

# SOCIOECONOMIC AND RELIGIOUS DIFFERENTIALS IN MARITAL FERTILITY DURING THE FERTILITY TRANSITION: A MICRO-LEVEL STUDY FROM WESTERN HUNGARY, 1850–1939<sup>1</sup>

Levente Pakot – Péter Óri

---

## ABSTRACT

The analysis of fertility decline and its socioeconomic and cultural determinants during the demographic transition is a topic that is rarely researched in Hungary. So far, the question has been examined only at country and regional levels, with the help of aggregate data. Much like the international research on historical demography, little attention has been paid to non-aggregate data and to the micro level. Previous family reconstitution studies, which can be regarded as the most feasible and prevalent method for micro-level analysis in Hungary, focused only on the analysis of pre-transitional fertility. We know, however, that on the one hand, in many communities irreversible fertility decline did not start before World War I, and on the other hand, the analysis of the transitional period offers more opportunities to better understand the background of changing fertility behaviour.

The aim of the present paper is to investigate the socioeconomic and denominational differentials in marital fertility in a rapidly industrializing Western Transdanubian community, which was heterogeneous in these respects. The analysis covers the pre-transitional period and the fertility transition, mainly from the second part of the 19th century up to World War II. This period of the Hungarian demographic transition has never been examined at micro level. According to the results, the upper groups of the local society had higher

---

<sup>1</sup> This study has been supported by the National Scientific Research Fund of Hungary (OTKA K-113100). L. Pakot has been supported by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences.

fertility compared to others prior to the transition, but the socioeconomic patterns of childbearing changed during the 1870s–1880s. First, local elite groups began to decrease their family size. They were followed later by local craftsmen and skilled workers, then by smallholders, and finally by semi-skilled and unskilled workers. The fertility of Lutherans was slightly lower than that of Roman Catholics, but this can be explained by the different demographic and socioeconomic composition of these denominational groups. Fertility transition on the spot meant not only parity-specific birth control, but also increasing birth intervals, which was particularly significant in the period of the Great Depression (1929–1933).

Keywords: Hungary, fertility transition, fertility differences, event history analysis

Levente Pakot – Péter Őri

Hungarian Demographic Research Institute

Email: pakot@demografia.hu; ori@demografia.hu

## INTRODUCTION

While the history of fertility transition is a thoroughly investigated topic, the details and specific mechanisms have still remained more or less unknown. Theories explaining the decrease of fertility emphasize the growing level of education, the employment of women outside the family, decreasing infant and child mortality rates, the appearance of new values, norms, and attitudes, as well as secularization, as important determinants.<sup>2</sup> Empirical evidence, however, seldom verifies or proves false these hypotheses, and sufficient statistical methods have rarely been used to differentiate between these factors by hierarchizing them in this respect. The use of high-level aggregate data with little information on socioeconomic differences, particularly for longer periods, is a fundamental problem. By contrast, almost no attention has been paid to data at the individual and the micro level, where it is possible that the most information on the socioeconomic and cultural positions of individuals can be collected (Guinnane, 2011; Dribe, Oris and Pozzi, 2014). Micro-analyses and the

---

<sup>2</sup> Individual records of Census 1857: National Archives of Hungary MNL OL X B 1762 microfilm.

use of individual-level data were necessarily linked to the statistical tools of the given period (e.g. family reconstitution), and to the results gained from, and questions posed by former macro-level studies. The time limits of observation also proved too narrow in many cases to reveal the whole process of fertility decline. Much attention was paid to pre-modern fertility variances and to the timing of deliberate birth control, while the process of fertility transition remained a poorly analysed phenomenon. In most of the cases where societal differences could not be observed, small rural communities were the ones that had been studied.

As a consequence of demographic transition theory (Notestein, 1945; Davis, 1945), a clear difference between pre-modern and modern reproductive behaviour was supposed. Deliberate birth control was identified by the spread of stopping behaviour – that is to say, by the end of childbearing after having a certain number of children. Pre-modern societies were characterised by the lack of this kind of behaviour ('natural fertility,' as it was called by Louis Henry), and it has changed only as a consequence of an adjustment to the modernizing economic and social circumstances. According to this hypothesis, changing economic conditions (industrialization), the changing occupational structure of the population, urbanization, increasing literacy, the rising expenses of child rearing, the diminishing demand for children in the labour force, and the changing role of women are responsible for this change in behaviour. The change was caused first and foremost, however, by declining infant and child mortality, that resulted in the spread of a new type of fertility behaviour.

The adjustment theory in its pure version was challenged later in the 1960s and 1970s by a large-scale macro-level research project (Princeton European Fertility Project). In the framework of the project European fertility decline was studied at the regional level (Coale and Watkins, 1986).<sup>3</sup> The dominant elements of transition theory (related to fertility decline, such as the role of economic development, the changing occupational structure, or the education level of the population, as well as the decrease in infant and child mortality as a driving force of fertility transition), were all questioned. Instead of these factors, the changes in values and norms were stressed. Birth control was regarded as a new form of behaviour, the spread of which was made possible by the acceptance of new values and attitudes towards reproduction. As Ansley Coale (1973) later

---

<sup>3</sup> For the results concerning Hungary see: Demeny (1972) and Dányi (1991a; 1991b).

formulated, willingness (the motivation) to engage in this new kind of behaviour, as well as technical knowledge (ability) were present prior to fertility transition, however readiness (norms which at least permit or accept it) came with the modern era. In this approach cultural changes (e.g. secularization) (Lesthaeghe, 1983; Lesthaeghe and Surkyn, 1988) or the role of cultural channels (ethnic, linguistic or denominational communities or borders), as factors in the diffusion of new norms, were emphasized.

Later on, newer analyses based on individual and longitudinal data questioned almost all the findings of the Princeton Project. The empirical view of fertility transition as a more or less simultaneous process, the methods and indicators used by the project, the rejection of the role of economic factors or declining mortality, have all been strongly criticised. Similarly, one of the cornerstones of both the Classical Transition Theory and the Princeton Project has also been refuted, namely the assumption that before the transition conscious birth control did not exist. On the contrary, the fact of spacing behaviour and its connection with socioeconomic status and changing economic circumstances have been pointed out several times (Brown and Guinnane, 2007; Bengtsson and Dribe, 2006; 2014, p.496; van Poppel and Derosas, 2006, pp.4-7.).

In order to understand fertility decline in a richer context by using a wider circle of the possible determinants, the opportunities provided by individual data and micro-level analysis should be much better utilized. At the same time, individual data used in the analysis must be longitudinal in order to reveal changes over time. Moreover, the multivariate analysis of life-course data might help us to comprehend the changes in individual decision-making, as well as to explain the mechanisms of long-term demographic development. This sort of data enables us to reconstruct the models of individual or family level decisions concerning reproduction for the entire period of fertility transition. Data on wealth, income, or occupational status may complete these models of individual behaviour. As it has recently been stressed, research aiming at better understanding the mechanisms and determinants of fertility transition should focus more and more on how socioeconomic status affected fertility during the transition and how differences in individual conditions and/or household position modified other effects on birth control and family size (Dribe, Oris and Pozzi, 2014, pp.163-164).

Scholars mostly agree that the positive association between socioeconomic status and fertility reversed during the transition, and those with a higher social status began to decrease their family size (Livi-Bacci, 1986; Skirbekk, 2008;

Cummins, 2012; Bengtsson and Dribe, 2014; for more recent results see: Breschi, Fornasin and Manfredin, 2014; Breschi, et al., 2014; Maloney, Hanson and Smith, 2014; Vézina, Gauvreau and Gagnon, 2014; Reher and Sanz-Gimeno, 2007).

The present paper attempts to investigate the socioeconomic and denominational fertility differentials in a rapidly industrializing Western Transdanubian community, which was heterogeneous in these respects. The analysis covers the pre-transitional period and the fertility transition, mainly from the second part of the 19th century up to the Second World War. This period of the Hungarian demographic transition has never been examined using individual level longitudinal data. We extended the analysis well into the key period of the transition (the mid-war era). We also investigate the possibility of the cultural and social diffusion of new reproductive behaviour when analysing the socio-occupational differences and timing of fertility decrease.

The structure of the paper is as follows: first we summarize the results of Hungarian research. Then we present the characteristics of the studied community. In the next section we describe the data and methods used to examine fertility and socioeconomic status in detail. Then we show the patterns of fertility in different socioeconomic and religious groups. The final part presents the results of multivariate analysis and the evolution of socioeconomic fertility differentials. The paper finishes with conclusions and suggestions for further research.

## **SOCIOECONOMIC STATUS, RELIGION AND FERTILITY DECLINE: RESULTS OF FORMER HUNGARIAN RESEARCH**

Fertility decline during the demographic transition is a topic that has not been well researched in Hungary. On the basis of aggregate data, prior research has examined fertility transition only at country or regional level. Hungarian researchers, similarly to their colleagues abroad, have paid little attention to non-aggregate data and to the micro level. Fertility transition was studied first in the interwar period, with tight relation to the debate on the “single child system” (Bodó, 2001; Vásáry, 1989) as well as to the fact that census data appropriate to the examination of the question became available in this period. The decrease of fertility, however, had been going on for quite sometime, as the average number of children, apart from those working in the agricultural sector, did not already reach the simple reproduction level in the 1930s (Andorka, 1987, p.276). Fertility decline was a relatively long and gradual process in the course of the 19<sup>th</sup> century.

It started very early in some micro-regions in entirely rural environment, while in other districts fertility did not begin to decline until the Great War (Andorka, 1998). At the same time the differences among denominational groups, towns, and villages also appear to have been important (Őri, 2007, 2009). However, it has not been clarified thus far whether locality (through differing social and economic conditions) or denominational composition (through existing religious norms) or the combination of those factors influenced the level and changes of fertility in the 19<sup>th</sup> century. The considerable decrease in fertility took place under the conditions of high and unchanged level of nuptiality and unfavourable mortality (Katus, 1980). The decisive and final turning point was World War I (WWI). After that, declining fertility was a common experience in all communities in Hungary. Regarding the whole period between 1880 and 1960, the decrease of fertility was very strong and rapid in international comparison (Hablicsek, 1991; Kamarás, 1991; Tomka, 2000, pp.20-21).

In trying to explain the main causes of fertility decline, one part of the research carried out in the interwar period focused mainly on the differences in fertility levels among the major denominational groups, especially Calvinists and Roman Catholics. According to this approach, the beginning and diffusion of birth control had been linked to differences among denominational groups in terms of religious dogmas, attitudes towards life and death, the value of children and family, or every-day habits and practices. One part of the observers, therefore, tried to demonstrate that early birth control emerged in the Hungarian Calvinist population and that it resulted from Calvinism, which was also the main factor in the spread of fertility decrease (Kovács, 1923; 1936). The entire debate about the “single child system” and the explanation based on cultural (denominational) differences were initiated and created by writers and politicians who did not take into consideration certain very important facts. For instance, although the fertility of Protestants proved to be lower than that of Roman Catholics according to most of the examinations, decreasing fertility or low fertility could not be connected exclusively to the Hungarian Calvinist population. Early birth control and low child number as a norm emerged in several different communities, independently of ethnicity, denomination or geographic situation. Others examined the socioeconomic – mainly occupational – factors of fertility decline, and showed their significance and priority over cultural/religious ones. They argued that the priority of socioeconomic factors in determining childbearing behaviour could be explained by the divergent living conditions and goals of particular social groups (Szél, 1930; Thirring 1936, 1941, 1959). The authors debating this question were professional statisticians who

were aware of the increasing impact of socioeconomic factors on demographic behaviour in the course of the 20<sup>th</sup> century. This type of reasoning was present throughout the interwar period and became dominant in the works of Rudolf Andorka, who carried out family reconstitution studies related to several Hungarian villages (for instance Andorka, 1998), and who provided an overall picture of the Hungarian fertility transition (Andorka, 1987, pp.259–299).

The first analysis of the fertility data of Census 1930 by mother tongue, religion and occupational group revealed the priority of socioeconomic factors over cultural ones (Thirring, 1941). The average number of children born differed considerably by socioeconomic group; the group of workers (agricultural workers, farm servants and day labourers etc.) had the highest fertility, while the group of clerks had the lowest one. According to this argument, fertility decline progressed more in groups of higher occupational status, to whom maintaining the living standard and social mobility was of the greatest importance. On the contrary, the decrease of fertility was less significant in lower occupational groups, where selling young children's labour was a source of subsistence. The re-examination of fertility based on census data from 1930 for rural Hungary verified this result by proving the existence of the aforementioned socioeconomic differences in fertility decline (Dányi, 1994, p.156). Regarding fertility level, the agrarian proletarians were characterized by high fertility and the local elite (village clerks and freeholders above 50 acres) were characterized by low fertility, and represented two opposite poles. Rural industrial workers, small and medium landholders, and village traders and artisans were located between the two extremes. Studies on subsequent periods demonstrate the social convergence of fertility behaviour. In 1949, the number of children in independent, worker and clerk groups also differed, however the most significant decrease was observed among workers, more precisely in the group of agricultural workers (Thirring, 1959).

Settlement-level family reconstitution can be considered an adequate method in Hungary for the micro-examination of fertility differences by denominational and social group. This kind of demographic analysis started in Hungary at the end of the 1960s (for a review see Benda, 2006). In the 1970s, these studies were incited to a large extent by Rudolf Andorka, who studied the question of low fertility and the “single-child system” in Hungary (Andorka 1975; 1981; 1991a; 1991b). On the basis of the family reconstitution of 13 parishes of different denominations, Andorka claimed that in certain parts of the country – namely in some rural districts in the Southern Transdanubian

region – birth control began spreading at the end of the 18th and the beginning of the 19th century. Moreover, he argued that differences in marital fertility and other demographical indicators could not be related to denominations. According to his hypothesis, family limitation among the land-owning peasantry – first of all he thought of landholding serfs – might have been a logical response to the danger of poverty. By using these means, they succeeded in avoiding the fragmentation of properties and pauperization under the special circumstances of the equal partition of inheritance among male heirs, and the custom of early and general marriage. According to Andorka, the frequently cited difference between Protestants and Roman Catholics regarding birth control might have been caused by another factor. “Calvinists were ‘overrepresented’ among landholders in all or almost all regions of Hungary” (Andorka 1991b, p.39.). This is the formulation of the well-known “Characteristics Hypothesis”, according to which the fertility differentials of denominational subgroups merely reflects their prevailing socioeconomic features (Goldscheider 1971, pp.272-273; van Poppel and Derosas, 2006).<sup>4</sup>

Former Hungarian family reconstitution studies regarded denomination and ethnicity as the main explanatory determinants of fertility decrease, and this assumption played the most important role when selecting the settlements for analysis. Marital fertility and other demographical indicators are not detailed by socioeconomic group in these analyses. These studies focused primarily on pre-transitional fertility and, in general, did not proceed beyond 1895, when birth certificates issued by the state became compulsory; thus they did not include the mid-war period, which was of great importance with respect to fertility decline. While the role of socioeconomic differences in fertility decrease – landholders versus landless agricultural workers – was phrased, this hypothesis has not been tested thus far. It is high time to analyse fertility differences by denominational and social group, by focusing on the period prior to and during the fertility decline in Hungary.

---

<sup>4</sup> Similar socially understood denominational differences in fertility (and mortality) have been found in Kiskunhalas by Melegh (2000).

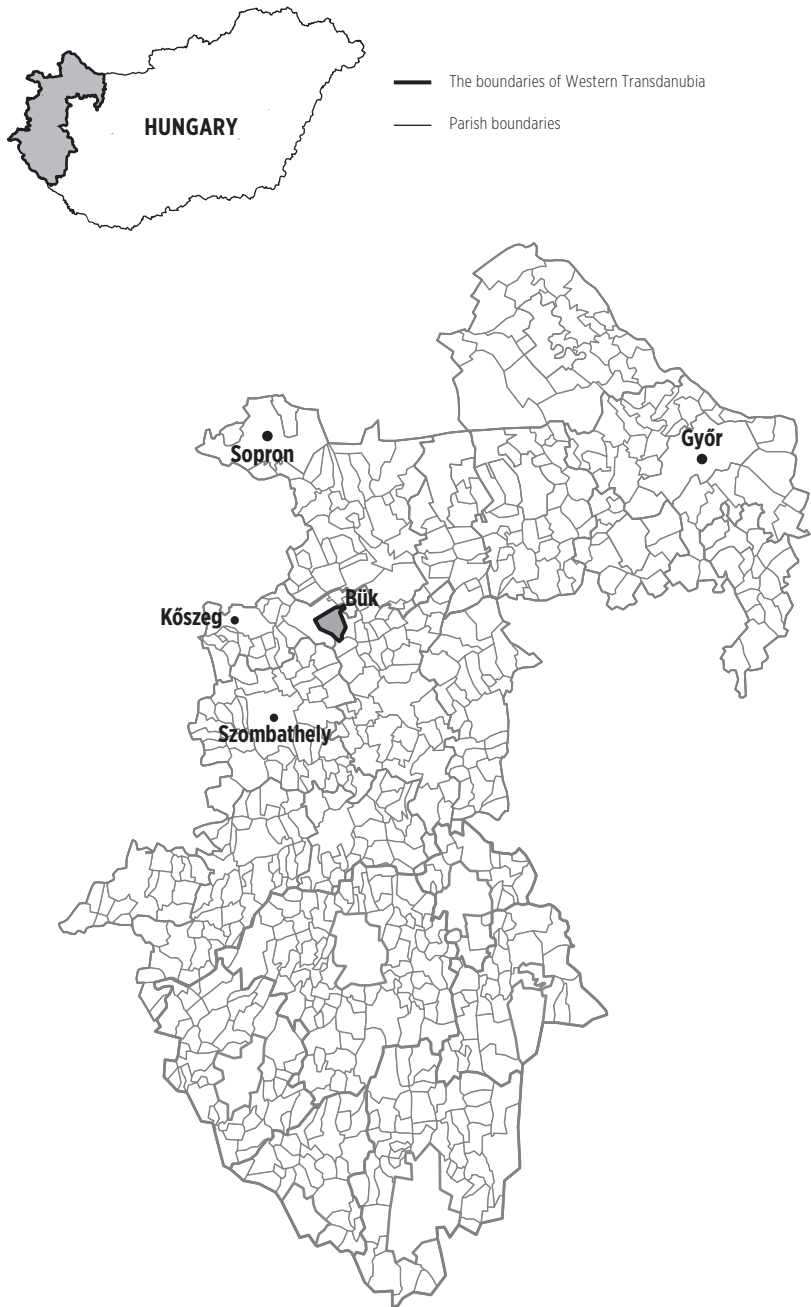


## THE AREA UNDER STUDY

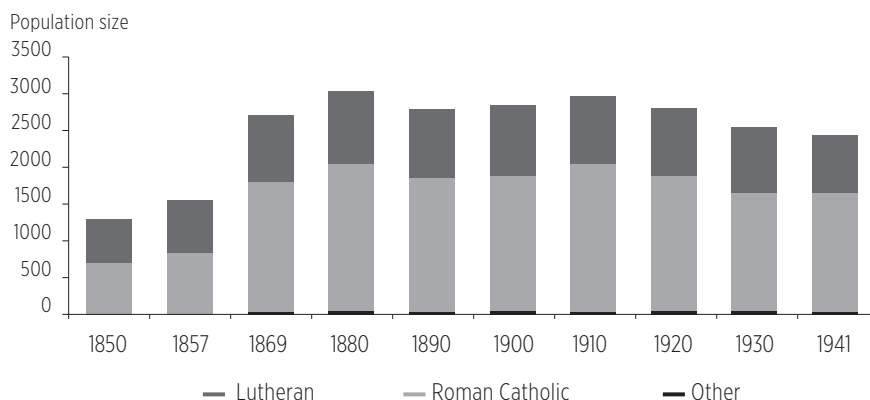
The studied community is Bük, located in Western Hungary (see *Map 1*). It is a settlement inhabited by Roman Catholics and Lutherans (Gyurácz, 2000; Németh, 2014; Szabó, 1985). During the 19th century, Bük consisted of three separate villages (Lower, Upper and Middle Bük), which were united in 1902. In 1850, the total population of the three Büks was 1,294; this figure grew to 2,447 by 1941. The population growth was mainly due to agricultural modernization, namely, the construction of a railroad by 1865, and the establishment of a modern sugar factory in 1867–1869, which resulted in a robust immigration into the settlements. The sugar factory leased the lands of local landowners and purchased the smaller lands owned by local freeholders. The sugar factory provided work for the poor living in Bük and the surrounding villages. They could work in the factory as “factory day labourers” or agricultural servants. At the same time, the factory owners built up modern facilities for the servants and the workers. The economic development reached its peak in the first decade of the 20th century. In 1910 the sugar factory employed 706 people (Gyurácz, 2000, p.82). In addition, a brick factory was established and other workshops of local artisans were opened in order to meet the increasing demands resulting from the constructions and the rapidly growing population size. The Great War put an end to this development, and unfortunately, the sugar factory burned down, in 1917. Between 1925 and 1930, the management gradually dissolved the factory, and its lands were purchased in part by local freeholders and in part by a big landowning family. A portion of the workers left the village, whereas others found jobs at the manorial farm of the estate formed after the fall of the sugar factory. The brick factories established around the turn of the century ceased to exist mainly due to the Great Depression (Németh, 2014). In the interwar period the population of the village continually decreased.

The immigration of the 1860s fundamentally transformed the denominational composition of Bük (*Figure 1*). While the number of Lutherans per 100 Roman Catholics was 82 before the agricultural modernization, this rate gradually changed, and Roman Catholics constituted the overwhelming majority (the two thirds of the entire population) by 1941 (49 Lutherans per 100 Roman Catholics).

*Map 1: Map of the area under study*



Map: Lajos Bálint, Hungarian Demographic Research Institute

*Figure 1: Population size and distribution by religion in Bük, 1850–1941*

Source: Censuses (own calculations).

The village was gradually transformed and its social stratification became more complex in the course of the 19<sup>th</sup> century. According to the census of 1857, 51% of the working age men (above the age of 25) were classified as day-labourers, whereas smallholders constituted 40%, tradesmen and artisans 6.5% and intellectuals 3%.<sup>5</sup> The occupational data of censuses 1910, 1920 and 1930 show that more than 20% of the breadwinners were industrial workers from the local handicraft industry and the sugar factory (*Table 1*).

*Table 1: The distribution of breadwinners by broad occupational groups in Bük, 1900–1930 (%)*

	1900	1910	1920	1930
Agriculture	58.05	52.45	63.19	64.04
Mining	0.00	0.00	0.00	0.00
Industry	24.88	28.48	16.11	15.88
Commerce	2.76	1.72	1.56	2.72
Transport	3.09	2.25	2.80	3.86
Civil service and lib. prof.	1.79	1.32	1.87	2.54
Soldiers	0.16	0.20	0.78	0.26
Day-labourers	0.49	2.98	4.12	1.23
Domestics	6.02	3.97	5.14	3.60
Others and unknown	2.76	6.62	4.44	5.88
N	1230	1510	1285	1140

Source: Unpublished working tables on occupational distributions. Censuses 1900, 1910, 1920, 1930. National Archives of Hungary.

<sup>5</sup> Individual records of Census 1857: National Archives of Hungary MNL OL X B 1762 microfilm.

Regarding the population living on agriculture, the proportion of landowners was around 40%. More than 60% of the agricultural employees were servants and agricultural workers (*Table 2*). The majority of peasant landholders farmed personally on the land that provided a living for the family. In the interwar period, the ratio of smallholders with 1–10 acres rose by 4–5% as compared to the earlier period, which can be explained by the division of lands and/or the land acquisitions of agricultural workers. Farm hands and wage labourers also had a considerable role in the agricultural production, most of them living and working on the estate owned by the sugar factory (prior to the 1920s).

*Table 2: Distribution of bread-winners in agriculture in Bük, 1910–1930, (%)*

	1910	1920	1930
Landowners, >1000 acres (575.5 ha)	0.00	0.13	0.00
Landowners, 200–1000 acres (115.1–575.5 ha)	0.00	0.13	0.00
Landowners, 100–200 acres (57.55–115.1 ha)	0.13	0.00	0.00
Landowners, 50–100 acres (28.78–57.55 ha)	0.13	0.13	0.35
Smallholders, 10–50 acres (5.76–28.78 ha)	14.56	15.66	10.97
Smallholders–day labourers, 1–10 acres (0.58–5.76 ha)	22.86	28.20	26.37
Smallholders–day labourers, <1 acre (0.58 ha)	0.89	1.13	0.53
Office holders	0.26	0.38	0.35
Farm hands	14.43	13.78	19.29
Labourers	46.74	40.48	42.12
N	1230	1510	1140

*Source:* Censuses (own calculations).

Individual census data showing the denominational and socio-occupational distribution of the population are available only for 1857 (Census 1857). According to the census data, Lutherans were overrepresented among landholders (62%). By contrast, this proportion was exactly the opposite among the landless, who were characterised by a slight Roman Catholic majority (55%). Historical reconstructions of the later periods constantly highlight the physical and social separation of the two denominational groups (Szabó, 1985). Starting from the 1870s Lutherans constituted only one third of the total population, however they owned two thirds of the lands around the village. Smallholders and servants represented a significant majority among Roman Catholics. Social and denominational separation was manifested by the elementary schools of the two churches working independently of one another throughout the entire period and similarly by the fact that Lutheran landholders established their own “Saving Granary” (Szabó, 1975).

## DATA AND METHODS

A database for the analysis was compiled by gathering the records of the parish registers of Bük from the 19<sup>th</sup> century and the civil registers from the period between 1895 and 1980. A longitudinal database has been created from parish register data by applying the method of family reconstitution (Henry and Blum, 1988; Gutmann and Alter, 1993). Furthermore, the family reconstitution database has been linked to the annual lists of voters (a minority group of population who had political rights at the time) for the period between 1861 and 1948, to the individual data from the census held in 1857, and the list of Roman Catholics living in Bük in 1850. As a result, we have a database containing the data of women who gave birth to children in their first marriage in Bük between 1850 and 1939. Each married woman has been followed from the time of her marriage or the birth of her first child, taking place in the parish until their death or out-migration. The date of the last observation in the census or in the list of voters has been used as censoring information. In total, the database contains 4,720 legitimate births from the period between 1850 and 1939, which constitutes 56% of all legitimate births from first and higher order marriages registered in Bük. Despite the effort to connect the data from different sources, one may assume that the highly mobile lower classes, namely, the farm servants, agricultural workers, and sometimes also skilled workers, still remain underrepresented in the database.

The beginning of the observation for every woman is the date of her first observed childbirth in the database. The end of the observation is as follows: 1) 31 12 1939, if the marriage still existed and the wife was under the age of 50; 2) The 50<sup>th</sup> birthday of the wife, if the marriage still existed and the wife reached her 50<sup>th</sup> birthday before 31 12 1939; 3) The date of dissolution of the marriage if it happened before 31 12 1939 or the 50<sup>th</sup> birthday of the wife; 4) The last date of record from the list of voters/census, which proves that the woman or her spouse was present in the village.

Descriptive statistics show the general characteristics of fertility in the first part of the analysis; here the emphasis is on the reconstruction of general marital fertility rates, age-specific marital fertility rates, SES-specific fertility rates, denominational group-specific fertility rates and birth intervals for the period between 1850 and 1939. Multivariate analysis in the second part seeks to analyse the development of marital fertility over time by socioeconomic and denominational differences, while controlling for a basic set of covariates (Gutmann and Alter, 1993). Here only the intervals among higher order births

have been taken into account.<sup>6</sup> We used piecewise constant exponential hazard models with a shared frailty at the individual (woman) level in order to account for repeated events for the same woman (in the analysis of higher order births). The frailty factor has been assumed to follow a Gaussian distribution. The duration variable was the time elapsed since last birth. We used six-month time periods for the baseline hazard. All higher order birth intervals have been analysed simultaneously.<sup>7</sup>

In the course of multivariate analysis a basic model has been estimated, which includes the socioeconomic status and denominational status of the head of family, the life status of the previously born child, time period, the woman's age, and the parish of residence, as explanatory variables. Three denominational groups, namely, Roman Catholic, Lutheran, and Jewish, have been included on the basis of the denominational status of the father. The case number of Jews, however, is so low that it does not permit us to come to a valid conclusion. The period of analysis is divided into seven distinct sections: 1850–1869, 1870–1884, 1885–1899, 1900–1914, 1915–1918, 1919–1929 and 1930–1939. In order to estimate the socioeconomic patterns of fertility decrease, another model has been constructed which includes interactions between socioeconomic status and time period, where the net effects of period (changes over time) by socioeconomic status can be examined.

For defining socioeconomic status, the information on occupation was used as it was recorded in the parish registers, census lists and the lists of voters. All occupations have been coded on the basis of the HISCO coding scheme (van Leeuwen, Maas and Miles, 2002), and after coding, the categories have been further contracted into four broad groups, more or less following the HISCLASS scheme (van Leeuwen and Maas, 2011). The classification formed here was a little simpler than the original one. Due to the small number of cases in some HISCLASS categories, it was not possible to use the classical range of HISCLASS in the analysis. *Table 3* displays the final classification.

---

<sup>6</sup> Throughout the analysis the method applied by Tommy Bengtsson and Martin Dribe has been followed (2014).

<sup>7</sup> During the statistical analysis we used Stata version 11 (StataCorp. 2009), and we applied *stpiece* command for regression analysis.

*Table 3: Classification of social classes by HISCLASS categories*

HISCLASS	Socioeconomic status	Examples
1-6	1 – Middle class	Higher managers, higher professionals, lower managers, lower professionals, clerical and sales, lower clerical and sales, foremen, etc.
8	2 – Smallholder	–
7-9	3 – Skilled worker	Craftsmen, blacksmiths, crofters, carpenters etc.
10-12	4 – Labourer	Day labourers, workers, farm servants, farm workers etc.

*Table 4* shows the distribution of the sample population by religion and social status in particular time periods. All in all, the stability of social groups is evident. The proportion of labourers gradually increased until World War I, then it started to decrease. The proportion of the middle class increased from 4% to 5–6% during the period under study. The proportion of smallholders constantly decreased until World War I, then it increased slightly again. The share of skilled workers remained around 11% until the end of World War I; however, it rose to 15% in the interwar period.

The changing distribution of the sample population by social group reveals the gradual transformation of the local occupational structure. The first increasing and then decreasing proportion of labourers might be explained by the altering phases of modernization in agriculture. It was due to the establishment of the sugar factory, as previously noted, as well as to its gradual liquidation after World War I. Changes appear rather dynamic when the occupational groups are broken down by religion. The initial hegemony of Lutherans among smallholders markedly decreased and their denominational distribution became more balanced during the interwar period. The overwhelming majority of Roman Catholics among skilled workers, that was originally noted, declined during the interwar period, when the number of Lutherans gradually rose to one third.

*Table 4: Distribution of the sample population by socioeconomic and denominational status of the family heads, Bük, 1850–1939 (%)*

Religion	Socioeconomic status	1850–1869	1870–1884	1885–1899	1900–1918	1919–1929	1930–1939	Total
Roman Catholic	Middle class	2.2	2.7	1.9	2.8	3.7	3.1	2.7
	Skilled worker	9.8	9.0	9.4	8.5	9.8	10.3	9.3
	Smallholder	19.7	18.7	20.9	20.8	23.6	23.5	21.0
	Labourer	23.8	25.3	23.6	27.5	24.6	21.5	24.8
Lutheran	Middle class	1.9	1.9	1.3	1.8	3.3	2.6	2.0
	Skilled worker	1.9	2.8	2.8	3.0	3.5	5.2	3.1
	Smallholder	30.1	27.6	30.4	26.8	23.0	23.1	27.2
	Labourer	10.5	11.9	9.7	8.8	8.5	10.8	10.0
All	Middle class	4.1	4.6	3.2	4.6	7.0	5.6	4.7
	Skilled worker	11.8	11.8	12.2	11.5	13.3	15.5	12.4
	Smallholder	49.8	46.3	51.3	47.6	46.7	46.5	48.1
	Labourer	34.4	37.3	33.3	36.3	33.1	32.3	34.8
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0
Time at risk		3659	3742	3827	5728	2947	2621	22524

Source: Family reconstitution database of Bük (Hungary).

Note: Without the Jewish denominational group.

## THE FERTILITY TRANSITION IN BÜK

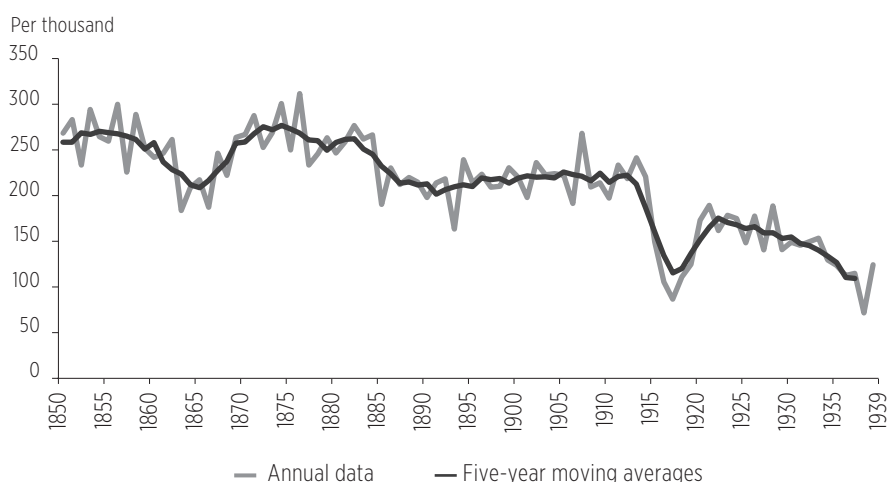
### Descriptive statistics

Figure 2 shows the changes in the general marital fertility rate (birth to married women divided by the person years at risk for married women 15–49 years) in Bük between 1850 and 1939. Prior to the turn of the century the trend of marital fertility appears to be wavering and the background and causes of the changes can only be assumed. The 1850s were characterized by a slow rise in marital fertility, which was followed by a significant fall in the mid-1860s. From the end of the 1860s, in conjunction with the modernization of agriculture and the



moving in of a young immigrant population (basically the workers in the sugar factory and the railways), marital fertility was rising slightly until the beginning of the 1880s, when it suddenly fell and then stabilized at a lower level. A drastic change occurred during World War I, when marital fertility declined to almost half of its former level. After the war, marital fertility rose slightly again as reproduction was necessarily postponed (due of the absence of husbands or the lack of proper bridegrooms) or it was, however, followed by a perpetual and decisive decline until the end of the 1930s.

*Figure 2: General marital fertility rates, Bük, 1850–1939 (annually and five-year moving averages)*

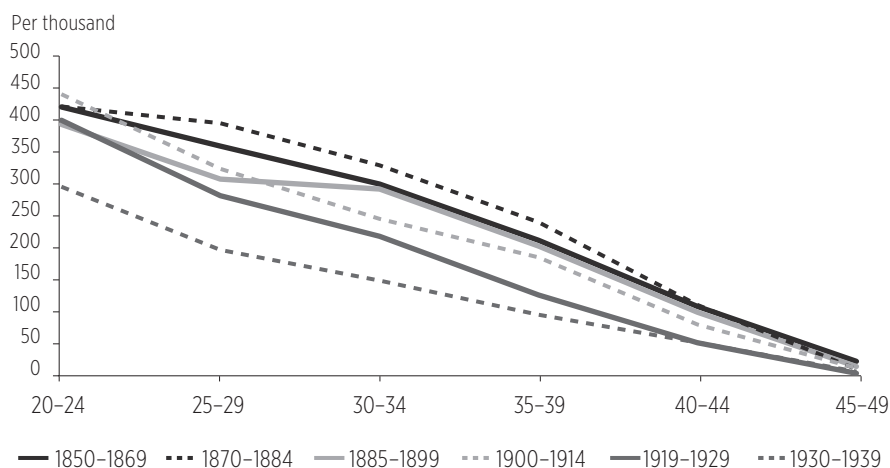


Source: Family reconstitution database of Bük (Hungary).

On the basis of *Figure 3* one can follow the development of age-specific marital fertility by subsequent time periods, except during the years of World War I. The marital fertility of those aged 25 or older almost halved during the period examined. The total marital fertility rate in the broad age group 20–49 gradually decreased from 7.2 to 3.9, while this figure was reduced from 5.0 to 2.5 in the age group 25–49. The average age of females at first marriage rose from 22 to 23 years of age, therefore we may suppose that the average number of births by a married woman between age 22 and 49 was around 6–7 before the transition, falling to 3 during the transition. This considerable decline in child number might have been due to parity-specific birth control, that is to say that fertility in higher age groups steadily decreased within a given period,

and over time as well, especially after the turn of the century. It is also worth mentioning that the level of fertility in the highest age group (above 45) did not decrease considerably, whereas in the youngest age group no significant decline came prior to the 1930s. This probably means that just after marriage, fertility was rather high and did not change until 1930, although the probability of childbirth decreased markedly with the age of wives, and this fall continued decade by decade. The decade and a half between 1870 and 1884 has to be excluded in this respect, since the level of fertility between the ages of 25 and 40 was markedly higher than formerly and later on. A significant fall of marital fertility rates appeared only above the age of 40. The 1930s and the period of World War I (not included here) also have to be considered exceptions, when the marital fertility of the youngest age groups also shrank to a large extent.

*Figure 3: Age-specific marital fertility rates by period, Bük, 1850–1939*

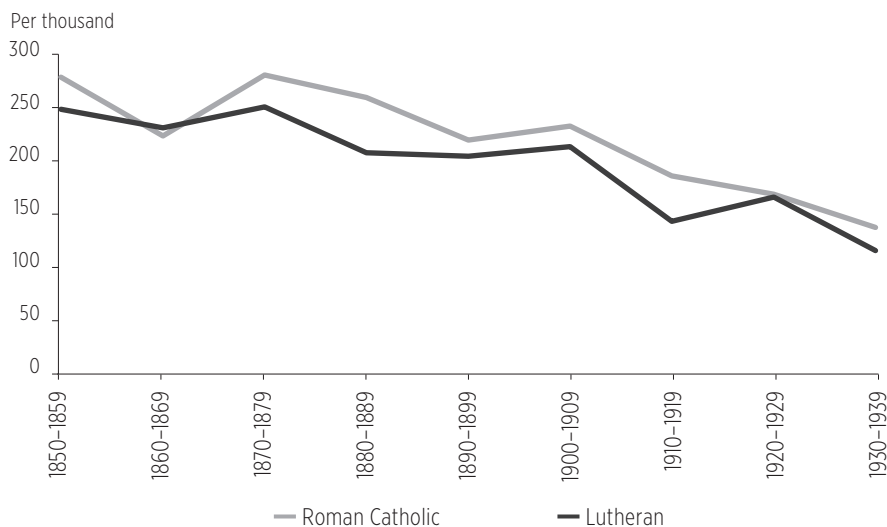


Source: Family reconstitution database of Bük (Hungary).

*Figure 4* displays the general marital fertility rate by the denominational group of the father and by time period. The fertility of Lutherans was apparently lower than that of Roman Catholics during the entire period examined here. Something else worth noting is that the curves of the two denominational groups moved together, and only the rate of decline or rise in some periods differed by denomination, thus the decline in the 1860s was much stronger among Roman Catholics in the period of in-migration and high population growth, which was

followed by a more pronounced rise in the 1870s, when young in-migrants successfully settled in the village. By contrast, from 1900 onwards the altering periods of decline and recuperation seem to have been more notable in the case of Lutherans.

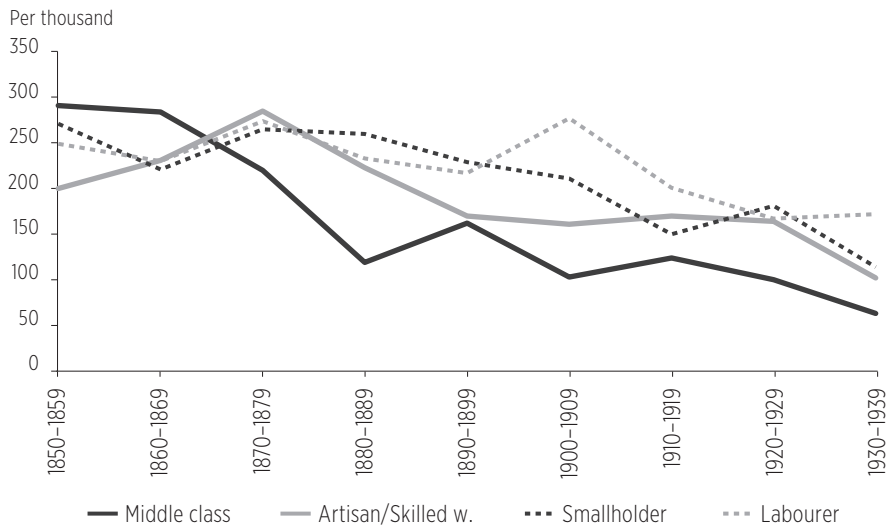
*Figure 4: General marital fertility rate by denomination in Bük, 1850–1939*



Source: Family reconstitution database of Bük (Hungary).

*Figure 5* shows the changes over time in the general marital fertility rate by the father's socioeconomic group. Prior to the beginning of this transition, fertility of the middle class was the highest, while that of the skilled workers was the lowest, with smallholders and labourers standing in the middle. From the 1870s onwards, middle-class fertility suddenly dropped. This can be considered the beginning of fertility transition in the village. In the subsequent decades, the same happened among skilled workers, then among smallholders, and finally, in the lower classes. In conjunction with economic modernization, socioeconomic differences in fertility became more and more visible. Fertility rates in the lower classes began to decline only in the interwar period, although socioeconomic differences were still significant at the end of the period studied.

Figure 5: General marital fertility rate by socioeconomic status in Bük, 1850–1939



Source: Family reconstitution database of Bük (Hungary).

Table 5 includes the mean birth intervals (in years) by denominational group, socioeconomic status, and time period. There was no significant difference between the two main denominational groups; at the same time birth intervals were increasing over time in every socioeconomic group, although to a different extent.

Table 5: Mean previous birth interval (years) by period, denomination and SES, Bük, 1850–1939

A. Religion									
	1850–1869	1870–1884	1885–1899	1900–1914	1915–1918	1919–1929	1930–1939	1850–1939	N
Lutheran	2.85	2.64	2.52	2.40	3.29	2.79	2.94	2.66	1526
Roman Catholic	2.63	2.37	2.57	2.36	3.52	2.77	3.04	2.59	2350
Jewish	---	---	3.21	2.85	4.25	2.48	2.87	3.13	18
Total	2.72	2.48	2.56	2.38	2.46	2.77	3.00	2.62	
N	751	845	716	791	152	360	279	3894	

## B. Socioeconomic status

	1850– 1869	1870– 1884	1885– 1899	1900– 1914	1915– 1918	1919– 1929	1930– 1939	1850– 1939	N
Middle class	2.75	2.16	3.35	2.53	2.95	2.67	3.69	2.73	140
Skilled worker	2.39	2.42	2.76	2.44	3.35	3.25	3.49	2.66	457
Smallholder	2.81	2.47	2.43	2.42	3.94	2.61	2.91	2.60	1854
Labourer	2.73	2.54	2.62	2.30	3.17	2.83	2.92	2.62	1443
Total	2.72	2.48	2.56	2.38	2.46	2.77	3.00	2.62	
N	751	845	716	791	152	360	279	3894	

Source: Family reconstitution database of Bük (Hungary).

Note: Closed birth intervals. Higher order births.

## Event-history analysis of birth intervals

Compositional effects might influence denominational and socioeconomic differentials. In order to identify and explain such differences more effectively, a multivariate analysis of the birth intervals has been applied in the next section of the paper. *Table 6* reports the distribution of covariates used in the analysis, and demonstrates the results of the regression analysis. In the course of the analysis, two models have been created for examining the denominational and socioeconomic differentials in fertility. On the one hand, the basic model expresses the differences in fertility by socioeconomic status, denomination, period, the mothers' ages, and the life status of previously born children. Relative risks refer in all cases to the entire period studied, or all the socioeconomic groups. On the other hand, the interaction model is expected to display the differences in pre-transitional and declining fertility by socioeconomic group.<sup>8</sup>

<sup>8</sup> In the interaction model of *Table 6* relative risks by socioeconomic status refer to the period 1850–1869, those by period refer only to labourers. The relative risks belonging to interactions express the probability of a next birth in a given socioeconomic group as compared to its value in the reference period (1850–1869). The variables and models used in the analysis follow those used by Bengtsson and Dribe (2014, pp.515–517).

*Table 6: Distribution of the covariates and the relative risk of births, a piecewise constant exponential model, higher order births, Bük, 1850–1939*

	Percent	Basic model		Interaction model	
		Relative risks	p	Relative risks	p
Socioeconomic status					
Labourer	34.33	1	ref.	1	ref.
Middle class	5.42	0.64	0.000	1.36	0.213
Skilled worker	12.51	0.89	0.151	1.18	0.311
Smallholder	47.74	1.00	0.949	1.10	0.379
Religion					
Roman Catholic	57.34	1	ref.	1	ref.
Lutheran	41.62	0.92	0.117	0.92	0.119
Jewish	1.04	0.67	0.184	0.84	0.583
Period					
1850–1869	15.94	1.00	ref.	1	ref.
1870–1884	16.57	1.17	0.013	1.24	0.042
1885–1899	17.05	0.98	0.755	1.01	0.902
1900–1914	19.14	0.95	0.474	1.14	0.247
1915–1918	6.47	0.46	0.000	0.54	0.000
1919–1929	12.95	0.69	0.000	0.81	0.131
1930–1939	11.89	0.50	0.000	0.70	0.014
Age of woman					
15–24	9.27	1.00	ref.	1	ref.
25–29	18.96	0.69	0.000	0.69	0.000
30–34	20.99	0.54	0.000	0.54	0.000
35–39	19.25	0.39	0.000	0.39	0.000
40–49	31.53	0.14	0.000	0.14	0.000

	Percent	Basic model		Interaction model	
		Relative risks	p	Relative risks	p
Life status of previously born child					
Alive	93.48	1	ref.	1	ref.
Dead	6.52	3.33	0.000	3.35	0.000
Interactions					
Middle class*1870–1884				0.55	0.056
Middle class*1885–1899				0.40	0.017
Middle class*1900–1914				0.30	0.001
Middle class*1915–1918				0.99	0.984
Middle class *1919–1929				0.29	0.002
Middle class *1930–1939				0.22	0.002
Skilled worker*1870–1884				0.93	0.739
Skilled worker *1885–1899				0.77	0.255
Skilled worker *1900–1914				0.66	0.072
Skilled worker *1915–1918				0.70	0.273
Skilled worker *1919–1929				0.69	0.152
Skilled worker *1930–1939				0.44	0.004
Smallholder*1870–1884				0.95	0.738
Smallholder*1885–1899				1.06	0.705
Smallholder*1900–1914				0.84	0.238
Smallholder*1915–1918				0.77	0.251
Smallholder*1919–1929				0.90	0.552
Smallholder*1930–1939				0.68	0.042
Frailty		0.28	0.000	0.27	0.000
Number of birth intervals		5131		5131	
Number of events	3842	3842		3842	
Time at risk	21279.5	21279.5		21279.5	
Chi <sup>2</sup>		5213.1	0.000	5227.7	0.000

Source: Family reconstitution database of Bük (Hungary).

As a first step in interpreting the results presented by *Table 6*, let us examine the relative risks in the basic model. Middle class and skilled workers had lower risk (longer birth intervals) than the reference category of labourers, while the birth intervals of smallholders were not different from the lower classes. The Lutheran denomination had a decreasing effect to the risk of another birth, however the difference of 8% is not statistically significant. It becomes quite clear that denominational differences demonstrated in the descriptive part of the paper were due first and foremost to compositional effects and not to specific norms or values characteristic of the local congregations that were studied. Regarding the effects of historical periods, a significant increase of the risk of another birth can be observed in the period of economic modernization between 1870 and 1884. This is probably due to the in-migration and settling down of a great number of young labour force, as previously mentioned, which also caused a considerable increase in population and the entire transformation of the local society in terms of societal and denominational distribution. Fertility increase was followed by stagnation until WWI, and then a sudden drop in childbearing can be observed. In this respect Bük was in all probability very similar to any other community in the country. After the war a modest recuperation came, but the probability of births never reached the level of its pre-war numbers. Compared to that, the drop was 25% in the 1920s. This was followed a newer 20% decrease during the 1930s, which altogether meant a decrease of 50% since the turn of the century.

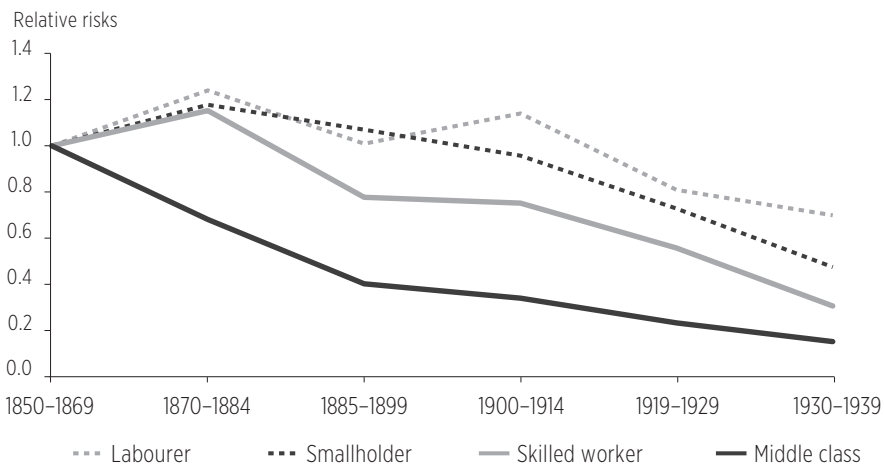
The age of women at childbirth naturally mattered a lot. Compared to the age group 15–24 the probability of a subsequent birth fell to almost 50% above the age of 30, and decreased by more than 60% in the age group of 35–39. As we have seen earlier, the risk of birth above the age of 40 was minimal during the entire period studied. At the same time, the death of the previously born child increased the risk of childbirth by 300%. This clearly illustrates that the decreasing infant and child mortality rate might have played an important role in the decline of marital fertility. The greatly increased risk of a subsequent birth refers to a well-articulated substitution effect; parents tried to substitute the dead child with a new-born baby. At the same time, a child's death could shorten the length of time until another birth, when birth control was not practised. The decreasing frequency of infant and child deaths could therefore affect the number of births in two different ways: through the decreasing necessity of substitution and the non-disturbed intervals between two births. Births risks strongly decreasing with the age of mother may show the probability of parity-specific birth control in the studied community; that is to say families might have had a more or less clear view on the ideal number of children and of family size, and in older age groups it considerably decreased the



probability of births, unless the still common death of infants and children modified these plans.

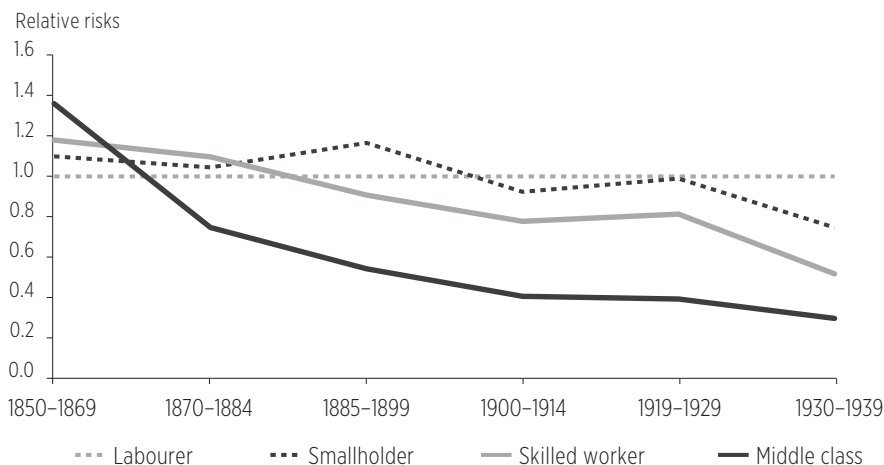
The socioeconomic pattern of fertility decline can be reconstructed on the basis of the results in the interaction model. Based on these values, *Figure 6* shows the net effects of period by socioeconomic status. Here the pre-transitional period (1850–1869) has been considered the reference category for all comparisons. Regarding the class of labourers, relative risks express the main effects of the period in the regression. By contrast, the relative risks of other groups show the net effects of the period and the interaction between the period and socioeconomic status. The local middle class first controlled its fertility after 1870, and from the middle of the 1880s they were followed by skilled workers and smallholders, although to a smaller degree. The unambiguous fertility decline among labourers did not emerge until after 1900. From this time onwards, fertility rates fell continuously and steadily in all socioeconomic groups. In contrast to the other groups, the highest rate of decrease can be observed for the period prior to 1900. After examining these results, it seems probable that smaller family size became more widespread in the local middle class in the period between 1870 and 1884. The spread of this new pattern in other socioeconomic groups is also highly visible, among skilled workers and smallholders around the turn of the century, and among lower skilled workers in the interwar period.

*Figure 6: Net effects of period on fertility by socioeconomic status*



Note: Calculations based on *Table 6*, p-values for main effects and interaction effects in *Table 6*.

Figure 7: Net effects of period on fertility by socioeconomic status



Note: Calculations based on Table 6, p-values for main effects and interaction effects in Table 6.

Figure 7 shows another aspect of the question, namely the development of socioeconomic differentials (their net effects on fertility) by historical period. The calculation was also based on the results of the interaction model. In contrast to Figure 6, in Figure 7 the reference group is the lower class in all periods, and the relative risks and p-values related to the first period (1850-1869) show the base effects of socioeconomic status in the regression, while those related to the other periods display the net effects of socioeconomic status and the interaction between socioeconomic status and period.

In the pre-transitional period, the middle class had the highest fertility rate, while the labourers had the lowest one, and skilled workers and smallholders stood in between. The socioeconomic pattern of fertility fundamentally changed during the transition. At the beginning of the 20th century the middle class and skilled workers had about by 50% and 20% lower risk of childbirth respectively than the lower class, but the fertility of smallholders did not differ significantly from that of the lower class. In the 1930s, the socioeconomic patterns constantly diverged; the relative risk of childbirth was by 70% lower in the middle class, 48% lower among skilled workers, and 25% lower among smallholders than it was in the lower class. Prior to the demographic transition, therefore, the birth intervals were the longest among the labourers and were the shortest in the local middle class, but these results are not statistically significant. More precisely, there is no

strong evidence that the latter group was the most likely to reproduce itself in the demographic sense (Cummins, 2012). In conjunction with the development of transition, birth intervals in the upper social groups were gradually prolonged and short birth intervals become characteristic of labourers.<sup>9</sup>

## CONCLUSION

The present paper has studied the denominational and socioeconomic patterns of fertility decline in a Western Transdanubian village inhabited by Lutherans and Roman Catholics for the period between 1850 and 1939. Instead of the former, first of all macro-level approaches, this analysis was based on individual data collected from parish registers and different sorts of enumerations. On the basis of this data collection, a longitudinal family reconstitution database has been created. In the course of the examination the micro-data have been analysed by the help of multivariate statistical methods.

According to the results of the analysis, in the community studied, fertility transition was started by the local middle class in the 1870s. This meant not only parity-specific birth control, the signs of which can be observed, but also the lengthening of birth intervals and the decreasing probability of a subsequent birth; referring to the existence of the so-called spacing behaviour. The youngest female age groups took part in birth control not earlier than in the interwar period. The relative risk of another birth among Lutherans was slightly lower than among Roman Catholics. This difference, however, was mainly due to the different demographic and socioeconomic composition of the two denominational groups. The so-called “Characteristics Hypothesis” seems to be confirmed.

The timing of fertility transition also differed by socioeconomic group. During the demographic transition, a shift to small family size was initiated by the local middle class. A few decades later they were followed first by the industrial/artisan group of the local society, then by smallholders, and finally by the groups of lower-skilled workers.<sup>10</sup> In the first decades of the 20<sup>th</sup> century fertility had divergent trends by socioeconomic group, and signs of convergence were not visible even at the end of the observed period. At the micro level (on the basis of individual data and concerning a local community) that socioeconomic status

---

<sup>9</sup> Quite similarly to the results of Bengtsson and Dribe (2014, p.519).

<sup>10</sup> The process of fertility transition by socioeconomic group in this Western Hungarian community was very similar to that of Southern Sweden (Bengtsson and Dribe, 2014, p.521).

strongly influenced both the timing and pace of fertility decline during the demographic transition as well as the level of pre-transitional fertility. The role of denominational affiliation has not been refuted in this respect; it might have affected fertility level and the spread of birth control to some extent but this analysis has also called attention to the differing socioeconomic composition of the denominational groups with differing demographic behaviour. According to our interpretation, the different elements of a given locality, namely denominational affiliation resulting in locally followed norms or societal and professional distribution, together with local geographic conditions, inextricably affected demographic behaviour. This view at the same time questions all attempts at finding a single explanation regarding demographic transition,. It also emphasizes the significance of individual level analyses and multivariate statistical methods with respect to better understanding demographic development in the past<sup>11</sup>.

## SOURCES

### Archival sources

Magyar Nemzeti Levéltár Országos Levéltára (MNL OL) [National Archives of Hungary]

XXXII-23-h KSH Népszámlálási feldolgozási táblák [Census tables], 1910, 1920, 1930.

Microfilm collection (X)

A 1692, A 1696: Roman catholic parish registers of Bük, 1700–1895.

A 2609, A 2610: Lutheran parish registers of Bük, 1784–1895.

B 1762: Census 1857, Sopron county.

A 3515: Jewish parish registers of Csepreg, 1886–1895.

Hungarian National Archives of Hungary, Győr-Moson-Sopron county Sopron archives

IV. B. 254. a. Sopron Vármegye Középponti Választmányának iratai 1861. Képviselőválasztási névjegyzékek 1861 [List of voters Central District of County Sopron 1861].

---

<sup>11</sup> See for instance Kok, 2014.

- IV. B. 255. Sopron Vármegye Középponti Választmányának iratai 1865 [List of voters Central District of County Sopron 1865].
- IV. B. 256. c. Sopron Vármegye Középponti Választmányának iratai 1867–1869. Képviselőválasztói névjegyzékek 1867–1869 [List of voters 1867–1869].
- IV. B. 404. c. Sopron Vármegye Törvényhatósági Bizottsága Központi Választmányának iratai 1872–1944. Képviselőválasztói névjegyzékek 1872–1944. [List of voters 1872–1944].

National Archives of Hungary, Vas County Archives  
State registers of Bük, 1895–1980.

#### TÁRKI

The records of Andorka Rudolf bequest. 1/a. Research notes on family reconstitution studies, 36–39 d.

#### Published sources

- Census 1900: A magyar korona országainak 1900. évi népszámlálása. Második rész. A népesség foglalkozása községenként. [The results of the census 1900 in Hungarian Kingdom. II. Occupational distribution of the population by settlements]. *Magyar Statisztikai Közlemények Új Sorozat*, vol. 2. Budapest, 1904.
- Census 1910: A magyar szent korona országainak 1910. évi népszámlálása. Második rész. A népesség foglalkozása és a nagyipari vállalatok községenként. [The results of the Census 1910. II. Occupational distribution of the population and industrial firms by settlements]. *Magyar Statisztikai Közlemények Új Sorozat*, vol. 48. Budapest, 1913.
- Census 1920: Az 1920. évi népszámlálás. Második rész. A népesség foglalkozása és a nagyipari és kereskedelmi vállalatok községenként. [The results of the Census 1920. II. Occupational distribution of the population and industrial and commercial firms by settlements]. *Magyar Statisztikai Közlemények Új Sorozat*, vol. 71. Budapest, 1925.
- Census 1930: Az 1930. évi népszámlálás. II. rész. Foglalkozási adatok községek és külterületi lakóhelyek szerint, továbbá az ipari és kereskedelmi nagyvállalatok. [The results of the Census 1930. II. Occupational distribution of the population by settlements and industrial and commercial firms]. *Magyar Statisztikai Közlemények Új Sorozat*, vol. 86. Budapest, 1934.

## REFERENCES

- Andorka, R. (1975). Az ormánsági születéskorlátozás története. [The history of family limitation in the region of Ormánság], *Valóság*, 18(6), pp.45-61.
- Andorka, R. (1978). *Determinants of Fertility in Advanced Societies*. London: Methuen.
- Andorka, R. (1981). A gyermekszám alakulásának társadalmi tényezői paraszti közösségekben (18–19. század). [Social determinants of fertility in rural communities (18–19th centuries)], *\*Ethnographia\**, 42(1), pp.94-110.
- Andorka, R. (1987). *Gyermekszám a fejlett országokban*. [Child number in developed countries], Budapest: Gondolat.
- Andorka, R. (1991a). Egy „igazi” magyar falu, Átány népesedésének története a XVIII–XIX. században. [Population development of a “real” Hungarian village: Átány in the XVIII–XIXth centuries], *Ethnográfia*, 102(1–2), pp.120-146.
- Andorka, R. (1991b). *Településszintű családrekonstrukciós vizsgálatok első eredményei*. [The first results of settlement level family reconstitution studies], KSH Történeti Demográfiai Füzetek, 9. Budapest: KSH Népeségtudományi Kutatóintézet, pp.35-41.
- Andorka, R. (1998). La population hongroise du XVIIIe siècle à 1914. J-P. Bardet and J. Dupâquier, eds., *Histoire des populations de l'Europe 2. La révolution démographique, 1750-1914*. Paris: Fayard, pp.427-439.
- Benda, Gy. (2006). A magyarországi családrekonstrukciós vizsgálatok mérlege. [An overview of family reconstitution studies in Hungary], In: Bend, Gy., *Társadalomtörténeti tanulmányok*. Budapest: Osiris, pp.67-76.
- Bengtsson, T. and Dribe, M. (2006). Deliberate control in a natural fertility population: Southern Sweden, 1766–1864. *Demography*, 43(4), pp.727-746.
- Bengtsson, T. and Dribe, M. (2014). The historical fertility transition at the micro level: Southern Sweden 1815–1939. *Demographic Research*, 30(17), pp.493-534.
- Bodó, B. (2001). Progress or National Suicide: The Single-Child Family in Hungarian Political Thought, 1840–1945. *Hungarian Studies Review*, 28(1–2), pp.185-208.
- Breschi, Esposito, M., Mazzoni, S. and Pozzi, L. (2014). Fertility transition and social stratification in the town of Alghero, Sardinia (1866–1935). *Demographic Research*, 30(28), pp.823-852.
- Breschi, M., Fornasini, A. and Manfredini, M. (2014). Patterns of reproductive behavior in transitional Italy: The rediscovery of the Italian fertility survey of 1961. *Demographic Research*, 14(44), pp.1227-1260.
- Brown, J. C. and Guinnane, T. W. (2007). Regions and Time in the European Fertility Transition: Problems in the Princeton Project's Statistical Methodology. *Economic History Review*, 60(3), pp.574-595.
- Coale, J. A. (1973). The demographic transition reconsidered. *International Population Conference, Liège, 1973. vol. I*. Liège: IUSSP,
- Coale, J. A. and Watkins, C. S. (1986). *The Decline of Fertility in Europe*. Princeton, NJ: Princeton University Press.
- Cummins, N. (2012). Marital fertility and wealth during the fertility transition: Rural France, 1750–1850. *The Economic History Review*, 66(2), pp.449-476.

- Dányi, D. (1991a). *Regionális családrekonstrukció, 1830–39, 1850–1859*. (A regional family reconstitution study, 1830–1839, 1850–1859) KSH NKI Történeti Demográfiai Füzetek 9. Budapest: KSH Népeségtudományi Kutatóintézet, pp.99-156.
- Dányi, D. (1991b). Demográfiai átmenet 1880–1960. [Demographic transition, 1880–1960], *KSH NKI Történeti Demográfiai Füzetek 9*. Budapest: KSH Népeségtudományi Kutatóintézet, pp.187-231.
- Dányi, D. (1994). Magyarország termékenységének csökkenése, 1910–1930. [Fertility decline in Hungary, 1910–1930], *KSH NKI Történeti Demográfiai Füzetek 13*. Budapest: KSH Népeségtudományi Kutatóintézet, pp.111-200.
- Davis, K. (1945). The world demographic transition. *The Annals of the American Academy of Political and Social Sciences*, 237, pp.1-11.
- Demeny, P. (1972). Early Fertility Decline in Austria-Hungary: A Lesson in Demographic Transition. *Daedalus*, 97(2), pp.502-522.
- Dribe, M., Oris, M. and Pozzi, L. (2014). Socioeconomic status and fertility before during, and after the demographic transition: An introduction. *Demographic Research*, 31(7), pp.161-182.
- Goldscheider, C. (1971). *\*Population, modernization, and social structure\**. Boston: Little, Brown and Company.
- Guinnane, T. W. (2011). The Historical Fertility Transition: A Guide for Economists. *Journal of Economic Literature*, 49(3), pp.589–614.
- Gutmann, M. and Alter, G. (1993). Family Reconstitution as Event History Analysis. In: D. Reher and R. Schofield, eds., *Old and New Methods in Historical Demography*. Oxford: Clarendon Press, pp.159-177.
- Gyurácz, F. (2000). *Bük (Száz magyar falu könyvesháza)*. [The monograph of Bük], Budapest: Száz Magyar Falu Könyvesháza KHT.
- Hablicsek, L. (1991). Demographic transition in Finland and Hungary: A comparative study. *Finnish Yearbook of Population Research*, 29, pp.32-60.
- Henry, L. and Blum, A. (1988). *Techniques d'analyse en démographie historique*. Paris: INED.
- Kamarás, F. (1991). *A magyarországi demográfiai átmenet sajátosságai, 1900–1920*. [Characteristics of the Hungarian demographic transition]. KSH NKI Történeti Demográfiai Füzetek 9. Budapest: KSH Népeségtudományi Kutatóintézet, pp.157-186.
- Katus, L. (1980). A demográfiai átmenet kérdései Magyarországon a 19. században. [The problem of the demographic transition in 19<sup>th</sup> century Hungary], *Történelmi Szemle*, 2, pp.270–288.
- Kok, J. (2014). Historical Demography: Understanding Temporal Change, Individual Variation and Regional Persistence. *Tijdschrift voor sociale en economische geschiedenis*, 11(2), pp.237-259.
- Kovács, A. (1923). Az egyke és a népszaporodás. [One child system and population growth], *Magyar Statisztikai Szemle*, 1(3–4), pp.65-79.
- Kovács, A. (1936). Az egyke pusztítása a Sárközben. [The destruction caused by the one child system in the region of Sárköz], *Magyar Statisztikai Szemle*, 14(11), pp.905-919.

- Lesthaeghe, R. (1983). A century of demographic and cultural change in Western Europe: An exploration of underlying dimensions. *Population and Development Review*, 9(3), pp.411-435.
- Lesthaeghe, R. and Surkyn, J. (1988). Cultural dynamics and economic theories of fertility decline. *Population and Development Review*, 14(1), pp.1-45.
- Livi-Bacci, M. (1986). Social-Group Forerunners of Fertility Control in Europe. In: A. J. Coale and S.C. Watkins, eds., *The Decline of Fertility in Europe*. Princeton, NJ: Princeton University Press, pp.182-200.
- Maloney, T. N., Hanson, H. A. and Smith, K. R. (2014). Occupation and fertility on the frontier: Evidence from the state of Utah. *Demographic Research*, 30(29), pp.853-886.
- Melegh, A. (2000). *Kiskunhalas népesedéstörténete a 17. század végétől a 20. század elejéig*. [The population history of Kiskunhalas from the end of the 17<sup>th</sup> century up to the beginning of the 20<sup>th</sup> century], Kutatási Jelentések 65. Budapest: KSH Népszéktudományi Kutatóintézet.
- Németh, S. (2014). *Bük és Csepreg összehasonlító településföldrajza*. [The comparative regional geography of Bük and Csepreg], PhD disszertáció. Pécsi Tudományegyetem.
- Notestein, F. W. (1945). Population – the Long View. In: T. W. Schulz, ed., *Food for the World*. Chicago: University of Chicago Press, pp.36-57.
- Őri, P. (2007). *Demographic Patterns and Transitions in 18-20th Century Hungary. County Pest-Pilis-Solt-Kiskun in the Late 18th and Early 20th Centuries*. Working Papers on Population, Family and Welfare, 10. Budapest: Hungarian Demographic Research Institute.
- Őri, P. (2009). Demográfiai átmenetek a 20. században. A demográfiai viselkedés térszerkezetének változásai a történeti Pest megye területén, 1900-2001. [Demographic transitions in the 20<sup>th</sup> century. Changes in the spatial structure of demographic behaviour on the territory of historic Pest county, 1900-2001], *Demográfia*, 52(1), pp.32-55.
- Reher, D. S. and Sanz-Gimeno, A. (2007). Rethinking Historical Reproductive Change: Insights from Longitudinal Data for a Spanish Town. *Population and Development Review*, 33(4), pp.703-727.
- Skirbekk, V. (2008). Fertility trends by social status. *Demographic Research*, 18(5), pp.145-180.
- StataCorp. (2009). *Stata statistical software: Release 11*. College Station, TX: StataCorp LP.
- Szabó, J. (1975). *A büki iskola fejlődésének története*. [The history of education in Bük]. Research Paper. Bük: Városi Könyvtár.
- Szabó, J. (1985). *Bük község másfél évszázada I – II*. [One and a half century of Bük], Research Paper. Bük: Városi Könyvtár.
- Szél, T. (1930). *A házasságok termékenysége Budapesten*. [Fertility of marriages in Budapest], Budapest Főváros Statisztikai Közleményei, 60(2) Budapest.
- Thirring, L. (1936). Adalékok a házasság termékenysége 1930. évi statisztikájához. [A contribution to the statistics on marital fertility in 1930], *Magyar Statisztikai Szemle*, 14(8), pp.667-693.



- Thirring, L. (1941). Foglalkozási sajátosságok és házasság termékenysége. [Occupational conditions and marital fertility], In: Thirring, L.: *Tanulmányok az 1930. évi népszámlálás köréből*. Budapest: Stephaneum, pp.61-77.
- Thirring, L. (1959). Vizsgálódások a termékenység alakulásának foglalkozási, társadalmi-gazdasági jellegzetességeiről. [Examinations of the development of marital fertility by occupation, social and economic group], *Demográfia*, 2(1), pp.54-73.
- Tomka, B. (2000). *Családfejlődés a 20. századi Magyarországon és Nyugat-Európában: Konvergencia vagy divergencia?* [Family development in Hungary and Western Europe in the 20<sup>th</sup> century: Convergence or divergence?]. Budapest: Osiris.
- van Leeuwen, M. H. D. and Maas, I. (2010). *HISCLASS: A Historical International Social Class Scheme*. Leuven: Leuven University Press.
- van Leeuwen, M. H. D., Maas, I. and Miles, A. (2002). *HISCO: Historical International Standard Classification of Occupations*. Leuven: Leuven University Press.
- van Poppel, F. and Derosas, R. (2006). Introduction. In: R. Derosas and F. van Poppel, eds., *Religion and the Decline of Fertility in the Western World*. Dordrecht: Springer, pp.59-81.
- Vásáry, I. (1989). The sin of Transdanubia: The one-child system in rural Hungary. *Continuity and Change*, 4(3), pp.429-468.
- Vézina, H., Gauvreau, D. and Gagnon, A. (2014). Socioeconomic fertility differentials in a late transition setting: A micro-level analysis of the Saguenay region in Quebec. *Demographic Research*, 30(38), pp.1097-1128.