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DEMOGRAPHIC PATTERNS AND TRANSITIONS IN 18–20TH CENTURY HUNGARY. COUNTY PEST-PILIS-SOLT-KISKUN IN THE LATE 18TH AND EARLY 20TH CENTURIES

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1 Introduction

This paper aims at analysing the different kinds of demographic behaviour and the local variations of demographic development in Hungary in the late 18th and 19th centuries. The analysis is a part of a larger country-wide research based on samples which reconstructs the country's demographic development in the mentioned period. In the analysis the data of about 200 settlements of the county of Pest-Pilis-Solt (around the capital) are used. The territory of the county was very varied in terms of ethnicity (Hungarians, Germans, Slovaks, Serbs, Croats, Jews), religion (Roman Catholics, Calvinists, Lutherans, Orthodox), geographic conditions and farming. Thus the county itself can be regarded as a representative sample of the country. The data used in the analysis are those of some 18th century population censuses (Conscriptio Animarum, 1774–1783 and the census of Joseph II, 1784–1787), some 19th century censuses (1869, 1880, 1890 and 1900) and local population movement registers (1828–1949). On the basis of the settlement level variables the different demographic patterns of the county are going to be separated by cluster-analysis with special respect to the differences in fertility at the end of the 19th century. Some variables relating to ethnicity, religion, occupational distribution, and farming can help to interpret the demographic differences pointed out by the former statistical analysis. Differences in fertility can be mainly analysed only for the period of the early 20th century, during the transition from the "traditional" to the "modern" demographic system. The analysis can be the basis of further research using samples and can show the demographic diversity of a region generally regarded as a transitional type between 'western' and 'eastern' demographic systems helping to explain the content of those transitional characteristics.

2 Aims and methods[1]

Attempts at Long Term Demographic Reconstruction

Studies of French and, to some extent, of British research on demographic history have shown that grand scale summaries overarching a long period of time on a national or regional level are best founded upon micro-examinations on the local (town or village) level. Standards of local level historical demographic micro-examinations were established in the 1950's and 60's – until this very day this mainly means the application of Henry's family reconstitution method. The problem of representativeness can only be solved by the most careful choice of samples; however, this requires serious knowledge regarding the regional differences of demographic behaviour and the causes of these differences. In England and France a great number of family reconstitutions and a great amount of research on social history, economic history, demography, sociology, historical geography, ethnology, etc. have provided a rich store of experience and a firm basis for such a choice of samples. This served as a basis for a methodological development and for attempts to carry out long term historical demographic reconstructions.[2]

[1] See Őri 2005. 43–44.

[2] See Dupâquier 1995, Wrigley and Schofield 1981, Wrigley et al. 1997, Bardet and Dupâquier 1997–1999.

Hungarian Research Results

In Hungary, research findings do not offer such a solid basis for interpreting different samples of demographic behaviour, while it is obvious that the country was extremely diverse. The few local level research pieces, which also include family reconstitution (e.g. Andorka 1988, 1991, 1998), are partly based on the examination of some specific demographic phenomenon (e.g. emergence of birth control) or assume that denominational and ethno-cultural differences can be used as a basis for selecting the communities. In the case of family reconstitutions or examinations of parish registers based on a different method of sampling (Dányi 1991; Hablicsek 1991) we might face the problem of representativeness in terms of time period. However, we must also take into account the increasing scepticism concerning macro-surveys using aggregated statistical data (including, in the final balance, family reconstitution itself). It seems that the most promising methodology is the '*approche multiscopique'* that has been developed in French social history. This approach does not deny the relevance of macro-level analyses but states that the results of the micro-historian, whose research takes place on a different scale, draw a different picture of the same phenomenon – just like different scales of maps do. Thus an examination is best carried out on a multiplicity of scales at one time, and it is beneficial to compare the macro and the micro level findings and to evaluate each in the light of the other (Revel 1996).

3 Sources

We have several series of census type sources from the beginning of the 18th century (tax assessments, population censuses). The material of tax assessments is not exploited and it is difficult to use them: they contain only the data of the taxpayers. As for population censuses we have no individual data except for some fragments the original questionnaires having been sorted out and most of the local level material has not been published yet. The same is true for parish registers: data of the period between 1828 and 1895 were published on a parish level and those of the period 1895–1968 on a settlement level. The two series can hardly be harmonised and all the rich material from the 18th century and from the beginning of the 19th century has hardly been analysed yet. Therefore, trying to separate the different types of demographic behaviour within the county considered as a sample of the whole country, we used two parts of the sources. One of them consists of the two most valuable source materials of the 18th century – at least in respect of historical demography: the settlement-level data of the non-noble population ('Conscriptio Animarum', 1774–1783) and those of the population census ordered by Joseph II. (in 1785 on the territory of the analysed county). The other large group of the sources used is the material of the population censuses performed in the second part of the 19th centuries (1850, 1857, 1869, 1880, 1890, 1900, 1910). As for the examined county the data of the first group (late 18th century) are elaborated and analysed (Őri 2003. 2005.), those of the second can only partly be used at this moment: mainly the 1890 and 1900 census material.

4 Location[3]

Geographic Characteristics

Pest County was one of the largest counties of Hungary both in terms of area and of population at the end of the 18th century. Its territory was 10,711 km^2 before 1876 and 12,010 km^2 after that (Figure A1 and Figure A2).

In geographical terms it is a highly varied entity, divided into two parts by the North-South flow of the Danube while the Northern, hilly zone of the county is also markedly different from the southern one which is part of the Great Plain of Hungary. From an agricultural point of view the presence of the great river and the difference in topography and vegetation between North and South are highly important, as is the closeness of Buda and Pest, centres of administration and market. The geographical environment, however, is only one decisive element of sustenance. The climate, the topography, the waters and vegetation of the region, the ecological landscape unit, as well as its commercial opportunities define the economic activity of the people who live there and who are exposed to more or less the same events (economic booms and recessions, natural disasters, epidemics, or wars). At the same time, the geographic region is the home to communities of different languages, religions and cultures, it is a scene for the communication between these communities, the exchange of goods and cultural wealth and it never acts as a sole determining force. Within its framework we often find plurality, a division of labour and complementary forms of sustenance.[4]

Population Density and Network of Townships

The original structure of the population and its towns and villages changed a great deal during the 150 years of Turkish rule (in the 16th and 17th centuries). The region around Buda and Pest became more scarcely populated and in the plains of the county this condition continued to prevail in the longer run, even after the war of liberation. Thus the original density of villages and towns was never restored. Part of the population was killed, some escaped or moved to safer towns or villages which enjoyed privileges. Thus a typical set of geographic, social and economic conditions developed on the Plain, which is characterised by large flat stretches of bare land, poor in wood, with little rain, where the soil is not well suited for cultivation as it is often sandy or sodic. The Turkish rule led to the increase and consolidation of features such as low population density, widely scattered, relatively large towns and villages. This state of affairs was not fundamentally altered by the in-migrations of the 18th century – the previous, originally scarce network of townships was not restored (Beluszky 1999. 88–89), and right up to the middle of the 19th century the most profitable economic activity was extensive stock breeding. These conditions also had their social aspect. Most of the population inhabiting the plain were free peasants and craftsmen (polgár) of the market towns not so closely controlled by landlords and thus in a rather favourable legal position. The special conditions of the Plain can be described as backwardness, peripheral position or a frontier type existence (Beluszky 1999). What appears significant from our point of view is that those districts of the county which

[3] About the location also see Őri 2005. 44–46.
[4] In Pest County in Pilis District: Faragó 1985.

are on the Plain show a marked difference from the hilly sections, even at first sight and this suggests the existence of a unique demographic structure.[5]

Table 1
Number and Average Size of Settlements by Districts (Pest-Pilis-Solt County in 1783 and Jászkun District in 1787) and Population Density (1787)

	Kecskemét district	Pilis district	Solt district	Vác district	County	Jászkun district
Characteristics	plain	mixed (plain and hilly)	plain	hilly	mixed	plain
Population density (person/ km^2)					25,4	19,8
Number of settlements	50	46	35	63	194	38
Average population size by settlement	1739	1063*	1366	923	1247	3753

Note: *686 among mountains on the northern part of the district.
Source: Őri 2003. 153–155., Thirring 1938. 117.

One can clearly see the difference between the Northern, hilly and the Southern, plain area on the basis of the average population size of the settlements. The data of the Jászkun district (privileged market towns and villages partly wedged in the territory of the plain region of the county and partly unified with it in 1876, the so called 'Pest-Pilis-Solt-Kiskun' county), which can be representative for the typical plain land, emphasize this difference and serve the comparison well.

Ethnic and Denominational Composition

The original Hungarian population of the county, which had mostly converted to Calvinism in the 16th century, only survived in the large market towns of the Plain and on the protected, marshy islands and floodplains of the Danube. In the southern part of the county we find smaller villages in the traditional sense of that word (under a 1000 inhabitants). In those parts of the county which are close to Buda and Pest, as well as in the Northern, hilly parts, partially or fully depopulated villages were repopulated after the liberating wars (from the late 17th century onwards). The new settlers significantly altered the ethnic and denominational character of the area: the organised repopulation of the Buda and Pest region led to the establishment of Catholic German villages, while other parts became populated by Catholic and Lutheran Slovakians, Catholic Croatians, and Orthodox Serbs. In addition several of the estate centres (e.g. Óbuda) saw the emergence of major Jewish communities in the 18th century.

[5] Similar conclusions have been reached by Attila Melegh investigating the population history of Kiskunhalas (Melegh 2000b).

Table 2
Population by Ethnicity (Spoken Language) and Denomination, Pest-Pilis-Solt County, 1774–1783

	Number of settlements	Roman Catholic %	Protestant %	Orthodox %	Jewish %
Hungarian	90	55.8	43.1*	0.1	0.8
German	32	93.8	5.0**	0.0	1.1
Slovakian	32	55.2	43.5**	0.0	1.2
Croat	2	99.5	0.0	0.0	0.5
Serbian	2	2.5	0.0	97.5	0.0
Mixed	27	60.2	29.8	8.3	1.7
Unknown	9	83.5	16.5	0.0	0.0
Total	194	63.4	33.2	2.3	1.0

Source: Conscriptio Animarum 1774–1783, (Őri 2003. 175.)
Note: nationality based on late 18th century data about spoken language
* Calvinists; ** Lutherans

Thus this is a county the territory of which unites scattered flatlands of the Great Plain of Hungary, the frequently flooded, marshy meadows and floodplain forests of the Danube, as well as some medium high mountains covered in forest. Farming ranged from extensive stock breeding through traditional crop cultivation to forestry, fishing, vine-growing and vine-making. Of the major denominational groups of Hungary the only one we do not find here are the Greek Catholics, of all its ethnic groups only Romanians and Rusins are not represented.

Table 3
Population by Ethnicity in Pest-Pilis-Solt-Kiskun County, 1880–1910 (%)

	Hungarian	German	Slovakian	Croatian	Serbian
1880	75.6	12.5	5.8	1.2	–
1890	80.8	12.9	4.4	0.1	1.3
1900	82.5	11.7	4.0	0.0	0.4
1910	87.9	8.1	2.6	0.1	0.4

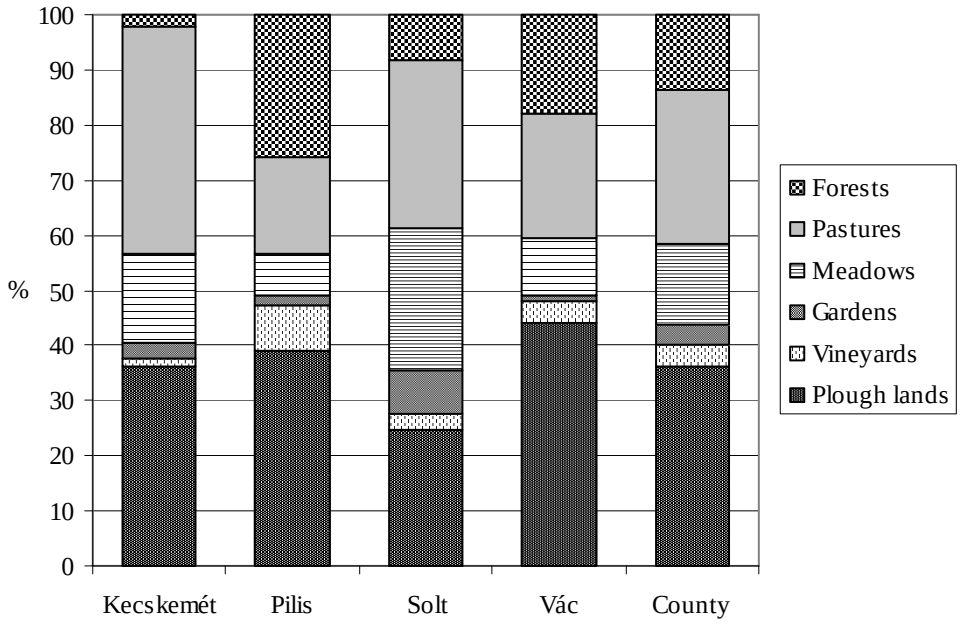
Source: census data (Kovacsics 2000. 50.)
Note: based on the statistics of mother tongue.

Table 4
Pest-Pilis-Solt County by the Size of Arable Land and Types of Farming, 1789

	Kecskemét district	Pilis district	Solt district	Vác district	County
Characteristics	plain	mixed (plain and hilly)	plain	hilly	mixed
Arable land per capita (in cadastral acres)*	10.8	2.8	7.5	5.5	6.6
Ratio of plough land (%)	36.3	38.9	24.6	44.2	36.0
Ratio of vineyards (%)	1.4	8.5	2.9	3.7	4.1
Ratio of gardens (%)	2.8	1.8	8.1	1.1	3.4
Ratio of meadows (%)	16.2	7.2	25.8	10.4	14.9
Ratio of pastures (%)	41.0	17.8	30.5	22.5	28.0
Ratio of forests (%)	2.3	25.7	8.1	18.1	13.6

Source: Cadastral survey, 1789, (Őri 2003. 347–350.)
* Agricultural area not including forests.
Source: Cadastral survey, 1789, (Őri 2003. 347–350.)

Figure 1
Districts of Pest-Pilis-Solt County by Types of Agricultural Land, 1789, %



Source: Cadastral survey, 1789, (Őri 2003. 347–350.)

Economic Conditions

On the basis of the cadastral survey carried out in 1789 one can clearly see the differences in the possibilities of farming. The different types of farming were balanced in the county, but the significance of extensive stock breeding was the highest on the real plain land (in the Kecskemét and Solt districts). There were some differences on the plain too: in the Solt district along the Danube there was less room for stock breeding, and the importance of other supplemental branches of agriculture (meadows, gardens) was much higher. Traditional plough land cultivation was very important in all districts but especially in the valleys and on the hillsides of the relatively densely populated Vác district. Wine was a very valuable product, there were important centres of wine-culture in all districts, especially in the hilly part of the Pilis district in the neighbourhood of Buda, the right-bank part of the new capital. There were huge forests in the northern hilly part of the county (Pilis and Vác districts), where in some villages forestry gave the only possibility for subsistence (felling of trees, charcoal-burning, lime-burning).

5 Demographic Development in Pest-Pilis-Solt County in the Late 18th Century (1774–1785)

Sources and Methods

As a first step of our analysis and the first element of selecting a sample from the settlements of the county we have to look at the demographic situation in the late 18th century. The analysis is based on the material of two population censuses: on the Conscriptio Animarum (1774–1783) and the population census of Joseph II. (1785). In both cases the settlement- level summaries have survived. Conscriptio Animarum contains data of the non-noble population (by denomination, social groups, sex and age groups – under and above the age 15) and basic statistics of population movement (numbers of births, deaths, migrants). The other census covers the whole population (by sex, rough age groups, certain socio-professional categories and marital status), gives the number of houses and households, but doesn't contain data about population movement. On the basis of the two sources (plus the above mentioned cadastral survey) 48 variables were calculated (Őri 2005. 73–74.). After the criticism of surveys 121 settlements were chosen for the analysis, where the non-noble census seemed to be relatively complete compared to the 1785 census (Őri 2003. 123–150., Őri 2005. 48–49.).

After separately analysing demographic differences spatially (fertility, mortality, marriage and household structure, migration and population growth)[6] we tried to examine simultaneously the most reliable variables by cluster-analysis in order to separate the different kinds of demographic behaviour within the county, independently of all possible a priori classification. The hierarchical cluster-analysis was carried out on the basis of exclusively demographic variables, while the variables of denomination, ethnicity and farming were to explain the created clusters.

Results of the Cluster-analysis

Three settlements of the 121 represented the extremities, and formed a separate cluster. Szentendre can be the example of the typical little town with 3–4 thousand inhabitants, where the households were small, the household structure was simple, the proportion of servants was very high (almost 15% within the whole population), but the town differed from the others because of its very low fertility and unfavourable mortality which caused natural decrease in the investigated period. Tököl (a village inhabited by Roman Catholic Croats) formed a separate cluster because of the complexity of its households, the significant proportion of early marriages among males, the high proportion of married persons and the very high level of mortality. Vadas was a small farmstead inhabited by servants where the data are very uncertain, it can be characterised by very early marriages, simple household structures, high fertility and very high proportion of illegitimate births (Table 5).

[6] See Őri 2003. and 2005.

Table 5
Demographic Characteristics of Settlement Groups Generated by Cluster-analysis, 1774–1785

	People under the age of 15 (%)	Number of births per 1000 married women	Number of deaths per 1 birth	Married men (%)	Married women (%)	Illegit-imate births (%)	House-hold size (persons)	Number of married men per house-hold	Rate of men married at the age 20 or younger (%)	Rate of women married at the age 20 or younger (%)
Average (N=121)	43.3	289.3	0.834	69.0	71.7	0.7	5.2	1.055	29.6	64.2
1. (N=13)	40.9	305.3	0.906	62.9	65.8	0.7	5.1	1.064	55.8	70.9
2. (N=30)	44.9	284.3	0.853	74.5	75.4	0.9	5.0	1.011	18.1	51.6
3. (N=16)	42.4	265.1	0.870	65.8	71.0	0.6	4.8	0.963	17.7	75.2
4. (N=22)	43.8	303.1	0.781	63.3	67.3	0.2	5.3	1.038	16.1	48.8
5. (N=8)	45.9	326.6	0.623	77.6	80.1	0.6	5.4	1.068	28.0	77.7
6. (N=24)	43.6	274.5	0.770	72.1	74.4	0.3	5.6	1.189	47.8	76.7
7. (N=5)	38.7	307.8	1.028	56.0	58.3	0.9	4.6	0.945	24.0	62.9
8. Szentendre	33.2	228.8	1.802	63.5	59.9	2.8	3.9	0.753	26.0	75.9
9. Tököl	46.6	283.2	1.156	83.4	87.0	0.0	6.6	1.560	64.0	69.7
10. Vadas	37.3	343.7	0.940	68.1	68.3	9.0	4.0	0.875	100.0	100.0

Source: Conscriptio Animarum, 1774–83. Census 1785. see: Őri 2005. 75.

Fertility and Household Structure

The major characteristics of the seven clusters are summarised in Table 6. The county was extremely varied in demographic terms, demographic behaviour had a lot of local variations, it cannot be divided into 'Eastern' and 'Western' types as suggested by the Hajnalian theory.[7] As for marriage customs and household structures we can find a typical 'Eastern' group (Cluster 6 besides Tököl), but in other clusters early marriages and more complex household structures do not seem to be connected. A relatively complex household structure seems to prevail in some villages inhabited by southern-Slavs, among land owning peasants especially along the river Danube, south of the capital. In that region family estates could not be expanded, the custom of early marriage prevailed, and an egalitarian inheritance system existed in which the heads of the households tried to avoid social degradation and the fragmentation of family estates by forming larger and more complex households. Perhaps that custom was connected with early birth control in late 18th and early 19th century in that region. The used variable related to marital fertility is relatively crude but the differences are high: in the above mentioned region, it is 251,2 births/1000 married women that means a level by almost 15% lower than the county average. Here the biggest difference is 40% compared to the average. This fact makes the existence of early birth control possible in the region of more complex household systems, but the situation is more complicated. Low fertility can

[7] See: J. Hajnal 1965. 1982. 1983. Tamás Faragó gives a profound analysis and criticism of Hajnal's theory on the basis of Hungarian data (Faragó 2003.).

be observed in the villages of simple household structures in the northern hilly part of the county among large forests while complex households were common on the plain where fertility was very high – probably because of the labour shortage in an abundant space. According to multiple linear regression analyses the proportion of plough lands was a significantly positive independent variable in the case of marital fertility, while early marriage of males and the proportion of married women had positive and the proportion of servants and the measure of natural population growth had negative connection with the complexity of households. Using servant labour force or that of a larger and more complex family seems to be alternatives of each other and a complex household system was accompanied by an early marriage in every case.

Table 6
Major Characteristics of the Clusters[8]

Clusters	Religion	Ethnicity	Farming	Fertility	Mortality	First marriage	Household structure
1.	Catholic majority	Hungarian-Slovakian	Plough lands and lots of forest	high	high	early	transitional
2.	Catholic-Protestant	Hungarian-German-Slovakian	Mixed land cultivation and stock breeding	average	average	rarely early	transitional
3.	Slight protestant majority	Hungarian-German-Slovakian	Strong stock breeding	low	average	early for women	simple
4.	Catholic majority	Hungarian, German, few Slovakians	Plough lands, mixed farming	High	low	rarely early	transitional
5.	Strong Catholic majority	Hungarian	Plough lands, mixed farming	very high	very low	early for women	transitional
6.	Catholic majority	Hungarian-Slovakian, a few Germans	Pastures, meadows, mixed farming	Low	low	early	complex
7.	Catholic-protestant	Hungarian-Slovakian-German	Besides plough lands a high proportion of vineyards and forests	High	very high	average	simple

Early marriages were very common in the county in the late 18th century but with huge local differences, fertility was high excluding some cases among special geographic, social, cultural conditions. Among those conditions the villages of more complex household systems along the Danube formed a special sub-type of relatively low fertility (they were very close to the settlements of early birth control which was demonstrated by the method of family reconstitution by R. Andorka[9]).

[8] See: Őri 2005. 76.
[9] See: Andorka 1998.

Marriage and Household Formation

The variance of marriage and household formation was caused by 18th century migration flows mixing different populations of different culture (Germans, Slovaks, Serbs, Croats and Hungarians) and by the diverse geographic and economic conditions of the examined region. (About the subtypes of marriage and household formation generated by cluster-analysis see Table 7 – Őri 2005. 62.).

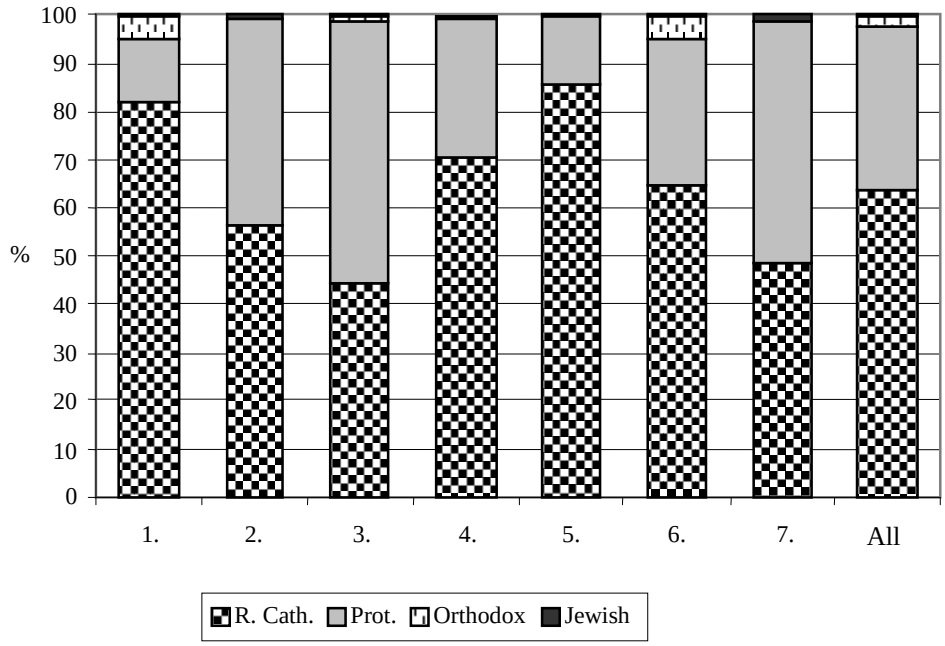
Table 7
Subtypes of Marriage and Household Formation in Pest-Pilis-Solt County in the Late 18th Century

Types of family system	Ratio of servants (%), 1774–83	Men's age at first marriage 1774–83	Women's age at first marriage, 1774–83	Average household size 1785	Married men/household 1785
I. 'Eastern': early marriage, few servants, highly complex households	4.5	20.6	19.6	5.5	1.199
II. 'Western': late marriages (for men), considerable presence of servants, predominance of nuclear family households	12.8	24.1	22.1	5.2	1.018
II/a 'Western' variant: Germans, Calvinists, urban populations with few servants	5.9	23.0	20.9	4.8	0.959
III. „Plain" version: significant presence of servants, early marriage, nuclear families	9.3	21.6	19.2	4.9	1.012
IV. „Transition type": somewhat later marrying age for men, transitional household structures, varying degrees of servant presence	5.6	23.1	19.6	5.4	1.103
County average (N=121)	8.1	22.4	20.3	5.2	1.055

Denominational Distribution in Settlement Clusters

Further examining the characteristics of the seven basic type of demographic behaviour, we can observe that denomination (mainly the proportion of Roman Catholics and Protestants) did not have a strong connection with demographic variables besides fertility. Roman Catholic population had higher fertility, but a lot of factors might have stood behind this fact: different social conditions, geographic situation and that the survival of Calvinist communities in the previous two centuries was not a matter of chance, but it was due to special local circumstances supporting low fertility.

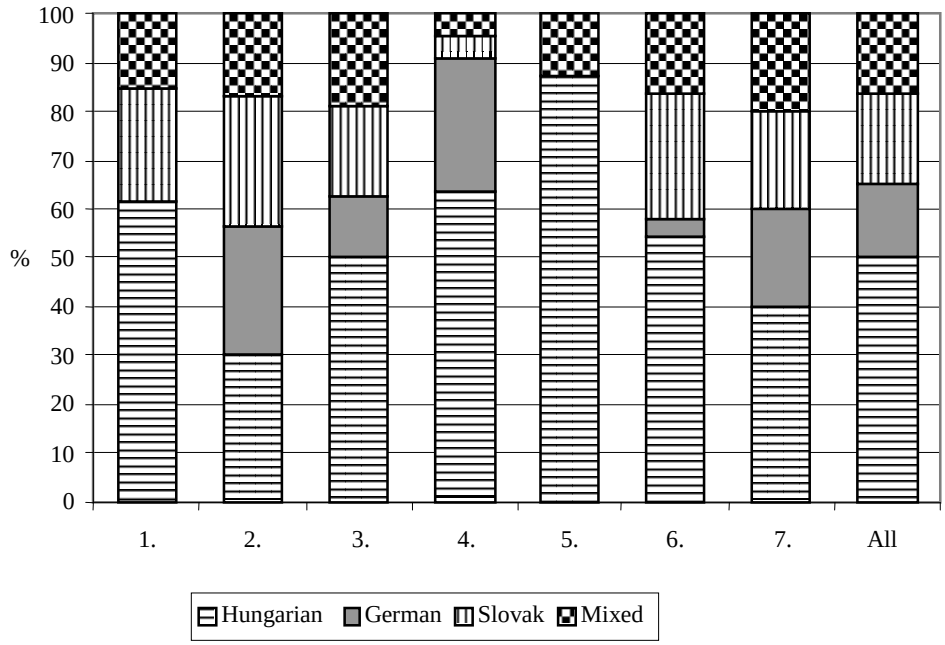
Figure 2
Population by Denomination in the Major Clusters of Demographic Behaviour, 1774–1783, %



Ethnic Characteristics of Settlement Clusters

Therefore, the traditional explanations of demographic differences based on denominational conditions seem to have no significance in this period. Basically the same can be observed relating to ethnic conditions.

Figure 3
Number of Settlement by Ethnicity in the Major Clusters of Demographic Behaviour, 1774–1783, %



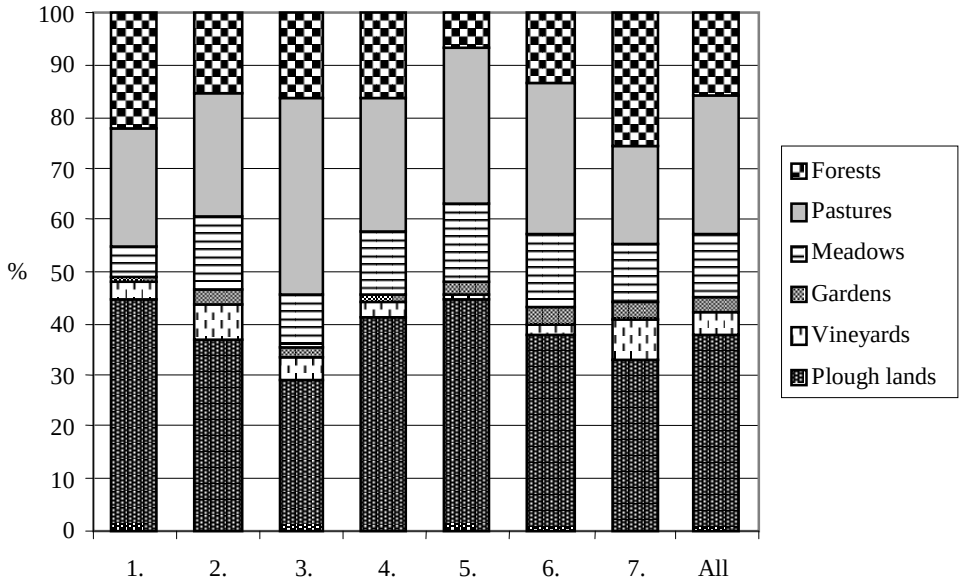
Note: The distribution of settlements in percentage based on the statistics of the spoken languages.

Germans cannot be found in the clusters of high fertility if it is accompanied by the custom of early marriage (clusters 1, 5), and few of them lived in those villages where the household structure was more complex than the average (cluster 6). But it would be difficult to draw any further conclusion concerning the connection of ethnicity and demographic behaviour.

Farming and Demographic Behaviour

Types of farming (the distribution of the fields by the branches of farming) seem to be a better explanation as our former studies point out. However, Figure IV doesn't show strong differences in this respect.

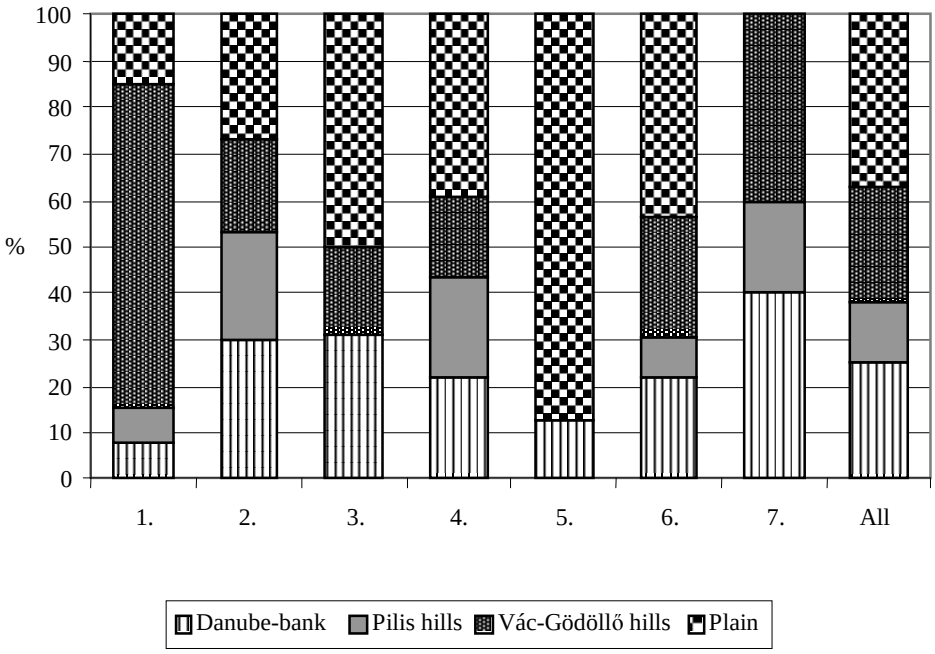
Figure 4
Basic Clusters of Demographic Behaviour by Types of Agricultural Land, 1789, %



Cluster 6., where relatively low fertility, a higher frequency of more complex households and early marriages coexisted, seems to be average in this respect. On the other hand in those clusters, where the balance of deaths and births was very unfavourable, probably as a consequence of high mortality, the proportion of forests was well above the average, that is to say in the northern, hilly part of the county (clusters 1, 7).

The result is clearer if we form four basic regions by geographic characteristics: the Plain, the banks of the Danube, and the two northern hilly regions.

Figure 5
Number of Settlement by Geographic Regions in the Major Clusters of Demographic Behaviour, 1774–1783, %



Cluster 5, with a high rate of natural population growth, was mainly situated on the Plain. On the other hand the circumstances of clusters 1 and 7 (settlements with natural decrease or very low rate of natural growth) were typical in the hilly regions or in the villages and small towns of the Danube-bank. At the same time the plain region was not homogeneous with respect to high fertility and high natural growth, as represented by cluster 3.

Summary of the Demographic Development in Pest-Pilis-Solt, 1774–1783

So we can come to the conclusion that explanations based on denomination and ethnicity are rather tenuous. Explanations based on differences in the geographic location and the mode of production are more promising, but variables based on the cadastral survey only provided a superficial image of the conditions of agricultural production, and failed to explain differences in demographic behaviour between the various clusters. It is natural that in a narrow geographic region we should find several basic demographic elements and the towns and villages of a region, even if similar in natural environment, were related to each other by the division of labour rather than being identical in production. Thus differences could occur in a smaller space in demographic behaviour, marriage habits, household size and complexity, and probably also in inheritance, servant employment and reproduction, with a wide range of strategies operating side by side which were at the same time similar to those observable in other, more remote villages. Differences also occurred even within one location, whether on an ethnic, a religious, a social or an occupational basis or as a combination of these: e.g. in the age at which men first married, in the practice of exogamy-endogamy of marriage, in household structure, in fertility, in the early appearance of conscious birth control or in mortality. The present analysis was unable to demonstrate such differences partly because individual towns and villages had to be treated as a unit and partly because our data did not

allow for such a subtle examination of demographic differences. It is particularly in the field of social differences that our data were painfully uninformative – thus we were forced to leave out of consideration perhaps the most vital explanatory dimension. The same applies to cultural differences, which are probably also very important in some respects (e.g. in terms of fertility).

At the same time our analysis could demonstrate that demographic behaviour was mosaic-like, its basic units consisting of two to three neighbouring villages. We only find two or three mosaic stones of the same colour side by side, others mingle with stones of different colour. This 'motley mosaic' character is perhaps the most powerful feature of the picture that has emerged in our analysis.[10] The only relatively clearly isolated and unified bigger region with a demographic character of its own was a cluster of largely Calvinist villages along the Danube. These were distinguished by lower fertility, a relatively low migration rate and a high prevalence of complex households. However, it is also clear that this picture is tied to the scene chosen for analysis, the sources used, the level and methods of analysis and it requires further examination to decide whether generalisations can be made. But by examining the micro-regions thus created, we might take a significant step ahead in gaining objective criteria for sample selection – a very important step for our further research.[11]

6 Demographic Development in Pest-Pilis-Solt-Kiskun County in the 19th and Early 20th Century

Sources

Analysing the demographic development of the late 19th and early 20th centuries, we have at our disposal the printed annual data of the population movement (births, deaths, marriages) for the period 1828–1900 by parishes and those of births and deaths for the period of 1900–1968 by settlements.[12] The two series of data can be hardly homogenised, thus we can use here only the summaries of the county and the capital[13] and those of the most important religious communities (Roman Catholics, Calvinists, Lutherans, Jews and Greek Orthodox). Besides these we can use the data of some vast territorial units the demographic characteristics of which seem to be different on the basis of our former studies.[14]

We could also use the printed and archival source materials of the population censuses carried out after 1869 by the Hungarian Central Statistical Office. Besides the demonstration of changes in time, we intended to seize the spatial differences in demographic behaviour as with regard to the 18th century. In this part of our work we used above all the published material of the population movement relating to the period 1901–

[10] This mosaic-like character of demographic behaviour was also shown by Pierre Chaunu examining the population history of Normandy (Chaunu 1972).

[11] About the conclusions also see Őri 2005. pages 67 and 68.

[12] Published by the Central Statistical Office (Klinger et al. 1972–84., Klinger 1969.).

[13] The town unified in 1873, which consists of three formerly independent parts: Buda and Pest privileged towns and Óbuda market town possessed by the Royal Chamber.

[14] Instead of the four large regions of figure V here we used a more detailed classification: the Danube bank, the two northern, hilly parts and the Great Plain (more or less equal to the regions used analysing the demographic conditions of the 18th century), and in addition the suburban zone around Budapest and Danube bend north of Budapest along the Danube (Figure A3).

1910, which contains a lot of important ratios (crude marriage, birth and death rates, infant mortality rates, that of population growth, illegitimate births etc. – Population movement 1901–1910).

In the examined period (the first decade of the 20th century) demographic changes already proceeded in Hungary. It was the age of 'demographic transition' when mortality significantly decreased – especially after 1880 and fertility also decreased further – after a long and gradually decline in the 19th century (Tekse 1969. 33. Dányi 1991a 13–16.).

The Theory of Demographic Transition

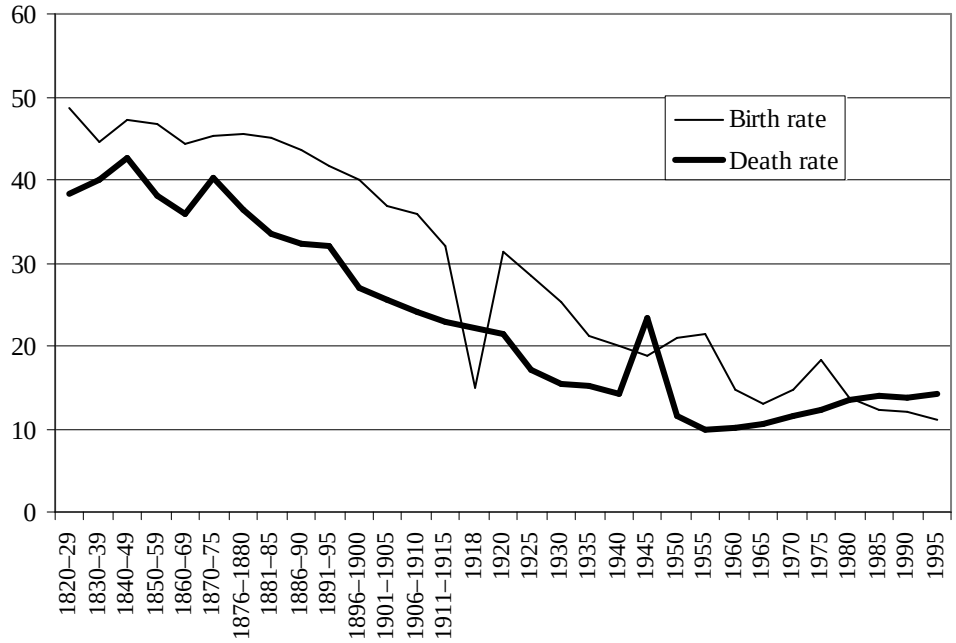
The theory of demographic transition, a model of transition from the traditional demographic regime to the modern one, has been strongly criticised recently. The criticism has not questioned the fact of demographic changes as important elements of modernisation. First of all the classical version of this theory has been criticised as a general model of change. Namely the possibility of clearly separating the pre- and post-transitional era from the period of transition can be doubted. In the same way, statements that the transition ought to have a well defined starting point and also a well defined end, and that this process would be a development from one type of balance to another one, are strongly disputable. One can doubt the deterministic and unilinear character of the classical transition theory and ask the question whether the demographic future of the countries being in a 'pre-transitional' phase can be foreseen on the basis of the experience gained from the past of the 'post-transitional' countries. Research on historical demography proved that both fertility and mortality strongly varied right before the transition, and thus due to local differences and fluctuation in time, it is very difficult to determine the beginning of the irreversible demographic change. It is also clear that the transition theory failed to predict the demographic future of the modern societies correctly since instead of a low-level stability of mortality and fertility we witness continuous change and instability – especially in fertility. At the same time continuous demographic change makes the creation of any general models very disputable but makes theories of newer 'demographic transitions' possible, which renew but to some extent also disqualify the classical theory. It is also very problematic to connect the start of the demographic transition to the decline of mortality, since in several countries (for example in France or Hungary) fertility dropped before any significant mortality decrease occurred. In these countries the population growth was also smaller than in the countries of "classical transition'. Mortality also began declining in several countries from the 18th century independently of changes in living standards or agricultural production and the mortality decline and the increasing standards of living were only closely connected from the second part of 19th century. The decline in fertility began among very different economic, social and cultural conditions, we cannot see a clear critical line of modernisation to which its significant change can be connected.[15]

[15] About the demographic transition see: Chesnais 1986. van de Walle 1998., Perrenoud 1998. Watkins 1986., Lesthaeghe 1980., Mason 1997., Bengtsson 1992, Tekse 1969, Dányi 1977, Valkovics 1982, Dányi 1991a, Szentgáli 1991, Hablicsek 1995, Melegh – Őri 2003.

Characteristics of Demographic Transition in Hungary

Hungarian research based on family reconstitutions on a village level (Andorka 1998) and being representative on a national level (Dányi 1991b) have also put the classical transition theory into critical perspective. Great variability and strong regional differences can be pointed out in the level of fertility from the end of the 18th century. In some villages within some areas – first of all in Southern and Western Hungary – birth control began as early as the late 18th, early 19th century, while in other areas fertility decrease did not start until the second half of the 19th century (Andorka 1998. 435–436.). In the 1820's birth control was probably no more than an isolated phenomenon, on the national level fertility was high, although it showed strong variations by region, type of settlement and religion (Hablicsek 1991. 77.). Fertility decline, while strong differences persisted, became noticeable from the 1850's onwards on the national level too (Dányi 1991b 127.). Thus we can suppose that fertility slowly decreased and fluctuated in the 19th century and birth control, which was a sporadic phenomenon at the beginning of the period, continuously spread throughout the country. Hungarian fertility was one of the lowest in Europe in 1880, which date is traditionally regarded as the starting point of the demographic transition of the country. This fertility decrease was accompanied by a high level of nuptiality (early marriage and low proportion of never married people). The decline of fertility observed before 1880 was not smaller than that of the period 1880–1910 (Tekse 1969. 44., Dányi 1991b 123.). Therefore 1880 as a starting point of demographic transition can be regarded rather as a date of technical characteristics fixed by the available sources than a real turning point in population development. Due to the relatively low fertility in 1880, the decline of fertility between 1880 and 1910 was smaller than in other European countries. But considering the period 1880–1960 we witness that fertility decreased by 70% which is the greatest decline in Europe (Dányi 1991a 12–16.). At the same time mortality was relatively high in the 19th century and it decreased very slowly. Periodically returning mortality crises hindered the population development until the 1870s. Mortality improved basically after 1873, the last great country-wide cholera epidemic. Mortality decrease did not precede and lead to the decrease of fertility, which was rooted in early 19th century and in rural conditions, and it was not connected to the decrease of infant mortality.

Figure 6
Crude Birth and Death Rates on the Present Territory of Hungary, 1820–1995



Note: Values relating to the period before 1876 are estimated.
Source: Hablicsek 1991. 73., Andorka 1998. 430., Dupâquier – Faron 1999. 640.

Figure VI demonstrate the characteristics of the Hungarian demographic transition on the basis of crude death and birth rates. After 1876 (from which date we have exact statistics of population movement) fertility decreased together with mortality, and though natural population growth was significant, the two curves do not diverge, one cannot observe an explosion-like population growth during the transition. Around 1960 the transition ended, but we witness the fluctuation of fertility and mortality, instead of a state of balance. Therefore Hungarian demographic changes in the 19–20th centuries can hardly be described by the terms of the classical demographic transition theory.

Decline of Fertility in Pest-Pilis-Solt-Kiskun County

Concerning the analysed county regarded as representative for the whole country, we can examine the problem of fertility decline on the basis of Princeton indices.[16]

[16] Indices of the Princeton research mean what proportion of the so called natural fertility general (I_f) or marital (I_g) fertility reach. Index of nuptiality (I_m) shows the proportion of married women of in age groups 15–49 compared to the total number of females of the same age.

Table 8
Princeton Indices of Fertility and Nuptiality, 1880–1910

	Hungary		
	I_f	I_g	I_m
1880	0.440	0.582	0.692
1890	0.443	0.581	0.713
1900	0.419	0.573	0.670
1910	0.384	0.541	0.665

Source: Andorka 1998. 437. (I_g) Dányi 1991c 190. (I_m) Kamarás 1991. 174. (I_f)

On national level we can see that fertility continuously declined between 1880 and 1910, while the level of nuptiality was relatively high and remained stable in this period. Hungary's fertility was the lowest in Europe (excluding France) in 1880. Fertility decrease got stronger after 1890, but it is clear that it was not merely caused by a diminishing level of nuptiality. At the same time the minimum values of the county-level marital fertility (I_g)[17] remind us that birth control was a real practice in some parts of the country well before 1880 (Andorka 1998. 437.).

Table 9
Princeton Indices of Fertility and Nuptiality, 1869–1910

	Pest-Pilis-Solt-Kiskun County			Budapest			Kecskemét		
	I_f	I_g	I_m	I_f	I_g	I_m	I_f	I_g	I_m
1869	0.591			0.369*			0.473		
1880	0.561	0.830	0.625	0.328	0.521	0.460	0.480	0.951	0.466
1890	0.549	0.676	0.750	0.331	0.522	0.464	0.510	0.726	0.649
1900	0.501	0.667	0.695	0.260	0.428	0.444	0.442	0.689	0.593
1910	0.461	0.606	0.705	0.202	0.346	0.426	0.434	0.674	0.595

Note: *Without Óbuda.

The values of marital fertility (I_g) are estimated . We know only the birth numbers, the number of legitimate births has been calculated on the basis of the proportion of illegitimacy observed in the period 1901–1910. The birth numbers used are the averages of a nine-year period (e.g. the value of 1869 is the average of the period 1865–1873).

Source: Klinger 1969, Klinger 1972–84., Censuses 1869, 1880, 1890, 1900a, 1910, Population movement 1901–10.

General fertility on a county level decreased gradually decade by decade, the change between 1869 and 1910 was significant. In the case of Kecskemét (important market town and agrarian centre on the Plain, its data are in a separate line in census volumes) the value of the index increased till 1890, which date seems to be the turning point. The same is true for Budapest, where the decisive period was also the 1890s. As for marital fertility in the county and in Kecskemét there was a significant decrease after 1880, which was followed by a more modest one, while in Budapest the turning point might have been in the 1890s in this respect too. The indices of nuptiality are more or less stable, fertility decrease was not connected to changes in marriage customs. Marital fertility was relatively high compared to the level of the country. The case of Kecskemét shows

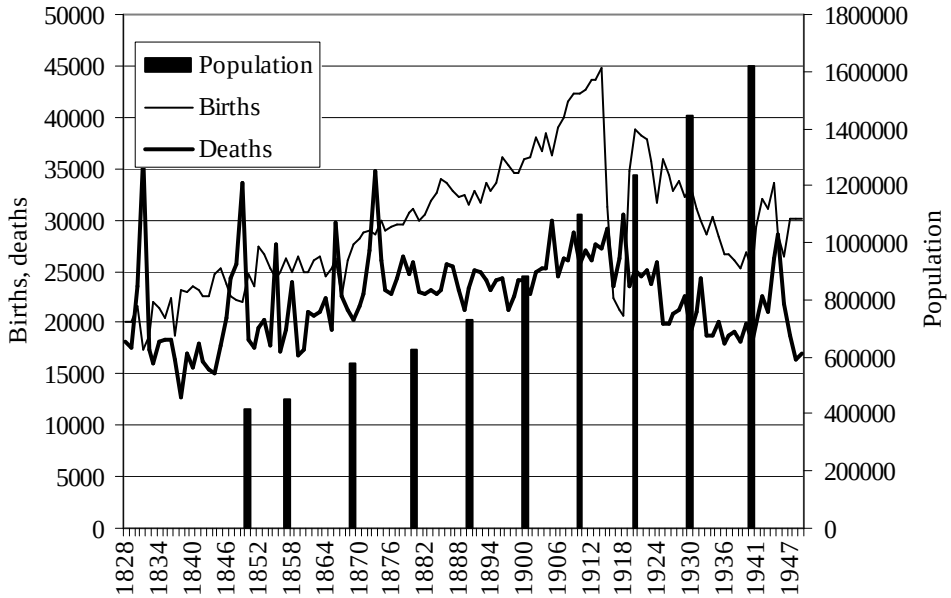
[17] 1880: 0,466; 1890: 0,419; 1900: 0,384; 1910: 0,357 (Andorka 1998. 437.).

that high marital fertility was typical on the Great Plain, where in the market towns the level of nuptiality was lower than in other parts of the county. The three territorial units seem to be examples of three different strategies: high nuptiality and lower marital fertility (in the county excluding Budapest and Kecskemét), lower nuptiality but very high marital fertility (for example in the market towns of the Great Plain), and low nuptiality and low marital fertility in Budapest which was the engine of the modernisation process in the region.

Population Development of Pest-Pilis-Solt-Kiskun County, 1828–1949

Princeton indices give a more or less exact picture of fertility decline but we cannot trace them back further than 1880. However, we saw that the origin of the phenomenon had been much older, thus we have to look for other possibilities to examine the problem. We have the birth and death numbers per settlements in the county at our disposal from 1828 onwards. These numbers give information about natural population growth, the dates and frequency of mortality crises, and, after 1869, together with population numbers, show the changes both in fertility and mortality. We also used crude birth and death rates calculated for the dates of the population censuses.[18] These figures and indices of fertility and mortality are crude since we cannot explore the changes and differences of the age structure and marital status of the examined populations. However, we cannot use more subtle means on this level of the analysis, and we suppose that the important changes and turning points can be found in this way too.

Figure 7
Number of Births and Deaths and Population Size, Pest-Pilis-Solt-Kiskun County[19], 1828–1949



[18] Source: Klinger 1969, 1972–84. Population census 1910, Kovacsics 2000, Dányi 1993. Calculating the birth and death rates we used a nine year average of the annual birth and death numbers.

[19] Territory of the county from 1876 onwards, without Buda, Pest and Óbuda.

Table 10
Crude Birth and Death Rates (‰), Pest-Pilis-Solt-Kiskun County

	1850	1857	1869	1880	1890	1900	1910	1920	1930
Crude birth rate	58.3	56.2	46.7	48.6	44.5	41.1	38.6	25.3	22.0
Crude death rate	52.7	44.6	42.2	38.1	32.7	27.1	24.2	20.5	14.3

As for the county the number of birth continuously increased till the First World War, which increased almost corresponded with that of the size of the population. Thus we can speak about decreasing fertility only to some extent on a county level before the war. The real turning point could be around the First World War, but the long-term decrease of fertility seems to have been significant during the previous sixty years. At the same time the number of deaths didn't follow the population growth after the last great cholera epidemic (1872–73) when the traditional mortality regime seems to have finally changed. It is also important that before there had been a significant natural growth on a regional level – excluding the mortality peaks caused by cholera epidemics. Thus – on a county or regional level – we can observe an alternative model of demographic transition with slowly decreasing fertility from the middle of the 19th century, which was followed by decreasing mortality in the 1870s. This scenario led to a significant population growth before the First World War.

Population Development of the Different Denominational Groups

The series of population movement can be examined by religious denomination also in order to see whether religious or mental and cultural differences had any role in changing demographic conditions. We can follow the curves till 1894 when the state registration of birth and death was set up.

Figure 8
Number of Births and Deaths and Population Size, Pest-Pilis-Solt-Kiskun County, Roman Catholics, 1828–1894

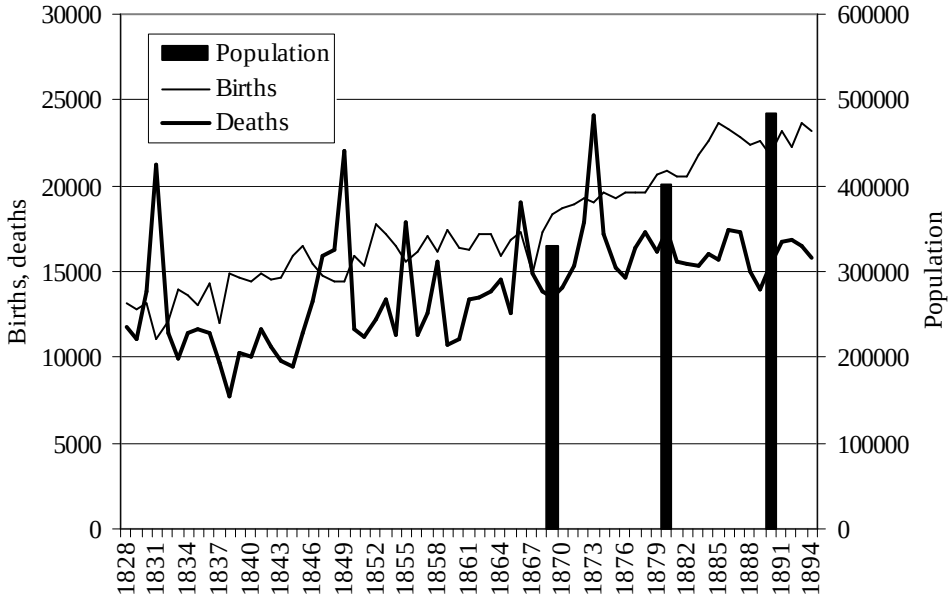


Table 11
Crude Birth and Death Rates (‰), Pest-Pilis-Solt-Kiskun County, Roman Catholics

	1869	1880	1890
Crude birth rate	54.4	51.3	47.1
Crude death rate	48.9	39.8	33.3

Among Roman Catholics fertility did not change significantly until the late 1880s, after that it seems to have decreased, but we need a much longer time- series to formulate firm statements. Mortality changed in the 1870s before the decrease of fertility, but the time between the two turning points was very short.

Figure 9
Number of Births and Deaths and Population Size, Pest-Pilis-Solt-Kiskun County, Calvinists, 1828–1894

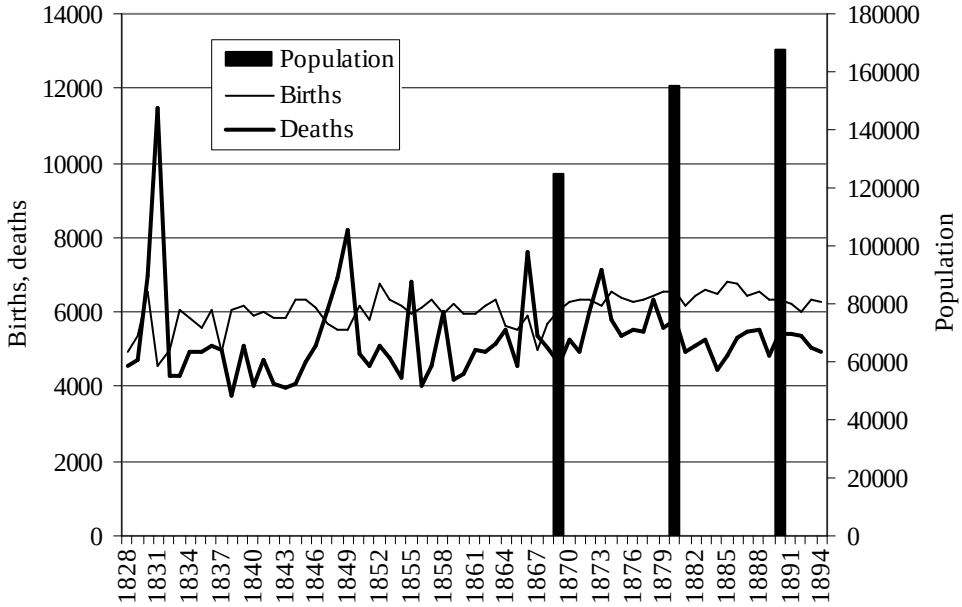


Table 12
Crude Birth and Death Rates (‰), Pest-Pilis-Solt-Kiskun County, Calvinists

	1869	1880	1890
Crude birth rate	47.4	41.4	37.9
Crude death rate	45.1	34.6	31.3

Though we do not know the exact number of the Calvinist population between 1828 and 1869, we may suppose a continuous growth of their population size. Therefore, the stagnating numbers of birth from 1869 onwards certainly mean a decrease of fertility, and a widespread practice of birth control which probably started well before that date. Apart from mortality peaks the mortality must have been low, it probably increased a bit only in the 1870s.

Figure 10
Number of Births and Deaths and Population Size, Pest-Pilis-Solt-Kiskun County, Lutherans, 1828–1894

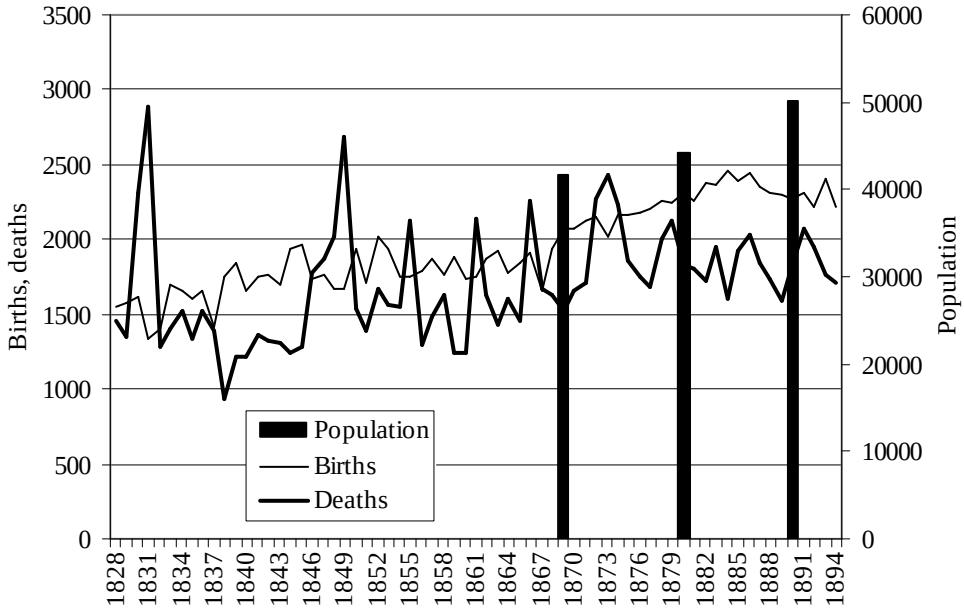


Table 13
Crude Birth and Death Rates (‰), Pest-Pilis-Solt-Kiskun County, Lutherans

	1869	1880	1890
Crude birth rate	47.2	52.0	46.1
Crude death rate	44.2	41.4.	36.6

The Lutheran population shows a rather similar picture as the Roman Catholic one except for a smaller population growth, and a little lower natural growth. The turning point of mortality was in the 1870s, that of fertility in the 1880s.

Figure 11
Number of Births and Deaths and Population Size, Pest-Pilis-Solt-Kiskun County, Jews, 1828–1894

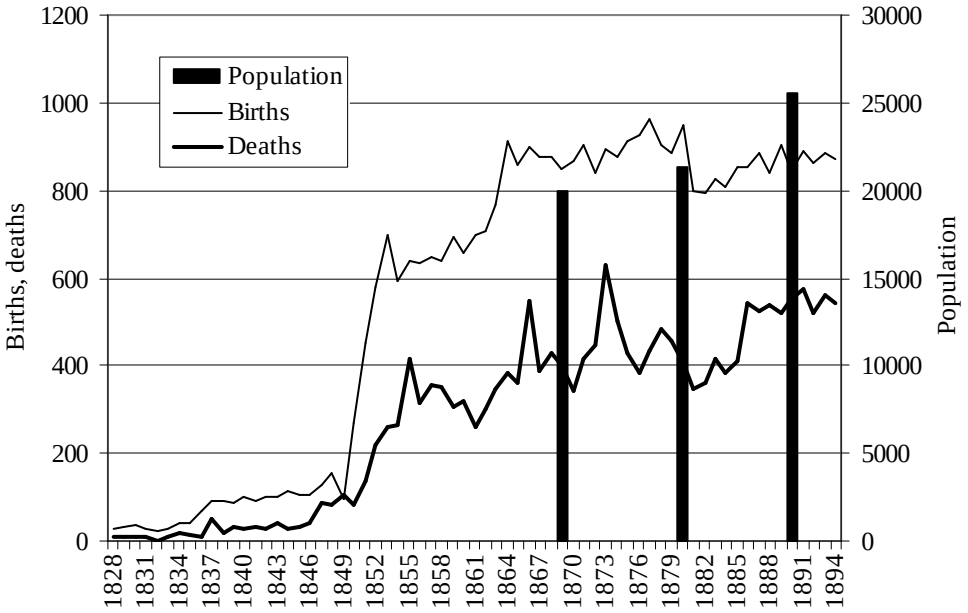


Table 14
Crude Birth and Death Rates (‰), Pest-Pilis-Solt-Kiskun County, Jews

	1869	1880	1890
Crude birth rate	43.7	40.9	34.0
Crude death rate	22.0	19.1	21.2

The birth and death numbers of the Jewish population are much more uncertain, their independent registration started only in the 1840s, as the dramatic increase of numbers show it. We see the same mortality peaks as in the case of other religious groups, but the huge natural growth can be the result of imprecise registration besides low mortality. Fertility change could start around 1880.

Figure 12
Number of Births and Deaths and Population Size, Pest-Pilis-Solt-Kiskun County, Orthodox Serbs, 1828–1894

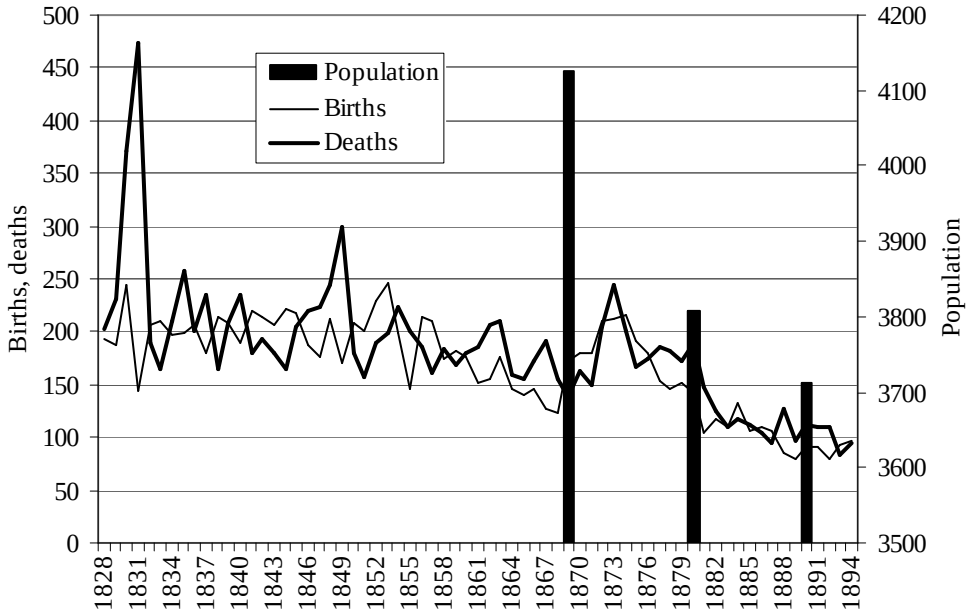


Table 15
Crude Birth and Death Rates (‰), Pest-Pilis-Solt-Kiskun County, Orthodox Serbs

	1869	1880	1890
Crude birth rate	40.1	36.1	24.8
Crude death rate	42.3	40.9	27.9

The Orthodox Serbs show the picture of a population gradually dying out because of natural decrease and assimilation. Fertility and mortality must have been stable in the course of the century, which meant a natural population decrease, as we can see in the case of Szentendre (where the majority of the Orthodox Serbs lived) in the second half of the 18th century. Thus most of them lived in an urban community where early birth control obviously started in the 18th century (Őri 2003. 215.).

Demographic Development in the Sub-regions of Pest-Pilis-Solt-Kiskun County

The other aspect we can examine here is that of regional differences, which seemed to be an important aspect of the demographic development in the 18th century.

Figure 13
Number of Births and Deaths and Population Size, Buda, Pest and Óbuda (Budapest after 1873), 1828–1949

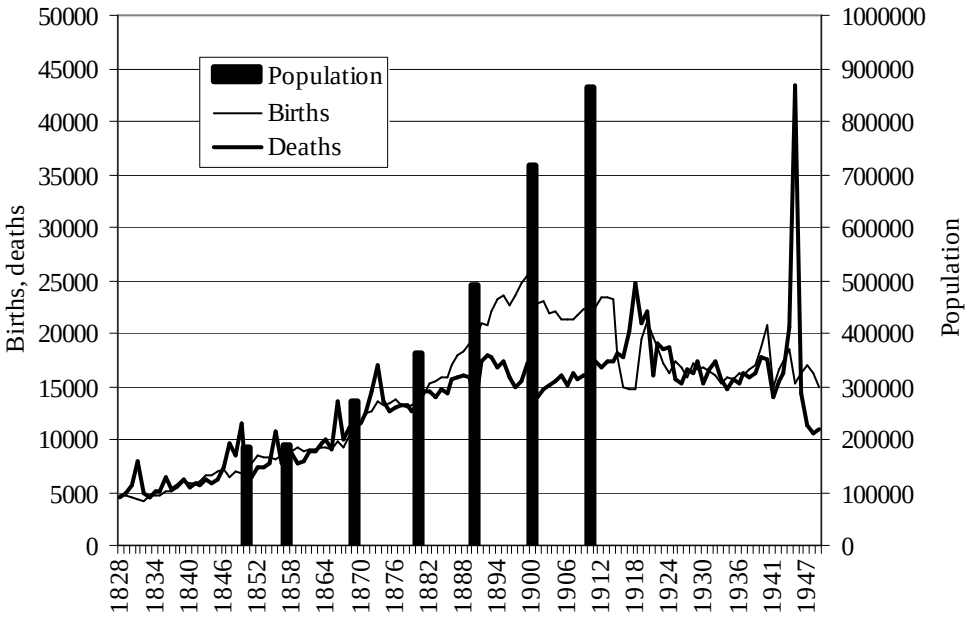


Table 16
Crude Birth and Death Rates (‰), Buda, Pest and Óbuda (Budapest after 1873)

	1850	1857	1869	1880	1890	1900	1910
Crude birth rate	40.2	46.3	40.9	39.3	40.3	32.8	25.9
Crude death rate	43.2	44.3	45.4	37.9	33.1	21.5	19.0

Examining the capital we find a somewhat different picture. First of all the traditional period of the town's population history lasted until about 1880, before this date we witness no natural population growth, death numbers equalled birth numbers even in the periods between two mortality peaks. Fertility started to decrease from the 1890s onwards, but the real decline could only start around 1900, thus the period of the great natural population growth was probably shorter than in the case of the county. But we can observe a classical type of demographic transition in this case too, where mortality decline plays the leading role. At the same time we have to take into consideration that the significant population growth was caused by in-migration,[20] and fertility (which began declining from 1890) was originally much lower than anywhere else in the county.[21] Besides the county's Calvinist and Orthodox population we may regard the population of Budapest as the forerunner of low fertility and birth control.

[20] The population growth of Budapest was the most rapid in Europe in second half of the 19th century except for Berlin.

[21] The difference shown by the crude birth rates and the indices of general fertility (I_f) can be partly due to the different age structure or marital status of the capital's population.

Figure 14
Number of Births and Deaths and Population Size, Suburban Zone[22], 1828–1949

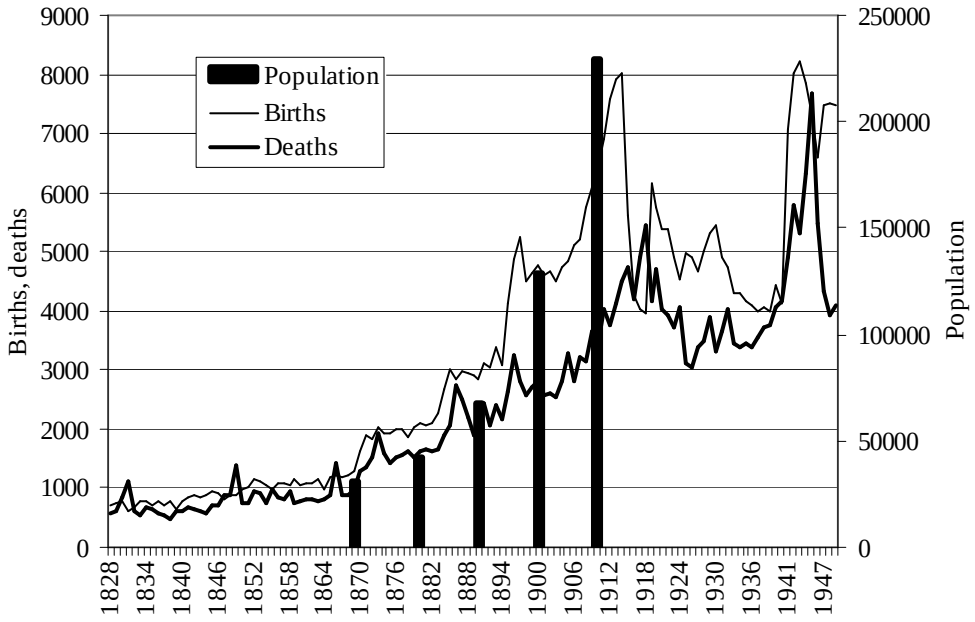


Table 17
Crude Birth and Death Rates (‰), Suburban Zone

	1869	1880	1890	1900	1910
Crude birth rate	47.7	50.2	44.2	36.7	28.6
Crude death rate	39.3	38.7	33.7	21.3	15.9

The population size in the suburban zone around Budapest increased significantly till 1900. It was caused mainly by in-migration, while natural growth began increasing only from 1890. Mortality declined very slowly before this date. The crude birth rate began gradually decreasing from the 1880s, and it reached a relatively low level at the beginning of the 20th century. The two rates, and in all probability fertility and mortality too, began diminishing more or less at the same time, though not in the same degree.

[22] Settlements unified with Budapest in 1950.

Figure 15
Number of Births and Deaths and Population Size, Danube Bend, 1828–1949

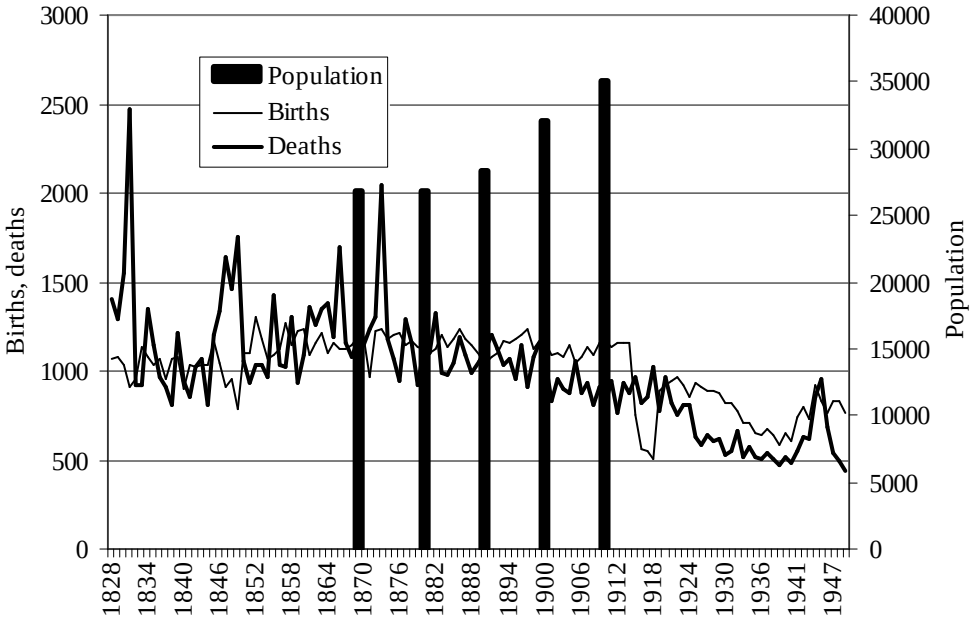


Table 18
Crude Birth and Death Rates (‰), Danube Bend

	1869	1880	1890	1900	1910
Crude birth rate	43.0	43.0	40.0	35.8	32.4
Crude death rate	49.9	40.7	38.7	31.0	24.9

North of Budapest, along the Danube, mortality was very unfavourable before 1900, although the great mortality peaks disappeared after 1873, the natural growth remained minimal before the war. Fertility certainly began decreasing from 1880, but some settlements of the region could be characterised by low fertility from the end of the 18th century. We can place among them Szentendre with its Greek Orthodox population or Visegrád and Vác market towns. First of all low fertility and high mortality in these towns led to the low natural growth of the region. Here we can look for the examples of early birth control, first of all analysing the demographic conditions in the market towns. The population development of these settlements can be regarded as an alternative model of 'classical' demographic transition.

Figure 16
Number of Births and Deaths and Population Size, Pilis Hills, 1828–1949

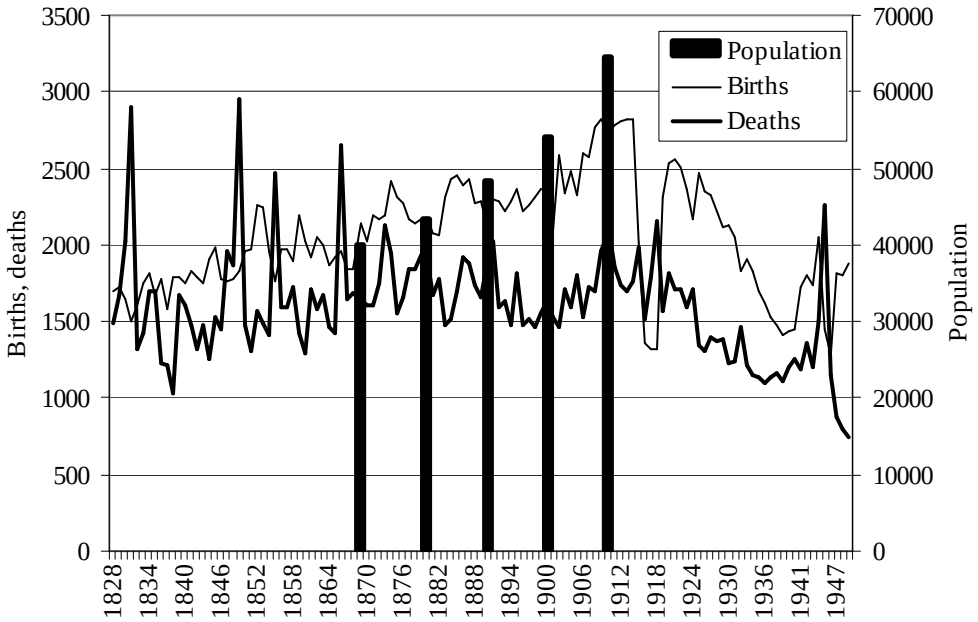


Table 19
Crude Birth and Death Rates (‰), Pilis Hills

	1869	1880	1890	1900	1910
Crude birth rate	50.7	50.8	47.3	43.1	42.6
Crude death rate	44.7	40.1	36.3	28.6	27.6

In the northern and western hilly background of Budapest and the Danube bend fertility was extremely varied and it did not change significantly before World War I. The relatively high crude birth rates indicate a fertility level well above the county average during this period. The decline of mortality led to a higher natural population growth after 1873. The period of rapid population growth was relatively long, almost 40 years. In this region, we witness a demographic change similar to the classical transition model.

Figure 17
Number of Births and Deaths and Population Size, Vác-Gödöllő Hills, 1828–1949

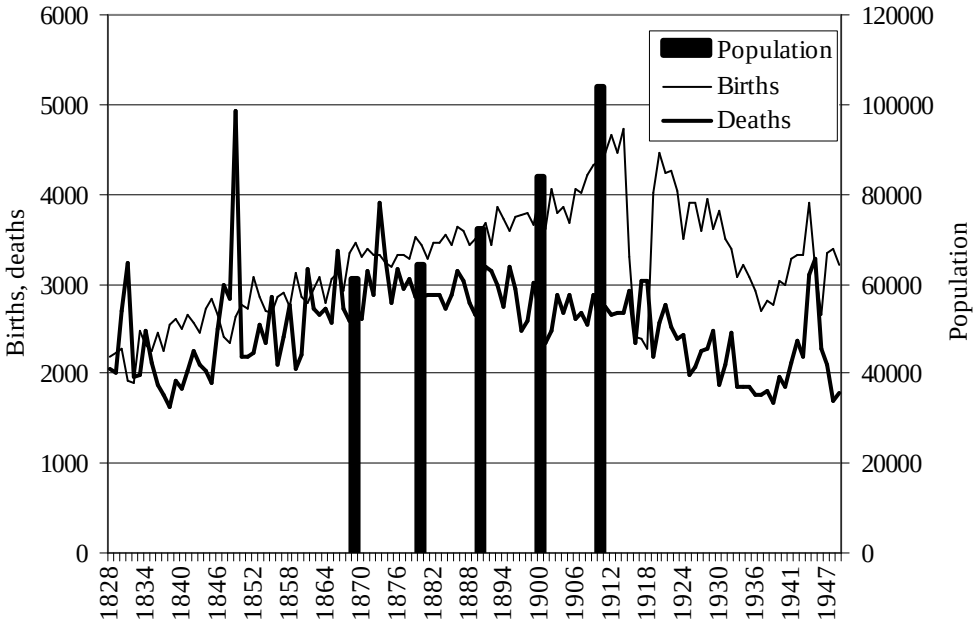


Table 20
Crude Birth and Death Rates (‰), Vác-Gödöllő Hills

	1869	1880	1890	1900	1910
Crude birth rate.	53.1	52.8	49.7	45.3	42.0
Crude death rate.	48.2	45.2	40.9	31.8	25.6

The same is true for the northern hilly part of the county with the difference that mortality, unfavourable earlier, declined perhaps more rapidly and uniformly after 1873.

Figure 18
Number of Births and Deaths and Population Size, Danube-bank, 1828–1949

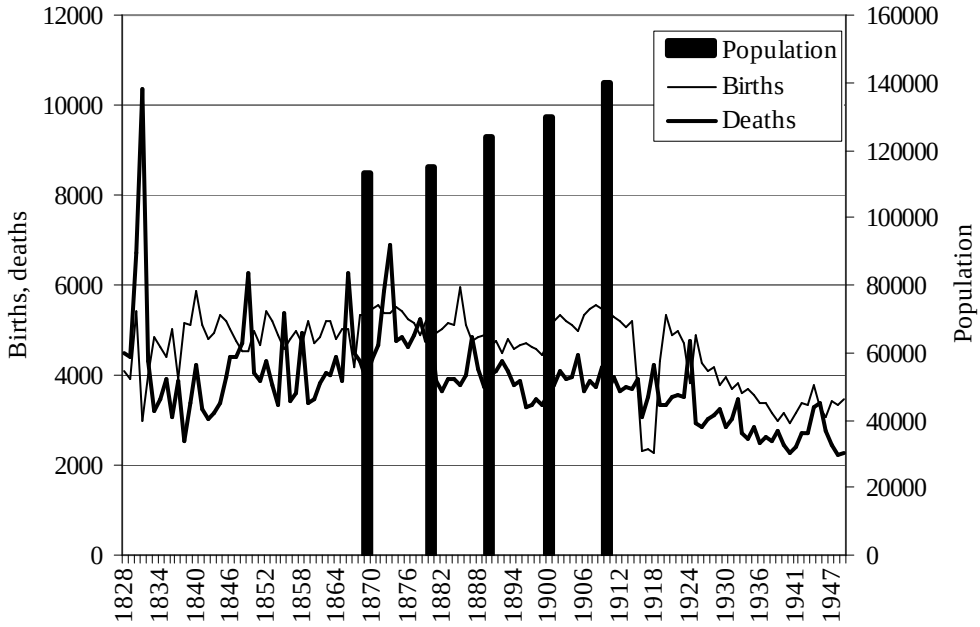


Table 21
Crude Birth and Death Rates (‰), Danube-bank

	1869	1880	1890	1900	1910
Crude birth rate	45.8	44.6	38.4	37.6	38.1
Crude death rate	43.7	38.4	33.2	28.1	27.1

The Danube-bank south of Budapest was of low fertility at the end of the 18th century, with early birth control probably beginning to spread in one part of the settlements from that time onwards (Őri 2005. 50., Figure A4). Since fertility probably diminished further in the 19th century and declined together with mortality from the 1870s, this area must have been one of the early birth control areas in the county (and in the country too), besides Budapest or the small towns of the Danube bend. It can be stated that the demographic conditions of this area led to first of all the low fertility and the early fertility decline of the county's Calvinist population too. At the same time, it is worth mentioning that, while the death rate continuously went down, the decrease of the crude birth rate stopped at the beginning of the 20th century. The decrease of the birth rate continued only after some delay, before World War I. This decrease was gradual and relatively small during the examined period, which fact shows that fertility decrease must have been a long, gradual process which did not go without fluctuations and stops.

Figure 19
Number of Births and Deaths and Population Size, Great Plain, 1828–1949

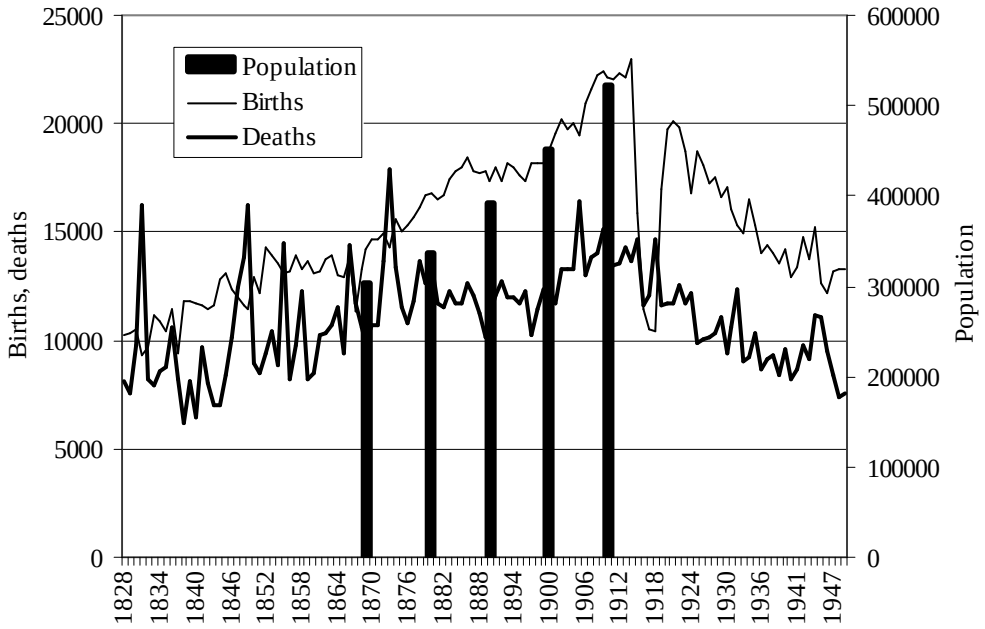


Table 22
Crude Birth and Death Rates (‰), Great Plain

	1869	1880	1890	1900	1910
Crude birth rate	45.4	49.2	45.5	41.9	42.3
Crude death rate	39.8	36.2	30.1	27.1	26.4

Our analysis relating to the late 18th century shows that the settlements of the Great Plain were of high fertility. Excluding the times of mortality crises the natural growth was high which further increased after 1873 until the World War. Fertility did not diminish significantly before the war. At the same time the crude birth rate refers to a fertility level not too high compared with the county average. The speciality of the birth rate is rather in its stability. Beside this the high level of natural population growth is also remarkable. The demographic development of the Great Plain is very similar to that of the classical transition model where the decrease of mortality is the starting point of the irreversible demographic change. Concerning the decrease of fertility the years of the World War I meant the decisive period, but the not too high values of the birth rate show that fertility decrease might have started earlier in the case of some settlements.

Summary of the Demographic Development in Pest-Pilis-Solt-Kiskun, 1828–1910

Summarising what we have learnt from our examinations relating to denominational and regional differences of the population movement, we may say that the turning point of mortality is obviously 1873, after that the disappearance of great epidemic crises basically changed the old mortality regime, independently from its former level. The level of fertility must have been very different, as it has been shown it was relatively high in the northern part of the county and perhaps in the bigger part of the Plain and

low in Budapest, on the Danube-bank and in the Danube bend. On the other hand the nuptiality indices of Kecskemét (great agrarian centre on the Plain) show that besides high marital fertility the relatively low nuptiality could influence the level of general fertility. All our former experience call the attention to the fact that market towns generally had different demographic characteristics (for instance the high proportion of unmarried population, and that of the non-family households etc.).[23] Denominational differences also seem to be important besides regional ones. The Roman Catholics were generally of much higher fertility than the Protestants, while the Calvinist and Orthodox communities show low fertility even in the 18th century. There was a turning point in the development of fertility in every region and denominational group, it was generally around 1880–1890, but in some regions (The Plain, the northern hilly parts) it began later, around World War I, while in other ones or in the case of some religious groups it started much earlier than 1880 (the Danube-bank, the Danube bend, the Calvinists, the Orthodox). There is a possibility of a double fertility decline in these latter cases, or more exactly there was a turning point in fertility changes at the end of the 19th century, a first or in some cases a newer wave of decrease maybe caused by the mortality decline and modernisation. But that turning point was preceeded by a gradual, much older decrease of fertility which spread along the Danube in the course of the 19th century and got mixed with the later wave totally transforming the demographic feature of the county by the time of World War I.[24] It is not yet clear whether the first wave of fertility decrease was caused by changes in culture and religious mentality or it was produced by shifts in economic and regional characteristics.

7 Different Patterns of Demographic Behaviour between 1901 and 1910

Clusters of Settlements as Different Patterns of Demographic Behaviour

We could draw a general picture of demographic development between 1870 and World War I and demonstrate some regional and denominational differences, but the causes of those differences remained obscure in the course of the analysis. To better understand the background of our results, we try to analyse several demographic settlement- level variables in order to separate different sorts of demographic behaviour. Since the data of population movement relating to the period 1901–1910 were published by the Statistical Office together with a lot of important demographic ratios (Population movement 1901–1910) in 1913, we are going to analyse this set of data with the help of hierarchical cluster-analysis. Having separated different types of demographic conditions (clusters of settlements), we tried to explain the differences using data of ethnic, denominational and occupational distribution.

[23] About this see Faragó 2000, Benda 2002, Melegh 2000, Őri 2005a 60–61. 2005b.

[24] The multiplication of the settlements of low (lower than the average minus standard deviation) birth rate (1774–83: number of the births per 1000 married women, 1901–10: crude birth rate) along the Danube in the 19th century refers to the spread of fertility decrease between the two examined period. See Figure A4 and Figure A5.

The result of the analysis was 10 groups of settlements. Table 23 demonstrates the characteristics of the variables used in the analysis which were completed by the rates of natural and total population growth.

Table 23
Characteristics of the Most Important Demographic Variables

	Pest-Pilis-Solt-Kiskun County, 1901–1910					Pest-Pilis-Solt, 1774–1783 *	Hungary, 1821–1830 **
	Mean	Standard deviation	N	High'	Low'		
Crude marriage rate (‰)	9.0	1.4	218	>10.4	<7.6	11.3	
Crude birth rate (‰)	40.7	7.0	218	>47.7	<33.7	56.8	48.6
Crude death rate (‰)	26.7	5.0	218	>31.7	<21.7	45.8	38.4
Natural growth (‰)	14.0	5.8	218	>19.8	<8.3	11.0	10.2
Population growth (‰)	16.8	17.7	218	>34.5	<-0.9	16.0	
Rate of migration (‰)	2.7	16.9	218	>19.6	<-14.2		
Infant mortality (%)	22.3	4.7	218	>27	<17.6		24.1
Rate of illegitimacy (%)	7.5	4.0	218	>11.5	<3.5	0.6	

Source: * Őri 2003. ** Hablicsek 1991. 73.
Note: 'High' values > mean + standard deviation; 'Low' values < mean – standard deviation
Annual mean values

Comparing our data of 20th century to those of 18th and 19th centuries, it is clear that certain demographic changes started well before the beginning of the 20th century, while others just began at the turn of the century – at least on county level. The frequency of marriages had got lower, and we can also observe a significant decrease in birth rates, though they were still rather high. There was a very strong decrease in death rates. Population growth in 1901–1910 was similar to that of 1774–1783, while natural growth must have had a more significant role at the beginning of the 20th century than in the 18th century. Infant mortality remained rather high, while the rate of illegitimacy increased to a very large extent. At the same time we have to recognise that changes were slow and gradual, and reached only one part of the settlements. It is clear that there were a lot of settlements at the beginning of the 20th century, where fertility and mortality decrease had not started yet. In those settlements the fertility and mortality were not lower than in the first half of the 19th century. Therefore, we can conclude that the demographic transition already started in the neighbourhood of the capital at the beginning of the 20th century, but it did not reach all communities of the county, and its timing and form also seems to have been different on the level of settlements.

Cluster analysis demonstrates our points.

Table 24

Result of the Cluster-analysis: the Most Important Demographic Variables by Clusters, Pest-Pilis-Solt-Kiskun County, 1901–1910

	N	Crude marriage rate (‰)	Crude birth rate (‰)	Crude death rate (‰)	Natural growth (‰)	Population growth (‰)	Migration rate (‰)	Infant mortality (%)	Rate of illegitimacy (%)
1	56	10.46	44.25	27.81	16.45	10.03	-6.41	21.59	6.21
2	25	9.63	47.59	35.28	12.31	17.16	4.86	30.42	4.92
3	24	8.01	41.74	23.04	18.68	11.01	-7.68	18.76	5.44
4	28	8.19	39.30	22.65	16.63	36.95	20.33	20.07	9.50
5	29	8.15	44.59	29.06	15.86	18.01	2.15	25.10	7.24
6	40	8.98	30.60	24.60	6.25	4.37	-1.87	19.94	7.93
7	4	8.38	47.28	30.70	16.58	11.88	-4.69	28.46	15.03
8	4	8.60	32.18	21.48	10.70	25.75	15.05	18.27	19.81
9	6	7.00	32.35	17.92	14.43	76.87	62.44	20.09	12.73
10	Budapest	9.20	27.20	19.10	8.10	36.08	27.98	15.08	26.76

Note: Annual mean values.

Focusing on the process of demographic transition we can observe that the 25 settlements of Cluster 2 represent a "traditional" demographic pattern with high fertility and mortality. Even Clusters 7 and 5 are not far from that model though mortality was a bit lower in them. Clusters 1, 3, 4 represent the transitional type where fertility was still high, while the mortality decline had already started and reached different levels. Clusters 6 8 9 and Budapest can be the examples for the next phase of transition where mortality was even lower and fertility also began decreasing. The low fertility between 1901 and 1910 does not refer to the beginning of the fertility decrease but Cluster 6 and 8 contain eight settlements where the birth rate was also very low (mean minus standard deviation) in the period 1774–1783 (Őri 2003. 205. Figure A4, A5). We regard these settlements (Szentendre market town, north of Budapest with a significant Orthodox Serbian population; Csővár Lutheran Slovak village in the northern part of the county and Bogyiszló, Dunavecse, Érsekcsanád, Ordas, Sükösd, Szeremle – all on the bank of the Danube in the southern part of the county) as the forerunners of fertility decrease or birth control. They were the centres of the spread of fertility decrease, most of Cluster 6 consist of settlements situated along the line of the Danube south of Budapest. In this region – among special geographic, and economic circumstances – fertility started decreasing, independently of any modernisation process. This way of behaviour gradually spread along the Danube in the 19th century. The market towns of the Plain (Cegléd, Kiskunhalas, Nagykőrös – in Cluster 6) might have also been the centres of the changes – but certainly later than the end of the 18th century. Another region completed the demographic transition in the second half of the 19th century: Budapest together with the suburban zone (Cluster 9). Thus we came to the conclusion that the fertility decline probably had three versions in the county: an early one along the Danube with some other settlements from the northern part of the country, a second version caused by the agrarian development of the Plain in the 19th century and the third led by a classical-type modernisation in the case of Budapest and the agglomeration. The first version gives an example for an alternative

model of demographic transition, in this case the fertility decline certainly came before mortality declined.

At the same time we can observe that changing demographic behaviour (decreasing fertility and mortality) led to a lower natural population increase (Clusters (6, 8, 9, 10) but it did not induce automatically low population growth. Budapest and Clusters 8 and 9 had a very high rate of population growth because of strong in-migration, while Cluster 6 produced relatively very low growth rate partly because of emigration. Thus a very important factor of population growth was migration (correlation between the two variables is 0,945, significant at p=0,01 level). Besides this, some old-type correlations existed at the beginning of the century: the strong connection between infant mortality and crude death rates, between birth and death rates and death and marriage rates, between birth rates and infant mortality rates, between illegitimacy and migration or population growth. At the same time a new type of correlation also emerged: the natural population growth was determined rather by fertility level than by mortality, while for an earlier period one could find the opposite. Thus this aspect also proves the transitional status of the examined region at the beginning of the 20th century (Table 25).

Table 25

Significant Correlation Coefficients between Basic Demographic Variables, Pest-Pilis-Solt-Kiskun County, 1901–1910

	Crude marriage rate	Crude birth rate	Crude death rate	Natural growth	Population growth	Rate of migration	Infant mortality
Crude marriage rate							
Crude birth rate	*0.140						
Crude death rate	***0.367*	***0.528*					
Natural growth		****0.694**	*-0.165				
Population growth	**-0.344		**-0.270	***0.308*			
Rate of migration	**-0.327	*-0.166	**-0.227		***0.945*		
Infant mortality		***0.452*	***0.763*				
Rate of illegitimacy	**-0.226	**-0.260	**-0.272		***0.287*	***0.337*	*-0.141

Notes: Pearson correlation coefficients, cursive: traditional correlation, bold: new correlation
* significant at p=0,05 level
** significant at p= 0,01 level

The result of the cluster-analysis (see Table 24) can be more easily summed up with the help of our following table (26).

Table 26
Summary of the Results of the Cluster-analysis, Pest-Pilis-Solt-Kiskun County, 1901–1910

	Demographic conditions	Fertility	Mortality	Population growth	Strength of norms (illegitimacy)[25]
2	Pre-modern	high	high	average	strong
7	Pre-modern with slowly decreasing mortality	high	high	small	weak
5	Pre-modern with slowly decreasing mortality	high	high	small	average
1	Transitional	high	decreasing	small	strong
3	Transitional	decreasing	low	small	strong
4	Transitional	decreasing	low	strong	average
6	Strongly changing	low	low	small	average
8	Strongly changing	low	low	strong	very weak
9	Strongly changing	low	low	very strong	weak
10	Strongly changing	low	low	very strong	very weak

We can see the gradual change in demographic behaviour. Cluster 6 was the starting point of that change, representing a non-modernisation-led version of the process. It started in a rural environment, among poor natural circumstances, which fact produced emigration and low population growth around the turn of the century. On the other hand, Budapest and other settlements with rapidly changing demographic conditions were the destination of migration and showed strong population growth in that period. Very strong in-migration and rapid population growth in the last three clusters (together with the high rate of illegitimate births, proving the decreasing strength of norms) are connected to a modernisation process in the case of these settlements.[26]

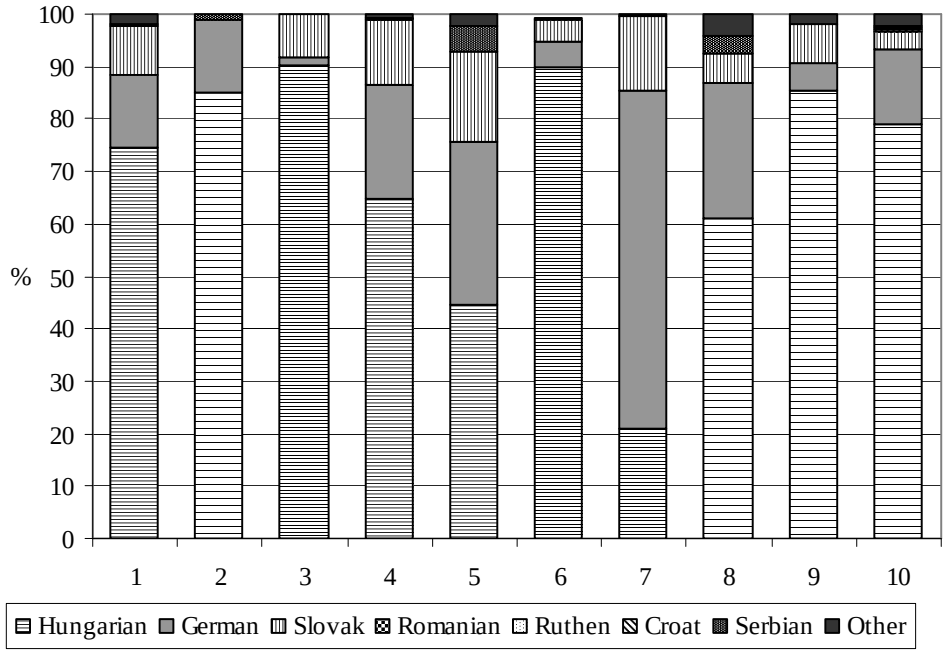
Ethnic Characteristics of the Clusters

We may contextualise the result of the cluster-analysis to a certain extent, for we have got the data of the 1900 and 1910 censuses. First of all we can examine the ethnic (on the basis of the mother tongue), denominational and occupational structure of the clusters on the basis of the elaborated data from the census of 1900, and look at the regional distribution of the clusters too.

[25] The rate of illegitimacy shows the strength of normes only to some extent, because in the case of Budapest and other towns the majority of illegitime infants were born by domestic servants. Therefore the high rate of births out-of-wedlock refers less to the spread of modern sexual behaviour than to the particular social conditions and hierarchy of the given settlements.

[26] Figure A6 demonstrates the state of demographic change ('demographic transition'), at the beginning of the 20th century. Here, besides the clusters of premodern and transitional demographic conditions, we separated cluster 6 (the possibility of early fertility decrease in a rural environment) and clusters 8, 9, 10 (classical transition). Three settlements (Szentendre, Bogyiszló, Gyömrő) belong to the latter group on the basis of the cluster analysis, though they can be examples only for early birth control, and not for early modernisation in the 19th century.

Figure 20
Population by Mother Tongue in the Clusters of Demographic Behaviour, Pest-Pilis-Solt-Kiskun, 1900, %

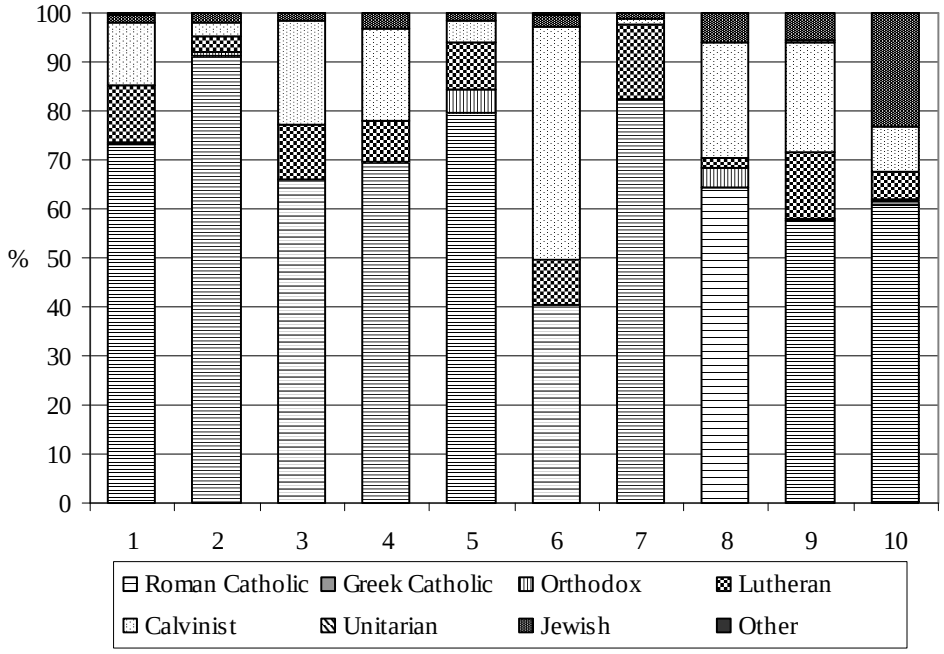


The distribution by mother tongue does not seem to be in correlation with changing demographic conditions. 'Pre-modern' clusters (2, 5, 7) are mixed in this respect, besides the Hungarian villages of Cluster 2 we can find here the German settlements in the north-western, hilly background of the capital or the Slovak villages in the northern part of the county. In the settlements of changing demographic behaviour there was a Hungarian majority, but in our opinion this fact did not influence demographic changes, it could rather be the consequence of demographic changes (e.g. strong population growth, in-migration) themselves.

Denominational Structure of the Population in the Clusters

As for denominational conditions we can find a stronger correlation, e.g. in the traditional, pre-modern clusters (2, 5, 7) the proportion of Roman Catholics were the highest, on the other hand many more protestants – especially Calvinists lived in the changing clusters. The very high proportion of Jews in Budapest, in the most rapidly changing settlement, is particularly remarkable (Figure 21). But denominational differences might conceal social differences, and for instance two different phenomena (the demographic changes and the strong presence of Jewish population) could be the result of the same modernisation process. Thus we cannot reach firm conclusions, and we need more research on the social-professional differences to understand the different relations better.

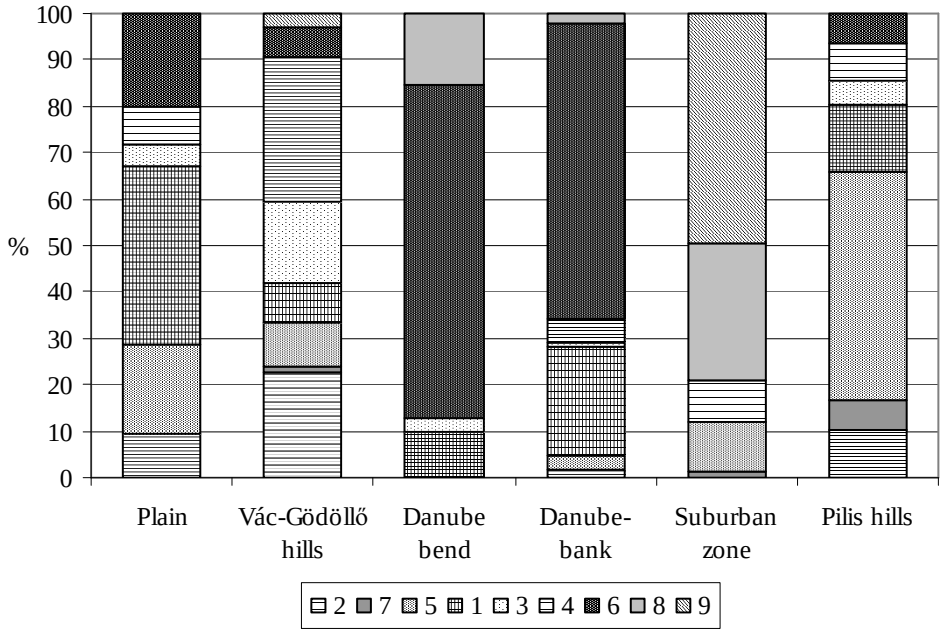
Figure 21
Population by Denomination in the Clusters of Demographic Behaviour, Pest-Pilis-Solt-Kiskun, 1900, %



Sub-regions by Types of Demographic Behaviour

Figure 22 demonstrates the distribution of the average population in 1901–1910 of different regions by clusters.

Figure 22
Population by the Clusters of Demographic Behaviour in Different Regions, Pest-Pilis-Solt-Kiskun, 1901–1910, %

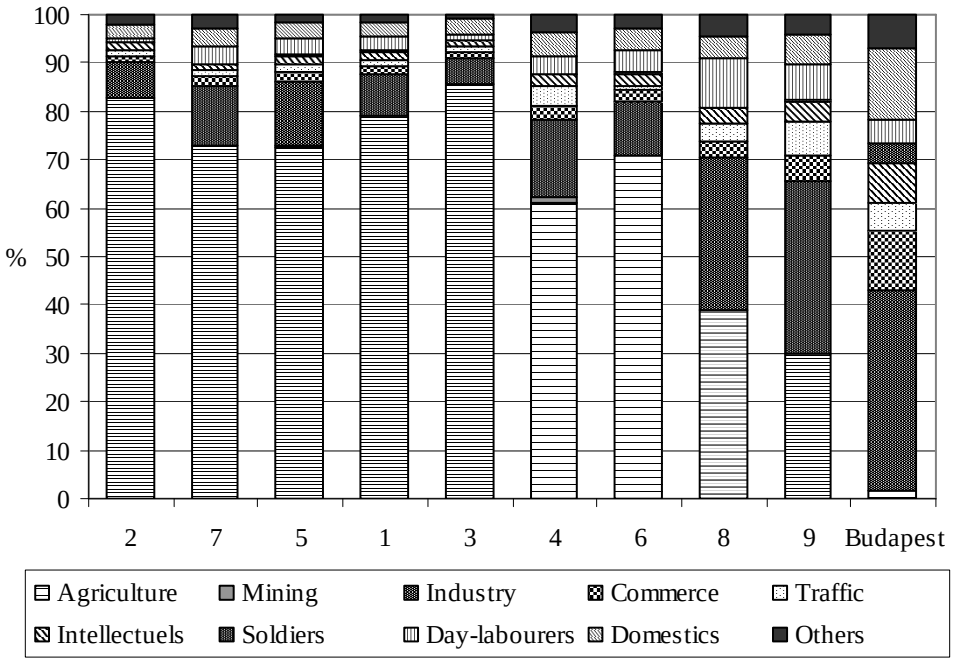


It is clear that the most archaic region in terms of demographic conditions was the hilly region around Buda (Pilis hills). The Plain was the most complex in this respect, 20% of the population lived in settlements of strongly changing demographic conditions, while about 30% in traditional, 50% in changing settlements. Vác-Gödöllő hilly region was more traditional to some extent, while the Danube bend, the Danube-bank and the suburban zone were the centres of demographic changes. Therefore, the regional factor proved to be much stronger than denomination and ethnicity as in the case of our analysis relating to 18th century demographic conditions. But it is not yet clear what this 'regional factor' implies, we cannot decide whether it means cultural differences or the differences of farming, professional structure etc.

Occupational Distribution of the Clusters

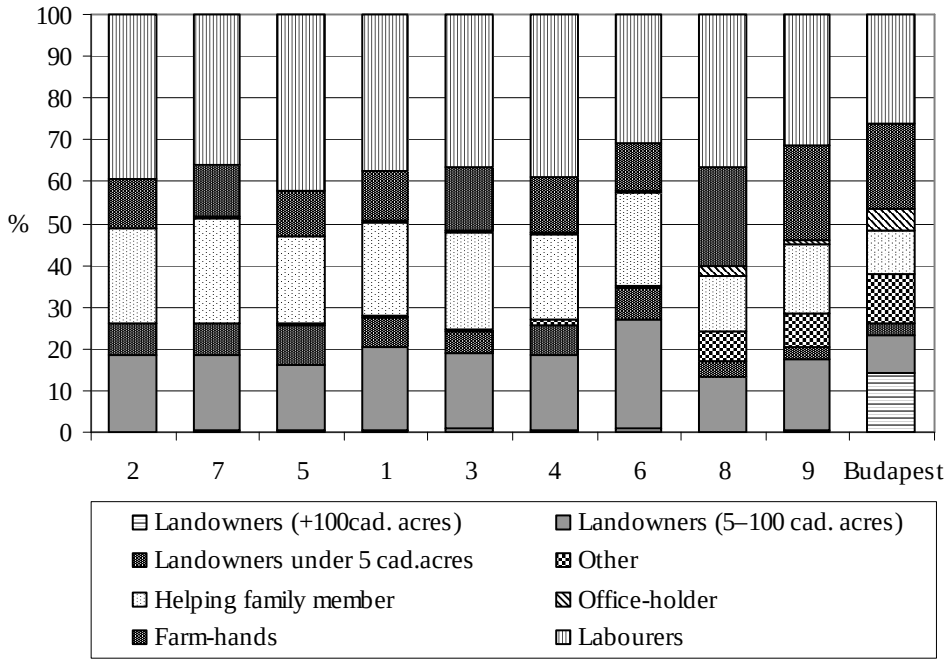
In this decision the examination of the clusters by occupational distribution can help us.

Figure 23
Population by Occupation in the Clusters of Demographic Behaviour, Pest-Pilis-Solt-Kiskun, 1900, %
(Distribution of the Bread-winners by Main Occupational Groups)



It is clear that demographic changes can be explained by occupational transformation only in the case of Budapest and the suburban zone (Clusters 8, 9). Therefore, we can conclude that demographic transformation was related to modernisation only around the capital, while in other regions it began mainly among rural circumstances. As a next step it is worth examining the structure of agricultural bread-winners by clusters in order to understand the demographic differences better among clusters of mainly agricultural characteristics.

Figure 24
Social Composition of the Agricultural Bread-winners in the Clusters of Demographic Behaviour, Pest-Pilis-Solt-Kiskun, 1900, %



We have to focus on clusters 1–7 where the proportion of agricultural bread-winners is really significant. The proportion of farm-hands and helping family members is more or less stable, we can see important differences in the proportion of landowners and labourers without land. Between the traditional group (clusters 2, 7, 5) and the category of changing pattern (clusters 1, 3, 4) there are no important differences, cluster 6 however slightly differs from them in this respect. We can conclude that we cannot explain demographic changes by the help of our occupational data excluding those settlements where demographic changes had already well proceeded among rural circumstances by the turn of the century. In those settlements – mainly along the Danube, north and south of the capital – fertility decline started at the beginning of the 19th century. There the proportion of Calvinist population was high and that of smallholders (between 100 and 5 cadastral acre) was higher than in other settlements. It means that Rudolf Andorka's hypothesis (1998. 438.) seems to be strengthened, according to which low fertility and the beginning of birth control can be associated with villages which were confined to a limited space and for which the opportunity to increase further was not to be found. Among mainly Calvinist smallholders living in these conditions we can find the first steps towards conscious birth control. But similar behaviour could occur among similar circumstances – independently of ethnic or denominational conditions (e.g. among Roman Catholic Germans or Orthodox Romanians in Southern Hungary and Transylvania – Andorka

1998.).[27] This custom probably spread in the 19th century, and got a newer rise between 1880 and the World War. Due to this strengthening custom the differences in religion or region and to some extent in profession seem to be important when we try to analyse the demographic conditions at the turn of the century, since the denominational and regional relations, traditions, and the similar socio-occupational status must have had a decisive role in spreading the new forms of behaviour. By this time the early demographic changes and their 'second wave' had got mixed, thus we can find similar processes among different circumstances. But behind the similarity there are important differences. In other words behind the similar demographic developments there can be different causes. But if we wish to understand the real demographic differences, the causes and origins of changes, we have to examine the local circumstances of farming, social relations, the operation of households, the system of inheritance, the role of migration. In this respect micro-analyses could be fruitful after having chosen some settlements as a suitable sample. Our examination could seize some demographic differences in the late 18th and early 20th centuries and demonstrate some demographic features of those periods, and draw some contours of demographic development between these two totally different ages. But real comprehension of these findings has to be based on further research.

8 Conclusions

First of all the main result of the analysis is the elaboration of a suitable method for analysing the rough data of about two hundred settlements and several hundred thousand people. The cluster-analysis proved to be suitable to separate different kinds of demographic behaviour. Using this method we could grasp some important demographic features of the late 18th century and the early 20th century analysing two huge data sets (Conscriptio Animarum and the population census of Joseph II. from the 18th century, and census materials from the period 1901–1910). At the same time elaborated data series of population movement enabled us to understand the demographic development better in the 19th century. The locality of the analysis can be regarded to some extent as representative for the whole country. Seizing demographic differences by the help of cluster-analysis means an important step towards sample selection for the purpose of further micro-analysis. Instead of selection made by chance, our sample selection can be based on macro-level analyses, avoiding any a priori classification or assumption.

At present we can use only one part of the available data, those of 18th century censuses and those of the population movement of the period 1901–1910. These data are completed by those of census 1900. Further research will make the material of other censuses available, and will make further more subtle analysis possible.

Both cluster-analysis (and the other, relating to 18th century marriage customs and household structure – Table 7) resulted in a very varied picture,

[27] After Andorka's research some South-Hungarian region (e.g. Ormánság) has become known as an important example of early birth control in early modern Europe (see for example: Van de Walle 1998. 147.).

a mosaic-like one, where two or three villages formed a demographic unit. But this fact does not result in too many basic types of demographic conditions, the mosaics can be unified in larger clusters, where generally 8–10 such groups present similar demographic differences in the county.

The demographic differences can hardly be explained by denominational or ethnic backgrounds. This statement seems to be valid for the 18th century and even for the beginning of the 20th century. Farming or social distribution seems to be more suitable factors for explaining demographic differences, but our 18th century data are rather poor in this respect. The occupational distribution calculated on the basis of the 1900 census data has a stronger explanatory force, but we need further, more detailed analysis to reach firm conclusion.

Demographic changes started in the county among Calvinists living along the Danube, while Roman Catholics and Lutherans living in the northern, hilly part of the county seem to have been more traditional in this respect. But we have to emphasize that regional characteristics seem to be more important factors than religion, denominational structure within a region could be the result of those special local circumstances, which led to early birth control too.

As analysis relating to late 18th century could seize demographic variety, the examination of 19th century data series and that of 20th century variables can show the process of demographic change. The two results can be connected to some extent, villages of low fertility at the end of the 18th century form a group where fertility decline and mortality changes had proceeded by the beginning of the 20th century.

The demographic transition had more waves, versions and forms in the 19–20th centuries. It had an early version, rooted in a rural environment, it was connected to farming conditions and an inheritance system, the possibilities of migration etc. This behaviour spread along the river Danube in the 19th century. Beside this there was another version which was connected to modernisation in the 19th century: this can be seen in the case of Budapest and its agglomeration around 1900. A third version might be the development of the large agrarian towns of the Plain, but we have little information about it on the basis of the recent analysis.[28]

These results show that one part of the settlements examined does not fit into the classical model of demographic transition, on the other hand it seems to be probable that behind a demographic phenomena (e.g. fertility decline) different reasons can be found.

At the same time we saw that in the county a typical 'eastern' population, the Orthodox Serbs were – together with others – the forerunners of fertility decline from the end of the 18th century onwards. So it is also clear that any simplifying division of the given population (for instance into 'western' and 'eastern' sub-groups) cannot be a solid basis for explaining the modern demographic changes.

[28] About this see Melegh 2000.

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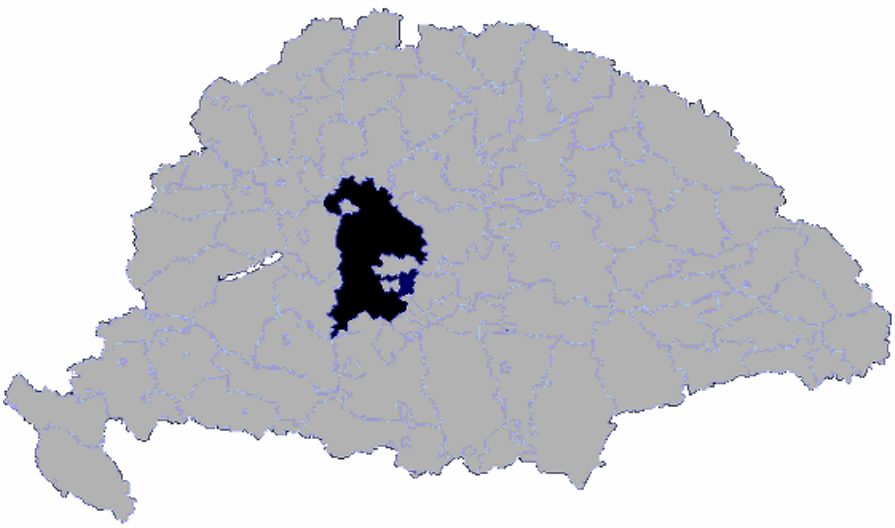
Appendix

Figure A1

Pest-Pilis-Solt County, 1711–1876, within the Actual Territory of Hungary



Note: light spots within the county: Buda and Pest, privileged towns (the northern one) and one part of the Jászkun district (the southern one). After 1876 these components were unified.

Figure A2

Pest-Pilis-Solt-Kiskun County, 1876–1950, within the Actual and the Present Boarders of Hungary

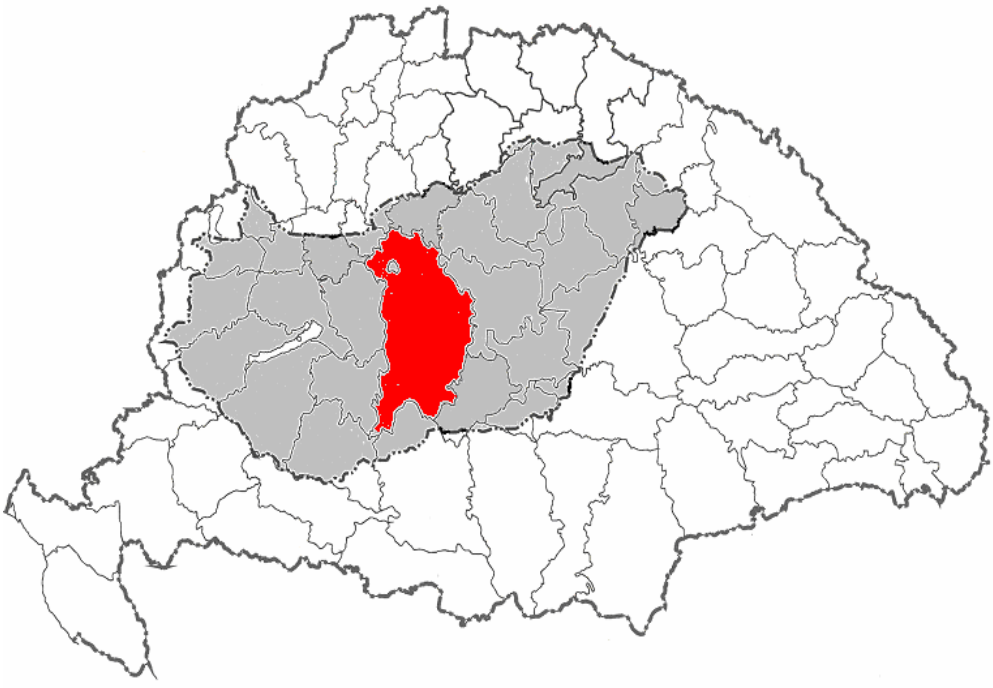
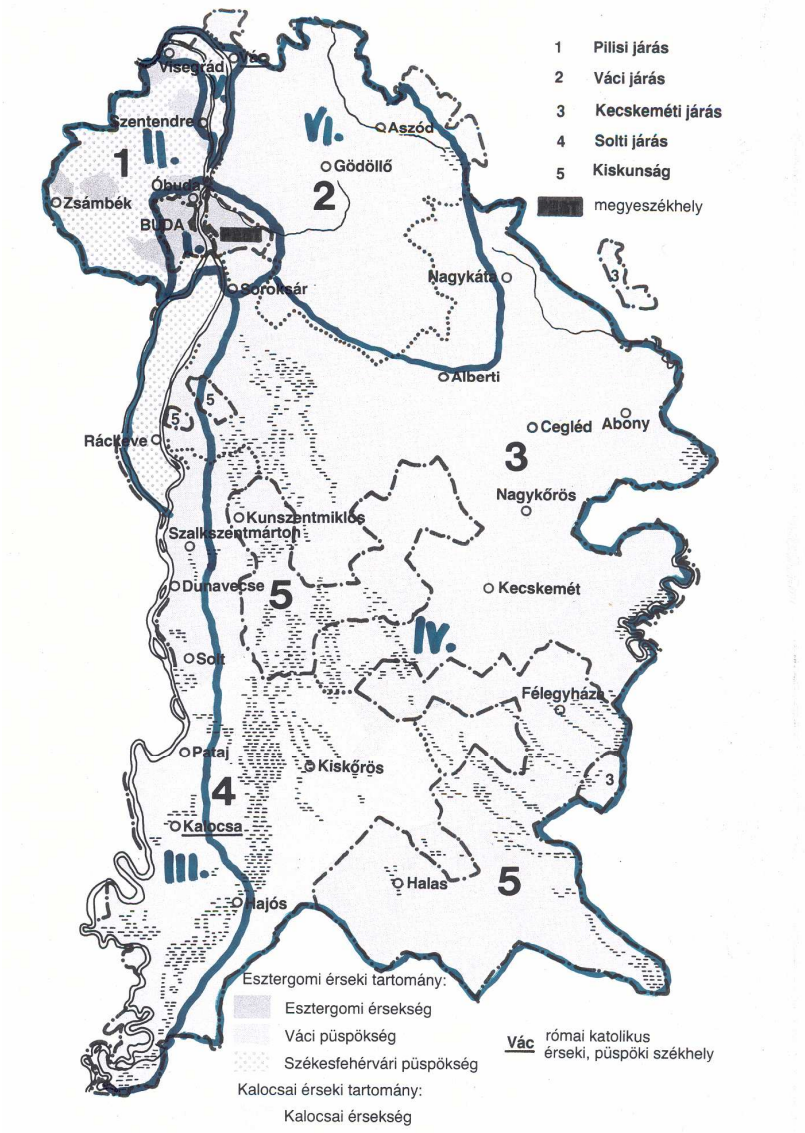


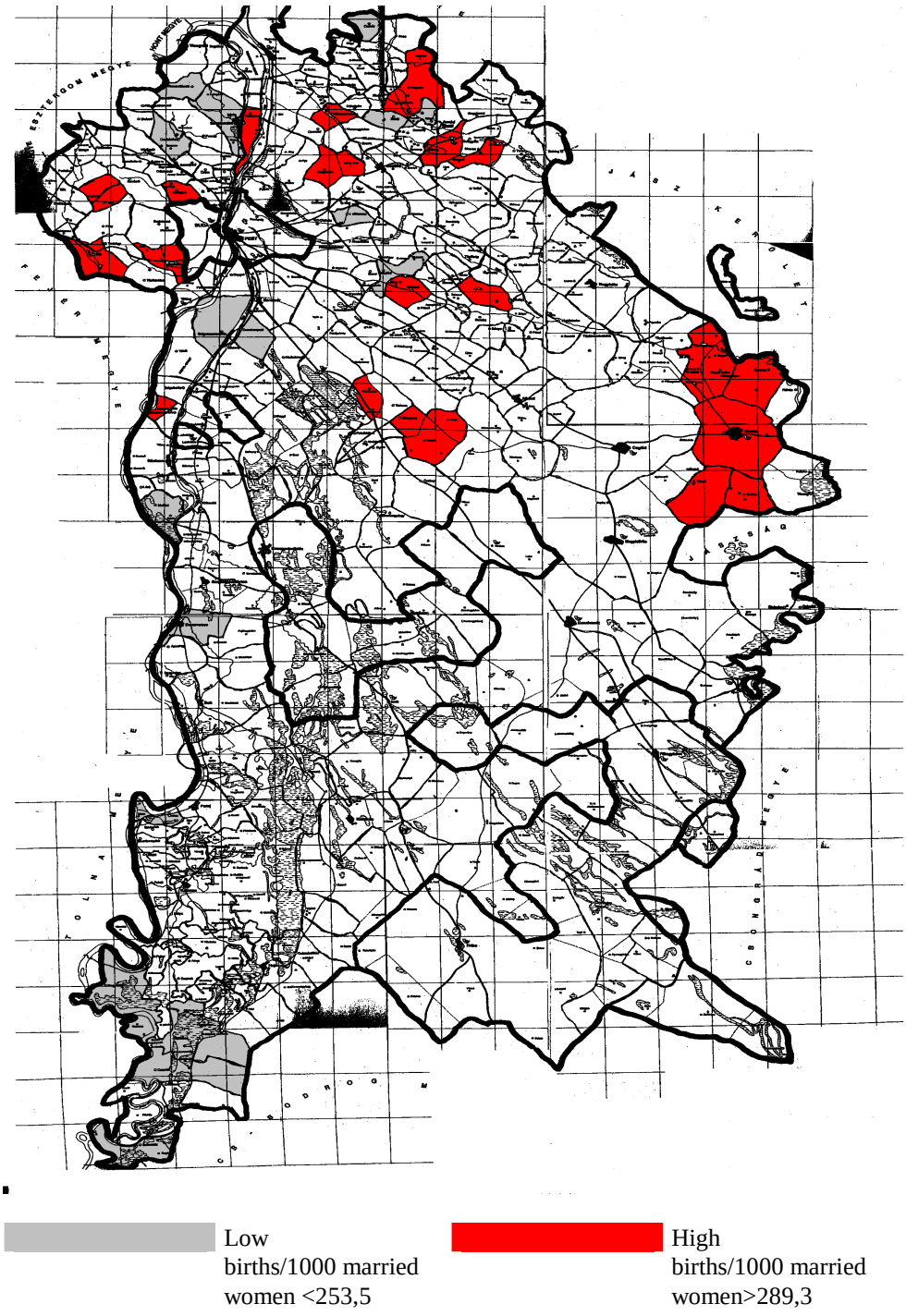
Figure A3
The Territorial Units Used in the Analysis, Pest-Pilis-Solt-Kiskun County, 1901–1910



I. Budapest and the suburban zone | II. Buda-Pilis hills | III. Danube-bank | IV. Great Plain | V. Danube-bend | VI. Vác-Gödöllő hills

Figure A4

The Low and High Values of Birth Rates, Pest-Pilis-Solt County, 1774–1783



Source: Őri 2003. 205.

Figure A5

The Low and High Values of Crude Birth Rates, Pest-Pilis-Solt-Kiskun County, 1901–1910

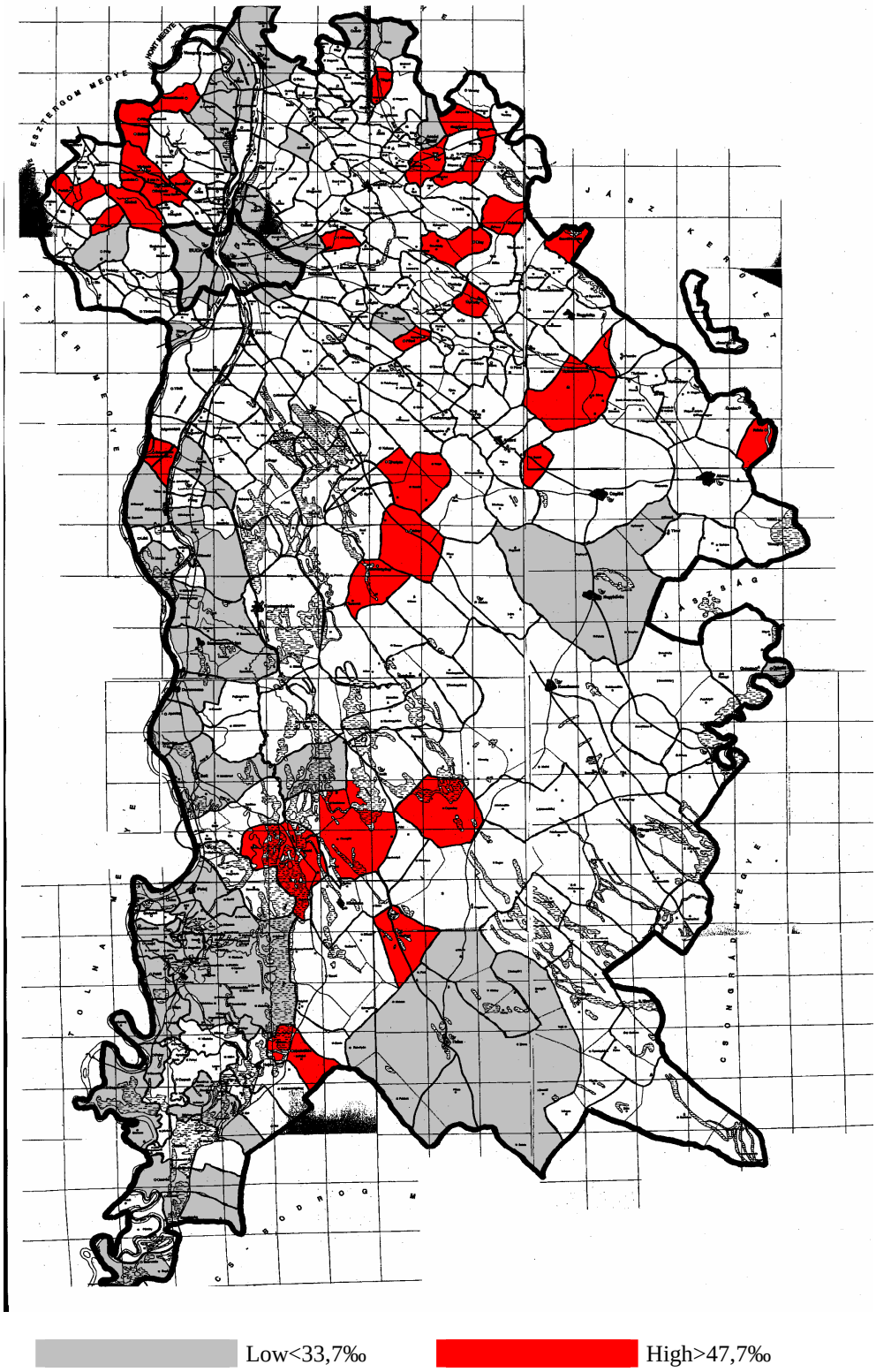
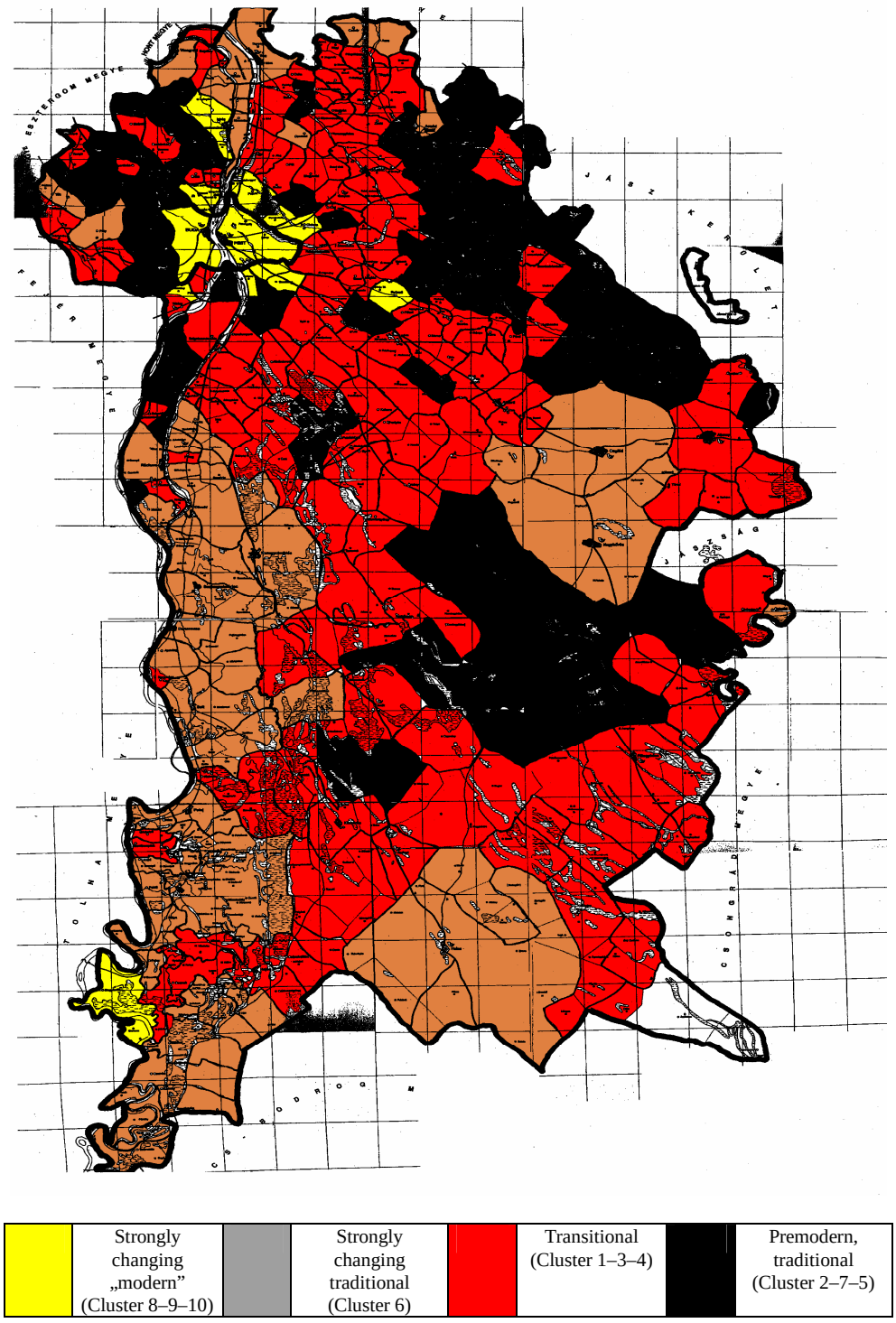


Figure A6

The State of Demographic Changes (the Summary of the Result of the Cluster-analysis), Pest-Pilis-Solt-Kiskun County, 1901–1910



	Strongly changing „modern" (Cluster 8–9–10)		Strongly changing traditional (Cluster 6)		Transitional (Cluster 1–3–4)		Premodern, traditional (Cluster 2–7–5)

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