Attractiveness of Different Districts in Helsinki:
Segregation in Terms of Poor Financial and Educational Status of the Residents

Linda Anttila, Topi Korpela, Saskia Lammi, Laura Pääkkönen and Ilkka Tani
Department of Real Estate, Planning and Geoinformatics
School of Engineering
Aalto University
00076 Aalto
linda.anttila@aalto.fi, topi.korpela@aalto.fi, saskia.lammi@aalto.fi, laura.paakkonen@aalto.fi, ilkka.tani@aalto.fi

Abstract. *The aim of this research is to study attractiveness of different districts in Helsinki. The research tries to find out if there are differences, and on the other hand, similarities between different districts in Helsinki if the financial and educational status of the residents are compared. The main research question is; are there some districts in Helsinki that have a risk to segregate in terms of poor financial and educational status of the residents?*

Previous researches related to this topic were mainly related to either educational segregation or economic segregation but there is a lack of researches which concentrate on the both aspects at the same time, and take also bad credit history into consideration.

This study is based on three different open data sets, two datasets from Paavo and one from Suomen Asiakastieto. In order to find out if there is segregation based on the average income, education level and bad credit history we use clustering analysis and especially dendrograms to analyze the data. In this study dendrograms are used for hierarchical cluster analysis. All of the dendrograms are created in IBM SPSS Statistics 22 -program. The results derived from two dendrograms and a proximity matrix created indicate that in general all of the areas in Helsinki are quite similar with each other. However, the dissimilarity between the extremities is eminent.

Keywords: segregation, open data, cluster analysis

1 Introduction

This research is related to the course "Game in urban planning and development" organized by Aalto University. In this survey we research attractiveness and segregation of different districts in Helsinki. We aim to find out if there are differences, and on the other hand, similarities between different districts in Helsinki by examining three variables: average income of residents, rate of residents with higher academic degree and rate of residents with bad credit history. The used data is open and it is available in Paavo (e.g. average income and education) and Suomen Asiakastieto (bad credit history) databases.

In general highly segregated societies are seen more unstable and unsettled than the more equal societies with lower level of segregation. Previous researches related to this topic are mainly related to either educational segregation or economic segregation but there is a lack of researches which concentrate on both of the factors at the same time, and take also bad credit history into consideration. In addition, the topic has been studied very little in Finland and there is not this kind of researches related to Finland available. In this research we try to point out by scientific methods the attractiveness of different districts in Helsinki, and which districts have a greater risk to segregate in terms of poor financial and educational status of the residents.

1.1 Research question and limitations

The research tries to find an answer to following research question:

1. Are there some districts in Helsinki that have a risk to segregate in terms of poor financial and educational status of the residents?

The research is outlined to deal with only the districts of Helsinki. In Helsinki there are 84 postal codes but four of them had to be excluded due to the lack of data. Postal code area 00230 is lacking the educational information and bad credit history data and postal code areas 00290, 00540 and 00220 are lacking the bad credit history data (less than 200 inhabitants).

1.2 Methodology

This study is based on three open data sets which are available in two sources: Paavo (average income and education) and Suomen Asiakastieto (bad credit history) databases. Firstly, the postal code areas will be arranged by Excel based on the level of higher level university degrees so that the area that has the highest percentage gets number one in ranking, second gets number two and so on. Same ranking will be done with the average income so that the highest income area gets number one etc. Third ranking will be done by percentage of areas bad credit history data. Finally, these rankings will be added together to make the overall ranking of the areas. The area with the lowest overall scores gets the highest ranking. After that we will use IBM SPSS Statistics 22 -program to make a clustering analysis and especially to find out dendrograms to analyze the data. Dendrograms will be used for hierarchical cluster analysis, and they are fast way to analyze how different groups are formulized. To create dendrogram in IBM SPSS Statistics 22 -program we will need to analyze, classify and then create hierarchical cluster.

To support our research we will explore carefully the previous researches related to the topic. We will concentrate mainly on scientific articles which are published in the 2000's and concerning Finland as well as the whole world. In order to find the scientific articles we will mainly use Google Scholar and Nelli-portaali.

1.3 Structure of the work

This research consists of four sections. Firstly, in the chapter two we concentrate on the theory and introduce previous researches related to the topic. The chapter three focuses on the empirical part of the study, in other words, the research itself. The chapter describes in detail the data collection, research method and results. In the chapter four the results are analyzed more carefully and our results are compared to the findings of the previous researches. Finally, in the chapter five strings are pulled together in form of a summary.

2 Theory

In the last few decades the individual mobility has increased in many major Western cities, especially among employees with higher education and those who are relatively affluent. The mobility reflects both in international and transnational migration. This kind of a development suggests that interurban and interregional competition is getting more intense when cities try to attract the best-qualified people. Furthermore, the cities aim to be attractive to new and economically successful high-tech industries, financial and business services, and cultural and consumer services industries which all are dependent upon well-educated employees. Highly segregated, socially and culturally less integrated cities do not support the requirements of these modern city profiles, thus, it is often seen that more mixed and balanced neighborhoods enhance individual social opportunities, and eventually, will strengthen the urban economy. (Musterd 2006)

Previous studies have examined the effect of socioeconomic segregation on urban economy and development of cities. However, the results of the studies are not consistent. For example, Jargowsky (2003) shows in his research that several highly segregated cities in the US were showing significant economic growth in the 1990s. Musterd (2006) does not find clear association between the level of social

segregation and the attractiveness of a city for business or the people working in these businesses. In addition, there is no evidence that the cities that are more socially integrative are performing better in economic terms. (Musterd 2006) On the other hand, Korsu and Wenglenski (2010) argue that segregation is an offending factor. Low-skilled workers in Paris are concentrated in certain neighborhoods with poverty and unemployment rates that are significantly above the average level. The conclusion of the study is that a low-skilled worker faces a greater risk of long-term unemployment if they experience long-term exposure to high-poverty neighborhoods. (Korsu et al. 2010)

In our study we concentrate on the educational and economic sides of segregations. The theory part of this research includes short review of the literature which is related to the subject. The theory consists of two parts: Firstly concept of educational segregation is described, and the second part focuses more on economic segregation.

2.1 Educational segregation

Education has a major role of describing a social segregation. Education has a strong connection to educational position and also income and quality of live. On the other hand, the education has an important role of immaterial capital and education level has a strong relation to the way of living. (Rasinkangas 2013)

The World Bank's World Development Report (2005) covers inequalities in education in the odd-sample of 60 countries. The report states that the inequality in education is significantly higher in developing countries than in high-income countries. According to the study, the inequity in education of the citizens is lowest in Finland, Germany and Sweden, whereas the highest educational inequity is in Burkina Faso, Mali and Mauritania. (World Bank 2005)

The study by Benaabdelaali, Hanchane and Kamal (2012) concentrates on analyzing the changes in educational inequity in 146 countries between the years 1950 and 2010. The results show that the educational inequity has decreased in all countries from 1950 to 2010. The change has been more evident in the developing countries but the gap between the advanced and developing countries is still manifest in 2010. As a matter of fact, the study indicates that the level of educational inequality for developing countries in 2010 is comparable to the level of advanced countries registered in 1950. (Benaadbeli et al. 2012)

2.2 Economic segregation

Townshend (2012) says that factorial economic studies have long shown that socio-economic or income segregation is one of the most important sources of social variation in the North American City, and is increasingly represented by new forms of inequality. Diamond (2014), an assistant professor of economics at the Stanford Graduate School of Business, found that economic well-being inequality in American metropolitan areas increased 67 percent from 1980 to 2000, primarily due to changes in wages, housing costs and local amenities. This is even greater than the 50 percent rise in the difference between wages for high school and college graduates in U.S. cities. America's cities are dividing themselves into two distinct groups with college-educated workers increasingly clustering in desirable places that less-educated people cannot afford. College-educated workers are increasingly attracted to "high skill cities" where the wages are higher and the quality of living better. This education and wage inequality reflects diverging economic growth – a nationwide "gentrification effect" – across America's urban landscape. (Diamond 2014)

Highest-income groups are not the most but least segregated according to these features. This group typically resides in neighborhoods with the lowest densities of high income households – a feature that is not surprising given the large housing and sprawling subdivision characteristics for this highest socio-economic status group. In contrast, lowest income households are not only unevenly distributed and have high probabilities of interacting with other low income households, they are also most spatially concentrated in tracts with above average shares and densities of other low income households. (Townshend 2012)

Somekh (2012) argue that higher income households have a higher opportunity cost of time, and in order to cut down on commuting costs would prefer to live closer to the Central Business District (CBD), where presumably most economic and social activities are centered. At the same time higher income families are more likely to have a greater demand for space, drawing them out to the more spacious

communities in the suburbs. These two opposing forces can result in different city structures depending on the extent of income inequality within the city, as well as the magnitude of demand for space across households with different levels of income. The authors also argue that the structure of the city would depend on the transportation infrastructure of the city which can impact commuting costs and the availability of affordable space in the city center. (Somekh 2012)

3 Empirical part

The aim of the analysis is to find out if there are differences, and the other hand, similarities between different districts in Helsinki.

This empirical part consist of three sections: data collection section where the used data is described, methods section where the used research method is described and the result section where the results of the research and calculations are explained.

3.1 Data collection

In this research we have used data from two sources Paavo and Suomen Asiakastieto. Paavo has many kinds of data by postal code areas but Suomen Asiakastieto is focused on the credit details.

Paavo provides open data by postal code area and this data is updated annually in January (Tilastokeskus 2015). The data is retrieved from Statistics Finland's geographic information interface and from Paikkatietoikkuna (Tilastokeskus 2015). Database contains different kind of variables from eight data groups: population structure, educational structure, residents' disposable monetary income, size and stage in life of households, households' disposable monetary income, buildings and dwellings, workplace structure and main type of activity (Tilastokeskus 2012). In this article we have used information about average income and education.

Data on educational structure (KO) for population living in a specific postal code area concern people aged 18 or over. Only the highest education for each person has been taken into account. The source of the data on educational structure is Statistics Finland's "Educational structure of population". (Tilastokeskus 2012)

Data on households' disposable monetary income (TR) is collected from Statistics Finland's Paavo database. In this data household is formed of people who live permanently in the same dwelling. This data is based on the disposable monetary income of households. The source of this data is also Statistics Finland's "total statistics on income distribution". (Tilastokeskus 2012) Suomen Asiakastieto provides information about personal credit data. The data is based on the Credit Information Act. (Asiakastieto, 2009) In this article we are using data about consumer's bad credit history in the specific postal code areas.

In Helsinki area there are 84 postal codes but four of them had to be excluded due to the lack of data. Postal code area 00230 is lacking the educational information and bad credit history data and postal code areas 00290, 00540 and 00220 are lacking the bad credit history data (less than 200 inhabitants). Due to a different date of data sets there are minor differences on the number of residents.

3.2 Methods

First the postal code areas are arranged by Excel based on the level of higher level university degrees so that the area that has the highest percentage gets number one in ranking (Lehtisaari-Kuusisaari 39.3% have higher level university degree), second gets number two and so on. Same ranking is done with the average income so that the highest income area (Lehtisaari-Kuusisaari EUR 71,427 per year) gets number one etc. Third ranking is done by percentage of area's bad credit history (Lehtisaari-Kuusisaari bad credit history 2.5% of inhabitants over 18 years old). Finally, these rankings are added together to make the overall ranking of the areas. The area with the lowest overall score gets the highest ranking. With this method it is easy to illustrate different areas. In this data average income is EUR 27,752, education level 19.3% and bad credit history 8.3%. These average points are marked with blue color in the table. (Appendix 1. Helsinki ranking)

In this study we use clustering analysis and especially dendrograms to analyze the data. Dendrograms are used for hierarchical cluster analysis. In order to create dendrogram in IBM SPSS

Statistics 22 -program we need to analyze, classify and then create hierarchical cluster. In the following table 1 the settings of SPSS are presented

Table 1. *Used settings of IBM SPSS Statistics 22 -program.*

Variables	matem_mean
Cluster	cases
Display	statistics, plots
Plots	dendogram
Method	Between groups linkage, Squared Euclidean distance, Transform values: Z Scores By variable
Save	Single solution, Number of clusters: 2

Dendrograms are fast way to analyze how different groups are formulized. Dendrograms present the formation of groups and indicate how the increasing distance can create larger groups. If the distance increases units that are close to each other or have previously formed groups form larger groups. In practice this means that at certain distance from each other groups or individuals are combined. (Niskanen, 2010)

With SPSS and K-means algorithm we can find the centers of each group. K-means algorithm starts by determining the centers of random groups and after that it counts the variances between and within groups. The position of group centers will be changed in small iterations until the variances between the groups are maximal and minimal inside of the groups. SPSS produces the F-ratios for each of those variances. Because of that the best group has the highest F-ratios. It can be said that this algorithm and other grouping methods work best if the groups are in the shape of circle. (Niskanen, 2010)

Dendrograms present the information concerning the observations that are grouped together at different levels of (dis)similarity. At the left side of the dendrogram each observation creates its own cluster. Vertical lines extend up from each observation and different values of (dis)similarity. These vertical lines are connected to the lines from other observations with horizontal line. That way all of the observations continue to combine until at the top of the dendrogram all of the observations are grouped together in a one cluster.

The height of the vertical lines tells about the strength of the cluster. If the vertical lines are long that indicates more distinct separation between different groups. If the vertical lines are long at the top of the diagram it indicates that the groups represented by those lines are really separated from one another. If the lines are short there is no distinction between the groups. (Stata)

3.3 Results of the calculations

Based on the ranking system a map was made with ArcMap to illustrate where the first ten and last ten areas are located and to check if there are some kinds of spatial clusters. As we can see from the figure 1 no pattern can be found. The pink color indicates the ten highest ranked areas and red indicates the lowest ten areas sorted by the three variables. Numbers shown are the postal codes of the areas.

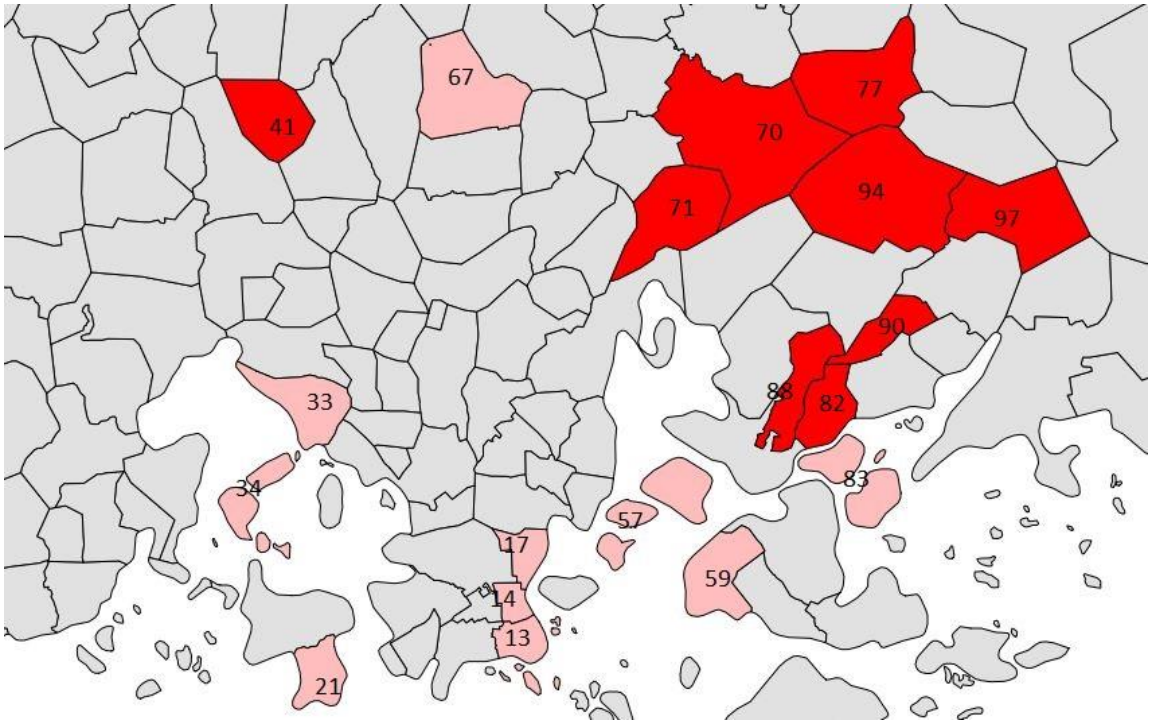


Figure 1. *Map of the ten highest and lowest ranked areas of Helsinki.*

Second analysis is done with IBM SPSS Statistics 22 -program and classified with Hierarchical Cluster analysis and K-means analysis to find similarities and dissimilarities of the areas. In K-means analysis the number of clusters is set on six. Variables used are percentage of the higher level education, average income and bad credit history percentage and cases are labeled by the postal code. In Hierarchical Clustering variables and labels are same and the method is Nearest neighbor and Ward's method.

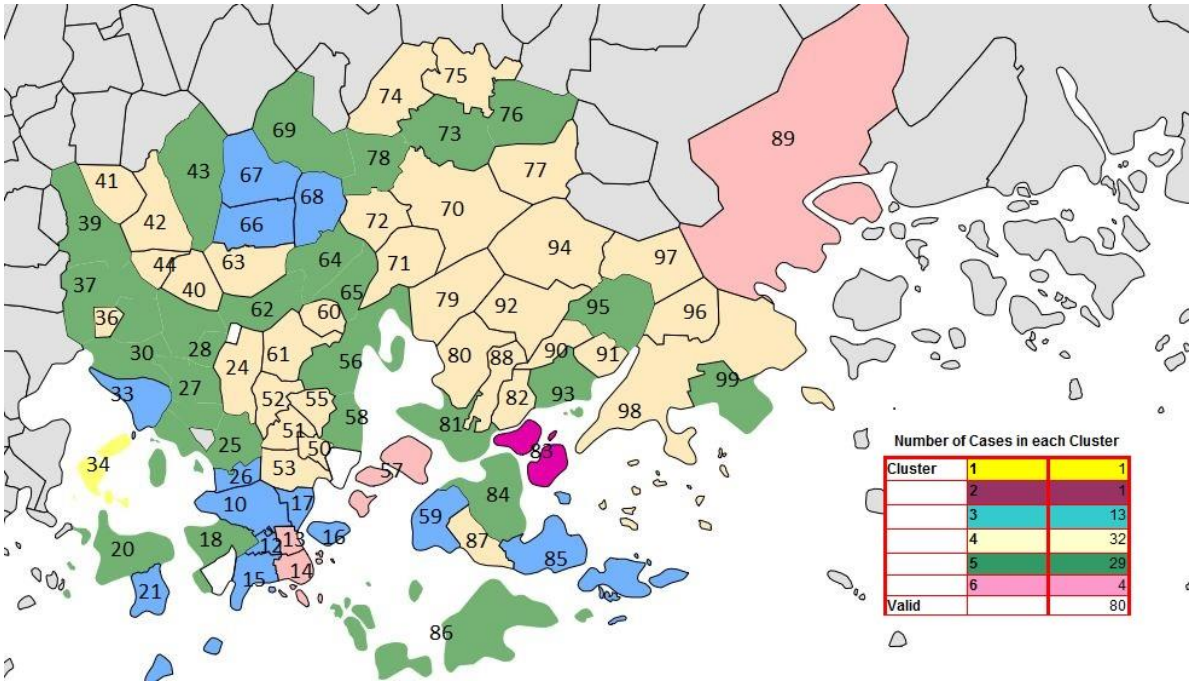


Figure 2. *Helsinki postal codes in six clusters by K-means.*

All the results of K-means analysis is shown in appendix 2. Clusters one and two are formed only from one area each. That reveals that these two areas, Lehtisaari-Kuusisaari and Tammisalo, are very dissimilar compared to rest of the Helsinki areas. Cluster number three has 13 areas, cluster number four 32, cluster number five 29 and cluster number six four areas. These six cluster are put on the map to show how the clusters are located (Figure 2).

Analyzing the two dendrograms (appendix 3) and proximity matrix (appendix 3) it is seen that areas are quite similar with each other but dissimilarity between the extremities is eminent. Half of the cluster (numbers 3, 4 and 5) present almost 93% of the whole Helsinki area. As the map shows (figure 2) there is no spatial pattern to be found on how the clusters are located.

4 Discussion and Conclusion

On the whole, the segregation in Helsinki based on our parameters is minor because 93% of the postal code areas are quite similar, thus, the risk of regional segregation is relatively low. However, the difference between the extremities, Lehtisaari-Kuusisaari and Jakomäki, is remarkable. Diamond (2014) presented results indicating that American cities are segregated but our study shows that in Helsinki the segregation is not such an issue at the moment. Our result is also supported by The World Bank's World Development Report (2005) which concluded that in Finland the inequity in education of the citizens is the lowest in the world. Somekh (2012) studied that higher income households want to live in a downtown close to services or in a suburb to have a greater demand for space. This variation on people can be seen on the cluster map of Helsinki area (figure 2) where the same color can be found in the south and north part of the city.

Previous studies show that the segregation is globally quite common. These studies have mainly concentrated only for a one factor like money or education. In this study we have analyzed the segregation from three different perspectives (income, education level and bad credit history) at the same time. With these results we can show that the segregation in a three dimension study does not appear so strongly than in a one dimension studies. From this point of view, the segregation and inequity is not a big problem for the city of Helsinki.

In our research we can see that the selected set of variables has an impact on the results. We decided to study the segregation by combining the three indicators (income, education level and bad credit history) of welfare, and when examining the segregation by using these variables Helsinki does not seem to be highly segregated. However, if we focus only on one variable, such as average income, at a time the level of segregation increases. This difference in the results can be explained by analyzing the selected variables more closely. For instance, even though the higher income and higher level of education can be both interpreted as an indicator of welfare, the higher level of education does not automatically lead to higher income. This fact implies that in some cases the selected variables make the results more homogeneous and slightly balance out the segregation.

For the further improvement the ranking system of the areas used in this study could be enhanced. The areas that have the same points could be ranked with the same number. This minor adjustment might change the score a little. Also the two areas, Lehtisaari-Kuusisaari and Tammisalo that differs significantly from the rest of the areas could be excluded from clustering to see what difference it would make.

4.1 Further research

The research could be developed by adding a couple of new variables in the model. For example, an unemployment rate has been used as a variable in some of the previous studies regarding the segregation (e.g. Korsu et al. 2010), and it would diversify the aspect of economic segregation of the research. Also, some research has been made about racial or ethnical segregation (see e.g. Dawkins 2004). In Finland the number of immigrants has grown substantially in the course of the last couple of decades, and at the moment, it is a burning issue in the politics. The research about the ethnical segregation would bring a current viewpoint to the political discussion.

In our study we have focused on the segregation of the different postal code areas in Helsinki. A potential topic for a further research could also be comparing the segregation of cities in North Europe and finding out what kind of effects the segregation would possible have on the economic success of the

cities. Furthermore, from the municipalities' point of view it would be useful to examine how the decisions of urban planners affect the segregation of a city.

References

Asiakastieto (2009). *Description of file of the personal credit data file*. [Online]. Cited 2. 5 2015, Available in: http://www.asiakastieto.fi/en/pdf/selattavat/rekisteriseloste_henkiloluottotiedot.html

Benaabdelaali, W., Hanchane, S. & Kamal, A. (2012). Educational Inequality in the World, 1950–2010: Estimates from a New Dataset. *In: Inequality, Mobility and Segregation: Essays in Honor of Jacques Silber – Research on Economic Inequality*, Volume 20, 337–366. Ed. Bishop, J. A. & Salas, R. Howard House, UK: Emerald Group Publishing Limited. ISBN: 978-1-78190-170-0.

Dawkins, C. J. (2004). Measuring the Spatial Pattern of Residential Segregation. *Urban Studies* 41:4, 833–851. DOI: 10.1080/0042098042000194133

Diamond, R. (2014). *U.S. Workers' Diverging Locations: Policy and Inequality Implications*. Stanford Institute for Economic Policy Research.

Jargowsky, P. (2003). Stunning Progress, Hidden Problems: Concentrated Poverty in the 1990s. *The Living Cities Census Series* May 2003, 1–23.

Korsu, E. & Wenglenski, S. (2010). Job Accessibility, Residential Segregation and Risk of Long-term Unemployment in the Paris Region. *Urban Studies* 47:11, 2279 – 2324. DOI: 10.1177/0042098009357962

Musterd, S. (2006). Segregation, Urban Space and the Resurgent City. *Urban Studies* 43:8, 1325–1340. DOI: 10.1080/00420980600776418

Niskanen, V. (2010). *Pehmomalleja ihmistieteisiin: Älykkäät ja oppivat järjestelmät tutkijan tukena*. [Helsinki]: University of Helsinki.

Rasinkangas, J. (2013). *Sosiaalinen eriytyminen Turun kaupunkiseudulla*. Doctoral dissertation. [Turku]: University of Turku.

Somekh, B. (2012). *Commuting and Shopping: Determinants of City Income Structure*. University of Haifa.

Stata (not dated). *Cluster dendrogram - Dendrograms for hierarchical cluster analysis*. [Online]. Cited 2. 5 2015. Available in: http://www.stata.com/manuals13/mvclusterdendrogram.pdf

Tilastokeskus (2012). Aineistokuvaus - Open data by postal code area. [Online]. Cited 2. 5 2015. Available in: http://stat.fi/tup/paavo/paavo_kuvaus_en.pdf

Tilastokeskus (2015). *Paavo - Open data by postal code area*. [Online]. Cited 2. 5 2015. Available in: http://stat.fi/tup/paavo/index_en.html

Townshend, I. (2002). The structure of income residential segregation in Canadian metropolitan area. Canadian Journal of Regional Science XXV:1, 25-52. ISSN: 0705-4580.

World Bank (2005). *World Development Report 2006: Equity and Development.* [New York]: Oxford University Press. ISBN: 0-8213-6249-6.

Appendices

Appendix 1. *Helsinki ranking.*

Postal codes	Aged 18 or over, total	Basic level studies	With education total	Matricu-lation examination	Vocational diploma	Lower academ	Higher academic	Basic level %	With education %	Matric %	Vocational %	Lower univ. %	Higher univ %	Ranking by education	Averige income	Ranking by income	% Bad credit history	Ranking by bad credit history	Overall points	Overall ranking
00340 Kuusisaari-Lehtisaari	1284	177	1107	182	270	150	505	13,8	86,2	14,2	21,0	11,7	39,3	1	71427	1	2,5	2	4	1
00830 Tammisalo	1721	282	1439	220	416	224	579	16,4	83,6	12,8	24,2	13,0	33,6	4	52438	2	2,5	3	9	2
00590 Kaitalahti	275	37	238	33	76	40	89	13,5	86,5	12,0	27,6	14,5	32,4	7	38572	8	2,5	4	19	3
00210 Vattuniemi	5707	855	4852	677	1418	910	1847	15,0	85,0	11,9	24,8	15,9	32,4	6	35971	9	3,4	6	21	4
00570 Kulosaari	3096	533	2563	464	675	444	980	17,2	82,8	15,0	21,8	14,3	31,7	9	42893	6	4,2	9	24	5
00140 Kaivopuisto	6713	965	5748	1266	1251	1006	2225	14,4	85,6	18,9	18,6	15,0	33,1	5	47176	3	5	16	24	6
00670 Paloheinä	4487	720	3767	514	1353	555	1345	16,0	84,0	11,5	30,2	12,4	30,0	13	33987	14	2,4	1	28	7
00170 Kruununhaka	6182	765	5417	1111	1187	963	2156	12,4	87,6	18,0	19,2	15,6	34,9	2	33507	17	4,3	11	30	8
00330 Munkkiniemi	7111	1146	5965	1059	1640	1026	2240	16,1	83,9	14,9	23,1	14,4	31,5	10	34695	13	4	8	31	9
00130 Kaartinkaupunki	1307	192	1115	248	235	185	447	14,7	85,3	19,0	18,0	14,2	34,2	3	46132	4	6,1	27	34	10
00660 Länsi-Pakila	5102	952	4150	518	1507	621	1504	18,7	81,3	10,2	29,5	12,2	29,5	17	33769	16	3,3	5	38	11
00890 Itäsalmi	1410	276	1134	140	501	166	327	19,6	80,4	9,9	35,5	11,8	23,2	26	44296	5	3,7	7	38	12
00160 Katajanokka	3808	680	3128	587	837	546	1158	17,9	82,1	15,4	22,0	14,3	30,4	12	35506	10	5,3	20	42	13
00120 Punavuori	5904	864	5040	1182	1146	859	1853	14,6	85,4	20,0	19,4	14,5	31,4	11	35038	12	5,4	21	44	14
00200 Lauttasaari	12475	1910	10565	2053	2758	2044	3710	15,3	84,7	16,5	22,1	16,4	29,7	15	30229	20	4,4	12	47	15
00850 Jollas	2279	405	1874	279	656	269	670	17,8	82,2	12,2	28,8	11,8	29,4	18	38927	7	6,4	28	53	16
00150 Eira	8299	1303	6996	1570	1609	1341	2476	15,7	84,3	18,9	19,4	16,2	29,8	14	35130	11	7,4	35	60	17
00260 Keski-Töölö	4924	827	4097	825	1009	805	1458	16,8	83,2	16,8	20,5	16,3	29,6	16	32454	18	6,6	29	63	18
00430 Maunnneva	3653	722	2931	466	1253	450	762	19,8	80,2	12,8	34,3	12,3	20,9	34	29495	21	4,2	10	65	19
00250 Taka-Töölö	9821	1391	8430	1868	2142	1710	2710	14,2	85,8	19,0	21,8	17,4	27,6	19	27626	28	5,2	18	65	20
00840 Laajasalo	6745	1475	5270	764	2219	872	1415	21,9	78,1	11,3	32,9	12,9	21,0	33	28101	24	4,7	14	71	21
00680 Itä-Pakila	2803	577	2226	305	880	365	676	20,6	79,4	10,9	31,4	13,0	24,1	24	33935	15	6,9	33	72	22
00690 Tuomarinkylä-Torpparinmäki	1998	428	1570	242	688	237	403	21,4	78,6	12,1	34,4	11,9	20,2	35	28431	23	4,8	15	73	23
00620 Metsälä-Etelä-Oulunkylä	2568	613	1955	305	752	337	561	23,9	76,1	11,9	29,3	13,1	21,8	30	27804	26	6	26	82	24
00580 Verkkosaari	1551	349	1202	192	400	255	355	22,5	77,5	12,4	25,8	16,4	22,9	27	26465	33	5,8	23	83	25
00100 Helsinki Keskusta	15521	2304	13217	2972	2800	2516	4929	14,8	85,2	19,1	18,0	16,2	31,8	8	31536	19	10,7	56	83	26
00560 Toukola-Vanhakaupunki	9808	1535	8273	1814	2495	1731	2233	15,7	84,3	18,5	25,4	17,6	22,8	28	24908	43	4,4	13	84	27
00320 Etelä-Haaga	8293	1473	6820	1371	2057	1444	1948	17,8	82,2	16,5	24,8	17,4	23,5	25	24851	44	5	17	86	28
00280 Ruskeasuo	2442	377	2065	531	543	397	594	15,4	84,6	21,7	22,2	16,3	24,3	23	24596	46	5,2	19	88	29
00950 Vartioharju	4326	1030	3296	453	1599	472	772	23,8	76,2	10,5	37,0	10,9	17,8	44	29142	22	5,9	24	90	30
00270 Pohjois-Meilahti	6460	1108	5352	1135	1575	1003	1639	17,2	82,8	17,6	24,4	15,5	25,4	22	26109	34	7,1	34	90	31
00990 Aurinkolahti	5939	1376	4563	619	2054	813	1077	23,2	76,8	10,4	34,6	13,7	18,1	42	27658	27	6,8	30	99	32
00860 Santahamina	333	29	304	29	133	54	88	8,7	91,3	8,7	39,9	16,2	26,4	20	27152	30	9,5	49	99	33
00180 Ruoholahti	10497	2078	8419	1784	2601	1656	2378	19,8	80,2	17,0	24,8	15,8	22,7	29	27099	31	7,9	43	103	34
00760 Suurmetsä	5834	1396	4438	587	2328	675	848	23,9	76,1	10,1	39,9	11,6	14,5	58	27881	25	6	25	108	35
00350 Munkkivuori-Niemenmäki	7525	1372	6153	1262	2111	1143	1637	18,2	81,8	16,8	28,1	15,2	21,8	31	25236	40	7,5	37	108	36
00640 Oulunkylä-Patola	6401	1592	4809	808	1959	825	1217	24,9	75,1	12,6	30,6	12,9	19,0	40	25524	37	6,8	32	109	37
00650 Veräjämäki	3345	792	2553	374	1065	404	710	23,7	76,3	11,2	31,8	12,1	21,2	32	26972	32	9,5	50	114	38
00190 Suomenlinna	570	113	457	66	195	50	146	19,8	80,2	11,6	34,2	8,8	25,6	21	24494	47	8,6	47	115	39
00360 Pajamäki	1644	340	1304	221	533	239	311	20,7	79,3	13,4	32,4	14,5	18,9	41	23048	53	5,5	22	116	40
00780 Tapaninvainio	5689	1464	4225	555	2121	685	864	25,7	74,3	9,8	37,3	12,0	15,2	56	27311	29	6,8	31	116	41
00370 Reimarla	5181	1322	3859	683	1618	670	888	25,5	74,5	13,2	31,2	12,9	17,1	46	25322	39	7,7	39	124	42
00610 Käpylä	6604	1659	4945	812	1917	896	1320	25,1	74,9	12,3	29,0	13,6	20,0	36	23981	49	7,8	41	126	43
00310 Kivihaka	776	149	627	115	238	134	140	19,2	80,8	14,8	30,7	17,3	18,0	43	24468	48	7,7	40	131	44
00240 Länsi-Pasila	4270	940	3330	603	1388	601	738	22,0	78,0	14,1	32,5	14,1	17,3	45	23335	51	7,4	36	132	45
00300 Pikku Huopalahti	4669	1049	3620	624	1462	621	913	22,5	77,5	13,4	31,3	13,3	19,6	37	25389	38	10,7	57	132	46
00730 Tapanila	8716	2105	6611	923	3226	1105	1357	24,2	75,8	10,6	37,0	12,7	15,6	53	26099	35	8,3	45	133	47
00790 Viikki	7584	1592	5992	1311	2004	1213	1464	21,0	79,0	17,3	26,4	16,0	19,3	39	22585	57	7,6	38	134	48
00530 Kallio	17397	3463	13934	3288	4439	2830	3377	19,9	80,1	18,9	25,5	16,3	19,4	38	22844	55	10	53	146	49
00390 Konala	4946	1316	3630	591	1759	644	636	26,6	73,4	11,9	35,6	13,0	12,9	61	24698	45	8,5	46	152	50
00810 Herttoniemi	8990	2282	6708	1100	2957	1175	1476	25,4	74,6	12,2	32,9	13,1	16,4	47	25103	41	11,7	64	152	51
00440 Lassila	3911	1098	2813	482	1210	515	606	28,1	71,9	12,3	30,9	13,2	15,5	55	22581	58	7,8	42	155	52
00400 Pohjois-Haaga	8069	2342	5727	1035	2346	1041	1305	29,0	71,0	12,8	29,1	12,9	16,2	50	21583	66	8,1	44	160	53
00380 Pitäjänmäen teollisuusalue	3369	842	2527	387	1112	477	551	25,0	75,0	11,5	33,0	14,2	16,4	49	25092	42	12,9	72	163	54
00520 Itä-Pasila	5747	1467	4280	909	1620	809	942	25,5	74,5	15,8	28,2	14,1	16,4	48	21698	64	9,9	52	164	55
00930 Itäkeskus-Marjaniemi	5306	1785	3521	588	1678	485	770	33,6	66,4	11,1	31,6	9,1	14,5	59	25865	36	13,7	75	170	56
00740 Siltamäki	7886	2422	5464	903	3030	822	709	30,7	69,3	11,5	38,4	10,4	9,0	73	23375	50	9	48	171	57
00870 Etelä-Laajasalo	3864	1306	2558	459	1265	349	485	33,8	66,2	11,9	32,7	9,0	12,6	62	23032	54	10,8	58	174	58
00800 Länsi-Herttoniemi	6016	1842	4174	768	1788	655	963	30,6	69,4	12,8	29,7	10,9	16,0	51	22439	59	11,8	66	176	59
00720 Pukinmäki-Savela	6985	2194	4791	703	2591	766	731	31,4	68,6	10,1	37,1	11,0	10,5	68	22112	61	10,4	54	183	60
00500 Sörnäinen	11842	2360	9482	2468	3115	2027	1872	19,9	80,1	20,8	26,3	17,1	15,8	52	21314	69	11,7	65	186	61
00550 Vallila	8227	1924	6303	1627	2156	1285	1235	23,4	76,6	19,8	26,2	15,6	15,0	57	20663	75	10,4	55	187	62
00920 Myllypuro	8866	3231	5635	769	3164	765	937	36,4	63,6	8,7	35,7	8,6	10,6	66	22211	60	11,3	61	187	63
00750 Puistola	7202	2138	5064	773	2685	799	807	29,7	70,3	10,7	37,3	11,1	11,2	65	23205	52	12,3	70	187	64
00600 Koskela-Helsinki	3495	1316	2179	516	946	304	413	37,7	62,3	14,8	27,1	8,7	11,8	64	20872	73	9,6	51	188	65
00510 Etu-Vallila	7948	1731	6217	1419	2210	1356	1232	21,8	78,2	17,9	27,8	17,1	15,5	54	21485	67	12,1	68	189	66
00960 Pohjois-Vuosaari	5643	1864	3779	536	2232	508	503	33,0	67,0	9,5	39,6	9,0	8,9	75	22613	56	11,3	60	191	67
00630 Maunula-Suursuo	6618	2398	4220	654	2059	588	919	36,2	63,8	9,9	31,1	8,9	13,9	60	21678	65	12	67	192	68
00910 Puotila	5149	1740	3409	598	1753	518	540	33,8	66,2	11,6	34,0	10,1	10,5	67	21374	68	11,3	62	197	69
00420 Kannelmäki	11548	3756	7792	1445	3959	1245	1143	32,5	67,5	12,5	34,3	10,8	9,9	70	21163	71	11,2	59	200	70
00980 Etelä-Vuosaari	17353	5889	11464	1665	6390	1658	1751	33,9	66,1	9,6	36,8	9,6	10,1	69	21852	62	14,3	77	208	71
00820 Roihuvuori	6090	2005	4085	722	1941	666	756	32,9	67,1	11,9	31,9	10,9	12,4	63	20709	74	13,2	74	211	72
00900 Puotinharju	3383	1255	2128	369	1144	311	304	37,1	62,9	10,9	33,8	9,2	9,0	74	20599	76	11,4	63	213	73
00710 Pihlajamäki	9824	3477	6347	943	3569	900	935	35,4	64,6	9,6	36,3	9,2	9,5	72	21138	72	12,2	69	213	74
00700 Malmi	10723	3645	7078	1093	4081	1033	871	34,0	66,0	10,2	38,1	9,6	8,1	76	21832	63	13,9	76	215	75
00410 Malminkartano	6979	2071	4908	1063	2437	735	673	29,7	70,3	15,2	34,9	10,5	9,6	71	20222	77	12,7	71	219	76
00970 Meilunkylä	8565	3028	5537	810	3507	656	564	35,4	64,6	9,5	40,9	7,7	6,6	77	21195	70	12,9	73	220	77
00940 Kontula	20334	8465	11869	1808	7433	1404	1224	41,6	58,4	8,9	36,6	6,9	6,0	78	19771	78	15,9	78	234	78
00880 Roihupellon teollisuusalue	52	23	29	2	22	3	2	44,2	55,8	3,8	42,3	5,8	3,8	79	18194	80	16,6	79	238	79
00770 Jakomäki	4825	2224	2601	381	1812	235	173	46,1	53,9	7,9	37,6	4,9	3,6	80	18965	79	18,3	80	239	80

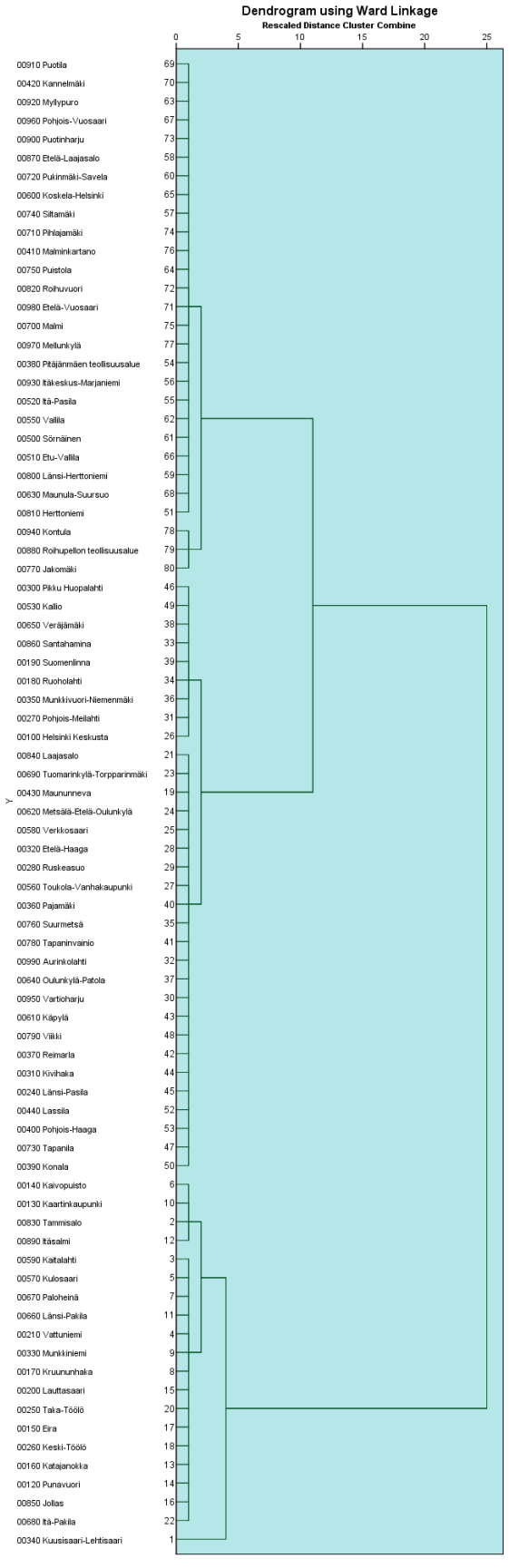
Appendix 2. *Results of the K-means analysis.*

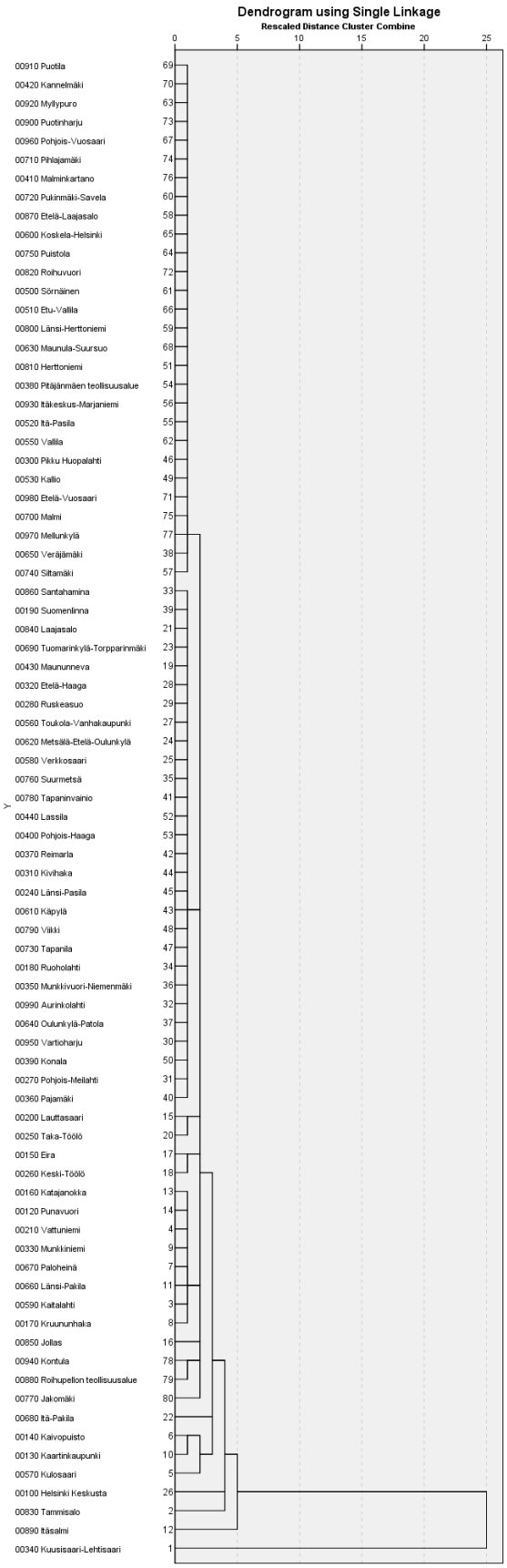
Cluster Membership

Case Number	Postal codes	Cluster	Distance
1	00340 Kuusisaari-Lehtisaari	1	0,000
2	00830 Tammisalo	2	0,000
26	00100 Helsinki Keskusta	3	3312,235
14	00120 Punavuori	3	189,771
17	00150 Eira	3	281,778
13	00160 Katajanokka	3	657,769
8	00170 Kruununhaka	3	1341,238
4	00210 Vattuniemi	3	1122,772
18	00260 Keski-Töölö	3	2394,231
9	00330 Munkkiniemi	3	153,239
3	00590 Kaitalahti	3	3723,771
11	00660 Länsi-Pakila	3	1079,233
7	00670 Paloheinä	3	861,236
22	00680 Itä-Pakila	3	913,255
16	00850 Jollas	3	4078,770
45	00240 Länsi-Pasila	4	1657,887
40	00360 Pajamäki	4	1370,903
53	00400 Pohjois-Haaga	4	94,259
76	00410 Malminkartano	4	1455,128
70	00420 Kannelmäki	4	514,131
52	00440 Lassila	4	903,887
61	00500 Sörnäinen	4	363,142
66	00510 Etu-Vallila	4	192,154
55	00520 Itä-Pasila	4	21,321
49	00530 Kallio	4	1166,897
62	00550 Vallila	4	1014,129
65	00600 Koskela-Helsinki	4	805,127
43	00610 Käpylä	4	2303,891
68	00630 Maunula-Suursuo	4	1,971
75	00700 Malmi	4	154,953
74	00710 Pihlajamäki	4	539,133
60	00720 Pukinmäki-Savela	4	434,880
57	00740 Siltamäki	4	1697,880
64	00750 Puistola	4	1527,876
80	00770 Jakomäki	4	2712,148
48	00790 Viikki	4	907,910
59	00800 Länsi-Herttoniemi	4	761,884
72	00820 Roihuvuori	4	968,127
58	00870 Etelä-Laajasalo	4	1354,875
79	00880 Roihupellon teollisuusalue	4	3483,139
73	00900 Puotinharju	4	1078,130
69	00910 Puotila	4	303,130
63	00920 Myllypuro	4	533,878
78	00940 Kontula	4	1906,141
67	00960 Pohjois-Vuosaari	4	935,881
77	00970 Mellunkylä	4	482,161
71	00980 Etelä-Vuosaari	4	174,915
34	00180 Ruoholahti	5	577,625
39	00190 Suomenlinna	5	2027,386
15	00200 Lauttasaari	5	3707,634
20	00250 Taka-Töölö	5	1104,646

31	00270 Pohjois-Meilahti	5	412,409
29	00280 Ruskeasuo	5	1925,384
46	00300 Pikku Huopalahti	5	1132,385
44	00310 Kivihaka	5	2053,381
28	00320 Etelä-Haaga	5	1670,384
36	00350 Munkkivuori-Niemenmäki	5	1285,380
42	00370 Reimarla	5	1199,384
54	00380 Pitäjänmäen teollisuusalue	5	1429,396
50	00390 Konala	5	1823,395
19	00430 Maununneva	5	2973,622
27	00560 Toukola-Vanhakaupunki	5	1613,384
25	00580 Verkkosaari	5	56,454
24	00620 Metsälä-Etelä-Oulunkylä	5	1282,622
37	00640 Oulunkylä-Patola	5	997,380
38	00650 Veräjämäki	5	450,626
23	00690 Tuomarinkylä-Torpparinmäki	5	1909,622
47	00730 Tapanila	5	422,408
35	00760 Suurmetsä	5	1359,634
41	00780 Tapaninvainio	5	789,638
51	00810 Herttoniemi	5	1418,392
21	00840 Laajasalo	5	1579,623
33	00860 Santahamina	5	630,653
56	00930 Itäkeskus-Marjaniemi	5	656,437
30	00950 Vartioharju	5	2620,622
32	00990 Aurinkolahti	5	1136,623
10	00130 Kaartinkaupunki	6	1007,758
6	00140 Kaivopuisto	6	2051,752
5	00570 Kulosaari	6	2231,250
12	00890 Itäsalmi	6	828,283

Appendix 3. *Dendrograms by Nearest neighbor and Ward's method.*





Appendix 4. *Proximity matrix.*

Case	1:00340 Kuusisaari-Lehtisaari	2:00830 Tammisalo	3:00590 Kaitalahti	4:00210 Vattuniemi	5:00570 Kulosaari	6:00140 Kaivopuisto	7:00670 Paloheinä	8:00170 Kruununhaka	9:00330 Munkkiniemi	10:00130 Kaartinkaupunki
1:00340 Kuusisaari-Lehtisaari	0,000	5,369	15,397	17,882	12,148	9,034	20,338	20,131	19,427	10,086
2:00830 Tammisalo	5,369	0,000	2,644	3,782	1,519	,860	4,831	5,156	4,529	1,541
3:00590 Kaitalahti	15,397	2,644	0,000	,154	,483	1,497	,367	,687	,388	1,821
4:00210 Vattuniemi	17,882	3,782	,154	0,000	,709	1,917	,210	,233	,060	2,014
5:00570 Kulosaari	12,148	1,519	,483	,709	0,000	,330	1,369	1,347	,920	,511
6:00140 Kaivopuisto	9,034	,860	1,497	1,917	,330	0,000	3,031	2,627	2,238	,123
7:00670 Paloheinä	20,338	4,831	,367	,210	1,369	3,031	0,000	,616	,236	3,311
8:00170 Kruununhaka	20,131	5,156	,687	,233	1,347	2,627	,616	0,000	,186	2,428
9:00330 Munkkiniemi	19,427	4,529	,388	,060	,920	2,238	,236	,186	0,000	2,224
10:00130 Kaartinkaupunki	10,086	1,541	1,821	2,014	,511	,123	3,311	2,428	2,224	0,000
11:00660 Länsi-Pakila	20,743	5,044	,480	,183	1,263	2,861	,066	,485	,107	2,997
12:00890 Itäsalmi	13,793	2,544	1,735	2,130	1,049	1,630	2,223	3,526	2,230	2,184
13:00160 Katajanokka	19,308	4,657	,783	,333	,858	1,968	,679	,410	,155	1,790
14:00120 Punavuori	19,583	4,844	,829	,332	,953	2,064	,733	,295	,152	1,827
15:00200 Lauttasaari	24,706	7,215	1,322	,623	2,241	4,106	,500	,517	,328	3,948
16:00850 Jollas	16,949	3,908	1,292	,933	,657	1,275	1,565	1,159	,748	1,037
17:00150 Eira	21,067	6,129	2,093	1,327	1,653	2,574	1,936	1,129	,928	2,047
18:00260 Keski-Töölö	23,321	6,962	1,906	1,060	1,986	3,326	1,387	,809	,637	2,865
19:00430 Maununneva	28,971	9,686	3,198	2,474	4,079	6,424	1,687	2,970	1,957	6,542
20:00250 Taka-Töölö	28,645	9,465	2,511	1,517	3,485	5,645	1,232	1,276	1,005	5,343
21:00840 Laajasalo	30,680	10,692	3,681	2,789	4,598	7,040	2,011	3,114	2,180	7,030
22:00680 Itä-Pakila	23,890	7,423	2,730	1,948	2,448	3,808	2,034	2,141	1,416	3,501
23:00690 Tuomarinkylä-Torpparinmäki	30,750	10,805	3,889	3,007	4,725	7,150	2,209	3,398	2,381	7,157
24:00620 Metsälä-Etelä-Oulunkylä	31,165	11,162	4,069	2,977	4,699	6,981	2,441	3,042	2,259	6,718
25:00580 Verkkosaari	32,183	11,652	4,091	2,931	4,952	7,370	2,361	2,860	2,210	7,072
26:00100 Helsinki Keskusta	27,657	11,164	5,838	4,361	5,000	5,854	5,411	3,331	3,580	4,611

27:00560 Toukola-Vanhakaupunki	33,622	12,266	4,112	3,035	5,519	8,296	2,158	3,061	2,386	8,193
28:00320 Etelä-Haaga	33,569	12,299	4,149	2,985	5,420	8,100	2,245	2,874	2,296	7,874
29:00280 Ruskeasuo	33,614	12,344	4,127	2,917	5,393	8,044	2,251	2,703	2,222	7,751
30:00950 Vartioharju	31,727	11,780	5,050	4,066	5,469	7,773	3,320	4,516	3,308	7,683
31:00270 Pohjois-Meilahti	32,352	12,033	4,425	3,061	5,038	7,235	2,837	2,612	2,268	6,634
32:00990 Aurinkolahti	33,827	13,158	5,877	4,663	6,242	8,597	3,994	4,869	3,778	8,304
33:00860 Santahamina	32,817	13,205	6,030	4,408	5,916	7,652	4,680	3,624	3,457	6,644
34:00180 Ruoholahti	32,921	12,682	5,351	3,946	5,585	7,682	3,718	3,645	3,049	7,054
35:00760 Suurmetsä	35,400	14,273	6,948	5,861	7,423	10,001	4,840	6,445	4,969	9,956
36:00350 Munkkivuori-Niemenmäki	35,333	13,985	5,918	4,437	6,458	8,859	3,986	4,128	3,489	8,272
37:00640 Oulunkylä-Patola	35,926	14,291	6,235	4,870	6,869	9,436	4,144	4,871	3,931	9,057
38:00650 Veräjämäki	35,292	14,759	7,330	5,695	7,133	9,108	5,610	5,265	4,612	8,249
39:00190 Suomenlinna	35,520	14,403	6,194	4,508	6,611	8,803	4,444	3,727	3,527	7,895
40:00360 Pajamäki	38,435	15,503	6,507	5,146	7,770	10,790	4,081	5,167	4,239	10,563
41:00780 Tapaninvainio	36,114	14,795	7,278	6,040	7,625	10,143	5,154	6,429	5,070	9,928
42:00370 Reimarla	37,950	15,912	7,713	6,209	8,098	10,657	5,485	6,204	5,135	10,176
43:00610 Käpylä	38,085	15,806	7,202	5,589	7,776	10,360	4,998	5,280	4,528	9,739
44:00310 Kivihaka	38,485	16,148	7,658	6,094	8,162	10,783	5,384	5,968	5,012	10,251
45:00240 Länsi-Pasila	40,180	17,137	8,191	6,588	8,892	11,713	5,720	6,480	5,476	11,222
46:00300 Pikku Huopalahti	39,531	17,912	9,824	7,911	9,468	11,550	7,813	7,327	6,622	10,493
47:00730 Tapanila	38,498	16,612	8,650	7,119	8,757	11,217	6,424	7,194	5,979	10,703
48:00790 Viikki	40,135	17,025	7,868	6,184	8,645	11,445	5,441	5,856	5,076	10,839
49:00530 Kallio	42,050	19,091	10,036	8,039	10,159	12,630	7,686	7,390	6,722	11,623
50:00390 Konala	42,343	19,301	10,712	9,054	10,877	13,589	8,132	9,197	7,781	13,082
51:00810 Herttoniemi	43,100	20,834	12,525	10,454	11,879	14,003	10,284	9,933	8,987	12,862
52:00440 Lassila	42,639	18,920	9,625	7,913	10,275	13,210	6,946	7,826	6,695	12,682
53:00400 Pohjois-Haaga	43,786	19,659	10,011	8,187	10,713	13,700	7,257	7,943	6,922	13,073
54:00380 Pitäjänmäen teollisuusalue	44,958	22,677	14,362	12,124	13,403	15,383	12,133	11,441	10,545	14,041
55:00520 Itä-Pasila	45,284	21,251	11,654	9,590	11,878	14,621	8,957	9,090	8,169	13,688
56:00930 Itäkeskus-Marjaniemi	46,549	24,374	16,285	13,992	14,990	16,858	14,042	13,379	12,321	15,458
57:00740 Siltamäki	47,609	23,265	14,038	12,217	14,152	17,118	11,042	12,474	10,758	16,603
58:00870 Etelä-Laajasalo	47,256	23,302	14,072	11,978	13,828	16,465	11,299	11,713	10,428	15,531

59:00800 Länsi-Herttoniemi	46,969	23,259	13,928	11,654	13,562	16,002	11,328	10,969	10,075	14,780
60:00720 Pukinmäki-Savela	49,610	24,847	15,195	13,091	15,122	18,003	12,161	12,966	11,495	17,171
61:00500 Sörnäinen	48,478	24,153	14,390	12,051	14,179	16,770	11,634	11,317	10,437	15,539
62:00550 Vallila	48,202	23,413	13,375	11,169	13,564	16,424	10,465	10,627	9,633	15,417
63:00920 Myllypuro	50,546	25,851	16,240	14,019	15,923	18,677	13,239	13,770	12,346	17,694
64:00750 Puistola	50,145	26,067	16,854	14,565	16,171	18,661	14,035	14,200	12,851	17,518
65:00600 Koskela-Helsinki	49,311	24,121	14,048	11,967	14,357	17,425	10,938	11,775	10,435	16,653
66:00510 Etu-Vallila	49,026	24,740	15,031	12,648	14,689	17,224	12,282	11,893	10,996	15,939
67:00960 Pohjois-Vuosaari	51,380	26,630	17,111	14,919	16,714	19,490	14,050	14,813	13,220	18,567
68:00630 Maunula-Suursuo	49,730	25,288	15,594	13,238	15,223	17,815	12,759	12,623	11,563	16,600
69:00910 Puotila	51,744	26,603	16,673	14,392	16,452	19,308	13,562	14,092	12,689	18,303
70:00420 Kannelmäki	52,380	27,036	17,004	14,722	16,823	19,740	13,826	14,464	13,006	18,764
71:00980 Etelä-Vuosaari	56,159	31,202	21,437	18,777	20,371	22,819	18,406	18,123	16,804	21,333
72:00820 Roihuvuori	53,996	28,818	18,705	16,115	18,105	20,725	15,669	15,372	14,260	19,324
73:00900 Puotinharju	54,190	28,409	18,131	15,782	17,946	20,943	14,825	15,522	14,006	19,944
74:00710 Pihlajamäki	54,141	28,723	18,668	16,247	18,222	21,035	15,477	15,875	14,429	19,901
75:00700 Malmi	57,139	31,858	22,016	19,409	21,017	23,599	18,844	18,947	17,425	22,238
76:00410 Malminkartano	56,067	30,195	19,798	17,243	19,332	22,186	16,509	16,732	15,350	20,937
77:00970 Mellunkylä	57,710	31,855	21,717	19,203	21,023	23,866	18,347	18,944	17,251	22,702
78:00940 Kontula	65,688	39,006	28,309	25,280	26,989	29,654	24,770	24,551	22,989	27,959
79:00880 Roihupellon teollisuusalue	71,513	43,668	32,297	29,059	30,937	33,791	28,426	28,281	26,597	31,998
80:00770 Jakomäki	74,561	47,074	35,985	32,567	34,086	36,652	32,219	31,624	29,969	34,601