3944	108	8	4
Repairing articles of personal use	4022	109	8	4
Fruit store	4050	110	8	4
Material store of construction	4063	111	8	4
Nursery - public	4106	112	8	4
Foot-wear store	4632	113	8	4
Domestic equipment store	4638	114	8	4
Furniture store	4958	115	8	4
Gas station	5020	116	8	4
Confectioner's	5668	117	8	4
Baker's shop	5729	118	8	4
Butcher's/Sausage shop	6708	119	9	5
Cars garage	7833	120	9	5
Primary school (4 years) - public	8322	121	9	5
Hairdresser	9956	122	9	5
Clothes store	10144	123	9	5
Restaurant	13667	124	10	5
Grocery	20330	125	10	5
Café, bar, tavern	34606	126	11	5