NORTH-HOLLAND

Journal of Income Distribution 9 (2000) 65–87

JOURNAL OF INCOME DISTRIBUTION

Inequality in property incomes in nineteenth-century Austria

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Received 1 June 1999

Abstract

The article examines the distribution of wealth in the alpine lands of the Habsburg Monarchy in the period 1820–1913. A moderate rise in overall inequality from the first to the second half of the period can be observed. This rise is due to sectoral shifts within the society. Inequality between various social groups shows various changes with widening as well as narrowing inequality in the different parts of society. Altogether, the changes in wealth inequality do not support the notion of widening income inequality in the early stages of industrialization in Austria.

JEL classification: N33

Keywords: Wealth distribution; Austria; Nineteenth century

In recent decades, the discussion on inequality has been an important part of the research on nineteenth century economic and social history of the Habsburg Empire. Important features of well-being that have been addressed in this discussion include housing, working conditions, nutrition, and education. These topics were investigated both on the micro- and the macro-level, with qualitative studies predominating. A quite different approach was used in a number of econometric studies done by American scholars who estimated income and some factors connected with it on the macro-economic level; these studies addressed the issue of inequality primarily as regional inequality.

In all these research efforts, the question of income and wealth inequality between individuals has attracted only limited interest. Several studies on local history focused on wealth inequality within narrowly defined social groups (see, for instance, Pammer, 1996), but there has been no study that examined inequality within social groups as opposed to

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0926-6437/00/$ – see front matter
PII: S0926-6437(99)00016-5

inequality between those groups, and none that examined inequality between individuals on the supraregional level.

This article addresses these latter issues for the major part of what is Austria today, including the provinces of Lower and Upper Austria, Vienna, Salzburg, Styria, Tyrol, and Vorarlberg. It relies on wealth data gained from probate inventories established in these provinces between 1820 and 1913. In contrast to other countries, Austrian laws provided for a probate process in every case of death. Thus, Austrian probate sources had coverage of the whole population, including persons without any property. For completely impoverished persons, the processes were summarily concluded by a short note stating that the deceased had left no wealth; however, this statement was kept in court like any other probate file and thus, we need not correct for missing cases at the lower end of the distribution. Although some series of files have been discarded, probate inventories have been preserved well enough to allow a thorough examination of wealth inequality in Austria. This analysis is based on a sample that consists of about 7,100 cases, all of them persons who died in the period between 1820 and 1913. Apart from the data on wealth, the files usually offer information on a number of relevant issues: gender, profession, age, and residence. In cases where this information is incomplete, files of medical examination could be used successfully to reconstruct missing data (for further discussion of the sources used in this analysis, see Pammer, 1998; Appendix A).

In this article, the research problems connected with this work are addressed in five sections. Section 1 discusses the concept of income that can be employed in a work that uses wealth data gathered from probate inventories. Section 2 investigates the impact of age on wealth in different social groups. Section 3 gives an outline of how the overall inequality observed in the data is disaggregated in order to distinguish between intersectoral and intrasectoral inequality. Section 4 discusses changes in intersectoral and intrasectoral inequality during the nineteenth century in order to determine how trends in widening inequality and egalitarian trends contributed to an overall pattern of changes in wealth distribution. Section 5 sums up the results.

1. Role of income in a research based on wealth data

For early periods, archival sources usually offer better and more thorough information on wealth than on income. Therefore, it may seem tempting to use wealth data for income estimates, which has been done, in fact, by several authors. However, wealth data offer a clue to income only to a limited extent, and the distribution of physical wealth differs from the distribution of income. Income estimates that assume a fixed wealth/income ratio seem little convincing because they usually exclude human capital from wealth (see, e.g., Jones, 1980, pp. 369–374). In the nineteenth century, according to probate data, a considerable part of the Austrian adult and working population did not own any physical wealth at all, but these people must have earned some income either in money or in kind or both.

Thus, we must distinguish between benefits gained from human capital and benefits gained from other capital (for the purposes of this analysis, income earned from

pension funds, life-annuities and similar sources can be treated like income earned from human capital because none of these sources of income is inventoried in probate files). These benefits include income earned in the market as well as private consumption and other welfare effects. Only benefits gained from physical capital can be estimated using probate data; thus, in the following, the term *wealth* denotes physical wealth. The distribution of benefits gained from physical wealth equals the distribution of wealth in the whole population only if the distribution of wealth in probate inventories equals the distribution of wealth in general and if the capital/output ratio is uniform for all kinds of wealth (like real estate, securities, debt claims, businesses, movable property, valuables).

The first of these two conditions is certainly not met. Therefore, the sample results used in this study must consider two kinds of biases before being extrapolated to the whole population. The first bias occurs in all studies based on probate files: As these files are established in occasion of death, even a sample of randomly selected cases shows an age structure that differs from the age structure in the whole population. The second bias results from the sample design in this study: The sample is stratified according to region and profession in order to include enough cases from important sectors that comprise only a small percentage of the population (for instance, entrepreneurs or free professionals).

For the estimation of welfare effects of property, the wealth/benefit ratio may be assumed to be in the same order of magnitude for all kinds of wealth. Several kinds of property yielded income that can easily be determined using market data: The most important example is financial securities whose returns in the Austrian stock market are well documented in published as well as archival sources. Similarly, gains from non-commercial loans that are registered as assets of wealth holders are specified in the probate inventories of the time.[1] The value of real estate was estimated either by assessment of the court or as a multiple of real-estate taxes, which were supposed to be levied not on property but on the income gained from it;[2] although these incomes from real estate may have been fictitious in many cases, that process seems to have been not entirely without any foundation: In a number of cases in an urban setting, we can duplicate the estimation procedure and arrive at a proportion of taxable annual net returns of the estimated property value,[3] which is in the same order of magnitude as the capital returns in the financial market.

Income from commercial and industrial businesses (except capital companies) and income from agricultural property are harder to assess because in these cases, wealth holders' input usually includes human capital; it makes sense, however, to assume a return on physical wealth of those wealth holders, similar to capital market returns, and to interpret all residual

[1] Annual returns from non-commercial loans were usually 6 percent throughout the period under consideration.

[2] Section 50, Provisorisches Gesetz über die Gebühren von Rechtsgeschäften, Urkunden, Schriften und Amtshandlungen, RGBl 329/1850; Section 208, Kaiserliches Patent vom 9. August 1854, RGBl 208/1854.

[3] The annual returns are 6.25 percent of estimated property value; see, for instance, Wiener Stadt- und Landesarchiv, Handelsgerichtsarchiv, Verlassenschaften: A 2 66, 1872/26; A 2 140, 1886/36; Bezirksgericht Neubau, 2A 16/36, 1910/363.

income as return on human capital.[4] We hardly need to stress that a major part of agricultural production was used for the owners' private consumption; thus, benefits in the agricultural sector were, in any case, higher than incomes gained in the market for agricultural products. It seems doubtful whether the income effects of movable property and valuables should be assessed in the same way because normally, there were clearly no marketable profits from these; however, we can assume that in cases where personal belongings comprised a more than negligible part of one's wealth, their owners estimated the benefits from using these things at least as high as benefits from equivalent wealth of a different kind.

Altogether, it seems justified to assume returns—either in money, or in kind, or immaterial benefits—to be equal for all kinds of wealth registered in the inventories. Correspondingly, the distribution of wealth in probate files can be assumed to equal the distribution of benefits derived from it.

2. Impact of age on wealth in different social groups

In the nineteenth century, age-specific mortality in the western half of the Habsburg Monarchy showed the usual pattern of mortality in industrialized countries of the time (Table 1): Infant mortality was highest, with annual death rates around 10 percent of the population under 5 years. Mortality was lowest in the age group between 10 and 20 years, rising thereafter and reaching a level for persons over 60 years that was almost as high as the rate for infants. Among infants and the age groups above 40 years, mortality was higher for males than for females, whereas women between 30 and 40—and sometimes even younger women—suffered higher mortality rates than men of the same age. Generally, mortality declined in all age groups in the decades prior to World War I.

Given age-specific mortality, a sample of probates will show a corresponding age-bias. In our sample, infant mortality presents no problem since children are not part of our sample. We excluded persons under 20 years of age from sampling because the probate files of these young persons almost always show zero wealth. For the remaining age groups, we can assume a monotonous positive relation between age and overrepresentation in the sample. Therefore, if young and old people show different wealth patterns, age will create a certain bias in a probate sample.

Changes in wealth patterns over lifetime are due to saving and dissaving in different stages of the life cycle. However, this process did not happen uniformly in all sectors and occurred differently in high- and low-income groups. Table 2 shows the results of a tobit analysis of the effects of age and other factors on wealth. In this and the following analyses, wealth is not measured by overall net wealth but by the logarithm of all private assets. Private assets are assets that are not part of an enterprise with personal liability of its owner; their amount correlates highly with the amount of overall net

[4] This seems justified because the Austrian capital and estate markets were relatively highly integrated, and market segmentations did occur in the labor market rather than in the capital market; capital movements in reaction to significant differences in returns between various kinds of investment would at least have been possible. There is, however, no positive proof of such investment behavior of wealth holders.

Table 1
Age-specific mortality in Cisleithania

Census	Gender	Age 0–5	5–10	10–20	20–30	30–40	40–50	50–60	60 +
1869	m	115.13	10.25	5.41	9.06	11.16	17.41	28.52	81.53
	f	96.78	9.98	5.43	8.74	11.44	15.14	26.08	85.12
1880	m	116.96	12.11	5.68	8.90	11.15	17.31	29.79	79.59
	f	99.22	12.10	6.05	8.53	11.27	14.68	25.54	75.60
1890	m	116.92	9.72	5.44	9.49	10.45	15.97	26.91	82.05
	f	100.79	10.05	6.18	9.13	11.08	13.75	23.28	78.62
1900	m	97.19	6.35	4.13	7.64	9.09	14.18	24.96	76.04
	f	81.99	6.95	4.92	7.91	9.72	11.84	21.15	74.45
1910	m	74.94	5.80	3.82	6.61	8.17	13.00	23.05	71.77
	f	63.75	6.21	4.49	7.13	8.47	10.46	18.16	69.30

Note: Numbers indicate deaths per 1,000 persons.
Source: Bolognese-Leuchtenmüller (1978, Table 38).

wealth. The variable *net wealth* is the difference between assets and liabilities; sometimes, it assumes negative values and is thus, less convenient to handle than the variable *private assets*, which is always either zero or positive.[5] Throughout this article, wealth numbers are given at 1914 prices, using a consumer price index (Mühlpeck et al., 1979, pp. 676–679).

Concerning the relation between age and wealth, we can distinguish between several patterns:

- Some people earned enough income to save during their active years accumulating some wealth. They dissaved after their retirement, using part of their accumulated wealth for their livelihood. For them, wealth is connected positively with age, and negatively with age squared. This pattern can be found, for instance, among middle- and lower-class persons in the secondary or service sector, like artisans, blue-collar workers, free professionals, or servants.
- Some people saved during their active years but did not need to dissave after their retirement because they received pensions. This is true for officials whose wealth is related positively to age but not to age squared, provided all officials are treated as a unified group.
- Some people's wealth status did not depend on saving and dissaving but on wealth transfers at a few occasions. They received wealth at a relatively young age from retiring parents. When they retired themselves they transferred the major part of their wealth to one of their own children, receiving a life-annuity in compensation. There is no linear relation between wealth and age or age squared in this group. This pattern was almost universal among active and retired farmers.

[5] For the calculation of logarithms, we added 1 florin to every estate; therefore, private assets is always positive, and the logarithm can be calculated for every case.

Table 2
Tobit estimates of wealth as a function of time, location, gender, and age

	Constant	Year	Vienna	Male	Age	Age-squared	Sigma	*N*	Log likelihood
Farmer	−16.362[a,b]	0.0123[c,d]	3.2105[c,d]	0.7167 [c,d]	0.0178	−0.0003	1.6659[c]	627	−1,210.232
	(6.3669)	(0.0034)	(0.5967)	(0.1355)	(0.0202)	(0.0003)	(0.0484)		
Stem elder	−12.413	0.0132	−18.018	0.0924	−0.2350	0.0020[d]	2.9541[c]	170	−398.3587
	(20.478)	(0.0106)	(142.32)	(0.4667)	(0.1696)	(0.0017)	0.1808)		
Farm laborer	6.4274	−0.0021	−3.7366[e]	0.3897	0.0512	−0.0010	4.1910[c]	194	−417.2298
	(29.427)	(0.0157)	(1.1949)	(0.6449)	(0.0650)	(0.0010)	(0.2959)		
Entrepreneur	19.488	−0.0075	−1.6244[c,d]	0.0102	0.1263[b,c]	−0.0009[a,b]	3.1824[c]	880	−2,224.635
	(10.960)	(0.0059)	(0.3821)	(0.3436)	(0.0310)	(0.0004)	(0.0790)		
Artisan	10.723	−0.0035	−1.9645[c,d]	0.2924	0.1081[b,c]	−0.0014[c,d]	3.8280[c]	1,617	−4,018.402
	(8.5525)	(0.0046)	(0.2705)	(0.2064)	(0.0248)	(0.0003)	(0.0787)		
Blue-collar worker	−9.7563	0.0057	−3.6973[c]	0.4992	0.1060[a,d]	−0.0018[a]	4.6970[c]	544	−1,107.254
	(17.825)	(0.0095)	(0.6268)	(0.4389)	(0.0420)	(0.0007)	(0.2123)		
Official (high)	−26.212	0.0179	0.5973	−0.0421	−0.0381	0.0009	3.0611[c]	168	−415.8072
	(22.368)	(0.0120)	(0.5061)	(0.5105)	(0.1241)	(0.0013)	(0.1772)		
Official (middle)	−2.5415	0.0026	0.3775	1.3657[e,d]	0.1095[a,d]	−0.0010	3.7885[c]	373	−938.4183
	(16.385)	(0.0087)	(0.4510)	(0.4333)	(0.0532)	(0.0007)	(0.1589)		
Official (low)	14.893	−0.0087	−0.0163	2.8521[e,f]	0.1446	−0.0022	4.5447[c]	130	−276.9366
	(38.222)	(0.0204)	(1.1003)	(0.9614)	(0.0897)	(0.0014)	(0.4010)		
Free professional	−52.995[e,f]	0.0303[e,f]	0.0453	1.2359[e,f]	0.1590[e]	−0.0020[e,f]	3.4639[c]	268	−677.7954
	(17.652)	(0.0095)	(0.4610)	(0.4534)	(0.0553)	(0.0007)	(0.1641)		
Servant	−7.5759	0.0050	−2.4919[c]	−0.6853	0.1587[e]	−0.0021[e]	4.2163[c]	277	−609.1887
	(21.736)	(0.0116)	(0.5790)	(0.5525)	(0.0530)	(0.0008)	(0.2407)		
Private person	19.973	−0.0086	−1.3437[e,f]	1.6075[c,d]	0.0566	−0.0004	4.8311[c]	628	−1,603.622
	(18.337)	(0.0098)	(0.4354)	(0.4252)	(0.0493)	(0.0006)	(0.1675)		

Notes: Numbers in parentheses are standard errors. Wealth numbers in florins, at 1914 prices (1 florin = 2 crowns).
[a] Coefficients significant at the 5 percent level.
[b] Marginal effects significant at the 5 percent level.
[c] Coefficients significant at the 0.1 percent level.
[d] Marginal effects significant at the 0.1 percent level.
[e] Coefficients significant at the 1 percent level.
[f] Marginal effects significant at the 1 percent level.
Source: See text.

- Farm laborers were often offspring of farmers who did not succeed in the farm. Instead of receiving a portion of the farm from retiring parents, they received a mortgage that was normally never paid. They did not accumulate any further wealth during their lifetime because farm laborers' income was relatively low and was mostly income in kind. When farm laborers became unable to work, they received their means of subsistence from the community. Thus, farm laborers received illiquid capital at a young age and did not change their wealth status significantly during their lifetime. Therefore, there is no linear relation between age and wealth for farm laborers either.
- Persons living from private means were, in fact, a mixed group of rich people of all ages who did not have to work, and elderly persons who may have worked previously but were characterized as private gentlemen or ladies (*Privat*) in the files. Due to the heterogenous character of this group, we do not find a systematic relation between wealth and age or age squared in this group.

Average age at death and, thus, at the time of probating was not equal for all groups. We need to consider average age only for those groups where age is related to wealth. We find that, on the average, entrepreneurs as well as artisans died at the age of 56 years. Free professionals and officials had 4 or 5 years more to live, whereas servants died at an age of 51, and blue-collar workers at an age of 48. Thus, the poor wealth status of servants and blue-collar workers was, in part, due to lower life expectancy; however, even a higher life expectancy would clearly not have enabled lower-class persons to bridge the whole gap between their own wealth status and that of artisans, free professionals, or entrepreneurs.

3. Disaggregation of overall inequality in data to distinguish between inter- and intrasectoral inequality

As in most European societies, modernization in Austria in the nineteenth century led to shifts in the sectoral composition of society, a process that included migration and radical changes in the professional structure of the economy. Sectoral shifts offer chances to improve one's living conditions—chances that depend on the present conditions an individual faces—and potential gains in a time of change. Thus, inequality in a society is not just an issue of how different people's living conditions are distributed in general, but also an issue of what gains may be expected within a process of social transformation in its various aspects.

A discussion of this topic requires a measure of inequality that allows a detailed examination of those expectations. We use the Gini coefficient because this measure can easily be disaggregated according to professional and other characteristics of the persons included in the sample; the Gini coefficient, while yielding rather ambiguous results when employed as an aggregate measure, offers much insight into the origins of inequality when used in its disaggregate form. (This part of the analysis follows Pyatt, 1976.)

For an analysis of the expectations offered by a change in the sectoral structure, the sample is divided into subgroups characterized by profession and by status within professions. We distinguish between the following groups: farmers, stem elders (retired farmers), farm

Table 3
Gains expected from changes within and between professional groups, 1820–1866 and 1867–1913

	Period	Mean wealth	Proportion	Farm laborer	Blue-collar worker	Official (low)	Servant	Stem elder
Farm	1	348	0.3394	249	225	273	619	1,699
laborer	2	417	0.2263	281	375	747	1,525	1,626
Blue-collar	1	300	0.1465	273	241	288	637	1,735
worker	2	492	0.2523	300	385	755	1,533	1,633
Official	1	342	0.0314	279	246	290	641	1,744
(low)	2	889	0.0266	275	357	707	1,483	1,534
Servant	1	705	0.0391	261	232	278	620	1,697
	2	1,686	0.0682	256	339	686	1,451	1,487
Stem elder	1	1,881	0.0328	166	154	205	521	1,461
	2	1,896	0.0219	146	229	527	1,277	1,159
Farmer	1	3,094	0.2765	102	98	149	438	1,264
	2	4,859	0.1844	75	143	387	1,110	857
Others	1	5,039	0.0165	150	139	182	472	1,340
	2	7,121	0.0272	172	229	475	1,211	1,034
Artisan	1	4,769	0.0714	158	143	186	481	1,361
	2	7,300	0.1230	155	220	481	1,216	1,052
Official	1	4,701	0.0117	155	142	182	469	1,337
(middle)	2	14,669	0.0099	170	230	477	1,196	1,043
Private	1	17,023	0.0317	140	126	159	418	1,198
person	2	24,267	0.0551	161	218	457	1,155	994
Official	1	15,875	0.0001	84	78	105	330	974
(high)	2	32,453	0.0001	87	130	293	929	647
Free	1	6,744	0.0009	123	113	148	414	1,199
professional	2	34,778	0.0018	86	123	280	926	615
Entrepreneur	1	66,358	0.0019	85	79	103	290	858
	2	167,796	0.0033	90	129	281	855	618

Notes: Expected gains are possible gains given the opportunity to change from the group indicated in column 1 to the group indicated in row 1; Mean wealth = mean wealth in the group indicated in column 1; Proportion = proportion of the group indicated in column 1 in the entire population. Wealth numbers in florins, at 1914 prices (1 florin = 2 crowns). Period 1 = 1820–1866; Period 2 = 1867–1913.

Source: See text.

laborers; entrepreneurs, artisans, blue-collar workers; high-, middle-, and low-ranking officials; free professionals; servants; private persons; others (including several small groups that are of minor importance for distribution in our period, namely white-collar workers, clerics, and artists).

Based on this stratification, the Gini coefficient—denoting wealth inequality in the whole population—is decomposed into several terms. One of these terms denotes wealth inequality within those subgroups, another depends on the differences in mean wealth between subgroups. The sum of these two terms would be equal to the Gini coefficient for the whole population, if the wealth distributions of different groups did not overlap each other; since they usually do overlap, a third term accounts for the inequality not covered by the other two terms. These three terms constitute the basic framework for the determination of what people could expect in a society in transformation.

Farmer	Others	Artisan	Official (middle)	Private person	Official (high)	Free professional	Entrepreneur
2,848	4,842	4,579	4,508	16,815	15,611	6,519	66,096
4,518	6,876	7,039	14,422	24,011	32,123	34,447	167,469
2,891	4,878	4,612	4,542	16,848	15,653	6,557	66,136
4,511	6,858	7,029	14,407	23,993	32,092	34,409	167,433
2,900	4,879	4,613	4,541	16,839	15,638	6,550	66,119
4,357	6,707	6,892	14,258	23,835	31,857	34,169	167,188
2,827	4,806	4,546	4,465	16,736	15,499	6,453	65,943
4,284	6,646	6,831	14,179	23,735	31,696	34,018	166,965
2,476	4,498	4,249	4,157	16,340	14,967	6,061	65,335
3,821	6,259	6,456	13,816	23,365	31,204	33,496	166,518
2,138	4,214	3,952	3,849	15,929	14,416	5,660	64,725
3,312	5,725	5,981	13,240	22,716	30,157	32,466	165,286
2,268	4,155	3,962	3,798	15,730	14,102	5,548	64,082
3,464	5,575	5,948	13,025	22,469	29,519	31,912	164,467
2,276	4,232	3,993	3,856	15,833	14,268	5,633	64,351
3,540	5,769	6,077	13,225	22,677	29,941	32,303	164,910
2,242	4,136	3,924	3,746	15,673	14,029	5,480	64,090
3,430	5,477	5,856	12,749	22,098	28,855	31,310	163,288
2,000	3,746	3,580	3,351	14,815	12,917	4,907	61,880
3,308	5,323	5,710	12,500	21,712	28,230	30,701	162,199
1,635	3,267	3,163	2,856	14,065	11,719	4,221	60,433
2,563	4,187	4,789	11,071	20,043	25,077	27,821	158,266
2,010	3,844	3,659	3,437	15,186	13,353	5,040	63,201
2,547	4,255	4,826	11,202	20,190	25,497	28,110	158,723
1,460	2,763	2,762	2,433	12,545	9,950	3,587	54,951
2,349	3,792	4,414	10,161	18,670	22,923	25,705	153,589

Table 3 illustrates this procedure by presenting the results from an analysis of wealth inequality within and between professional groups in the periods 1820–1866 (upper line of cells) and 1867–1913 (lower line of cells). In this table, inequality is expressed as the expected difference in wealth between two individuals drawn at random. The expected differences are attributed to constellations of groups to which the individuals belong; they can be interpreted as possible gains in a game where an individual from a certain group (indicated in column 1) had the free choice to keep their place in society or to switch to a different place randomly selected from the same or another group (indicated in row 1): An individual would keep their former place if the new place offered no advantages (in which case the gains would be zero), but would take the new place if it promised higher wealth. The crucial point is that, in such a game, the expected differences in wealth are always either zero or positive, and thus, there are no losers.

In Table 3, the diagonal values denote expected differences when both individuals that are involved come from the same group; dividing the diagonal values by group-specific mean wealth yields the Gini coefficients for the respective subgroups in the respective period (given also in Table 5, columns 7 and 8). The sum of these group-specific Gini coefficients, weighted by the squared proportions of the groups in the whole population, yields the first term mentioned above, which indicates inequality within groups in the respective period.

The gains that would have to be expected if there were no intragroup variation can easily be calculated employing the group means. If, for instance, between 1867 and 1913, every farm laborer had owned 417 florins, which was the mean wealth among farm laborers in that period, and if every blue-collar worker had owned 492 florins (the mean wealth among officials of low ranks in the same period), the expected difference in wealth between a farm laborer and a blue-collar worker would have been 75 florins in any case. Thus, in a no-loser game as characterized above, the expected gain would be 75 florins for farm laborers and zero for blue-collar workers. These values are calculated accordingly for all pairs of groups (they are included in the numbers above the diagonal cells of Table 3); the sum of these values, related to mean wealth in the corresponding subgroups and weighted according to the proportions of the respective groups in the whole population, yields a term denoting intergroup inequality in the respective period.

In addition to intragroup variation and intergroup variation discussed so far, there is still additional intergroup variation resulting from overlapping distributions of different groups. In a no-loser game, members of both groups involved can expect some gain from those overlapping distributions. When the table is ordered according to group-specific mean wealth, the values below the diagonal in Table 3 indicate the gains that are to be expected when persons from a wealthier group had the option to change to a poorer group;[6] and the numbers above the diagonal include the gains to be expected when members of a poorer group had the opportunity to change to a wealthier group. Since the expected gains from overlapping distributions must clearly be the same in both directions, the values included in the numbers above the diagonal are equal to the corresponding subdiagonal values. For instance, between 1867 and 1913, a blue-collar worker who considered becoming a farm laborer would arrive at an expected gain of 300 florins due to the overlapping distribution, although mean wealth was lower among farm laborers; a farm laborer opting for a place among blue-collar workers could expect 300 florins due to the overlapping distribution as well (and, as mentioned above, an additional 75 florins due to the difference in group mean wealth—therefore, the value is 375 in this cell). Relating these 300 florins and corresponding numbers for other constellations to group means, and weighting them according to the proportions of the groups in the whole population yields a term, which, added to the intragroup coefficient and the other intergroup term, results in the Gini coefficient for the whole population.

Column 4 of Table 4 shows the Gini coefficient for wealth in Austria between 1867 and 1913 and its disaggregation in intra- and intergroup terms. We see that the Gini coefficient is about 0.90, which is not uncommonly high for wealth distributions (compare, for instance, Soltow, 1979, p. 130, 1980, pp. 230–231, who gives Gini coefficients for wealth distributions

[6] Tables were ordered according to the stratification in the period 1867–1913.

Table 4
Gini coefficients and their disaggregation, 1820–1866 and 1867–1913

	Demographic structure of 1850		Demographic structure of 1890	
	(1) 1820–1866	(2) 1867–1913	(3) 1820–1866	(4) 1867–1913
Total inequality	0.864428	0.866470	0.893696	0.895541
Intra-group inequality	0.104431	0.097144	0.077362	0.072163
Inter-group inequality	0.604528	0.629666	0.655904	0.671136
Inequality due to overlapping distributions	0.155468	0.139660	0.160430	0.152242

Notes: For the calculation of columns 1 and 2, data on conditional expectations were applied to demographic data of 1850; for columns 3 and 4, the demographic data of 1890 were used. Wealth numbers in florins, at 1914 prices (1 florin = 2 crowns).

Source: See text.

of 0.88 for Norway and even higher numbers for Denmark). The inequality between professional groups contributes 0.67 to overall inequality, while intragroup variation contributes just 0.07; 0.15 is due to overlapping distributions of various groups. Thus, with our scheme of professional groups, a large part of inequality can be explained by the professional factor. It should be stressed that this result (though not the Gini coefficient for the whole population) depends heavily on the number and size of groups. Just raising the number of groups by refining the stratification in a sensible way would lower the amount of overall intragroup inequality even more.

4. Role of widening inequality and egalitarian trends in the overall pattern of changes in wealth distribution

Did inequality rise in Austria during the nineteenth century? The nineteenth century saw sustained economic growth in the Habsburg Monarchy, starting around 1820 and creating a slow, though steady rise in income up to World War I. According to our data, real wealth at 1914 prices was around 4500 florins between 1867 and 1913, and around 2270 florins between 1820 and 1866—amounting to an average annual growth rate of 1.5 percent over 47 years—which can be taken as an estimate of the rate of income growth as well. Since that time was the period when modern economic growth started in the Habsburg Monarchy, we may hypothetically assume widening income inequality during that period to be followed by narrowing income inequality in the twentieth century—in other words, a Kuznets curve. If such a development occurred, it should appear even more pronounced for wealth inequality since high-income groups have usually higher savings rates and consequently accumulate disproportionately more wealth than low-income groups. Thus, countries with rising inequality in income should show rising inequality in wealth as well.[7]

[7] The only relevant exception might be the case of a widening income distribution among those who do not own any wealth at all. Such a process, while raising income inequality, will leave no traces in the wealth distribution.

We compare wealth in the periods 1820–1866 and 1867–1913, dividing the population in both periods into professional groups as described in Section 3. The proportions of professional groups in the population were assumed to have remained constant within both periods but differed between the first and the second periods. The professional structure was determined using census data from 1850 for the period 1820–1866 and data from 1890 for the second period (see Appendix B).

First, we compare overall inequality in both periods. Columns 1 and 4 of Table 4 show the Gini coefficients for 1820–1866 and 1867–1913 and their disaggregation. We see that wealth inequality did, in fact, rise from the first to the second period although the change from a Gini coefficient of 0.86 to one of 0.90 may seem moderate. The rise in inequality is almost entirely due to shifts in the sectoral composition of society. Columns 2 and 3 of Table 4 give Gini coefficients, calculated under the assumption of constant proportions of professional groups in the population: column 2 uses demographic data from 1850 to calculate a Gini coefficient for the period 1867–1913, and column 3 uses the sectoral composition of 1890 for an estimate of inequality 1820–1866. We see that constant proportions of professional groups in the population, applied to time-specific conditional expectations of these groups, yield almost identical Gini coefficients for both periods. Similarly, the differences in estimates of intragroup inequality, intergroup inequality and inequality due to overlapping distributions in both periods narrows down when constant demographic patterns are assumed.

This result is in accordance with Kuznets's considerations of intersectoral shifts in industrializing economies (Kuznets, 1955, pp. 12–15). Clearly, the most important shift occurred between the agricultural sector and the other sectors, with an agricultural sector shrinking from 69 percent in 1850 to 46 percent in 1890 in what is Austria today (Sandgruber, 1978, p. 132). Wealth distribution between the agricultural sector and the other sectors and within those sectors can be described as follows (see Table 5):

- Real wealth in agriculture grew more slowly than in the other sectors.
- The distribution within the non-agricultural sector was more unequal than the distribution within agriculture throughout the nineteenth century, and even more so in the period 1867–1913.

Both conditions favor widening overall inequality and thus, a growing Gini coefficient during the nineteenth century.

The fact that overall inequality would not have widened if sectoral shifts had been absent does not mean that group-specific conditional expectations remained the same in any constellation. We find numerous changes in expectations working in various directions and thus, contributing either positively or negatively to overall inequality.

First, we take a look on intragroup inequality in both periods. The results suggest that intragroup inequality changed in specific ways in different parts of society (Table 5). The agricultural professions (farmers, stem elders, farm laborers) and the middle and lower classes in general (artisans, blue-collar workers, low ranking officials, servants) show shrinking intragroup inequality, whereas wealth within the groups of businesspersons, middle to high ranking officials, free professionals and private persons seems to have become distributed more unequal in the later period.

Table 5
Mean wealth 1820–1866 and 1867–1913 and within-group Gini coefficients

	1	2	3	4	5	6	7	8	9
	Proportion		Mean wealth				Gini coefficients		
	1850	1890	1820–1866	1867–1913	(4)/(3)	Annual growth rate	1820–1867	1867–1913	(8)/(7)
Farmer	0.2765	0.1844	3,094	4,859	1.57	0.97	0.69	0.68	0.99
Stem elder	0.0328	0.0219	1,881	1,896	1.01	0.02	0.78	0.61	0.79
Farm laborer	0.3394	0.2263	348	417	1.20	0.38	0.72	0.67	0.94
Entrepreneur	0.0019	0.0033	66,358	167,796	2.53	1.99	0.83	0.92	1.11
Artisan	0.0714	0.1230	4,769	7,300	1.53	0.91	0.84	0.83	0.99
Others	0.0165	0.0272	5,039	7,121	1.41	0.74	0.82	0.78	0.95
Blue-collar worker	0.1465	0.2523	300	492	1.64	1.05	0.80	0.78	0.97
Official (high)	0.0001	0.0001	15,875	32,453	2.04	1.53	0.74	0.77	1.05
Official (middle)	0.0117	0.0099	4,701	14,669	3.12	2.45	0.80	0.87	1.09
Official (low)	0.0314	0.0266	342	889	2.60	2.05	0.85	0.80	0.94
Free professional	0.0009	0.0018	6,744	34,778	5.16	3.55	0.75	0.81	1.08
Servant	0.0391	0.0682	705	1,686	2.39	1.87	0.88	0.86	0.98
Private person	0.0317	0.0551	17,023	24,267	1.43	0.76	0.87	0.89	1.03

Notes: Annual growth rate is the average annual rate of wealth growth from the period 1820–1866 to the period 1867–1913 (in percentage points). Wealth numbers are in florins, at 1914 prices (1 florin = 2 crowns); Proportion = proportion of the group indicated in column 1 in the entire population.

Source: See text.

Real mean wealth grew in almost all groups but at a different pace.[8] The rate of wealth growth is related to the changes in inequality: Groups with rising intragroup inequality were groups whose wealth grew especially fast during the nineteenth century. The tobit analysis of the effect of group-specific rates of annual wealth growth on changes in intragroup inequality yields a coefficient that is significant at the 0.1 percent level (Table 6, left). The result is robust toward modifications of the model. The effect remains significant if we introduce mean wealth in the first period or mean wealth in the second period or both as independent variables into the model. The mean wealth variables show a significant positive effect on inequality although this effect is weaker than the effect of growth rates.

[8] Due to the skewed distribution of wealth, in several groups the differences between the arithmetic means of wealth in both periods are insignificant; however, significant differences were obtained for all groups—except entrepreneurs and high-ranking officials—when the logarithm of wealth was employed.

Table 6
Effects of growth in group-specific mean wealth on changes in intra-group and inter-group inequality

	Changes in intra-group inequality		Changes in inter-group inequality	
Constant	0.9075	(0.0293)	2.0045	(0.1128)
Wealth growth	0.0609	(0.0174)	−0.5391	(0.0671)
Sigma	0.0579	(0.0114)	0.7735	(0.0438)
N	13		156	
Log likelihood	18.59102		−181.2886	

Notes: Estimates are maximum likelihood estimates.

Changes in intra-group inequality = intra-group inequality 1867–1913 divided by intra-group inequality 1820–1866. Intra-group inequality equals expected gains given the opportunity to change to a different place within the same professional group in the respective period. Calculations were made for 13 professional groups. Changes in inter-group inequality = inter-group inequality 1867–1913 divided by inter-group inequality 1820–1866. Inter-group inequality equals expected gains given the opportunity to change to a different professional group in the respective period.

Calculations were made for 156 pairwise combinations of groups.

Wealth growth = group-specific average annual rate of wealth growth from the period 1820–1866 to the period 1867–1913. Values in parentheses are standard errors. All coefficients are significant at the 0.1 percent level. Wealth numbers in florins, at 1914 prices (1 florin = 2 crowns).

Source: For intra-group inequality, see Table 5; for inter-group inequality, see text.

These results suggest that although economic growth allowed for growth in mean wealth in all parts of society, a minority gained disproportionately high benefits from this process. These winners were distributed among several, though not all, professional groups and remained a minority in those groups, too. Thus, the winners' gains raised, at the same time, the mean wealth and intragroup inequality in the groups they belonged to.

Group-specific wealth gains had effects on inequality between groups as well (Table 6, right). Gains to be expected from a change to a different group grew slowly for members of those groups where mean wealth grew at an especially high rate. The tobit analysis of the effect of group-specific growth rates on changes in gains to be expected from a change to a different group yields a negative coefficient that is significant at the 0.001 percent level. Group-specific mean wealth in the first, or second period, or both, when introduced in addition, shows no significant effect on the result.

Thus, members of groups with fast rising mean wealth could expect fast rising gains from mobility within their group and slowly rising gains from a change to other groups.

Table 7 gives a comprehensive view on groupwise measures of inequality. For each group, row 1 lists the numbers for the period 1820–1866, and row 2 lists the numbers for 1867–1913. For the calculation of the terms, we used expected gains as described in Section 3 and given in Table 3, that is, expected gains given the opportunity to change from the group indicated in column 1 to the group indicated in row 1. These expected gains were multiplied by two other terms:

- by the product of the proportions of both groups in the population, and
- by the proportion of mean wealth in the group indicated in column 1 to mean wealth for the whole population.

The sum of all terms for 1820–1866 is equal to the overall Gini coefficient for this period as given in Table 4, column 1; accordingly, the terms for 1867–1913 yield the respective Gini coefficient as given in Table 4, column 4. Thus, Table 7 displays the contribution of different cells to overall Gini coefficients. The examination reveals that a relatively small number of cells contribute the lion's share to inequality: of 169 cells for the period 1820–1866 and 169 for 1867–1913, just 13 and 16, respectively, contribute two thirds to the overall inequality (the respective numbers are underlined).

Most of these cells comprise larger segments of the population, primarily constellations between farmers, farm laborers, and blue-collar workers on the one hand, and the other groups on the other hand. Since the agricultural sector remained large well into the second half of the nineteenth century, inequality within agriculture and between agricultural and other professions was relatively important in the context of overall inequality. For intragroup inequality, agriculture was important as well. Between 1820 and 1866, inequality among farmers contributed 0.072 to a total of 0.104 in intragroup inequality. However, the size of groups involved was not the only factor that mattered. For instance, inequality between farm laborers and blue-collar workers was comparably unimportant although both groups were relatively large: The opportunity to switch from one of these two group to the other concerns about one tenth of possible moves in our game but yields just 1.3 percent of overall inequality in the years 1820–1866. Similarly, intragroup inequality among farm laborers contributed only 1.5 percent of overall inequality in the same period, although moves within this group comprised 11.5 percent of all possible moves.

The second factor that determined which constellations contributed most to inequality is differences in mean wealth between groups. For instance, the farm laborers' options to take the place of a Viennese entrepreneur concerned only 0.04 percent of possible moves but inequality between these two groups contributed more than 2 percent of overall inequality between 1820 and 1866 and even more so in the following period. We find similar relations between other groups and entrepreneurs as well.

Thus, inequality between professional groups is mainly inequality between large groups with a moderate difference in mean wealth, or inequality between a large group and a small one where the difference in mean wealth is large.

Comparing the 1820–1866 and 1867–1913 numbers for otherwise identical pairs of groups, we see more clearly how shifts in the sectoral composition of the population and changing wealth differentials affected overall inequality (Table 7). The following points are especially important.

- The shrinking share of agriculture results in shrinking contributions of agriculture to overall inequality. Looking at the *Farmer* column in Table 7, we see that the absolute amount of inequality between farmers and any other group, and inequality among farmers, was considerably higher between 1820 and 1866 as compared to the following period. The same is true for the *Stem elder* and the *Farm laborer* columns.
- Accordingly, inequality within the expanding secondary sector rose in absolute terms. For instance, inequality between blue-collar workers and entrepreneurs had made a

Table 7
Contributions of pairwise combinations of professional groups to overall inequality, 1820–1866 and 1867–1913

	Period	Mean wealth	Proportion	Farm laborer	Blue-collar worker	Official (low)	Servant	Stem elder
Farm laborer	1	348	0.3394	0.0126	0.0049	0.0013	0.0036	0.0083
	2	417	0.2263	0.0032	0.0048	0.0010	0.0052	0.0018
Blue-collar worker	1	300	0.1465	0.0060	0.0023	0.0006	0.0016	0.0037
	2	492	0.2523	0.0038	0.0055	0.0011	0.0059	0.0020
Official (low)	1	342	0.0314	0.0013	0.0005	0.0001	0.0003	0.0008
	2	889	0.0266	0.0004	0.0005	0.0001	0.0006	0.0002
Servant	1	705	0.0391	0.0015	0.0006	0.0002	0.0004	0.0010
	2	1,686	0.0682	0.0009	0.0013	0.0003	0.0015	0.0005
Stem elder	1	1,881	0.0328	0.0008	0.0003	0.0001	0.0003	0.0007
	2	1,896	0.0219	0.0002	0.0003	0.0001	0.0004	0.0001
Farmer	1	3,094	0.2765	0.0042	0.0018	0.0006	0.0021	0.0050
	2	4,859	0.1844	0.0007	0.0015	0.0004	0.0031	0.0008
Others	1	5,039	0.0165	0.0004	0.0001	0.0000	0.0001	0.0003
	2	7,121	0.0272	0.0002	0.0004	0.0001	0.0005	0.0001
Artisan	1	4,769	0.0714	0.0017	0.0007	0.0002	0.0006	0.0014
	2	7,300	0.1230	0.0010	0.0015	0.0004	0.0023	0.0006
Official (middle)	1	4,701	0.0117	0.0003	0.0001	0.0000	0.0001	0.0002
	2	14,669	0.0099	0.0001	0.0001	0.0000	0.0002	0.0001
Private person	1	17,023	0.0317	0.0007	0.0003	0.0001	0.0002	0.0005
	2	24,267	0.0551	0.0004	0.0007	0.0001	0.0010	0.0003
Official (high)	1	15,875	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
	2	32,453	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Free professional	1	6,744	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
	2	34,778	0.0018	0.0000	0.0000	0.0000	0.0000	0.0000
Entrepreneur	1	66,358	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000
	2	167,796	0.0033	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: Numbers in cells denote expected gains, weighted by the proportions of both groups in the population and by the relation of group-specific mean wealth as given in column 3 to mean wealth in the whole population; Mean wealth = mean wealth in the group indicated in the first column; Proportion = proportion of group indicated in the first column in the whole population; Period 1 = 1820–1866; Period 2 = 1867–1913. Wealth numbers in florins, at 1914 prices (1 florin = 2 crowns).

Source: See text; for expected gains, see Tables 3 and 4.

negligible contribution to overall inequality in the period 1820–1866. During the following decades, this constellation became much more important. Similarly, inequality between blue-collar workers and artisans—though not unimportant in the earlier period—became one of the most important sources of inequality in the late nineteenth century.

– The gap between private persons and other professions was a major and ever more important source of inequality throughout the nineteenth century. More than one third of all inequality in the period 1867–1913 was due to inequality between private persons and the rest; in 1820–1866, only slightly more than a quarter of all inequality had resulted from these constellations.

Farmer	Others	Artisan	Official (middle)	Private person	Official (high)	Free professional	Entrepreneur
0.1177	0.0119	0.0489	0.0079	0.0795	0.0002	0.0009	0.0192
0.0419	0.0094	0.0436	0.0072	0.0666	0.0001	0.0031	0.0282
0.0516	0.0052	0.0213	0.0034	0.0344	0.0001	0.0004	0.0083
0.0467	0.0105	0.0485	0.0080	0.0742	0.0001	0.0035	0.0314
0.0111	0.0011	0.0046	0.0007	0.0074	0.0000	0.0001	0.0018
0.0048	0.0011	0.0050	0.0008	0.0078	0.0000	0.0004	0.0033
0.0135	0.0014	0.0056	0.0009	0.0091	0.0000	0.0001	0.0022
0.0120	0.0027	0.0127	0.0021	0.0198	0.0000	0.0009	0.0085
0.0099	0.0011	0.0044	0.0007	0.0075	0.0000	0.0001	0.0018
0.0034	0.0008	0.0039	0.0007	0.0063	0.0000	0.0003	0.0027
0.0720	0.0085	0.0344	0.0055	0.0614	0.0001	0.0006	0.0153
0.0250	0.0064	0.0302	0.0054	0.0514	0.0001	0.0024	0.0227
0.0046	0.0005	0.0021	0.0003	0.0036	0.0000	0.0000	0.0009
0.0039	0.0009	0.0044	0.0008	0.0075	0.0000	0.0004	0.0033
0.0198	0.0022	0.0090	0.0014	0.0158	0.0000	0.0002	0.0039
0.0179	0.0043	0.0205	0.0036	0.0342	0.0000	0.0016	0.0151
0.0032	0.0004	0.0014	0.0002	0.0026	0.0000	0.0000	0.0006
0.0014	0.0003	0.0016	0.0003	0.0027	0.0000	0.0001	0.0012
0.0077	0.0009	0.0036	0.0005	0.0065	0.0000	0.0001	0.0017
0.0075	0.0018	0.0086	0.0015	0.0147	0.0000	0.0007	0.0067
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0002	0.0000	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000
0.0002	0.0000	0.0002	0.0000	0.0004	0.0000	0.0000	0.0002
0.0003	0.0000	0.0002	0.0000	0.0003	0.0000	0.0000	0.0001
0.0003	0.0001	0.0004	0.0001	0.0008	0.0000	0.0000	0.0004

– Widening wealth differentials resulted in a slight rise in overall inequality and shifts between the three terms determining it.[9] Wealth differentials widen when the growth rate in a more affluent group is higher compared to the growth rate in a less affluent group, and narrow down when the less affluent group displays a higher growth rate. Widening wealth differentials result in higher inequality due to intergroup inequality, and lower inequality usually due to overlapping distributions, while narrowing wealth differentials have the opposite effect. The effect on

[9] For this calculation, the numbers in the cells of Table 7 must be divided by the proportions of both groups involved, in the population, and by the relation between group specific mean wealth and mean wealth in the whole population. The resulting term is equal to expected gains as given in Tables 3 and 6, divided by group specific mean wealth.

intergroup inequality is more pronounced than the effect on inequality due to overlapping distributions. Therefore, widening wealth differentials produce higher overall inequality. In our sample, the more affluent groups—such as free professionals and entrepreneurs—show comparably high growth rates, whereas wealth among the poor—such as farm laborers or blue-collar workers—rose only moderately. However, several middle-class groups, such as farmers or artisans, show low rates of growth as well, and officials of middle ranks display a high growth rate. Altogether, wealth differentials widened rather than narrowed down during the nineteenth century, resulting in a moderate rise in overall inequality and intergroup inequality and a moderate decline in inequality due to overlapping distributions (Table 4).

5. Conclusion

In this article, we discuss the factors that contributed to inequality in Austria during the nineteenth century and to changes in inequality.

Concerning age, we saw specific patterns of saving and dissaving in different social groups. Lower- and middle-class persons followed a pattern discussed frequently in literature on inequality—accumulating wealth up to retirement, and dissaving during the retirement years. The more affluent classes and the whole agricultural sector differ from this pattern for various reasons. In addition, life expectancy is associated with wealth status insofar as the least affluent groups show the lowest life expectancy.

Concerning changes in inequality from the first to the second half of the period 1820–1913, our results suggest that the level of overall inequality rose by a small degree. It would not have risen if the sectoral composition of society had remained stable throughout that period. However, this does not mean that no changes in inequality between and within professional groups happened; the changes that did happen worked, in part, toward widening inequality and, in part, toward narrowing inequality, thus raising the overall amount of inequality only by a small degree. Due to sectoral shifts, agriculture lost some of its earlier importance as a source of inequality, while the secondary sector became a more important source of inequality. In addition, inequality between persons living from private means on one hand and other persons on the other hand, contributed ever more to inequality during the nineteenth century. In addition to sectoral shifts, widening wealth differentials raised intergroup inequality and lowered inequality due to overlapping distributions; they concerned primarily the relations between the entrepreneurial class, the free professionals, and middle-ranking officials on one hand, and the rest of society on the other.

It has been said most people would agree that inequality due to a life-cycle pattern of accumulation is of minimal concern because a flat age–income profile may hardly seem essential for perfect equality (Paglin, 1975, pp. 598–599; Gallman, 1978, pp. 196–197; Atack & Bateman, 1981, p. 93). It may be argued equally that a change in inequality that is due to changes in the sectoral composition of society is of minor concern as well because it does not affect the status differences between a single lower-class person and a single upper-class person: the gains a lower-class person could expect when they switched

to an upper-class person's place may remain constant while sectoral shifts may raise the total amount of inequality in a society. Our results suggest that the moderate rise in overall wealth inequality in Austria during the nineteenth century was mostly due to such a process.

As we pointed out earlier, the distribution of wealth is usually more unequal than the distribution of income. If and when the income distribution is widening in a process of industrialization, we may assume that the wealth distribution is widening even more. Reversibly, if the distribution of wealth changes little during industrialization, the distribution of income will probably have changed even less or not at all. The Austrian data suggest that, in this country, the distribution of wealth did not change substantially during the nineteenth century. Since the same is probably true for the distribution of income as well, the Austrian case does not support the notion of a connection between rising incomes and rising inequality in the early stages of industrialization.

The measures described above give an idea that gains could be expected from the transformation of the Austrian society. However, great expectations may fail to materialize, and it is still up for discussion which of these gains were actually realized by individual persons in the process of Austrian development in the nineteenth century and which sectors of the society were particularly successful in seizing their opportunities. A thorough estimation of that kind goes beyond the scope of this article due to numerous deficiencies in the data;[10] however, even the placement of people within their social group and the placement of social groups among other groups and the regrouping of those orders represent important living conditions that people had to face.

Appendix A. Probate sources

The data used in the present analysis were collected in the course of a project on wealth formation in central Europe in the period between 1820 and 1913. As mentioned in the text, the data used to determine investment behavior were gained from probate inventories established in those crown lands that now form the Republic of Austria.

The following archival sources were used for sampling.

Lower Austria: Niederösterreichisches Landesarchiv, A-Akten, BG Amstetten (A 1–20, 22, 26, 28, 32), Aspang (K 1–5, 10–11, 16–18, 25–32), Baden (K 3–34), Ebreichsdorf (A 6–10).

Vienna: Wiener Stadt- und Landesarchiv, Handelsgericht (A 2 Sch. 1–41, 45–75, 78, 82, 86–95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 159, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 230, 233, 235, 244, 245, 258, 260; A 11 Sch. 8, 10, 29, 30, 31, 50, 69, 70, 82, 90, 92, 109, 110, 113, 117–118, 129, 130, 150, 165, 170, 190, 210, 219, 220, 230, 240, 250, 258, 260, 270, 289, 290); BG Innere Stadt I (A 2 Sch. 1, 3–6,

[10] The biggest problem is the adequate assessment of intersectoral mobility; although we can arrive at an acceptable estimate of the sectoral composition of the society at different times, we have little idea about the streams between the sectors; moreover, most of sectoral mobility did not happen in the course of individual life cycles but rather as a change over generations.

30–32, 52, 80, 100, 120, 140, 145, 150, 155, 160, 190, 198, 200, 209, 210, 220, 228, 230, 240, 250, 260, 270, 280, 300, 315, 330, 340, 360, 370, 390, 400, 420, 430, 440, 460, 480, 500, 520, 540, 560, 580, 587, 600, 607, 620, 636, 640, 660, 680, 695, 700, 707, 720, 740; 5A 31 Sch. 1, 5, 8, 13; 6A 36 Sch. 47, 51, 53), Leopoldstadt I (A 1850, 1851, A 2 Sch. 6; 1A 11 Sch. 25, 46), Landstraße (A 1875–1897; 5A 21 Sch. 43, 49, 61, 65), Wieden (A 2 Sch. 18, 36, 60, 95, 100; A 11 Sch. 71), Mariahilf (A 1850), Neubau (A 2 Sch. 9, 52; 2A 16 Sch. 36).

Upper Austria: Oberösterreichisches Landesarchiv, BG/LG Linz (Präs 1854 ff, Abh. Sch. 1,000–1,007, 1,009, 1,011–1,012, 1,015–1,016, 1,019, 1,025, 1,027, 1,028, 1,032–1,035, 1,037, 1,040, 1,042, 1,045, 1,047–1,051, 1,053, 1,055–1,056), BG Braunau (A 54, 64, 91–92, 108), Eferding (A 7, 44), Frankenmarkt (A 4, 12, 71), Freistadt (A 17, 44, 70, 108), Grein (A 16, 53), Grieskirchen (A 16, 46), Grünburg (A 8, 15, 16, 23, 28, 44), Ischl (A 13, 42, 44, 52, 54, 58, 70, 78), Kirchdorf (A 1, 19), Kremsmünster (A 3, 22, 28, 31, 58, 81, 87, 89, 91, 115–116), Lambach (A 8, 17–18, 34, 42–43, 48), Leonfelden (A 34, 46, 64, 106), Mauthausen (A 2), Mondsee (A 19), Ottensheim (A 10, 17), Pregarten (A 30), Ried (A 3, 55, 65, 78, 96, 119, 137, 140), Schärding (A 73, 106, 110, 115, 134, 185, 194, 200), Urfahr (A 10, 36), Wildshut (A 2, 10, 14, 24), Wels (A 10, 30, 35, 47, 50, 70, 126).

Salzburg: Salzburger Landesarchiv, BG Salzburg (A Sch. 430, 432, 436, 438, 442, 445, 447, 450, 455, 464, 466, 474, 477, 536, 559, 570, 597, 598, 610; A I Sch. 160, 185, 249), Golling (A I Sch. 6–8), Hallein (A Sch. 98, 107, 109, 111, 117, 121, 122, 129, 130, 145, 146), Lofer (IV A Sch. 7, 9, 16), Mattsee (Sch. 17, 19), Mittersill (A Sch. 226–229, 231–236, 240, 243–245, 248–259, 269, 270, 274, 277, 285, 288, 289, 291), Neumarkt (1 A 1898–1899, 1909–1911), Oberndorf (IV 1861; IV A 1869 57; IV 1870; IV A 1874 63), Saalfelden (A Sch. 67, 142, 148–149), St. Gilgen (A Sch. 21, 29), Tamsweg (P 89), Thalgau (A 8, 29, 30), Werfen (A Sch. 60, 75, 76, 122–125, 132–133), Zell am See (A 7a, 13, 29).

Styria: Steiermärkisches Landesarchiv, Landesgericht (A 1903, 1–13), BG Aflenz (A 1884, 1904), Birkfeld (A 1850), Bruck (A 1865, 1871, 1872–1873, 1879, 1893, 1912), Eisenerz (A 1858–1861), Fürstenfeld (A 1871–1872, 1906–1907), Gleisdorf (A Sch. 22), Graz (D 1853, 1856, 1860, 1862, 1867, 1869, 1871, 1873, 1882, 1886, 1891, 1892, 1895; A 8 1899, 1901, 1905, 1910, 1912), Graz-Umgebung (A 1868), Gröbming (A 1899–1903), Hartberg (A Sch. 48, 228), Irdning (A Sch. 10, 88), Judenburg (A Sch. 57, 73, 74, 77, 80, 84, 89), Knittelfeld (A 1850, 1898, 1900, 1901, 1903), Leibnitz (A Sch. 66, 74), Liezen (A 1863, 1907), Murau (A Sch. 8), Mureck (A 1855, 1909), Neumarkt (A 1870, 1873, 1875, 1879, 1911), Obdach (A Sch. 7–8), Oberwölz (A Sch. 9, 11), Pöllau (A Sch. 193, 200, 202), Radkersburg (A Sch. 108, 137), Schladming (A 1899), Stainz (A Sch. 38, 47, 198), Voitsberg (A 1859, 1865, 1872, 1876, 1880, 1883, 1889, 1894, 1896, 1897, 1899–1909), Vorau (A 1856–1863), Weiz (A 1877, 1885).

Tyrol: Tiroler Landesarchiv, BG Imst (A 1, 2, 6), Innsbruck (A 1, 10, 17, 23, 34, 41, 45, 49, 52, 55, 60, 76, 82, 110, 124, 127, 136, 140, 145, 148), Reutte-Ehrenberg (A 1, 4, 10), Schwaz (A 2, 7, 9), Nauders (A 1, 3–4, 6–7, 9).

Vorarlberg: Vorarlberger Landesarchiv, BG Bludenz (A Sch. 61, 65, 70, 75, 78, 81, 84, 92, 94, 96), Bregenz (A Sch. 104, 114, 121, 127, 130–133, 144, 152, 156, 164, 169, 172, 180, 184, 186, 188, 189, 190, 192, 193, 196), Feldkirch (A Sch. 38, 49, 57, 67, 69, 77, 88, 93, 98, 106, 111, 112, 117, 124, 128, 133, 148, 146, 147, 154, 168, 170, 171, 186, 191, 195, 197, 204, 207, 212, 214, 221, 229, 234, 238, 240–244, 248, 252–254).

Appendix B. Demographic data

We used published census data for the estimation of proportions of various professional groups in the population. Census data are available for 1869, 1880, 1890, 1900, and 1910. The criteria for the classification of the population changed between 1869 and 1880, and again between 1880 and 1890. For the last three censuses, the data are easy to compare; the 1890 census offers the most comprehensive documentation on the regional level. Therefore, we relied primarily on the 1890 data for our calculations (Statistische Central-Commission, 1894).

The census publications offer data for crown lands and districts. For each regional unity, the population is split up according to gender, profession, and status within a profession. Status categories are self-employed, white-collar worker, blue-collar worker, day laborer, collaborating family members, dependents, and house-servants. We modified the numbers in the following ways:

- Persons younger than 20 years except self-employed persons were removed from the respective categories.
- In the secondary and tertiary sectors, dependents were added to the other status categories, with proportions of dependents being equal in all status categories. In both sectors, house-servants were removed from the respective professional groups and treated as a separate professional group of servants.
- For farmer couples, the census tables normally assume the husband to be the employer and his wife to be a collaborating family member. Usually, however, farmer couples owned their farms as joint property; since wealth is the interesting point in this analysis, we assumed the numbers of self-employed men and women in agriculture to be equal and lowered the numbers of collaborating family members in farms accordingly.
- In agriculture, all persons who were not self-employed including dependents and house-servants were classified as farm laborers.
- In industry, we assumed the proportion of businesspersons among all self-employed persons to be equal to the proportion of businesses with more than 20 employees in all businesses (compare Pammer, 1996, p. 59). The same rate was used to estimate the proportion of managers in white-collar workers. Subsequently, businesspersons and managers were classified as entrepreneurs.
- Day laborers in industry were classified as blue-collar workers.

Stratification within the bureaucracy is hard to assess. We followed Karl Megner who presents numbers for officials with and without tenure and the proportion of different ranks in the number of officials with tenure (Megner, 1985). In contemporary schemes, tenured officials were classified in 11 ranks. We distinguish between high ranking officials (tenured officials of ranks 1–5), middle–high ranks (tenured officials of ranks 6–9), middle–low ranks (tenured officials of ranks 10–11, untenured *Diurnisten* and *Praktikanten*) and low ranks (untenured *Diener*). Using numbers of 1846 and 1893 for the calculation, we estimated the proportion of high ranks in all officials to be 0.158; middle–high ranks comprised about

4.5 percent, middle–low officials about 22.5 percent, and low ranks almost 73 percent. For this version of the article, middle–low and middle–high ranks were drawn together and constitute one category of middle ranks.

For the first half of our period, we have only fragmentary demographic data. For simplicity, throughout the nineteenth century, we assumed the following:

- constant proportions of dependent persons in the respective professional groups;
- constant proportions of self-employed persons, farm laborers- and retired farmers in agriculture;
- a constant proportion of entrepreneurs in self-employed persons in industry;
- constant proportions of self-employed persons, white-collar workers- and blue-collar workers in industry;
- a constant proportion of physicians in free professionals;
- a constant stratification among tenured officials and constant proportions of tenured and untenured officials.

The proportions of agriculture in the population, and numbers of physicians and clerics could be determined independently (Sandgruber, 1978, p. 132; Direction der administrativen Statistik (Ed.), 1853).

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