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FUNCTIONAL URBAN REGIONS IN AUSTRIA

K. Sherrill

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Preface

One of the principal activities of the IIASA research task on Human Settlement Systems: Development Processes and Strategies is the delineation of functional economic areas in countries in Eastern and Western Europe, North America and Japan. These urban regions consist of core cities or agglomerations and their surrounding hinterlands, which are linked to the urban cores by flows of people, goods and services, and information. The present paper sets out the delineation criteria for urban regions of Austria and discusses some of the main characteristics of these regions. An economic and demographic analysis of the regions will appear in a forthcoming paper in this series.

Abstract

This paper sets out a regionalization of Austria into functional urban regions, each of which consists of an urban core(s) of at least 50,000 population and/or 20,000 jobs and the surrounding hinterland that is economically linked to the urban cores through commuting flows. The regionalization is based primarily on population and commuting data for 1971 and, to a lesser extent, on the geographical orientation of major highway networks. These functional urban regions are to serve as the spatial bases of data collection and of forthcoming analyses of demographic and employment change during the 1950-60 and 1960-70 periods in Austria.

Acknowledgements

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FUNCTIONAL URBAN REGIONS IN AUSTRIA

Introduction

The urban region, defined to consist of a city or agglomeration and the surrounding hinterland that is functionally linked to the core city through flows of people, goods and services, and information, is the spatial unit of analysis for the Human Settlement Systems Project (HSSP) that is currently underway at IIASA (Hall, Hansen and Swain, 1975a, 1975b). The urban region is a nodal-functional region that is polarized with respect to the spatial dimensions of growth and is internally spatially differentiated with respect to the distribution of people and economic activities. Each urban region specializes in the production of goods and services in which it has a relative advantage, and each is relatively self-contained with respect to residentiary activities.

It is necessary at the outset to provide a clear definition of an urban region and to specify a set of delineation criteria by which the concept of urban region may be given empirical substance. The criteria for regionalizing each nation, whose spatial and temporal development processes are the object of inquiry, into a set of urban regions should be applicable to all, since comparability of spatial units of analysis is a minimum requirement for the analysis. One such method for delineating urban regions is the application of central place concepts in classifying urban centers according to the functions each performs for its surrounding hinterland. This method has been used in delineating planning regions in Switzerland and the Federal Republic of Germany (Sherrill, 1976a, 1976b). An analysis of journey-to-work (commuting) data is another method by which urban regions may be defined and delineated. Urban cores are selected on the basis of their importance as employment centers, while the hinterlands of urban cores are defined to be within the spatial sphere of influence of the urban core to which they send the greatest number of commuters. This method produces a set of functional labor market areas; the urban core is the center of

employment while the hinterland serves as an additional source of labor for productive activities that are conducted in the urban center. The functional urban region that is defined on the basis of commuting flows contains both the residences and work places of most of the economically active population of the area; furthermore, there is relatively little commuting across regional boundaries. Since commuting flows and employment data provide a fairly good indication of the degree of spatial interaction and functional linkages among the areal units of an economic system, and since excellent commuting data are available for Austria, it was decided to divide Austria into a set of functional urban regions based on these data. The delineation procedure is similar to that employed by Hall in his regionalizations of other western European nations, and is discussed in the following section.

The Delineation Criteria

Hall employed two sets of delineation criteria in his regionalization of Great Britain, both of which are based on 1971 employment and commuting data (Hall, 1976a). One set of criteria, derived from the concept of a nodal-functional region, was used to define and delimit urban regions, each of which consists of a clearly dominant center and its surrounding sphere of influence; the other set of criteria was used to delimit non-urban regions in sparsely-settled rural areas that do not contain a strong urban center. The latter set of criteria will not be discussed since this procedure was not used in delimiting any Austrian regions.

Urban cores, as defined by Hall, consist of cities containing at least 20,000 jobs, to which are added all contiguous communities that contain at least 12.35 jobs per hectare (five jobs per acre). Hall identified 138 urban cores in Great Britain. Every hinterland district (a "local authority") is allocated to the urban core to which it sends the greatest number of its resident economically active population, provided that the district is either contiguous to the core or to another hinterland district

that has already been allocated to the core in question. If a hinterland district is not contiguous to any part of a region to whose core it sends the greatest number of commuters, then it is assigned to the core to which it sends the next largest proportion of its work force, provided that contiguity occurs. Contiguity outwards from the core is observed in all cases. Relatively isolated hinterland districts that are located on the peripheries of already defined urban regions, and which do not send commuters to any core, are assigned to the urban regions with which they exhibit the greatest connectivity, as measured by total work force movements.

The procedure for identifying urban cores did not include any population criterion for core size. The justification for omitting a population constraint is that the employment criterion of 20,000 is roughly equivalent to 50,000 population and has the additional advantage of identifying employment centers as opposed to dormitory centers. The only population criterion employed by Hall was that the combined core and hinterland must contain at least 60,000 persons; if not, the core was not eligible for designation as an urban core.

Hall's regionalization of Great Britain produced a set of 158 regions which exhaust the national territory. A similar procedure was utilized to regionalize Denmark into a set of 12 urban regions and 20 non-urban regions (Hall, 1976b).

A comparable procedure was used to regionalize Austria into a set of urban regions, which, taken together, exhaust the national territory. The main difference between Hall's delineations and this delineation is that the former are based on community data whereas the latter is based on county (Bezirk) data. Although total employment and commuting data exist for communities (Gemeinden) in Austria, it would have been disadvantageous to produce a regionalization of the country that does not conform to Bezirk boundaries. Nearly all of the relevant demographic and employment data that are to be the bases of forthcoming analysis are available only at the Bezirk level in Austria.

Functional Urban Regions in Austria

These nodal-functional criteria were applied to Austrian population, employment and daily commuting data for 1971 to produce a set of thirteen functional urban regions for the country. These regions are shown in Map 1. The nodes of these regions consist of an urban core area, comprised of one or more cities. The hinterland of each urban region consists of those Bezirke that are economically linked to the urban cores as measured by daily commuting flows from hinterland to urban core. These thirteen regions are postulated to be internally complementary regions; that is, the components of each region display more interdependencies among themselves than they do with neighboring regions. Moreover, these regions are not internally uniform with respect to socio-economic characteristics. They are characterized by a considerable degree of internal spatial differentiation; i.e., the distribution of population and economic activity varies markedly between the core and hinterland areas of each region.

The Austrian commuting data from the national census of May 12, 1971 represent a complete coverage of the population.[1] Although there exist varying definitions of a commuter, corresponding to the various types of areal units under observation, throughout this paper a daily commuter is defined to be an employed person[2] who works in a Bezirk other than his Bezirk of residence, unless otherwise noted, and who commutes daily to his place of work from his primary place of residence. The commuting data do not include persons in military service. The employment data that are included in Tables 1 and 2, as well as in Appendix A, were also compiled from the commuting tables of the 1971 census. These data exclude the unemployed but include persons in military service. The resident work force of a Bezirk or other political district is defined to include all employed persons (Beschäftigte insgesamt) who reside in the district but who do not necessarily work there.

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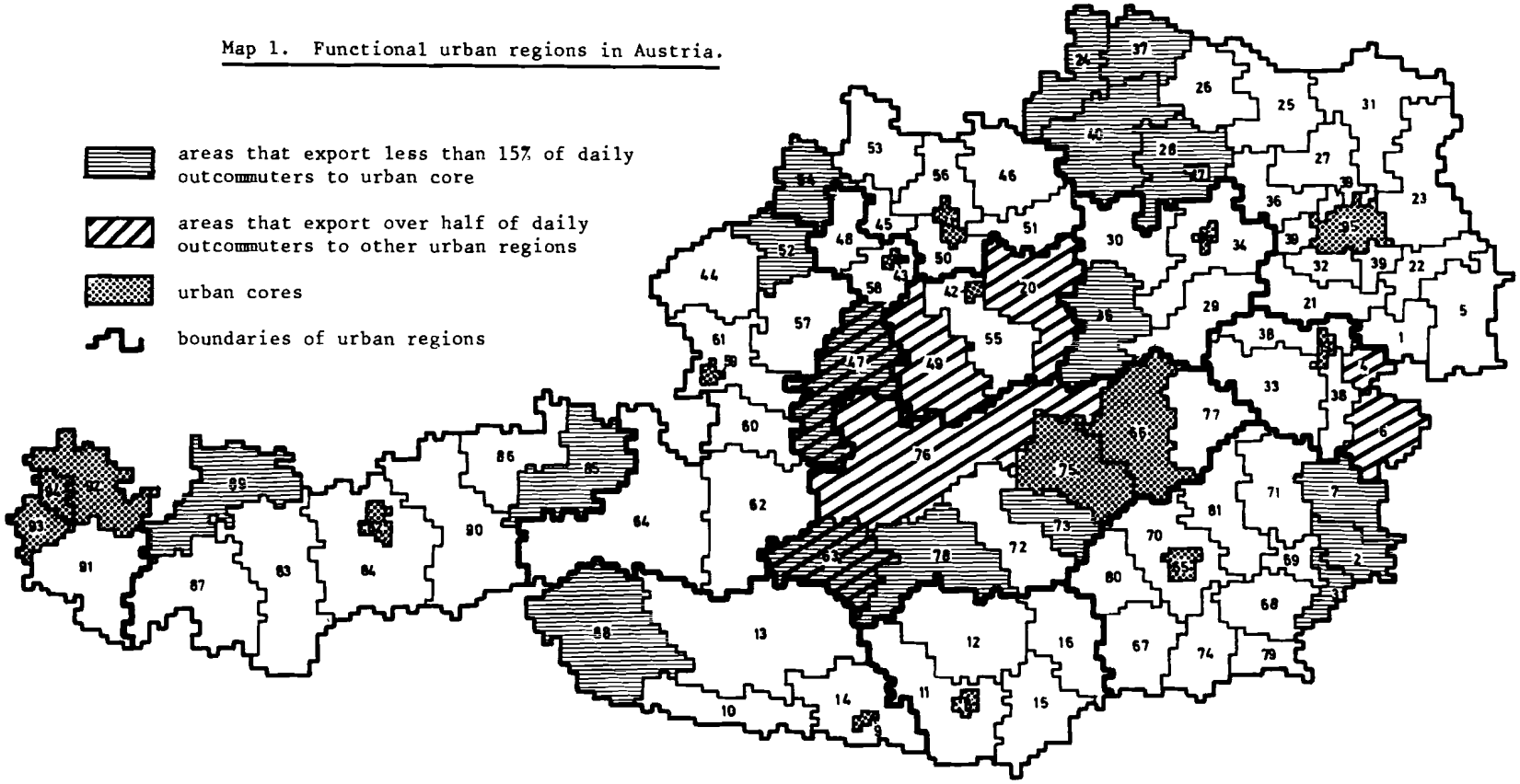
[1] Gross flows of less than 20 persons to and from specific destinations are not given in the official data.

[2] One who works at least 14 hours per week on average.

Map 1. Functional urban regions in Austria.



BURGENLAND

1 Eisenstadt (Stadt), Eisenstadt-Umg., Rust (Stadt)
2 Güssing
3 Jennersdorf
4 Mattersburg
5 Neusiedl am See
6 Oberpullendorf
7 Oberwart

KÄRNTEN

8 Klagenfurt (Stadt)
9 Villach (Stadt)
10 Hermagor
11 Klagenfurt Land
12 St. Veit an der Glan
13 Spittal an der Drau
14 Villach Land
15 Völkermarkt
16 Wolfsberg

NIEDERÖSTERREICH

17 Krems an der Donau (Stadt)
18 St. Pölten (Stadt)
19 Wiener Neustadt (Stadt)
20 Amstetten und Waidhofen an der Ybbs (Stadt)
21 Baden
22 Bruck an der Leitha
23 Gänserndorf
24 Gmünd
25 Hollabrunn
26 Horn
27 Korneuburg
28 Krems an der Donau Land
29 Lilienfeld
30 Melk
31 Mistelbach an der Zaya
32 Mödling
33 Neunkirchen
34 St. Pölten Land
35 Scheibbs
36 Tulln
37 Waidhofen an der Thaya
38 Wiener Neustadt Land
39 Wien Umgebung
40 Zwettl

OBERÖSTERREICH

41 Linz (Stadt)
42 Steyr (Stadt)
43 Wels (Stadt)
44 Braunau am Inn
45 Eferding
46 Freistadt
47 Gmunden
48 Grieskirchen
49 Kirchdorf an der Krems
50 Linz Land
51 Perg
52 Ried im Innkreis
53 Rohrbach
54 Schärding
55 Steyr Land
56 Urfahr-Umgebung
57 Vöcklabruck
58 Wels Land

SALZBURG

59 Salzburg (Stadt)
60 Hallein
61 Salzburg-Umgebung
62 St. Johann im Pongau
63 Tamsweg
64 Zell am See

STEIERMARK

65 Graz (Stadt)
66 Bruck an der Mur
67 Deutschlandsberg
68 Feldbach
69 Fürstenfeld
70 Graz-Umgebung
71 Hartberg
72 Judenburg
73 Knittelfeld
74 Leibnitz
75 Leoben
76 Liezen
77 Mürzzuschlag
78 Murau
79 Radkersburg
80 Voitsberg
81 Weiz

TIROL

82 Innsbruck (Stadt)
83 Imst
84 Innsbruck (Land)
85 Kitzbühel
86 Kufstein
87 Landeck
88 Lienz
89 Reutte
90 Schwaz

VORARLBERG

91 Bludenz
92 Bregenz
93 Feldkirch
94 Dornbirn

WIEN

95 Wien

The total employment (Arbeitsbevölkerung) of a district includes all persons who are employed in the district, but who do not necessarily reside there. Total employment in a particular district is therefore equal to the resident work force minus all outcommuters plus all incommuters.

Candidates for core status included all Austrian cities containing a working population of at least 20,000 and a resident population of at least 50,000. Eleven of the cities that were selected for core status meet the employment criterion; five of these eleven cities do not meet the population criterion. St. Pölten, Steyr, Villach, Wels, and Wiener Neustadt all contain less than 50,000 resident population and less than 20,000 resident economically active persons; however, all five are major commuting destinations for economically active persons resident in the respective hinterlands (see Table 1). The substantial amount of incommuting directed at each of these five centers results in their having over 20,000 working population. Since each of these five cities serves as a major economic center for its hinterland, the population constraint was relaxed and all five were designated as urban cores.

Two urban cores consist of three cities each, none of which, when taken alone, meets the population and employment criteria. The cities of Bregenz, Dornbirn and Feldkirch in the Vorarlberg, all of which are in close proximity, merge into an urban zone which is the focal point of activity in the Vorarlberg region. These cities, taken together, contain 77,863 population and nearly 40,000 jobs; consequently, all three were designated as comprising the urban core of the region. However, due to the constraint that the boundaries of both cores and hinterlands cannot violate Bezirk boundaries, the three Bezirke of Bregenz, Dornbirn and Feldkirch comprise the urban core of the region.

The Leoben-Bruck an der Mur region also contains an urban core area consisting of three small cities. This area, which consists of seven Bezirke in the northern and western parts of Steiermark, plus a neighboring Bezirk in Salzburg Land, is clearly large enough in terms of population and employment to support at

Table 1. Population, employment and daily commuting, 1971 for urban cores of functional urban regions in Austria.

Urban Core	Population	Work Force[1] (Resident)	Total Employment[2]	Daily Commuters[3]		
				Incommuters		Outcommuters
				Total	Hinterland	
Bregenz-Dornbirn-Feldkirch[4]	222,606	93,125	90,595	1,041[6]	1,008	8,092[6]
Graz	248,500	103,623	135,633	26,261	25,768	1,941
Innsbruck	115,197	46,662	63,120	14,484	14,480	1,393
Klagenfurt	74,326	32,302	47,464	13,304	12,220	809
Leoben-Bruck-Kapfenberg[5]	159,374	59,704	63,344	2,011[6]	1,506	831[6]
Linz	202,874	92,334	142,067	39,336	33,176	1,917
Salzburg	128,845	56,860	73,612	14,953	14,824	2,726
St. Pölten	43,300	17,520	23,861	7,331	6,759	1,558
Steyr	40,578	16,554	23,580	7,339	6,904	727
Villach	34,595	13,719	21,656	8,339	7,443	1,221
Wels	47,279	20,270	28,482	8,907	7,124	1,664
Wien	1,614,841	707,454	786,209	67,382	59,673	15,086
Wr. Neustadt	34,774	14,061	20,406	8,086	6,992	2,251
Total	2,967,089	1,274,188	1,520,029	218,774	197,877	40,216
Austria	7,456,403	3,052,807	3,039,700	318,413[7]	--	336,124[8]

Table 1. Population, employment and daily commuting, 1971 for urban cores of functional urban regions in Austria (continued).

Urban Core	Hinterland Incommuters as Percentage of:			
	Population	Work Force (Resident)	Total Employment	Total Incommuters
Bregenz-Dornbirn-Feldkirch	0.5	1.1	1.1	96.8
Graz	10.4	24.9	19.0	98.1
Innsbruck	12.6	31.0	22.9	99.9
Klagenfurt	16.4	37.8	25.7	91.9
Leoben-Bruck-Kapfenburg	0.9	2.5	2.4	60.8
Linz	16.4	35.9	23.4	84.3
Salzburg	11.5	26.1	20.1	99.1
St. Pölten	15.6	38.6	28.3	92.2
Steyr	17.0	41.7	29.3	94.1
Villach	21.5	54.3	34.4	89.3
Wels	15.1	35.1	25.0	80.0
Wien	3.7	8.4	7.6	88.6
Wiener Neustadt	20.1	49.7	34.3	86.5
Total	6.7	15.3	13.0	90.5

Footnotes to Table 1

[1] Economically active persons who reside in a particular Bezirk but who do not necessarily work there. Excludes the unemployed but not those in military service.

[2] Equals resident work force plus all incommuters, whether daily or non-daily, minus all outcommuters, whether daily or non-daily.

[3] Excludes those in military service.

[4] Consists of three Bezirke, since complete commuting data are not available at Gemeinde level.

[5] Consists of two Bezirke, since complete commuting data are not available at Gemeinde level.

[6] Does not include cross-commuters between core Bezirke.

[7] By Bezirke. Does not include daily incommuters from foreign countries.

[8] By Bezirke. Includes destinations in foreign countries. Daily incommuters do not equal daily outcommuters because of foreign commuting.

Sources: Population data compiled from data provided by Österreichisches Institut für Raumplanung; employment and commuting data compiled from Österreichisches Statistische Zentralamt, Wohngemeinde-Arbeitsgemeinde der Beschäftigten in Österreich, Wien, 1974.

least one regional center. However, the region does not contain a single dominant urban center, whether measured in terms of population, employment, or commuting flows. The economic center of the region consists of the five small cities of Judenberg, Knittelfeld, Leoben, Bruck an der Mur, and Kapfenberg, which are dispersed along a 75 kilometer strip of national highway; however, none of the cities outstrips the others in economic importance. Collectively, these five cities form a rather weakly developed settlement axis that serves as a subcenter within the larger Graz hinterland. Commuting connections with the city of Graz are rather weak; only about twelve percent of all outcommuters (from Bezirke) in the region hold jobs in Graz. The destinations of most outcommuters are scattered about in the region and in other Länder.

There exist three cities along this settlement axis which are suitable candidates for core status. Leoben, with 35,153 inhabitants and 19,184 jobs--nearly 5,300 of which are held by incommuters--is the largest of these. Most of these commuters live in other places within the same Bezirk; consequently, Leoben is clearly not a major commuting center for the region. Less than ten percent of outcommuters form the remaining Bezirke in the region work in the city of Leoben. The neighboring Bezirk of Bruck an der Mur contains two cities, Bruck an der Mur and Kapfenberg, which taken together, have 42,360 inhabitants and 21,900 jobs. This Bezirk is not a commuting center, because less than fifteen percent of the outcommuters from the remaining Bezirke in the region are employed in the Bruck-Kapfenberg Bezirk.

The best solution to designating a "core" area for this region seems to be the selection of these three cities,--Leoben, Bruck an der Mur, and Kapfenberg,--as constituting the center of the region. These cities are located in the Bezirke of Leoben and Bruck an der Mur; consequently, these two Bezirke were designated as the urban core of the region. Although these cities are within 20 kilometers of one another, there is virtually no cross-commuting between Leoben and the remaining two. There is substantial cross-commuting between Bruck an der Mur and Kapfenberg, indicating that these cities are closely linked

economically. The three cities together provide jobs to 41,000 persons, over 11,000 of whom commute daily from other places.

Hinterland Bezirke were allocated to the urban cores to which they sent the greatest number of daily outcommuters, with but few exceptions. As noted earlier, one criterion is that contiguity outward from the core is essential. That is, if a Bezirk is engulfed within the commuting field of an urban center, it is automatically allocated to the urban region of that center, irrespective of the intensity of its commuting ties with any other particular urban center. A few Bezirke in the Steyr, Wels, and Wiener Neustadt regions exhibit strong commuting ties with the urban cores of neighboring urban regions, and these are noted in Map 1. With the exception of the commuting characteristics of the population in two hinterland Bezirke of the Steyr urban region, these multiple-foci daily commuting streams represent only a small percentage of all hinterland commuters.

On the peripheries of urban regions there exist numerous relatively isolated Bezirke which exhibit no commuting linkages with urban cores. (Appendix A contains population, employment, and daily commuting data for each of the hinterland Bezirke.) Many of these Bezirke are characterized by a relatively low incicence of commuting. Most of these small commuting streams are not focused on a specific center but rather are distributed among small neighboring centers. In nearly all instances these Bezirke were allocated to the urban region with which they displayed any linkages, however insignificant. It should be noted that these commuting linkages exist primarily between two or more hinterland Bezirke of a functional urban region, since in a few peripheral Bezirke no daily commuters are sent to the urban core.

The population, employment, and daily commuting data for the hinterlands of each functional urban region are displayed in Table 2. The hinterland areas have a total population of nearly 4.5 million persons, or 60 percent of the total Austrian population of nearly 7.5 million. The hinterland work force of nearly 1.8 million persons accounts for 58 percent of the total Austrian work force; while hinterland employment of 1.5 million represents 50 percent of total Austrian employment.

Another item of interest that is displayed in Table 2 is that less than 15 percent of the total hinterland work force commute daily to employment in urban cores (see also Map 2). Only in the Vienna and Linz hinterlands do more than 15 percent of the resident work force commute daily to the respective core areas. This relatively low incidence of daily commuting-to-core is not an indication that these functional urban regions are not an accurate representation of the commuting fields of Austrian cities; rather, it reflects a relatively low incidence of daily inter-Bezirke commuting in all of Austria. Only 16 percent of the resident hinterland work force commute on a daily basis, and of these outcommuters, nearly 70 percent commute to employment in the respective urban cores. Only 11 percent of all daily outcommuters travel to employment in other urban regions.

A final notable characteristic of daily commuting flows in the hinterland areas is that, without exception, all hinterlands are net losers in commuting exchanges. Since the incidence of commuting is closely related to accessibility to job opportunities, and given that job opportunities are greater in larger cities, one would expect that the greatest commuting losses occur in the hinterlands of the larger cities. This is indeed the case. The Vienna, Linz, and Graz hinterlands have the largest daily commuting losses in absolute but not in relative terms. Nearly all Bezirke in all hinterlands have negative commuting balances, including those immediately adjacent to urban cores. However, these latter Bezirke attract the greatest number of daily in-commuters (to hinterland Bezirke) in both absolute and relative terms, indicating that some decentralization of economic activity from the cities may have occurred. Final judgement upon the phenomenon of decentralization will have to wait upon analyses of employment data for the 1961-71 period.

Central Place Regions in Austria

A final question that needs to be addressed is why this regionalization is preferable to a central place regionalization of Austria, particularly since central place regionalizations

Table 2. Population, employment and daily commuting, 1971, for hinterlands of functional urban regions in Austria.

Urban Region	Population	Work Force[1] (Resident)	Total Employment[2]	Daily Outcommuters[3]	
				total	% of work force
Bregenz-Dornbirn-Feldkirch	48,867	18,443	17,670	1,628	8.8
Graz	642,768	260,844	212,762	33,807	13.0
Innsbruck	380,005	144,197	129,518	20,174	14.0
Klagenfurt	241,366	88,540	69,288	15,084	17.0
Leoben-Bruck	263,108	96,261	92,356	4,108	4.3
Linz	390,779	155,879	113,908	40,381	25.9
Salzburg	501,636	204,359	184,619	25,010	12.2
St. Pölten	222,749	88,532	74,777	12,834	14.5
Steyr	210,572	82,863	70,049	11,946	14.4
Villach	221,010	79,168	68,569	10,521	13.3
Wels	193,627	77,795	67,069	12,298	15.8
Wien	951,490	394,472	349,081	82,580	20.9
Wiener Neustadt	221,337	87,266	70,005	15,579	17.9
Total	4,489,314	1,778,619	1,519,671	285,950	16.1
Austria	7,456,403	3,052,807	3,039,700	336,124[5]	11.1

Table 2. Population, employment and daily commuting, 1971, for hinterlands of functional urban regions in Austria (continued).

Urban Region	Destinations of Daily Outcommuters						Commuting Balance[4]
		Urban Core		Other Regions		Foreign	
	total	% of total	% of work force	total	% of total		
Bregenz-Dornbirn-Feldkirch	1,008	61.9	5.5	5	0.3	615	- 1,089
Graz	25,768	76.2	9.9	890	2.6	4	-24,612
Innsbruck	14,480	71.8	10.0	171	0.9	1,508	-14,587
Klagenfurt	12,220	81.0	13.8	1,723	11.4	15	-12,814
Leoben-Bruck	1,506	36.7	1.6	808	19.7	1	- 1,069
Linz	33,176	82.2	21.3	2,872	7.1	2,634	-34,639
Salzburg	14,824	59.3	7.3	2,099	8.4	4,354	-17,429
St. Pölten	6,759	52.7	7.6	4,548	35.4	--	- 9,548
Steyr	6,904	57.8	8.3	4,458	37.3	6	- 9,199
Villach	7,443	70.7	9.4	1,378	13.1	73	- 7,016
Wels	7,124	57.9	9.2	4,467	36.2	48	- 9,088
Wien	59,673	72.3	15.1	2,424	2.9	34	-43,450
Wiener Neustadt	7,139	45.8	8.2	6,684	42.9	11	-11,611
Total	198,024	69.3	11.1	32,527	11.4	9,303	-196,151
Austria	--	--	--	--	--	17,711	-17,711

Footnotes to Table 2

[1] Economically active persons who reside in a particular Bezirk but who do not necessarily work there. Excludes the unemployed but not those in military service.

[2] Equals resident work force plus all incommuters, whether daily or non-daily, minus all outcommuters, whether daily or non-daily.

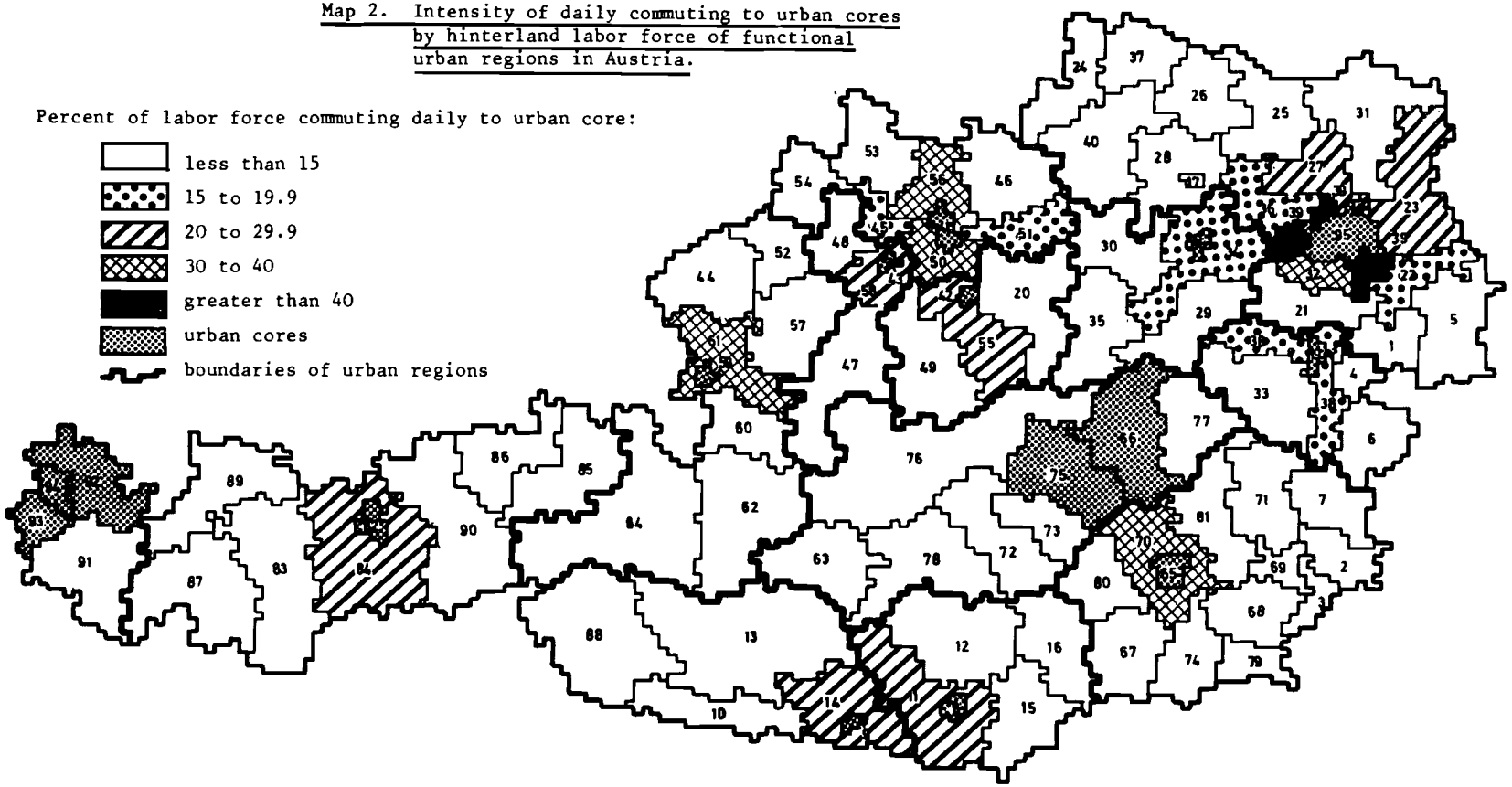
[3] Military personnel excluded from all commuting data.

[4] Difference between daily incommuters and daily outcommuters only.

[5] By Bezirk. Includes destinations in foreign countries.

Sources: Population data compiled from data provided by Österreichisches Institut für Raumplanung; employment and commuting data compiled from Österreichisches Statistische Zentralamt, Wohngemeinde-Arbeitsgemeinde der Beschäftigten in Österreich, Wien, 1974.

Map 2. Intensity of daily commuting to urban cores by hinterland labor force of functional urban regions in Austria.



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70 Graz-Umgebung
71 Hartberg
72 Judenburg
73 Knittelfeld
74 Leibnitz
75 Leoben
76 Liezen
77 Mürzzuschlag
78 Murau
79 Radkersburg
80 Voitsberg
81 Weiz

TIROL

82 Innsbruck (Stadt)
83 Imst
84 Innsbruck (Land)
85 Kitzbühel
86 Kufstein
87 Landeck
88 Lienz
89 Reutte
90 Schwaz

VORARLBERG

91 Bludenz
92 Bregenz
93 Feldkirch
94 Dornbirn

WIEN

95 Wien

of Switzerland and the Federal Republic of Germany are to serve as the spatially organizing frameworks of analyses of demographic and employment changes in those countries. As mentioned earlier, since the HSSP Project involves international comparisons, it is essential that the areal units of analysis be conceptually and empirically compatible across all countries.

A delineation of national economies based on central place concepts is probably comparable to a regionalization based on labor market criteria, although the theoretical issues have not been fully resolved. Berry's extensive work on central places has led him to conclude that functional labor market areas which correspond to the daily spheres of influence of a system of cities closely approximate the closed trade areas of central place theory "in which the number and type of establishments and their size and trade areas are bounded by the relative transportation costs from hinterland to competing centers." (Berry, 1973, p. 15; see also Berry and Pred, 1965.) The closure of central place areas with respect to residentiary activities is nearly complete with respect to wholesale and retail trade activities and any other activities, the products of which are difficult to transport and are most efficiently consumed in the vicinity of production. To the extent that shopping excursions are directed at centers that are also the foci of commuting destinations, central place areas do indeed correspond to functional labor market areas. Christaller himself is not particularly helpful in providing conceptual clarification on this latter point. He has written that only the exchange of supplies and demands of labor constitutes a "labor market." A labor market may evolve at the source of demand, at the source of supply, or at a central place. Whether or not a labor market will evolve at a "generally located central place" will depend on the existence of organized labor agencies which facilitate the exchange process and which may or may not be located at existing central places (Christaller, 1966, p. 97). Some authors have explicitly equated labor centers (Arbeits-zentralität) with service centers (Dienstleistungszentralität) (see, for example, Kannenberg, 1965); while other researchers have implicitly equated the two (Sherrill, 1976b). Theoretically,

there is no justification for equating labor sheds with shopping excursions; however, most empirical work on central places has corroborated the hypothesis that the spatial range of attraction of employment centers corresponds to the spatial range of attraction of shopping and service centers.

Bobek's work in classifying Austrian cities into a ten-level central place hierarchy and in delineating the boundaries of their hinterlands into a four-level system represents a fairly comprehensive study of the Austrian central place network (Bobek, 1966, 1975). Bobek's regionalization is the only territorially exhaustive delineation of Austria that is known to the author. Bobek has divided the country into seven regions based on higher-order central places and 592 regions based on middle-order (intermediate-sized) and lower-order central places. The seven regions are displayed in Map 3; a reproducible map of the 592 regions is not available. Austrian cities were classified into nine levels of "centrality" based on the proportion of 182 services that are offered within their boundaries.[3] The hinterlands of central places were determined on the basis of the frequency of trips to various cities by the population for 38 private and official services (health care, banks, schools, etc.). The frequency of trips to specific cities was determined by a survey of officials of 5,000 communities. The question put to them was "To which city does the population of your community go when they require the following services?"

The boundaries of the higher-order central place regions in Austria do not correspond to the boundaries of functional urban regions as defined in this paper; the extent of the discrepancies can be determined by a comparison of Maps 1 and 3. It is for this reason that the central place regions were not used as the spatial units of analysis of Austrian data. The element of non-daily travel, probably consisting of individual trips of longer duration than daily commuting trips, plays a more prominant role

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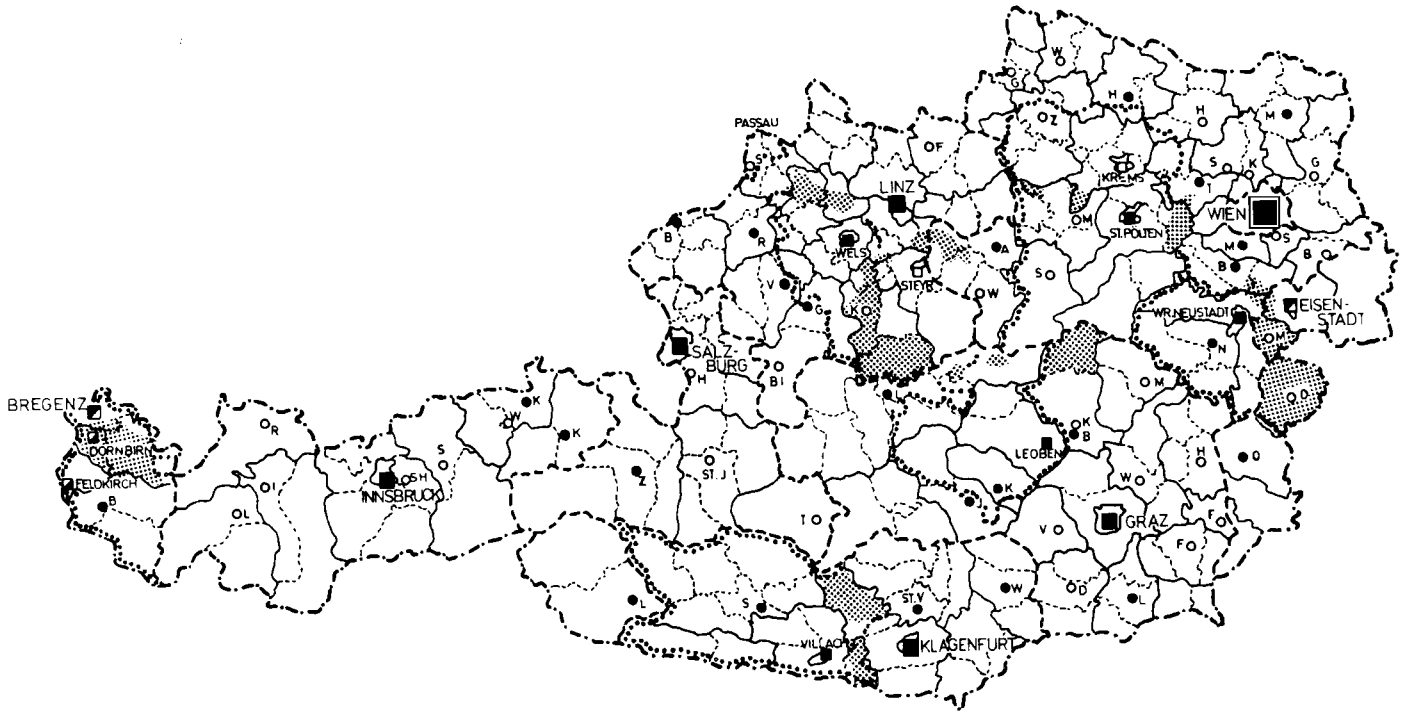
[3]Vienna alone occupies the tenth and highest rung of the central place hierarchy.

MAP 3. Central Places and Their Hinterlands in Austria (1973)
(See next page for explanation of map symbols)



Scale: 1:3.000.000

Hinterlands of Subregional Center

Boundary of extent of clear influence of subregional center.

Areas with no clear orientation

Adapted from Map: Published by the Austrian Academy of Sciences, 6th edition (1975), Commission for Regional Research (under the direction of H. Bobek).

CENTRAL PLACES

Rank 10 — Federal Capital

Rank 9 — Regional Center, good to well supplied

Rank 8 — Regional Center, poorly supplied

Subregional Center

Good to well supplied

Rank 7 — Moderately supplied, within reach of a regional center

Moderately supplied

Rank 6 — Good to well

Rank 5 — Moderate

Rank 4 — Poor

Rank 3 — Good to well

Rank 2 — Moderate

Rank 1 — poor

Types of central places at level of county center

Lower order central places

in the delimitation criteria of central place regions and this no doubt accounts for most of the discrepancies.

References

Berry, Brian J.L. (1973), *Growth Centers in the American Urban System*, Vol. 1, Ballinger, Cambridge, Mass.

Berry, Brian J.L., and A. Pred (1965), *Central Place Studies: A Bibliography of Theory and Applications*, Regional Science Research Institute, Philadelphia, Pennsylvania.

Bobek, H. (1966), Aspekte der zentralörtlichen Gliederung Österreichs, *Berichte z. Raumforschung u. Raumplanung*, 10, 2, 114-129.

Bobek, H. (1975), Zentrale Orte und ihre Bereiche - Neuerhebung 1973, 6. Lieferung, *Österreich-Atlas*, Österreichische Akademie der Wissenschaften, Kommission f. Raumforschung, Wien.

Christaller, Walter (1966), *Central Places in Southern Germany*, Trans. by C.W. Boskin, Prentice-Hall, Englewood Cliffs, N.J.

Hall, Peter (1976a), *Urban Regionalisation of Great Britain 1971*, forthcoming.

Hall, Peter (1976b), *Regionalisation of Denmark*, forthcoming.

Hall, P., N. Hansen, and H. Swain (1975a), *Urban Systems: A Comparative Analysis of Structure, Change and Public Policy*, RM-75-35, International Institute for Applied Systems Analysis, Laxenburg, Austria.

Hall, P., N. Hansen, and H. Swain (1975b), *Status and Future Directions of the Comparative Urban Region Study: A Summary of Workshop Conclusions*, RM-75-59, International Institute for Applied Systems Analysis, Laxenburg, Austria.

Kannenberg, E.G. (1965), Zur Methodik der Ermittlung von zentralen Orten und von Beurteilungsgrundlagen für Förderungsmassnahmen, *Informationen*, 15, 13, 393-404.

Österreichisches Statistische Zentralamt (1974), *Wohngemeinde-Arbeitsgemeinde der Beschäftigten in Österreich*, Ergebnisse der Volkzählung vom 12. Mai 1971, Wien.

Sherrill, K. (1976a), *Functional Urban Regions in Switzerland*, forthcoming, International Institute for Applied Systems Analysis, Laxenburg, Austria.

Sherrill, K. (1976b), *Central Place Theory: Concepts and Applications in West German Planning Delineations*, forthcoming, International Institute for Applied Systems Analysis, Laxenburg, Austria.

Appendix A. Population, employment and daily commuting 1971, for hinterland Bezirke of functional urban regions in Austria.

Bezirk	Population	Work Force[1] (Resident)	Total Employment[2]	Daily Outcommuters[3] (destinations)						Daily Incommuters[3]
				Total	Urban Core		Other Regions		Foreign	
					total	% of total	total	% of total		
Region: Bregenz-Dornbirn-Feldkirch										
Bludenz	48,867	18,443	17,670	1,628	1,008	61.9	5	0.3	615	539
Region: Graz										
Deutschlandsberg	59,033	22,711	18,142	2,922	2,548	87.2	20	0.7	1	407
Feldbach	64,805	28,315	24,757	2,079	1,319	63.4	15	0.7	--	642
Fuerstenfeld	22,329	9,549	8,882	799	232	29.0	5	0.6	--	879
Graz Umgb.	99,589	40,021	27,495	14,746	14,159	96.0	191	1.3	2	2,800
Guessing	29,416	12,776	9,562	940	--	0.0	5	0.5	1	421
Hartberg	63,187	25,815	22,413	1,004	184	18.3	177	17.6	--	894
Jennersdorf	19,703	8,673	6,512	865	71	8.2	3	0.3	--	194
Leibnitz	69,632	27,905	22,638	3,682	2,720	73.9	20	0.5	--	787
Oberwart	53,471	21,099	17,429	486	--	0.0	113	23.3	--	823
Radkersburg	26,294	11,270	10,019	699	229	32.8	5	0.7	--	169
Voitsberg	56,888	21,266	18,669	1,930	1,625	84.2	22	1.1	--	315
Weiz	78,421	31,444	26,244	3,655	2,681	73.4	314	8.6	--	864
Total	642,768	260,844	212,762	33,807	25,768	76.2	890	2.6	4	9,195
Region: Innsbruck										
Imst	38,274	13,126	10,665	1,638	777	47.4	10	0.6	82	262
Innsbruck Land	106,532	41,028	32,114	12,577	12,147	96.6	0	--	132	2,832
Kitzbühel	46,340	17,890	17,243	875	80	9.1	53	6.1	67	392
Kufstein	70,280	27,310	26,369	2,021	410	20.3	10	0.5	568	893
Landeck	35,531	12,096	11,261	418	120	28.7	85	20.3	29	224
Reutte	25,760	10,286	10,173	590	38	6.4	6	1.0	540	35
Schwarz	57,288	22,461	21,693	2,055	908	44.2	7	0.3	90	949
Total	380,005	144,197	129,518	20,174	14,480	71.8	171	.85	1,508	5,587
Region: Klagenfurt										
Klagenfurt Land	80,767	30,534	20,130	10,291	8,509	82.7	1,389	13.5	6	1,123
St. Veit a.d.G.	60,436	21,791	18,883	1,709	1,357	79.4	93	5.4	6	686
Völkermarkt	43,027	15,652	11,875	2,510	2,093	83.4	17	0.7	2	201
Wolfsberg	57,136	20,563	18,400	574	261	45.5	224	39.0	1	260
Total	241,366	88,540	69,288	15,084	12,220	81.0	1,723	11.4	15	2,270
Region: Leoben-Bruck										
Judenberg	54,055	19,229	19,721	616	53	8.6	66	10.7	1	1,422
Knittelfeld	29,446	10,692	9,968	1,182	150	12.7	33	2.8	--	512
Liezen	79,150	30,253	29,549	515	245	47.6	259	50.3	--	462
Muerzzuschlag	48,566	17,528	16,673	1,272	1,026	80.7	223	17.5	--	499
Murau	32,831	12,020	10,342	461	32	6.9	191	41.4	--	87
Tamsweg	19,060	6,539	6,103	62	--	--	36	--	--	57
Total	263,108	96,261	92,356	4,108	1,506	36.7	808	19.7	1	3,039
Region: Linz										
Eferding	26,443	10,732	7,769	2,491	1,950	78.3	699	28.1	--	396
Freistadt	56,131	21,543	16,305	3,209	2,577	80.3	37	1.2	--	206
Linz Land	96,377	40,439	27,687	16,925	15,798	93.3	997	5.9	3	3,419
Perg	52,271	20,123	15,655	4,409	3,614	82.0	322	7.3	--	673
Rohrbach	53,294	20,523	16,193	1,980	1,108	56.0	13	0.7	585	55
Schärding	53,947	21,471	17,339	3,128	233	7.4	790	25.3	2,045	365
Urfahr-Umgb.	52,316	21,048	12,960	8,239	7,896	95.8	14	0.2	1	628
Total	390,779	155,879	113,908	40,381	33,176	82.2	2,872	7.1	2,634	5,742
Region: Salzburg										
Braunau/Inn	85,286	35,725	30,084	5,545	1,287	23.2	111	0.08	3,169	739
Hallein	40,479	16,763	16,007	1,997	1,413	70.8	11	0.6	112	870
Ried i.I.	52,826	22,257	21,167	1,601	155	9.7	479	29.9	244	933
Salzburg Umgb.	84,585	35,555	25,861	12,180	10,790	88.6	197	1.6	658	2,992
St. Johann i.P.	62,783	24,856	25,059	858	385	44.9	65	7.6	11	500
Vöcklabruck	109,663	43,983	42,931	2,044	622	30.4	1,020	49.9	9	1,294
Zell am See	66,014	25,220	23,510	785	172	21.9	216	27.5	151	253
Total	501,636	204,359	184,619	25,010	14,824	59.3	2,099	8.4	4,354	7,581

Appendix A. Population, employment and daily commuting 1971, for hinterland Bezirke of functional urban regions in Austria (continued).

Bezirk	Population	Work Force[1] (Resident)	Total Employment[2]	Daily Outcommuters[3] (destinations)						Daily Incommuters[3]
				Total	Urban Core		Other Regions		Foreign	
					total	% of total	total	% of total		
Region: St. Pölten										
Lilienfeld	28,826	11,301	10,370	894	377	42.2	271	30.3	--	260
Melk	70,163	27,677	24,256	2,779	1,056	38.0	960	34.5	--	858
St. Pölten Land	84,895	33,991	25,823	8,644	5,283	61.1	3,094	35.8	--	1,615
Scheibbs	38,865	15,563	14,328	517	43	8.3	223	43.1	--	553
Total	222,749	88,532	74,777	12,834	6,759	52.7	4,548	35.4	--	3,286
Region: Steyr										
Amstetten[4]	110,040	42,675	37,565	4,768	1,828	38.3	2,832	59.4	--	1,357
Kirchdorf a.d.K.	48,195	19,923	18,163	1,641	406	24.7	1,018	62.0	--	557
Steyr Land	52,337	20,265	14,321	5,537	4,670	84.3	608	11.0	6	833
Total	210,572	82,863	70,049	11,946	6,904	57.8	4,458	37.3	6	2,747
Region: Villach										
Hermagor	20,722	7,321	6,361	468	173	37.0	51	10.9	3	82
Lienz	45,569	15,696	14,964	73	n.a.	--	8	11.0	22	231
Spittal a.d.D.	77,752	28,669	28,284	757	159	21.0	365	48.2	6	1,617
Villach Land	76,967	27,482	18,960	9,223	7,111	77.1	954	10.3	42	1,575
Total	221,010	79,168	68,569	10,521	7,443	70.7	1,378	13.1	73	3,505
Region: Wels										
Gmunden	87,783	33,360	32,896	1,378	131	9.5	1,137	82.5	--	1,168
Grieskirchen	54,816	23,270	19,972	3,136	1,344	42.9	1,526	48.7	48	815
Wels Land	51,028	21,165	14,201	7,784	5,649	72.6	1,804	23.2	--	1,227
Total	193,627	77,795	67,069	12,298	7,124	57.9	4,467	36.2	48	3,210
Region: Wien										
Baden	103,786	44,334	41,713	8,438	5,021	59.5	795	9.4	--	4,709
Bruck a.d.L.	37,641	15,438	11,907	4,636	2,966	64.0	--	--	4	1,284
Eisenstadt[5]	45,286	19,393	17,288	3,370	1,695	50.3	501	14.9	5	1,594
Gänserndorf	76,097	31,151	26,232	7,627	6,961	91.3	--	--	--	2,742
Gmünd	47,041	19,768	19,706	317	--	0.0	14	4.4	--	727
Hollabrunn	54,826	22,120	19,831	2,160	1,159	53.7	0	--	--	410
Horn	36,856	14,798	14,597	547	272	49.7	0	--	--	686
Korneuburg	54,927	22,736	18,900	5,703	5,274	92.5	0	--	--	1,753
Krems a.d.D. (Stadt)	21,733	8,839	13,418	686	173	25.2	110	16.0	--	4,834
Krems a.d.D. (Land)	56,109	23,105	17,330	5,469	288	5.3	295	5.4	--	712
Mistelbach a.d.Z.	75,092	30,637	25,816	4,796	3,025	63.1	0	--	--	736
Mödling	79,620	34,019	30,919	13,247	12,219	92.2	104	0.8	--	8,429
Neusiedl a.S.	49,293	20,216	15,197	4,020	2,690	66.9	198	4.9	23	615
Tulln	50,388	20,197	16,012	5,086	3,872	76.1	269	5.3	--	1,068
Waidhofen a.d.T.	32,172	13,363	12,853	647	--	0.0	0	--	1	477
Wien Umgb.	80,275	33,703	28,760	14,824	14,058	94.8	55	0.4	1	8,502
Zwettl	50,348	20,655	18,602	1,007	--	0.0	83	8.2	--	467
Total	951,490	394,472	349,081	82,580	59,673	72.3	2,424	2.9	34	39,130
Region: Wiener Neustadt										
Mattersburg	33,572	12,795	8,077	4,305	1,510	35.1	2,506	58.2	8	584
Neunkirchen	88,129	35,165	32,744	3,275	1,402	42.8	1,337	40.8	--	1,156
Oberpullendorf	41,378	15,576	10,945	836	147	17.6	425	50.1	3	104
Wr. Neustadt Land	58,258	23,730	18,239	7,163	4,080	57.0	2,416	33.7	--	2,124
Total	221,337	87,266	70,005	15,579	7,139	45.8	6,684	42.9	11	3,968

Footnotes to Appendix A

[1] Economically active persons who reside in a particular Bezirk but who do not necessarily work there. Excludes the unemployed but includes persons in military service.

[2] Equals resident work force plus all incommuters, whether daily or non-daily, plus all outcommuters, whether daily or non-daily.

[3] Military personnel excluded from all commuting data.

[4] Includes Waidhofen an der Ybbs.

[5] Includes Eisenstadt Stadt, Rust Stadt, and Eisenstadt Umgebung.

n.a.: Not available. Cannot be calculated from existing data.

-- Equals zero or not available.

Sources: Population data compiled from data provided by Österreichisches Institut für Raumplanung; employment and commuting data compiled from Österreichisches Statistische Zentralamt, Wohngemeinde-Arbeitsgemeinde der Beschäftigten in Österreich, Wien, 1974.