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HUMAN CAPITAL TRANSFER OF GERMAN-SPEAKING
MIGRANTS IN EASTERN EUROPE, 1780s-1820s

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Working Paper 21-03

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Human capital transfer of German-speaking migrants in Eastern Europe, 1780s-1820s

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Abstract

Prior to the Age of Mass Migration, Germans left central Europe to settle primarily in modern-day Hungary, Serbia, Romania, Ukraine and Russia. Despite the harsh conditions that the first generation of settlers had to endure, their descendants often fared better, not worse, compared to native population groups. This study offers a possible explanation for this surprising outcome. We use data on approximately 11,500 individuals to estimate and compare basic numeracy scores of German settlers and other populations groups in target regions. We find that German settlers generally had superior basic numeracy levels, suggesting that these settlers must have contributed positively to the human capital endowment in their target regions. The numeracy of Germans was somewhat higher than the numeracy of Hungarians and substantially higher than the numeracy of Russians, Ukrainians and Serbs. We do not find noteworthy differences in terms of numeracy between German emigrants and the population they left behind, suggesting the absence of substantial migrant selection.

Keywords: Migration; Economic History; Germany; Hungary; Russian Empire; Ukraine; Eastern Europe

JEL codes: N13, N23

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Introduction

Migration has long been recognised by economic historians as a major determinant of economic and social organisation. Migration has resulted in social change as well as new labour market equilibria; it has altered both the sending as well as the receiving societies. These observations are well established. Recent literature has emphasised the critical importance of migrants' selectivity, skills, culture, and institutions in explaining economic development.⁴

The predominant themes in recent studies on the economic history of migration examine the size, composition, and economic and social consequences of migration to the Americas, especially migration during the Age of Mass Migration.⁵ A recent study illustrates that US counties with more historic European immigration have higher income, less poverty, less unemployment, higher rates of urbanization, and greater educational attainment today.⁶ Similarly, Brazilian municipalities that attracted more skilled immigrants during the nineteenth and early twentieth centuries had higher levels of schooling and higher incomes one century later.⁷ Elsewhere, human capital, technology transfer and the creation of favourable economic structures supported economic development in Argentina, Brazil and Paraguay.⁸ Additional recent research on European migration to the US during the twentieth century include German Jewish immigrants and their impact on US inventions and Holocaust refugees' contribution to US human capital accumulation.⁹

In contrast, cliometric case studies on the consequences of European migration to other world regions and for periods before 1850 are less abundant. Notable exceptions include a study on the economic consequences of Huguenot immigrants to Brandenburg-Prussia, where immigration lists from 1700 are combined with Prussian firm-level data.¹⁰ This research demonstrates that Huguenot immigrants introduced skills during the sixteenth century that had long-term effects on the productivity of textile manufactories. Elsewhere, rare individual records are the basis for tracing migration patterns across the North Sea region in the period 1550 to 1850.¹¹ Other notable studies include Simone Wegge's work on German emigrants from Hesse.¹² Wegge

⁴ Spolaore and Wacziarg, *Roots of economic development*.

⁵ Hatton, *The cliometrics of international migration*, pp. 941-969; Abramitzky and Boustan, *Immigration in American economic history*; Sánchez-Alonso, *Age of mass migration*.

⁶ Sequeira, Nunn and Qian, *Immigrants and the Making of America*.

⁷ Rocha, Ferraz and Soares, *Human capital persistence*.

⁸ Droller, *population composition*; Valencia Caicedo, *The mission*.

⁹ Moser, Voena and Waldinger, *German Jewish émigrés*; Blum and Rei, *Escaping Europe*.

¹⁰ Hornung, *Diffusion of technology*.

¹¹ Van Lottum, *Across the North Sea*; Van Lottum, *Labour migration and economic performance*; Brock and van Lottum, *Rural maritime labour migration*.

¹² Wegge, *Migration decisions*; Wegge, *Chain migration*; Wegge, *To part or not to part*; Wegge, *Occupational self-selection*.

provides a comprehensive cliometric account of German¹³ emigrants during the nineteenth century, analyzing migrant networks, chain migration, human capital, self-selection, and institutions.¹⁴

We are contributing another study to this body of literature by investigating eighteenth-century migrants from German territorial states and territorial authorities of the Holy Roman Empire, as well as from Alsace and Lorraine in France and some Habsburg territories in modern-day Switzerland to the Kingdom of Hungary and the Russian Empire.¹⁵ This migration episode has received little attention in the English-language economic history literature despite its effect on the demography and economic history of modern-day Russia, Ukraine, Moldova, Hungary, Romania, and Serbia.¹⁶ The number of German-speaking migrants to Hungary alone during the eighteenth and early nineteenth centuries was approximately 150,000 in total.¹⁷ These are relatively small figures when compared to the Age of Mass Migration but the impact these migrants had on their adopted homelands was very significant. These migrants settled in a concentrated area in the southern part of the Pannonian Basin (and some distinct locations in the Russian Empire). As a result of this concentrated settlement, ethnic Germans' population shares were up to 25 per cent by 1850 in the Voivodeship of Serbia and Banat of Temeswar and the district of Akkerman (Bessarabia), making these migrants an important and influential minority.

The presence of ethnic Germans in various settlement areas in Eastern Europe began to decline in the 1940s, when Germans in Bessarabia were resettled at the end of 1940 under the slogan, '*Home to the Reich*', and many Germans in Vojvodina fled by the autumn of 1944. The approximately 200,000 Germans who remained in Yugoslavia fell victim to the unchecked drive for revenge and retribution at the end of the second World War. About 30,000 were transported to

¹³ We use the terms, 'German-speaking' and 'German' even though there was no homogenous group of Germans, no German national identity, nor did a German national state exist at the time of migration, nor did all migrants originate from modern-day Germany. Exclusively for convenience we use the term 'German' and 'Germany' henceforth to refer to these migrants.

¹⁴ There is also a series of cross-country studies in the spirit of Acemoglu, Johnson and Robinson (2001).

¹⁵ Holy Roman Empire during the late eighteenth century included huge territories, encompassing territories in among others modern-day Austria, Belgium, Czech Republic, Germany, Poland and Slovenia. Migrants investigated in this study originated from various regions within the Empire; Migrants to the Kingdom of Hungary by and large originated from the Central and Southern parts of the Empire whereas migrants to the Russian Empire originated from Central to Northern parts. Main target regions in the Kingdom of Hungary were the Banat, the Batschka, southern Transdanubia, Transdanubian mountains, Satu Mare (Sathmar) and Slavonia.

¹⁶ Other target regions in the Russian Empire were Bessarabia, Wolhynia and the Caucasus region.

¹⁷ Hegediš, Antal; Čobanović, Katarina: Demografska i agrarna statistika Vojvodine 1767-1867. Novi Sad 1991, p. 113. See Seewann (2012), p. 213-215, for migration figures. Oltmer 2012, p.1. Estimates differ somewhat since not all immigrants were registered. A minimum of 100,000 Germans immigrated to the Kingdom of Hungary; some (probably overshooting) estimates suggest an influx of up to 400,000 German immigrants (see Seewann (2012) for a discussion, p. 213-215). Kocsis and Kicosev (2004) report population numbers in the Vojvodina, which represents the part of the Pannonian Basin that is part of modern-day Serbia. Population shares for several benchmark years which are based on historical censuses confirm this figure. The first benchmark year with a notable German population was 1787. At this point, 58,866 Germans (or 12.8% of the population) of the Vojvodina were of German origin. By 1828 this number had risen to 142,653 (16.4%) and by 1840 the census suggests 154,047 Germans (16.9%). It is important to mention that the Vojvodina region was only created in 1849; it is difficult to directly compare the Vojvodina and the various historical settlement regions in the Kingdom of Hungary.

the Soviet Union for forced labour and an estimated 70,000 people perished in camps.¹⁸ In 1948, these camps were dissolved and the survivors released, and most of them found a new home in Germany and Austria. In total, approximately 14 Million ethnic Germans fled from late 1944 or were expelled. Eventually, the German Statistical Office estimates that approximately 4.5 million ethnic Germans and their families immigrated from Eastern Europe to Germany during 1950 and 2011.¹⁹

This case study introduces a European testing ground for theories and hypotheses on international migration. In particular, this study offers important lessons on the beneficial effects of skilled migration. Surprisingly, areas that had experienced destruction and depopulation during the Habsburg-Ottoman wars up to the eighteenth century and immigration in subsequent decades are found to be better off, not worse, in the early twentieth century compared to areas with little or no destruction or areas that received fewer German immigrants.²⁰ Likewise, areas that were colonised by German immigrants in the Russian Empire fared well, despite the hardships and adverse conditions in target regions. For example, German and Mennonite colonies in the Black Sea area surpassed the local Bulgarian colonists in terms of measurable economic success only three to five years after their founding.²¹ As for the Habsburg Empire, the legacy of German cultural norms and institutions have been found to be a determinant of economic development.²²

Here, we offer a different explanation of the undoubted link between society and economy. Our approach will assess the skill level of German immigrants as well as provide a comparison of German immigrants with native populations. This study forms a basis for understanding the consequences of this episode in international migration and some of the differences in terms of development in Central and Eastern Europe. We use several datasets previously unused in cliometric studies to estimate basic numeracy levels of German settlers migrating to the Kingdom of Hungary and the Russian Empire during the late eighteenth and early nineteenth centuries. Migrants to the Russian Empire are identified in census records while migrants to the Habsburg Empire self-reported their personal information to Viennese authorities en route to their target regions. We compare these estimates with Germans who stayed behind to identify the magnitude of selection and the transfer of human capital.²³ We find that these German migrants show little, if any, difference in terms of skill levels compared to their home region. We find that German settlers generally had superior basic numeracy levels compared to local population groups in their target

¹⁸ Violence against ethnic German civilians was often a response to war crimes committed by Nazi Germany and its allies.

¹⁹ Worbs et al., *(Spät-)Aussiedler in Deutschland*. Braun and Kvasnicka, *Immigration and structural change*. Braun and Mahmoud, *employment effects*.

²⁰ Nikolic and Blum, *Immigration and development*.

²¹ Myeshkov, *Die Schwarzmeerdeutschen*, p. 46.

²² Becker et al., *The empire is dead, long live the empire!*

²³ Borjas, *Self-selection*.

regions, suggesting that these settlers must have contributed positively to the human capital endowment in their target regions.

Our second contribution relates to the body of literature on German emigrants to various target regions in Central and Eastern Europe. There is a considerable German-language literature on various aspects of these historic episodes, but these studies often have a focus on sociology, demography, and cultural studies and are not easily accessible for international scholars. This inaccessibility for international scholars is unfortunate since these landmark publications are highly valuable contributions in journals and edited volumes, rich in primary sources and acknowledging the complex transnational, socioeconomic, and contextualized realities of this historical period.²⁴ As a result, outdated myths and stereotypes are still treated as valid hypotheses elsewhere in academia, even though they have been demonstrably disproven according to the extensive German language literature. For example, the ‘creatio ex nihilo’ legend which suggests German immigrants to Eastern Europe settled in an empty space and created abundance without any interrelation with local authorities or native populations oversimplifies and idealizes historical circumstances. Elsewhere, the literature refers to the ‘three migration waves of the Danube Swabians’ (“*drei Schwabenzüge*”), overemphasizing the (modern) nation-state while ignoring the complex socioeconomic conditions that influenced the stream of migrants that spread over more than a century.²⁵ More recent publications are valuable complements and updates of established English-language readings.²⁶ Elsewhere, real-partitioning of inheritance (*Realteilung*) is overestimated as a driver of migration; some authors simply ignore the fact that the majority of migrants originated in Catholic areas in Central Europe practicing *Anerbenrecht*, the legal tradition of inheriting land undivided.²⁷

The remainder of this study proceeds as follows: section two introduces the historical background and the causes and consequences of German migration in Eastern Europe, while section three discusses the costs and benefits of German immigration from the immigration country’s perspective. In section four our methodology, dataset, and data quality are introduced. In subsequent sections empirical analyses and results are presented and estimates of numeracy are shown and compared with numeracy of selected Eastern European populations.

²⁴ Fata, *Migration im kameralistischen Staat*; Myeshkov, *Die Schwarzmeerdeutschen*. For example, a rich archival source of information in this regard are probate files (Verlassenschaftsakten) allowing the scholar to understand the nature of this contemporary ‘homo migrans’ (Krauss 2015).

²⁵ See Seewann, *Siebenbürger Sachse, Ungarndeutscher, Donauschwabe?* for a discussion.

²⁶ See for example Paikert’s, *The Danube Swabians*, who underestimates the initiatives of private landlords to attract German settlers and overestimates the ‘Germanisation’ of some target regions.

²⁷ Fenske, *International migration*. For a discussion of the relationship between religion and inheritance customs see Ekelund, Hébert and Tollison (2002) and Rink and Hilbig (2018). In a society that had not fully develop the idea of a nation state, religion was an important settler characteristic. It is no surprise that predominantly Catholic Habsburg preferred to attract Catholic settlers.

Causes and consequences of German migration to Eastern Europe

Many eighteenth-century migrants originated from overpopulated and land-constrained regions in the Holy Roman Empire and neighbouring territories. Settlers often brought monetary assets to the target regions and invested them into travel, farms, and equipment.²⁸ The average fortune per family was 233 guilders per family including subsidies; net family assets without any subsidies were approximately 210 guilders per family.²⁹ Carrying such an amount indicates that those settlers were members of the lower or lower-middle classes, but were by no means penniless travellers.³⁰ Most settlers were agriculturalists and craftsmen by trade, leaving economically suboptimal conditions, but most migrants had sufficient purchasing power to sustain their families during the journey.

Excerpts from migrants' letters sent from their destinations provide insights into their motivations for leaving their homes. These letters suggest lively communication between settlers and those who stayed behind, with the former often trying to encourage family members to follow, suggesting the existence of chain migration effects. In addition, the quality of writing in these letters illustrates the literacy of some migrants. Hans Georg Nagler, an immigrant from Lorraine, wrote in 1784 from the Banat region in Hungary to a relative, "[o]nce the autumn planting job is done there is nothing else to do than drinking wine and chatting with the women."³¹ Such promotional letters must have made emigration look attractive, especially among recipients in densely populated areas. Emigration became increasingly popular and authorities became worried about population losses in Germany. For example, on 12 March 1785 the ducal government of Palatinate-Zweibrücken complained that 15 letters from Hungary and Poland had arrived recently that had the potential to promote emigration and argued that these letters should not be served to prevent further emigration. Also, pastors were prohibited from issuing baptismal certificates, which were required for identification for potential emigrants.³²

Evaluating contemporary Germany migration policies is a difficult task since settlers originated from various independent states. The territorial and political fragmentation of the Holy Roman Empire led to a plethora of emigration rules; any independent state was able to adopt its own migration law and policies. Some states prohibited emigration altogether, such as the

²⁸ Krauss, *Mit einem Bündel sind sie gekommen*.

²⁹ We are indebted to Zoltán Csapo, who provided a complementary data source containing individual data of German settlers. See Blum and Krauss (2017) and the data section below for discussions of this data source. In contrast to Hacker's (1969, 1983) data, Csapo's data indicate the fortune to be 178 guilders per family; this difference is partly caused by migrants' self-reporting of assets and context-specific factors.

³⁰ Hacker, *Auswanderung aus dem Raum der späteren Hohenzollerischen Lande*.

³¹ Original wording: „Wan die Herbstsatt gedan ist, so haben wir nicks zu dun als Wein zu drinken oder mitt den Weiber[n] zu sprechen.“ Archives départementales de la Moselle, Metz, Cours et juridictions antérieures à 1790, Maréchaussée de Sarreguemines, B 10561, Fasz. 4, without folio, letter from Hans Georg Nagler (Mercydorf) to Joseph Trapp, Wiebersweiler (Vibersviller, Département Moselle) dated 4th of October 1784.

³² Landesarchiv Speyer, B 2, number 4313, folio 22-23.

Electorate of Bavaria. Individuals who emigrated without permission risked losing any property left behind, including future inheritances. These policies aimed at limiting net capital exports and a negative balance of payment;³³ emigrants were relatively poor in capital, but their capital exports usually exceeded remittances and other benefits of emigration. German states tried to address the negative consequences of emigration by introducing emigration bans and negotiating compensation payments between target countries and German territorial states.³⁴

An important role in determining the final destination country for these potential migrants was played by the German territorial state's migration policies, dynastic ties, denominations, previous emigration experience, the success of advertisers and agents, private or official reports from the target areas, legal framework conditions, subsidies and other financial incentives, personal assets, and other socio-economic conditions. General expectations and rumours were a factor also; destination countries were sometimes imagined to provide heavenly living conditions. High expectations are reflected in a popular contemporary Bavarian-Swabian emigrant song:

Hungary is the richest country.
There is a lot of wine and grain,
That's how it was proclaimed in Günzburg,
The ships are ready.
There [In Hungary] is a lot of cattle and fish and poultry,
And there [In Hungary] is plenty of pasture land,
Who now moves to Hungary,
Can expect a Golden Age.

For some Pietist-separatist emigrants to the Russian Empire, the saying, “[a] light is burning in the east; From the Ararat mountain God's face shines upon us” reflects similar expectations. Elsewhere, a contemporary songbook proclaims the divinity of the Russian Tsar Alexander I:

God has chosen the monarch of the Russian States
chooses to the tool of great graces
He is the Blessed on this earth,
Helps Christ now gather the believing herds.³⁵

³³ Krauss, *Lebenswelten*, 2015, p. 88-90

³⁴ The following archival sources provide examples on how emigration bans and compensation payments were used to limit the negative fiscal consequences of emigration. Staatsarchiv Marburg, 90b, Fürststäbte, Landeshoheit, Reichs- und Kreissachen, Auswärtige Angelegenheiten, Nr. 1848, Vereinbarungen über Abzugsgeldzahlungen von Vermögen und Erbschaften zwischen dem Bistum Fulda und den Österreichischen Erblanden sowie den Königreichen Ungarn, Polen und Böhmen, 1767-1827, pp. 10-13; Bayerisches Hauptstaatsarchiv (BayHStA), Generalregistratur (GR), Fasz. 417, number 32, Die zwischen Churbayern und dem Königreich Ungarn wechselseitige Einforderung der Nachsteuer und Freigeld betr., 1805-1808, without fol. See Pisarevskij, *Izbrannye proizvedenija*, for a discussion of recruitment and travel bans in Prussia and Danzig during the 1780s. Bartlett, *Human capital*, p. 57, also discusses emigration bans.

³⁵ Songbook of Johann Jakob Koch, a miller from Schlüchtern, a town in the German principality of Hesse-Cassel. Source: Zwink and Trautwein, *Geistliche Gedichte*, p.47-90.

Existing per capita GDP figures for Eastern Europe indicate that general income levels in target regions cannot have been the sole reason for migration. GDP per capita estimates for 1700 and 1820 in Eastern Europe are 606 and 683 US\$ (in 1990 PPP), respectively. Corresponding levels for German states in 1700 were between 910 and 993 US\$ and for 1820 these estimates suggest GDP per capita to be 1,077 and 1,218 US\$, respectively.³⁶

Average heights of the populations inhabiting Central and Eastern Europe provide an alternative view on differences in living standards during the period under observation, and these differences may help elucidate the incentives leading to migration. Average height reflects the net nutritional status of a population, i.e., gross nutritional intake less the burden on the growing body caused by hard physical labour, especially child labour, and adverse disease environment.³⁷ A comparison between average heights in Hungary and southern Germany during the period under observation confirms that southern Germans enjoyed somewhat higher living standards; male average height in southern Bavaria of the 1780s birth cohort is found to be 166.3 centimetres while Hungarians born during this time reached an average height of 163.3. Similarly, male average height during the 1810s and 1820s in southern Germany were between 165.7 and 166.5 centimetres while the average height in the Russian Empire was approximately 162 centimetres.³⁸ This height difference of approximately three to four centimetres corresponds to decades of economic development, indicating that general living standards in the Kingdom of Hungary and the Russian Empire were probably not the prime reason for migration.³⁹

The economic prospects in destination countries seem to be a more important motivator for migration.⁴⁰ Differences in living standards also corresponded to low agricultural productivity and low price levels of land in general. Settlers were attracted by land abundance and low land prices; many migrants tried to use migration as a vehicle to move out of the landless class. Also, low risk of unemployment and relatively high wages in destination countries have been identified as encouraging factors for migration. Migrants described local circumstances in letters to their relatives; for example, a settler named Joseph Schäfer reports that prices are particularly low in villages inhabited by Serbians.⁴¹ Agricultural land could be purchased with a fraction of the expenditure necessary in the Holy Roman Empire; a large farm in southern Germany was worth

³⁶ Maddison, *The World Economy*.

³⁷ Steckel, *Stature and the standard of living*.

³⁸ Komlos, *Stature and Nutrition*; Baten, *Ernährung*; Baten, *Economic development*; Mironov and A'Hearn, *Russian living standards*.

³⁹ See for example Baten and Blum (2012) for more context and an impression of height growth during the nineteenth and twentieth centuries. Baten (2000) and Baten und Blum (2014) show that height and monetary income indicators correlate systematically and how anthropometric indicators can be used to gain an insight into wealth and well-being in the absence of monetary indicators.

⁴⁰ Gould, *European inter-continental emigration*; Hatton, *The cliometrics of international migration*.

⁴¹ Original wording: „Wan man aber auf die Raatzen [Raitzen, orthodox Serbians] Orth fahren thut, so bekommt man noch alles wohl feiler als in deutschen Orten“ (Generallandesarchiv Karlsruhe, 119, number 196, without folio).

several thousand guilders, while the same property in the Kingdom of Hungary could be purchased by investing only a few hundred guilders.⁴² For example, during the mid-eighteenth century, a farm estate could be purchased with approximately 200 guilders. That said, such a transaction typically did not include the farm land, which usually remained the landlord's property.⁴³ Moreover, if settlers were able to work as craftsmen – an additional source of income during slack times in the agricultural year – wages for skilled labour allowed for, “living the life of a Lord”.⁴⁴

Habsburg authorities tried to exploit these circumstances by carrying out several campaigns during the eighteenth century to attract settlers. Migration to regions with low population density was generally welcome, and authorities subsidized immigration; this was necessary to stay attractive in light of Prussian and Russian competition for migrants. During the Josephinian settlement period (1784-86), for example, settlers were promised travel subsidies in cash, advance payments, and tax reliefs as well as farm land via ground rent and machinery, which included investments in land surveying and measurement, drainage, and other cultivation measures. Settler families were also provided with food to bridge the period until their own subsistence was built up.⁴⁵

Consequently, the ethnographic landscape of the present study's target regions changed substantially. Between the late seventeenth and the early nineteenth centuries, at least 150,000 German migrants arrived in various regions in the Kingdom of Hungary.⁴⁶ Mortality among newly arrived settlers was usually high; death record entries and reports indicate that many colonists who died in the first years fell victims to febrile infectious diseases and gastrointestinal diseases due to lack of immunization and unawareness of conditions in their settlement areas. Common symptoms include cough, fever, pleurisy, vomiting, and diarrhoea, with diagnoses including chickenpox, dysentery, typhus, malaria, tuberculosis, and plague. These infectious diseases hit not only the poorer people and the lower social strata, but all non-immunized people. Yet, successful livelihoods and substantial population growth led to large German minorities. In some Hungarian regions, for example, Germans accounted for a relative or even an absolute majority (see maps 1 and 2).

⁴² BayHStA, GR, Fasz. 417, number 31, folio 130–145.

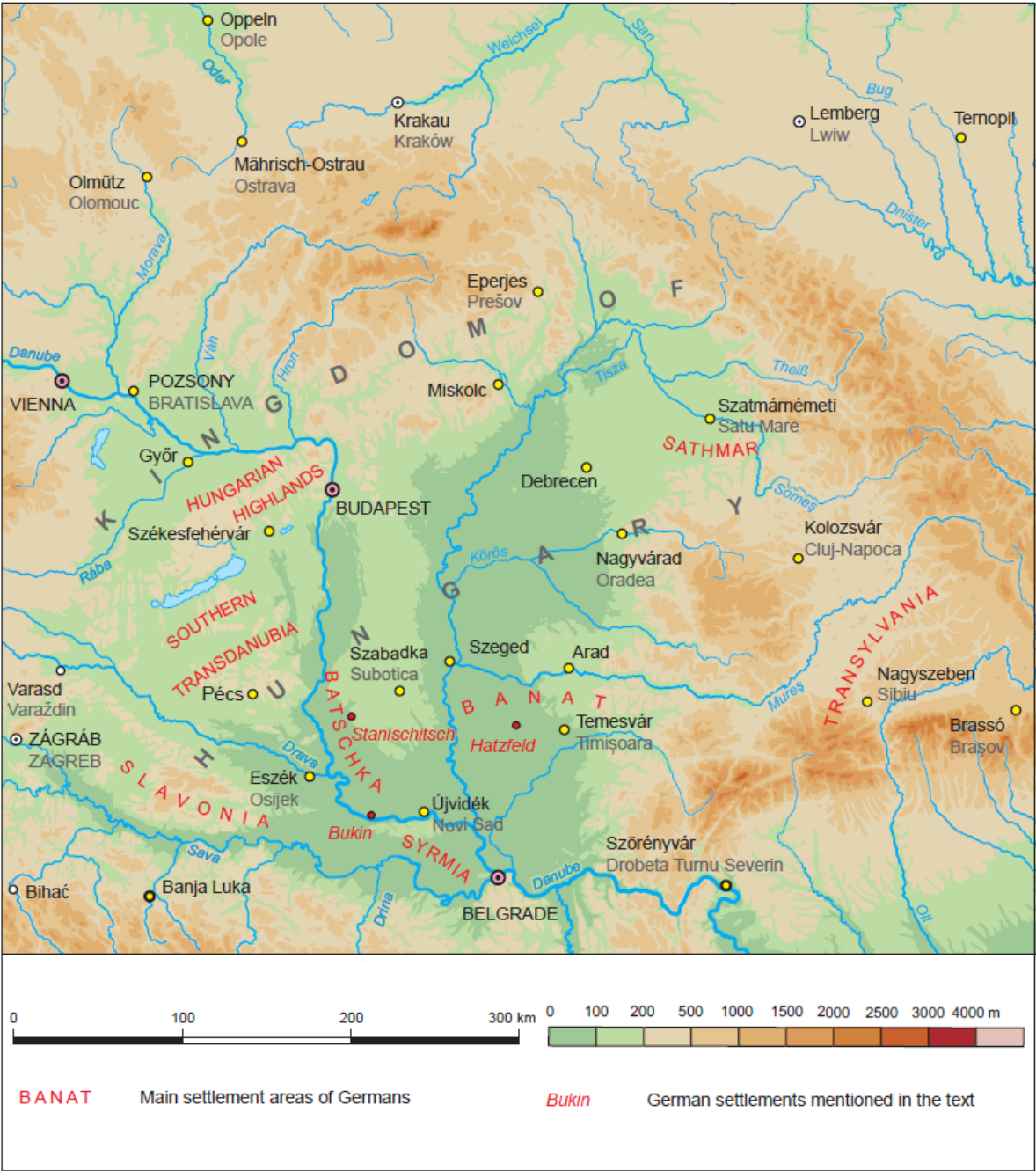
⁴³ Magyar Nemzeti Levéltár-Baranya Megyei Levéltár, VI, Batthyány-Montenuovo család bolyi levéltára, Fasz. 37.

⁴⁴ Original wording of Nicolas Schanen's letter in 1783 to his brother: „*Dan umb ein kleines Geldt kanst Du Dir ein Hauß mitt sambt 12 Morgen Landt [...] kaufen [...] und wan Du auf Deinem Handwerk wilst arbeyten, so kanst Du leben wie ein Herr*“ (Archives de l'État en Belgique, Archives générales du Royaume, Brussels, Belgium, Conseil Privé sous le régime Autrichien (CP), liasse 673b, 1784, without folio).

⁴⁵ Seewann et al., *Die Ansiedlung der Deutschen*.

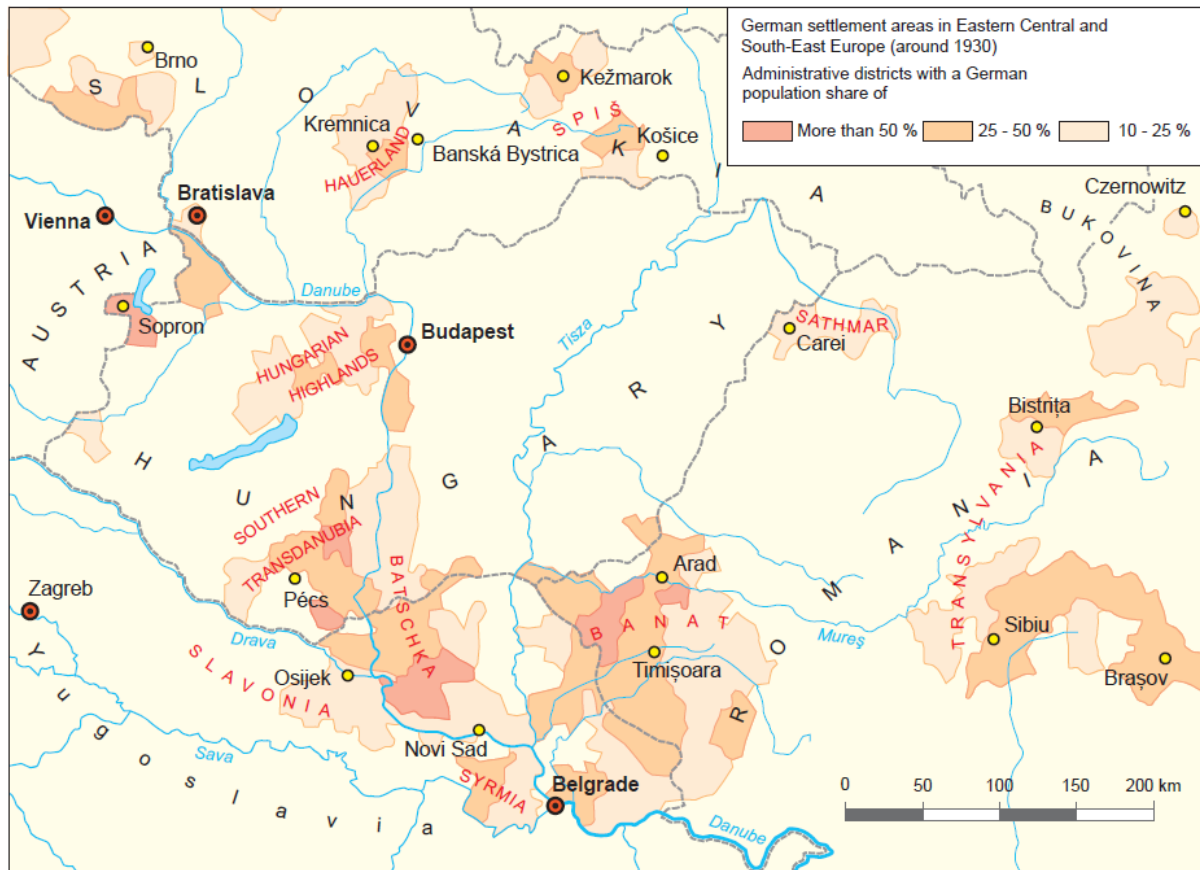
⁴⁶ Main regions of settlement were the Bánság (Serbian and German: Banat), Bácska (Serbian: Bačka; German: Batschka), Szatmárnémeti (Romanian: Satu Mare; German: Sathmar), southern Dunántúl (Transdanubia), Bakony and the hills around Buda in modern-day Hungary, Romania and Serbia.

Map 1: Main settlement areas of Germans in the Kingdom of Hungary



Design and cartography: Karl-Peter Krauss, Richard Szydlak.

Map 2: German settlement areas in Eastern Central and South-East Europe (around 1930).



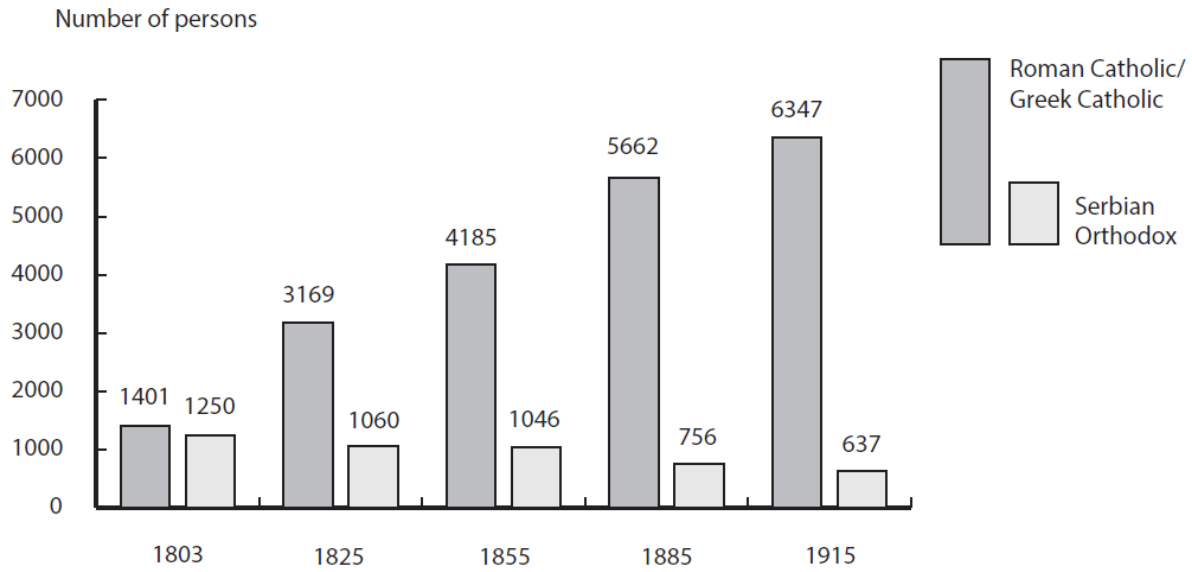
Design and cartography: Karl-Peter Krauss, Josef Wolf.

Precise and reliable estimations of population shares are rare, but one source reports that in 1720 the number of villages was 8,438 and that by 1787 this figure had increased to 9,654, equalling a growth of 14 per cent.⁴⁷ Also, in many villages the total population and the German share increased substantially, partly in a process where Germans gradually crowded out other ethnicities. An exemplary case is the village of Stanischitsch (Serbian: Stanišić; Hungarian: Órszállás) in the Bačka region, which grew from a village of 2,651 inhabitants in 1803 to approximately 7,000 inhabitants in 1915. While Roman Catholic and Serbian Orthodox groups accounted for approximately equal shares in 1803, by 1915 the share of Catholics had increased to 91 per cent of the population mainly due to the immigration and birth surplus of Catholics from German states.⁴⁸ Moreover, during most of the late eighteenth and early nineteenth centuries, the number of baptisms exceeded the number of births, indicating a continuous population growth (figures 1 and 2).

⁴⁷ Kurucz, *Agrarwirtschaft und Kolonisation in Ungarn*.

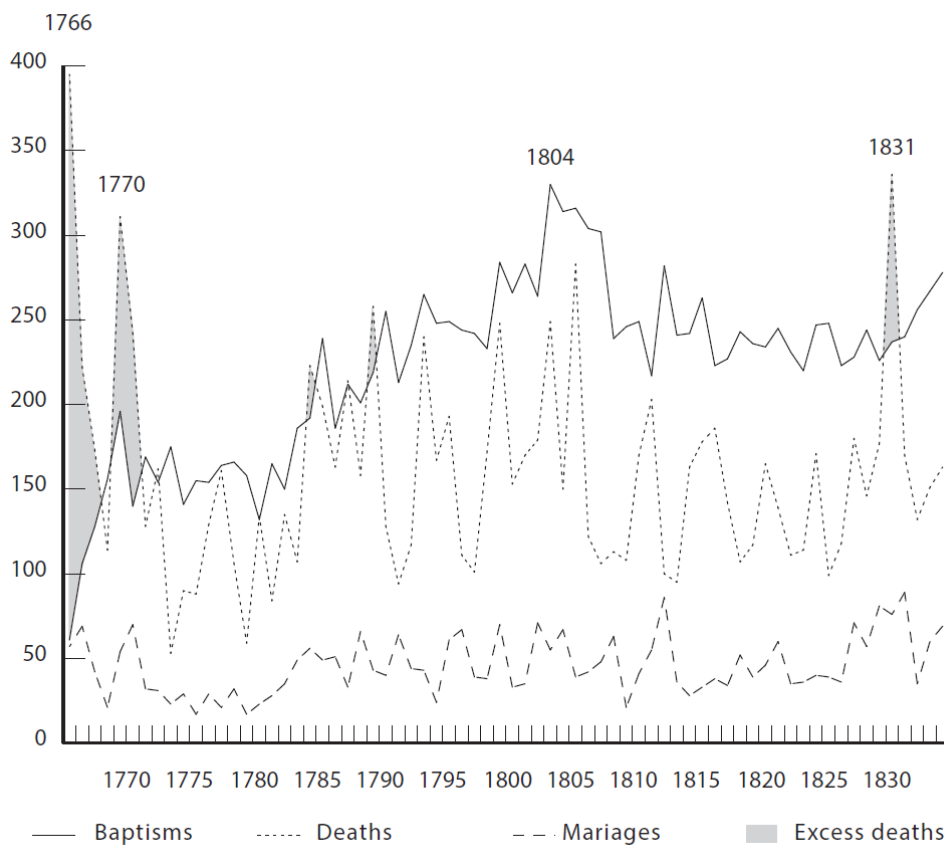
⁴⁸ Until Hungary's Emperor Joseph II's 'Edict of Tolerance' (*Toleranzedikt*) in 1781, almost only Catholic Germans were settled in the Kingdom of Hungary. The case of Stanischitsch illustrates that the Catholic inhabitants were of German origin, the Serbian Orthodox people were Serbs. Lakatos (2002), p. 261-162; Hegediš and Čobanović (1991), p. 113.

Figure 1: Population changes of Stanischitsch village, 1803 to 1915



Source: Lakatos (2002); Hegediš and Čobanović (1991).

Figure 2: Baptisms, deaths and marriages in Hatzfeld village, 1766 to 1835



Source: Vital statistics, church register of Hatzfeld village (Romanian: Jimbolia; Hungarian: Zsombolia).

Immigration, birth surpluses, and systematic colonization of the Banat and Bácska regions led to the creation of some agglomerations of Germans. By 1720, Germans accounted for approximately half of the population of Buda; by the end of the eighteenth century, this population share had grown to approximately 75 per cent. By 1848, the share of Germans in Buda and Pest was approximately two thirds and 70 per cent, respectively. Population numbers from mid-nineteenth century Pécs and Kanizsa, where Germans accounted for approximately 30 and 50 per cent of the population, suggest that Buda and Pest were somewhat special in this regard and that accumulations of Germans were less in other parts of the Kingdom of Hungary.⁴⁹

As for the Russian case, the Empire had a long history of encouraging immigration as a means to modernization, but migration to the Russian Empire was never a mass phenomenon.⁵⁰ The initiation of a new colonization policy has traditionally been attributed to Tsarina Catherine II the Great (reign 1762 to 1796; Catherine II henceforth), but already under her predecessor Tsarina Elizabeth I (1709-1761), plans for the recruitment of foreigners via policies similar to those in Prussia and Denmark were implemented, such as the invitation of persecuted French Protestants (Huguenots). However, these policies did not come to pass for various reasons, and until the 1760s the migration of skilled workers, including from German territorial states, happened on an individual basis.

It was only after the Seven Years' War that Russia began a transition to systematic immigration (colonization policy), which had already begun decades earlier in Prussia and Hungary. Tsarina Catherine II was determined to colonize south eastern and southern territories of Russia, but Russia had to deal early on with a scarcity of human resources due to the spread of serfdom inside the country. Therefore, settlers who were supposed to defend the border areas and contribute to the economic development of the region included not only southern Slavs from south eastern Europe, but also Germans from the territorial states to whom Catherine II addressed her manifestos of 1762 and 1763.

In the years following 1762/3 the primary stream of German settlers initially headed towards the Volga due to the Russian-Turkish wars. After the Russian expansion towards the Ottoman territories near the Black Sea coast, the conditions for a transition from border or military colonization to economic development in the region were ripe. At the end of the eighteenth century, the number of foreign - mainly German - colonists in the northern Black Sea area reached several thousand people. Eventually, nearly 30,000 German colonists settled in the Volga area and up to 55,000 in the northern Black Sea area (map 3). However, an unknown number of settlers originally inhabiting the agricultural colonies of the northern Black Sea area fled to the cities of the northern

⁴⁹ Kaposi, *Die wirtschaftlichen Auswirkungen*.

⁵⁰ The recruitment of specialists by the Tsarist Empire, including experts from the German territorial states is considered a continuation of Tsar Peter I's (1672-1725) modernization policy.

Map 3: Settlement areas in the Black Sea region



Design and cartography: Karl-Peter Krauss, Dmytro Myeshkov.

Black Sea area. This mass rural-to-urban movement occurred during the last third of the eighteenth century and the first third of the nineteenth century.

Major events that triggered migration flows towards Eastern Europe were the famine years of 1816 and 1817 following the eruption of the Tambora volcano in April 1815 in modern-day Indonesia, causing a major climatic deterioration and several harvest failures.⁵¹ The year 1816 became known as the ‘year without summer’; the agricultural season in 1816 started in late April, but the absence of a summer climate led to a devastating harvest. Another contributing factor that encouraged many families to migrate was the fact that Europe was poorly prepared for poor harvests after years of conflict during the Napoleonic Wars.

Imperial Russian authorities aimed to attract able agriculturalists to foster economic development and strengthen the tax base. In reality, settlers were a heterogeneous group consisting of agriculturalists, craftsmen, low and unskilled immigrants, and anyone who hoped to better his family’s well-being through acquiring cheap land. While not everyone was low skilled, only some of these settlers had actual experience in agriculture; others simply seized the opportunity of a fresh start. It is not a surprise, therefore, that multiple affirmations exist supporting the thesis that not all immigrants to the Black Sea area were high skilled, particularly when judged by their farming

⁵¹ Post, *Subsistence crisis*. Oppenheimer, *Consequences*.

expertise, and they did not always meet Russian expectations. Even religiously motivated migrants (especially emigration from Wuerttemberg to the Tsarist Empire in 1817) were similar in terms of their skills and socioeconomic background. This explains why both the Russian government and the administrations of Royal Hungarian Court Chamber⁵² repeatedly complained of a lack of agricultural skills among colonists. In Russia, this finding resulted in a more discriminating selection of colonists as well as a required minimum amount of money that emigrants needed to carry. Thus, at least since 1803/4, it became increasingly difficult for people lacking means to achieve the status of 'privileged colonist'.⁵³

This begs the question, why were German settlers so in demand while authorities in target regions simultaneously complained about them? German immigrants had received considerable schooling by contemporary standards, and craftsmen and smallholder farmers brought important skills that added to the human capital and technological base in their new homes. The growth of many of the German settlements indicates their economic success, especially in the medium and long run, but the perception of Habsburg and Russian officials was somewhat different. Authorities hoped to attract able agriculturalists to strengthen their tax base in underpopulated areas; settlers, however, did not possess the specialised skills, tools, and technologies needed to instantly adapt to local climatic and agricultural conditions. A mortality crisis in the years after arrival impaired settlers' moral and entrepreneurial activities, which added to the authorities' disappointment.⁵⁴ These problems, which dominated the years after arrival, shaped the experience and perception of authorities in the short run.

Costs and benefits of German immigration

Anecdotal evidence suggests that German migrants were skilled, educated, and well-organized, helping many to acquire above-average living standards and expanding their subsistence, often at the expense of local farmers or other migrant groups in target regions who sold their land to more prosperous Germans.⁵⁵ Accordingly, there was a high demand for German settlers; a fact that is reflected by competition between local authorities, big landowners, and the clergy who were all eager to attract German settlers. Johann Franz Albert Crauß, an agent recruiting settlers in the German Lands, reported in 1722 that among 300 families who intended to emigrate to the Banat

⁵² In the Kingdom of Hungary, the Latin term "Camera Regia Hungarica" or "Camera Hungarica Aulica" was used.

⁵³ These privileges included the right to self-government (to a large extent also in ecclesiastical matters), provision of land, financial assistance, provision of material and/or equipment (which for the most part did not have to be paid back), tax exemption for 10 years and sometimes more, exemption from military service, own state authority (i.e. also own jurisdiction of the 1st instance).

⁵⁴ Myeshkov, *Die Schwarzmeerdeutschen*, p. 262-266.

⁵⁵ This section deliberately focusses on the Hungarian case, illustrating the conceptual world of migrants and the conditions they found themselves in after migration. For the Russian-bound migrants, however, similar issues apply, especially the cost and difficulties of travel as well as the challenges in adapting to local conditions in the Russian Empire.

region (an area of modern day Romania, Serbia, and Hungary), the majority never arrived there because Hungarian landlords recruited them along the way.⁵⁶ Migrants invested in local businesses, either directly by bringing monetary assets, or via transferring inherited assets at a later stage.⁵⁷ Nevertheless, state authorities and landlords occasionally complained about the new settlers since these newcomers needed time to adapt to local conditions; consequently, the authorities first had to invest in those immigrants who did not have the means to build a rural livelihood on their own and contribute to economic development.

The costs of attracting settlers for the public purse was considerable since authorities often offered direct travel subsidies, financed land surveying, measurement, drainage and other cultivation measures, provided seed, built roads and canals, and granted temporary tax exemption for periods up to ten years.⁵⁸ An official document issued on 16 April 1784 states that every person willing to migrate during the Josephinian colonisation period (1784-6) could obtain a travel allowance. Authorities offered two guilders for each traveller upon arrival in Vienna, and one guilder per person upon arrival in Pest and upon arrival at the place of destination.⁵⁹ More importantly, the Emperor and King of Hungary himself promised to provide education, free housing, sufficient arable and pasture land for farmers, and the amount of 50 guilders for craftsmen to buy equipment necessary to start a business. Authorities also promised to employ clergymen for each of the newly formed communities, reducing culture-related migration barriers. This is an important feature of this episode in European migration since it illustrates that opportunity costs and transaction costs related to migration was modest; settlers were compensated for migrating, and cultural and institutional barriers were limited. However, to the disappointment of local authorities, German settlers were often not prepared to live and work in an unknown climate and under unknown agricultural conditions. Also, the mortality of German settlers was in the first years after settlement typically high, meaning that the country's investments partly turned out to be lost, resulted in considerable healthcare costs, and did not result in the expected returns (figure 3).

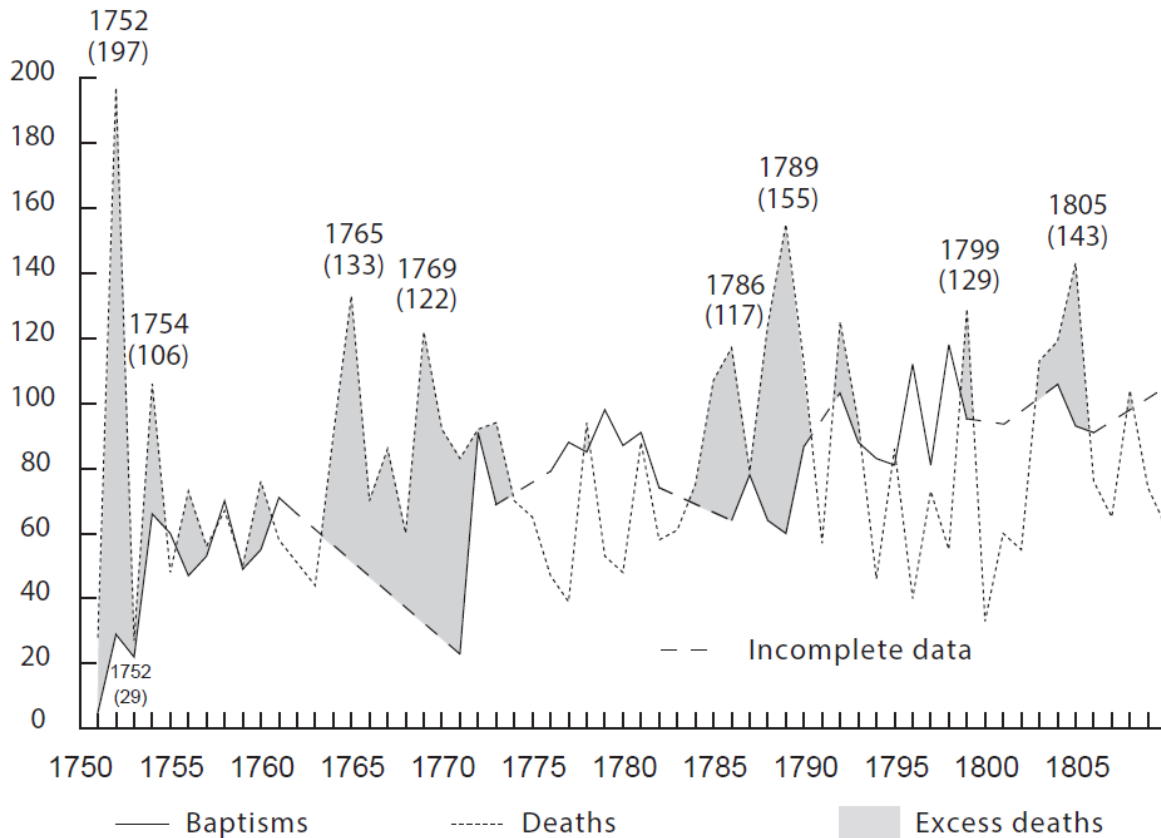
⁵⁶ Tafferner, *Quellenbuch*, p.185.

⁵⁷ Krauss, *Quellen*.

⁵⁸ Kaposi, *Auswirkungen*.

⁵⁹ Original wording: „So werden alldiejenigen...[welche] in Wien erscheinen, eben allhier ein Reisegeld von 2 Gulden per Kopferhalten...und allda [in Pest] ein weiteres Reisegeld von 1 Gulden per Kopf und endlichen bei ihrer Ankunft in dem Bestimmungs Ort abermahl 1 Gulden... Jene aber, so ohne derley Pässe ankommen werden, wird man zwahr annehmen, jedoch als unbekannten, welche ihr Schicksaal frey suchen, gedachtes Reisegeld nicht verabreichen.“ (Source: Österreichisches Staatsarchiv, Finanz- und Hofkammerarchiv, Galizische Domänen, red number 68, folio 777ff, quoted after Feldtänzer, p. 236).

Figure 3: Baptisms and deaths in Bukin village, 1751-1810⁶⁰



Source: Church registers of Bukin (Serbian: Mladenovo; Hungarian: Dunabökény).

The high mortality phenomenon is also documented in Church registers. For example, Josef Wohlfahrt, parish priest of the community of Jahrmarkt (Hungarian: Temesgyarmat; Romanian: Giarmata), took notice of the period between July 1770 and June 1771, when 711 out of approximately 2000-2500 inhabitants died, noting in the community's death register: 'In July 1770 the "Great Dying" among newly immigrated settlers broke out. The cemetery is full. What will happen to this community?'⁶¹ Elsewhere, on the 23rd of November 1785, Temeswar (Timișoara) authorities wrote to the Hungarian governor's office that, 'during the past summer many inhabitants developed various diseases and, despite all efforts to help them, a substantial share of them died. And since many of them have not recovered still, we expect more to die before the next spring.'⁶² Similarly, in 1777 Friedrich Wilhelm von Taube, a contemporary observer, stated:

⁶⁰ Years of excess deaths are defined as years or periods in which the number of recorded deaths exceeded the number of baptisms. Excess deaths are not tantamount to population growth, since immigration and emigration flows are not taken into account in this graph.

⁶¹ In German: „Im Juli 1770 ist unter den neu eingewanderten Ansiedlern das große Sterben ausgebrochen. Der Friedhof ist voll. Was soll aus der Gemeinde werden?“ (Death register of Jahrmarkt/Giarmata, Romania).

⁶² Original wording: „Den verfloßenen Sommer hindurch fielen die Leute allenthalben in verschiedene Krankheiten, ein beträchtlicher Theil derselben, ohngeacht aller angewandten Mühe starb, und weil noch viele mit Krankheiten ebenfalls belastet sind, so ist zu vermuthen, daß biß künftigen Frühling wohl noch mehrere absterben werden.“ (Magyar Nemzeti Levéltár-Országos Levéltár (OL), Magyar Kincstári Levéltárak, E 125 Impopulationalia, (Microfilm 22239), 1785/86, Fons 121-135.

Swamps cause malignant fevers, which kill so many, especially foreigners. [The cities of] Eseck and Pederwardein are called cemetery of the Germans. Another plague that arises from the swamps is ... vermin, which becomes unbearable during the summer. Mosquitoes are so numerous that on a summer evening they sometimes darken the sun. They are a bit bigger than in Germany, and their sting is more painful and poisonous than theirs. You would not be able to sleep without a net over the bed.⁶³

Despite these adverse circumstances, emigration remained a highly attractive prospect for numerous aforementioned reasons, in particular the prospect of owning farm land. Incoming migrants undertook important measures leading to a substantial increase in arable and grazing land. During the late eighteenth century only 35 to 40 per cent of the territory of the Kingdom of Hungary could be used for agriculture since vast areas were covered with forests, marshlands and wastelands. From this, immigrant farmers and local authorities redeveloped the land they were settling on, drained marshes, rebuilt farms, purchased land, and constructed roads and canals. Between 1683 and the end of the eighteenth century the areas of arable and pasture land increased by the factor 4.3 and 6.5, and in the newly conquered territories arable and pasture land increased by the factor 3.9 and 9.1.⁶⁴

German agriculturalists advanced economic development by introducing superior technologies.⁶⁵ Modern ploughing techniques, the use of modern granaries and other farm buildings to limit post-harvest losses, and the use of horses instead of oxen as superior draught animals played an important role in this regard. The German practice of keeping cattle in stalls helped to introduce more modern crop rotation systems, where otherwise fallow lands were used to grow animal feed, especially leguminous plants. The German settlers relied on more profitable grain production, but also on specialty crops such as grapes and tobacco cultivation, and produced agricultural products to be sold in markets.⁶⁶ Moreover, agricultural production became more diverse through the introduction of new animal breeds. Settlers were allowed to institute the

⁶³ Original wording: „Daher [wegen der Sümpfe] entstehen die bösertigen Fieber, welche so viele Menschen, besonders Ausländer, wegraffen, daß Eseck und Pederwardein der Kirchhof der Deutschen genannt werden. Eine andere Landplage, die aus den Sümpfen entsteht, ist das viele und mancherley Ungeziefer, welches im Sommer unerträglich fällt, die Mücken sind so zahlreich, daß sie an einem Sommerabend zuweilen die Sonne verfinstern. Sie sind etwas größer, als in Deutschland, und ihr Stich ist schmerzhafter und giftiger, als jene ihrer. Man würde ohne ein Netz über das Bette gar nicht schlafen können.“ (Friedrich Wilhelm von Taube, *Historische und geographische Beschreibung* p. 89).

⁶⁴ Kaposi, *Auswirkungen*. Kurucz, *Agrarwirtschaft und Kolonisation in Ungarn*.

⁶⁵ The introduction of modern techniques did not happen immediately, but happened often over the course of decades.

⁶⁶ Kaposi, *Auswirkungen*, p. 101-123.

practice of inheriting property undivided (*Anerbenrecht*), which prevented fractionalization of agricultural land and helped keeping productivity high.⁶⁷

The majority of migrants consisted of farmers, but other settlers included craftsmen, civil servants, merchants, and miners, helping to transfer human capital and technologies into non-agricultural sectors also. Approximately one third of migrants' occupations were related to manufacturing or repairing agricultural equipment and machinery, while approximately 20 per cent were masons or carpenters.⁶⁸ A disproportionately high number of Germans had sophisticated occupations like physicians, pharmacists, or bookbinders. In contrast, in 1786 approximately 93 per cent of Hungary's population consisted of peasants, and only seven per cent were merchants and craftsmen, indicating that the influx of so many skilled craftsmen migrants was a substantial enrichment to local economies. This evidence suggests that in the long run the cost of the German immigration was a worthwhile investment because economic development and therefore tax revenues were bolstered by German immigration.⁶⁹

Methodology and data

Our aim is to quantify and compare basic human capital levels of German migrants to Eastern and south eastern Europe. For German settlers in the Russian Empire, we use records of the Russian censuses of 1811 (sixth revision), 1816 (seventh revision), of 1835 (eighth revision) and of 1858 (tenth revision). These revision lists relate to colonies in the Black Sea area and allow us to distinguish residents by names, gender, and ages for each individual town (or colony) and form the ideal comparison group for predominantly agriculturalist immigrants. The results of the eighth revision (1835) have been preserved for the Molochna (Ukrainian: Молочна) Mennonite district, which consisted of a series of German-founded villages in modern-day Zaporizhzhia Oblast, Ukraine. We use age statements of approximately 3,200 individuals to estimate the numeracy of these settlers.

When selecting revision lists, care was taken to ensure that all three denominations were represented among German colonists. Our sample therefore contains Catholic and Lutheran settlers as well as Mennonite.⁷⁰ For some colonial communities, census lists from several revisions were available and evaluated, allowing us to investigate individual villages.⁷¹ Materials from the tenth revision (1858) have been collected from the following colonies: Helenental; Neufreudental;

⁶⁷ Kurucz, *Agrarwirtschaft und Kolonisation in Ungarn*.

⁶⁸ Bohony, *Német falvak Komárom megyében*.

⁶⁹ Kaposi, *Die wirtschaftlichen Auswirkungen*.

⁷⁰ Migrants to the Kingdom of Hungary self-reported their religion. As for Germans in the Russian Empire, the name of their colony and introducing text to the census report provide information on religious background, so etwa bei den Mennoniten: Deržavnyj Archiv Odes'koj Oblasti, Fond 89, op. 1, spr. 357.

⁷¹ The lists of the sixth and the seventh revisions (1811 and 1816) can be found in the archival holdings of the "Guardenship Office for New Russian Foreign Settlers" and "Ekaterinoslav Office for Foreign Settlers". Deržavnyj Archiv Dnipropetrovs'koj Oblasti, Fond 134, op. 1, spr. 444-492.

Johannestal; Worms; Rohrbach; Waterloo; Speyer; Landau; Katharinental; Karlsruhe; Sulz; eleven colonies of the district Liebental; Neudorf; Alt-Danzig; Kassel; Hoffnungstal; and Glückstal.⁷²

Revisions in the Black Sea provinces of the Empire were prepared and executed by local law enforcement officers (*Dorfschulze*) and civil servants. These lists were compiled for the purpose of identifying all taxable inhabitants, i.e., the general population without clergy and nobility. Language barriers did not impair the accuracy of the census records because the main census taker in the Mennonite District, Gerhard Martens, was one of the settlers himself.

A histogram illustrating the precise year of migration suggests that approximately 24 per cent of all families in the sample arrived in the years 1803 and 1804 alone, and approximately 33 per cent of all families migrated during 1817-9 (figure 4 and table 1). The share of males and females in the dataset is 52 per cent and 48 per cent respectively, indicating the migration of families rather than individuals; the latter would have been predominantly male. Records were ordered by farm and contained full names of individuals, ages, names and ages of relatives, information regarding migration date, and whether an individual had been recorded in the previous census (1816). For approximately 64 per cent of all families we know the precise year of migration. The earliest arrivals in the data were in 1788 and the latest were in 1856. Approximately 48 per cent of all settlers immigrated prior to 1816 and 52 per cent after this year. Both males (52 per cent of all individuals) and females (48 per cent) had to sign the completed census form separately. This is an important piece of information as it indicates that females actually reported their own age.⁷³

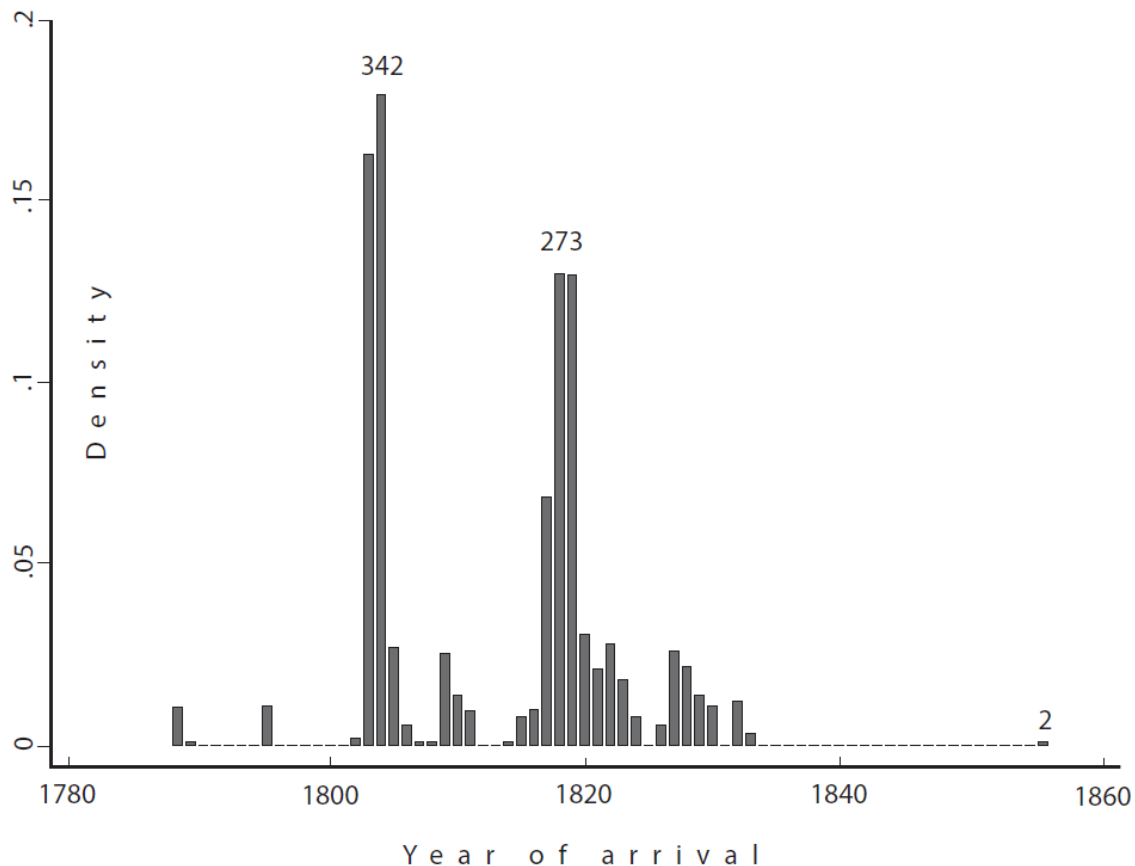
Table 1: Descriptive statistics of Mennonite migrants to the Russian Empire

	(1) N	(2) mean	(3) sd	(4) min	(5) Max
Age	3,249	40.11	12.13	23	72
Year of arrival	2,095	1,813	9.321	1,788	1,856
Female	3,249	0.479	0.500	0	1
Male	3,249	0.521	0.500	0	1
Non-rounded age	3,249	0.782	0.413	0	1
Age 23 to 32	3,249	0.323	0.468	0	1

⁷² Deržavnyj Archiv Khersons'koï Oblasti, Fond 22, op. 1, spr. 68, 97, 128.

⁷³ It is crucial that females report their own age to compute reliable female basic numeracy values. Many historical data sources contain female age statements that might have been reported by the (often male) household head. For a discussion see for example Földvari et al., *How did women count?* and Blum et al., *Can women count?*

Figure 4: Year of arrival of German Mennonite settlers in the Molochna Colony (Russian Empire)



Data source: Epp (2004)

As for German settlers to the Kingdom of Hungary, we use a dataset comprising information on approximately 4,800 German settlers who migrated to the Kingdom of Hungary via Vienna during the Josephinian Colonization period, 1784-86.⁷⁴ Upon arrival, household heads were asked by civil Habsburg administrators for their names, ages, occupations, denomination, places of origin, size of family, assets, and marital status. Keeping individual records was necessary for two reasons. First, migrants were supposed to be able to identify themselves with official documents, but the settlers' documents did not usually consist of passports. Settlers brought a patchwork of documents that could include all sorts of attestations, certificates, or references of a former employer; the overwhelming majority of these documents did not include a note on the settler's birth year or age, allowing the bulk of age statements to be unambiguously used as an indicator of the settlers' numeracy. Second, migrants who registered in Vienna and were able to identify themselves with appropriate documents were entitled to receive a travel allowance of two guilders to enable

⁷⁴ Original data sources: OL, Magyar Kancelláriai Levéltár Acta generalia, A 39, 1784/6267; 1784/7720; 1784/11093; 1784/11251; 1784/11427; 1784/12969; 1784/11721; 1785/15591; 1786/13806. We are grateful to Zoltán Csapo for compiling and providing this dataset.

continuation of their travel. Accurate record keeping was necessary for Habsburg authorities to avoid paying multiple subsidies and keeping track of the number of immigrants.

We have the personal information of reporting household heads, who were predominantly male, and while we also know the number of fellow passengers, their personal information is unknown. It is reasonable to assume that information on the number of fellow travellers to a large extent reflects family size, but it is also possible that in rare cases this number includes maids and servants. Descriptive statistics presented in table 2 suggest that 68 per cent reported a non-rounded age and were treated as ‘numerate’ for statistical reasons. This information forms the basis for computing numeracy values as described below. The average age of migrants to the Kingdom of Hungary was approximately 39 years, with a standard deviation of 9.7, and minimum and maximum values of 23 and 70 years, respectively.

The majority of migrants were born during the 1740s and 1750s (34 per cent each). 19 per cent of all migrants were born in the 1730s; five and eight per cent of migrants were born in the 1720s and 1760s, respectively. Average age was approximately 39 years, with most settlers being in their 30s and 40s. We also know an individual’s year of migration, allowing us to control for some of the potential selection effects, in case of qualitative differences between early-movers and latecomers.

96 per cent of migrant household heads were male. We do not know every individual’s circumstances that lead to a report by females, but we find that 81 per cent of all female household heads were widows, suggesting that these women were travelling without a male household head. We find that 87 per cent of all migrants were married by the time they were interviewed in Vienna; a common practice for single migrants was to find a spouse and get married en route, since marriage was an important prerequisite for obtaining the permission to settle in target regions. Accordingly, only seven per cent of migrants were single, with six per cent being widowed. 69 per cent of migrants were Catholics and 31 per cent were from a Protestant denomination.

Table 2: Descriptive statistics of 4,788 migrants to the Kingdom of Hungary (in %)

Numeracy	Numerate	68
	Non-numerate	32
Birth decade	1720	05
	1730	19
	1740	34
	1750	34
	1760	8
Year of migration	1784	35
	1785	22
	1786	43
Gender of household head	Female	04
	Male	96
Average number of fellow passengers		4.58
Assets (in Guilders)		35.05
Denomination	Roman-Catholic	69
	Protestants	31
Marital status	Single	7
	Married	87
	Widowed	6
Occupational class⁷⁵	Unskilled	<1
	Semi-skilled	13
	Skilled	15
	Semi-professional	1
	Professional	<1
	Unknown	71
Place of origin⁷⁶	Alsace and Lorraine	16
	Baden	06
	Bavaria	04
	Mainz	05
	Palatinate	11
	Rheingau	2
	Saarbrücken	6
	Swabia	5
	Trier	9
	Württemberg	4
	Zweibrücken	4
	Other	29

Note: All values are expressed in shares all household, unless otherwise stated.

⁷⁵ Habsburg administrators were not able to verify occupational information. We therefore use occupational information provided by settlers themselves.

⁷⁶ Descriptions of regional origins were motivated by geography, not precise description of territorial dominion. For example, ‘Trier’ refers to the region surrounding the city of Trier, including the Archmonastery (*Erzstift*) Trier and the Electorate (*Kurfürstentum*) Trier.

Methodology

In poorly educated societies, individuals tend to report rounded ages if they do not know their age, do not have the skills to compute their age accurately, or do not consider this information very useful. The result of this behaviour is an age distribution with excessive statements of ages ending in zero or five. We utilize these systematic inaccuracies to assess numerical skills of German migrants to Eastern Europe.⁷⁷ Economic historians employ this phenomenon by calculating the ratio of the share of people reporting an age ending in 0 or 5 relative to all age statements in order to estimate the basic numeracy skills of the underlying population. Numeracy reflects a bundle of skills such as precision, computational skills, and may also reflect cultural and institutional modernisation, all of which are considered important for economic development and has been found to be correlated with literacy skills both on an individual and aggregate level.⁷⁸ Formula 1 shows how to calculate the Whipple Index of a population:

$$WI = \left(\frac{n_{25} + n_{30} + \dots + n_{65} + n_{70}}{1/5 \times (n_{23} + n_{24} + n_{25} + \dots + n_{72})} \right) \times 100 \text{ if } WI \geq 100; \text{ else } WI = 100. \quad (1)$$

According to the Whipple Index, a value of 500 indicates that all age statements end in 0 or 5 (lowest numeracy score possible) while 100 (highest score possible) indicates no age heaping. Generally, all population samples are restricted to ages between 23 and 72, since it is argued that individuals under the age of 23 tend to heap systematically different compared to their older peers; among late teenagers and individuals in their early twenties age heaping on even numbers instead of 0 and 5 is often observed.⁷⁹ Older ages, small sample size, selective mortality and a tendency to exaggerate age distorts estimations and are considered a potential bias.⁸⁰ In addition, this specific setting – Mennonites in the Russian Empire for example reported their age years after arrival – introduces a specific challenge to accuracy and comparability of numeracy estimates. We do not expect significant inaccuracies due to ageing of these settlers since we apply the standard methodology when computing numeracy estimates, i.e., we only use individuals between the ages of 23 and 72. However, the youngest cohort might have been, at least in part, socialised and educated in a colony of German settlers, while the majority of older Mennonite settlers received their education in the Holy Roman Empire. Any direct comparison between these cohorts and settler groups should take this fact into consideration.

Since the Whipple scale contradicts intuition – high values represent low numeracy – we use a simple transformation resulting in numeracy values ranging between 0 and 100 (formula 2).

⁷⁷ The United Nations uses the Whipple Index (WI) until to-date for detecting age-heaping and assessing the quality of population data. United Nations, *2004 Demographic yearbook*, p. 5, 133.

⁷⁸ A'Hearn *et al.*, *Quantifying quantitative literacy*; A'Hearn, Delfino and Nuvolari, *Rethinking Age-Heaping*; Hippe and Baten, *Regional inequality*; Blum *et al.* Can women count?

⁷⁹ Prayon, *Age heaping on even numbers*.

⁸⁰ Crayen and Baten, *Global trends*.

This transformed index is known as the ABCC index, and it can be interpreted as the estimated share of people who are able to report their age accurately:

$$ABCC = \left(1 - \frac{(WI - 100)}{400}\right) \times 100 \quad \text{if } WI \geq 100; \text{ else } ABCC = 100. \quad (2)$$

Figure 5 illustrates the age distribution of German migrants to the Kingdom of Hungary aged 23 to 72. Similar patterns of heaping at ages ending in zero and five occur for both male and female migrants. For males, excessive statements of ages ending in zero are observable, but age heaping seems to be even more pronounced among females; large heaps at ages ending in zero are clearly visible while reports of ages 41, 49, 51, and 61 are absent, and statements of similar ages are rare. Conversely, German migrants to the Russian Empire report ages more accurately; excessive rounded age statements are absent (figure 6). These differences in the propensity to report an accurate age produce ABCC scores of 85 and 98 for settlers to the Kingdom of Hungary and the Russian Empire, respectively. Rounded and non-rounded age statements are then used to estimate WI and ABCC indices according to the aforementioned formulas.

Human capital estimates of German migrants in comparative perspective

We use the methodology above to estimate basic numeracy skills of German migrants to the Kingdom of Hungary and the Russian Empire. We use a set of logistic regression models to investigate correlates of numeracy, where the dependent variable equals 1 if an individual reports a non-rounded age or 0 if a multiple of zero or five is reported. We use information on various socio-economic characteristics as explanatory variables: year of migration, monetary possessions, number of fellow travellers, denomination, gender, marital status, and occupational class, whereas binary variables controlling for the decade of birth and origin serve as the basis for estimating numeracy of a certain birth cohort. These controls are necessary since migrants may have undergone selection, and this selection may vary over the years under study.⁸¹ By statistically controlling for socioeconomic variables apart from age and period of birth, we aim at reducing these biases. In essence, numeracy estimates are fairly robust to controls in a multivariate regression framework.

⁸¹ Bodenhorn, *Sample-selection biases*.

Figure 5: Age-heaping among female and male migrants to the Kingdom of Hungary

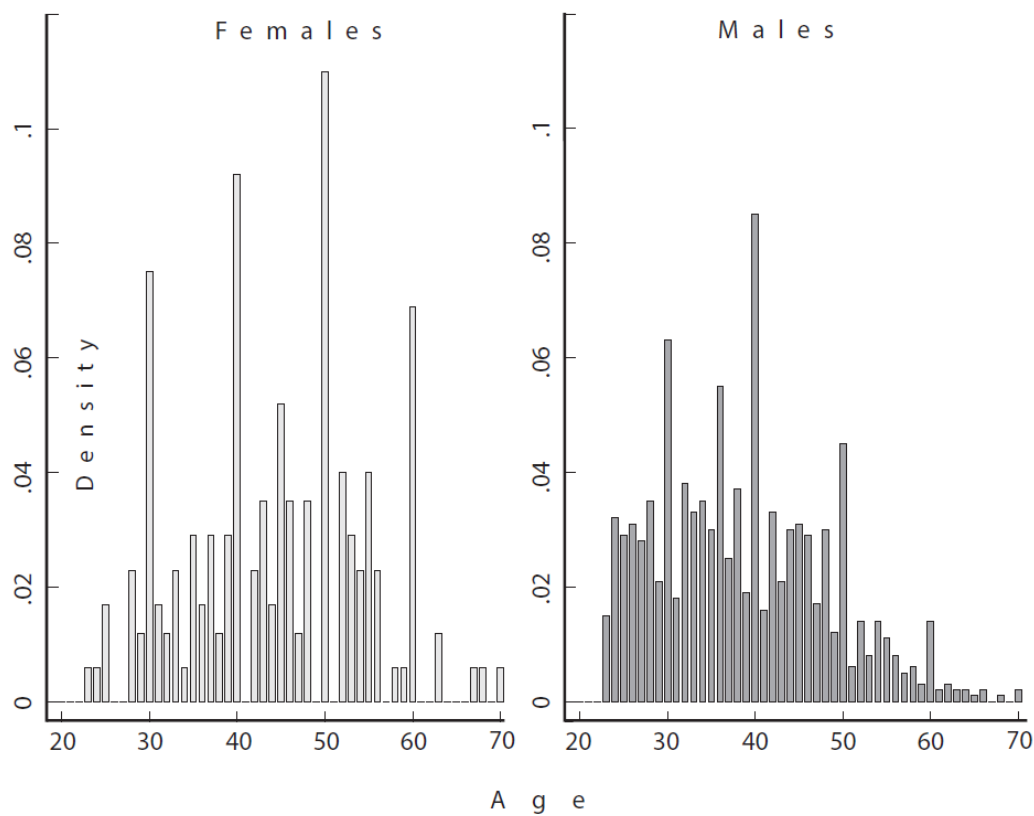
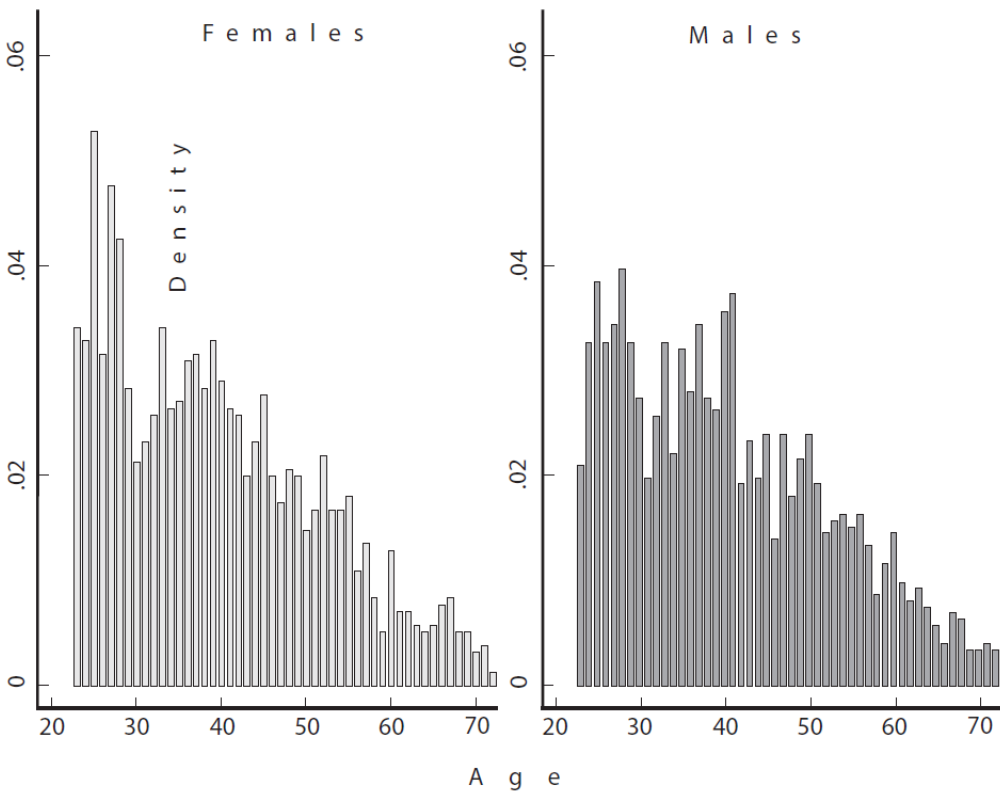


Figure 6: Age-heaping among female and male migrants to the Russian Empire



In our basic model, we estimate birth decade dummy variables to obtain a basis for estimating numeracy, with gender being the only control at this stage (model 1, table 3). We do not have a sufficient number of observations to estimate a separate numeracy trend of females; instead, we decided to pool males and females, adding a control for females to test for systematic differences in the accuracy of age statements.⁸² It is important to note that both male and females in our dataset were household heads, otherwise they would not have made a personal statement and their identities would not have been recorded. We can therefore rule out that husbands recorded ages of their female family members, a common source of mismeasurement in this literature.⁸³

In subsequent models, we add explanatory variables stepwise to test for effects related to the changing composition of the dataset and to verify the results of our basic model. Controlling for changes in the composition of the sample over time may be necessary to compensate for this potential bias; for example, what appears to be superior numeracy of early migrants might in fact be the superior numeracy of a disproportionate number of educated individuals among early settlers. To separate effects related to other socioeconomic features, we add a control for the year of migration in model two, taking into account potential differences between early migrants and followers. The literature suggests that the time of migration may have an impact on the self-selection processes leading to differences in human capital between early migrants and followers. Risks and uncertainty related to migration and higher transaction costs of early migration are the prime reasons for this selection, whereas late migrants may benefit from remittances and information about the journey and target regions, lowering transaction costs in general and making it possible for the broader population to take up the journey. Starting in model two, we add controls for time of migration, treating early migrants as the reference category and tested for differences between this group and later migrants; the coefficients identifying the 1785 and 1786 migrant waves are small in magnitude and consistently statistically insignificant. Adding controls for the year of migration does not substantially alter the size of birth decade coefficients, nor is the magnitude of this effect or the level of statistical significance robust.

A related barrier for potential migrants were poverty constraints, i.e., when costs of migration exceed a family's financial abilities.⁸⁴ We do not expect a large effect of time of

⁸² In a model not shown here we excluded females and re-ran model 6 of table 3. All results, including the numeracy trends that can be derived from them, are similar or virtually identical.

⁸³ This literature suggests that male numeracy scores often tend to be higher than those of females (Manzel & Baten 2009; Friesen, Baten and Prayon 2010; Blum *et al.* 2014). Conversely, De Moor and Zuijderduijn (2013) use age data from portrait paintings from the early modern period in the Netherlands, finding that married women in upper social strata were more numerate, not less, than their husbands. Pooling males and females and testing for differences in numeracy suggests that females were less likely to be 'numerate', i.e. to report a non-rounded age. This finding is robust and statistically significant to the inclusion of various control variables.

⁸⁴ Hatton, *The cliometrics of international migration*. Stolz and Baten, *Brain drain*.

migration since, in a southern German context, both uncertainty and travel costs were relatively modest and an exchange of information in both directions was common.⁸⁵

Starting in model three, we add controls for cash assets and future assets, such as future inheritance. Approximately two thirds of all travellers reported no cash assets, but we do not expect to find an effect here for various reasons: every family who decided to migrate must have had access to travel subsidies sufficient enough to reach the target region. If there was selection on unobservables, such as poverty constraints, we are not able to observe it accurately since these data obviously do not include families too poor to migrate. Also, the authors are under the impression that there was a tendency to underreport cash assets; migrants might have been concerned that they would not qualify for travel subsidies if their cash assets were too plenty. This form of mismeasurement may bias the estimated coefficient towards zero. Indeed, results of these regression models do not indicate that individuals reporting more assets (cash or expected) were more numerate (models 3 to 6).

We also control for a difference between Protestants and Catholics since we find a disproportionate number of Protestants in our data set, however we do not find a statistically or economically significant difference between Catholic and Protestant settlers.⁸⁶ In general, Protestant and Catholic numeracy in Germany differed by 19 and 10 ABCC values for the early and mid-eighteenth century, respectively.⁸⁷ Yet our finding is not a surprising result, since Habsburg recruitment offices attached importance to the minimum skills levels of settlers, potentially discouraging or excluding lower skilled settler. In fact, the strategy of authorities was to attract skilled settlers, even at the expense of not maximizing the absolute number of potential migrants.⁸⁸ If by the time of the Josephinian Settlements differences in numeracy between Protestant and Catholic communities still existed, it is possible that this approach resulted in a modest upward-selection of Catholic migrants' average skill level.

⁸⁵ The dialect spoken in Austria and parts of Hungary was often similar to the one spoken by southern German migrants. Travel reports sent by letter were written in semi-standardized language; this allowed family and friends at home to obtain first-hand information about conditions en route and in target regions. Also, travel subsidies paid by Habsburg authorities limited financial risk and enabled migration of poorer families.

⁸⁶ We tested for differences between Protestant denominations (results not shown here). The dataset on Hungary allows to distinguish the following denominations: Roman Catholic (approx. 69% of observations) and a series of Protestant groups: Augsburg; Reformed (4.9%); Swiss (,Helv.', 1.6%); Lutheran (2.2%) and one generic ,evangelical' group (19.2%). The only statistically significant coefficient is that of Swiss-reformed (Protestant) identity, which shows a positive correlation compared to Catholics in terms of the likelihood to report a non-rounded age. It is unclear, however, if this is a regional (Southern German/Swiss) effect of whether this is actually caused by religious identity.

⁸⁷ A'Hearn et al, *Quantifying quantitative literacy*.

⁸⁸ Fata, *Migration*.

Table 3: Correlates of numeracy among migrants to the Kingdom of Hungary

		(1)	(2)	(3)	(4)	(5)	(6)
Birth decade	1720s	0.49 (1.08)	0.50 (1.08)	0.49 (1.04)	0.48 (1.04)	0.48 (1.02)	0.47 (0.99)
	1730s	0.57 (1.28)	0.57 (1.28)	0.56 (1.24)	0.56 (1.23)	0.54 (1.19)	0.53 (1.16)
	1740s	0.73 (1.64)	0.73 (1.64)	0.72 (1.60)	0.71 (1.58)	0.69 (1.53)	0.68 (1.51)
	1750s	1.00** (2.25)	1.00** (2.25)	0.99** (2.20)	0.98** (2.18)	0.97** (2.15)	0.97** (2.13)
	1760s	1.07** (2.35)	1.06** (2.33)	1.05** (2.27)	1.04** (2.26)	1.07** (2.30)	1.07** (2.28)
Gender	Female	-0.65*** (-4.11)	-0.65*** (-4.10)	-0.65*** (-4.11)	-0.65*** (-4.12)	-0.59*** (-2.92)	-0.56*** (-2.78)
	Male	reference	reference	reference	reference	reference	reference
Year of migration	1784		reference	reference	reference	reference	reference
	1785		-0.08 (-0.97)	-0.09 (-1.04)	-0.09 (-1.02)	-0.08 (-0.94)	-0.12 (-1.32)
	1786		0.05 (0.68)	0.04 (0.58)	0.06 (0.75)	0.06 (0.78)	0.01 (0.17)
Assets (per capita)	Cash			-0.00 (-0.18)	-0.00 (-0.22)	-0.00 (-0.20)	-0.00 (-0.55)
	Expected ^φ			-0.00 (-0.58)	-0.00 (-0.60)	-0.00 (-0.63)	-0.00 (-0.70)
Denomination	Roman Catholic				reference	reference	reference
	Protestant				0.09 (1.36)	0.09 (1.32)	0.08 (1.02)
Marital status	Married					0.19 (1.49)	0.20 (1.51)
	Single					reference	reference
	Widowed					0.11 (0.51)	0.10 (0.48)
Occupational class	Unskilled						-0.59 (-0.82)
	Semi-skilled						-0.08 (-0.87)
	Skilled						reference
	Semi-professional						0.46 (1.39)
	Professional						-0.97 (-1.25)
Region of origin	Baden						-0.02 (-0.14)
	Bavaria						0.19 (1.07)
	Alsace & Lorraine						-0.21** (-2.07)
	Swabia						-0.12 (-0.78)
	Wuerttemberg						-0.02 (-0.13)
	Rheingau						0.06 (0.28)
	Saarbruecken						-0.05 (-0.36)
	Mainz						0.09 (0.58)
	Zweibruecken						0.02 (0.10)
	Trier						0.02 (0.16)
	Palatinate						-0.04 (-0.34)
	Other						reference
	Constant	-0.01 (-0.01)	-0.01 (-0.02)	0.01 (0.02)	-0.02 (-0.04)	-0.18 (-0.39)	-0.11 (-0.22)
	Observations	4,788	4,788	4,788	4,788	4,788	4,788

Note: The dependent variable equals one if an individual reports an age not ending in zero or five, and zero otherwise. Robust z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1. ^φ Expected assets refer to any outstanding or expected future payments, such as an inheritance.

In contrast, recent research suggests that literacy among Protestants was generally higher compared to Catholics and that this difference may have been linked to Protestants' tendency to read the bible in German.⁸⁹ Archival sources confirm this finding in the literature; letters written by contemporary Protestant settlers suggest superior written language skills, especially in terms of language, style, and fluency. Officially, Protestants were given the permission to immigrate to the Kingdom of Hungary after the Patent of Toleration was issued in 1781. Unofficially, Protestant settlements had existed since the 1720s in the administrative county of Tolnau (Hungarian: Tolna), although prior to 1781 Protestants could only exercise their religious beliefs under restrictions. In contrast, emigration to Russia was dominated by Protestant settlers. The main states of Russia-bound emigrants were Hesse, Württemberg, Baden, but there were also Mennonites from the West Prussian area. The strong emigration from Wuerttemberg in 1817 was also religiously motivated.⁹⁰

In model five we investigate differences between individuals' marital status. We find that married or widowed individuals are more likely to report a non-rounded age, but none of these results are statistically significant. In model six, we include dummy variables to control for possible influences related to the settlers' places of origin. Here, we address the possibility that settlers are unequally distributed geographically, that local institutions or migration policies influenced the composition of settler streams, and we account for potential differences with respect to educational standards. Econometrically speaking, in model six we include region-fixed effects and estimate the remaining time-fixed effects. Results presented in table 3 indicate that there are no differences in numeracy between regions of origin within the Holy Roman Empire; only settlers from Alsace and Lorraine were less 'numerate' compared to other settlers. Also, controlling for the associated effect does not substantially alter the estimated numeracy trend.

We apply the same methodology to the dataset of German migrants in the Russian Empire. Regression results shown in table 4 suggest that there are no notable differences in numeracy between males and females, and between early and late migrants. We estimate ABCC values on the basis of marginal effects of birth decade coefficients; these were estimated for the aforementioned sets of logistic regressions.⁹¹ These ABCC values are used to compare numeracy of this population with populations in Germany (figure 7) and in target regions in Central and Eastern Europe (figure 8).

For migrants to the Kingdom of Hungry, we find an overall ABCC score of approximately 85, while settlers in the Russian Empire show little to no age-heaping, resulting in an average

⁸⁹ Becker and Woessmann, *Was Weber wrong?*; Boppart et al., *Protestantism and education*.

⁹⁰ Kannenberg, *Jerusalemsehnsucht*. In the South Caucasus near Mount Ararat, many pietists and separatist emigrants saw Russia as their place of salvation. There, in the realm of the Christian tsar, they intended to await the return of Jesus and the dawn of the millennial kingdom promised in the Bible.

⁹¹ See Juif and Baten, *human capital of Inca Indios*, for details on this methodology.

ABCC score of approximately 98. For migrants to the Kingdom of Hungary, there are substantial differences between young and elderly migrants. Based on these differences we present ABCC values by birth decade, allowing us to investigate different age groups' numeracy separately and compare these groups with other populations inhabiting the Pannonian Basin and its neighbouring territories in more detail. We compare German migrants' numeracy with the numeracy of the population these migrants had left behind in order to investigate the degree of selection this group underwent. Migrants to the Kingdom of Hungary are found to be somewhat poorer than average, concluding that these Germans were positively selected in terms of their skills, but negatively selected in terms of their financial assets. Numeracy trends presented in figure 7 suggest that on average numeracy of German migrants was similar to the numeracy in Germany, indicating that migrant selection in our samples is minimal. For the migrants to the Kingdom of Hungary, younger migrants tend to be characterized by higher numeracy, with ABCC scores ranging between 91 and 94. Conversely, settlers who migrated in their 40s and 50s had ABCC scores of 79 and 76; older individuals who migrated in their 70s were characterized by a relatively low ABCC score of 61. Similarly, ABCC scores of the Germans migrating to the Russian Empire are similar to the ABCC scores for Germany. ABCCs of younger and middle-aged cohorts are on a similar level to the corresponding ABCC scores of the populations in Germany.

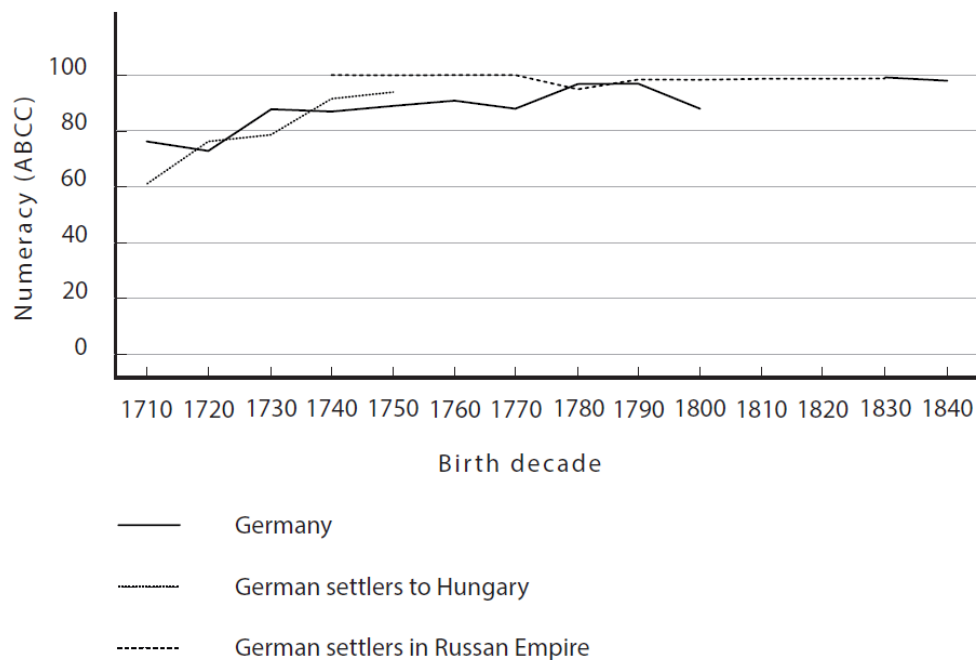
A comparison of the numeracy trends of German emigrants and that of the population in the target regions suggest that these migrants had the highest numeracy among all groups settling in the Kingdom of Hungary and the Russian Empire (figure 8). The ABCC of Hungarians was relatively high throughout the early eighteenth century and almost as high as the German one. We find that differences in numeracy between German settlers in the Kingdom of Hungary and native Hungarians average ten ABCC points for younger cohorts; we find virtually no differences between mid-aged population groups. Conversely, for the early eighteenth century we find substantial differences between ABCC scores of German migrants and Russians and Ukrainians. We also compare ABCC levels of settlers in the Russian Empire with those in Eastern Europe: the numeracy of Germans ranges between 93 and 99 ABCC points, indicating superior skill levels compared with the local populations in target countries. The ABCC score of Romania in the 1800s and 1810s are on a relatively low level of 78 and 85 points, respectively; Serbian ABCC scores in the 1790s through 1830s vary between 19 and 59, suggesting substantial differences in numeracy between Serbians and German immigrants. The numeracy of Russians and Ukrainians was considerably lower than that of German migrants. Differences between high-numeracy migrants to the Russian Empire and Russians ranges between 10 to 28 ABCC points, and differences between Germans and Ukrainians range between 29 and 49 ABCC points.

Table 4: Determinants of numeracy among Mennonite migrants to the Russian Empire

		(1)	(2)	(3)
Birth decade	1810s	reference	reference	reference
	1800s	0.04 (0.33)	0.03 (0.25)	0.04 (0.31)
	1790s	-0.04 (-0.31)	0.00 (0.00)	-0.06 (-0.51)
	1780s	-0.15 (-1.11)	-0.14 (-0.82)	-0.12 (-0.79)
	1770s	0.29 (1.35)	0.64** (2.06)	0.29 (1.33)
Gender	male	reference	reference	reference
	female	0.07 (0.78)	0.01 (0.10)	0.05 (0.59)
Time of migration	Year of migration		0.00 (0.72)	
	Migration until 1815			reference
	Migration after 1815			0.08 (0.87)
	Constant	1.25*** (14.62)	-6.29 (-0.60)	1.19*** (11.80)
	Observations	3,249	2,095	2,829

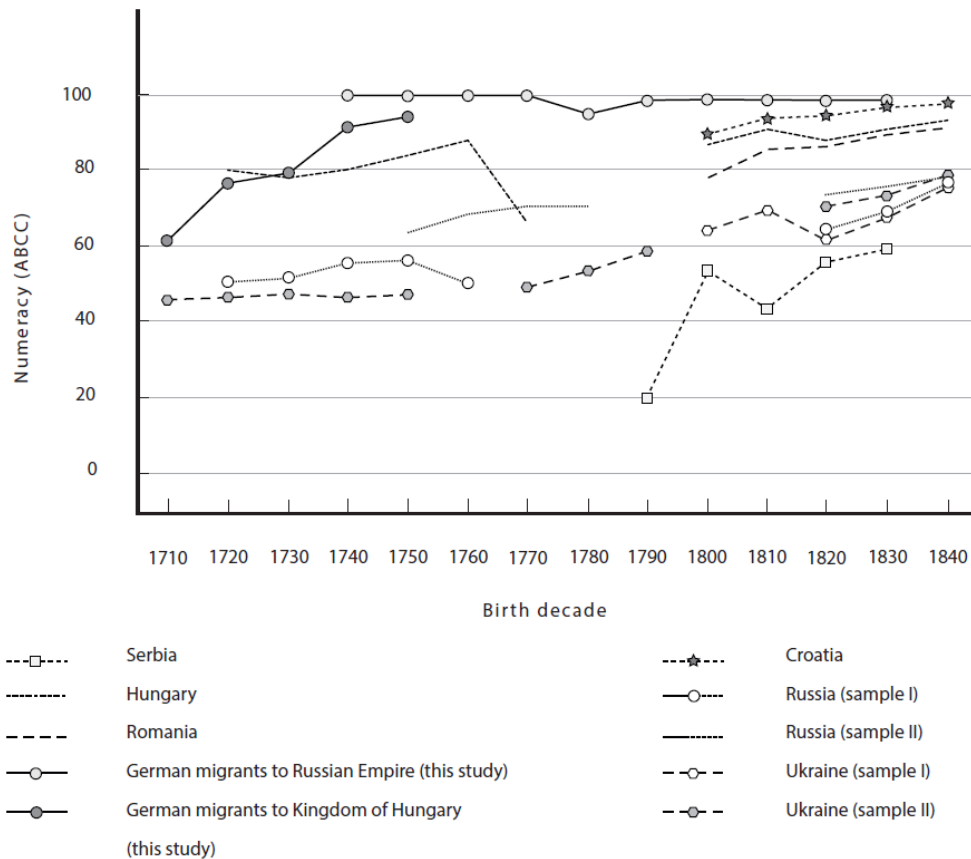
Note: The dependent variable equals one if an individual reports an age not ending in zero or five, and zero otherwise. Robust z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Descriptive statistics in table 1 indicate that age-heaping in this sample is minimal. It is therefore difficult to exploit and analyse the remaining systematic variation in age-heaping.

Figure 7: Numeracy in Germany and among migrant populations, 1710-1840



Sources: For Germany, see human capital section here: <https://clio-infra.eu>; German settlers to Hungary and the Russian Empire see text.

Figure 8: Numeracy among migrant populations and target countries, 1710-1840



Sources: We used two numeracy estimates for Russia and Ukraine each. Numeracy data are taken from the Clioinfra database (<https://clio-infra.eu>; A'Hearn, Baten and Crayen, 2009; Crayen and Baten, 2010) except Russia II and Ukraine II samples, which were taken from Baten and Szołtysek (2012); Migrant data: see text. Note: A reviewer correctly noted that ABCC scores tend to increase over time. Indeed, this is a common pattern observed in the literature; see for example Baten and Crayen and A'Hearn, Delfino and Nuvolari (2016) for a discussion. There is also a tendency for ABCC trends to converge as they rise since the ABCC range is limited to a maximum of 100. This somewhat limits the score for interpretation, but for this study it is important to note that some regions achieve high ABCC scores fairly early and constantly remain ahead of other regions over time.

Conclusion

We have assessed the skill levels of migrants from the Holy Roman Empire and its successor states during the eighteenth and nineteenth centuries. These mostly German-speaking settlers left overpopulated regions in Central Europe to settle in Eastern and south eastern Europe. These settlers were invited to develop or revive these territories, which had experienced war, depopulation and destruction.

We compare these migrants with populations in target regions, and also with their countrymen they left behind, to assess migrants' self-selection and the transfer of human capital. We find little evidence for migrant self-selection, but superior skill levels compared to native populations. We use a variety of indicators to glean a picture of the skills that these settlers carried. Data-focused age-heaping analysis of three datasets comprising approximately 11,500 individuals allows us to assess basic numeracy skills, i.e., the ability to report an accurate age. Additionally,

qualitative evidence in the form of letters, poems, and occupational information helps us to gain insights into literacy and practical skills. There is overwhelming evidence that these German-speaking migrants contributed positively to the human capital basis in their new homes in Eastern Europe, especially in areas that were dominated by Ukrainian and Serbian population groups.

The wider implications of these findings relate to the long-term consequences of this migration episode and the development path of Central-Eastern and Eastern Europe took in subsequent years. Areas in the Kingdom of Hungary inhabited by German-speaking groups are found to fare better, not worse, despite the destruction that they had experienced during Habsburg-Ottoman wars.⁹² Similarly, target regions benefitted from the import of Central European institutions, and the positive effects are still visible today.⁹³ Evidence presented in this study provides historical context to these phenomena and emphasizes the crucial, beneficial role of human capital in the process of economic development.

⁹² Nikolic and Blum, *Immigration and Development*.

⁹³ Becker et al., *The empire is dead, long live the empire!*

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Romania

Death register of Jahrmarkt/Giarmata, Romania

Appendix: Reliability of statements of the migrants to the Kingdom of Hungary

Habsburg civil servants were encouraged to verify migrants' self-reported information, which theoretically was fairly easy given that migrants and authorities spoke dialects of the same language and documents gave some information about an individuals' background. In reality, civil servants faced substantial time pressure and had to dispatch migrants quickly – authorities were concerned that if migrants would stay too long in Vienna, travel subsidies and cash assets would have been spent for subsistence rather than used to continue travelling to the settlers' final destinations. In fact, arrival and dispatching of settlers in Vienna was often chaotic, taking away the possibility to ensure accuracy of all statements. This scenario indicates that civil servant had little time to actually verify age statements, enabling modern-day economic historians to utilize the inaccuracy of age statements to derive basic human capital estimates. On the other hand, statements about assets and occupational backgrounds should be treated with care. There is evidence that migrants used civil servants' time pressure to declare their assets untruthfully. We compared a sample of migrants in the Csapo-list and compared their statements regarding monetary possessions in Vienna in their home communities upon departure. Latter information is provided by Hacker (1969, 1983) who recorded migrants' individual information at the time of departure. We identified 28 individuals, whose assets are reported both in the Csapo and Hacker lists, allowing us to compare different statements of monetary possessions. Average amount of money in possession at the start of their journey was 228 Guilders (Hacker), but when migrants had to report their possessions to Viennese officials (Csapo) this amount had shrunk to 96 Guilders, equaling only 42 per cent of amount stated at the time of departure. We are under the impression that this drop is a result of untruthfully reported assets rather than the costs of migration to Vienna as these costs cannot fully explain this substantial difference. Contemporary reports from the mid-eighteenth century about the costs of passage on the Danube River from Ulm to Budapest suggest transportation costs for a family in the order of eight guilders, but extraordinary transportation at lower prices was offered occasionally.⁹⁴ We believe that this evidence points towards systematically underreported assets in order to increase the chances to maximize travel subsidy.

Migrants also reported their occupational background, but there is reason to belief that these statements were often untrue as well. One of the main aims of the Josephinian Settlements was attracting settlers that were able to settle on uncultivated areas or revive deserted agricultural lands. In anticipation of the Habsburg authorities' demand for agriculturalists the overwhelming majority claimed to be farmers, often in combination with a second – possibly their true – occupation. To

⁹⁴ A contemporary settler, named Epple, wrote about his journey from Ulm to Hungary „...*Wie unser Reiß geweße ist, das will ich eich auch schreibe. Wo wir auf Ulm kome sind, so ist das Schiff in 2 Stund ab gange und do sind wir vier Woche auf dem Waser gewese vom Ulm bis auf Ofe bey Bäst, das ist ein Schif Stattzion, das hat uns kost 8 fl., von Ofe bis auf Abbadin 8 fl. und hat der Kåiser bezalt und zehen Stund auf dem Land, auf dem Waser sind wir gewese 4 Woche und das Gott Lob gesund bey hundert Persohne, und die Bube sind recht frech worde auf dem Waser.*“

obtain some information about settlers' occupational background in the dataset we decided to ignore statements of agricultural professions, but only used statements on second professions, assuming that these statements are more likely to be true. Also, in those days almost any rural dweller must have had some kind of experience in working in agriculture; such a statement therefore does not necessarily reflect professional skills. We used Armstrong's (1972) scheme to categorize occupation into unskilled, semi-skilled, skilled, semi-professional and professional groups. This scheme also provides for a separate class for agriculturalists, but because of aforementioned reasons we refrain from taking this option. Results of this strategy indicate that most settlers had a semi-skilled or skilled background; only very few reported an unskilled, semi-professional or professional occupation.