The Distribution of Land in Luxembourg (1766–1872): Family-Level Wealth Persistence in the Midst of Institutional Change

Sonia Schifano and Antoine Paccoud

The paper analyzes family-level wealth inequality and social mobility in Dudelange (Luxembourg) over five generations between 1766 and 1872, a period that saw the end of feudal social relations. While the integration of Luxembourg into the French revolutionary regime produced a reduction in the Gini coefficient for the ownership of land, the social mobility analysis reveals a relative stability of family positions within the land-wealth distribution throughout the period. This shows that family-level transmission mechanisms limit social mobility and strongly advantage those with ancestors owning property wealth, even when there are significant changes in the organization of property relations.

In recent years, studies of wealth inequality have prospered, and growing attention has been paid to the mechanisms through which wealth is transmitted across generations and to how this impacts social mobility (Adermon, Lindahl, and Waldenström 2018; Barone and Mocetti 2021; Corak 2004; Clark 2014; Piketty 2014, 2015; Pfeffer and Killewald 2018; Wegge 2021). This research has shown that it is imperative to

The Journal of Economic History, Vol. 84, No. 4 (December 2024). doi: 10.1017/S0022050724000421

Sonia Schifano is Postdoctoral Researcher, Università Commerciale Luigi Bocconi, Via Roengten 1, 20136 Milano (Italy) E-mail: sonia.schifano@unibocconi.it (corresponding author). Antoine Paccoud is Research Scientist, Luxembourg Institute of Socio-Economic Research (LISER), 11, Porte des Sciences, Maison des Sciences Humaines, L-4366 Esch-sur-Alzette/Belval (Luxembourg). E-mail: Antoine.Paccoud@liser.lu.

The authors would like to thank Guido Alfani, Conchita D'Ambrosio, Philippe Van Kerm, and Anthony Lepinteur for their constant support, as well as the editor of this journal, Bishnupriya Gupta, and the anonymous referees for their many helpful comments. We are also grateful to Frida Ramirez Perrusquia and Tiago Ferreira Flores for their research assistance, as well as to the participants in the Graduate Economic History Seminars 2020–2021, the Nuffield Historical Social Mobility Seminar (December 2020) and in the SMITE Workshop "Studying Social Mobility in Past Societies" (Bocconi University, 8 November 2021) for the constructive feedback. The authors are also grateful to the *Archives nationales de Luxembourg* and the *Administration du Cadastre et de la Topographie du Luxembourg* for the help and support received. The authors acknowledge financial support from the Fonds National de la Recherche (FNR) in Luxembourg (Grant 12553347 – AFR Individual and C18_SC_12690935_TER_INEQ).

examine the temporal dynamics of both inequality and social mobility from a long-run perspective. Indeed, when income and wealth inequalities increase, it is difficult to move up the social ladder without the external help of redistributive policies. On the other hand, ensuring high rates of social mobility can help to boost social and economic equality (Goldthorpe and Jackson 2007). Recent research has also highlighted the impact of large-scale events and social transformations on inequality levels and on the extent of social mobility. Piketty (2014) identified the inequality-reducing effect of the world wars and of the related increase in wealth taxation in the first half of the twentieth century. The inequality-reducing impact of violent shocks throughout history is in general well-established in the literature (Alfani 2010; Alfani, Gierok, and Schaff 2022; Scheidel 2017), as is the impact that different inheritance systems can have on economic inequality (Alfani 2022; Wegge 2021). While the literature has mostly focused on changes in inequality following pandemics and wars, this paper studies the effect on inequality and social mobility of an institutional innovation, the abolition of feudalism. Using a novel data set and connecting five generations over a century, we investigate the relationship between social mobility and wealth inequality following the abolition of feudalism in Luxembourg in 1795.

This is a period in which wealth data are very fragmented, and this makes it difficult to have harmonized sources to study how wealth inequality has evolved over long time periods in different countries (Alfani and Schifano 2021). Major studies are limited to societies that developed complex and well-organized fiscal administrations (Alfani 2015, 2017; Alfani and Di Tullio 2019; Brea-Martínez and Pujadas-Mora 2019; Canbakal, Filiztekin, and Pamuk 2018; Espín-Sánchez et al. 2019; Nicolini and Ramos Palencia 2016). The Florentine State, for which data is available, has been studied extensively and has contributed to our understanding of preindustrial inequality (Alfani and Ammannati 2017; Barone and Mocetti 2021; Padgett 2010). For pre-industrial times, the availability of data on the distribution of wealth conditions the choice of inequality measures. This problem is even more acute in the study of social mobility, where data collection is further complicated by the necessity of linking individuals to their descendants. Deutscher and Mazumder (2021), in comparing different estimators for historical intergenerational income mobility, highlighted that results depend in part on the methodological choices imposed by the available evidence. Santiago-Caballero (2018), drawing on marital registries, showed that Valencia became a polarized society between 1840 and 1870 and that growing up in a

wealthy family increased the probability of maintaining and increasing that status. Clark and Cummins (2015) used the wealth owned at death by people with rare surnames to show that wealth was persistent both in the short and long term in England between 1858 and 2012. Van Leeuwen et al. (2016) observed an increase in social mobility in France between 1720 and 1986 using social mobility tables with direct links between fathers and sons. In addition to vertical intergenerational mobility, Pujadas-Mora and Brea-Martínez (2020) looked at horizontal social mobility, that is, class mobility between siblings, using the surnames and occupations listed in Barcelona marital registries between 1451 and 1905. They found that the influence of siblings on socioeconomic class increased in the eighteenth and nineteenth centuries as compared to the sixteenth and seventeenth centuries, a result they attribute to the move from an impartible to a partible inheritance system.

In this paper, we focus on another major institutional transformation: the transition from feudalism to full property rights. Given the significant feudal burdens weighing on the population, we can reasonably expect that their abolition led to a decrease in wealth inequality. The distributive implications of the feudal system have already been the object of important studies (Rosdolsky 1951; Brenner 1978), and the abolishment of feudalism has also been analyzed from a distributive perspective, for example, in France (Sutherland 2002) or Hungary (Venyige 2021). However, so far, no attempt has been made to look directly at the association between this crucial transition and overall levels of economic inequality and social mobility. The aim of the paper is to study both of these aspects. To do so, we exploit the exceptionally detailed information available for Dudelange, a municipality in the south of Luxembourg, between 1766 and 1872. We collected information on landownership from new archival research and used a compendium of all the families that lived in Dudelange from 1645 onwards (Pauly 2014) to link ancestors and descendants. For pre-industrial societies, and especially in a rural context such as Dudelange, land is a good proxy for overall wealth (Lindert 1986), and the use of fiscal sources to estimate land values is well-established in the literature (Barbot et al. 2018). We use demographic information as well as direct links between ancestors and descendants to study intergenerational social mobility. We find that in the context of a major change in the socio-legal organization of property ownership and in the ruling regime (Luxemburg was temporarily annexed to France in 1795), family practices regarding inheritance continued to operate in the same way, leading to substantial persistence in the distribution of property and stifling social mobility.

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

HISTORICAL CONTEXT IN LUXEMBOURG AND DUDELANGE, 1766–1872

In the period from 1715 to 1795, Luxembourg was under Austro-Hungarian rule, characterized by relative peace and reforms. It remained a predominantly rural country with no road connections to Brussels, limiting its trade with neighboring nations. The country's isolation began to ease towards the end of the eighteenth century with the construction of its first long-distance paved roads (Atten 1989). In 1766, Maria-Theresa of Austria (archduchess of Austria, queen of Hungary and Bohemia, and empress of the Holy Roman Empire) introduced a land survey to improve fiscal equity and tax collection from landowners and tenants, recording for the first time the land-based wealth of the nobility and clergy for tax purposes. The Maria-Theresa land survey was part of an effort to create a more egalitarian society and abolish certain feudal privileges (Moreau de Gerbehaye 1994, p. 95). However, the full abolition of the feudal system and its associated privileges only occurred in 1795, when Luxembourg was integrated into the French revolutionary regime. Until 1815, Luxembourg was part of the French regime, also known as the Napoleonic regime from 1799 onward. In 1804, the Code Civil was introduced, focusing on family and property legislation. In 1815, the Congress of Vienna divided Luxembourg's territory, with the eastern part going to Prussia and the remainder forming the Grand Duchy of Luxembourg. Under Dutch rule, which lasted until 1839, new taxes and customs tariffs were introduced that limited commercial activities. Luxembourg remained primarily a rural country during this period, facing economic challenges imposed by Dutch fiscal and commercial policies. Although Luxembourg was already considered a separate entity, William I of the Netherlands treated it as part of his kingdom and worked to ensure that it would not join the new Belgian Kingdom that emerged from the Belgian Revolution in 1831. The standoff between the Dutch and Belgian kingdoms regarding the status of Luxembourg found its resolution in the 1839 Treaty of London, which further divided the country: most of its territory became part of Belgium (now the Walloon province of Luxembourg), while the remainder became the independent Grand Duchy of Luxembourg (with its current borders intact). The country's independence was reaffirmed by the Treaty of London in 1867. During the first half of the nineteenth century, Luxembourg remained largely rural, with some involvement in the textile industry, particularly in fabric and shoe production. However, the latter half of the nineteenth century witnessed the emergence and development of the steel industry, which soon became the country's dominant economic sector.

In this paper, we focus on the municipality of Dudelange, located in the south of Luxembourg, on the French border. In the period under study, Dudelange was an average municipality in a country heavily dependent on agriculture and in which 96 percent of the population lived in the countryside (Trausch 1993). Cereals and potatoes were the main crops, but yields were not abundant relative to the country's population. With the exception of Luxembourg City (a free city under feudalism and a strategic fortress) and Echternach (a religious center since the Middle Ages), Dudelange is thus representative of Luxembourg, which until industrialization took off at the end of the nineteenth century was mainly composed of small rural settlements.[1] At the end of the nineteenth century, the town developed into a regionally important steel production center, with large population increases linked to domestic and international migration. While Dudelange's population was roughly constant between 1821 (1,398 inhabitants) and 1872 (1,691 inhabitants), it grew to a population of 10,803 in 1910 and to 21,513 today. To give a picture of its size in relation to other municipalities in the country, Dudelange was the 29th most populous municipality in 1821 and the 41st most populous in 1871. By 1910, it was the fourth most populous town in Luxembourg, after Luxembourg City, Esch-sur-Alzette, and Differdange.[2]

LAND: INEQUALITY AND INSTITUTIONS

Detailed analyses of contemporary land registry records, drawing on Paccoud (2020), have shown that the origins of the large landowning families in Dudelange can be traced back to the nineteenth century. This situation seems to have materialized because of the absence of regulatory instruments limiting the intergenerational transmission of land. Indeed, since the end of feudalism, Luxembourg has continuously exempted transfers to direct heirs from any inheritance tax. While the country has always had a land tax, its importance relative to the value of land has fallen drastically since the country's industrialization at the end of the nineteenth century. Very little is however known about the development of these land-based inequalities and how they have been perpetuated in a country that has known both an industrial and a financial revolution since the end of the nineteenth century. The analyses conducted here can thus offer important insights into the historical roots of the country's concentrated landownership structure.

[1] Ferraris maps from 1778 of the different municipalities in Luxembourg are available at geoportail.lu website.

[2] https://statistiques.public.lu/fr.html

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

These analyses start from the latter half of the eighteenth century, a period that represents a moment of relative peace and prosperity following the turmoil of the seventeenth century. During the seventeenth century, destructions, extortions, and pandemics contributed to the reduction in the population living in Luxembourg. The Thirty Years' War in particular had a dramatic effect on the territory's population. As early as 1637, the county council of Luxembourg mentioned a loss of two-thirds of the population living in the province, while in 1648, at the end of the war, the population was reduced to one-tenth (Kohn 1894, pp. 29). In line with the effect that the Thirty Years' War had on Germany (for a discussion see Alfani, Gierok, and Schaff 2022), we would expect inequality to have decreased during the seventeenth century, because of an abundance of land and a scarce labor force, and then to have increased again because of the repopulation of the country, similarly to what happened in Germany (Pfister 2020). Secondly, the fiscal military state in the wider region (Alfani, Gierok, and Schaff 2022; Alfani and Di Tullio 2019; Alfani 2021; Schaff 2023) increased the fiscal burden for the poorest while benefiting the rich. Our analyses thus start at a moment in which land-related inequalities are important, even though direct comparisons with Germany are made difficult by the fact that Luxembourg remained largely rural until the end of the nineteenth century (the Dudelange steel factory only opened in 1886).

As concerns institutions, the traditional law regulating the relationship between feudal lords and peasants (tenants) was the *Weistümer,* orally transmitted until the fifteenth-sixteenth century. In this context, property ownership was not complete: owners or possessors could not dispose of their land at their convenience, but they had to respect the law written in the *Weistümer*. In 1632, the perpetual right to use the land was attributed to tenants and transmitted from father to son, although the feudal burdens had to be paid to the feudal lord and to the Church. At this point, ownership became linked to the users or tenants more than to the feudal lords. This system persisted until the end of the eighteenth century and survived the efforts of Joseph II, son of Marie Therese, who in 1782 abolished serfdom as well as some feudal taxes such as the cens and corvées and allowed the inhabitants to leave the fiefdom and to marry outside of it (Ferreira Flores 2022). It is only following the country's annexation by the French Revolutionary regime and the application of the French 17 July 1793 decree in 1795 that the feudal system came to an end and full ownership rights were given to tenants. Our data sources clearly reflect this: in the 1766 cadastre, the feudal burdens paid by the tenants are reported in the section "charges inhérentes aux biens et droits" (duties pertaining to property ownership and feudal rights). In contrast, the land

registries of 1842 and 1872 report the surface and value of each type of property owned. In Dudelange, the Boland and Chanclos families were the owners of the seigneurie (the feudal estate) at the end of the eighteenth century. The Baron de Boland was defeated at the head of an armed force resisting French revolutionary incursions into the country in 1792 and 1793. He was able to return to the seigneurie when order was restored in Dudelange, but had to sell his stake in the seigneurie to pay his war debts. His land was acquired by the Metz family, who also purchased the Chanclos half of the seigneurie at the beginning of the nineteenth century. The Metz family sold the entirety of the original Dudelange seigneurie to the Bertier family, who then contributed this land for the creation of the steel company in Dudelange in return for a significant proportion of the company's shares at the end of the nineteenth century.

DATA

The analysis focuses on the distribution and transmission of land wealth over time and relies on information in the original sources named "net product" in 1766 and "net revenue" in 1842 and 1872. These are the monetary valuation of the yields expected from the land owned or used (based on its type, its quality, and its surface) net of cultivation costs (such as the costs associated with sowing, harvesting, and maintaining the land, but not personal subsistence costs), and for that reason can be considered to be a proxy for wealth. Net revenues and net products are simply the original terms used in the archival sources; in the rest of the text, we will use the notion of wealth for all three time points. In the 1766 land survey, declared land-based wealth is taken as 4 percent of the value of the land, computed based on the surface and the category of land owned or used. This value integrates cultivation costs and other expenses associated with landownership. These costs are kept constant within each category of land and are scaled according to the land surface owned. The values are reported in écu, escalins, sols, and deniers.[3] In the context of the feudal system in 1766, the tax paid to the Church and the feudal burdens were deducted from the total value of the land and thus already taken into account in the wealth computation. Since feudal burdens were sometimes greater than the total value of the land owned or used, some individuals in 1766 ended up having zero wealth. The 1842 and 1872 land registries directly report property owners' wealth, computed based on the surface and quality of the category of land owned for a given

[3] 1 écu corresponds to 8 escalins, 1 escalin to 7 sols and one sol is made up of 12 deniers (Hudemann-Simon 1985).

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

TABLE 1
MAIN VARIABLE OVER DATASETS

	1766	1842	1872
Variable in the Source	Net Product	Net Revenue	Net Revenue
Computation	4 percent of a fixed amount (constant within Dudelange) per unit of surface. The amount is different for each type of land and quality level.	Fixed amount (established by the municipality) per unit of surface. The amount is different for each type of land and quality level.	Fixed amount (established by the municipality) per unit of surface. The amount is different for each type of land and quality level.
Net of cultivation costs	Yes	Yes	Yes
Net of feudal burdens	Yes	N/A	N/A

Source: The table was created by the authors to summarize information on the main variables used to estimate wealth across the time points. Variable names as reported in the original sources.

municipality, net of cultivation costs.[4] While the valuation of particular types of land by quality varies over time, this does not affect our results since the evaluation method is kept constant within each time point and because we work with ranks or hyperbolic inverse sine transformations rather than with the raw distributions. Table 1 summarizes the similarities and differences between sources.

The first snapshot in time used in the analysis comes from the 1766 Maria Theresa land survey for the municipality of Dudelange.[5] This survey precisely identifies the distribution of land-based wealth, including the properties of the nobility and the Church, which made it possible to request tax from these actors for the first time in Luxembourg's history. The 12 March 1766 law, which ordered the implementation of the land survey, clearly stated that the tax on properties had to be paid by owners and users with no difference between the nobility, clergy, and the rest of the population. The Maria-Theresa land survey is thus a unique archival source to investigate the full distribution of land in Luxembourg in 1766. It is a collection of individual declarations[6] in which the owners and tenants of land had to declare the amount and type of land that they owned or

[4] The land area is expressed in hectares, ares, and centiares, while the associated wealth is reported in florins and centimes.

[5] Luxembourg, Archives Nationales [hereafter LAN], A-XIV Cadastre de Marie-Thérèse, 1752–1772 (Fonds), Quartier de Luxembourg (Série), Monst-St-Jean (seigneurie) (Sous-série), A-XIV-79 and A-XIV-80 Dudelange (justice) - Budersberg et Buringen (Dossier).

[6] Declarants could fill out the declaration table in either French or German. Despite Dudelange bordering France, only 3 percent of the declarations were filled out in French. What may have happened is that the declarants who were unable to write had to go through a civil servant in charge of encoding the oral declarations into the form.

cultivated.[7] In each declaration from 1766, we have the name and the surname of the declarants, their place of residence, and their profession. The tables also include a section for the *droits et prestations*, that is, the feudal transfers that the owners of the land received from the tenants, and a column that lists the duties pertaining to property ownership and feudal rights that the tenants had to pay. The declarations were collected in the municipality where the land or the building was situated, and a person had to complete a declaration for each municipality in which they owned or rented land. The 1766 land survey for Dudelange contains 273 declarations (266 if we exclude the municipality, churches, and congregations), of which 190 were filled in by Dudelange residents. This is representative of the population of the municipality in 1821 (1,398), based on an estimated family multiplier of 6 based on the data we extracted from Pauly (2014). This means that our unit of analysis is the land in Dudelange and its distribution among different families over time. The figures in the Maria Theresa land survey are self-measurements, not calculations by a state officer. Historians estimate that a quarter of the land surface is missing from the declarations (Thewes 2008, p. 350). However, external and internal commissioners checked the declarations to ensure people did not underreport the land surface owned or rented to pay less taxes, and the declarations were public so that everyone could check the amount of land reported by each declarant. Moreover, anyone who correctly reported someone having falsified the amount of land declared would obtain half of the value associated with the "hidden" land for ten years, with the other half going to the state.[8] For these reasons, we believe that the data from this land survey are of sufficient quality. If misreporting were to have occurred, historians believe that this behavior should be attributed mainly to the rich or to the clergy. For these categories, given the large quantity of land owned, it would have been plausible to misreport some land without anyone else noticing it. In this scenario, our inequality estimates would be downward biased.

The other sources used are the land registers of 1842 and 1872 that list all the property owners and the extent of their land holdings at each of these dates.[9] These registers contain the name, surname, profession, and place of residence of each property owner, as well as the land area and the value associated with each property they own, computed after the

[7] The different categories of land are: arable land, gardens, forests, vineyards, meadows, enclosures, ponds, pastures, wasteland, and buildings.

[8] The original document in French can be found in the archives: LAN, B-0103 Cadastre de 1766 - Lois et instructions sur le nouveau cadastre, 1227–1238 (Dossier), *Placcard concernant le rapport et l'estimation générale de tous les biens fonds de nos Pays, Duché de Luxembourg et Compté de Chiny, du 12 Mars 1766*, Art. 4.

[9] Luxembourg, Archives de l'Administration du Cadastre et de la Topographie, Matrice cadastrale des propriétés foncières bâties et non-bâties de 1842 et 1872, Commune de Dudelange.

deduction of cultivation costs.[10] The land registries of 1842 and 1872 list 543 and 651 property owners (530 and 627, respectively, if we exclude municipalities, churches, and congregations).

We used the personal information in the 1766, 1842, and 1872 archives to link the owners of property to individuals listed in the *Chronique familiale de la Ville de Dudelange* (Pauly 2014), a compendium of families that lived in Dudelange from 1645 to the 1950s. Each family, composed on the basis of birth, marriage, and death records in Dudelange, is assigned a unique code. For each head of a family, the name, surname, profession, dates of birth and death (when available), and the name and surname of the parents are reported. Pauly also collected the same information for the spouse or spouses of the head of the family. Usually the head of the family is the male, unless a woman had a child outside of marriage. In the latter case, the woman could be listed twice: once as *liaison avec inconnu*[11] and again in the husband's family. If a woman married twice, she is listed in both husbands' families and was thus given two family codes. For each family listed in the book, we also have a list of the children with their dates of birth and, when available, their death dates. If one of the children started a family in Dudelange, we also have the family code associated with his or her future family. We thus also used Pauly (2014) to compute how many children and siblings each declarant had. In addition, for the 1872 property owners, we were able to count the number of their ancestors who appear in the 1766 and 1842 datasets. This provides information on the extent to which land owned in 1766 and 1842 was divided among descendants as well as on the number of land-owning ancestors a given property owner had.

The matches between the registers and Pauly (2014) were done using the name, surname, dates of birth and death, place of residence, and profession of the declarants. If available, information on the spouse was particularly useful to match individuals, as it meant looking for pairs of names in Pauly (2014). The dates of birth and death were used to establish the people alive when the registers were collected. The 1842 and 1872 land registries also contain information on the land transactions that took place in intervening years (between 1842 and 1872 and between 1872 and the next property register prepared in 1905).[12] The transactions

[10] Art. III of the law n. 2197 of 1798. Text available at https://legilux.public.lu/eli/etat/leg/loi/1798/11/23/n1/jo.

[11] Meaning "relationship with an unknown person." It is used when a child is born from an unknown father, out of wedlock.

[12] This register is available to the authors but was not included in the analysis as a time point given that it covers a period of significant social change following the opening of the steel factory in Dudelange in 1886.

TABLE 2
LINKS BETWEEN DECLARANTS AND PAULY (2014)

	1766	1842	1872
Total	266	530	627
Linked to Pauly (2014)	177	469	554
Unmatched non-residents	62	58	67
Unmatched residents	27	3	6

Sources: Authors' calculation based on the 1766, 1842, and 1872 registries and Pauly (2014).

that occurred at the end of an individual's life offered additional information that could be used to match owners to individuals in Pauly (2014). Indeed, these transactions usually favored sons or sons-in-law, and it was in some cases possible to match owners in a given registry by looking for pairs of related individuals (i.e., a father and a son with the same last name and specific first names). We analyzed the individuals on a case-by-case basis and only linked individuals in the registries with codes in Pauly (2014) when the match was the only one that was possible on the basis of the available information. Table 2 presents the outcome of the matching exercise. For the 1766 time point, 177 out of 266 declarants were matched to an individual in Pauly (2014). Of the 89 unmatched declarants, 62 did not live in Dudelange and are thus not included in the scope of Pauly (2014). As concerns 1842, we found matches in Pauly (2014) for 469 out of the 530 listed property owners. Out of the 61 unmatched property owners, 58 were not Dudelange residents. For 1872, we matched 554 out of the 627 property owners with individuals in Pauly (2014). Sixty-seven out of 73 unmatched property owners did not live in Dudelange. The individuals listed in our sources as living in Dudelange who are not in Pauly (2014) were not born in Dudelange, and they did not marry or die in the municipality. Consequently, they were not recorded through any major life event. However, it could also be that their name or surname changed significantly over time or was misspelled in the declaration. In the last step, we used Pauly (2014) to collect five generations of descendants (around 15,000 individuals) of the matched 1766 declarants. Links between individuals are made from vertical parent-child relationships, starting from the 1766 declarants. We extracted the children of these declarants from Pauly (2014), both male and female. All of the children found belong to "generation 1." We then collected the children of all individuals in "generation 1"—these are the individuals in "generation 2." We continued this process until the fifth generation. This makes it possible to look for the individuals matched to Pauly (2014) in the 1842 and 1872 time points within this list of all individuals connected to the fifth generation to declarants in 1766. This

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

approach ensures the inclusion in the analysis of all the ancestors of the owners in 1842 and 1872 who lived in Dudelange long enough to be recorded in Pauly (2014), be they from the father's or the mother's side. Following both the mother's and the father's lineages thus indirectly takes into account the wealth brought to the family through the dowry. To illustrate the complexity of the family links that the analysis that follows relies on, we present the case of two property owners in 1872:

- Jean Nieles was born in 1818. His father, Antoine Niles, born in 1785, owned property in 1842. Three of his great-grandparents declared important land-based wealth in 1766: his father's paternal grandfather Jean Niles (born 1723), his mother's grandfather Nicolas Barthel (born 1730), and his grandfather's father-in-law Mathias Reuter (born in 1713).
- Alexandre Pauly was born in 1837. He is child number 13 in the family, and the ninth to reach adulthood. All his other eight siblings (seven brothers and one sister) were also property owners in 1872. His father is Jacques Pauly, born in 1786, and a property owner in 1842. He has two ancestors who declared important land-based wealth in 1766: his father's paternal grandfather Nicolas Pauly (born in 1714) and his mother's maternal grandfather Michel Jaminé (born in 1714).

METHODOLOGY: LAND INEQUALITY

We started our analysis by looking at the distribution of land-based wealth in 1766, 1842, and 1872. The municipality of Dudelange includes the areas of Dudelange, Burange and Budersberg. The cadastral plan in Online Appendix Figure 1 shows how the territory of Dudelange was divided into land plots in 1824, when the first official land register was established. To evaluate the distribution of land, we used the inverse hyperbolic sine transformation[13] instead of a logarithmic transformation because 51 out of 266 of the 1766 declarants reported wealth equal to 0 (because of feudal burdens that were higher than the value of the property). In contrast to the logarithmic transformation, the inverse hyperbolic sine transformation allows us to consider these 0 values in the analysis and to compare the three distributions. We can graphically compare these distributions using their Lorenz curves. To compute the Gini coefficients and the Lorenz curves, we used the full distribution of individual declarants. We thus excluded organizations and institutions (such as religious

[13] It takes the form of IHS(x) = log(x + sqrt(x^2 + 1)).

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

TABLE 3
GINI COEFFICIENTS FOR DIFFERENT SAMPLE SPECIFICATIONS: INCLUDING OR EXCLUDING DECLARANTS WITH NULL WEALTH (0S) IN 1766 AND/OR THOSE NOT RESIDING IN DUDELANGE

	Gini Including 0s (1)	Gini Excluding 0s (2)	Gini Including 0s: Only Residents (3)	Gini Excluding 0s: Only Residents (4)
1766	0.84 (0.73;0.96)	0.81 (0.67;0.95)	0.73 (0.69;0.77)	0.63 (0.59;0.67)
1842	0.70 (0.63;0.78)	0.70 (0.63;0.78)	0.62 (0.59;0.66)	0.62 (0.59;0.66)
1872	0.69 (0.62;0.77)	0.69 (0.62;0.77)	0.62 (0.58;0.66)	0.62 (0.58;0.66)

Sources: The authors computed the Gini coefficients with and without null wealth declarations. The Confidence Intervals (CI) are in brackets and have been computed using a bootstrap with 1,000 repetitions at the 95% level.

TABLE 4
SHARE OF THE DISTRIBUTION OF LAND WEALTH, BY DECILES, IN DUDELANGE 1766–1842–1872

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	Top 5%	Top 1%	*N*
1766	0	0	0.24	0.69	1.24	1.89	3.15	5.52	12.97	74.30	62.52	47.98	266
1842	0.23	0.70	1.21	1.92	2.68	4.20	6.37	10.13	16.05	56.51	43.61	29.29	530
1872	0.23	0.64	1.17	1.91	2.92	4.33	6.74	10.65	17.60	53.82	40.10	22.88	627

Notes: Representation of the share of wealth owned by each decile (D1 to D10) and by the top 5 percent and top 1 percent of the distribution, *N* is the number of individual observations.
Source: Authors' analysis based on the land distribution of 1766, 1842, and 1872.

brotherhoods), but kept individuals who declared null wealth. We also report the results of the inequality analysis, excluding individuals with null wealth as well as including or excluding non-resident declarants. The summary statistics are shown in Table 5, while the results of the inequality analysis are in Tables 3 (Gini coefficients including and excluding the 1766 declarants with null wealth) and Table 4 (see later for the discussion).

METHODOLOGY: INTERGENERATIONAL MOBILITY IN LAND OWNERSHIP

To assess how land was transmitted between generations, we computed the percentile, rank, and quartile positions of each individual for each of the time points, based on the entire list of individuals with land wealth at that time point. This means that percentiles, rank positions, and quartiles

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

TABLE 5
SUMMARY STATISTICS ORIGINAL SAMPLE

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Wealth 1766	266	17.16	105.78	0	1651.50
Wealth 1842	530	44.08	152.86	0.03	3214.23
Wealth 1872	627	143.24	505.85	0.31	11523.57
Female 1766	266	0.10	0.30	0	1
Female 1842	530	0.09	0.29	0	1
Female 1872	627	0.10	0.30	0	1
Age of declarant 1766	157	44.34	17.78	1.0	100.0
Age of declarant 1842	467	46.82	15.69	11.0	96.0
Age of declarant 1872	545	54.13	17.82	8.0	112.0

Source: Authors' analysis based on the land distribution of 1766, 1842, and 1872.

are computed on the whole distribution, including people who are not in the database of descendants created from Pauly (2014). The analysis is limited to individuals who can be linked through the three data points and whose rank position can be compared and interpreted in terms of social mobility. As highlighted previously, this means that owners of property in Dudelange and their descendants who did not live there (or have a significant enough presence to be registered in birth, marriage, or death certificates in Dudelange) are not taken into account in the analysis. Given that Boland and Chanclos, the two feudal lords who owned the Seigneurie de Dudelange in 1766, sold their land to the Metz family who lived outside of Dudelange, the analysis also does not include the two richest families in 1766.

Since we are able to follow both the mothers' and the fathers' lines, individuals can have different numbers of ancestors depending on their family histories. The variable number of ancestors that we can find for each declarant depends on whether these ancestors lived in Dudelange at the time of the establishment of the 1766 land survey. It could be that a declarant in 1842 was born in Dudelange because his father married a woman living there. In such a case, only the ancestors from his mother's side can be found in Pauly (2014). To account for these differences, we counted the number of ancestors available in each data point for each declarant on both the maternal and paternal sides and the generational descendant-ancestor distance that separates this individual from his or her ancestors. We thus computed average wealth across all of the ancestors we had for a particular declarant, weighing each value by the generational distance that separates the declarant from a given ancestor. In this way, the wealth of the closest ancestors has a greater weight in the average than the wealth of the more distant ones. The rationale behind this is that the wealth of more distant ancestors is potentially exposed to

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

additional levels of fragmentation before reaching the descendant than the wealth of closer ancestors. The percentage of wealth that is transmitted is generally proportional to the generational distance between ancestors and descendants, because the land owned by a grandfather will be shared among his children and then among the grandchildren, while the land owned by a father will be shared only among his children. To be sure that the weighting procedure did not influence the result, we also ran our main regression using unweighted wealth.[14] The relevant results were unchanged. We tried to include this information in our empirical strategy to compute intergenerational land mobility in Dudelange between 1766 and 1872, which is based on the following equation:

$$Net\ Rank72_i = \beta_0 + \beta_1 Female_i + \beta_2 Old_i + \beta_3 Ancestors42_i + \beta_4 Ancestors72_i + \varepsilon_i,$$

where $Net\ Rank72_i$ is the rank based on the wealth of individual i in 1872, $Female_i$ takes value 1 if the individual i in 1872 was female, and Old_i takes value 1 if the individual i in 1872 was more than 50 years of age.[15] $Ancestor_i$ is a vector for the average ancestors' rank adjusted for generational distance in 1766 and 1842, the average number of children older than 13 adjusted for generational distance in 1766 and 1842, and the number of ancestors in the previous time points. In the analysis, we only include the ancestors, and for a property owner in 1872, we never take into account the wealth they may have declared in 1842. As mentioned earlier, our sample is restricted to individuals who can be found in Pauly (2014) and to individuals with land wealth in 1872 who had at least one ancestor in both 1842 and 1766.

In Table 6, we present the summary statistics of our final sample, based on 371 individuals linked to all three data points. Half of the declarants in 1872 are older than 50, and only 10 percent are female. The mean rank position in 1766 is notably low, because the generational distance between ancestors in 1766 and descendants in 1872 is always greater than 1. To overcome the problem of distributions in different monetary units and of the influence of inflation, we decided to use a rank-rank analysis. This approach is also a convenient method, in light of the fact that 20 percent of our declarants in 1766 declared wealth equal to 0.[16]

[14] See the Online Appendix Table 1.

[15] In our sample, the median is 49 and the mean is 48.9. We used age 50 as a cut-off point, as we consider it an age in which a person would be old enough to have accumulated wealth.

[16] In Online Appendix Table 2, we also show the results for the inverse hyperbolic sine transformation model.

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

TABLE 6
SUMMARY STATISTICS OF THE SELECTED GENERATIONAL SAMPLE

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Rank 1872	371	354.25	174.15	9.0	626.0
Older than 50 in 1872	371	0.46	0.50	0	1
Being female in 1872	371	0.11	0.31	0	1
Average rank ancestors 1766 (adj.)	371	50.94	22.18	6.50	127.50
Number of ancestors in 1766	371	3.27	1.95	1.0	9.0
Average number of children ancestors 1766 (adj.)	371	2.39	0.80	0.33	5.83
Average rank ancestors 1842 (adj.)	371	330.31	115.19	14.50	524.0
Number of ancestors in 1842	371	1.64	1.15	0	6.0
Average number of children ancestors 1842 (adj.)	371	4.87	2.07	1.0	11.0
Firstborn 1872	371	0.20	0.40	0	1
Firstborn "de facto" 1872	371	0.26	0.44	0	1

Source: Authors' analysis based on the land distribution of 1766, 1842, and 1872.

We standardized our continuous variables, both dependent and independent, since their distributions are very different (see summary statistics Table 6).

RESULTS: LAND INEQUALITY

The histogram in Figure 1 suggests that there was an increase in the land-based wealth over time and that the distributions for 1842 and 1872 are more normally distributed than the 1766 distribution.[17] The spike for the value 0 for the 1766 time point corresponds to the 51 individuals who reported wealth equal to 0 in their declarations (because they owed more in feudal duties than the value they could generate from the land they worked). The median wealth of the IHS transformed distribution are 1.72 for 1766, 3.38 for 1842, and 4.63 for 1872.[18]

Using the entire distributions, we computed the Lorenz curve and the Gini index[19] for the original distribution of land-based wealth. Figure 2 shows that the Lorenz curves for the 1766, 1842, and 1872 distributions do not cross. As to be expected from the evolution of the Lorenz curves, we find that the value of the Gini coefficient decreased over time: for 1766, the Gini coefficient is 0.84, while it is 0.70 for 1842 and 0.69 for

[17] Data and other replication files for this article are provided in Schifano and Paccoud (2023).

[18] Median total wealth refers here to the values after the IHS transformation, while in Table 4 we report the share owned by different deciles of the original distributions.

[19] The Gini index is calculated according to the following formula: $G = \sum_{i=1}^{n} \sum_{j=1}^{n} \frac{|x_i - x_j|}{2\bar{y}n^2}$, where n is the number of declarants, $\bar{y}$ is the arithmetic mean of the total value of wealth, and y_i is the wealth of declarant i. The Gini coefficient can take values between 0 (perfect equality) and 1 (perfect inequality).

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

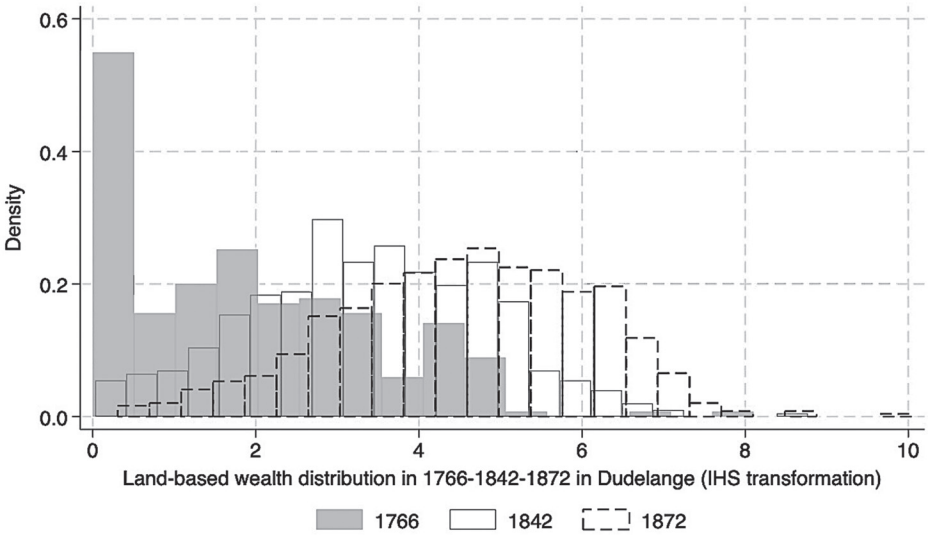

FIGURE 1
INVERSE HYPERBOLIC SINE TRANSFORMATION OF THE WEALTH DISTRIBUTIONS, 1766–1842–1872

Note: The Gini coefficient for the 1766, 1842, and 1872 are respectively 0.84, 0.70, and 0.69
Sources: The authors used the distribution of land in 1766, 1842, and 1872 generated from the Marie Therese Cadastre of 1766 and the land registries of 1842 and 1872 to create this graph.

1872. The drop in the level of inequality between 1766 and 1842 reflects the socio-legal change that took place in the intervening period, as full ownership rights replaced the tenured relations of feudalism in 1795. The loss of feudal privileges translated into a decrease in wealth for the top of the distribution and an increase in wealth for the bottom.

Table 4 reflects this institutional change, as we can see that the top 10 percent experienced a reduction of one-third in the share of the wealth it owned between 1766 and 1842, a phenomenon fully driven by the drop in the share owned by the top 1 percent of declarants. At the other end of the distribution, the share of the bottom 50 percent was more than three times larger in 1842 and 1872 than in 1766. At the top, this change is visible in the relation between the land surface owned and the wealth it represents. While the feudal lords in 1766, Boland and Chanclos, and the largest property owner in 1842, Berthier, owned more or less the same area of land in Dudelange, Berthier had a much smaller share of total wealth in 1842 than the feudal lords had in 1766 (12.3 percent compared with 44.3 percent of total wealth). This derives from the fact that in 1766, the wealth of the feudal lords included both the land they owned directly and the feudal payments received for land they tenanted out to their feudal subjects, while in 1842 all property owners had full ownership of their

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

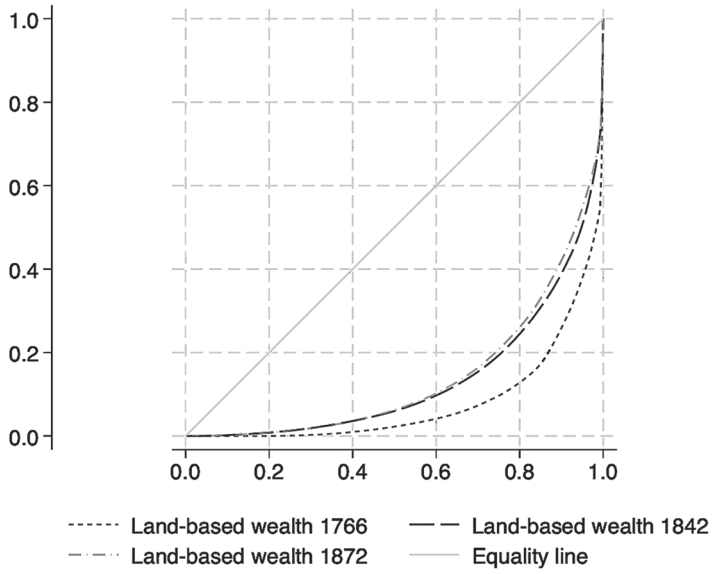

FIGURE 2
LORENZ CURVES FOR THE DISTRIBUTION OF LAND-BASED WEALTH
1766, 1842, AND 1872

Sources: The authors used the distribution of land in 1766, 1842, and 1872 generated from the Marie Therese Cadastre of 1766 and the land registries of 1842 and 1872 to compute the Lorenz curves.

land, thus limiting wealth only to the land they actually owned. At the bottom, the same disappearance of the feudal burdens weighing on property owners meant that there were no longer records with null wealth in 1842 and 1872 (all wealth values were positive). This consequently increased the wealth reported by the bottom 60 percent of the declarants in these time points as compared to 1766, as can be seen in the Lorenz curves. The presence of Lorenz domination over the time points allows us to generalize our findings of a decrease in inequality as measured by the Gini coefficient to all relative inequality indices, for example, such as the Theil coefficient.

In our view, this socio-legal change in relation to property thus accounts for the majority of the drop in inequality between the 1766 and the 1842–1872 time points. This can be seen in Table 3, which shows the Gini coefficients for the three time points, including or excluding the 1766 declarants with null wealth and including or excluding property owners not residing in Dudelange. We present these results with the confidence interval in brackets (computed using a bootstrap with 1,000 repetitions and a 95 percent confidence level). Excluding declarants with null wealth produces a drop in the Gini coefficient for the 1766 time

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

point. The Gini nonetheless remains significantly higher than in 1842 and 1872. The difference between the Gini coefficients in 1766 and in the later time points only disappears when both declarants with null wealth and those not residing in Dudelange are excluded. The reduction in the Gini due to the exclusion of non-residents in 1766 is explained by the fact that the two richest persons among the declarants at that time point were the owners of the feudal lordship, one of them was a person residing in Belgium. The stability of the Gini coefficient between 1766 and 1842 when we exclude the zeros and non-residents thus derives from the absence in this specification of the major sources of inequality (the presence of the feudal lords and the significant feudal duties weighing on land users with null wealth) that derive from the feudal system in place in 1766. These results are thus in line with those of the social mobility analysis (see later for a discussion), which also excludes non-residents because of their absence in Pauly (2014).

In Table 4, we look in detail at the distribution of land-based wealth in 1766, 1842, and 1872. The table shows the share of wealth owned by each decile of the distribution and by the richest 5 and 1 percent. Even though the Gini coefficients for 1842 and 1872 are very similar, the table suggests that there was a drop of 7 percentage points in the land-based wealth owned by the top 1 percent between the two time points. This reflects a redistribution within the top, since the loss in the top 1 percent of the distribution went to the ninth and the rest of the tenth decile.

RESULTS: INTERGENERATIONAL LAND MOBILITY

Table 7 shows the results of our rank-rank regression of wealth in 1872 on the average wealth of the ancestors, adjusted for generational distance. In Column (1), we regress the rank position of the property owner in 1872 on two dummy variables: being older than 50 at the time of the measurement and being female. Being older than 50 increases the rank position by 53 percent of a standard deviation; that is, equivalent to a rise of 92.3 ranks (0.53*174.15) in the 1872 rank distribution. On the other hand, being female reduces the rank position by 0.66 of the standard deviation of the rank position of the 1872 property owners. These females were widows or married women who owned land independently from their husbands, usually land transmitted from the woman's family to assure her of some protection; the negative coefficient confirms this.

In Column (2), we measure intergenerational mobility between 1872 and 1842, while in Column (3) we do the same for 1872 and 1766. This allows us to investigate how intergenerational mobility evolved over time.

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

TABLE 7
REGRESSION RESULTS: RANK ANALYSIS, GENERATIONAL ADJUSTMENT, AND STANDARDIZATION

	(1)	(2)	(3)	(4)	(5)	(6)
Older than 50 in 1872	0.533***	0.449***	0.431***	0.389***	0.379***	0.386***
	(0.099)	(0.089)	(0.093)	(0.089)	(0.089)	(0.089)
Being female in 1872	–0.657***	–0.613***	–0.677***	–0.620***	–0.603***	–0.618***
	(0.140)	(0.133)	(0.139)	(0.134)	(0.134)	(0.135)
Avg rank in 1842 adj. gen. distance		0.475***		0.430***	0.433***	0.430***
		(0.047)		(0.054)	(0.054)	(0.054)
Number of ancestors in 1842		0.165***		0.136**	0.142**	0.138**
		(0.056)		(0.067)	(0.068)	(0.068)
Avg children>13 in 1842 adj. gen. distance		–0.130***		–0.146***	–0.135***	–0.143***
		(0.044)		(0.045)	(0.046)	(0.045)
Avg rank in 1766 adj. gen. distance			0.216***	0.082	0.082	0.082
			(0.047)	(0.050)	(0.051)	(0.050)
Number of ancestors in 1766			0.127**	0.040	0.037	0.039
			(0.050)	(0.053)	(0.053)	(0.053)
Avg children>13 in 1766 adj. gen. distance			0.095**	0.098**	0.099**	0.098**
			(0.047)	(0.042)	(0.042)	(0.042)
Firstborn 1872					0.159	
					(0.106)	
Firstborn "de facto" 1872						0.032
						(0.102)
Observations	371	371	371	371	371	371
Adjusted R^2	0.117	0.292	0.187	0.305	0.307	0.303

Notes: Robust standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Dependent and independent continuous variables are standardized.
Source: Authors' analysis based on the land distribution of 1766, 1842, and 1872.

The coefficients for being female and being older than 50 do not change across the model specifications. This means that the effect of those two variables on the rank position does not depend on the rank positions of the ancestors. Column (2) shows that one standard deviation increase in the average rank position of the ancestors in 1842 increases the rank position of the property owner in 1872 by 0.50 standard deviations. This means that by increasing the rank position of the ancestors in 1842 by 115, the rank position of the property owner in 1872 will increase by 83.[20] The number of ancestors in 1842 is also positive and significant, indicating that the larger the number of ancestors who owned land in 1842,

[20] The standard deviation of the average rank position of ancestors in 1842 is 115.19, and the standard deviation of the rank position of declarants in 1872 is 174.15. The figure of 83 is obtained by multiplying the latter number by 0.475.

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

the higher the rank of the property owner in 1872. We can also observe that the coefficient for the number of children of the ancestors in 1842 is negative and significant. In our sample, 70 percent of the ancestors in 1842 were parents of the owners in 1872, and for those, the children of the ancestors in 1842 were the siblings of the owners in 1872. This means that the greater the number of siblings the declarants had in 1872, the more the land could be fragmented among them. We also tested whether the effect of the number of siblings is mediated by the inheritance system.

In Column (3), we add only the information related to the ancestors in 1766. A one standard deviation increase in the rank position of the ancestors in 1766 is associated with an increase in the rank position of the property owner in 1872 by 0.22 of its standard deviation. The number of ancestors in 1766 is positive and significant, indicating that the larger the number of ancestors who owned land in 1766, the higher the rank position of the property owner in 1872. If the number of ancestors is higher, it is more likely that both spouses came from Dudelange and that their ancestors owned land. It was thus presumably easier for them to accumulate or keep control of land than it was for a couple in which only one of the spouses had ancestors who owned land in Dudelange.

In Column (4), we include information on the ancestors for both 1766 and 1842. Here, the effect of the ancestors in 1766 is not significant. This specification confirms that the wealth of the closer ancestors has a greater impact on the wealth of the descendants than the land owned by more distant ancestors. This can be seen to mediate the effect of the last specification. Column (4) also confirms the results obtained for the average number of children of the ancestors in 1842 and the number of ancestors present in the 1842 land registry. Figure 3 shows that using a single time point in the regression or using both changes our coefficients significantly for 1766 only, and that the effect of the average rank position of the ancestors in 1766 is independent from the effect of the ancestors' average rank in 1842. These results are not affected by multicollinearity among variables.[21]

Thanks to the demographic information that we collected from Pauly (2014), we also know if the declarants in 1872 are the firstborn or not, and if they had older siblings who died before turning 13 (so that they became firstborn "de facto"). In Table 7, Columns (5) and (6), we thus present the results when we include a dummy for being the first child or the first child "de facto," in order to check whether being a firstborn child provides

[21] In Online Appendix Table 3 we present the output of the Variance Inflation Factors (VIF)—"vif" command run in STATA—for the regression shown in Column (4) of Table 7. The VIFs are all below 5, meaning that our variables are not affected by multicollinearity.

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

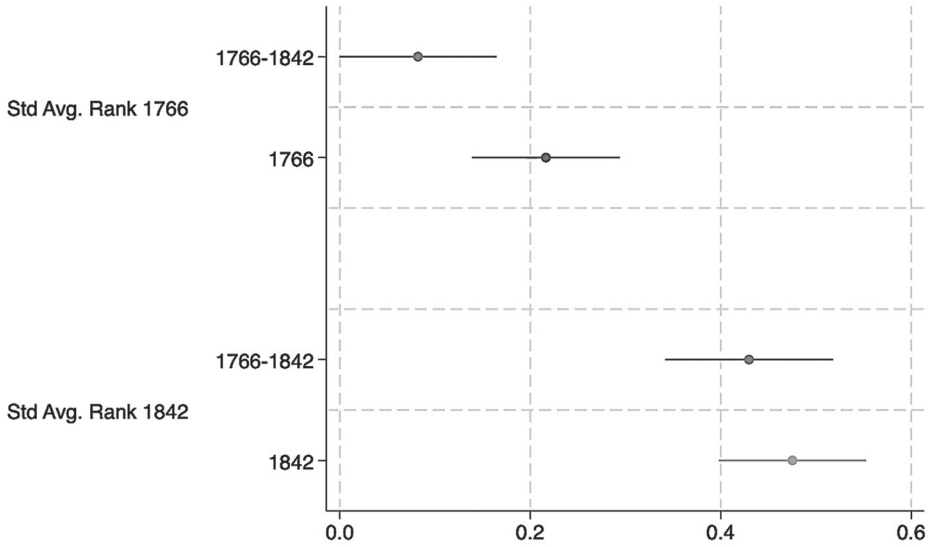

FIGURE 3
ESTIMATED COEFFICIENTS

Sources: The authors analyzed the distribution of land in 1766, 1842, and 1872 generated from the Marie Therese Cadastre of 1766 and the land registries of 1842 and 1872. The graph shows the coefficients of the average wealth of ancestors, and they compare these coefficients when the regression is done using only the ancestors in 1766, only the ancestors in 1842, and both.

any wealth advantage with respect to the other siblings. The firstborn child had an advantage in pre-industrial society because of the primogeniture rule, which aimed to preserve family holdings from fragmentation by bequeathing the full inheritance to the firstborn child. Results for Germany in the nineteenth century show that higher inequality is associated with impartible inheritance practices (Wegge 2021). In the case of Luxembourg, it has not yet been empirically established whether land was transmitted following a partible or an impartible system. At least among the nobility, the inheritance system was regulated by specific norms that are based on the *Coutume du Luxembourg* (Hudemann-Simon 1985), and the primogeniture was called *droit d'aînesse*. Although inheritance was regulated, it was very common not to respect the *droit d'aînesse* and to share the family wealth among all the heirs. The *droit d'aînesse* was formally abolished with the French Revolution, but there is wide agreement that it was never fully applied before this time in Luxembourg, with families often splitting the inheritance among all the children, even if not in equal parts (Hudemann-Simon 1985; Wealer 2010).

Columns (5) and (6) in Table 7 show the intriguing fact that in Luxembourg, primogeniture did not give a substantial advantage to children who were either chronologically or "de facto" the firstborn (while

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

TABLE 8
REGRESSION RESULTS: ANALYSIS BY QUARTILE OF THE DISTRIBUTION

	All	1st	2nd	3rd	4th	P0–50	P51–100
Older than 50 in 1872	0.388***	0.052	–0.070	0	0.163***	0.094	0.214***
	(0.089)	(0.092)	(0.061)	(0.053)	(0.051)	(0.088)	(0.058)
Being female in 1872	–0.615***	–0.020	0.081	–0.175**	0.073	0.042	–0.330***
	(0.134)	(0.090)	(0.080)	(0.086)	(0.046)	(0.115)	(0.122)
Avg percentile in 1842 adj. gen. distance	0.434***	0.005	–0.009	0.077*	0.122***	–0.026	0.270***
	(0.053)	(0.043)	(0.044)	(0.040)	(0.037)	(0.061)	(0.043)
Number of ancestors in 1842	0.139**	–0.027	–0.019	0.082*	0.098***	–0.041	0.242***
	(0.067)	(0.034)	(0.036)	(0.044)	(0.034)	(0.051)	(0.041)
Avg children>13 in 1842 adj. gen. distance	–0.146***	0.053	0.020	–0.013	–0.067**	0.110*	–0.096***
	(0.045)	(0.040)	(0.039)	(0.029)	(0.029)	(0.059)	(0.028)
Avg percentile in 1766 adj. gen. distance	0.074	–0.075	–0.031	0.003	0.048	–0.072	0.093***
	(0.049)	(0.051)	(0.029)	(0.026)	(0.034)	(0.051)	(0.034)
Number of ancestors in 1766	0.038	0.068**	0.041	–0.038	–0.041	0.036	–0.034
	(0.053)	(0.031)	(0.034)	(0.036)	(0.025)	(0.053)	(0.033)
Avg children>13 in 1766 adj. gen. distance	0.102**	0.017	–0.020	0.019	0.009	0.048	0.016
	(0.042)	(0.047)	(0.031)	(0.024)	(0.025)	(0.050)	(0.028)
Observations	371	65	81	113	112	146	225
Adjusted R^2	0.304	0.030	–0.028	0.043	0.206	0.040	0.352

Notes: Robust standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. Dependent and independent continuous variables are standardized.
Source: Authors' analysis based on the land distribution of 1766, 1842, and 1872.

all the coefficients are positive, they are not statistically significant). This phenomenon may be explained by the high percentage of children who died at an early age,[22] including firstborn children, and the scarce use of the *droit d'aînesse*. While we know that there was no significant difference in the average rank position of the ancestors in 1842 among declarants in 1872 that were firstborn, firstborn "de facto" or further down the siblings list, reaching any final conclusions concerning the reasons for this result requires further study.

To test the robustness of the main results, we conducted a series of further analyses. We first ran a heterogeneity analysis, meaning that we split our sample into subsamples based on the quartile associated with the position in the original distribution, to see if our estimates result from the top, the bottom, or the middle of the distribution. Table 8 shows us that in our sample we have an overrepresentation of the top 50 percent of the distribution in 1872 and that our results depend on this 50 percent. The

[22] Collecting the data from Pauly (2014), we noticed that infant mortality was, in general, very high.

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

results for the bottom quartile of the distribution indicate that the average percentile of the ancestors in 1766 has a negative effect on the percentile of the 1872 property owners. Bearing in mind that we only have 65 individuals in the bottom quartile who are part of our sample, this result seems to us to derive from the fact that in a rural area such as Dudelange in the eighteenth and nineteenth centuries, families in the bottom quartile of the land distribution were living very close to the subsistence level. It is thus possible that in this quartile, land fragmentation at the point of inheritance was more widespread than in the other quartiles because land was a vital source of income and thus had to be distributed between children if they were to survive. Table 8 also shows that the extent to which ancestors influence the socio-economic life of descendants is greater at the top of the distribution.

We also tried to compare our estimation results with social mobility tables for the periods 1766–1842 and 1842–1872. In the regressions presented in Table 10, the variables are standardized, and we regress the rank position in time point t on the average rank in t-1 (adjusted for the generational distance), the number of ancestors in t-1, and the number of children in t-1 (also adjusted for the generational distance). The social mobility tables only take into account the rank position without adjusting for generational distance. The two regressions were carried out independently, because we want to look at the links between the two time points and to obtain results that are comparable with our social mobility tables. If we look at Table 9, we find that social mobility between 1766 and 1842 was almost the same as during the 1842–1872 period, shown by quasi equal amounts of upward, downward, and stable social mobility. This trend is confirmed by our estimation results presented in Table 10. A one standard deviation increase in the average rank position of the ancestors in 1766 leads to a 0.32 standard deviation increase in the rank position in 1842, and a one standard deviation increase in the average rank position of the ancestors in 1842 leads to a 0.52 standard deviation increase in the rank position in 1872 (Table 10).[23] These results suggest that social mobility remained reasonably stable once the new political order had been established. The land ownership persistence found here is in line with the Gini coefficients obtained in Table 3, Column (4). The Gini coefficient does not change between 1766 and 1842 when we exclude the non-residents, among which we have the richest person in 1766. After the end of feudalism, the top of the property wealth distribution was only slightly open to newcomers over time.

[23] The sample used for the regression between descendants in 1842 and ancestors in 1766 is larger because we also included the links that do not have further descendants in 1872.

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

TABLE 9
SOCIAL MOBILITY TABLE 1766–1842, 1842–1872

Social Mobility Table 1766–1842

Quartile:	1842				
1766	1	2	3	4	Tot
1	38	25	20	6	89
2	18	22	24	25	89
3	19	25	26	25	95
4	14	17	19	32	82
Total	89	89	89	88	355

Social Mobility Table 1842–1872

Quartile:	1872				
1842	1	2	3	4	Tot
1	28	38	19	8	93
2	35	23	23	12	93
3	17	21	31	24	93
4	13	11	20	48	92
Total	93	93	93	92	371

Summary Table

	1766–842	1842–72
UM	35.2%	33.4%
DM	31.5%	31.5%
0M	33.2%	35%
TM	66.8%	65%

Legend: UM=Upward Mobility; DM=Downward Mobility; 0M=No Mobility; TM=Total Mobility (UM+DM)

Note: Social mobility table includes the number of observations in each class combination.
Source: Authors' analysis based on the land distribution of 1766, 1842, and 1872.

TABLE 10
RANK-RANK REGRESSION BETWEEN 1842 DESCENDANTS WITH 1766 ANCESTORS, AND 1872 DESCENDANTS WITH 1842 ANCESTORS

	Rank 1842	Rank 1872
Avg rank 1766	0.32	
S.D. avg. rank 1766	40.27	
S.D. rank 1842	144.96	
Avg rank 1842		0.52
S.D. avg. rank 1842		115.19
S.D. rank 1872		174.15
N	355	371
Controls	Yes	Yes

Note: Dependent and independent continuous variables are standardized.
Source: Authors' analysis based on the land distribution of 1766, 1842, and 1872.

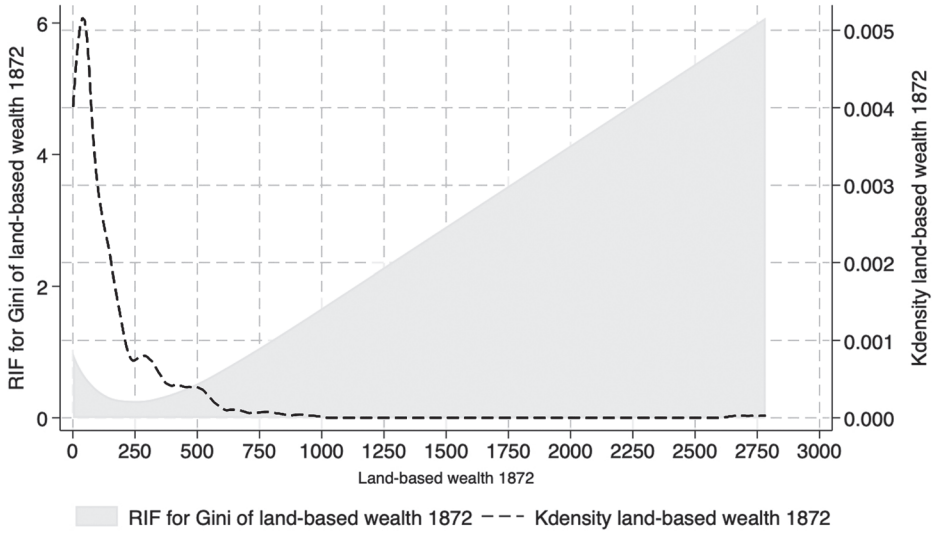

FIGURE 4
INFLUENCE FUNCTIONS FOR THE GINI COEFFICIENT OF NET WORTH

Source: Authors analysis based on Firpo, Fortin, and Lemieux (2018).

Finally, to combine our regression results with the inequality measure we previously presented, we ran a RIF (Recentered Influence Functions) regression based on the method outlined in Firpo, Fortin, and Lemieux (2018). We focus on the Gini coefficient, and Figure 4 displays the RIF (w; Gini; F) in the distribution of wealth for 1872 and the density function for wealth in 1872. The U shape of the RIF function is in line with previous studies on inequality and wealth (Morelli et al. 2023) and represents the fact that a marginal increase in the proportion of households at

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

the top or at the bottom of the distribution will increase inequality either from the top or the bottom. To reduce inequality, we need to marginally increase the proportion of households in the middle of the distribution, between the 52nd and the 97th percentile (corresponding to wealth levels of between 53 and 500 florins in the x axis of the graph).

CONCLUSIONS

In this paper, we use the case of Luxembourg to contribute to research on the impact of large-scale social transformations on both levels of inequality and social mobility. Despite the recent interest in income and wealth inequality in Western Europe, Luxembourg has been overlooked in the research agenda concerning this topic but can provide insights into the processes that took place in pre-industrialized rural areas of central Europe. In the analyses, we drew on detailed genealogical information to precisely link the individuals in the Maria Theresa land survey of 1766 to those in the complete land registries of 1842 and 1872. Using exact links between ancestors and descendants for these three time points, we were able to study the distribution of land wealth and its transmission between generations during the transition from a feudal to a full property rights regime in Dudelange, Luxembourg.

Our analysis of wealth inequality across these time points first seemed to show a significant drop in the Gini coefficient between 1766 and 1842. However, this drop disappears when the analysis excludes declarants who were not Dudelange residents as well as those who declared null wealth in 1766. This suggests that the more unequal distribution of land-based wealth among all declarants in 1766 derives from the significant feudal duties that weighed on land users and which were transferred to a very small number of individuals. It thus seems that those who stood to lose the most from the end of feudalism in Dudelange were the feudal lords.

This prompted us to look more closely at the transmission of wealth within families who had lower wealth than the very top landowners, but who had better economic circumstances than the landless. In this segment of the population and in the context of a large change in the socio-legal organization of property ownership linked to the country being ruled by different empires, we find a significant persistence of land-based wealth in families over time. With the limitation that we only considered declarants in 1766 that lived in Dudelange, our results also suggest that the wealth of the closer ancestors influences the wealth of their descendants more than the wealth of more distant ancestors, and that being the first child did not offer a substantial advantage in terms of land inheritance. We also find that family

https://doi.org/10.1017/S0022050724000421 Published online by Cambridge University Press

practices around inheritance, linked to the number of siblings and the order of birth of each child, do not seem to follow the primogeniture rule as established by the *Coutume du Luxembourg* for the nobility. The persistence of land-based wealth in families over time, most clearly seen in the top half of the distribution, can be linked to the fact that there were no inheritance taxes on transfers in direct line and steadily decreasing property taxes throughout the period. This points to the fact that in the absence of targeted taxation, family-level transmission mechanisms limit social mobility and strongly advantage those with ancestors owning property wealth, even when there are significant changes in the organization of property relations.

These results can help explain why Luxembourg's structure of ownership has remained so unequally distributed to this day. Indeed, a recent analysis has shown that 0.5 percent of Luxembourg residents today own half of all residential land in the country (Paccoud et al. 2021). In the period under study here, agriculture was the main source of income, and keeping land in the family was essential to maintaining access to economic production. However, steadily increasing land values since the early twentieth century seem to have created a new incentive for landowners to keep land in the family, giving further wind to the mechanisms uncovered here for the eighteenth and nineteenth centuries. Our results thus suggest that in the absence of major changes in the taxation of property or inheritances, historical landownership dynamics can have real impacts on current-day socio-economic conditions, such as on land prices and housing affordability (Paccoud et al. 2022).

REFERENCES

Adermon, Adrian, Mikeal Lindahl, and Daniel Waldenström. "Intergenerational Wealth Mobility and the Role of Inheritance: Evidence from Multiple Generations." *Economic Journal* 128, no. 612 (2018): 251–75.

Alfani, Guido. "The Effects of Plague on the Distribution of Property: Ivrea, Northern Italy 1630." *Population Studies* 64, no. 1 (2010): 61–75.

———. "Economic Inequality in Northwestern Italy: A Long-Term View (Fourteenth to Eighteenth Centuries)." *Journal of Economic History* 75, no. 4 (2015): 1058–96.

———. "The Rich in Historical Perspective. Evidence for Preindustrial Europe (ca. 1300–1800)." *Cliometrica* 11, no. 3 (2017): 321–48.

———. "Economic Inequality in Preindustrial Times: Europe and Beyond." *Journal of Economic Literature* 59, no. 1 (2021): 3–44.

———. "Epidemics, Inequality and Poverty in Preindustrial and Early Industrial Times." *Journal of Economic Literature* 60, no. 1 (2022): 3–40.

Alfani, Guido, and Francesco Ammannati. "Long-Term Trends in Economic Inequality: The Case of the Florentine State, c. 1300–1800." *Economic History Review* 70, no. 4 (2017): 1072–102.

Alfani, Guido, and Matteo Di Tullio. *The Lion's Share. Inequality and the Rise of the Fiscal State in Preindustrial Europe*. Cambridge: Cambridge University Press, 2019.

Alfani, Guido, Victoria Gierok, and Felix S.F. Schaff. "Economic Inequality in Preindustrial Germany, ca. 1300–1850." *Journal of Economic History* 2, no. 1 (2022): 87–125.

Alfani, Guido, and Sonia Schifano. "Wealth Inequality in the Long Run." In *How Was Life? Volume II: New Perspectives on Well-Being and Global Inequality since 1820*, edited by Jan Luiten Van Zanden, Marco Mira d'Ercole, Mikolaj Malinowski, and Auke Rijpma, 103–23. Paris: OECD Publishing, 2021.

Atten, Alain. *Le Luxembourg à La Fin De L'Ancien Régime: Structures Politiques, Sociales Et économiques: Exposition Documentaire Du 6 Au 31 Janvier 1989 Au Cercle Municipal De Luxembourg*. Luxembourg: Archives nationales, 1989.

Barbot, Michela, Marco Cattini, Matteo Di Tullio, and Luca Mocarelli. *Stimare il Valore dei Beni: una Prospettiva Europea* (secoli XIV–XX). Udine: Forum, 2018.

Barone, Guglielmo, and Sauro Mocetti. "Intergenerational Mobility in the Very Long Run: Florence 1427–2011." *Review of Economic Studies* 88, no. 4 (2021): 1863–91.

Brea-Martínez, Gabriel, and Joana-Maria Pujadas-Mora. "Estimating Long-Term Socioeconomic Inequality in Southern Europe: The Barcelona Area, 1481–1880." *European Review of Economic History* 23, no. 4 (2019): 397–420.

Brenner, Robert. "Dobb on the Transition from Feudalism to Capitalism." *Cambridge Journal of Economics* 2, no. 2 (1978): 121–40.

Canbakal, Hülya, Alpay Filiztekin, and Sevket Pamuk. "Distribution of Income and Wealth in the Ottoman Empire, 1500–1914." Paper presented at the World Economic History Congress, Boston, 30 July–3 August 2018.

Clark, Gregory. *The Son Also Rises: Surnames and the History of Social Mobility*. Princeton: Princeton University Press, 2014.

Clark, Gregory, and Neil Cummins. "Intergenerational Wealth Mobility in England, 1858–2012: Surnames and Social Mobility." *Economic Journal* 125, no. 582 (2015): 61–85.

Corak Miles. *Generational Income Mobility in North America and Europe.* Cambridge: Cambridge University Press, 2004.

Deutscher, Nathan, and Bhashkar Mazumder. "Measuring Intergenerational Income Mobility: A Synthesis of Approaches." Stone Center On Socio-Economic Inequality Working Paper Series No. 39, New York, NY, 2021.

Espín-Sánchez, José-Antonio, Salvador Gil-Guirado, W. Daniel Giraldo-Páez, and Chris Vickers. "Labor Income Inequality in Pre-Industrial Mediterranean Spain: The City of Murcia in the 18th Century." *Explorations in Economic History* 73 (2019): 101274. doi: 10.1016/j.eeh.2019.05.002

Ferreira Flores, T. *L'industrialisation et l'Évolution de la Propriété Foncière et Immobilière. Le cas de l'Industrie Sidérurgique à Dudelange entre 1824–1905*. Mémoire scientifique, Université du Luxembourg, 2022.

Firpo, Sergio P., Nicole M. Fortin, and Thomas Lemieux. "Decomposing Wage Distributions Using Recentered Influence Function Regressions." *Econometrics* 6, no. 2 (2018): 28.

Goldthorpe, John H., and Michelle Jackson. "Intergenerational Class Mobility in Contemporary Britain: Political Concerns and Empirical Findings." *British Journal of Sociology* 58, no. 4 (2007): 525–46.

Hudemann-Simon, Calixte. *La Noblesse Luxembourgeoise Au XVIIIe Siècle*. Paris/Luxembourg: Publications De La Sorbonne et Section Historique De L'Institut Grand-Ducal De Luxembourg, 1985.

Kohn, Jean Charles. *Monographie De La Seigneurie De Dudelange Ou Mont-Saint-Jean*. Luxembourg: St. Paul Print, 1894.

Lindert, Peter H. "Unequal English Wealth since 1670." *Journal of Political Economy* 94, no. 6 (1986): 1127–62.

Moreau de Gerbehaye, Claude de. *L'abrogation des Privilèges Fiscaux et ses Antécédents: la Lente Maturation du Cadastre Therésien au Duché de Luxembourg (1684–1774)*. In *Collection Histoire* Série In-8°, no. 90. Brussels: Crédit Communal, 1994.

Morelli, Salvatore, Nolan Brian, Juan C. Palomino, and Philippe Van Kerm. "The Influence of Intergenerational Transfers on Wealth Inequality in Rich Countries: Size Matters." Unpublished Manuscript, January 2023.

Nicolini, Esteban A., and Fernando Ramos Palencia. "Comparing Income and Wealth Inequality in Preindustrial Economies: Lessons from 18th-Century Spain." EHES Working Paper No. 95, Stuttgart, Germany, March 2016.

Paccoud, Antoine. "The Top Tail of the Property Wealth Distribution and the Production of the Residential Environment." *International Journal of Housing Policy* 20, no. 1 (2020): 100–19.

Paccoud, Antoine, Valérie Feltgen, Konrad Skoczylas, and Karolina Zięba-Kulawik. *La D*étention du *Foncier Constructible pour l'Habitat au Luxembourg en 2020/2021: Distribution et Typologie de Propriétaires*. Note 29 de l'Observatoire de l'Habitat, LISER, 2021. Available at https://logement.public.lu/fr/publications/observatoire/note-29.html.

Paccoud, Antoine, Markus Hesse, Tom Becker, and Magdalena Górczyńska-Angiulli. "Land and the Housing Affordability Crisis: Landowner and Developer Strategies in Luxembourg's Facilitative Planning Context." *Housing Studies* 37, no. 10 (2022): 1782–99.

Padgett, John F. "Open Elite? Social Mobility, Marriage, and Family in Florence, 1282–1494." *Renaissance Quarterly* 63, no. 2 (2010): 357–411.

Pauly, Marc. *Chronique familiale de la ville de Dudelange depuis 1645*. Diddeleng: Gemeng, 2014.

Pfeffer, Fabian T., and Alexandra Killewald. "Generations of Advantage. Multigenerational Correlations in Family Wealth." *Social Force* 96, no. 4 (2018): 1411–42.

Pfister, Ulrich. "Economic Inequality in Germany, c. 1500–1800." In *Economic Inequality in Pre-Industrial Societies: Causes and Effect,* edited by Gampiero Nigro, 301–24. Florence: Firenze University Press, 2020.

Piketty, Thomas. *Capital in the Twenty-First Century*. Cambridge, MA: Belknap Press of Harvard University Press, 2014.

———. "Putting Distribution Back at the Center of Economics: Reflections on Capital in the Twenty-First Century." *Journal of Economic Perspectives* 29, no. 1 (2015): 67–88.

Pujadas-Mora, Joana Maria, and Gabriel Brea-Martínez. "The Increasing Influence of Siblings in Social Mobility. A Long-Term Historical View (Barcelona Area, 16th–19th Centuries)." *SocArXiv* 16 (2020): 1–34.

Rosdolsky, Roman. "The Distribution of the Agrarian Product in Feudalism." *Journal of Economic History* 11, no. 3 (1951): 247–65.

Santiago-Caballero, Carlos. "Social Mobility in Nineteenth Century Spain: Valencia, 1841–1870." Universidad Carlos III de Madrid, Instituto Figuerola, Working Paper No. 27620, Getafe, Spain, 2018.

Schaff, Felix S.F. "Warfare and Economic Inequality: Evidence from Preindustrial Germany (c. 1400–1800)." *Explorations in Economic History* 89 (2023): 101495.

Scheidel, Walter. *The Great Leveler: Violence and the History of Inequality from the Stone Age to the Twenty-First Century*. New Jersey: Princeton University Press, 2017.

Schifano, Sonia, and Antoine Paccoud. "The Distribution of Land in Luxembourg (1766–1872): Family-level Wealth Persistence in the Midst of Institutional Change." Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2023-12-22. https://doi.org/10.3886/E195987V1

Sutherland, D. M. G. "Peasants, Lords, and Leviathan: Winners and Losers from the Abolition of French Feudalism, 1780–1820." *Journal of Economic History* 62, no. 1 (2002): 1–24.

Thewes, Guy. "Le Cadastre de Marie-Thérèse au Duché de Luxembourg: Mythe et Historiographie." In *Hémecht. Actes des Deuxièmes Assises de l'Historiographie Luxembourgeoise*, edited by Sonja Kmec, 343–62. Luxembourg: St. Paul Print, 2008.

Trausch, Gilbert, ed. *Le Luxembourg sous l'Ancien Régime: (17e, 18e siècles et débuts du 19e siècle)*. In *Manuel d'Histoire Luxembourgeoise*, 3rd ed. Luxembourg: Ministère de l'Éducation nationale, 1993.

Van Leeuwen, Marco H.D., Ineke Maas, Danièle Rébaudo, and Jean-Pierre Pélissier. "Social Mobility in France 1720–1986: Effects of Wars, Revolution and Economic Change." *Journal of Social History* 49, no. 3 (2016): 585–616.

Venyige, Róbert. "The Road from Serfdom: Property Rights and the End of the Feudal Economic System." Ph.D. diss., University of Michigan, 2021.

Wealer, Robert. *Une Identité Paysagère du Luxembourg?* Ph.D. diss., Université Nancy 2, 2010.

Wegge, Simone A. "Inheritance Institutions and Landholding Inequality in Nineteenth-Century Germany: Village-Level Evidence from Hesse-Cassel." *Journal of Economic History* 80, no. 3 (2021): 909–42.