Available online at www.sciencedirect.com

SciVerse ScienceDirect

Research in Social Stratification and Mobility 33 (2013) 40–55

Research in Social Stratification and Mobility

http://elsevier.com/locate/rssm

Intergenerational class mobility in Hungary between 1865 and 1950: Testing models of change in social openness

Zoltán Lippényi [a,*], Ineke Maas [b], Marco H.D. van Leeuwen [c]

[a] *ICS/Utrecht University, Department of Sociology, Padualaan 14, room C2.06, 3584 CH Utrecht, The Netherlands*
[b] *ICS/Utrecht University, Department of Sociology, Padualaan 14, 3584 CH Utrecht, The Netherlands*
[c] *ICS/Utrecht University, Department of Sociology/IISG, Padualaan 14, 3584 CH Utrecht, The Netherlands*

Received 21 June 2012; received in revised form 22 February 2013; accepted 4 March 2013
Available online 14 March 2013

Abstract

This article describes long-term changes in the occupational class structure and intergenerational social mobility in Hungary between 1865 and 1950, a period that has not been studied in previous mobility research. The study's long time span and the fact that the Hungarian economy began to industrialize in the second half of the 19th century allows us to test several competing hypotheses about changes in social mobility. We use a large, individual-level, historical dataset with over 73,000 marriage records, representing all regions of present-day Hungary. Although the occupational structure remained predominantly agrarian, total mobility increased over the observed period, with an upward shift in the occupational distribution. Log-multiplicative association models were used to compare relative mobility patterns of men across 17 mobility tables over five-year periods. Relative mobility increased, lending partial support to the modernization thesis. The increase of relative mobility can be attributed to decreasing diagonal association. Off-diagonal association, indicating class-based inequalities in mobility chances, increased during the first period of industrialization. The results call for a closer examination of the mechanisms causing changes in social mobility during industrialization.

Keywords: Intergenerational social mobility; Occupational class; Relative mobility; Hungary; Log-linear models

1. Introduction

In this article, we analyze intergenerational social mobility in Hungary between 1865 and 1950 with a large-scale dataset of marriage records from the territory of present-day Hungary. The results of this study contribute to the tradition of research on intergenerational mobility in at least two ways.

First, previous research on intergenerational mobility in Hungary suggests that interesting changes took place in Hungary from 1865 to 1950, but no study has thoroughly investigated this claim. Studies on intergenerational mobility in Hungary have so far focused on two important economic-political transitions in Hungarian history: the socialist restructuring of the 1950s (Andorka, 1982; Ganzeboom, De Graaf, & Róbert, 1990; Luijkx, Róbert, De Graaf, & Ganzeboom, 2002; Simkus, 1981, 1984; Szelényi, Aschaffenburg, Chang, & Poster, 1998) and the transition to a market economy (Bukodi & Goldthorpe, 2009; Róbert & Bukodi, 2004). These studies conclude that relative intergenerational mobility increased during the socialist restructuring, but they

* Corresponding author. Tel.: +31 0302534830.
E-mail addresses: z.lippenyi@uu.nl (Z. Lippényi), i.maas@uu.nl (I. Maas), m.h.d.vanleeuwen@uu.nl (M.H.D. van Leeuwen).

0276-5624/$ – see front matter
http://dx.doi.org/10.1016/j.rssm.2013.03.001

also find evidence that changes in the mobility regime might have taken place before the 1950s (Ganzeboom et al., 1990; Luijkx et al., 2002; Simkus, 1981; Szelényi & Szelényi, 1995). In one study that included birth cohorts before the 1950s, the overall trend in increasing relative mobility did not change its pace after the communist takeover (Ganzeboom et al., 1990). Luijkx et al. (2002) found similar results and concluded that "the communist take-over cannot be considered as an important break in the developments of declining ascriptive criteria for social mobility in Hungary." These studies, however, cover only a short period before 1950 that includes World War II, making it difficult to draw firm conclusions about long-term changes. Our study covers almost a century, allowing us to analyze long-term trends in intergenerational mobility and the effects of historical events, such as World Wars I and II and the Great Depression. This long time span makes it possible to test the claim that a long-term increase in relative mobility occurred in Hungary before the communist takeover.

Secondly, this study provides empirical tests of hypotheses about long-term changes in relative mobility. In the theoretical literature, there are contrasting views about how the social mobility regimes of industrialized societies have changed over time. According to the *modernization thesis*, modernization processes gradually break down the barriers of traditional society and lead to increasing social mobility over time (Blau & Duncan, 1967; Treiman, 1970). Others cast doubt on the proposition that social class rigidities gradually decline over time. Building on Featherman, Jones and Hauser's (1975) hypothesis of constant relative mobility, Grusky and Hauser argue that there might have been a *one-time increase* in relative mobility rates during the early industrialization period, but relative mobility rates do not change or vary between countries once a certain level of industrialization is reached (Grusky, 1983; Grusky & Hauser, 1984). Conflict theorists doubt that there has been any increase in relative mobility over time. In their view, social elites react to developments threatening their positions by adopting strategies of *status reproduction* to maintain high status for themselves and their children (Bourdieu & Passeron [1970] 1990; Collins, 1971). The period covered by our data includes both the onset and development of industrialization in Hungary, providing an excellent opportunity to test these competing hypotheses.

More than 60 years of stratification and mobility research have not been able to solve the theoretical debate surrounding changes in mobility. Using large-scale mobility surveys, stratification and mobility researchers have mainly investigated if industrial societies since the 1950s have had similar levels of absolute and relative social mobility and if social mobility changes over time (Breen, 2004; Erikson & Goldthorpe, 1992; Featherman et al., 1975; Ganzeboom, Luijkx, & Treiman, 1989; Grusky & Hauser, 1984; Hauser & Grusky, 1988; Lipset & Zetterberg, 1959). Recent comparative studies on intergenerational social mobility show considerable cross-country differences in the extent of social mobility and no evidence that the mobility regimes of industrial societies have converged toward a common pattern of mobility since the 1970s (Breen & Jonsson, 2005). These findings call for a closer examination of mobility patterns over longer periods of time to understand the driving factors behind present day differences in social mobility.

Sociologists increasingly rely on historical micro-data to analyze long-term changes in social mobility (van Leeuwen & Maas, 2010). Until recently, only a handful of countries have been studied, including Great Britain (Lambert, Prandy, & Bottero, 2007; Miles, 1994), the U.S. (Grusky & Fukumoto, 1989; Guest, 2005; Guest, Landale, & McCann, 1989), France (Fukumoto & Grusky, 1993), the Netherlands (van Leeuwen & Maas, 1997), and Sweden (Maas & van Leeuwen, 2002). There have also been a few comparative studies between these countries (Long & Ferrie, 2005, 2007). One challenge presented by studies of long-term mobility is to obtain micro-data that are representative across a given time period for a specific geographic area and reliable enough to make generalizable conclusions and comparisons with other periods or countries (Goldthorpe, 2007; Grusky & Fukumoto, 1989). With some exceptions, such as the Dutch Historical Sample of the Netherlands (Mandemakers, 2000), historical datasets are not collected using random sampling techniques and often only represent the working population of smaller geographic entities, such as towns and cities (Kaelble, 1983; Thernstrom, 1980). As a result, conclusions based on these data are susceptible to sample selection bias because of geographic mobility or the geographic distribution of occupations.

In this study, we utilize a large, recently collected, occupation-based mobility dataset based on marriage records from Hungary (Lippényi, Maas, van Leeuwen, & Margittai, 2011) that were collected using probability sampling techniques and include all regions and municipalities of present-day Hungary between 1865 and 1950. Our research question is: *How did Hungary's social structure and social mobility patterns change between 1865 and 1950?*

2. Theories of long-term changes in social mobility

Sorokin was one of the first sociologists to empirically address changes in social mobility (Sorokin [1928] 1959). Sorokin considered the amount of intergenerational flow between "classes" to be an indicator of the openness of a given society. As noted by later generations of sociologists, absolute mobility flows between classes are not genuine measures of openness because changes in class sizes between generations (due to differential fertility rates across classes or structural shifts in the economy) influence the amount of observed mobility. The extent to which people from different occupational class backgrounds have equal chances of accessing other occupational classes is a better operationalization of social openness that is captured by the concept and measurement of relative mobility. We begin by reviewing different hypotheses about long-term changes in relative social mobility, including hypotheses that predict a gradual increase, no trend, and convergence or a sudden increase followed by constant fluctuations in social mobility.

Modernization theory argues that, following industrialization, there was a permanent increase in relative mobility in industrialized societies. In pre-industrialized economies, labor was distributed based on familial or kinship ties; however, in industrial labor markets, labor was allocated according to formal hiring practices. Economic rationality shifted hiring practices toward universalism. New occupations in industrial production were complex or involved a great amount of responsibility (e.g. supervisors in factory production or engine operators) that made it necessary for employers to select workers based on skills, experience, and acquired knowledge. On the supply side, labor became more highly educated, increasingly mobile due to better and cheaper means of transportation, and better informed about job opportunities because of the spread of printed media and electronic mass communication. Because people could acquire skills, experience, and knowledge, lower social classes were able to attain higher occupational positions (Landes, 1969; Treiman, 1970).

An important aspect of the relationship between modernization and relative mobility is gradual change once the principles of competition and economic efficiency pervade the labor market, unless the economic system changes, the rigidities of the class system will gradually break down, leading to an increase in relative mobility over time (*H*1).

An important revision of the modernization thesis originated from the work of Sorokin, who argued that there is no trend in mobility; just a "trendless fluctuation" between periods of greater and less mobility. Status reproduction theory developed mechanisms that could produce such fluctuations in relative mobility. Bourdieu and Collins, proponents of status reproduction theory, argued that parents adopt strategies to successfully reproduce their status when their status positions are threatened by increasing competition from other classes. For example, parents may invest more in the human and cultural capital of their children so that they are more successful in school examinations (Bourdieu & Passeron [1970] 1990; Collins, 1971). Because lower status parents cannot afford to invest in their children's human and cultural capital as much as higher status parents, children from higher status backgrounds enjoy a comparative advantage in the competition for valued resources, such as prestigious occupations.

The theory of occupational closure describes a somewhat similar mechanism to that proposed by status reproduction theorists. Occupational closure theory postulates that occupational groups rationalize and optimize selection processes through bureaucratic practices (e.g., licensing, educational credentialing, certification, unionization) that provide a gate-keeping function (Weeden, 2002). Acquiring additional certificates, credentials, or associational memberships usually requires money or other forms of investment that job candidates with higher socio-economic resources find it easier to make. Consequently, jobs with higher occupational closure may be more difficult to attain for job candidates from lower socio-economic backgrounds. Occupational closure theory highlights the two sides to meritocratic selection. On the one hand, meritocratic selection provides greater opportunities for talented candidates from lower socio-economic backgrounds. On the other hand, more formalized selection criteria that require more credentials place an additional burden on job candidates, whose level of socio-economic resources may determine if they can clear these hurdles (Grusky & Weeden, 2001). Based on the mechanisms described by status reproduction theory and occupational closure theory, we expect that there is no continuous trend toward increasing or decreasing relative social mobility over time (*H*2).

Another important revision of the modernization thesis argues that relative mobility is not gradually increasing but remains constant in industrialized societies (Featherman et al., 1975). The theoretical reasoning is that the amount of social inequality is determined by the opportunities in a given political and economic system and, provided that there is stability or little change in these conditions, relative mobility is not expected to deviate much (Parkin, 1971). This

hypothesis was tested using cross-sectional data to compare social-democratic and liberal welfare states (Erikson, Goldthorpe, & Portocarero, 1979; Erikson, Goldthorpe, & Portocarero, 1982) and investigate the peculiarities of socialist planned economies (Wong, 1995; Wong & Hauser, 1992). To study long-term trends, Fukumoto and Grusky (1993) reformulated the hypothesis, arguing that during periods of dramatic economic change, such as early industrial expansion, we can expect larger changes in social mobility than in periods with little economic change (Fukumoto & Grusky, 1993).

To apply this theory to the Hungarian case, we must identify Hungary's period of industrial expansion. Historical research dates the start of industrialization in Hungary around the 1860s. In the second half of the 19th century, Western European agricultural production could not adequately supply its large population. Hungary, as well as other late industrializing nations, had large agricultural reserves and exported agrarian products and other raw materials to Western Europe (Berend, 2003). The establishment of the Austro-Hungarian Empire in 1867 created a larger market and unified economic policies, providing a favorable economic background to modernization (Swain, 1992). Increases in the production of agrarian goods had incidental effects on industrial development; most importantly for the food processing industry (Eddie, 1989). Although the Hungarian economy was predominantly agricultural, there were important developments in the mining and steel industries, partly to utilize raw materials and partly to fuel the rapid development of the railroad system across the empire (Berend, 2003). According to John Komlos's estimates, industrial output increased by 600 percent until 1914 (Good, 1984), with increases in industrial output coming to an end during World War I. In the peace treaties after World War I, Hungary lost two-thirds of its territory, including important cities, transport connections, and more than half of its previous population, leading to industrial and commercial decline. Hungary also sheltered many refugees who had fled to Hungary from its former territories after the war.

Based on theoretical arguments and Hungarian economic history, we expect there to be a steeper increase in relative mobility in the period before World War I than after World War I (*H*3).

Sorokin originally argued that changes in social mobility are *temporal* because they occur around important historical events, such as wars, revolutions, and political regime changes. *War* may lead to increased social mobility. For instance, war economies increase industrial production that may lead to a temporary or permanent increase in the size of lower, non-manual classes because of an increased number of military professions and an increase in the size of the non-agrarian, manual classes. Damage to industry or the land and increased mortality (Cantrell & Clark, 1982; Keyfitz, 1973) may also forcibly change people's mobility. These changes concern total mobility. One reason total mobility may be affected by war is that the types of occupations that increase in number during war, such as military positions, are more meritocratic and provide more opportunities for vertical mobility for people from lower class backgrounds. The reason why relative mobility can also change is that during and after war, a large number of occupational positions must be rapidly filled or redistributed due to casualties and damage, which shock the mechanisms of social reproduction and labor market selection and could lead to an increase in relative mobility. *Revolutions or political regime changes* could also "shock" the mobility regime, by opening previously barred positions to some, while at the same time removing wealth and positions from those previously in power.

Hungary suffered significant property damage and casualties during World War I and II. The post-war periods in Hungary also brought political turmoil (Berend, 2001). After World War I, the empire was abolished and the First Hungarian Republic was established in 1918, followed by the short-lived Hungarian Soviet Republic in 1919 and, finally, the restoration of the empire at the end of 1919 under the regency of Admiral Miklós Horthy. After World War II, the Second Hungarian Republic was established in 1946 only to be abolished in the communist takeover at the end of the 1940s.

We expect relative mobility in Hungary to be greater during World War I (1915–1919) and World War II (1940–1944 and 1945–1950) (H4).

3. Data

Historical data were collected as a part of the Hungarian Historical Social Mobility Project to study long-term changes in social inequalities in Hungary. The sampling frame comes from municipal parish marriage registers that contain information on the occupations of grooms and their fathers. We were unable to collect data for the entire historical territory of Hungary. Therefore, our results are generalizable only to present-day Hungary, whose borders were established in 1920. Drawing a random sample from all marriage registers in this territory would not only be difficult, but it would also lead to little variation with respect to occupational class because Hungarian society is still largely agrarian. We therefore drew a random sample of marriage records from a

stratified sample of municipalities, including municipalities with different economic structures.

An important concern we addressed with the design of the sample was that the legal status of a settlement (e.g., village or town) does not necessarily reflect the level of their development. In his study on Hungarian settlement structures in 1910, Beluszky (2001) showed that approximately 300 settlements had some urban functions (more than twice the number of the officially acknowledged towns), but some official municipalities lacked any urban character (Beluszky, 2001). We therefore stratified Hungarian municipalities both by the legal status of the settlement (villages, towns, and regional centers) and by the level of its development. To obtain the latter, we used demographic and development indicators from the 1930 Hungarian Census and performed cluster analyses. The 1930 Hungarian Census contains information on demographics, labor, and housing conditions for the Hungarian population. The figures were aggregated to the municipal level and supplemented with information on economic establishments from the Hungarian Central Statistical Office. Full information for all relevant statistics was available for 3.417 municipalities. Published volumes of the Census, containing data aggregated to the municipal level, were used (Census, 1930, 1935). Further details on the cluster analyses can be obtained from the dataset's codebook (Lippényi et al., 2011). The following settlement clusters were identified: rural villages, developing rural villages, urban-type villages, agrarian towns, industrializing towns, developed urban towns, and regional centers with municipal rights.

The second concern with the design of the sample was that Hungarian settlements were overwhelmingly agrarian; rural villages made up more than two-thirds of all municipalities. Non-agrarian municipalities, where less than half of the population works in agriculture, composed only 5.4 percent of all settlements. The distribution of the population was, however, more even across agrarian and non-agrarian settlements: 37 percent of the Hungarian population lived in non-agrarian settlements, whereas 63 percent lived in agrarian-type municipalities. To represent all types of municipalities, we used a two-stage stratified cluster sample design to sample municipalities. We used the 1930 Census as a sampling frame. Sampling within the randomly selected, larger regions of Hungary was performed by first randomly selecting a maximum of two towns from each developmental cluster with municipalities present in the region. For three of the randomly selected regions, we also sampled one regional center with municipal rights and included two districts from the capital city of Budapest. Next, for each town or regional center, we randomly selected one or two villages in the micro-region of the town, again, one or two from each developmental cluster. Although the sample should be weighted to represent the country, this method allowed us to include each region and type of municipal development in the sample.

For each municipality, we proceeded by digitizing the marriage acts from the church books of all local religious congregations, including Roman Catholic, Hungarian Reformed, Lutheran, and Jewish.[1] Church books' marriage records were registered by the registrar or priest and, in some cases, did not document the occupation of the father, groom, or both. Church books did not always document occupational information because of different customs. It was necessary to pre-select sampled towns to circumvent towns with very few marriages or little occupational information documented in their church books. Towns were pre-selected by first counting the number of church-marriage records every five years and the number of marriages that did not contain occupational information for the father, the groom, or both. Based on these counts, we decided to either proceed with data collection for the town or select another town. The decision rule was that if valid observations for the most popular denomination were absent over a period of 30 years or the number of valid observations made up less than 30 percent of all marriages within that denomination, we dropped the town from the sample and sampled another town from the same region and developmental type. If a town was sampled, we repeated the same procedure as below for each of the sampled villages in the micro-region, dropping those with sparse marriage records and randomly selecting a replacement village from the micro-region with a similar developmental profile.

For larger cities, systematic random sampling of marriages was necessary because there were too many marriages. Random sampling was achieved by assigning a sampling interval for each year, denomination, and municipality. The starting point for a given page of a church book was selected randomly.

The digitized data only contain recorded marriages with occupational information. The final dataset contains 73,893 marriage records.

The data were collapsed into 17 five-year periods beginning in 1865. To describe the social structure and total mobility, the data were weighted to reflect the population distributions across macro-regions and

[1] For the South Hungarian town of Kalocsa and two surrounding villages, church books had already been digitized and put at our disposal. Our estimates for the data collection, e.g., the expected number of marriages per period, were based upon the inspection of these data.

Table 1
Number of cases in the total sample.

Period	Unweighted *N*	Weighted *N*
1865–1869	1447	613
1870–1874	1719	468
1875–1879	1856	415
1880–1884	2290	1108
1885–1889	2887	2354
1890–1894	4208	2390
1895–1899	4138	2636
1900–1904	4707	4707
1905–1909	5617	5618
1910–1914	5167	5168
1915–1919	4115	3130
1920–1924	5450	5450
1925–1929	5795	5560
1930–1934	5835	5726
1935–1939	5967	5426
1940–1944	5464	3613
1945–1950	7231	7203
Total	73,893	61,585

developmental clusters. We used iterative proportional weighting to fit the data to the population distribution. The population sizes were obtained using municipal-level aggregate data on population size from the Hungarian Census, held once every ten years between 1869 and 1949 (Dallos & Klinger, 1990). Table 1 shows the number of observations for each five-year period. Reductions in the number of observations in some periods are caused by a rescaling of the weights to avoid extremely high or low weights.

During the study period, marriage was almost universal in Hungary according to historical demographic estimates (Hajnal, 1953, 1982). Therefore, we expect that the data adequately represent the population of Hungary. The results over time may have been affected by changes in the marriage age of grooms, but further evaluation of this issue does not suggest any bias. The average age of grooms in the sample was 25 and did not change over time.[2]

4. Occupations and occupational classes

The occupations of the groom and his father were recorded by the registrar in the marriage registers. The occupational information was digitized and coded using the Historical Intergenerational Standard Classification of Occupations (HISCO) is an occupational classification system used for historical and international occupational titles. HISCO has been applied to data originating from more than 15 countries (Leeuwen, Maas, & Miles, 2002). The purpose of HISCO is to create comparable occupational categories across historical periods and countries that can later be classified into classes or scales using status scores. The occupational codes were then classified according to the Historical International Social Class Scheme (HISCLASS), a historical social class scheme based on HISCO (van Leeuwen & Maas, 2011).

HISCLASS distinguishes between 12 classes, but not all classes were well-represented in the Hungarian occupational structure because some were too small. We chose to combine classes such that they represent primarily the *manual/non-manual*, *sectorial*, and, to a lesser extent, *skill-level* dimensions of the labor market. The dimension of *supervision* was omitted because it was difficult to identify in most marriage records that only contained occupational titles and no detailed information about the position of a person's particular job. We concentrate on 6 categories of HISCLASS: *managers and professionals; lower-level managers and professionals and clerical and sales personnel; highly skilled workers; farmers; low-skilled workers; and farm workers*. With respect to the 12 original categories for HISCLASS, we merged the classes for *higher-level managers* and *higher-level professionals* to form the highest class, which also includes large proprietors and estate owners in keeping with the original HISCLASS scheme. The other non-manual workers, including *lower-level managers and professionals and clerical and sales personnel* and *lower-level clerical and sales personnel*, were placed in the second class. The two higher-skilled, non-agrarian manual classes, *foremen* and *medium-skilled workers* were placed in the same class as *highly skilled workers.* This class also includes non-factory skilled manual workers, such as artisans. The *farmers* in our classification scheme represent primary sector workers who are likely to be owners of their land, or perform highly skilled farm labor, and are identical to the class of *farmers and fisherman* in the original class scheme. *Low-skilled workers* and *unskilled workers* not employed in the primary sector were merged into a single class, and *low-skilled farm workers* and *unskilled farm workers* were merged into a single class as well. Non-ranked soldiers were excluded from the analyses. A vast majority of non-ranked soldiers were unlikely to have actual occupations in the military due to mandatory conscription.

[2] The class structure and amount of total mobility does not differ between the age group 18–35 and those who were older than 36. The only difference comes in a steeper increase in the number of *Managers and Professionals* in the older age group than in the younger age group, which can be explained by the fact that access to occupations in this class is mostly possible in a later career stage.

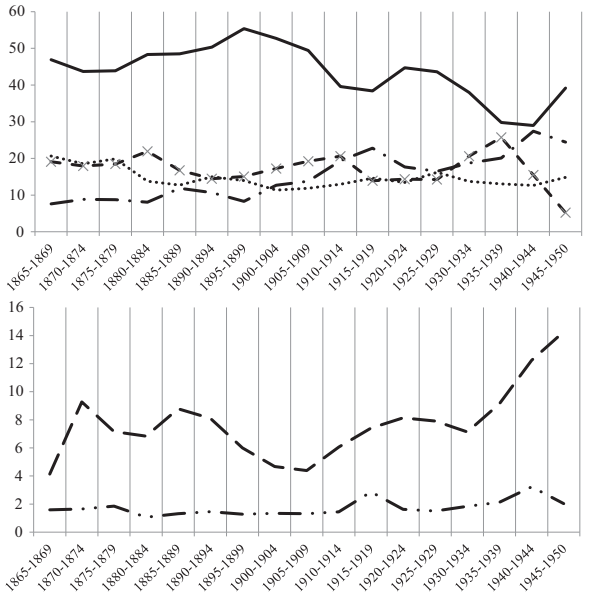

Fig. 1. Changes in class structure in Hungary, 1865–1950. (a) *Source*: Hungarian Historical Mobility data file (a) farmers ——— farm workers ---×--- highly skilled workers ..... low-skilled workers — · — managers and professionals — . . — lower-level managers and professionals, clerical, sales — — · .

5. Changes in the occupational structure and total mobility

Although our focus is on relative mobility, it is also interesting to look at the extent to which the occupational structure changed in terms of the *relative* size of occupational destinations and the extent of mobility between generations. Fig. 1 shows changes in the occupational structure of Hungary between 1865 and 1950 based on Hungarian Historical Mobility data.

The largest class throughout the entire historical period is the class of *farmers*. Its dominance in the class structure, however, diminishes over time. There is an initial decrease in the size of the *farming* class that may be attributed to the fact that the sons of liberated serfs, who received land in 1848, were forced to leave the agricultural sector because they could not maintain their property, or because the land was too small to make harvesting economically worthwhile (Kövér & Gyáni, 1998). Between the 1870s and 1895, there was an increase in the relative size of the farming class, mostly at the expense of *highly skilled workers* and *farm workers* and, to a lesser extent, *low-skilled workers*. In this period, there was a high demand for agricultural products in Europe (Eddie, 1989). These favorable conditions partly explain why sons of *farm workers* and *highly skilled workers* tried to engage in farming.

The relative size of the *farming* class diminishes gradually in the first half of the 20th century until the period between 1945 and 1950. The decrease in this class after the turn of the century is paralleled by an increase in the size of the class of *farm workers* until World War I and, based on the trends in other classes, may be attributable to two interrelated processes: the downward mobility of farm owners' sons who could not make a living during a period of difficult economic conditions for farmers and the upward mobility of sons of well-to-do farmers into non-manual or industrial classes, which increases the demand for farm labor among families that owned farms.

There are two large, abrupt changes in the relative size of the agrarian classes. Just before and during World War I, the relative size of the *farming* class decreases abruptly. Between 1945 and 1950, the sudden increase in the relative size of the farming class and sudden drop in the *farm workers* class is most likely caused by agricultural reform in 1946, which redistributed land among agricultural workers (Romsics, 1999).

The relative size of the class of *low-skilled workers* increases steadily across the period, mirroring the change in the *farming* class to a great extent. The relative size of the class of *highly skilled workers* remains fairly stable, after an initial decrease, until the turn of the century.

The proportion of *lower-level managers and professionals and clerical and sales personnel* decreases until 1910, after which there is sudden increase likely due to the war economy. Thereafter, there is an almost uninterrupted increase in the size of this class until 1950. Although smaller, the development of the class of *professionals and managers* mirrors that of the class of *lower-level managers and professionals and clerical and sales personnel*. An interesting finding is the sudden increase in the 1860s and 1870s in the number of *lower-level managers and professionals and clerical and sales personnel*. This increase may be attributable to the establishment of the Austro-Hungarian Empire in 1867, during which time new state institutions created a large number of clerical and other governmental positions (Berend, 2003).

The most important structural findings are as follows. First, the relative size of the *farming* class diminishes, but not in a linear fashion. In some periods the farming class even increases, possibly reflecting changes in the price of and markets for agrarian products. Second, developments in the relative class size of *low-skilled workers* and *farm workers* and, in the early period, *highly skilled* workers, mirrors the development of the relative class size of *farmers*, forestalling a great amount of exchange between manual classes. Third, the class

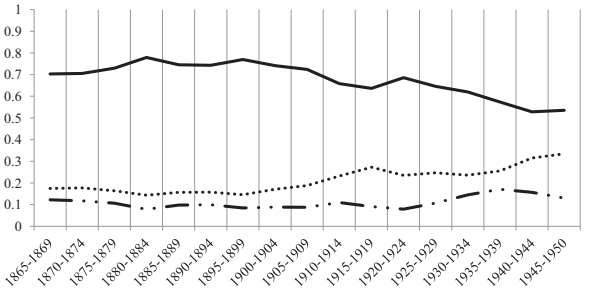

Fig. 2. Total immobility, downward and upward mobility in Hungary, 1865–1950. (a) Source: Hungarian Historical Mobility data file (b) Immobility ——— Upward mobility ..... Downward mobility — . . — .

size of non-manual workers increases over time, indicating that modernization and urbanization processes took place during this period.

To investigate the direction of exchange between classes and the extent of immobility, we calculated the percentage of grooms who were upwardly mobile, downwardly mobile, and immobile for each period. Industrial to non-manual transitions, agrarian to non-manual transitions, and agrarian to industrial transitions were treated as upward mobility. Within sectors, non-skilled to skilled transitions were treated as upward mobility. The reverse of these transitions were treated as downward mobility. Overall, we see a pattern supporting the modernization thesis; declining immobility and an upward shift in the occupational distribution (Fig. 2). There is, however, a slight increase in downward mobility as well.

6. Modeling relative mobility

Absolute mobility flows between classes are influenced by changes in class sizes between generations. Relative mobility shows the pattern and magnitude of relative differences in mobility flows from certain occupational origins to occupational destinations, net of the impact of changes in the marginal distributions (i.e., the underlying inequalities in the mobility regime). Log-linear and log-multiplicative models capture relative mobility by modeling the association structure with odds ratios between origins and destinations in each mobility table. Odds ratios do not depend on changes in the marginal distributions of occupational origins and destinations (i.e., in structural changes) and are useful measures to study variation in underlying inequality in the class structure across mobility tables.

We estimated a quasi-row and column association (RC) model as a baseline model of mobility (Goodman, 1979). The off-diagonal association is modeled by a multiplicative interaction term, consisting of a single, scaled association parameter and occupational origin and destination class scores. The class scores and the association parameter are both estimated from the model. The origin scores can be interpreted as the relative amount of resources for mobility that each individual, on average, can draw from his class origin (Breen, 1994; DiPrete, 1990). The underlying assumption is that classes can be placed in a hierarchical order in terms of their general resources, and the distances between these classes indicate the extent to which they are similar in resources. Destination scores can be interpreted as the desirability that people, on average, attribute to each class destination, regardless of social origin. Thus, destination scores indicate the strength of competition for positions in a specific class destination. Again, a hierarchical order is assumed. The assumption is that the difference in mobility flows (above structural changes in the margins) from origin classes A and A′, respectively, to a destination class B, indicates the resource differential between classes A and A′. Similarly, the difference in mobility flows to destination classes B and B′ from origin A expresses the desirability differential between destination classes B and B′. The single association parameter expresses the intensity with which class inequality, in terms of available general resources (inequality of origins), affects class inequality in terms of mobility chances (inequality of destinations).

The diagonal cells hold specific importance in mobility tables because they indicate the propensity of certain classes for self-recruitment. These parameters estimate the extent to which classes are “relatively” more immobile than one would predict based on the origin and destination marginal distributions. In substantive terms, the diagonal effects express the joint impact of two mechanisms. First, the diagonal effects represent the extent to which class origins command specific resources (or confront class-specific barriers) that lead to the reproduction of occupational class positions but not an advantage in access to other occupational classes. Land is a good example of a class-specific resource that provides advantages to sons of farmers who directly inherit it from their father’s occupational class. However, land is not a directly transferable resource such as capital or education. Second, the diagonal effects represent “tastes” or the norms of members in a specific class that are associated with staying in the same class as one’s father.

7. Modeling change across tables

To compare the level of off-diagonal associations across tables, log-multiplicative layer-effect models are estimated (Erikson & Goldthorpe, 1992; Xie, 1992).

These models provide a method for parsimonious comparisons of the level of association across mobility tables. The models include parameters that describe the common level of association, and table-specific comparison parameters, referred to as multipliers. The table-specific multipliers show the extent to which the association multiplicatively differs in the specific table from the common level of association. Because the diagonal association is expressed by more than one parameter, we estimated "uniform difference" models and also models in which the parameters could change heterogeneously.

To test the hypothesis that mobility fluctuates over time but does not exhibit a particular trend (H2), we specified a model with separate multipliers for each period. The modernization thesis (H1) is tested by imposing a linear time trend on the multiplier. We also estimated a more flexible change model by specifying a quadratic trend for the multipliers. The "industrial jump" hypothesis (H3) is tested by specifying a linear trend for the period before World War I and a different linear trend thereafter.

To test whether historical events deliver temporal shocks that cause changes in social mobility (H4), we also estimated "shock" variants of all the change models and a shock version of the models predicting no change in social mobility. In addition to periods of war, we also control for the period of the Great Depression. The shock models include the following temporal shocks: World War I (1915–1919), World War II (1940–1944 and 1945–1950), the Great Depression (1930–1934), both war periods, and all periods (1915–1919, 1930–1934, 1940–1944, and 1945–1950).

The levels of diagonal and off-diagonal association do not necessarily change in uniform fashion from one period to another. It could be that a class's propensity to be immobile decreases from one period to another, but the relative mobility chances across classes remains the same. In other words, the general resources and desirability of the occupational classes maintain the distribution of the previous period(s), but class-specific resources, that drive immobility, decline or cannot be effectively used to reproduce status. If, however, only off-diagonal associations decrease, the distribution of general resources may be more equal across origins or the desirability of destinations may be more equal but class-specific resources for social reproduction and "tastes" for staying in one's class origin remain the same.

We estimated all possible combinations of the aforementioned shock and change models, both for the off-diagonal association parameters and the diagonal association parameters. Changes in the diagonal association parameters are also estimated for two different types of change, including uniform or heterogeneous changes across classes. In total, we estimated 1225 models.

All models were specified and estimated using the GNM-macro in R (Firth & Turner, 2005). We used the un-weighted dataset for the analysis.[3]

We estimated a large number of non-nested models and investigated the set of models similar to the best fitting model in terms of model fit. We used the Bayesian Information Criterion (BIC) to compare models.[4] First, we ordered the models in terms of their BIC to review the change in fit for the best-fitting 50 models (Fig. 3). The figure shows a clear 'jump' from the 8th best-fitting model. The eight best-fitting models are clearly the ones in contention for being the preferred one, while the others produce a substantially worse fit in terms of BIC. We also applied a more formal selection criterion: according to Raftery (1995) a difference of 10 in BIC values between two models indicates strong evidence in favor of the model with the lower BIC value. The first seven models were within the 10-point range of the best-fitting model. Table 2 presents these models. As an indication of the overall fit, we estimated the percentage of cases erroneously predicted by the model.[5]

In all of the best-fitting models, change on the diagonal is heterogeneous across classes; the trend is linear in the diagonal parameter and quadratic in the off-diagonal parameter. The first conclusion is that there is a clear trend in relative mobility in this period; however, closer inspection of the parameters is necessary to investigate the direction and magnitude of the change.

[3] The starting values for the maximum likelihood estimation were provided by the null-association model. In all models, the row and column marginal effects were fitted for each cohort separately. As convergence of increasingly complex models could be problematic, models were re-estimated at maximum 50 times if the initial estimation did not converge. Even after 50 trials, 138 models did not converge. Of these, 136 included a homogeneous change of the diagonal parameter which is a misspecification given the data, and the 2 other models that included heterogeneous change on the diagonal were models with only shock, for which the lack of trend caused the misspecification.

[4] Simulation studies showed that the BIC selects the true model from a set of candidate models, including the true model, with a higher probability as the sample size increases. The other frequently-used comparative fit measure, Aikake's Information Criterion (AIC), does not have this property (Kuha, 2004). As we rely on large-scale data and test a large set of theoretically plausible models to find the true model, we expect the BIC to perform better as selection criterion than AIC.

[5] Global measures of fit, such as χ^2 are relatively misleading due to the large sample size and because of the extremely uneven distribution of data between the diagonal and off-diagonal cells. The proportion of erroneously categorized cases gives a better indication of the magnitude of the misfit in the data, although it is by no means a formal test of model fit.

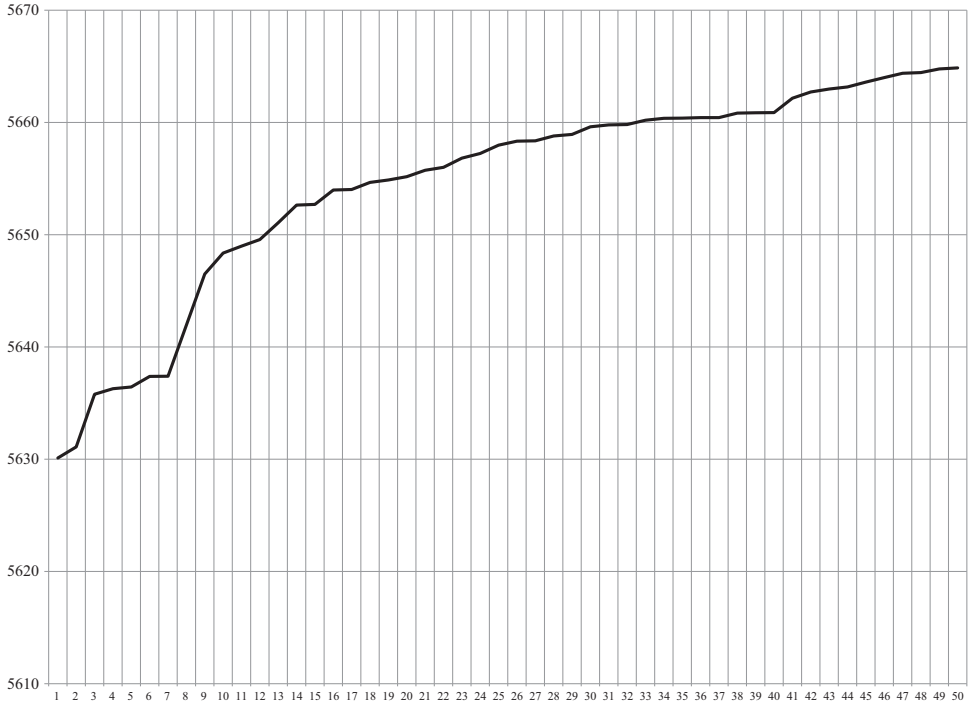

Fig. 3. BIC values from the best-fitting 50 estimated models.

With respect to the diagonal shocks, some models show no evidence of shocks and others show evidence of a shock during World War I. The two best-fitting models with almost identical BIC values differ with regard to if there is a shock during World War I. As the BIC is inconclusive, we have to look for other criteria to select the best fitting model. The percentage of erroneously categorized cases is lower in the shock model. Likelihood-ratio tests show that there is shock in the diagonal association: the deviance between the model with and without a shock is 37.5 with 6 degrees of freedom (heterogeneous for each class) and is statistically significant ($p = 0.000$), indicating that the World War I shock model fits the data better.

For the off-diagonal shock, the two best-fitting models indicate no shock and the difference in the proportion of erroneously categorized cases between the model with no off-diagonal shock (model 2 in Table 2) and the models with an off-diagonal shock (models 6 and 7) is virtually zero. We conclude that the most preferred model is the model with linear change in the diagonal association, quadratic change in the off-diagonal association, and a shock during World War I in the diagonal association (model 2 in Table 2).

8. Results from the best-fitting model

Table 3 shows the estimated parameters from the best-fitting model. The hierarchy of classes can be seen from the origin-destination scale values at the bottom of

Table 2
Best-fitting RC models[a].

No.	Diagonal trend	Diagonal change	Off-diagonal trend	Diagonal shock	Off-diagonal shock	df	BIC	% error
1	Linear	Heterogeneous	Quadratic	No shock	No shock	406	5630	5.91%
2	*Linear*	*Heterogeneous*	*Quadratic*	*WW1*	*No shock*	*400*	*5631*	*5.72%*
3	Linear	Heterogeneous	Quadratic	No shock	WW2	405	5636	5.91%
4	Linear	Heterogeneous	Quadratic	No shock	WW1	405	5636	5.90%
5	Linear	Heterogeneous	Quadratic	No shock	Great depression	405	5636	5.91%
6	Linear	Heterogeneous	Quadratic	WW1	Great depression	399	5637	5.73%
7	Linear	Heterogeneous	Quadratic	WW1	WW1	399	5637	5.72%

[a] Only the models for which the BIC difference with the best-fitting model was smaller than 10 are included. The preferred model is presented in italics.

Table 3
Parameter estimates from model 2[a].

	Estimate	Std. error	*z* value	*p*-Value
Diagonal intercept 1865–1869				
Managers and professionals	−0.040	0.340	−0.118	0.547
Lower-level managers, prof, clerical, sales	1.554	0.103	15.096	0.000
Highly skilled workers	1.694	0.064	26.601	0.000
Farmers	3.765	0.079	47.960	0.000
Low-skilled workers	1.417	0.077	18.477	0.000
Farm workers	0.778	0.160	4.853	0.000
Diagonal linear slope				
Managers and professionals	0.035	0.018	1.942	0.974
Lower-level managers, prof, clerical, sales	−0.060	0.008	−7.904	0.000
Highly skilled workers	−0.070	0.006	−12.372	0.000
Farmers	−0.055	0.007	−8.215	0.000
Low-skilled workers	−0.042	0.006	−6.576	0.000
Farm workers	−0.007	0.009	−0.738	0.230
Diagonal shock WW1				
Managers and professionals	−0.381	0.294	−1.297	0.097
Lower-level managers, prof, clerical, sales	−0.371	0.143	−2.590	0.005
Highly skilled workers	−0.112	0.106	−1.056	0.145
Farmers	−0.520	0.106	−4.897	0.000
Low-skilled workers	0.014	0.117	0.119	0.453
Farm workers	0.250	0.130	1.925	0.027
Off-diagonal association				
Off-diagonal association linear slope	0.068	0.013	5.232	0.000
Off-diagonal association quadratic slope	−0.005	0.001	−6.673	0.000
Scaled association parameter intercept 1865–1869	3.134	0.283	11.058	0.000
Scale parameters				
Managers and professionals[b]	1			
Lower-level managers, prof, clerical, sales	0.666	0.021	32.119	0.000
Highly skilled workers	0.477	0.012	41.163	0.000
Farmers	0.262	0.014	18.342	0.000
Low-skilled workers	0.382	0.012	32.307	0.000
Farm workers	0			

[a] Residual deviance: 1057; df: 400; the off-diagonal linear and quadratic slope parameters are multiplicative and show the deviations from 1. In period 1, the multiplier is $1 + 0 \times 0.068 - 0 \times 0.005 = 1$; in period 3, the multiplier of the scaled association parameter is $1 + 2 \times 0.068 - 4 \times 0.005 = 1.116$.

[b] The origin-destination score of *managers and professionals* is constrained to 1 and *farm workers* is constrained to 0 for the purpose of identification.

the table.[6] The scale values of all classes differ significantly from each other. *Managers and professionals* are the furthest away from the other classes. Managers and professionals' distance from the other non-manual class (*lower-level professional*, *clerical*, and *sales personnel*) is even larger than their distance from the manual classes, indicating a largely exclusive, elite class at the top of the class hierarchy. The two industrial classes are the closest two classes in the class hierarchy (*highly skilled* and *low-skilled workers*). The *farming* class is closer to the industrial classes than to the class of *farm workers*, indicating that *farm workers* were the most deprived class in the class hierarchy in terms of mobility resources and desirability.

The diagonal intercepts presented in Table 3 show the estimated diagonal association by class in the mobility table from 1865 to 1869. In this period, the *farming* class has the highest diagonal association compared to other classes; the odds of immobility compared to mobility is 43 ($e^{3.765}$). The classes of *lower-level managers and professionals and clerical and sales personnel*, *higher-skilled workers*, *lower-skilled workers*, and *farm workers* also have higher odds of immobility than mobility in the

[6] We tested whether scale values are equal for the same origins and destinations. Equality does not hold as the model with unequal origin and destination scores fits the data better in a likelihood-ratio test. Inspection of the identified scale parameters and their standard errors, however, reveal that none of the differences between origin and destination scores for the same occupations are statistically significant. We can conclude that the latent resources of class origins and the latent desirability of class destinations do not differ from each other.

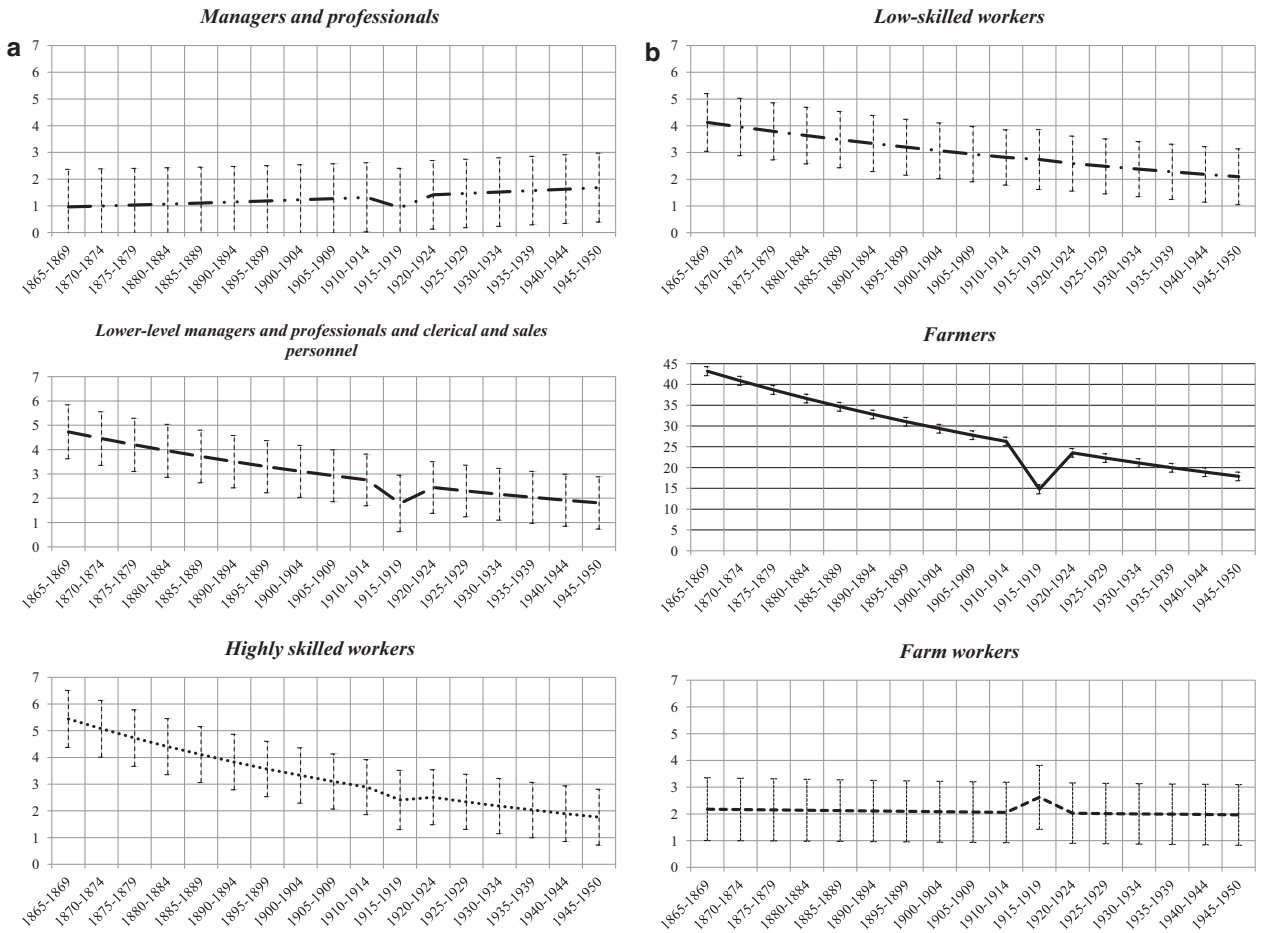

Fig. 4. Diagonal association: ratios per class and period, 1865–1950. (a) confidence intervals: $\alpha = 0.05$.

first period, although the odds *farm workers* are immobile are smaller than the immobility odds of the other three classes. The odds *managers and professionals* are immobile is not significantly different from 1, which may be because there are too few observations for this class in the earlier period.

Fig. 4 shows the heterogeneous linear trends and the shocks that occur in the diagonal associations by class (see Table 3 for the parameter estimates). The diagonal association decreased for all classes, except for *managers and professionals* and *farm workers.* The greatest decrease in the odds of immobility (approximately 60 percent) occurred for the classes of *farmers*, *highly skilled workers*, and *lower-level managers and professionals and clerical and sales personnel*. The decrease in immobility for *low-skilled workers* is approximately 50 percent. For *highly skilled workers* and *lower-level managers and professionals and clerical and sales personnel* the estimated odds of immobility do not differ significantly from 1 during the last three periods. *Farmers* still have very high odds (18) of reproducing their class position in the last period. The gradual decline in the diagonal association for most classes supports the modernization thesis that predicts a gradual decrease in relative mobility over time (*H*1), and fails to support hypotheses predicting trendless fluctuations in mobility (*H*2) or a sudden increase in mobility due to industrialization (*H*3).

During World War I, the odds of immobility significantly decreases for *farmers* and *lower-level managers and professionals and clerical and sales personnel*, and significantly increase for *farm workers*. This finding, however, provides only weak support for *H*4. First, the shocks are not the only changes that occur in the mobility regime, we also observe a linear trend. Second, the period during World War II does not seem to change the diagonal association at all. Finally, changes in this period are not uniformly toward more mobility for all classes.

The change in the scaled association parameter is quadratic. The linear component of the change is positive, and the quadratic component is negative (Table 3).

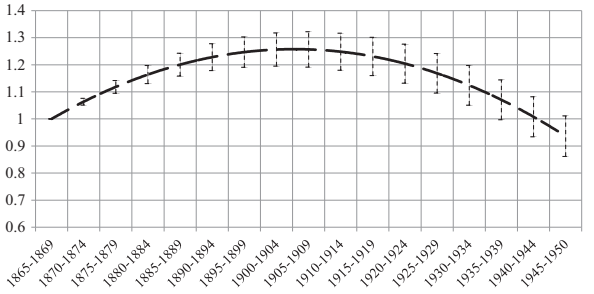

Fig. 5. Change in the multiplier of the scaled association parameter, 1865–1950. (a) Confidence intervals: $\alpha = 0.05$.

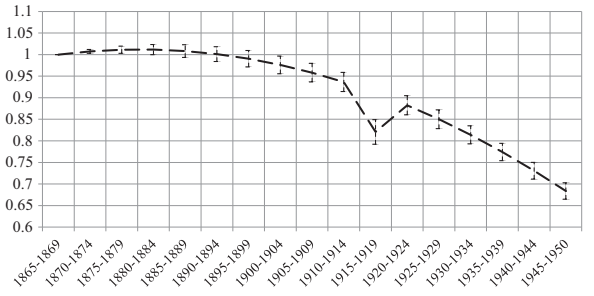

Fig. 6. Change in the UNIDIFF-multiplier for the origin-destination association parameters, 1865–1950. (a) confidence intervals $\alpha = 0.05$ (b) BIC: 5328, % error: 5.2 (lowest BIC among the estimated models) (c) model includes a quadratic change and a World War I shock.

The off-diagonal association increases at a decreasing rate until the period from 1905 to 1909, after which the association decreases (see Fig. 5). The results for the off-diagonal association do not support any of the hypotheses we have formulated. During the first industrialization period, there is an increase in the off-diagonal origin-destination association in Hungary, but the association decreases after this period. From 1935 onwards, the off-diagonal association is not significantly higher than it was in the first period from 1865 to 1869.

So far, we see different trends for the diagonal and the off-diagonal associations. To assess how the *total origin-destination association* changed, we estimated uniform difference models that do not constrain the origin and destination association structure[7] but use the different change and shock specifications we introduced in previous models. The best model included a quadratic change with a World War I shock. The estimated change in the UNIDIFF-multiplier is shown in Fig. 6. The total origin-destination association does not change much between 1865 and 1900, but decreases significantly thereafter. From 1945 to 1950, the association is 70 percent of that in the first period. If we look at the total association between origins and destinations, we can conclude that relative social mobility increased in Hungary in a fairly stable fashion from the turn of the century, interrupted only by a sharp increase during World War I.

9. Conclusions and discussion

In this paper, we have analyzed changes in social mobility in Hungary between 1865 and 1950. The occupational structure of Hungary was predominantly agrarian with a large class of farmers and a smaller class of *farm workers*, but there was an upward shift in the class distribution driven by an increase in the percentage of lower, non-manual workers and low-skilled industrial sector workers. Total mobility increased during this period.

Origin-destination scales estimated from the scaled association models revealed the existence of an underclass (*farm workers*) and upper class (*managers* and *professionals*) in the Hungarian class hierarchy. These findings mirror, to the extent that our macro-classes allow, historical descriptions of the Hungarian class structure during this period that highlight the existence of a bourgeois, professional, estate-owner elite and an agrarian underclass (Berend, 2003; Kövér & Gyáni, 1998).

One of the goals of this study was to test existing hypotheses about long-term changes in social mobility during and after industrialization. We distinguished between four hypotheses that predict the following changes in social mobility: a gradual increase in mobility, trendless fluctuations in mobility, a sudden increase in mobility during industrialization, and shocks to mobility regimes caused by wars and political changes. Modernization theory, which predicts a gradual increase in social mobility, received the most support in this analysis. From 1900 onward, Hungarian society became more open as relative mobility increased. Note that these increases in relative mobility occurred later than the industrialization in Hungary which started in approximately 1860. The mobility regime was temporarily shocked in the period during and shortly after World War I, although only for the odds of immobility, not for all classes, and not in an uniform direction. There were no effects found during the period of World War II. As the evidence for the shock-hypothesis is not yet conclusive, a closer look at the war involvement of the labor force is necessary. A promising way for future research is to consider how differences across social classes in participation in warfare

[7] The unconstrained association has $(6–1)(6–1) = 25$ identifiable parameters, obviously less parsimonious than the previous models in which the association was modeled with 10 parameters (6 diagonal and 4 off-diagonal).

and war-related mortality could distort social reproduction mechanisms during war periods.

Our second goal was to empirically investigate the claim that a long-term increase in relative mobility occurred in Hungary before the Communist takeover in the 1950s (Luijkx et al., 2002). Our findings support this claim. We observe a steady increase in relative mobility between 1900 and 1950. Our data do not enable us to test whether this trend continued unchanged in the decades after 1950. However, Communist restructuring definitely did not induce the first increase for Hungary's mobility regime.

During the period before the turn of the century, we found that stable relative mobility concealed two opposite trends. On the one hand, we observed an increase in relative mobility caused by diminishing relative class inheritance. On the other hand, the off-diagonal association increased until the turn-of-the-century. The downward trend in the diagonal association indicates that class-specific resources or barriers and norms that cause class reproduction became less important in determining mobility in Hungary over time. The initial increase in the off-diagonal association, however, shows that class-based inequalities in mobility chances intensified until the turn-of-the-century.

This increasing rigidity in class inequalities between 1865 and 1905 is most likely explained by reproduction theory. It could be that during this period of early industrialization, classes with resource advantages did not use their resources to keep their children in their class, but used their resources to help their children enter new, prestigious occupations. This would imply that resourceful classes were the most successful at adapting to the new challenges and opportunities presented by a developing economy.

The number of studies in the mobility literature studies on late-industrializing countries is increasing (e.g. Ishida, 2001; Torche, 2004), and further investigations of the impact of economic and institutional changes on the mobility regime during industrial development could be fruitful for the field.

In this respect, analyzing the mobility of smaller occupational groups (e.g., micro-classes or occupations) (Grusky & Weeden, 2001) with careful consideration of the historical context may provide additional insights. A further reason to look at occupations or micro-classes along with larger classes is that the occupational composition of macro-classes might change over a long time period. Our results indicate that changes in occupational characteristics could play a role. The high proportion of immobile men among *highly skilled workers* and *lower-level managers and professionals and clerical and sales personnel* during earlier periods may be explained by the pervasiveness of self-employment (artisanship and small proprietorship) in these classes compared to industrial blue-collar and non-manual, white-collar occupations. Future research could explore the extent that the rates of total mobility and patterns of relative mobility are driven by compositional changes in the larger classes by looking at occupations and occupational classes simultaneously. In addition, this endeavor might provide insights into the economic-historical aspects of social class formation (Goldthorpe & McKnight, 2006).

In this paper, we focused on national-level trends in mobility in Hungary. Historically, industrialization and modernization occurred at different rates in regions across Hungary (Beluszky, 2001). Comparing regional and municipal levels of social mobility with the data presented in this paper could add interesting insights into how the processes of industrialization and modernization affect social stratification. A further step in this research agenda, already taken by researchers of historical patterns in status attainment (Zijdeman, 2008), is a more direct test of the modernization thesis that measures how regional or municipal differences in the presence of industries or schools is related to social mobility.

References

Andorka, R. (1982). *A tařsadalmi mobilitaš vařltozaťsai Magyarorszaťgon [Changes in social mobility in Hungary]*. Budapest: Gondolat.

Beluszky, P. (2001). The spatial differences of modernization in Hungary at the beginning of the 20th century, Center for Regional Studies of Hungarian Academy of Sciences, Discussion Papers no. 37.

Berend, I. T. (2001). *Decades of crisis: Central and Eastern Europe before World War II*. Berkeley: University of California Press.

Berend, I. T. (2003). *History derailed: Central and Eastern Europe in the long nineteenth century*. Berkeley: University of California Press.

Blau, P. M., & Duncan, O. D. (1967). *The American occupational structure*. New York: Wiley.

Bourdieu, P., & Passeron, J. (1990). *Reproduction in education, society and culture*. London: Sage., 1970.

Breen, R. (1994). Individual level models for mobility tables and other cross-classifications. *Sociological Methods and Research*, *23*(2), 147–173.

Breen, R. (2004). *Social mobility in Europe*. Oxford: Oxford University Press.

Breen, R., & Jonsson, J. O. (2005). Inequality of opportunity in comparative perspective: Recent research on educational attainment and social mobility. *Annual Review of Sociology*, *31*, 223–243.

Bukodi, E., & Goldthorpe, J. H. (2009). Market versus meritocracy: Hungary as a critical case. *European Sociological Review*, *26*(6), 1–20.

Cantrell, R. S., & Clark, R. L. (1982). Individual mobility, population growth and labor force participation. *Demography*, *19*(2), 147–159.

Census, 1930. (1935). Az 1930. évi népszámlálás, 1. és 2. kötet [The 1930 Hungarian census, 1st and 2nd volume]. Budapest: Magyar Kir. Központi Statisztikai Hivatal.

Collins, R. (1971). Functional and conflict theories of educational stratification. *American Sociological Review*, *36*(6), 1002–1019.

Dallos, Ö., & Klinger, A. (1990). *A magyar népszámlálások előkészítése és publikációi 1869–1990 [Preparing and publishing the Hungarian Censuses 1869–1990]*. Budapest: KSH.

DiPrete, T. A. (1990). Adding covariates to log-linear models for the study of social mobility. *American Sociological Review*, *55*(5), 757–773.

Eddie, S. (1989). Economic policy and economic development in Austria-Hungary, 1867–1913. *The Cambridge Economic History of Europe*, *8*, 814–886.

Erikson, R., Goldthorpe, J. H., & Portocarero, L. (1979). Intergenerational class mobility in three western European societies: England, France and Sweden. *The British Journal of Sociology*, *30*(4), 415–441.

Erikson, R., Goldthorpe, J. H., & Portocarero, L. (1982). Social fluidity in industrial nations: England, France and Sweden. *The British Journal of Sociology*, *33*(1), 1–34.

Erikson, R., & Goldthorpe, J. H. (1992). *The constant flux: A study of class mobility in industrial societies*. Oxford: Clarendon Press.

Featherman, D. L., Jones, F. L., & Hauser, R. M. (1975). Assumptions of social mobility research in the United States: The case of occupational status. *Social Science Research*, *4*, 329–360.

Firth, D., & Turner, H. (2005). *Generalized non-linear models (GNM) for R, version 1.0-2*. UK: University of Warwick.

Fukumoto, I. K., & Grusky, D. B. (1993). Social mobility and class structure in early industrial France. In A. Miles, & D. Vincent (Eds.), *Building European society: Occupational change and social mobility in Europe 1840–1940* (pp. 40–67). Manchester: Manchester University Press.

Ganzeboom, H. B. G., De Graaf, P. M., & Robert, P. (1990). Reproduction theory on socialist ground: Intergenerational transmission of inequalities in Hungary. *Research in Social Stratification and Mobility*, *9*, 79–104.

Ganzeboom, H. B. G., Luijkx, R., & Treiman, D. J. (1989). Intergenerational class mobility in comparative perspective. *Research in Social Stratification and Mobility*, *8*, 3–84.

Goldthorpe, J. H. (2007). *On sociology*. Stanford: Stanford University Press.

Goldthorpe, J. H., & McKnight, A. (2006). The economic basis of social class. In S. L. Morgan, D. B. Grusky, & G. S. Fields (Eds.), *Mobility and inequality: Frontiers of research in sociology and economics* (pp. 109–137). Stanford: Stanford University Press.

Good, D. F. (1984). *The economic rise of the Habsburg Empire, 1750–1914*. Berkeley: University of California Press.

Goodman, L. A. (1979). Multiplicative models for the analysis of occupational mobility tables and other kinds of cross-classification tables. *The American Journal of Sociology*, *84*(4), 804–819.

Grusky, D. B. (1983). Industrialization and the status attainment process: The thesis of industrialism reconsidered. *American Sociological Review*, *48*(4), 494–506.

Grusky, D. B., & Fukumoto, I. K. (1989). Social history update: A sociological approach to historical social mobility. *Journal of Social History*, *23*(1), 221–232.

Grusky, D. B., & Hauser, R. M. (1984). Comparative social mobility revisited: Models of convergence and divergence in 16 countries. *American Sociological Review*, *49*(1), 19–38.

Grusky, D. B., & Weeden, K. A. (2001). Decomposition without death: A research agenda for a new class analysis. *Acta Sociologica*, *44*(3), 203–218.

Guest, A. M. (2005). Frontier and urban-industrial explanations of US occupational mobility in the late 1800. *Social Science Research*, *34*(1), 140–164.

Guest, A. M., Landale, N. S., & McCann, J. C. (1989). Intergenerational occupational mobility in the late 19th century United States. *Social Forces*, *68*(2), 351–378.

Hajnal, J. (1953). Age at marriage and proportions marrying. *Population Studies*, *7*(2), 111–136.

Hajnal, J. (1982). Two kinds of preindustrial household formation system. *Population and Development Review*, *8*(3), 449–494.

Hauser, R. M., & Grusky, D. B. (1988). Cross-national variation in occupational distributions, relative mobility chances, and intergenerational shifts in occupational distributions. *American Sociological Review*, *53*(5), 723–741.

Ishida, H. (2001). Industrialization, class structure, and social mobility in postwar Japan. *The British Journal of Sociology*, *52*, 579–604.

Kaelble, H. (1983). *Social mobility in the 19th and 20th centuries. Europe and America in comparative perspective*. Lemington Spa: Berg.

Keyfitz, N. (1973). Individual mobility in a stationary population. *Population Studies*, *27*(2), 335–352.

Kövér, G., & Gyáni, G. (1998). *Magyarország társadalomtörténete [The social history of Hungary]*. Budapest: Osiris.

Kuha, J. (2004). AIC and BIC, comparisons of assumptions and performance. *Sociological Methods and Research*, *33*(2), 188–229.

Lambert, P., Prandy, K., & Bottero, W. (2007). By slow degrees: Two centuries of social reproduction and mobility in Britain. *Sociological Research Online*, *12*(1).

Landes, D. S. (1969). *The unbounded Prometheus*. Cambridge: Cambridge University Press.

Lippényi, Z., Maas, I., van Leeuwen, M. H. D., & Margittai, L. (2011). *The Hungarian historical social mobility project 1850–1950. Codebook and machine readable dataset*. Utrecht University.

Lipset, S. M., & Zetterberg, H. L. (1959). Social mobility in industrial societies. In S. M. Lipset, & R. Bendix (Eds.), *Social mobility in industrial society* (pp. 11–75). Berkeley: University of California Press.

Long, J., & Ferrie, J. (2005). A tale of two labor markets: Intergenerational occupational mobility in Britain and the US since 1850. NBER Working Paper No. 11253.

Long, J., & Ferrie, J. (2007). The path to convergence: Intergenerational occupational mobility in Britain and the US in three eras. *The Economic Journal*, *117*(519), 61–71.

Luijkx, R., Róbert, P., De Graaf, P. M., & Ganzeboom, H. B. G. (2002). Changes in status attainment in Hungary between 1910 and 1989. *European Societies*, *4*(1), 107–140.

Maas, I., & van Leeuwen, M. H. D. (2002). Industrialization and intergenerational mobility in Sweden. *Acta Sociologica*, *45*(3), 179–194.

Mandemakers, K. (2000). Historical sample of the Netherlands. In P. K. Hall, & al. et (Eds.), *Handbook of international historical microdata for population research* (pp. 259–284). Minneapolis: Minnesota Population Center.

Miles, A. (1994). How open was nineteenth-century British society? Social mobility and equality of opportunity, 1839–1914. In A. Miles, & D. Vincent (Eds.), *Building European society: Occupational change and social mobility in Europe 1840–1940* (pp. 18–39). Manchester: Manchester University Press.

Parkin, F. (1971). *Class inequality and political order: Social stratification in capitalist and communist societies*. London: MacGibbon & Kee London.

Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology*, *25*, 111–164.

Romsics, I. (1999). *Magyarország története a XX. században [Hungarian history in the twentieth century]*. Budapest: Corvina.

Róbert, P., & Bukodi, E. (2004). Changes in intergenerational class mobility in Hungary 1973–2000. In R. Breen (Ed.), *Social mobility in Europe* (pp. 287–314). Oxford: Oxford University Press.

Simkus, A. (1981). Historical changes in occupational inheritance under socialism: Hungary 1930–1973. *Research in Social Stratification and Mobility*, *1*, 171–203.

Simkus, A. (1984). Structural transformation and social mobility: Hungary 1938–1973. *American Sociological Review*, *49*(3), 291–307.

Sorokin, P. A. (1959). *Social and cultural mobility*. New York: The Free Press., 1928.

Swain, N. (1992). *Hungary before socialist industrialization. CCEES Rural transition series*. University of Liverpool.

Szelényi, I., & Szelényi, S. (1995). Circulation or reproduction of elites during the post-communist transformation of Eastern Europe. *Theory and Society*, *24*(5), 615–638.

Szelényi, S., Aschaffenburg, K., Chang, M. L., & Poster, W. (1998). *Equality by design: The grand experiment in destratification in socialist Hungary*. Stanford: Stanford University Press.

Thernstrom, S. (1980). *Poverty and progress: Social mobility in a nineteenth century city*. Chicago: Harvard University Press.

Treiman, D. J. (1970). Industrialization and social stratification. In E. O. Laumann (Ed.), *Social stratification: Research and theory for the 1970* (pp. 207–235). Indianapolis: Bobbs-Merrill.

Torche, F. (2004). Unequal but fluid: Social mobility in Chile in Comparative Perspective. *American Sociological Review*, *70*(3), 422–450.

van Leeuwen, M. H. D., & Maas, I. (2011). *HISCLASS: A historical international social class scheme*. Leuven: Leuven University Press.

van Leeuwen, M. H. D., & Maas, I. (2010). Historical studies of social mobility and stratification. *Annual Review of Sociology*, *36*, 429–451.

van Leeuwen, M. H. D., & Maas, I. (1997). Social mobility in a Dutch province, Utrecht 1850–1940. *Journal of Social History*, *30*(3), 619–645.

van Leeuwen, M. H. D., Maas, I., & Miles, A. (2002). *Historical international classification of occupations (HISCO)*. Leuven: Leuven University Press.

Weeden, K. A. (2002). Why do some occupations pay more than others? Social closure and earnings inequality in the United States. *American Journal of Sociology*, *108*(1), 55–101.

Wong, R. S. K. (1995). Socialist stratification and mobility: Cross-national and gender differences in Czechoslovakia, Hungary, and Poland. *Social Science Research*, *24*(3), 302–328.

Wong, R. S. K., & Hauser, R. M. (1992). Trends in occupational mobility in Hungary under socialism. *Social Science Research*, *21*(4), 419–444.

Xie, Y. (1992). The log-multiplicative layer effect model for comparing mobility tables. *American Sociological Review*, *57*(3), 380–395.

Zijdeman, R. L. (2008). Intergenerational transfer of occupational status in nineteenth century Zeeland, the Netherlands: A test of the influence of industrialization, mass communication and urbanization in 117 municipalities. *International Journal of Sociology and Social Policy*, *28*(5–6), 204–216.