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Regional perspectives on office service accessibility in Finnish banking markets: are there differences in service accessibility between the regions?

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ABSTRACT

Structural changes in retail banking markets and technological development have reduced the number of bank branches in Finnish retail banking markets. In this paper we are seeking the answer for two questions: first, are there regional differences in bank office service accessibility between the Finnish great-areas, and second, has there been interregional differences in development of accessibility or are the possible differences one legacy of the financial crisis in early 1990's. Accessibility is measured based both in bank group and offices. Empirical analysis shows that there are interregional differences in accessibility but no differences in the development of accessibility. Hence it seems that relative accessibility of banking services in different great-areas of Finland is defined during the financial crisis.

1. Introduction

During the last years banks in Finland have substantially closed their branches. This development has driven both by the development of remote access technologies making some of branch offices redundant and by changes in market structure in Finnish retail banking markets. In this paper we analyze whether there are differences between Finnish regions in accessibility to banking services.

Accessibility of the branch services is typically studied in terms of branch density (see e.g. Evanoff 1988, Gunther 1997), i.e. by numbers of banks per square kilometer. In this paper, in addition to this approach, we also analyze the accessibility with taking into account the entry conditions. This approach is chosen according to the idea that it is more appropriate analyze the accessibility in the same basis than the decisions are made by firms. With another words, we see that this approach enriches the picture about the accessibility of services with taking into account the economic constraints faced by the banks.

The banks entry in certain market is driven by expected profitability the market. A simple entry analysis methodology is provided by Bresnahan & Reiss (1987, 1990, 1991). This methodology is based on the observed number of firms in certain markets and assumed demand conditions in the market indicated by certain market characteristics. By using ordered probit estimation econometrician can estimate the entry thresholds in market size for different number of firms operating in the market. This methodology is applied in retail banking markets for instance by Cetorelli (2002). In this paper we take a shortcut and do not estimate the entry thresholds, but concentrate on parameter coefficient estimates of the index function to see what parameters are ones driving entry and furthermore affect on accessibility of banking service provided in offices.

The second question in this paper is whether the banking service accessibility has developed differently in the great regions of Finland between 1995 and 2001. Gunther (1997) analyzed development of banking service accessibility in rural areas of the U.S. In his analysis he was assuming that changes in branching restrictions could have effect

on the banking service accessibility. In our study we have no a priori assumption concerning neither regional differences nor the development of accessibility, but it is possible that the effects of restructuring the Finnish retail banking markets has been regionally unequal. If we found regional differences in accessibility but no differences in the development of accessibility we have to conclude that the interregional differences are the legacy of financial crisis in early 90's. In the analysis the year we are using as an initial year is 1995 and the accessibility analyses are made for year 2001.

In addition to the regional differences we are interested on differences in accessibility between different municipality types. Koponen & Widgrén (2003) found that the production of financial services is concentrating in Finland towards the existing region centers. In this study we can test if the accessibility of the banking services was better in local market centers. The concentration towards centers can be analyzed by the development of accessibility of banks.

The paper is organized as follows. In section 2 we take a look in the Finnish retail banking markets. Section 3 presents the data used in analyses. Section 4 presents the results and section 5 concludes.

2. Finnish retail banking markets and development of branch networks

According to Finnish Bankers' Association, at the end of 2001 there were a total of 334 domestic banks operating in Finland, which included 8 commercial banks, 244 co-operative banks belonging to the OKO Bank Group, 42 local co-operatives and 40 savings banks. Additionally, there are 18 branch offices of foreign credit institutions active in Finland, of which seven receive deposits. Those banks are grouped in this paper as follows:

1. Nordea: Finnish retail banking activities of Nordea. The branches of Finnish predecessors of Nordea are treated like the offices of Nordea.
2. Savings banks: Savings banks are treated as a one group. Savings banks include both local savings banks and a bigger savings bank, Aktia, which was the "central bank" of the group during the period of analysis. Current

savings banks are the few ones survived from Finnish banking crises in early 90's.

3. OKO Bank Group: local cooperative banks, which are members of the OKO Bank Group and commercial bank OKO Bank operating in Helsinki-area.
4. Local cooperative banks: local cooperative banks which did not join the OKO Bank Group and which established The Association of Local Co-operative Banks in 1997
5. Bank of Åland Group: mainly locally operating bank group in Ahvenanmaa.
6. Sampo Group (formerly known as Postipankki, Leonia-bank, current name from year 2001.)
7. Other banks; mainly branch offices of international large bank corporations. Includes also few small Finnish banks with legal right for retail banking.[1]

During the analysis period there was a few occasions affecting on market structure in retail banking markets and furthermore on the number of branch offices. The first one was the merger of Kansallis-Osake-Pankki and Union Bank of Finland in 1995 and formed the predecessor of current Nordea-bank's operations in Finland. This decreased the number of branches of the group due to elimination of overlaps in branch network. In 1997 the current OKO Bank Group was officially established. Due to conflicts of opinions about the group structure some 40 something local cooperative banks left OKO Bank Group and established group of local cooperative banks. At the same time the group structure of OKO Bank Group became more solid. The third major structural change in market structure and later on the number of bank branches in markets started in 1997 when state-owned bank, Postipankki, merged with Suomen vientiluotto oy (Finnish Export Credit ltd.). As a result of this merger the activities of these firms we pooled under new holding company, which was renamed to Leonia-bank in 1998. This event did not affect on branch network of the bank but end of cooperation in office service provision between Finnish Post and Leonia-bank (predecessor of Sampo Bank) in the beginning of the year 2000 and drastically decreased the number of outlets where Leonia-bank's services were supplied. Finally Leonia-Bank merged with insurance company Sampo. The subsequent merger with Mandatum investment bank created practically the current Sampo-bank.[2] Also over the time many banks with small-scale activities in Finland have entered to the market.

The effects of these occasions are as follows. The elimination of the branch network overlaps of Union Bank of Finland and KOP and end of the old and traditional Post-Leonia –cooperation both decreased the number of branch offices in the market.[3] Contrary to this changes in cooperative bank group had increasing effect on branch office availability, i.e. after this the number of major bank groups operating in some municipalities increased. Generally development of remote access technologies has decreased the importance of branch offices and made some branch offices redundant.[4] Therefore there has been trend of decrease in number of branch offices. Development of number of branch offices will be presented in table 1.

Table 1. Development of bank office networks by bank groups

	1995	1997	1999	2001
Nordea and its predecessors	806	484	347	301
Savings banks	256	252	262	267
OKO Bank Group	974	898	736	711
Local Cooperative Banks Group	0	0	108	129
Sampo and its predecessors	1034	778	543	150
Other	31	42	54	62
Total	3101	2454	2050	1620

Source: Finnish Bankers' Association. Note that Saving banks include Aktia and local savings banks. Respectively Sampo and its predecessors includes the number of post offices, which provided bank services.

3. Data

As measures of the accessibility can be seen either accessibility of different bank groups' branches or branches in the municipality in general. The first one is more appropriate if analyst sees the variety of different bank groups more important than unconditional proximity of the branch. Basically, in the first case analyst values higher the differentiation between the bank groups than the distance based differentiation. To achieve more alternatives for the analyses we estimate similar functions for both measures.

In accessibility estimations we use as dependent variables both bank and group densities and number of major bank groups operating in the municipality and the number of bank offices (both branches and own banks are included) in the municipality. Respectively in the analyses on change of accessibility we use growth rates of numbers of bank groups

or branches in municipality. As described above, the trend in number of branches has been decreasing. From 1995 to 2001 there was only few municipalities where number of branches increased. Therefore, we analyze only the change in number of bank groups operating in municipalities. During the analyzed period there have been few consolidation of municipalities. These have been treated retrospectively. We have also made few artificial consolidations due to difficulties to distinguish the locations of the branches between those municipalities. The artificial consolidations have been justified since in these cases the municipalities are ones, which are very likely to be consolidated officially within few years. Descriptive statistics and more detailed variable descriptions of dependent variables are presented in table 2 below.

Table 2. Variable descriptions and descriptive statistics of dependent variables

	Mean	Std.Dev.
GROUP – Number of bank groups operating in municipality	2.21719	1.27166
BRANCH – Number of bank offices in municipality	3.20136	2.32363
GRGROWTH – Logarithmic growth in number of bank groups in municipality, 1995-2001	-0.34973	0.350237
BRAGROWTH – Logarithmic growth in number of bank offices in municipality, 1995-2001	-0.59771	0.317283
BANKDENS – Logarithmic bank density (GROUP/AREA)	-5.31353	1.25389
BRADENS – Logarithmic office density (BRANCH/AREA)	-5.01178	1.31294
GROUPCH – Ordinal level change of groups operating in town (decrease=0, no change=1, increase=2), 1995-2001	0.395928	0.662765

Notes. Source: Finnish Bankers' Association. Nobs=442. Growth in number of banks or branches is equivalent to growth in the respective densities.

In the estimations, we use, as Evanoff (1988) and Gunther (1997), the population and per capita income in municipality in analysis of accessibility and growth of these respectively in the analysis of the development of accessibility as variables to control differences between the municipalities. One characteristic in their studies was that they did not take into account the geographic area of the municipality. This, in a way, reveals results on absolute differences in service accessibility, i.e. if we are trying to achieve absolute equality in accessibility, in each municipality, not depending the area, the average distance to bank office must be the same. This, however, is approach is rather hard to justify, since from banks' point of view for same profitability in municipality with two times bigger area the price of the services should be doubled. Therefore, we take into analyses also the geographic area of the municipality. It is likely that area has

positive effect on the number of banks or offices in municipality due to higher returns generated by better possibility of horizontal differentiation.

In today's economy many people work outside the hometown. Since people typically are working at the same time when the banks are open, it is possible that those who work outside the hometown also do business with the bank located at the municipality where the work place is. The municipalities with high job sufficiency levels have therefore higher customer potential it can be assumed that the service accessibility is higher. The initial levels of service accessibility are measured by population-to-office and population-to-bank –ratios.

The differences in the municipalities are also captured by dummy-variables describing the municipality's type. Municipality classification is one used by Statistics Finland. In the classification the municipalities belong either the group of rural municipalities, densely populated municipalities or town-like municipalities. In theoretical models the concentration of economic activity is encouraged via circular causality. Spatial concentration of activities, thus, itself creates an environment for further regional concentration (see Krugman 1991, Fujita, Krugman & Venables 1999). The share of immobile labor works like friction in this system. Therefore, in areas with high share of agrarian labor it can be assumed that the people are not willing to move another areas and therefore providing more stable demand and the accessibility of bank services should be higher than otherwise. Dummy for town status is included, since it is likely that towns are centers were the accessibility of bank services is higher than otherwise.

At last, the potential differences in service accessibility between the reflected by dummy-variables. The reference group is the town-like municipalities in Uusimaa-region (For NUTS2 regions of Finland, see map in appendix I.). Independent variables used in estimations are described in table 3.

Table 3. Variable descriptions and descriptive statistics of independent variables

POP – Logarithm of population	8.52599	1.13911
POPD – Logarithmic growth in population, 1995-2001	11713.4	33927.9
INC – Logarithm of per capita taxable income (in thousands euros)	2.56654	0.161705
INCD – Logarithmic growth in per capita taxable income, 1995-2001	0.292532	0.069157
AREA – Logarithm of geographic area of municipality	6.01151	1.07161
JOBSUF – Logarithm of job-sufficiency of municipality (Jobs/Employed labor force)	-0.1795	0.226814
PBR1995 – Logarithm of population-to-bank group –ratio in 1995	7.55232	0.955026
POR1995– Logarithm of population-to-office –ratio in 1995	7.00156	0.650456
DENSE – Municipality is classified to be densely populated (dummy)	0.162896	0.369689
RURAL – Municipality is classified to be rural municipality (dummy)	0.68552	0.464834
TOWN – Municipality has town status (dummy)	0.246606	0.431524
REGIOND2 – Municipality is located in South Finland (dummy)	0.384615	0.487056
REGIOND3 – Municipality is located in East Finland (dummy)	0.169683	0.37578
REGIOND4 – Municipality is located in Central Finland (dummy)	0.19457	0.396318
REGIOND5 – Municipality is located in Northern Finland (dummy)	0.138009	0.3453
REGIOND6 – Municipality is located in Ahvenanmaa (dummy)	0.036199	0.186997

Source: Statistics Finland. Nobs=442.

4. Estimation results

4.1. Accessibility of bank services

In estimations of accessibility we applied OLS for bank and office densities and ordered probit estimations for the number of banks and offices in the municipality (for ordered probit, see e.g. Maddala 1983 or Greene 2000). In ordered probit estimations dependent variable has to take all the values from 0 to maximum. In the case of the bank groups, dependent variable takes all the values from zero to seven and therefore there are no problems with estimations. Unfortunately, this is not the case with the branches. The maximum number of branches in the municipality was in 2001 as high as 100. Therefore it is clear that required presence of all values in the sequence of ordered responses does not satisfy. Therefore we have censored the data such that for all municipalities with at least 10 branches the number of branches is recoded to 10. 10 branches as a cut-off point is originally chosen rather heuristically. We also tested how the results change if we use either lower of higher branch levels for minimum value for belonging to the highest group. By increasing the J we observed that actually

qualitatively the results are almost unchanged up to J=10, but after that there are changes in the signs and significances of coefficients. Therefore J=10 is the maximum value where the estimations reflect best the regional characteristics (there are also regions where number of branches is less than 10 at max). In every case of accessibility we estimated two model specifications, one with and one without region dummies. The estimation results are presented in table 4 below.

In entry-models based accessibility estimations we estimated the models with number of bank groups present in municipality as a dependent variable. Population of municipality has positive sign as assumed. Also job-sufficiency of the municipality increases the number of bank groups operating in municipality. The population-to-bank –ratio is statistically negative. This implicates that in Finnish banking markets banks have not make so many entries in new municipalities after 1995 and if the accessibility measured by number of banks was low related to the population in 1995, so was it in 2001. If municipality had town-status, here implicating some smaller region center, the municipality had more banks. Interesting finding here is the statistical insignificance of geographic area of municipality. According to theory this should have positive sign, i.e. the market size should encourage entry. Therefore it seems that the excess revenues due to differentiation are negligible. The number of bank groups in municipalities of Northern Finland (region 5) was lower than in other regions. Oppositely in Ahvenanmaa (region 6) the number of bank groups was higher. The inclusion of region dummies created no considerable changes in other parameter.

OLS-estimation for bank density, not surprisingly, gives similar results for parameter coefficients. Since the geographic area had no statistically significant impact on number of bank groups, it is natural that the effect of it on accessibility measured by bank density is negative. Otherwise the interregional differences were the same as previously, but the accessibility of bank services in East Finland (region 3) seems to be significantly below average.

Table 4. Accessibility level estimations

	Ordered probit				OLS			
	Number of bank groups		Number of offices		Bank density		Office density	
	No region-dummies	With region-dummies	No region-dummies	With region-dummies	No region-dummies	With region-dummies	No region-dummies	With region-dummies
CONSTANT	-6.94048**	-7.02003**	-2.48761	-2.33748	-1.5339**	-1.31392**	-5.89471**	-4.78675**
	(1.85259)	(2.15606)	(1.73528)	(1.96062)	(0.351144)	(0.3856)	(0.596447)	(0.641444)
POP	5.94426**	5.82626**	-3.23748**	-3.18253**	1.09469**	1.03012**	0.0002973	1.68E-05
	(0.281496)	(0.300411)	(0.160313)	(0.168798)	(0.052051)	(0.053538)	(0.00045)	(0.000418)
INC	-0.0568288	-0.511314	0.0470496	-0.5361	0.0900419	-0.0771243	0.759912**	0.231034
	(0.560053)	(0.697067)	(0.507682)	(0.621279)	(0.109423)	(0.126034)	(0.190186)	(0.212542)
AREA	-0.108709	0.10109	-0.35985**	-0.168832	-0.996994**	-0.961654**	-1.05352**	-0.964**
	(0.086748)	(0.10151)	(0.07807)	(0.091389)	(0.017075)	(0.018762)	(0.030403)	(0.031741)
JOBSUFF	1.10834**	1.14493**	0.827236**	0.88004**	0.134019*	0.154293*	0.35411**	0.38253**
	(0.350512)	(0.367057)	(0.300868)	(0.31305)	(0.066136)	(0.065798)	(0.117087)	(0.110008)
PAUR1995	-4.86548**	-4.65982**	3.6382**	3.71948**	-0.979083**	-0.894971**	0.554645**	0.560635**
	(0.303737)	(0.317889)	(0.141384)	(0.154861)	(0.059595)	(0.060381)	(0.036726)	(0.037575)
DENSE	0.0953975	-0.276917	1.1613**	0.810182**	0.0009827	-0.056901	0.394847**	0.204125*
	(0.257598)	(0.275373)	(0.233669)	(0.248356)	(0.054558)	(0.054964)	(0.09567)	(0.092553)
RURAL	0.289023	-0.138678	1.50779**	1.15083**	-0.0379591	-0.105942	0.637396**	0.4308**
	(0.334027)	(0.359764)	(0.30322)	(0.322459)	(0.068747)	(0.069728)	(0.120839)	(0.117235)
TOWN	0.710283**	0.68114**	0.365215	0.302246	0.196133**	0.171658**	0.215181**	0.151333*
	(0.21331)	(0.218524)	(0.191203)	(0.194318)	(0.044459)	(0.043587)	(0.079458)	(0.073867)
REGION2		0.198429		-0.121741		0.0209387		-0.07193
		(0.259259)		(0.228705)		(0.049677)		(0.083826)
REGION3		-0.610087		-0.74692*		-0.13134*		-0.48009**
		(0.344224)		(0.29872)		(0.064139)		(0.105978)
REGION4		0.343262		0.36996		0.0267917		0.034833**
		(0.304186)		(0.268425)		(0.058092)		(0.097918)
REGION5		-0.791903*		-0.94512**		-0.158415*		-0.4357**
		(0.360983)		(0.31395)		(0.066122)		(0.110499)
REGION6		0.897663*		0.91147*		0.222998**		0.449986**
		(0.449573)		(0.399954)		(0.083958)		(0.141936)
R^2	0.534	0.557	0.416	0.443	0.953	0.956	0.869	0.891

Notes. All values of continuous dependent variables are logarithmic. Standard errors are in parentheses. Significance levels of 5% and 1% are denoted respectively by * and **. PAUR1995 (population-to-analyzed unit –ratio) refers to either POR1995 or PBR1995. R^2 in ordered probit estimations is pseudo-R^2 calculated as $R^2=1-(L_f/L_r)$, where L_f is value of log likelihood function maximized with respect to both the intercepts and explanatory variables and L_r is value of log likelihood function maximized with respect to intercepts alone. In ordered probit estimations Nobs. 442 and In OLS estimations the no-bank municipalities are omitted (Nobs. 438).

Another way to analyze the accessibility is to use number of offices as a basic unit. In the ordered probit estimation for number of offices came up peculiar result: the sign of population is negative. One possible explanation for this is phenomenon is the positive correlation between the population-to-office –ratio and population. The signs of these variables are opposite and highly significant and therefore the variables override each other's effect. The problem with this explanation is that there are no signs of significant multicollinearity. After inclusion of region-dummies the effect of area on the number of offices is statistically insignificant. Job sufficiency has positive impact on number of

offices in the municipality. Generally it seems that in town-like municipalities the number of bank offices is lower than in rural and densely populated ones. East Finland and Northern Finland suffer from lowers accessibility and oppositely in Ahvenanmaa there are more offices than in other regions.

If we measured accessibility by branch density, population loses its significance. Positive sign of population-to-office –ratio seems to confirm the problem of correlation between it and population. Taxable income per capita has positive effect on accessibility in estimation without region-dummies, but loses its significance after inclusion of them. Therefore it is clear that there are interregional differences in taxable income. This can be also seen in other estimations: in each case the inclusion of region-dummies has reduced the coefficient of income substantially. Area has negative effect on accessibility as assumed, i.e. like previously the higher fees due to differentiation do not seem to occur. Therefore it is natural that in increase in area decreases the accessibility. Otherwise the only differences to the estimation of number of offices is that the office accessibility is significantly lower in town-like municipalities than in densely populated and rural municipalities and in municipalities having town-status. Also the accessibility is higher in Central Finland, which is understandably since the region is core market area of cooperative banks and also savings banks are strong in Swedish coast area.

In general the bank accessibility, either measured by bank groups or offices, is better in towns even with taking into account the municipality characteristics. There are statistically significant differences between the regions. The question whether those differences are the legacy of financial crisis or created during the late 1990's will be analyzed in next subsection.

4.2. Changes in bank accessibility

Like in previous subsection, we apply here OLS and ordered probit estimations in analysis of changes in bank accessibility. The changes in accessibility are measured by logarithmic growth of bank groups and offices (OLS) and by qualitative change in the number of bank groups operating in the municipality. Estimation results are presented in table 5.

Table 5. Changes in accessibility

	OLS				Ordered probit	
	Growth in groups		Growth in offices		Change in number of groups	
	Model 3	Model 4	Model 3	Model 4	Model 3	Model 4
CONSTANT	-2.06161**	-1.88812**	-0.3246	-0.33202	-5.53921*	-6.24062**
	(0.40062)	(0.449486)	(0.444752)	(0.516916)	(2.51006)	(2.83209)
POP	0.107731*	0.053771	-1.18E-06*	-1.19E-06*	-1.66689**	-1.92027**
	(0.053185)	(0.054849)	(5.50E-07)	(5.48E-07)	(0.334668)	(0.368229)
POPD	-4.02E-07	-4.78E-07	5.61E-05	-8.28E-06	8.67E-05**	8.46E-05**
	(4.75E-07)	(4.72E-07)	(0.000301)	(0.000299)	(1.77E-05)	(1.87E-05)
INC	0.317434*	0.163997	-0.15371	-0.16014	1.06437	0.65012
	(0.14386)	(0.171881)	(0.164066)	(0.200311)	(0.853055)	(1.06252)
INCD	-0.4029	-0.3586	0.459741	0.299759	0.127787	0.617238
	(0.253358)	(0.266603)	(0.294079)	(0.31095)	(1.40674)	(1.56348)
AREA	-0.0166	0.012939	-0.1108**	-0.0831**	-0.18659	-0.02676
	(0.017671)	(0.019548)	(0.020441)	(0.022728)	(0.11055)	(0.123126)
JOBSUFF	0.033264	0.049198	0.044931	0.027253	0.304472	0.296063
	(0.068309)	(0.068795)	(0.078543)	(0.079037)	(0.420398)	(0.435008)
PAUR1995	0.026923	0.100848	0.046169	0.042009	2.11912**	2.50282**
	(0.060002)	(0.061048)	(0.027178)	(0.029491)	(0.385721)	(0.414683)
DENSE	-0.0026	-0.0552	0.293651**	0.231692**	0.769941*	0.475718
	(0.056036)	(0.056947)	(0.063968)	(0.066041)	(0.307664)	(0.32697)
RURAL	-0.05512	-0.10969	0.310302**	0.246092**	0.590757	0.31039
	(0.070816)	(0.07254)	(0.080906)	(0.083866)	(0.39997)	(0.427141)
TOWN	0.169862**	0.151339**	0.082831	0.060019	0.910022**	0.906725**
	(0.046126)	(0.045398)	(0.053557)	(0.052894)	(0.230245)	(0.236476)
REGION2		0.020845		-0.00503		0.36809
		(0.051939)		(0.060193)		(0.331311)
REGION3		-0.13043		-0.09182		-0.45267
		(0.067212)		(0.076382)		(0.430559)
REGION4		0.043402		0.110559		0.496366
		(0.062419)		(0.072317)		(0.390625)
REGION5		-0.11426		-0.08727		-0.41053
		(0.069999)		(0.080492)		(0.456293)
REGION6		0.20023*		0.129931		1.08385
		(0.086858)		(0.10092)		(0.565938)
R^2	0.468649	0.499089	0.130303	0.17455	0.419859	0.44863

Notes. All values of continuous dependent variables are logarithmic. Standard errors are in parentheses. Significance levels of 5% and 1% are denoted respectively by * and **. PAUR1995 (population-to-analyzed unit –ratio) refers to either POR1995 or PBR1995. R^2 in ordered probit estimations is pseudo-R^2 calculated as $R^2=1-(L_f/L_r)$, where L_f is value of log likelihood function maximized with respect to both the intercepts and explanatory variables and L_r is value of log likelihood function maximized with respect to intercepts alone. In ordered probit estimations Nobs. 442 and In OLS estimations the no-bank municipalities are omitted (Nobs. 438).

The change in accessibility is first analyzed by the logarithmic growth in number of bank groups operating in municipality. Since the bank density is defined by number of banks divided by geographic area of the region, this measure is equivalent to the growth in bank density. In change the constant have theoretical interpretation: negative sign implicates that in general the bank density has decreased from 1995 to 2001 in Finland. Population and per capita taxable incomes have positive sign in estimation without region-dummies, but lose significances after inclusion of them. Bank density has decreased at lower pace in municipalities having town-status. Also in Ahvenanmaa the

accessibility measured by bank density has decreased at lower pace than in other municipalities. Otherwise there are no interregional differences.

If we measured the change in accessibility by growth in offices the constant is not statistically significant. However higher the population is, higher is the decrease in branch density. Also the AREA has negative sign, i.e. the bigger the municipality, the more branch density decreases. In densely populated and rural municipalities the branch density has decreased less than on average. This can be possibly explained again by the different group strategies: cooperative banks are typically located in smaller municipalities and they have not consummated as dramatic reductions in branch networks than either Sampo or Nordea. In branch density development there are no differences between the regions.

If we measured the development of accessibility by qualitative changes in number of bank groups operating in municipality, the results are pretty much similar to ones presented previously. However now the results are more in line with theory and easier to interpret. Again the constant is significantly negative implicating the general decline in accessibility. The sign of population is negative, i.e. the bigger the municipality, more likely the number of bank groups has decreased. The increase in population makes the decrease in number of banks less likely. Town status creates the same impact, i.e. this reveals that banking activity is concentrating to centers. Population-to-bank –ratio has positive sign here, i.e. the municipalities having higher population-to-bank –ratio in 1995 have less likely faced decrease in number of banks. This is natural since the more extensive use of remote access technologies in banking has made lots of branch offices redundant and furthermore increased the average population-to-bank –ratio. The municipalities, which had already in 1995 high PBR, have kind of prepared to the decrease in need of real presence of banks. This analysis does not reveal any regional differences.

As a general result about changes of accessibility we can conclude that if we measured the accessibility by number of bank groups the banking activity has concentrated in towns. If changes of accessibility are measured by branch density, town-like municipalities have suffered most. In both cases there are no negative interregional

differences in development, i.e. the lower levels of accessibility are legacy of the banking crisis.

5. Conclusions

In this paper we analyzed interregional differences in bank service accessibility in Finnish retail banking markets. Bank service accessibility was measured both with accessibility to certain bank groups and overall accessibility to bank offices. Previous approach was based on the idea that customers have preferences concerning different bank groups and latter just on idea that closer the bank office is, better off the customer is. Also the development of accessibility was analyzed. In the analysis we tried to find out whether there are differences in accessibilities, first between regions of Finland, and second between different types of municipalities. Also we analyzed if there has been differences in development of bank accessibility. As control variables we used population, taxable income, geographic area and job sufficiency of the municipality. Also the initial conditions of service accessibility in the municipality were taken into account, as well as the per capita income and population growth.

The result of the analysis was that there are indeed differences in bank accessibility both measured in bank or branch density and number of bank groups or offices in the municipality. In previous case we used OLS for the levels and in latter one ordered probit. Both methods revealed understandable results close to each other. The differences between the regions were higher when we measured accessibility by the proximity to offices in general. Also initial conditions of accessibility as well as the municipality type were significant factors defining accessibility. Accessibility of bank groups were significantly higher in towns other things being equal. This shows that banking activity is concentrating in the centers. In the development of accessibility we did not find differences between the regions.

Of course, we must take into account the possible problems of this study. At first, is municipality natural unit of analysis? If we are comparing interregional differences in bank service accessibility measured by offices, we think it is. For banks it is not, since a bank can have branch network strategy based on the use of remote access technologies.

However, it this behavior is same in every region of the country then there should not be differences in branch accessibility. More difficult question is the appropriateness of the NUTS2 regions defined by Eurostat. These regions are purely statistical units and definitions for Finnish regions are concurrently even changing. It is obvious that the use of NUTS2-classification is not necessarily the best grouping method for the study of regional differences. Hence, in the future we are going to try other regional classifications for the regions. Also, as turned up with Eastern and Northern Finland, for more rigorous analysis there is need for deeper time-dimension in the data.

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Endnotes.

[1)] For more detailed information on other banks operating in Finland, visit Finnish Bankers Association's homepage <http://www.pankkiyhdistys.fi/english/index.html>.

[2)] For overall view of developments of market structure, see e.g. Anderson et al. (2000).

[3)] Naturally, in the previous case the decrease in number of branch offices was merely due to elimination of overlaps in branch office networks and it did not actually affect so much in the branch office service accessibility. In latter case the accessibility of current Sampo Group's office services was weakened remarkably.

[4)] According to Finnish Bankers' Association in 1995 some 48 % of the payments were made in branch office. This ratio was as low as 11,8 % in 2000. Number of payments made via online connections increased 184 % (12,3 % p.a.) from 1991 to 2000. Respectively number of payments made with giro ATMs increased 119 % with average yearly growth rate of 9 %. For a study on the customers' choices on e-banking in Finland, see Karjaluoto (2002). Vesala (2000) provides a study in competitive effects technological transformation on retail banking.

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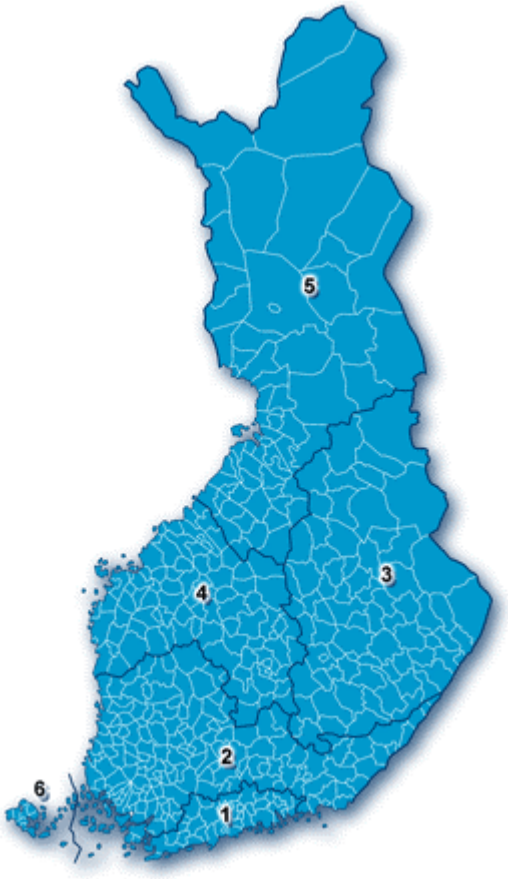
APPENDIX I. NUTS2 Regions in Finland



Region-codes

1. Uusimaa
2. South Finland
3. East Finland
4. Central Finland
5. Northern Finland
6. Ahvenanmaa