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Understanding the Distribution of Wealth at Death: A Probate Based Approach

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Abstract

In many countries with fragmented or absent tax data, the evidence on intergenerational wealth transmission and wealth distribution is limited. This paper considers the potential of probate records to fill this data void, relying on digitized court files from estate settlement proceedings (probates) in Vienna. In contrast to most other administrative wealth data sets, our probate data has no missing population due to minimum asset thresholds, as the Austrian courts create files for all deceased individuals. While the top 1% of completed probate cases account for 39% of wealth, almost half of the probate cases have zero or negative net wealth. We also shed light on the role of heirs in probate proceedings, revealing that a non-negligible minority (6%) of heirs do not accept their inheritance. The paper highlights the value of contemporary probate records for research. As we uncover substantial debt at the bottom of the distribution, the findings have implications for the mortality-multiplier method. In addition, we illustrate the important role of heir choices in shaping the probate process and the link between the distribution of bequests and inheritances.

Keywords— Bequests, Inheritance, Wealth Distribution, Probate Records, Administrative Date, Measurement
JEL Codes: D31, D64, J62, N34 D12, D31, E21, J62

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1 Introduction

In the context of continued research and public interest in the distribution of estates, inheritances, and wealth inequality, data originating in the processes of taxation has proven important. In countries where inheritances, wealth, or capital incomes are subject to taxation, tax data has facilitated the estimation of long-run trends (Kopczuk and Saez 2004; Piketty, Postel-Vinay, and Rosenthal 2006; Roine and Waldenström 2015; Lundberg and Waldenström 2018; Jakobsen et al. 2020; Iacono and Palagi 2023; Albers, Bartels, and Schularik 2022; Garbinti, Goupille-Lebret, and Piketty 2021; Acciari, Alvaredo, and Morelli 2024), and provides insights into the behavioral responses to the taxation of capital (Seim 2017; Alstadsæter et al. 2022; Brülhart et al. 2022; Iacono 2023; Garbinti, Goupille-Lebret, Muñoz, et al. 2023).

Several countries, including Austria, tax neither wealth nor intergenerational wealth transfers, such as inheritances, and lack (comprehensive enough) coverage of capital income in personal income tax statistics due to taxation at source.[1] In countries that do not have tax regimes relevant to research on wealth or that may not grant researchers access to tax data, survey evidence provides a critical alternative. However, most survey data is error-prone and covers only relatively recent years. In addition, surveys are often collected infrequently, and small sample sizes make subgroup analyses infeasible (for example, at the regional level).

This scenario posits the question: How can we capture the dynamics of the distribution of estates, inheritances, and wealth in the absence of relevant tax data, particularly when survey data is insufficient? The key approach developed in recent years centers around supplementing survey data with information on top-wealth as provided by journalistic evidence from rich-lists (Vermeulen 2018; Disslbacher et al. 2023; Baselgia and Martinez 2024). Our paper focuses on an alternative approach based on the registration of the legal transition of ownership rights, as in a probate process (Cummins 2021).

We consider three related questions. Firstly, the paper asks how probated wealth, that is wealth at death, is distributed along the entire distribution, not least at the bottom. Secondly, we are interested in the behavior of heirs in the probate process - to what extent are heirs willing to forego their inheritance or face higher procedural costs to minimize the risk of taking over the debt of a deceased individual? Finally, we are interested in how a sample of probate records can be used to draw inferences about the volume of bequests.

[1] In Austria, no inheritance tax is operative since 2008, while net wealth taxation was abolished in 1993. In addition, capital income is only partly reflected in individual tax returns. For example, the capital gains tax on domestic and foreign investment income drawn in Austria is implemented as a withholding tax, such that it is not visible in individual tax records.

Findings We demonstrate that Austrian probate records are a rich data source for the measurement of wealth at death. Based on our sample of completed probate records, we shed light on an average annual probate wealth volume in ten Viennese districts of about 0€.7 billion, and a highly skewed distribution of probate wealth. The estimates suggest that between 2014 and 2019, the top 1% of probate cases accounts for 39% of probate wealth. At the same time, half of the population leaves behind zero or negative probate wealth. While the mean probate wealth in the top 1% of the distribution amounts to approximately 4€.7 million, deceased individuals in the bottom 5% of the probate wealth distribution die with debts of approximately 2€27,000, on average. Our analysis of heirs suggests that more than one in twenty heirs do not accept their inheritance. Around 40% of heirs opt for a more expensive and complex procedure (conditional acceptance) to limit their liability to the assets that they inherit.

Probate records Our paper connects to the literature on inheritances from probate records. Probate data has been used across countries especially in recent years to generate long-run time series of wealth. A notable example is the UK probate data. Cummins (2021) offers a time series on probated wealth from 1892 to 1992, drawing on micro data from digitized records of the English Principal Probate Registry (PPR). The data covers a substantial share of the population, though supplementary data is necessary to account for the deceased who die with assets below the probate threshold (amounting to £5,000 in the 1990s). The PPR has several other limitations, such as the limited coverage of assets held in joint ownership, which is exempt from the probate. Apart from Cummins (2021), who studies the universe of probate records, some researchers rely on samples of probate records. Yet, sampling probate records for wealth research can be challenging (Lindert 1981). In the US, probate records were employed to study historical distributional outcomes (Jones and Bruchey 1977), and to test hypotheses on bequest behavior (Tomes 1981; Menchik and David 1983), for example. In Austria, historical probate records are also used to generate evidence on inequality from a historical perspective (Pammer 2013). In contrast, contemporary records have not received any scholarly attention.

Intergenerational transfers and wealth distribution Through collecting data on contemporary probate records in Austria, this paper is related to a large literature on the measurement of the distribution of both bequests and, by extension, wealth (Berman and Morelli 2021). For example, Alvaredo, Atkinson, and Morelli (2018) and Acciari, Alvaredo, and Morelli (2024) rely on data from inheritance tax statistics to study the distribution of inheritances and wealth among the living. Similar results for selected years when inheritance taxation was operative exists in Austria (Ertl 2024). An important limitation of these studies is that they focus on positive estates, while

the wealth of deceased individuals below a certain threshold is missing.[2] The paper also supplements survey-evidence on intergenerational transfers in Austria. The most recent Household Finance and Consumption Survey (HFCS) data suggests that approximately 40% of households in Austria have received an inheritance or gift (Fessler, Lindner, and Schürz 2023). The conditional mean of transfers received is 159,200 €. This is substantially more than the conditional median (49,900 €), pointing towards a skewed distribution.[3] Data from the Austrian HFCS can also be combined with demographic data to simulate inheritance flows (Humer 2016). Yet, a decisive disadvantage of the Austrian HFCS in contrast to most other wealth surveys is the absence of an oversampling strategy for affluent households. As a result, the effective oversampling rate of the top 5% in the Austrian data is -15% (Disslbacher et al. 2023).

Contributions This paper is innovative for several reasons. Firstly, we expand on other approaches that have used samples of probate records, by introducing a new sampling strategy. Our method is geared towards covering the top of the probate wealth distribution, and we show that our approach improves the coverage of affluent individuals. Secondly, our data establishes a link between probate cases and heirs. This allows us to shed light on important phenomena that are hard to study with most probate and tax data that usually feature in the literature. For example, the paper documents significant agency of heirs in the probate proceedings by revealing a non-trivial number of heirs who decline their inheritance.[4] Thirdly, the paper is the inaugural study of bequests in Austria utilizing contemporary probate records - providing for the first time current administrative wealth data in absence of inheritance taxation.[5] In addition to presenting results on the volume and distribution of probate wealth, we show that the volume of probate wealth in our study suggests a higher annual bequest flow than previous studies. Despite the narrow geographical focus, our data may be of interest to the broader realm of wealth research. As opposed to tax and probate data that is traditionally used to study the distribution of estates,

[2]For example, towards the end of the time series in their paper, Alvaredo, Atkinson, and Morelli (2018) find that about half of deaths are not covered by their tax data.

[3]Direct comparisons between the statistics reported in this paper and the HFCS results are complicated for several reasons. For example, while this paper documents wealth left by the deceased individuals (bequests), the HFCS considers heirs (the recipients). Another reason for limited comparability is that our data assumes an individual perspective, while the HFCS takes the household as a unit of measurement.

[4]We also study the distribution of probate wealth and the distribution of inheritances jointly in the Appendix (Elinder, Erixson, and Waldenström 2018; Erixson and Ohlsson 2019). Note that heirs in our paper may not live in the same place as the deceased, such that the distribution of inheritances that we obtain does not necessarily refer to the ten Viennese districts that we study.

[5]We provide novel estimates of the relationship between administrative property values and market values. This is vital for the estimation of bequests and their distribution, as administrative values bear little resemblance to market values. We show that the ratio of market values over administrative values corresponds approximately to 18.5, which is significantly more than the ratio of 2 to 10 that previous studies find. Since some real estate property in the probate records is valued administratively, we correct these values.

and by extension the distribution of wealth among the living, our data benefits from the fact that Austrian probate courts generate a file for every deceased individual, regardless of any asset thresholds. Therefore, we can study probate wealth of individuals regardless of their level of net wealth at death, including cases with highly negative wealth. We show that negative probate cases have a significant impact on distributional statistics of net wealth at death. The importance of negative probate wealth has important implications for the estate multiplier method, for example, that is usually applied to truncated data (at zero or some other minimum asset threshold).

Policy implications The insights in this paper are highly policy relevant. On the one hand, we provide new evidence on the volume and distribution of bequests. In principle, this information is vital for tax policy, as it allows computing the revenue potential and equity implications of different inheritance tax models.[6] As our data only refers to a small subsample of the Austrian population, our estimates do not directly lend themselves to revenue calculations. However, they provide indicative evidence, that should be interpreted together with evidence from other sources. At the same time, we show that the probate process collects extensive data on the deceased population's wealth. This implies that the administrative burden associated with the re-introduction of inheritance taxation is relatively small, as estates have to be valued even in the absence of taxation. Submitting the estimated value of the estate generated in the probate process to the tax authority is unlikely to result in a substantial additional administrative burden. Finally, our estimates of the relationship between administrative values and market values that we use to adjust undervalued property wealth to current prices are informative to revenue simulations for a land tax reform, which is currently based on administrative values. Our estimates may improve tax revenue projections that would materialize if administrative values are updated.

Roadmap The remainder of the paper is organized as follows. Section 2 outlines the institutional background of the Austrian probate process. Subsequently, Section 3 describes our sample, oversampling strategy and weighting approach, before defining probate wealth and discussing the components of household assets and liabilities included in this concept. Section 4 reports our estimates of the volume and distribution of probate wealth in 10 Viennese districts (Subsection 4.1). Our results on volume and distribution cover participation in different asset classes, as

[6] In addition to data on the volume and distribution of bequests in absence of taxation, an estimate of the potential tax revenue may also take behavioral responses into account. A large literature deals with the effects of inheritances on labor supply and consumption decisions (Nekoei and Seim 2023; Druedahl and Martinello 2022; Kindermann, Mayr, and Sachs 2020; Bø, Halvorsen, and Thoresen 2019; Doorley and Pestel 2020).

well as horizontal and vertical inequality. In addition, we supplement the focus on the deceased that is prevalent throughout the paper with an analysis of heirs and their behavior in Subsection 4.2. Subsection 4.3 triangulates our findings with other evidence on the volume of bequests in Austria. Section 5 concludes.

2 Institutional background

Even though there is no taxation of bequests in Austria, rich administrative data on bequests exists. The availability of this data is due to the legal procedure that is necessary to administer the transfer of a deceased person's estate to the heirs. This procedure is called probate proceeding. By contrast to other countries, by Austrian law a probate proceeding is initiated for every death, irrespective of the level or composition of assets held by the deceased. Since every probate proceeding is documented and a record is created by district courts and notaries, a rich data source on estates and heirs is created as a side product of the probate proceedings.

The administration of estates in Austria is largely regulated by the Non-contentious Proceedings Act (*AuSSerstreitgesetz AuSSStrG*) and the General Civil Code (*Allgemeines bürgerliches Gesetzbuch - ABGB*). Schilchegger and Kieber (2015), Oswald (2016), and Verweijen (2021), among others, provide in-depth discussions of the probate process.

The process of estate settlement in Austria entails that upon the death of a person, a death certificate is issued by a registry office. The registry office then forwards this death certificate to the district court in charge. The assignment of the district court is based on the jurisdiction of the deceased person's last place of residence.[7] In a next step, the district court assigns the case to a notary office in the district. After the notary has contacted the relatives, a death record is created (*Todesfallaufnahme*). This step entails checking for any testamentary dispositions in the Central Testament Register or the Testament Register of Austrian Lawyers. The creation of the death record implies the collection of personal and financial information of the deceased person. Before it is possible to determine further procedural steps, a decision on the applicable jurisdiction is required. At this point, the Austrian courts may decide that they are not responsible, or that domestic (movable) assets have to be surrendered to heirs in a foreign jurisdiction.

[7] More specifically, each death case is allocated to a district court based on the deceased individual's general legal venue (*allgemeiner Gerichtsstand in Streitsachen*), which corresponds to their place of residence or habitual residence. The general legal venue is defined in the *Jurisdiktsnorm*, the law that governs the responsibility of civil courts in Austria. In principle, the legal venue is defined by an individual's durable relationship to a specific place, the amount of time an individual spends there, and the individual's other personal circumstances. In many cases, the deceased individual's main residence is in the jurisdiction of the relevant district court.

If the Austrian jurisdiction is responsible, the subsequent stage of the process depends on the information gathered through the death record's preliminary screening of the deceased individual's wealth. If liabilities exceed assets or if assets are relatively low according to the preliminary screening, there is no full probate proceeding (end of the probate proceedings without a hearing). If there are assets to be distributed, potential heirs must then either accept or decline the inheritance. The former means that the heirs choose between a conditional or unconditional declaration of inheritance acceptance. Declining results in exclusion from inheritance. Against this backdrop, most court files document a process that falls into one of four main categories (1 as well as 2.a -2.c):

1. Termination of the probate proceeding without a hearing: If the estate is over-indebted or valued at less than 5,000 € (4,000 € before 2015), the procedure can be terminated early. This happens in certain cases where no further provisions ought to be made, such as an entry in the property register. If there is an early termination of the probate process, the parties can submit claims to any assets that may be left. Creditors can receive a transfer in lieu of payments to cover (part of) their claims. In particular, the costs of the probate administration as well as the funeral are senior claims, such that they are satisfied first. More complex cases may involve a bankruptcy proceeding.

2. Full probate proceeding: If positive net wealth remains after the deduction of all costs, including the funeral, then the heirs can choose between three options:

   (a) Negative declaration of acceptance of the inheritance: A heir may choose to decline the inheritance. The shares of other heirs are altered by the renunciation of any given heir.

   (b) Unconditional declaration of acceptance of the inheritance: Together with the notary, the heirs prepare a statement of assets and liabilities. This is a declaration on oath about the assets and liabilities of the deceased person. False statements by the heirs are subject to legal consequences. If the liabilities turn out to exceed the assets of the estate after an unconditional acceptance,[8] unconditional heirs are liable with all their personal assets. While the decision to accept an inheritance unconditionally can be risky due to the unlimited liability, the advantages of an unconditional acceptance are the simplicity and the lower cost of the process. In practice, unconditional declarations of inheritance are often requested by heirs who had a close relationship with

[8] This situation can materialize if certain liabilities were unknown at the time of the probate proceeding, for example.

the deceased person and who consider the risk of unknown liabilities to be relatively low.

(c) Conditional declaration of inheritance acceptance: In contrast to the unconditional declaration of inheritance acceptance, heirs do not make a statement of assets and liabilities if they accept an inheritance conditionally. Instead, the notary compiles an inventory, which may also involve the valuation of certain assets (such as real estate and valuables) by a certified expert. This option relieves the heirs of the risk of personal liability with their entire personal wealth. The liability is limited to the assets that a heir receives as their inheritance. The creation of the inventory is usually more expensive and time-consuming. Unlike the unconditional declaration of inheritance acceptance, heirs require less knowledge about the financial situation of the deceased person.

While it is possible that some heirs decline their inheritance and others accept, heirs usually decide jointly on the unconditional vis-à-vis conditional acceptance. In some cases, it is possible that all entitled heirs do not accept their inheritance or that heirs are unknown. In this case, the notary must search for entitled heirs. This can be a long process. It may involve the use of professional services specialized in finding heirs. If there are no accepting heirs, the Federal Republic of Austria becomes the beneficiary of the inheritance (*heimfällig*). At the end of a procedure, when assets are transferred to heirs, the notary issues a decree of inheritance, which stipulates the shares of each heir. The determination of inheritance shares is based on Austrian inheritance law, taking into account existing wills. At the end of the procedure, changes can be made to the land register, commercial register, or other registers.

Depending on the procedure, different types of documents feature in the archived files. Data is most limited in cases where the Austrian jurisdiction is not responsible. Moreover, information on cases where assets are surrendered to heirs in a foreign country without a domestic probate procedure is relatively sparse. In all other cases, there is at least a death record form, that provides basic demographic data and a preliminary assessment of a deceased individual's wealth. In cases with early termination, we supplement data from the death recording form with information from the final decision, as well as bills and other documentation on assets and liabilities that feature in the file. In the other cases, we draw on the decree of inheritance, as well as inventories and the assets declarations that unconditionally accepting heirs provide.

3 Data Source

Due to the great number of probate proceeding files in the district courts (corresponding to the number of deceased individuals) and the complex nature of each file, it is necessary to draw a sample from the universe of Austrian probate records archived in the districts that are of interest to this paper.[9] We describe the sampling in Subsection 3.1. Working through each individual sampled file and extracting the necessary information from the documents mentioned in Section 2, it is possible to compute a measure of probate wealth (Subsection 3.2).

3.1 Sample

The sample period focuses on probate records from the years 2014 to 2019 (inclusive). Therefore, we exploit the possibility to generate data for a time period after the abolition of inheritance taxation in Austria. While it would be interesting to study more recently deceased individuals, it is worth noting that proceedings are more likely to be still ongoing the shorter the time interval between data collection and timing of death. The files of ongoing probate proceedings are kept at the notary offices, rather than in the archives of the district courts. As our study cannot draw strong conclusions regarding such cases, we focus on completed probate proceedings in a time window that trades off the number of completed cases and the timeliness of the data.

The study is based on two samples of probate records. Subsample 1 builds on the sampling of cases by the Federal Computing Centre (BRZ) from different court locations. It includes the district courts of Innere Stadt, Döbling, and Donaustadt. For this subsample, file IDs were drawn from the list of all probate proceedings using a stratified random sampling method. Subsample 2 includes the district court of Meidling. This sample was drawn purely at random.

The selection of district courts is designed to cover as much of the city area as possible with the fewest number of involved district courts. The district court Innere Stadt is not only responsible for the first district (1) but also for the districts of LandstraSSe (3), Wieden (4), Margarethen (5), Mariahilf (6), and Simmering (11). The Döbling district court archives cases from Währing (18) and Döbling (19). The district courts of Donaustadt (22) and Meidling (12) are each responsible for only one district. Thus, the sample covers 10 out of 23 Viennese districts.[10]

[9] Each probate case file is physically archived in a district court. We screen each file for the relevant documents in a first step and enter the data manually into a database using a database tool. In some cases, a third step is necessary to supplement information from the key documents with contextual data that may be documented anywhere in the file. We set out the detailed procedure in the Appendix.

[10] In addition to the practical dimension of this selection, an analysis of aggregated HFCS data suggests that the selected districts cover both affluent and less affluent parts of the city area.

Subsample 1 covers approximately 14% of the total volume of completed probate records within a year in each district. There is an oversampling of cases with high probate wealth.[11] To that end, the stratification of the selection within the court districts aims to draw particularly complex proceedings with a higher probability. This approach is based on the assumption that complex proceedings with more procedural steps are also associated with higher estate values.[12] Crucially, the number of procedural steps is a correlate of the duration of a probate case. However, a probate case with a long time interval between death and the date of the final decision does not necessarily have many procedural steps. Against this backdrop, $\rho = 0.05 = 5\%$ of the cases in Subsample 1 represent in each district the probate cases with the most procedural steps. The other cases are drawn randomly from the total population in each year.

In retrospect, it is possible to test whether the oversampling of complex proceedings improves the representation of extreme wealth values. Table 1 shows that the stratification succeeds in improving the representation of estates with high probate wealth. It contains the coefficients of two regression models. In each model, the value of the estate is explained by an indicator variable, which assumes unity in cases that have entered the sample through oversampling. It is evident that the average probate wealth among the complex cases is more than 1 € million higher than the average wealth of the other cases. The two models differ in that the second model includes the postal code of the last place of residence as a control variable. However, qualitatively, the results are the same in both models.

Subsample 2 is based on a less complex sampling procedure. It consists of approximately 50 records from each year within the observation period at the Meidling district court. The draws are random.[13] In contrast to Subsample 1, this may result in slightly less comprehensive coverage of sizable estates. The sample collection period is June 2021. The administration of the sampling process is the reason for a different sampling design in Subsample 2. The share of the Meidling population that is covered by Subsample 2 is somewhat smaller than the share of the population in the other nine districts that Subsample 1 covers. Therefore, both subsamples together result in a total sample of 13% of completed probate cases.

[11] The oversampling is designed to ensure that the extremes of the wealth distribution are well represented. In a purely random sample, extreme cases are often not represented because only a few individuals possess particularly high wealth and therefore are rarely randomly selected. From the perspective of wealth research, this approach is analogous to oversampling attempts in survey settings, where wealthy households are more likely to be represented in the sample. To obtain a representative sample in the results, the over-sampled cases must be included in the calculations with appropriate weights, thus adjusting their proportion to the actual proportion in the population.

[12] Many procedural steps are common if there are legal disputes over certain assets, for example.

[13] Instead of stratifying the sample and drawing cases with many procedural steps by design, we take every tenth completed file in each year from different units of the district court. This does not unduly affect the coverage of deaths in later calendar months.

Table 1: Oversampling and mean probate wealth

	Naive	With controls
(Intercept)	88484.93***	0.00
	22496.99	1669385.42
Oversampled case	1149804.82***	1103056.15***
	127083.31	127999.79
Num. Obs.	5849	5849
R^2	0.014	0.019
R^2 Adj.	0.013	0.013

+ $p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

As the selection of probate records within the districts is a sample, each record $x_{n,i,o}$ that is the n-th observation in the i-th district that may be in the set of over-sampled observations O must be weighted by a weight $\omega_{i,o}$. Thus, the sample can reflect the total number N_i of proceedings in each of the ten districts that we consider. In a pure random selection, it is sufficient to weight each observation by the inverse sampling probability, corresponding to the sample size N_i/S_i, where S_i is the sample size in each district. However, the weights of all files added to the sample through oversampling must equal unity. As a result, the higher sampling probability is balanced out. We obtain weights that vary slightly by district i, and between cases in the set O that were drawn by oversampling. We proxy the total number of cases in each district and year by 2016 values, where we have complete data on each district. Sampling weights are given by:

$$\omega_{i,o} = \begin{cases} 1 & \text{if } x_{n,i,o} \in O \\ \frac{N_i - \rho \cdot S_i}{(1-\rho) \cdot S_i} & \text{if } x_{n,i,o} \notin O \end{cases} \tag{1}$$

In the Appendix, we provide an overview of the total sample and population estimate of complete cases in each district by year. As the total sample includes probate proceedings where Austrian courts are not responsible, we restrict the sample to the target population by removing such cases, as they usually contain very limited data.

Table 2 provides a set of summary statistics on the target population in the ten districts that this paper considers. Among the probate cases across all years, there is a slight majority of women. Approximately 53% of the weighted sample are women, and around 47% are men. The average age at death varies significantly between genders. A woman lives 81 years on average, while the average male individual dies at an age of 73 years. For both genders combined, the average age at death is 77 years. As far as nationality is concerned, there are approximately 35,000 individuals

Table 2: Socio-demographics of the deceased

Description	Number	Share
N women	20183	52.96
N men	17923	47.03
Average age	77	N. Def
Average age women	81	N. Def
Average age men	73	N. Def
N Austrian citizenship	34888	91.55
N other citizenship	3219	8.45

[a] Note: The table displays various weighted characteristics based on both absolute and relative numbers. Percentage shares with respect to age indicators are not defined (N. Def). The data covers probate records between 2014 and 2019.

[b] Source: Own calculations and data with district weights.

who are Austrian citizens, accounting for 91.55% of the total.

The rich probate data allows us to connect each probate case to a set of heirs. While we have much less information on heirs than on deceased individuals, our data allows us to identify the gender of heirs. In addition, we can observe their choices on the type of probate proceeding. Finally, we can track how probate wealth is split between heirs.

3.2 Probate wealth definition

This study aims to comprehensively document the wealth of deceased individuals as recorded in probate records. At the center of interest is a concept of probate wealth, where positive assets are aggregated and netted out with liabilities. The probate records focus on wealth at the disposition of a deceased individual as of the moment of death, such that claims to future defined benefit pensions and human capital do not feature in the concept of probate wealth. It is worth noting that our measure refers to individual wealth holdings. If the deceased individual co-owned assets with other people, the share owned by the deceased is included in the probate wealth. In many cases, spouses share bank accounts or own properties jointly. Overall, the concept of probate wealth in this study is broadly consistent with the concept of the net estate in probate proceedings (*Reiner Nachlass*), which includes all assets minus debt and death-related expenses (funeral costs, for example). However, there are some notable differences between the legal concept of the net estate in probate proceedings and the notion of probate wealth that underlies

the results in this paper. We deviate from the net estate in the probate proceedings regarding the inclusion of specific asset classes that we discuss below where measurement is problematic.

Assets In the probate proceedings, probate wealth generally includes most assets of deceased individuals. We collect data on the number and value of vehicles as well as real estate properties. In addition, the data features information about other real assets. This category comprises of valuables, such as paintings, furniture or coin collections, for example. While some assets of this type have a well-defined value, the value of others is less obvious. If the notary offices compile an inventory, experts commissioned by the notary offices provide an estimate of the market price of valuables. In cases where heirs declare the value of the estate, they would estimate the market value themselves. Even though individuals in our data tend to be retired, there is a small minority who hold wealth in non-traded self-employed businesses. The value of this asset class is usually equal to the deceased individual's business share. Businesses are commonly valued at some notion of the market value, though there is a broad range of valuation approaches (including different valuations for voting and non-voting shares, for example). Regarding financial wealth, our database tool aggregates investments held in bonds, publicly traded shares, investment funds and managed accounts into one category (other financial investments).

Furthermore, we collect data on life insurances but exclude them from our concept of probate wealth. This type of insurance is not always fully recorded in the probate process, since life insurances that have a specific named beneficiary are excluded from the probate proceedings.[14] Furthermore, we record funeral insurance policies. As funeral expenses are fully considered on the liabilities side, we fully consider these burial insurance policies on the asset side for consistency. [15]

In addition burial insurances, we record other insurances, building society contracts, bank passbooks and bank accounts (the sum of sight accounts and savings accounts) in separate categories respectively. In addition, our approach records cash holdings. Lastly, there is a category of other assets that do not fall into any of the previous categories. This predominantly includes claims against other individuals or organizations.

Valuation of Real Estate By default, under inheritance law, real estate (including land and buildings) is assessed using the three-fold unit value method (*Dreifacher Einheitswert*). However,

[14]The sample features 240 estates with life insurance policies that are not part of the estate. These can only be partially quantified. On average, they amount to around 3 €0,000.

[15]Most records feature information on funeral insurance policies, such that it is possible to consistently include them in our probate wealth concept. Their value is usually offset against the funeral expenses.

in instances involving at least one conditional succession declaration, market values are provided by court-appointed reviewers. This availability of both, the unit value and the market value, typically also occurs in cases involving disputes between the heirs concerning the estate's division. For other cases, only the unit values are used and part of the probate files. The unit value for real estate, derived through a complex and opaque algorithm by the Austrian Ministry of Finance, is based on data generated in 1973, and last updated in 1983. Since 2001, due to the growing discrepancy between market and unit values, the legal standard has been to apply the three-fold unit value for assessments. In general, no recent (post 1988) data on the relationship between unit and market values is available. To standardize real estate valuation across our dataset, we estimate the correlation between market and unit values.[16] Figure 1 illustrates this relationship. It plots the log of the market value against the log of the three-fold unit value. We then adjust unit values to market values using these estimates. Overall, we adjust prices of property valued initially at the administrative value with a factor of around 1:18.5.

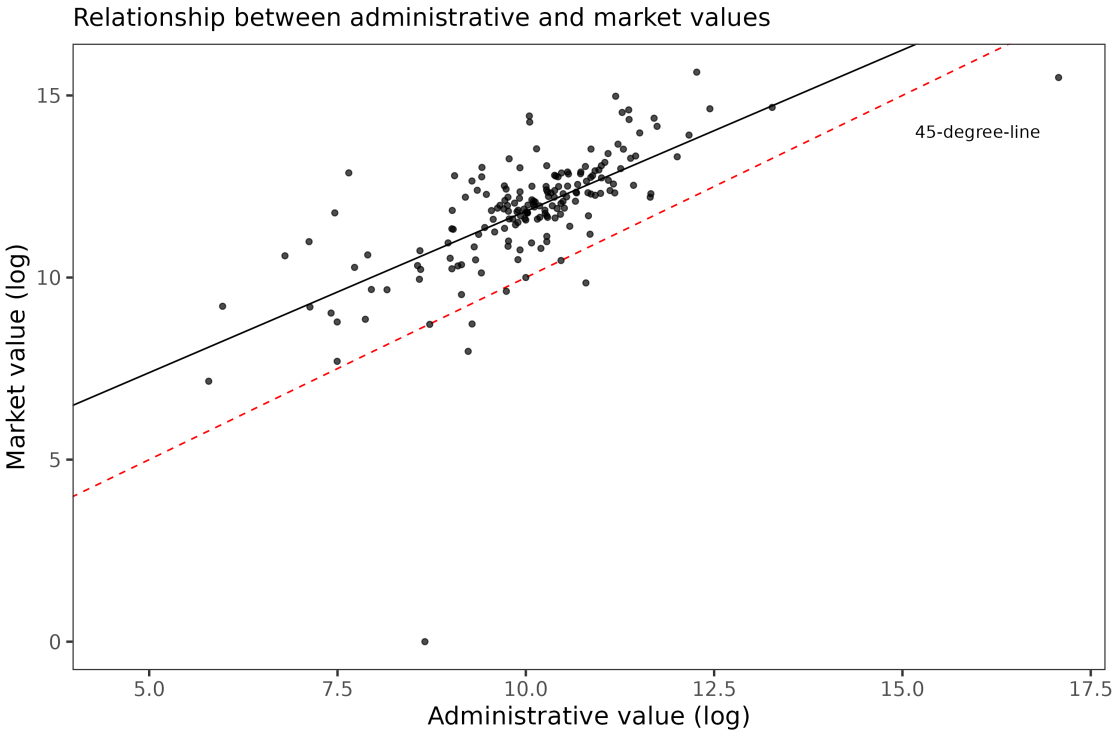
Treatment of Inter-Vivos Gifts Gifts can be deducted from the share of the net estate allocated to the heir who received the gift, upon any other heir requesting the consideration of the gift. The deceased individual can deny heirs the right to consider gifts in the probate proceedings,[17] as long as forced shares remain unaffected. Gifts made to individuals who do not have a claim to any forced shares are to be considered in the probate proceedings only if they are made at most two years before death. Moreover, regular transfers out of the income of the deceased person (for example ordinary birthday gifts), do not count as gifts in the probate proceedings. Therefore, we do not consider gifts in our measure of probate wealth. However, we discuss the role of gifts in Section 4.3 against the background of our estimates of bequest flows, supplementing our data with aggregates from the Austrian Ministry of Finance Gifts Registry.

Liabilities Debt in the probate proceedings refers to the outstanding claims against the deceased person. We consider negative bank accounts and bank loans, death-related costs, debt generated by the public asset recovery process to cover care costs and other liabilities (owed to natural and legal persons). However, we do not account for all liabilities in the subsequent calculations. While funeral expenses are documented as liabilities, court and notary

[16] In the Appendix, we report the regression results for several models. The table compares naive specifications without control variables and models where we estimate the relationship between threefold unit-value and market values conditional on observable property characteristics. Control variables include property size, location, and construction year using the sample of real estate cases (a probate case can include multiple real estate units). The naive model performs well in predicting market values based on the three-fold unit value and rests on the largest number of observations to estimate the model coefficients. Therefore, we use the coefficients from the naive model in all further computations.

[17] This could be achieved by writing a will, for example.

Figure 1: Property values: correcting administrative values



[a] Note: The figure illustrates the relationship of real estate market values and the three-fold unit values. The log three-fold unit value is plotted on the x-axis, while the corresponding log market value of the property is on the y-axis. The dashed red line represents a 45-degree line. The solid line represents a simple OLS fit.

[b] Source: Own calculations based on real estate in probate cases in the years 2014-2019.

fees, as well as any costs incurred for estate trustees, do not factor into the probate wealth concept in this study. We also exclude the cost of valuation reports, following from property value appraisals, for example. While liabilities are well documented in the probate files overall, especially in inventories and asset statements, they are sometimes challenging to ascertain. This is the case in estates with minimal assets and clear insolvency, where a complete listing of claims may not necessarily be available. In such cases, only information from invoices attached to the case file and documented claims could be utilized. Generally, liabilities are only included in the estate settlement process if their determination does not significantly delay the proceedings. This occurs, for example, when a claim is contested through legal means.

Overall, the Austrian probate data set differs from probate records in other countries not only due to its broad coverage due to the absence of asset thresholds, but also its coverage of some components of individual balance sheets. For example, the inclusion of jointly held property in the probate wealth concept is an important difference to the English PPR. Moreover, in contrast to the data from the PPR, it is possible to extract data on portfolios and specific wealth components from our dataset, such as housing wealth. The omission of inter-vivos gifts that we discuss in Subsection 4.3 is common though not universal in probate data. It is also a characteristic of the PPR. In the US, some probate data sources also omit inter-vivos gifts (Tomes 1981), whereas others include them if they "appeared in the probate records" (Menchik and David 1983, p. 679). Finally, the focus on wealth that is at the disposition of the deceased at death is also common in other probate records, such as the PPR.

4 Results

We first present our main results on the volume, composition and distribution of probate wealth from the perspective of the deceased population in Subsection 4.1, taking each probate case as one weighted unit of observation. The findings on distributional outcomes refer to both vertical inequality and the horizontal distribution between men and women. Subsequently, the analysis focuses on the probate process from the perspective of heirs in Subsection 4.2. We consider the (weighted) distribution of heirs across probate cases, study their demographic characteristics and choices made in the probate proceedings.

Table 3: Bequest volume by year

Year	Volume
2014	0.736 Bn.
2015	0.660 Bn.
2016	0.391 Bn.
2017	0.907 Bn.
2018	0.765 Bn.
2019	0.715 Bn.

[a] Note: The table illustrates the total probate wealth in billions of euros for all years of the sample.
[b] Source: Own calculations and data with district weights.

4.1 Volume and distribution of bequests

Based on our probate data, it is possible to arrive at a measure for the total volume of probate wealth across districts for each year. The results of this exercise are reported in Table 3. There is no apparent time trend over the period that the data covers. On the contrary, significant variation across the individual years prevails. The aggregate probate wealth volume ranges from a minimum of 0€.4 billion in 2016 to a maximum of 0€.9 billion in 2017. The mean value across years is 0€.7 billion.

The aggregates in Table 3 can be decomposed into different classes of assets and liabilities. Table 4 reports the number and share of estates that include certain components of net wealth. Regarding real assets, 7,295 estates include property wealth, corresponding to around 19% of estates. Only around 16% of individuals in the probate records own vehicles,and a small minority owns self-employed business wealth (1%). Approximately one in five probate cases include valuables, which is somewhat below the number of estates with cash being transferred. Regarding financial assets, building society contracts and bank passbooks are the most common types, with more than 17% of the target population participating in the former, and 30% in the latter. A large majority of 85% have a bank account. Approximately 15% of individuals have an insurance to cover their funeral expenses, while more than 16% hold other types of insurances (excluding life insurance). 17% of probate cases contain assets that fall into the residual category of financial investments. Only approximately one in ten individuals passes away with bank debt in the target population.

The Pen's Parade in Figure 2 illustrates the distribution of probate wealth. The x-axis shows the estate wealth percentiles of the target population of this study, and the y-axis shows the mean

Table 4: Participation rates in asset types

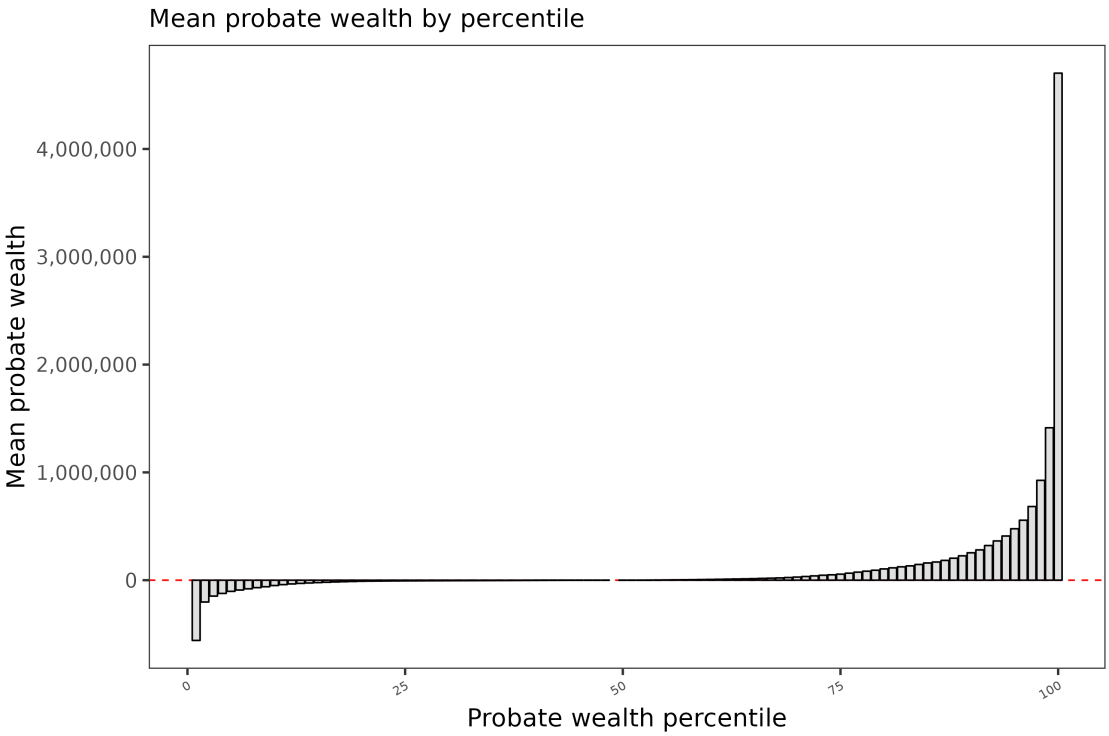
Component	N individuals	Participation rate
Real estate	7295	19.14
Vehicle	5958	15.64
Business wealth	545	1.43
Valuables	8003	21.00
Cash	8905	23.37
Building society contract	6600	17.32
Bank passbook	11297	29.65
Bank account	32291	84.74
Funeral insurance	5525	14.50
Other insurance	6177	16.21
Other financial investments	6549	17.19
Bank debt	3761	9.87

[a] Note: The table provides the participation in various types of assets. The first column refers to the weighted number of deceased individuals owning each respective asset type (each row). The second column shows the proportion of estates featuring a specific asset component out of all probate cases between 2014 and 2019.
[b] Source: Own calculations and data with district weights.

per percentile of estate wealth. The graph illustrates that probate wealth between the 20^{th} and 70^{th} percentiles is close to zero. This means that approximately 50% of all completed probate cases contain very little wealth or even debt of a few thousand euros net of funeral expenses. The distribution looks markedly different at the tails. At the bottom end of the distribution, individuals die with substantial amounts of debt. The difference between assets and liabilities ranges from approximately 558,912 € debt on average in the first percentile to precisely 0 € at the median of the probate wealth distribution. From the 7^{th} decile onwards, the weighted mean probate wealth increases. The Pen's Parade becomes much steeper from the 85^{th} percentile onwards, and is almost vertical across the top percentiles of the distribution. Mean probate wealth rises from approximately 1,018,240 € in the 10^{th} decile to a mean estate of around 4,703,271 € in the top percentile. Dispersion in estate wealth increases even further at the very top of the distribution. The top 0.5% own an average estate of slightly more than 7 € million, and the richest 0.1% around 14,573,400 €. Therefore, the dispersion of the probate wealth distribution is mainly driven by the relationship between the top deciles and the share of the lower half of the distribution.

Turning to inequality indicators, Table 5 reports the Gini index of probate wealth by year. The first column refers to the Gini indices for the entire target population, whereas the second is computed on a subsample excluding negative estates. The scale of the coefficient typically ranges from 0 to 1. Under certain circumstances, however, the Gini coefficient can also take negative values or

Figure 2: Pen's parade of probate wealth



[a] Note: The Figure shows the Pen's Parade of estate values. The x-axis represents the percentiles of estate assets. The y-axis depicts the weighted average estate per percentile in .€

[b] Source: Own calculations based on probate records in the years 2014-2019.

Table 5: Bequest Gini index by year

Year	Gini Index all estates	Gini Index non-negative estates
2014	1.194	0.765
2015	1.232	0.779
2016	1.500	0.711
2017	1.210	0.810
2018	1.062	0.811
2019	1.026	0.796

[a] Note: The table illustrates the gini index for probate wealth for all years of the sample.
[b] Source: Own calculations and data with district weights.

values greater than 1 (Chakravarty 1988). This occurs particularly if the proportion of estates where liabilities exceed assets is high. The latter is the case in the distribution of probate wealth in Vienna, as the first column illustrates. The Gini indices for individual years range between 1.026 in 2019 and 1.5 in 2016 for all completed probate cases. As Figure 2 suggests, the high levels of debt at the bottom of the distribution and the substantial estates at the top lead to these exceptionally high Gini indices. The Gini coefficients for individual years vary significantly. The variance derives from the sensitivity of the Gini index to observations with particularly high levels of probate wealth. These probate cases are not statistical outliers, but rather reflect the high level of inequality of probate wealth.

Once negative values for probate wealth are removed, the Gini indices range at more moderate levels between 0.71 and 0.81. Two observations stand out. Firstly, the years with minimum and maximum inequality do not coincide between the first and the second column. While inequality is the highest in the first column in the year 2016, it is lowest in that year in the second column (0.71). The year with the highest inequality in terms of non-negative probate wealth Gini indices is 2018, where the index corresponds to 0.81. Secondly, the variability of the index over time is lower in the second column than it is in the first. The difference between the maximum and the minimum in the first column is 0.47, whereas it amounts to 0.1 in the second column.

Next, Table 6 reports indicators of probate wealth concentration. Observations are pooled across years. We focus on the share of the top 1% percent of the distribution, along with the top 5%, and top 10%. Finally, Table 6 supplements indicators of concentration at the top with the share of probate wealth in the least affluent 50% of cases. The top 1% with the highest probate wealth in the distribution bequeathed approximately 39% of the total probate wealth between 2014 and 2019 in the 10 Vienna districts that we study. The wealthiest 5% left their heirs approximately 72% of total probate wealth. The most affluent 10% account for around 90% of total probate

Table 6: Concentration measures

Indicator	Value
Top 1%	38.80
Top 5%	72.15
Top 10%	90.33
Bottom 50 %	-16.57

[a] Note: The table illustrates the shares of individuals at different parts of the probate wealth distribution across all years of the sample.
[b] Source: Own calculations and data with district weights.

Table 7: Probate wealth by gender

Gender	N	Mean	Median	Gini	Aggregate
Male	17,923	124,180.25	1,196.63	1.16	2.226 Mio.
Female	20,183	96,490.18	0.00	1.21	1.947 Mio.

[a] Note: The table reports probate wealth separately for men and women by pooling observations across 2014-2019.
[b] Source: Own calculations and data with district weights.

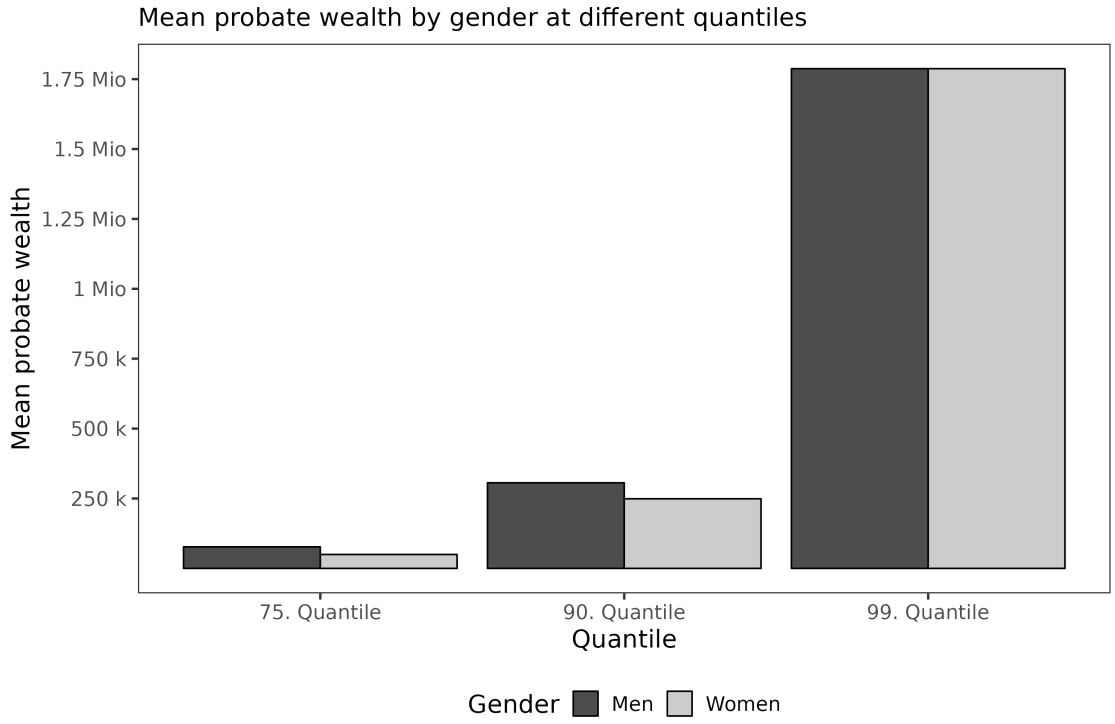
wealth. Conversely, the share of the bottom half of estates is -16.57%. The negative share of the bottom 50% is consistent with the findings regarding the Gini coefficients above unity. From the median value of probate wealth at 0, it follows that every deceased individual in the poorer half of the probate wealth distribution dies with zero or negative probate wealth.

The probate data offers several ways to consider horizontal inequality between different demographic groups. For example, we can compute gender probate wealth gaps at the individual level. Table 7 disaggregates summary statistics on probate wealth and its distribution by gender, by pooling data across all years. Both the mean and the median probate wealth is higher among men. The gender probate wealth gap is higher in terms of the mean than in terms of the median. On average, men leave probate wealth of 124,180.25€. For women, this number is 96,490€. The difference between the means is the probate wealth gap. The median for men is 1,197€, while it corresponds to zero for women. Table 7 also reports Gini indices computed within each group across years. The Gini coefficient calculated from the distribution of probate wealth among women (1.21) is 0.05 higher than for men (1.16). The aggregate probate wealth across years is 2€.226 million for men and 1€.947 million for women.

Figure 3 also provides evidence on the horizontal distribution of probate wealth between men and women. It reports the gap in mean wealth between men and women at different quantiles of

the distribution of probate wealth across all years from 2014 to 2019. We focus on the upper half of the distribution where probate wealth is positive (75^{th} percentile, 90^{th} percentile, and the 99^{th} percentile). The y-axis illustrates the weighted value of net probate wealth. The results suggest that men die with more wealth than women primarily in the group of people with positive but moderate levels of probate wealth: In the 75^{th} percentile, men leave 77,151.07 €, and women leave 49,829.19 € to potential heirs. In the 90^{th} percentile, probate wealth amounts to 306,165.10 € for men and 249,011.85 € for women. At the top of the distribution (the 99^{th} percentile in Figure 3), both men and women have probate wealth of around 1 €.8 million.

Figure 3: Gender probate wealth gap at different quantiles



[a] Note: The Figure shows the average probate wealth sum for men and women at the 75^{th}, 90^{th}, and 99^{th} percentiles. The difference between mean wealth of men and women is the gender probate wealth gap at different quantiles. The different quantiles are on the x-axis, while the y-axis refers to the average probate wealth. The y-axis refers to values in .€

[b] Source: Own calculations based on probate records in the years 2014-2019.

4.2 Heirs in the probate proceedings

Even though our probate data mainly sheds light on the characteristics of the deceased individuals, it is possible to study the choices that heirs make in the probate process and to examine the distribution of male and female heirs across probate cases. Table 8 provides evidence on

Table 8: Heirs by declaration type

Procedure type	N	Share
In lieu of payment	21,381	36.97%
Unconditional	19,075	32.99%
Conditional	14,623	25.29%
Negative	2,232	3.86%
Other	420	0.73%
Legate	96	0.17%
Sum	57,827	100.00%

[a] Note: The table shows the number and share of inheritance declarations by procedure type for all persons who received a transfer from a probate case. The data are derived from the documentation of estate files from the period 2014-2019.
[b] Source: Own calculations and data with district weights.

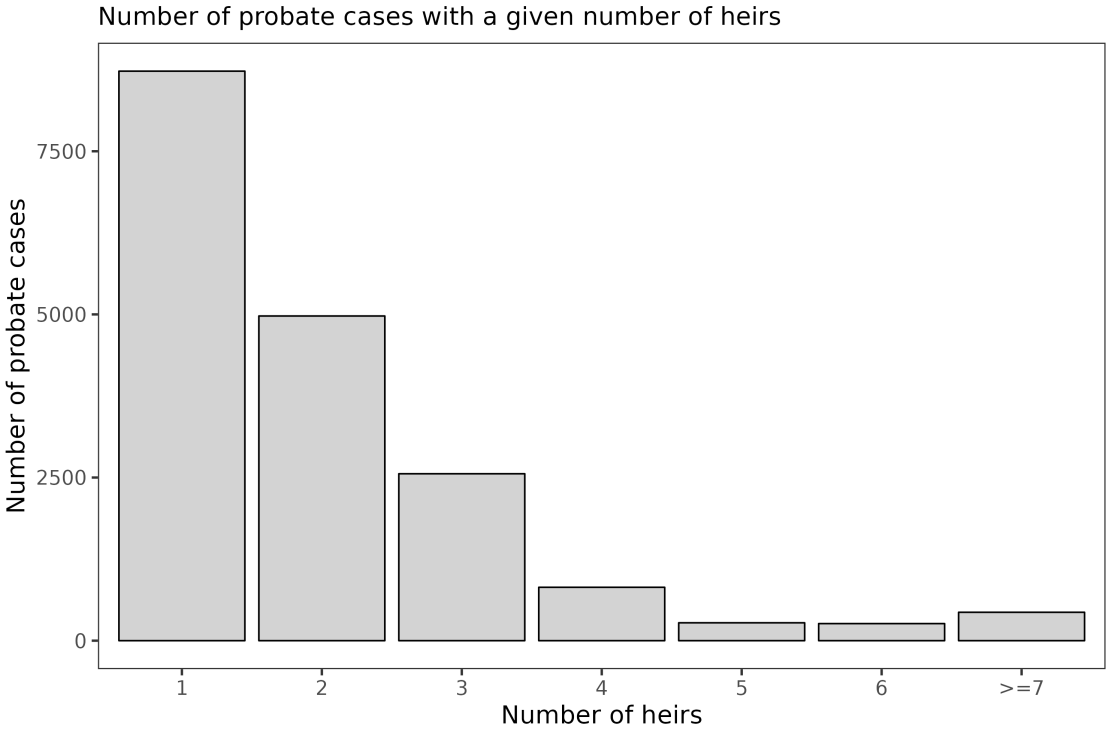
the recipients of transfers out of probate wealth. Heirs (who either decline or unconditionally/-conditionally accept the inheritance) are a subset of this group, as estate wealth can also go to creditors (transfer in lieu of payment), the individual recipient of probate wealth with the net estate below the minimum threshold for a full probate proceeding (falling into the category of "others", together with transfer recipients that were not unambiguously classifiable), and legatees (who are not necessarily heirs).[18] To begin with, among heirs, unconditional acceptances are the most popular choice. 19,075 heirs opt for this type of acceptance declaration. In contrast, 14,623 individuals accept their inheritance conditionally. A non-trivial minority of 2,232 individuals declines their inheritance. Aside from heirs, the largest category consists of persons who receive assets from an estate in lieu of payment. According to our data, 96 individuals are legatees. Other cases are relatively limited, totaling 420 transfer recipients.

Figure 4 reports the distribution of the number of heirs in each probate case. It shows the number of individuals inheriting a share of the estate for all probate cases with conditional or unconditional acceptance declarations between 2014 and 2019. Cases with more than six heirs are aggregated into one category. While some probate cases feature a substantial number of heirs, probate cases with only one heir are the most common by far (approximately 8,000 cases). The second-largest groups are probate cases with two heirs, totaling approximately 5,000 cases. Roughly 2,500 heirs share an estate between three individuals. With less than 1,000 cases by group, estates inherited by four or more heirs are much less common.

Next, we investigate the distribution of heirs along the distribution of probate wealth and ask if

[18] Legatees receive specific items through a testament (such as jewelry or stamp collection) but may also have claims to a specific sum of money.

Figure 4: Number of heirs by probate case



[a] Note: The figure depicts the frequency of different size classes for the number of heirs by probate case (conditional and unconditional acceptances only). The x-axis refers to different size classes, where probate cases with seven and more heirs are summarized in one class. The y-axis indicates the number of probate cases in each size class.

[b] Source: Own calculations based on probate records in the years 2014-2019.

larger estates are distributed among a larger number of heirs. Figure 5 plots the mean number of heirs in each probate case by decile of the probate wealth distribution. The underlying data refers to cases with conditional or unconditional acceptance declarations between 2014 and 2019. Note that at the lower end of the distribution where the bars are more transparent, means are estimated on a relatively small sample of heirs (20 cases or fewer), since only a few cases where probate wealth is low or even negative feature conditional or unconditional inheritance declarations. The average number of heirs increases as probate wealth increases. The mean number of heirs is approximately 1.64 in the first decile of the probate wealth distribution and around 2.60 in the top decile. Yet, the increase is not monotonic. In the upper half of the distribution, the number of heirs increases from the 6^{th} decile to the 8^{th} decile, while it marginally declines in the 9^{th} decile before a jump occurs in the 10^{th} decile. Across the entire distribution in Figure 5, the average number of heirs is 2.05. The red line marks this number.

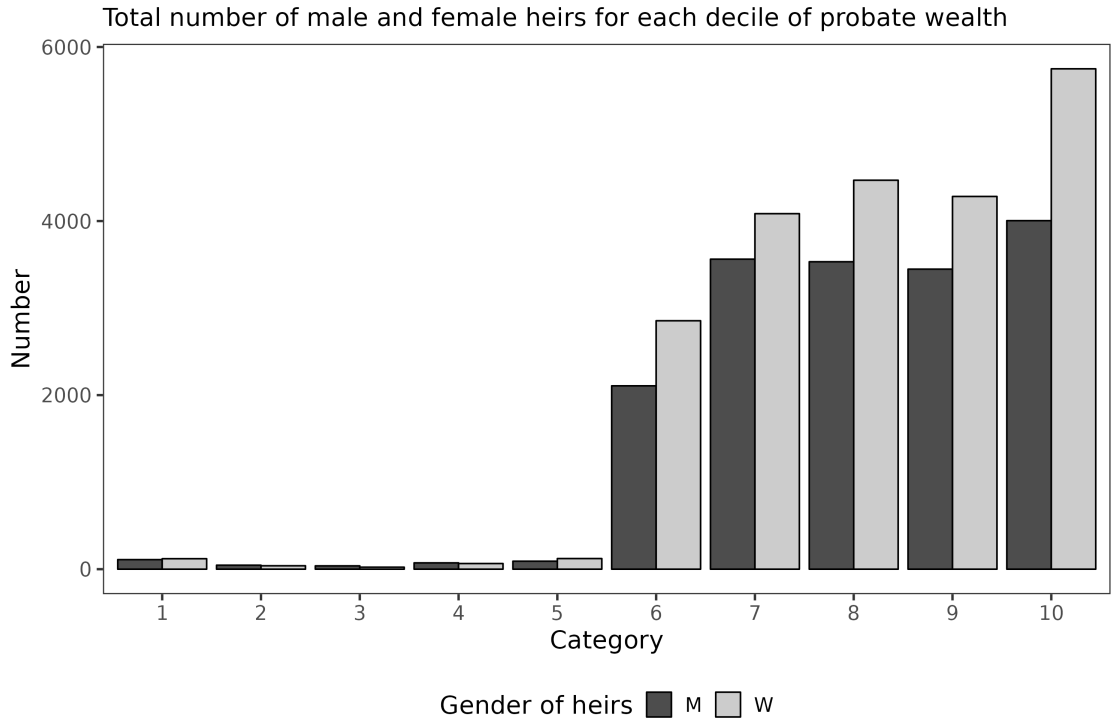
Figure 5: Heirs along the probate wealth distribution

[a] Note: The figure illustrates the average number of heirs for each probate case along the distribution of probate wealth for different deciles. The graph refers to cases with conditional/unconditional acceptance declarations. The x-axis represents the deciles of probate wealth, while the y-axis refers to the average number of heirs per case. The red line marks the average number of heirs across the entire probate wealth distribution. Transparent bars are statistics based on 20 observations or fewer.

[b] Source: Own calculations based on probate records in the years 2014-2019.

Figure 6 plots the total number of heirs with conditional and unconditional acceptance declarations by decile of the probate wealth distribution and gender. Paralleling Figure 5, probate cases in the bottom half of the distribution are associated with a low number of heirs, as there is little or no positive probate wealth at death to be distributed. From the 6^{th} decile onwards, probate wealth turns positive and the number of conditional or unconditional inheritance declarations increases abruptly. As in Figure 5, there is a non-monotonic increase in the number of heirs, both for men and for women. However, significant differences between genders prevail across the distribution of probate wealth: In each decile with positive probate wealth, the number of female heirs exceeds the number of male heirs. While the number of male heirs peaks at 4,005 in the 10^{th} decile, the number of female heirs in the top decile is 5,749. It is also in the top decile, where the ratio of female heirs over male heirs is the highest. We provide additional distributional estimates from the perspective of heirs in the Appendix, Section A.5.

Figure 6: Heirs by gender along the probate wealth distribution



[a] Note: The figure displays the number of male (dark) and female (fair) heirs across the deciles of the probate wealth distribution. The graph refers to cases with conditional/unconditional acceptance declarations. The x-axis refers to the deciles of the probate wealth distribution, and the y-axis indicates the number of individuals in each group.

[b] Source: Own calculations based on probate records in the years 2014-2019.

4.3 Data triangulation

The data presented in this study marks an important contribution to measuring the volume and distribution of bequests in Austria. Due to conceptual differences, our estimates are not directly comparable to prior evidence on intergenerational wealth transfers in Austria.

First, our probate data refers to Viennese districts, such that heavy extrapolation would be necessary to draw conclusions about the estate distribution at the national level. Our data captures wealth at death of 38,106 individuals across ten Viennese districts in the period 2014 – 2019. In Austria, a total of 492,625 individuals deceased (Statistics Austria 2023) in these years. Therefore, our dataset covers 7.74% of the relevant Austrian reference population. Working with a sample of data is not a problem in and of itself, especially when sampling probabilities are known. In our case, the key problem hindering direct comparison with available estimates on the distribution of bequests across Austria is that the distribution of wealth in Vienna is structurally different from the distribution of wealth in the rest of the country, especially rural areas. Region-specific estimates based on the HFCS suggest that the median Viennese household owns approximately a quarter of the wealth level of the median household in the other provinces of Austria (Dabrowski et al. 2020). On average, mean wealth in the Austrian districts that we do not cover exceeds mean wealth in the 10 Viennese districts of this study by more than 40%. Therefore, the aggregates in this would likely require upscaling to the national average, under the assumption that the probate wealth ratio is similar to the ratio of survey net wealth.

Second, our probate data refers to the number of completed probate cases, rather than to the entity of bequeathed wealth. Therefore, there might be a few bequests across our study years, especially in the latest year(s), as the proceedings have not yet been concluded. Especially in recent years, not all probate cases will be completed. A simplistic weighting approach that scales up the weights of the sampled cases uniformly is problematic if ongoing cases are systematically different from completed ones. Moreover, it is not clear whether the number of incomplete cases differs across Austrian court districts.

Third, there are important conceptual differences between wealth at death and inheritances, to which prior evidence from the HFCS refers. Wealth can be transferred irrespective of death. Therefore, wealth at death tends to underestimate total wealth transferred from one generation to the next.[19] While gifts are in principle part of estimations of the level and distribution of

[19] In terms of gifts made before death, a key concern is the transfer of closely held businesses and real estate. A substantial body of work on bequests and inheritances suggest that, especially at the upper tail of the wealth distribution, wealth transfers are well-planned with the purpose of ensuring that wealth remains *within the family* in its entity and without being split-up across several entitled heirs (Bessière and Gollac 2023).

intergenerational wealth transfers, we are not able to cover gifts systematically. In summary, our probate data leads to an under-estimation of total wealth transferred from one generation to the next and thus inherited and gifted wealth.

Our results, suggesting that 7.74% of the deceased population in Austria bequeathed an annual value of € 0.7 billion, add a new data point to the estimated value of intergenerational transfers in Austria. A back-of-the-envelope calculation suggests a total bequest volume of approximately 1€2.7 billion annually.[20] Recent evidence from the Austrian gifts registry suggests that the volume of large gifts made is around 6€ billion per year, resulting in a total transfer of wealth of 1€8.7 annually. These results supplement the findings of Humer (2016), who estimates using HFCS data that the bequest volume is likely to increase from 8€ billion in 2010 to € 20 billion in 2035. The Austrian HFCS however under-samples the uppermost percentiles of the wealth distribution substantially, suggesting the results provided by Humer (2016) are not accounting for the largest bequests. In contrast, our probate data has been obtained by over-sampling the top of the estate distribution. Another point of reference is a recent contribution using parliamentary inquiries that resulted in tabulated information on taxed inheritances and gifts (Ertl 2024). Notably, this paper refers to the years 2002, 2005, 2006 and 2007, before the inheritance tax was abolished. The estimates imply an annual transfer flow between € 4.7 billion and € 6.2 billion. These estimates likely underestimate the transfer flow, given a substantial share of non-filing individuals and the fact that many asset types were exempted from taxation.

Neither the existing evidence from the HFCS nor the earlier tax data provide data on the distribution of bequests, as we set out above. Therefore, we cannot benchmark the distributional statistics provided in this paper with any other external sources.

It is important to emphasize that based on the results presented here, no strong conclusions can be drawn about the volume and distribution of bequests in Austria. Paralleling previous research on bequests, this study is not based on full population data providing a complete survey but a sample of all probate cases. Although significant quality improvements in the sample selection as compared to existing population surveys were achieved through oversampling, further progress can be achieved through expanding the coverage of the sample. However, given the substantial number of records and limited existence of digitized files, this approach is quite resource intensive.

[20] Flow of bequests according to probate data/Share of population covered in weighted probate sample * (Mean wealth in regions not in sample according to HFCS/Mean wealth in regions in sample according to HFCS) * (1 - Share of population covered in weighted probate sample) + Flow of bequests according to probate data = $0.7/0.0774 \cdot 1.44 \cdot 0.9226 + 0.7 \approx 12.7$.

5 Summary remarks

The volume and distribution of bequests are statistics relevant to both economic research and policy. However, data on intergenerational wealth transmission is scarce in many countries, in particular those that do not tax wealth and inheritances. This paper contributes to the evidence on bequests in Austria by exploring data from a new source: current probate record files. By contrast to other countries with a similar legal proceeding in place, a probate process is opened for each deceased, irrespective of the level and composition of of wealth held at death.

The probate records contain substantial and novel information on demographic characteristics, the assets and liabilities of the deceased, as well as their portfolio choices. We illustrate how the data can be sampled and used to estimates of the volume and distribution of probate wealth. Our findings from probate records in ten Viennese districts point towards an annual probate wealth volume of approximately 0€.7 billion in the districts that this paper studies. Moreover, we find that the distribution of probate wealth is highly dispersed. Crucially, this dispersion is not only due to a high concentration of probate wealth at the top with a top 1% share of 39%, but also due to substantial debt at the bottom of the distribution. Finally, our data reveals that approximately 40% of heirs conditionally accept their inheritance, while around 6% of heirs decline their inheritance.

To deal with the vast number of probate files and without compromising on the quality of the data, we develop a new probate record sampling strategy based on the number of procedural steps in the probate case. This strategy proves to enhance the coverage at the top of the distribution, in particular. Moreover, our data provides interesting insights on the distribution of wealth at death at the bottom of the distribution, which is usually truncated in tax data. The paper reveals substantial negative net wealth among a large share of deceased individuals, significantly affecting distributional statistics. This has vital implications for methods that recover wealth inequality estimates among the living from inheritance tax data. Furthermore, we demonstrate that the probate data offers interesting insights into the decisions that heirs make during the probate process. For example, we show that a large minority of heirs does not accept their inheritance. Finally, our back-of-the-envelope calculation suggests that the probate data yields a higher total estimate of the annual bequest flow than survey and Austrian tax data.

Looking ahead, the evidence in this paper bears important ramifications for future economic policy debates, against the backdrop of demographic shifts and the changing significance of inherited wealth across countries (Piketty 2011). As projections indicate a substantial rise in inheritance flows over the coming decades, the volume and large disparities in probate wealth

in this contribution underscores the importance of proactive policy measures aimed at managing the consequences for economic efficiency and equity. Through offering empirical insights into the probate process, this research can inform evidence-based policy decisions.

Since the data underlying this contribution is limited to a narrow geographical area, future work may investigate ways to bring the digitization of probate records to scale, thus reducing the substantial resource cost involved in generating probate data that is useful for research. At the same time, a vital next step will be to capitalize on the rich nature of the dataset to learn more about the behavior of heirs when claiming an estate, their procedural choices and reporting behavior. In particular, it would be interesting to investigate whether assets are shielded from the probate process, despite the limited economic incentives to do so created by the absence of inheritance taxation.

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A Appendix

A.1 Digitizing Austrian probate data

The dataset that constitutes the empirical base of this paper is a hand-collected sample from the court records generated in the Austrian probate proceedings. Court records were kindly made available by several Viennese district courts for this project, following a basic permission to inspect the files for scientific purposes granted by the Federal Ministry of Justice.

In each court, a list of files was generated that lists all files in the sample. The court staff brought the files to a room where the project team worked. Each file was carefully reviewed. In a first step, this involved screening the file for the most important documents (*Todesfallaufnahme*, *Vermögensaufstellung*, *Vermögenserklärung*, *Inventar*, *Beschluss*, *Einantwortungsbeschluss*). In some cases, the information in these documents was insufficient to reconstruct a given probate case, such that the rest of that record would be screened for contextual data in a second step. Finally, we entered the information required for this study manually into our database tool.

Currently, the probate data is still not digitized (i.e. stored as text or scanned documents). In the future, probate proceedings might be changed to a harmonized digital systems. Using text recognition software and natural language processing tools, it could be possible to scale up the probate data coverage substantially, if digitized records are available.

A.2 Further descriptive statistics

The following Table 9 reports the number of sampled cases as well as the number of total completed probate records by district.

Table 9: Sample size and total population by court district and year

	Observations (N)				Population (N)			
Year	Doebling	Donaustadt	Innere Stadt	Meidling	Doebling	Donaustadt	Innere Stadt	Meidling
2014	181	164	614	51	1325	1207	4518	972
2015	173	185	628	39	1291	1368	4645	744
2016	176	186	616	51	1300	1369	4567	972
2017	171	159	472	51	1289	1182	3523	972
2018	179	176	604	49	1323	1345	4502	934
2019	105	186	582	51	777	1382	4301	972

[a] Note: The table reports the number of cases in the sample and the total number of deceased individuals by year and district.
[b] Source: Own calculations and data with district weights.

A.3 Regression models for real estate value adjustment

To analyze the relationship between the three-fold unit value (catastral value, administrative value) and the market value, we estimate several models with different independent variables. Table 10 reports the key coefficients of these regressions, which is the intercept and the coefficient on the association between the three-fold unit value and the market value. The first model is the model that we use throughout this paper to adjust the valuation of real estate that would otherwise enter probate wealth valued at the three-fold unit value. It represents a simple OLS regression with the market value as the dependent variable and the three-fold unit value as the regressor. Both variables are log-transformed. The intercept is marginally below three, while the coefficient on the three-fold unit value is 0.89. The second model includes year fixed effects. The intercept falls marginally, while the coefficient on the three-fold unit value increases by a small margin (0.02 units). The third column reports the coefficients of a regression model with more granular regional controls, adding to the regression model district level indicator variables. In addition, a set of controls related to the property characteristics (size of the building area, total area, and - if available - agricultural land area for the property) enter the model. This depresses the coefficient on the three-fold unit value by approximately 0.08 units. Yet, the change in the coefficient is not driven by confounding variables. The drop from the second to the third column results almost exclusively from the sample restriction to observations where data on property characteristics was available. The last column in Table 10 reports the same model as in the second column of the table, while implementing the sample restriction. The simple exclusion of a large share of properties where granular property characteristics are not available gives almost identical coefficients to those that rely on more extensive controls.

We choose the first model because it relies on the largest sample. While the other results in Table 10 suggest that there may be some heterogeneity in the relationship between market values and administrative values, it also implies that the naive estimate is unlikely to be unduly affected by omitted variable biases.

A.4 Detailed descriptive statistics

Table 11 provides a detailed breakdown of the distribution of probate wealth for different segments of the distribution. The first two columns report the average assets and number of individuals in each vingtile of the probate wealth distribution (pooled across the years 2014-2019). The least wealthy 5% of estates have an average debt level of 2 €27,002.60. From the 11^{th} vingtile onwards, average probate wealth of the deceased population is valued at 1 €,667,429.70. Columns

Table 10: Estimating the relationship between market and catastral values

	Naive	Year fixed effects	Property ctrl.	Sample restriction
Intercept	2.958***	2.638***	2.787+	3.405***
	(0.748)	(0.766)	(1.394)	(0.928)
Catastral value	0.886***	0.903***	0.823***	0.825***
	(0.074)	(0.072)	(0.118)	(0.085)
Num.Obs.	179	179	77	77
R2	0.448	0.506	0.873	0.605
R2 Adj.	0.445	0.486	0.770	0.571

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3 to 4 in Table 11 report means for probate wealth at different deciles and then offer a more granular breakdown of the top decile and the top percentile. Again, we report the number of probate cases in each segment of the distribution. While the average probate wealth in the 90^{th} percentile amounts to 2€54,199.80, deceased individuals in the top percentile hold around 4€.7 million. Within the wealthiest 0.5 percent of the distribution, average assets amount to 7€,038,093.70, while the largest 0.1% of estates are worth around 1€4,573,400 million.

A.5 Distribution of inheritances

The analysis presented in the main text centers on the perspective of *probate cases* and is primarily interested in the distribution of wealth at death. In this subsection, we present additional descriptive statistics on the distribution of *inheritances*, that is, the distribution of probate wealth among heirs. This is possible as each probate case includes the information on the gender and the share of the estate received by heir.

Table 11: Mean probate wealth for different groups

Quantile	Probate wealth	Quantile	Probate wealth
1. Vingtile	-227,002.6	1. Decile	-148,565.4
2. Vingtile	-70,127.9	2. Decile	-22,603.5
3. Vingtile	-30,773.2	3. Decile	-6,547.3
4. Vingtile	-14,431.6	4. Decile	-3,337.1
5. Vingtile	-7,634.5	5. Decile	-661.8
6. Vingtile	-5,457.6	6. Decile	3,242.6
7. Vingtile	-4,006.7	7. Decile	16,731.8
8. Vingtile	-2,675.6	8. Decile	64,541.0
9. Vingtile	-1,217.7	9. Decile	170,924.0
10. Vingtile	-107.9	10. Decile	1,017,112.1
11. Vingtile	1,357.5	90. Percentile	254,199.8
12. Vingtile	5,134.3	91. Percentile	281,193.7
13. Vingtile	11,360.0	92. Percentile	321,466.6
14. Vingtile	22,081.3	93. Percentile	364,159.6
15. Vingtile	45,168.8	94. Percentile	409,905.7
16. Vingtile	83,882.4	95. Percentile	477,116.9
17. Vingtile	135,303.5	96. Percentile	556,247.5
18. Vingtile	206,987.5	97. Percentile	683,368.1
19. Vingtile	370,152.3	98. Percentile	926,087.7
20. Vingtile	1,667,429.7	99. Percentile	1,414,002.4
		100. Percentile	4,703,270.8
		Top 0.5	7,038,093.7
		Top 0.1	14,573,399.9

[a] Note: The table displays mean probate wealth for vingtiles, deciles, percentiles, top 10%, the top 0.5%, and the top 0.1% of the probate wealth distribution. Negative values indicate estate debt. Data pooled over 2014-2019.

[b] Source: Own calculations and data with district weights.

Table 12: Gini index: Estates and inheritances

Year	Gini index - Estates	Gini index - Inheritances
2014	0.765	0.804
2015	0.756	0.792
2016	0.693	0.734
2017	0.825	0.851
2018	0.794	0.797
2019	0.797	0.801

[a] Note: The table comparest the gini index for probate wealth (estates) to the gini index of inheritances by year.

[b] Source: Own calculations and data with district weights.

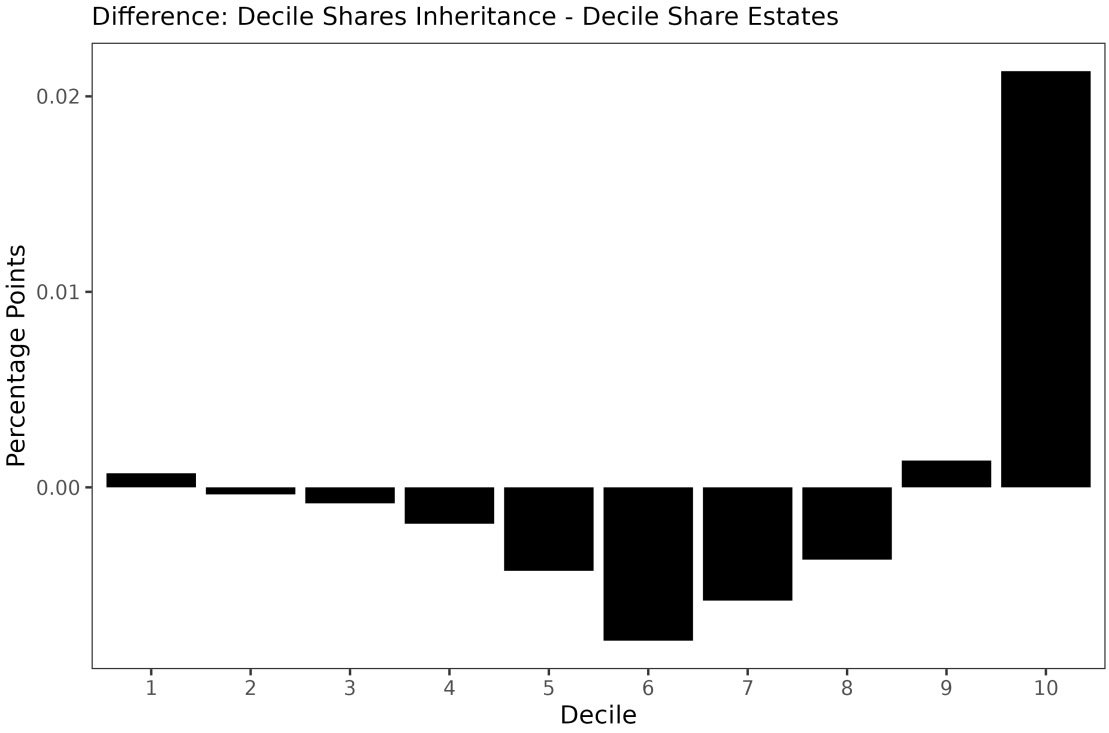
Table 13: Concentration measures - Inheritances

Indicator	Value
Top 1%	20.60
Top 5%	49.48
Top 10%	65.11
Bottom 50 %	2.44

[a] Note: The table illustrates the shares of heirs at different parts of the distribution of inheritances, with data pooled aross all years of the sample.

[b] Source: Own calculations and data with district weights.

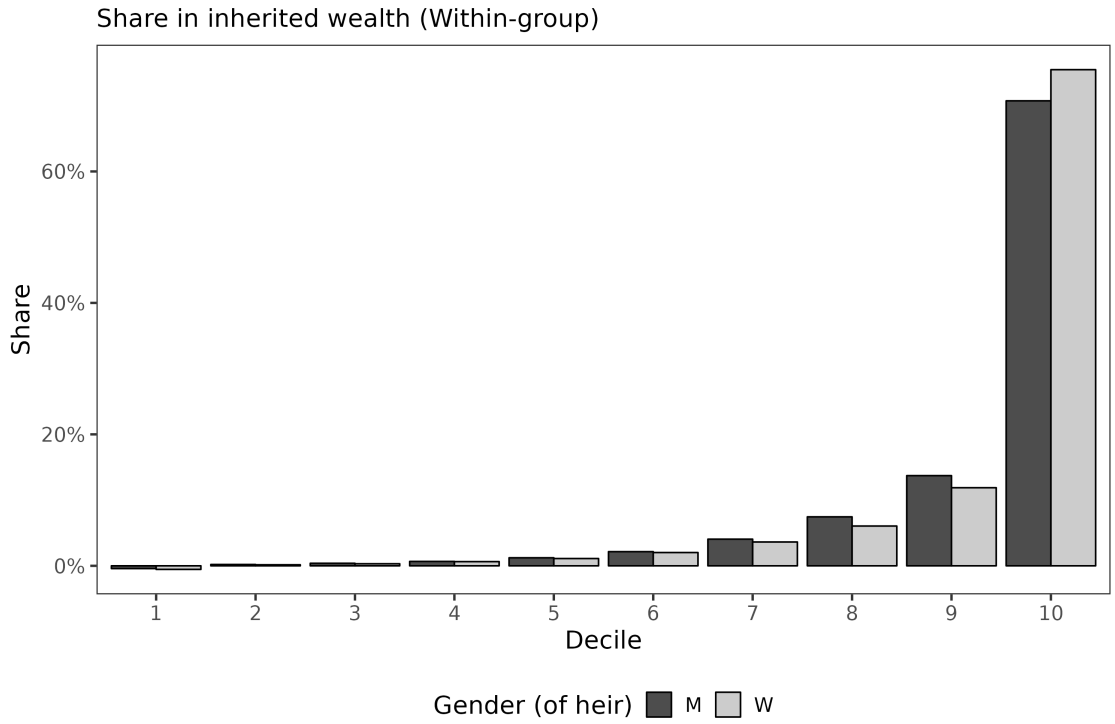
Figure 7: Heirs along the probate wealth distribution



[a] Note: The figure illustrates the difference in the share of estates and the share of inheritances received by each decile (of the estate / inheritance distribution). The graph refers to cases with conditional/unconditional acceptance declarations. The x-axis represents the deciles of probate wealth and inheritances, while the y-axis refers to the percentage points difference in the shares received by each decile.

[b] Source: Own calculations based on probate records in the years 2014-2019.

Figure 8: Heirs along the probate wealth distribution



[a] Note: The figure illustrates the gender-specific distribution of inheritances across the inheritance distribution. The graph refers to cases with conditional/unconditional acceptance declarations. The x-axis represents the deciles of the gender-specific inheritance distribution, while the y-axis refers to the share of inheritances received by each gender. Only cases with conditional/unconditional acceptance declaration.

[b] Source: Own calculations based on probate records in the years 2014-2019.