Inheritance and Wealth Inequality: Evidence from Population Registers

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ABSTRACT
This paper uses population register data on inheritances and wealth in Sweden to estimate the causal impact of inheritances on wealth inequality. We find that inheritances reduce wealth inequality, as measured by the Gini coefficient or top wealth shares, but that they increase absolute dispersion. This duality in effects stems from the fact that even though richer heirs inherit larger amounts, the relative importance of the inheritance is larger for less wealthy heirs, who inherit more relative to their pre-inheritance wealth. This is in part driven by the fact that heirs do not inherit debts, which makes the distribution of inheritances more equal than the distribution of wealth among the heirs. Behavioral adjustments seem to mitigate the equalizing effect of inheritances, possibly through higher consumption among the poorer heirs. Inheritance taxation counteracts the equalizing inheritance effect, but redistribution of inheritance tax revenues can reverse this result and make the inheritance tax equalizing. Finally, we also find that inheritances increase intragenerational wealth mobility, but the effect is short-lived.

JEL: H24, D63, E21
Keywords: bequests, estates, net worth, inheritance taxation, wealth distribution

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1. INTRODUCTION

The evolution of wealth inequality and its determinants have received tremendous attention in recent years. After decades of decreasing or relatively low levels of wealth inequality throughout the Western world, wealth inequality may now be on the rise.\(^1\) A small but growing body of research has also shown that the importance of inherited wealth has increased recently (Piketty 2011; Ohlsson, Roine and Waldenström 2014). If wealthy children inherit from wealthy parents and inheritances therefore primarily benefit a small elite, there may be a link between increased inheritance flows and increased inequality in the wealth distribution.

In this paper, we investigate the impact of inheritances on the distribution of wealth. Although we are not the first to address this issue, it is fair to say that a consensus has not been reached in the literature about whether inheritances increase or decrease wealth inequality. To the best of our knowledge, we are, however, the first to use population-wide individual-level data on both inheritances and wealth to estimate the causal effects of inheritances and characterize the underlying mechanisms. We also contribute by studying the impact of inheritances on wealth mobility and the ways in which inheritance taxation influences wealth inequality.

At our disposal is a new population-wide database that contains detailed individual-level information about the estates and bequests of all Swedes who passed away during the 2002–2004 period. Our analysis is based on 168,000 decedents, and of all their family and non-family heirs, comprising 475,000 individuals. The panel dimension of the data allows us to follow heirs and their marketable net worth (which we will hereafter refer to as wealth) for several years—both before and after they inherit.

Our identification strategy relies on observing inheritances and wealth distributions for yearly cohorts of heirs. Two different causal effects are identified. First, we estimate a direct mechanical effect (DME), which captures the immediate impact of inheritances, and occurs before any behavioral responses (i.e., before heirs can consume the inheritance). Although we ideally want to evaluate this effect by comparing inequalities just before and just after heirs receive their inheritances, we come close to identifying this effect by comparing wealth inequality at the end of the year preceding the inheritance year, with a measure of post-inheritance

\(^1\) Roine and Waldenström (2015) document long-run trends in wealth concentration throughout the Western world since the industrial era (see also Piketty and Zucman 2015). In terms of recent developments, few countries offer consistent wealth inequality trends. For the United States, Saez and Zucman (2016) present evidence that suggests dramatic increases in wealth inequality (but the exact size and timing of the increase is discussed, e.g., by Kopczuk 2015 and Bricker et al. 2015). For Sweden, Lundberg and Waldenström (2018) document modest increases in the years following the Great Recession.
wealth inequality, obtained by adding the value of the inheritance to each heir’s wealth in the year preceding the inheritance year.

The second effect, denoted the behavior-adjusted effect (BAE), shows that heirs may change their behaviors in response to their inheritances, e.g., by consuming or investing part of their inheritances or by working less. We identify this effect by using a difference-in-differences estimator, which compares pre-inheritance inequality with post-inheritance inequality across the three sequentially inheriting cohorts. Heirs who inherit one or two years later serve as the control group for those who inherit in a given year. Note that our focus on heirs only is not very restrictive because everyone will inherit at some point (although a zero amount in some cases). This estimation strategy effectively removes biases stemming from macroeconomic events that might influence wealth inequality from one year to the next, as well as biases stemming from the aging of heirs. As pre-inheritance inequality trends are almost perfectly parallel across inheritance cohorts, we are confident in making a causal interpretation of the estimated effects.

Our main finding is that inheritances reduce relative wealth inequality. The direct mechanical effect works to reduce the Gini coefficient by approximately 7 percent. As a point of reference, this decline is about as large as the equalization following the dotcom crash in 2000, when the stock prices of internet companies, presumably owned by the rich, plummeted. Examining different parts of the wealth distribution, we find that the top decile’s wealth share decreases substantially, whereas the wealth share of the bottom half increases from a negative to a positive share.

While inheritances reduce relative inequality, we find that they increase the absolute dispersion of wealth. This discrepancy between relative and absolute inheritance effects exists because, while wealthier heirs inherit larger amounts, less wealthy heirs receive much larger inheritances relative to their pre-inheritance wealth.

Behavioral adjustments appear to dilute the equalizing impact of inheritances. The behavior-adjusted effects are generally smaller than the direct mechanical effects; for example, the Gini coefficient falls by 4 percent rather than 7 percent. This equality-diluting effect is consistent with previous research showing that less wealthy heirs spend a larger share of their inherited wealth than wealthier heirs (Druedahl and Martinello 2017).

We are also able to present the first register-based empirical estimates of how inheritance

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2 Had we instead compared heirs with the entire population, that would have resulted in a control group containing a combination of individuals, some of which had already inherited and some who were still to inherit at some future point in time and we would have no possibility to know which one of these would be true in each case.
taxation affects wealth inequality, exploiting information about actual individual tax payments. The results indicate that the inheritance tax increases wealth inequality, reflecting that less wealthy heirs pay more in taxes relative to their wealth than wealthier heirs do. Still, wealthier heirs pay higher inheritance taxes, but their tax payments are almost always negligible relative to their wealth. However, we show that the redistribution of inheritance tax revenues can reverse this result and make the inheritance tax equalizing.

Moreover, we estimate the effect of inheritances on wealth mobility. The welfare interpretation of our inequality results may partly depend on whether heirs switch places in the wealth distribution or retain their ranks after they inherit. We find that, overall, mobility rises substantially, with increased mobility across all parts of the wealth distribution.

A series of sensitivity checks suggest that our main findings are robust across several dimensions. First, they do not change when the observed wealth levels are adjusted for potential measurement errors in our wealth and inheritance data. Second, they do not seem to be driven by unobserved inter vivos gifts from wealthy decedents; if anything, adding estimated gifts strengthens the equalizing impact of inheritances. Third, only analyzing inheritances from parents to their children (and neglecting one-third of heirs with more distant family or non-family ties) has a negligible impact on our conclusions. Fourth, we study the importance of young heirs (40 and younger), who could be driving the results because they tend to have relatively little wealth and thus should be affected relatively more by inheriting. While inheritance effects are indeed substantially larger in this younger group, inheritance effects are also important among older heirs. Finally, we exploit parent-child correlations in wealth accumulation and sudden deaths to examine whether heirs adjust their saving behaviors in response to expectations about future inheritances. If such responses were quantitatively important, we would miss a relevant aspect of how inheritances influence the wealth distribution. However, we find no indications of their importance or influence in the data.

Our study contributes to the previous empirical literature on the distributional consequences of inherited wealth. One group of studies uses simulation methods to model people’s savings and giving behavior to calibrate synthetic wealth and inheritance distributions. A sweeping generalization is that these studies tend to find that inheritances constitute a major

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3 Castaneda, Díaz-Gimenez, and Rios-Rull (2003), Cagetti and De Nardi (2009) and Benhabib, Bisin, and Zhu (2011) calibrate dynamic models to evaluate the impact of the U.S. estate tax on income and wealth inequality.

4 See Davies and Shorrocks (2000) and Wolff (2015, chapter 2) for reviews of this literature.
Another group uses individual-level data on people’s self-reported wealth and their receipt of gifts and inheritances. The seminal contributions of Wolff (2002, 2003, 2015) and Wolff and Gittleman (2014) use data from the Survey of Consumer Finances to estimate how gifts and inheritances influence the distribution of wealth in the United States. A consistent finding in these studies is that the rich inherit more than the less affluent, but that the rich inherit less relative to their existing wealth, causing inheritances to have an equalizing effect on the distribution of wealth. Similar equalizing effects of inheritances are found in survey data from the United Kingdom (Karagiannaki 2015; Crawford and Hood 2015), Japan (Horioka 2009), Sweden (Klevmarken 2004) and eight EU countries (Bönke, von Werder and Westermeier 2017).

In a study closely related to ours, Boserup, Kopczuk and Kreiner (2016) examine Danish individual-level tax register data on wealth to estimate the effect of inheritances on wealth inequality. The identification of the effect is based on following the wealth of children (45 to 50 years old) before and after the demise of their parents and then comparing this evolution to the wealth of similarly aged children whose parents did not pass away during the study period. The main findings are similar to ours, that is, inheritances cause an increase in the absolute dispersion of wealth and a decrease in the relative wealth inequality. They find larger equalizing effects than we do, although our studies cannot be directly compared with each other. While their approach has several similarities with our BAE analysis, our population is different from theirs in that it includes all adult heirs (not only children). The key difference, however, is that our data contain information about the value of their inheritances, which allows us to estimate the direct mechanical effect and dig deeper into how and why inheritances affect wealth inequality and mobility. It also allows us to study how inheritance taxation affects wealth inequality.

The remainder of the paper is structured as follows. Section 2 presents the institutional sources of wealth inequality.

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5 A disequalizing effect of inheritances is in accordance with exchange models, which are predicated on the idea that the most supportive—and typically the most resourceful—heirs receive more transfers in exchange for their support of donors (Bernheim, Shleifer and Summers 1985; Cox 1987). Other models of intergenerational transfers emphasize the role of family patterns, e.g., assortative mating, fertility or estate division, and luck components, in distributional outcomes. Some of these models suggest that inheritances are equalizing (e.g., Laitner 1979a,b; Gokhale et al. 2001), while others suggest a disequalizing impact of bequests (e.g., Atkinson 1971; Blinder 1973; Davies and Shorrocks 1978; Davies 1982; Davies and Kuhn 1991; Greenwood and Wolff 1992; De Nardi 2004).

6 In an ongoing project using Swedish register-based microdata, Arash Nikoei and David Seim directly address how inheriting affects both consumption behavior and wealth inequality; and have reported that consumption responses may dilute the equalizing effects of inheritances in the long-run.
context and the data. Section 3 presents our main findings. Section 4 explains how wealth mobility is influenced by inheritances, and Section 5 discusses the role of inheritance taxation. Section 6 discusses some implications of our findings.

2. INSTITUTIONAL CONTEXT AND DATA

In this section, we present the Swedish legislation regarding inheritances and inheritance taxation. Moreover, we provide descriptions of the data and the study population and discuss the various measures of wealth inequality that we use in the empirical analysis.

2.1 Inheritance legislation and taxation

In Sweden, when a person passes away, an estate inventory report should be filed with the tax agency, reporting the values of the decedent’s assets and debts. If the decedent has a positive net worth, his or her estate is distributed to the heirs according to a succession scheme that is based on genetic relationships. The decedent’s relatives are classified into three groups of legal heirs: children and their offspring, parents and their offspring (the decedent’s siblings, nephews and nieces), and grandparents and their children (i.e., aunts and uncles). Heirs in the second (third) group inherit only if there are no heirs in first (first or second) group. If the decedent has a spouse, the estate is transferred to him or her. If the spouses have common children, the surviving spouse receives what is referred to as free disposal of the estate, which means that the money could be spent but not bequeathed to others than the children. The common children receive the inheritance from the first deceased parent when the second parent passes away. The deceased’s children who are not common with the surviving spouse will, on the other, hand inherit immediately when their parent passes away.

The default succession scheme can be set aside by a will, but children are always entitled to half of what they would inherit in the case of intestacy, i.e., in the absence of a will. It should be noted also that heirs do not inherit any debts that the decedents may have at the time of death.

Inheritance and gift taxes existed in Sweden until their abolishment by the end of 2004. In the early 2000s, inheritances exceeding SEK 70,000 (approximately USD 11,000) were

[^7]: Cousins do not inherit according to the inheritance law. If there are no legal heirs in these three groups, no spouse, and no will, the estate will go to a public fund: the Swedish Inheritance Fund.
[^8]: The inheritance tax had been criticized for complicating the succession of family firms and for generating unreasonably large tax payments for widows.
[^9]: Using the exchange rate as of Dec. 30, 2004: 6.6 SEK/USD.
taxed according to a progressive three-bracket schedule, with marginal tax rates ranging from 10 percent (paid by heirs who inherited amounts approximately between the 70th and the 90th percentiles in the inheritance distribution) to 30 percent in the highest bracket on inheritances over SEK 600,000 (USD 91,000, paid by, approximately, the top two percent).\(^\text{10}\) All inherited assets were taxable, but important concessions were made to keep the effective tax down on certain assets, especially firm equity (see also Ohlsson 2011 and Henrekson and Waldenström 2016).

2.2 Data and study population

Our main data source is a population-wide register called Belinda. It originates from the Swedish Tax Agency and contains detailed accounts of the estates of, and inheritances, from all individuals who passed away in 2002–2004 and all of their biological and non-biological heirs. Data are available from this period because the tax agency was obliged to electronically codify all estate reports starting in July 2001, but this obligation was suspended in 2005 when the inheritance tax had been abolished. To these data, we have added information from other administrative registers, primarily those covering personal wealth but also other relevant economic and demographic characteristics for both the decedents and their heirs.

In particular, the information about *decedents* in Belinda includes the net worth at death and its main components (total assets and total debts), the value of the estate, a list of heirs, special rules that apply to the estate and the bequests (e.g., will, prenuptial agreement, and life insurance policy) and personal details (e.g., identity number, marital status, and death date).

The information about *heirs* in Belinda includes the value of their received inheritance, inheritance tax payments (if any), the taxable gifts received over the past ten years, the receipt of life insurance payments from the deceased and personal details (e.g., identity number and relationship to the decedent). Inheritances from a previous decedent (e.g., a late spouse), which the current decedent possessed with free disposal, are divided between the previous decedent’s heirs, and the amounts are listed separately in the database.

We define *inheritance* as the total net-of-tax value of inheritances and any insurance received from the decedent (unless it is explicitly stated to be the before-tax inheritance). For heirs who receive two inheritances when the decedent passes away (typically a child who receives one inheritance from the recently deceased parent and one from a previously deceased...

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\(^{10}\) For a comparison of inheritance and estate taxes between countries, see Cremer and Pestieau (2001).
parent), we define the inheritance as the total sum of these transfers (plus any insurance payments from the two decedents, net of tax). It should be noted that the estates and inheritances observed in the data are reported at tax values, which are sometimes lower than the market values. For instance, real estate was valued at the tax-assessed value, intended to correspond to approximately 75 percent of the market value. In the main analyses, we use the amounts as given in the database but, in robustness tests, we investigate how the results change when we attempt to adjust the inheritance values to their market values.

We define heirs as individuals who live in Sweden and receive an inheritance through the succession order, are beneficiaries of a will, or are beneficiaries of a life insurance policy. We focus on the final estate division of a household and, therefore, do not include heirs who were the spouse or partner of the decedent in our study population. We further restrict our attention to heirs who were at least 18 years old in the year when the decedent passed away because inheritances received by minors fall under the protection of a guardian and are, in practice, controlled by the parents.11

A key feature of our analysis is our classification of heirs into inheritance cohorts according to the year when the deceased passed away. We thus have three inheritance cohorts: 2002, 2003 and 2004, covering a total of 475,120 heirs connected to 168,055 decedents.

Wealth data are collected from the wealth register of Statistics Sweden, which is available for the 1999–2007 period, i.e., several years before and after the 2002–2004 inheritance years. The wealth register contains detailed accounts of real and financial assets and debts, all recorded in market values at each year’s end, for all individuals in the population. We focus on private net worth, which is the market value of real and financial assets less all debts. Specifically, on the asset side, the wealth portfolios comprise non-financial assets (owner-occupied housing, secondary homes, land, agricultural property, commercial real estate, etc.) and financial assets (bank deposits, listed stocks and bonds, mutual funds and other financial securities). Debts are mainly mortgage loans and state-subsidized loans for higher education. The wealth data are particularly advantageous because the bulk of the records come from third-party reports to the tax agency by financial institutions. The wealth register has limited information about some assets. The register does not cover funded pension assets. In addition, closely held corporations are incompletely covered, and compared with estimates of their aggregate value reported in the

11 Moreover, from the study population we drop individuals for which we lack inheritance data or a personal identity number, in total 16 percent of the population. See Appendix A for further details about the selection of the study population and the analysis sample.
Financial Accounts, only about one tenth is accounted for in the wealth register. While these limitations are unfortunate, even when these assets are observed, e.g., in surveys, they are notoriously difficult to value and are, moreover, not always fully marketable. Moreover, consumer durables are not well covered by the wealth register. This may be problematic for an analysis of distributional consequences of inheritances since these goods can be important, not least in relative terms in less wealthy households. In the robustness analyses we, therefore, attempt to assess how sensitive our results are to the undervaluation of consumer durables by approximating the value of these goods using, e.g., estimated car values.

Despite some shortcomings, it should be noted that our wealth data are the same ones as those used in the international wealth data project, the Luxemburg Wealth Study (see Sierminska, Brandolini and Smeeding 2006).

2.3 Descriptive statistics

This study offers the first comprehensive view of the distribution of estates and inheritances in a population-wide register (see Figure 1). First, we observe that the distribution of the decedents’ estates is highly skewed, as most of the mass is located in the left tail and 17 percent of the estates have zero value. The median value is just over SEK 93,000 (approximately USD 14,000), the mean is approximately SEK 264,000 (USD 40,000) and the 99th percentile of estates is approximately SEK 2.2 million (USD 330,000). The top percentile share accounts for 19 percent of the total estate wealth, and the top decile accounts for 55 percent, which are levels that are consistent with those of previous wealth distribution studies (Roine and Waldenström 2009). Second, the distribution of the inheritances that the heirs receive is similar to that of the estates—skewed, with 19 percent of the heirs inheriting nothing at all; the top tenth of inheritances represent 56 percent of the total inherited wealth. Third, the graph in the lower left-hand corner displays the wealth distributions in the year before inheritance ($T - 1$) for each inheritance cohort. These distributions are nearly identical across the cohorts, highly skewed (with Gini coefficients of approximately 0.8, as examined further in the next section) and show that a non-negligible fraction of the heirs have zero or close to zero wealth. Finally, the figure displays the heirs’ age distribution. A slight majority of the heirs (56 percent) are

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12 Consumer durables amounted to approximately ten percent of total household assets in Sweden in the early 2000s (Waldenström 2016)
13 See Elinder et al. (2014) for a more comprehensive description of Belinda and details on estates and inheritances in Sweden.
14 3 percent have exactly zero wealth.
between 50 and 70 years old.

Figure 1. The Estate, Inheritance, Wealth, and Age Distributions. Estates, inheritances and wealth are presented in SEK 1,000 in 2003 constant prices. The distribution graphs of estates are calculated for the decedents (168,055) and the other graphs are calculated for the heirs (475,120). The top percentile is excluded in the estate and inheritance distribution graphs. The top and bottom percentiles are excluded in the wealth distribution graph. The bandwidths used in the estate, inheritance, and wealth graphs are SEK 50,000, 20,000 and 150,000, respectively. The reported densities (vertical axes) are scaled with the bandwidths.

Table 1 presents additional descriptive statistics. The inheritance cohorts are nearly identical in all dimensions, which is also expected, as they comprise essentially the entire population of inheriting individuals for each year. The average wealth of the heirs one year prior to the inheritance year varies somewhat across cohorts. This variation likely reflects annual differences in macroeconomic conditions, particularly stock market and housing price changes. The bottom panel of the table shows statistics for the decedents. Similar to the statistics for the heirs, the differences are very small, and we thus conclude that the inheritance cohorts are also similar in terms of the characteristics of the donors.

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15 In Appendix B.1, Table B1, we display comparisons of the heir-decedents relationships for the three cohorts.
Table 1.
Comparison of Cohort Means for Economic and Demographic Variables

<table>
<thead>
<tr>
<th>Characteristics of heirs</th>
<th>Inheritance cohort</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at inheritance</td>
<td>54.0</td>
<td>54.1</td>
<td>54.4</td>
<td></td>
</tr>
<tr>
<td>Child of the decedent (%)</td>
<td>58.8</td>
<td>59.5</td>
<td>57.7</td>
<td></td>
</tr>
<tr>
<td>Woman (%)</td>
<td>50.6</td>
<td>50.4</td>
<td>50.7</td>
<td></td>
</tr>
<tr>
<td>Married (%)</td>
<td>53.3</td>
<td>52.7</td>
<td>52.2</td>
<td></td>
</tr>
<tr>
<td>Upper secondary or post-graduate degree (%)</td>
<td>24.7</td>
<td>25.5</td>
<td>25.6</td>
<td></td>
</tr>
<tr>
<td>Taxable labor income</td>
<td>224,600</td>
<td>228,800</td>
<td>230,900</td>
<td></td>
</tr>
<tr>
<td>Wealth $T - 1$</td>
<td>643,900</td>
<td>593,500</td>
<td>627,700</td>
<td></td>
</tr>
<tr>
<td>Gross inheritance</td>
<td>94,600</td>
<td>96,100</td>
<td>101,400</td>
<td></td>
</tr>
<tr>
<td>Net inheritance</td>
<td>83,600</td>
<td>85,300</td>
<td>89,500</td>
<td></td>
</tr>
<tr>
<td>Paying inheritance tax (%)</td>
<td>35.8</td>
<td>36.4</td>
<td>37.6</td>
<td></td>
</tr>
<tr>
<td>Received taxable gifts (%)</td>
<td>2.0</td>
<td>2.0</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Taxable gifts</td>
<td>2,800</td>
<td>3,000</td>
<td>3,000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristics of decedents</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>80.9</td>
<td>80.7</td>
<td>81.0</td>
</tr>
<tr>
<td>Woman (%)</td>
<td>61.2</td>
<td>60.3</td>
<td>61.0</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widow/widower (%)</td>
<td>60.3</td>
<td>59.5</td>
<td>60.5</td>
</tr>
<tr>
<td>Never married (%)</td>
<td>17.0</td>
<td>17.1</td>
<td>17.3</td>
</tr>
<tr>
<td>Divorced (%)</td>
<td>17.0</td>
<td>17.7</td>
<td>18.0</td>
</tr>
<tr>
<td>Number of heirs</td>
<td>2.81</td>
<td>2.80</td>
<td>2.86</td>
</tr>
<tr>
<td>Number of children</td>
<td>1.65</td>
<td>1.67</td>
<td>1.65</td>
</tr>
<tr>
<td>Estate</td>
<td>263,300</td>
<td>257,100</td>
<td>273,700</td>
</tr>
<tr>
<td>Number of decedents</td>
<td>58,925</td>
<td>57,213</td>
<td>52,083</td>
</tr>
<tr>
<td>Number of heirs</td>
<td>165,641</td>
<td>160,387</td>
<td>149,092</td>
</tr>
</tbody>
</table>

*Notes: All monetary values are measured in the year prior to the inheritance, and they are expressed in 2003 constant prices, rounded to nearest hundreds. Means of the decedents’ characteristics are calculated over the number of decedents.*

2.4 Measuring wealth inequality

The measurement of wealth inequality is somewhat more complex than the measurement of, for instance, income inequality because some individuals have negative wealth (i.e., when debts are larger than assets). Therefore, we conduct our analyses using various unidimensional
inequality measures that are defined for variables containing positive as well as negative values.\textsuperscript{16} Our focus is on the Gini coefficient, which is the most widely used inequality measure. While the statistical properties of the Gini coefficient are fully intact when negative values exist, the normative interpretations from a certain level or trend may be less straightforward (e.g., How should the negative shares of a pie be distributed?). We complement the analysis with other unidimensional inequality measures that can handle negative values: top and bottom wealth shares, wealth percentile ratios, and a measure of absolute dispersion (the interquartile wealth range, and, in the appendix, also the range between the 1st and 99th wealth percentiles, as well as the coefficient of variation).

3. **THE EFFECT OF INHERITING ON WEALTH INEQUALITY**

We estimate two types of inheritance effects on wealth inequality among heirs: one direct mechanical and one behavior-adjusted. Conceptually, the direct mechanical effect (DME) represents the immediate distributional change that arises from adding the inherited amount to the heirs’ pre-inheritance wealth. This is our main estimator of interest as it offers the clearest channel from inheritance to inequality change. The behavior-adjusted effect (BAE) accounts for behavioral responses among heirs, which reflect that receiving an inheritance may influence labor supply, consumption and investment decisions that, in turn, may affect wealth accumulation and inequality. The estimations of the two effects are performed both non-parametrically, showing how the distribution changes graphically, and for the different unidimensional measures of inequality.

We focus on heirs of all the decedents who passed away between 2002 and 2004. Focusing on heirs is a natural starting point for our study of the distributional consequences of inheritances because almost everyone inherits sooner or later in life, whether the inheritance is a tiny amount (or even zero) or a larger sum.

\textsuperscript{16} The Theil and Atkinson indices are examples of inequality measures that cannot handle negative values. For more detailed discussions of inequality measures with negative values, see Cowell (2013) and OECD (2013, Ch. 7).
3.1 The direct mechanical inheritance effect

The DME captures how the wealth distribution among the heirs will change if the heirs save their entire inheritances and nothing else happens. To evaluate this effect, we would like to compare the inequality in the wealth distribution in the period just before the heirs inherit to the inequality in the distribution in the period just after the inheritance. Denoting the measure of the wealth distribution of interest \( D^W \) (e.g., the Gini coefficient), the time of the inheritance \( T \) and the length of time until the inheritance \( \varepsilon \), the DME on \( D^W \) would be given by \( D^W_{T+\varepsilon} - D^W_{T-\varepsilon} \). To estimate the DME using this strategy, \( \varepsilon \) would need to be extremely small (e.g., one day) to avoid the influence of behavioral responses. However, we do not know the exact date when heirs received their inheritances (only the date when the decedents passed away), and we only observe their wealth on December 31 of each year. Comparing wealth distributions in the years before and after inheritance is clearly a too long time span to identify the DME because behavioral responses and changes in macroeconomic conditions may confound the estimates.

Instead, we will estimate the DME by comparing inequality in the wealth distribution one year prior to the inheritance with a measure of wealth inequality that is obtained by adding the value of the inheritance (received in year \( T \)) to each heir’s wealth in the year before the inheritance. In terms of notation, we will estimate DME as follows:

\[
DME = D^W_{T-1} - D^W_{T-1},
\]

where \( D^W_{T-1} \) is the measure of wealth distribution in the year prior to the inheritance, and \( D^W_{T-1}^{I+} \) is the same distributional measure that is calculated for the distribution of the sum of wealth (in \( T - 1 \)) and the inheritance \( I \).

To examine the statistical robustness of the effect, we compute standard errors by bootstrapping the estimates using 1000 repetitions. The standard errors are typically very small, reflecting both that the DMEs are mechanical in nature, without any stochastic element, and the large size of the dataset.

3.1.1 Estimation results: Direct mechanical effect.

We start by presenting a non-parametric estimation of the DME, which evaluates how the density distribution of wealth changes as a consequence of inheritances. Figure 2 shows how the wealth distribution changes at different wealth levels when we add each heir’s inheritance to his or her pre-inheritance wealth. Clearly, a pronounced drop in density occurs around zero wealth, and a sizable increase in density occurs at moderate wealth levels. Thus, heirs with zero
(or almost zero) wealth move up in the distribution after having received inheritances. By contrast, no changes appear at very low (negative) and very high wealth levels. In these segments, the densities are similar both before and after inheritance, and the differences in the graph are accordingly quite close to the zero line. In other words, adding inheritances to the heirs’ pre-inheritance wealth has the largest influence, quantitatively, on the middle parts of the wealth distribution, whereas the tails are nearly unaffected.

Figure 2. Non-Parametrical Illustration of the DME on the Wealth Distribution. The graph (solid) displays the difference in densities (using bins of SEK 250,000) between the distributions in $T - 1$ of wealth and of wealth plus inheritances, i.e., $D_{T-1}^{W+I} - D_{T-1}^{W}$. The estimates are based on data on 475,120 heirs (2002–2004 cohorts). The confidence bands (dashed) are based on bootstrapped standard errors (1,000 repetitions). Wealth (SEK 1,000) is presented in 2003 constant prices.

We now shift focus to estimate the DME on unidimensional measures of wealth inequality. We seek to quantify the distributional effects of inheritance in terms of standard measures of inequality, which, in turn, facilitates comparisons with other factors and events that affect the wealth distribution.

Panel A of Table 2 presents the DME on five unidimensional measures of inequality that
were discussed in Section 2.4.\textsuperscript{17} The estimated effects with respect to these measures mirror the pattern displayed in Figure 2. First, we see that the relative inequality decreases. The Gini coefficient falls from 0.804 to 0.748 (averaged over the three inheritance cohorts), corresponding to a reduction of 7 percent - a substantial equalization effect. For example, this drop in the Gini coefficient is larger than that following the dotcom bubble in 2000, when stock prices fell sharply, affecting primarily stockholders (who are typically in the top of the distribution).

Similar results, showing an equalizing effect, are found for the other measures of relative inequality. The wealth percentile ratio P90/P50 falls quite substantially—by approximately 17 percent. The wealth share of the top decile also falls, from 55.9 to 52.3 percent (a 7 percent drop), while the wealth share of the bottom half of the distribution actually increases from minus 1.5 percent to plus 2 percent.

Interestingly, the measure of absolute dispersion, the wealth percentile gap P75–P25, increases by 8 percent, which confirms the pattern of a high correlation of wealth across generations, in general, and between the heirs’ wealth and inheritance amounts in particular.

In summary, the results with respect to the DME indicate that inheritances equalize the wealth distribution of heirs, an effect that is consistent across both non-parametric estimation of the change in distribution and a range of well-known wealth inequality measures. In addition, the data confirm the conventionally held view that richer heirs inherit more than poorer heirs do, as indicated by the increased absolute dispersion of wealth.

\textsuperscript{17} In Appendix B, Table B2 (Panel A), it is shown that the DMEs for additional unidimensional (wealth share of top 1 percent, P99/P50, coefficient of variation (CV) and P1–P99) display patterns that are akin to the DMEs for the five main measures.
### Table 2
DME on Wealth Inequality

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(1) Gini</th>
<th>(2) P90/P50</th>
<th>(3) Top 10%</th>
<th>(4) Bottom 50%</th>
<th>(5) P75–P25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: Analysis sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.056^{***}$</td>
<td>$-1.122^{***}$</td>
<td>$-0.036^{***}$</td>
<td>$0.035^{***}$</td>
<td>$63,822^{***}$</td>
</tr>
<tr>
<td>Mean of outcome $T-1$</td>
<td>0.804</td>
<td>6.665</td>
<td>0.559</td>
<td>-0.015</td>
<td>767,262</td>
</tr>
<tr>
<td>Effect in %</td>
<td>-7</td>
<td>-17</td>
<td>-6</td>
<td>.</td>
<td>8</td>
</tr>
<tr>
<td>Panel B: Children only sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.062^{***}$</td>
<td>$-1.303^{***}$</td>
<td>$-0.041^{***}$</td>
<td>$0.038^{***}$</td>
<td>$87,607^{***}$</td>
</tr>
<tr>
<td>Mean of outcome $T-1$</td>
<td>0.823</td>
<td>6.913</td>
<td>0.577</td>
<td>-0.024</td>
<td>773,970</td>
</tr>
<tr>
<td>Effect in %</td>
<td>-8</td>
<td>-19</td>
<td>-7</td>
<td>.</td>
<td>11</td>
</tr>
</tbody>
</table>

*Notes: The estimates provide the difference between the unidimensional measure for the wealth distribution in $T-1$ and the unidimensional measure for the distribution of the sum of wealth in $T-1$ and the inheritance. The estimates in Panel A are based on data on 475,120 heirs (2002–2004 cohorts) and estimates in Panel B are based on data on 278,781 children heirs (2002–2004 cohorts). Bootstrapped standard errors are presented in parentheses (1,000 repetitions). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. Effect in % is calculated as (Inheritance effect / Mean of outcome $T-1$) × 100.*

Our results so far show the effect of inheritances on the wealth distribution among all heirs, not only the children of the decedents. To facilitate comparisons with previous studies focusing on children heirs, and to rule out the possibility that our results are driven by including all family and non-family heirs, panel B of Table 2 presents the DME estimates for a sample consisting only of the decedents’ children. The point estimates indicate a slightly larger equalizing effect of inheritances and a larger increase in the absolute dispersion among the children-heirs, but the differences between the two samples are small. We, thus, conclude that the choice of including or excluding heirs other than the children of the decedents is not important for our main conclusion that inheritances decrease relative inequality and increase absolute dispersion.

In Appendix B.2, we present results from several additional robustness tests. We show that the equalizing effects are more pronounced among the younger (and less wealthy) heirs, but still important across all ages and that our results are robust to the inclusion of heirs younger than 18 years, at the time of the inheritance (Appendix B.2.1).

Moreover, we perform several tests intended to assess how sensitive our results are to alternative measurements of wealth and inheritance measures. These tests show first, that the underreporting of consumer durables in

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18 The available evidence regarding life-cycle wealth profiles in Sweden confirms that people generally have little wealth before they enter their 40s (see, e.g., for Sweden, Ohlsson et al. 2014), which is also true in our population of heirs.
our main wealth measures and, second, that using inheritances at market values (rather than at
tax values as recorded in the data), have a minimal impact on our results (Appendix B.2.2 and
Appendix B.2.3). Finally, we dig deeper into how inheritance of financial and real assets affect
inequality in the distributions of financial and real assets (Appendix B.2.4). Since financial
assets are more liquid than real assets, inheritances containing more real estate will affect con-
sumption possibilities in the short run less than inheritances containing more financial assets.
We find that inheritances reduce inequality in both financial and real estate assets, but that the
effect is more pronounced for financial assets. This follows, as we show in Figure B1, from the
fact that inheritances typically contain equal amounts of real and financial assets and that a large
fraction of heirs own real estate while only relatively few (but rich) had substantial amounts in
financial assets.

3.1.2 How can the equalizing effect be explained?

The result that inheritances lead to lower relative wealth inequality is explained by the
distribution of inheritances being more equal than the distribution of wealth among the heirs. If
the distribution of wealth of decedents is more equal than the distribution of wealth among heirs
and all decedents split their wealth equally between their children and have the same number
of children, then the distribution of inheritances will also be more equal than the distribution of
wealth among the heirs. These conditions appear to be met in our data. The Gini coefficient for
the distribution of wealth among the decedents (in the year before the demise) is 0.76 and the
Gini coefficient for the distribution of inheritances (net of taxes) is 0.73, while the Gini of the
wealth distribution among the heirs (in the year before inheriting) is 0.80. Because wealth is
positively correlated across generations (see, e.g., Charles and Hurst, 2003)\footnote{The correlation between donors’ wealth and heirs’ wealth (both measured in T-1) is 0.2 in the Analysis sample and 0.4 in the Children sample. We also illustrate the positive relationship between heirs’ wealth and decedents’ estate wealth in Figure B2.}, wealthier heirs
receive larger inheritances in absolute amounts, but because the distribution of inheritances is
more equal than the distribution of wealth among heirs, less wealthy heirs will inherit more
relative to the wealth they already hold prior to receiving the inheritance.

Figure 3 shows how the inherited amounts vary with the wealth of heirs. Looking first at
absolute amounts (right axis), we see that wealthier heirs inherit more money.\footnote{The first three deciles are omitted because wealth is negative, which would confound the illustration of inheritance to wealth ratios.} For example,
heirs in the fourth wealth decile (ranked before inheriting) receive inheritances worth, on average, SEK 64,000, whereas heirs in the top decile inherited, on average, SEK 193,000. Thus, there is a positive association between the heirs’ wealth and the amount inherited, which explains why absolute dispersion increases. When looking at the relative importance of inheritances instead, dividing inheritances by the heirs’ wealth, the pattern is reversed. Heirs in the fourth wealth decile receive inheritances that are larger than their own wealth, whereas heirs in the top decile receive inheritances worth only one twentieth of their wealth. This pattern explains the decrease in relative wealth inequality among heirs. Relatively poor heirs often inherit amounts that are large relative to their own wealth, while this is typically not the case for richer heirs.

Figure 3. Absolute and Relative Sizes of Inheritance by Pre-Inheritance Wealth Decile. Wealth (SEK 1,000) and inheritance (SEK 1,000) are presented in 2003 constant prices for the 2002–2004 cohorts. Wealth deciles 1–3 are omitted because of negative wealth values. Mean wealth and mean inheritance for deciles 1–3 are SEK – 115,000 and SEK 53,000, respectively.

The equalizing effect can be explained solely by the distribution of wealth among the decedents being more equal than the distribution of wealth among the heirs. Any factor affecting wealth accumulation processes among the donor generation and the heir generation may thus affect
how inheritances affect the wealth distribution among heirs. Still, inheritances appears to be more equally distributed than the wealth of the decedents, which then contributes to the equalizing effect we find. Several mechanisms may be responsible for why the distribution of inheritances is more equal than the distribution of wealth among the decedents. Below, we address the importance of five such mechanisms.

First, if wealthier decedents have more children, their estates will be distributed among more lots, causing each child to inherit less than he or she would have done had there been fewer children. However, we find no support for this mechanism. In particular, richer decedents do not have more children than less wealthy decedents and variation in the number of children has no important impact on the results. See Appendix B.3.1 for details.

Second, if wealthier decedents testate a disproportionally larger share of their wealth to charities, the heirs would inherit less than they would have done in the absence of charitable bequests. In our data, we see that wealthier decedents indeed testate a larger fraction of their estate to charities. This is line with the literature on charitable contributions at death (see, e.g., Joulfaian 2001). However, even among the wealthiest decedents, only 2.5 percent of the estate goes to charity. Moreover, a counterfactual analysis, in which we redistribute the charitable bequests to the heirs, produces DMEs that are essentially identical to the main ones. We are therefore confident that charitable bequests among the rich are not the driver behind the finding that inheritances lead to lower relative inequality. See Appendix B.3.2 for details.

Third, if wealthier decedents circumvent the default succession rules by writing wills stating that part of their wealth should go to individuals outside the succession order, each heir would inherit less than he or she would have done in the case of intestacy. We address the relevance of this mechanism by calculating the hypothetical inheritance each child would receive in the absence of wills. The DMEs from this counterfactual exercise are largely similar to the main results, suggesting that the equalizing effect cannot be explained by richer decedents’ preferences for distributing their wealth among more heirs. The results also suggest that the limited freedom to testate in the Swedish and Roman inheritance law tradition (Pestieau 2003) is not the driver of the equalizing effect. See Appendix B.3.3 for details.

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21 Fundamentally, this boils down to factors affecting disposable income and savings, like income growth and the design of tax and transfer systems.
22 A standard implication of any model of intergenerational transfers is that the degree of equalization increases with the number of children (see, e.g., Stiglitz 1969; Atkinson and Harrison 1978), and, if wealthy decedents have more children, inheritances seemingly have an equalizing effect.
23 A growing stream of literature is studying end of life charitable giving (see e.g. James 2009 and Meer and Rosen 2013)
Fourth, intergenerational transfers consist of both inheritances at death and gifts that the decedents give to their heirs during their lifetime, i.e., *inter vivos*. If substantial amounts were transferred during the years just prior to the inheritance, the interpretation of our results could be misleading. If richer parents were more likely to transfer wealth to their children in the years before the demise, the DMEs would show more equalization than if these transfers would instead take place as inheritances. We conduct several tests, using both data on reported taxable gifts and by assuming that the gift giving patterns in our sample are similar to those in other data sources (Ohlsson et al. 2014; Piketty and Zucman 2015). We find that decedents with smaller estates make smaller gifts in absolute terms, but that they give away larger shares of their wealth. If we add the value of gifts to the inherited amounts, we find slightly larger equalizing effects. This suggests that the equalizing effects are not much affected by *inter vivos* gifts. See Appendix B.3.4 for details.

Fifth, the inheritance law states that the heirs do not inherit the decedent’s debts. If the decedent has negative net wealth, the heirs will inherit zero. This feature of the inheritance law makes the inheritance distribution more equal than the wealth distribution of the decedents. If we replace all negative wealth values with zeros and calculate the Gini coefficient for the wealth distribution of the decedents (in the year before the demise), we obtain a value of 0.73, which is akin to the Gini for the inheritance distribution but lower than the Gini for decedent wealth including negative values, which is 0.76. It is hence clear that this part of the inheritance law contributes to the equalizing effects that we find.

Out of the five mechanisms discussed above, only the last one appears to be quantitatively important.

Another possible explanation for the result is methodological and concerns the identification strategy. If heirs have adjusted their savings in the years prior to inheritance because they expect to receive inheritances, potentially important parts of the total wealth response to inheritances may be overlooked with the strategy. Heirs expecting large inheritances are likely to save less than heirs expecting a small inheritance. As such, the pre-inheritance wealth distribution will be more compressed than in a world in which heirs do not adjust savings decisions based on their inheritance-related expectations. Consequently, the total effect of inheritances—including both pre-inheritance and post-inheritance responses—might be more equalizing than what our estimates suggest. Quantifying expectation responses to inheritances is difficult, and
only a few studies have attempted to do so (Wolff 2015; Elinder, Erixson and Ohlsson 2012).24 We conduct tests designed to assess how expectations about future inheritances may influence heirs’ pre-inheritance wealth levels. A first test is based on the idea that if decedents (in the years before the demise) suddenly become richer (poorer) and heirs adjust their savings in response to changes in the expected size of inheritances, we expect that the heirs will respond by dissaving (saving) an offsetting amount of wealth. In a second test, we exploit the idea that heirs may respond more strongly to changes in the decedent’s wealth in the years before inheritance if the decedent passes away as a result of a terminal illness rather than passing away suddenly. To investigate this idea more carefully, we use data from the Cause of Death register to identify heir-decedent pairs in which the decedent has passed away suddenly. The classification of sudden deaths (natural and unnatural) follows the classification in Andersen and Nielsen (2011). Neither of the tests provide evidence of responses in the heirs’ wealth prior to inheritance. Altogether, the concern that heirs’ saving behaviors depend on their inheritance expectations may be plausible, but we find little evidence in our data—or in the previous literature—that these behaviors will confound our main findings. While we clearly cannot rule out that such behavioral effects exist, they do not seem to matter much empirically. See Appendix B.3.5 for details.

3.2 The behavior-adjusted inheritance effect

In this section, we estimate the BAE, which captures not only the DME but also how inheritances alter other determinants of wealth accumulation, such as labor supply, consumption, savings and investment decisions.25 For example, if heirs immediately consume a substantial fraction of the inheritance, the DME may not be informative about how the wealth distribution actually evolves after inheritances are received. Following the notation used above, the

24 Wolff (2015, Chapter 3) presents simulation evidence on the extent of saving responses to expectations about future inheritances and finds these expectations to be quantitatively unimportant with regard to saving behaviors. Moreover, Elinder, Erixson and Ohlsson (2012) study the impact of inheritance on the labor income of heirs and present evidence that heirs have adjusted (lowered) their labor incomes in response to inheritances several years before receiving them, suggesting the presence of inheritance expectations. However, the authors provide no estimates of the magnitude or importance of such expectation responses. Additionally, Dynan, Skinner and Zeldes (2002) and Kopczuk and Lupton (2007) study those who intend to leave bequests and their responsiveness in terms of wealth accumulation to the possibility of bequeathing their wealth. These studies find that, although the donors have bequest motives, a confiscatory inheritance tax would not change their savings behaviors much, perhaps with the exception of the wealthiest groups. Even at the donor level, it is not clear that behavioral responses to inheritances will be important enough to influence our analysis.

25 There is a small but growing literature on the consequences of inheritances for economic outcomes of individuals, e.g., consumption (e.g. Weil 1994), labor supply (e.g. Joulaian and Wilhelm 1994; Brown, Coile and Weisbenner 2010; Elinder, Erixson and Ohlsson 2012), investment decisions (Andersen and Nielsen 2011), and health (e.g. Erixson 2017).
BAE can, ceteris paribus, be formulated as follows:

\[
BAE = D_{\text{Post}}^W - D_{\text{Pre}}^W
\]  

(2)

where \(D_{\text{Pre}}^W\) and \(D_{\text{Post}}^W\) denote measures of wealth distribution in the period before and after inheritance.

When empirically estimating the BAE on wealth inequality (and mobility), several challenges arise related to concerns about the ceteris paribus condition not being fulfilled. To illustrate the two most prominent challenges, consider first a strategy that compares the wealth distribution of heirs before and after the receipt of inheritance. The difference between the two distributions may be caused by inheriting only, though a singular source is unlikely. For example, macroeconomic events, such as housing market downturns, tend to slash middle-class wealth and thus increase wealth inequality, whereas financial market crashes primarily hit the wealthy and tend to make the wealth distribution more equal (Wolff 2013; Lundberg and Waldenström, 2018). Second, age-wealth profiles generally imply that, within a birth cohort, wealth becomes more equally distributed with age (Paglin 1975). Therefore, a simple before-after analysis may yield biased estimates of the effects of inheritances on the wealth distribution.

This problem can be solved by comparing the before-after change in the wealth distribution of the cohort of heirs who inherit in a given year with the same before-after change of cohorts that are identical, except that they inherit one or two years later. In our case, we will compare the development of inequality in wealth from 1999–2007 across the three cohorts that inherited sequentially over the 2002–2004 period. The counterfactual is, thus, the development of inequality in the cohorts inheriting one or two years later. In particular, we estimate the BAE on unidimensional measures of inequality, using the following empirical model:

\[
D_{c,y}^W = \delta \cdot \text{PostInheritance}_{c,y} + \lambda_y + \lambda_c + \varepsilon_{c,y}.
\]  

(3)

In Equation (3), \(D_{c,y}^W\) denotes the wealth inequality that varies across cohort \(c\) and calendar year \(y\). \(\text{PostInheritance}\) is a cohort-specific indicator variable, which equals one from the year of the inheritance and onwards. We also include year and cohort fixed effects, captured by \(\lambda_y\) and \(\lambda_c\), respectively, and \(\varepsilon_{c,y}\) is a random error term. The estimation model is essentially a difference-in-differences estimator, where the identifying assumption is that the outcome would have evolved similarly for the inheriting cohort and the “to-inherit” cohort(s) in the absence of
inheritance (i.e., a parallel trends assumption). While this assumption cannot be explicitly tested, it is possible to obtain indirect evidence of whether it holds by studying the outcome trends for the groups in the pre-treatment period, i.e., before inheritance. In the next section, we investigate the validity of the assumption and show that it appears to hold.

### 3.2.1 Estimation results: Behavior-adjusted effect.

Similar to the DME analysis, we start the BAE analysis with a non-parametrical, graphical illustration. The estimated effect of inheritance, by comparing pre- and post-distributions, may be biased by macroeconomic and demographic (aging) influences; to account for such potential confounders, we compare the wealth distribution changes of the 2002 and 2004 inheritance cohorts between 2001 and 2003, i.e., when the 2002 cohort inherits, and the 2004 cohort does not. Because both cohorts experience the same macro environment and aging process, the differences in wealth distributions effectively only reflect the inheritances of the 2002 cohort.\textsuperscript{26} Figure 4 shows the results. An initial observation is that the pattern resembles the one seen for the DME in Figure 2; inheritances positively affect a substantial mass of heirs from the bottom and the middle of the distribution. That said, the size of the BAE appears to be smaller than the DME.

\textsuperscript{26} While this comparison effectively removes biases that stem from aging and changing macroeconomic conditions, the estimated change may still be biased if the 2002 and 2004 cohorts are affected \textit{differently} by macroeconomic events or aging. We cannot graphically illustrate the differences in such effects during the treatment years, but we can show differences in the evolution of the wealth distributions of the two cohorts between 1999 and 2001, i.e., when neither of the cohorts have inherited. The results of this placebo test are presented in Appendix B.4. Figure B5 shows that the changes in the wealth distributions of the two cohorts between 1999 and 2001 are nearly identical. As such, we conclude that cohort-specific macroeconomic effects do not appear to confound the inheritance effect presented in Figure 4.
Next, we turn to analyzing the BAE on unidimensional wealth inequality and absolute dispersion. In contrast to the graphical analysis, we now use the 2002, 2003 and 2004 cohorts simultaneously and exploit the full wealth register data from 1999 to 2007. Therefore, the estimated inheritance effect can capture the average effect up to five years after inheritance, but in practice, most of the variation used in the estimations of the effect comes from the first two years after inheriting, which is why it is safer to say that we capture the effect up to two years after inheriting. As noted in the previous section, the identification strategy assumes that wealth inequality would evolve similarly for all cohorts had they not inherited.

Figure 5 depicts the evolution of the Gini coefficient for the three cohorts over the entire period. Until 2001, i.e., the year before the first cohort inherits, a near-identical development of the Gini coefficient occurs for all three cohorts, strongly suggesting that the parallel trends assumption is fulfilled. The Gini coefficients fall from approximately 0.85 in 1999 to 0.82 in 2000 and 0.81 in 2001. In 2002, the 2002 cohort inherits, and we see an immediate and sharp drop in the Gini coefficient to 0.78, falling further in 2003 when the heirs of the decedents who passed away in late 2002 received their inheritances. By contrast, the Gini coefficients of the
two non-inheriting cohorts remain virtually unchanged in 2002. Starting in 2003, when the 2003 cohort inherits, the Gini coefficients of that cohort drop over the next two years. This pattern is repeated again for the 2004 cohort. Between 2005 and 2007, when all the cohorts have inherited, the Gini coefficients return to a common level and development. As clearly shown in Figure 5, changes in wealth inequality differ across the cohorts only in the two years when they inherit. This strikingly consistent pattern offers strong evidence that the equalizing effect of inheritances on the wealth distribution persist for at least a few years.

![Figure 5. Development of the Gini Coefficient by Inheritance Cohort.](image)

The points on the graphs indicate the Gini coefficients calculated for the distribution of wealth as of December 31 of the respective year.

Table 3 reports the estimation results of the BAE on the five inequality and dispersion measures generated by the difference-in-differences estimator (Eq. 3). The coefficient estimate in the first column shows that the inheritance effect causes a reduction in the Gini coefficient by 0.037 points, which is equivalent to a drop of 4.6 percent (when compared with the baseline of 0.804). In Appendix B.4.2, Table B5, we show that the BAES are robust in the dimensions as the DMEs.

The estimates of the inheritance effects on the other relative dispersion measures confirm what we have observed already in Figure 4 and Figure 5, and they are qualitatively similar to
the DMEs. The P90/P50 decreases by 10.5 percent, and the share of total wealth held by the wealthiest decile falls by 5 percent. Notably, the poorest half increases their share of total wealth from minus 1.6 percent to just above zero. Finally, the estimated effect of inheritances on the distance between the 75th and the 25th wealth percentiles indicates that wealth dispersion increases as a consequence of inheritances. Taken together, the results confirm the patterns we found when we estimated the DME, which was that relative inequality decreases while absolute dispersion increases, suggesting that behavioral responses to inheritances do not mute the equalization effect, at least not in the short-run.

To be able to firmly assess whether the equalizing effect remains in a longer perspective, we would need more inheritance cohorts that inherit in later years and could serve as longer-run counterfactuals for the cohorts who inherit early. In Appendix B.4.3 Figure B6, we use a slightly different dataset in an attempt to investigate whether the equalizing effects are still present five years after inheriting. The results suggest that the equalizing effect is present at least up to five years after inheriting. Unfortunately, data restrictions imply that we cannot say whether the effect decreases or increases over a period of more than five years.

That said, the equalizing effects appear to be smaller when accounting for the behavioral adjustments of the wealth holdings. Therefore, we continue by investigating some possible explanations for this finding in the next section.

### Table 3

<table>
<thead>
<tr>
<th>BAE on Wealth Inequality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome</strong></td>
</tr>
<tr>
<td>Inheritance effect (δ)</td>
</tr>
<tr>
<td>Mean of outcome T−1</td>
</tr>
<tr>
<td>Effect in %</td>
</tr>
</tbody>
</table>

Notes: The estimates are based on 24 observations (3 cohorts [2002–2004] over 8 years) using data on 475,120 heirs. Standard errors appear in parentheses. * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. $δ$ is the coefficient of $PostInheritance$ in Equation (4). Effect in % is calculated as $\frac{Inheritance\ \text{effect} \ (δ)}{Mean\ \text{of outcome} \ T−1} \times 100$.

3.2.2 Potential explanations for why is the behavior-adjusted effect is smaller than the direct mechanical effect?

When comparing the two inheritance effects on wealth inequality, we see that the BAE is smaller than the DME. In the case of Gini coefficients, the BAE is 5 percent, and the DME is 7
percent. We discuss two possibilities for this discrepancy. The first relates to behavioral responses among the heirs, which may dilute the equalizing effect. The second relates to methodological differences between the DME and BAE. The task to separate the relative importance of the two explanations is, however, beyond the scope of this paper.

Why might the equalizing effect of inheritances be less pronounced when behavioral responses are accounted for? Departing from a standard framework for wealth accumulation, several possible explanations are consistent with such a pattern. Compared with wealthier heirs, less wealthy heirs have a higher marginal propensity to consume their inheritances (see, e.g., Druedahl and Martinello 2017). The second explanation is that wealthier heirs receive higher returns on their savings than poorer heirs do (Andersen and Nielsen 2011). Both of these explanations would lead to increased wealth inequality and, in turn, mitigate the equalizing direct mechanical effect. However, without data on consumption, we cannot credibly assess the importance of these two explanations for our findings.

The difference between the DMEs and the BAEs could potentially also result from differences in the estimation methods. A key difference between the two estimation methods is that the DME uses wealth data in the year before inheriting and data on the inheritance, while the estimation of BME is based only on wealth data, but for several years. A potential concern here is discrepancies between how wealth and inheritances are measured. While the wealth data are recorded at market values, the data essentially lack consumer durables. The inheritances, on the other hand, include durables but are recorded at tax values. As discussed in Section 2.4, for some asset types, most notably stocks and real estate, the tax value is lower than the market value. However, in Appendix B.2.2 and Appendix B.4.2, we show that the DMEs and the BAEs are not altered much when we attempt to correct for the underreporting of consumer durables. Moreover, in Appendix B.2.3, we showed that the DMEs are not altered when we attempt to adjust inheritances to market values.

We, therefore, find no indications that the differences in the DMEs and BAEs stem from these types of measurement errors. However, we cannot rule out that the differences between

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27 A simple process for wealth accumulation (see, e.g., Davies and Shorrocks 2000) would be one that describes the next period’s wealth as a function of past wealth plus net income savings (which could depend on inheritances for labor supply reasons) and inherited wealth: \( W_{t+1} = W_t + (s - c)Y_t(I) + (s - c)I_t. \) In this framework, wealth accumulation depends on the rates of saving \( s \) and consumption \( c \) and on potential labor supply effects by inheriting \( Y' \) over and above the inheritances.

28 In addition, labor supply, and thus labor earnings, may also change upon the receipt of inheritances if heirs decide to work less, retire earlier than planned, or use inheritances to start a new venture (see for example, Elinder Erixon and Ohlsson 2012, Brown, Coile and Weisbenner 2010; Holtz-Eakin, Jouluiaan and Rosen 1994).
the DMEs and BAEs are the result of any difference in how the effects are estimated.

4. INHERITANCE AND WEALTH MOBILITY

Another possible consequence of the effects of intergenerational transfers is that they may influence the level of wealth mobility among the heirs. We are interested in mobility effects for two reasons. First, the normative interpretation of the inequality effects depends on how mobility is affected. Inheritances decrease relative inequality, but do inheritances also increase the chances of the poor to increase their wealth rank? Second, do inheritances set off mobility processes? If receiving inheritances makes people behave differently, perhaps taking more risk or changing their activity in the labor market, inheritances may affect wealth mobility long after the receipt. Even though our previous analysis indicated that behavioral effects exist, mainly working to mute the distributional consequences, perhaps the effect on mobility will still be more evident in this respect? This section presents an analysis—to the best of our knowledge, the first of its kind—on how inheritances influence wealth mobility.

Our focus is on intragenerational wealth mobility, which means the rate at which heirs change wealth ranks in their distribution.\(^{29}\) There are several different ways to empirically measure intragenerational wealth mobility as discussed by Burkhauser, Nolan and Couch (2009) and Jäntti and Jenkins (2015). We show results using one of the most common methods, which involves calculating transition probability matrices in the wealth distribution for heirs before and after inheritance. By comparing transition probabilities across quintiles, the matrix shows whether actual mobility patterns at the bottom, the middle and the top of the distribution differ. We then convert these matrices into a unidimensional metric, the Shorrocks-Prais mobility index (Prais 1955; Shorrocks 1978), which is an index centered on the diagonal elements in the matrices and ranges from 0 (perfect immobility) to 1 (perfect mobility).\(^{30}\) For robustness purposes, we also examine the change in Spearman rank correlation coefficients between the

\(^{29}\) Another mobility dimension concerns the role of family background, i.e., the degree of intergenerational mobility. While most such previous studies of Sweden have focused on incomes or other socio-economic outcomes (see, e.g., Björklund and Jäntti, 1997 or Clark 2014), Adermon, Lindahl and Waldenström (2018) study how inheritance affects intergenerational wealth mobility patterns.

\(^{30}\) For an \(n \times n\) matrix \(M\), the Shorrocks-Prais mobility index is defined as \((n - \text{trace}(M))/(n - 1)\). In the estimations of the main results, we let \(n=5\). However, we also test the robustness of the main results by letting \(n=10\) and the estimates with respect to the Shorrocks-Prais index are qualitatively and quantitatively unaffected by this, see Appendix B.5.1.
same distributions, i.e., heirs’ wealth before and after receiving an inheritance. While the difference in Spearman correlations is not a direct measure of mobility, it imposes less structure and relies on fewer assumptions than the Shorrocks-Prais index.

The DME for mobility is estimated by computing two transition matrices, one measuring the individual transitions from \( T - 2 \) to \( T - 1 \) (with the inheritance) and the mobility measure for the transition period from \( T - 2 \) to \( T - 1 \) (without the inheritance). Table 4 shows that the Shorrocks-Prais index increases by 43 percent when adding inheritances, which means that mobility increases substantially as a result of inheriting. When evaluating leaving probabilities across wealth quintiles (columns 2 through 6), we see that the mobility effect is larger among heirs in the lower part of the wealth distribution than among the heirs in the top. As a sign of robustness of this effect, the last column of the table shows that inheriting wealth also leads to a significant decrease in the rate of change in Spearman rank correlations across years. Such a decrease reflects a higher degree of rank movements along the wealth distribution when inheriting, which is in line with higher intragenerational mobility.

We also estimate the DME on mobility for the Children sample. The results, reported in Appendix B.5.2, display a similar pattern to those for the full sample.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Shorrocks-Prais</th>
<th>Probability of leaving nth quintile after inheriting</th>
<th>Spearman’s rank correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inheritance effect</td>
<td>0.113*** (0.001)</td>
<td>0.101*** (0.001)</td>
<td>0.149*** (0.001)</td>
</tr>
<tr>
<td>Mean in ( T - 1 )</td>
<td>0.259</td>
<td>0.168</td>
<td>0.253</td>
</tr>
<tr>
<td>Effect in %</td>
<td>43</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

Notes: The estimates provide the difference between the mobility measure for the transition period from \( T - 2 \) to \( T - 1 \) (with the inheritance) and the mobility measure for the transition period from \( T - 2 \) to \( T - 1 \) (without the inheritance). The estimates are based on data for 475,120 heirs (2002–2004 cohorts). Bootstrapped standard errors are presented in parentheses (1,000 repetitions). * significant at the 10-percent level, ** significant at the 5-percent level, * significant at the 1-percent level. Effect in % is calculated as (Inheritance effect / Mean of outcome \( T - 1 \)) \times 100.

To estimate the BAE for mobility, we implement the same approach as in the inequality analysis. In Figure 6, we depict the evolution of Shorrocks-Prais mobility indices for wealth transitions around the year of inheritance (i.e., from \( W_{pre} \) to \( W_{post} \)). The parallel trends assumption appears to hold, judging from the similar levels of wealth mobility in the pre-inheritance transition periods. Despite an overall rise in mobility from 2001–2002, the 2002 inheritance
cohort exhibits an even higher mobility increase, from 0.23 to 0.32, than the two other cohorts (which increase from 0.23 to 0.28). One year later, the 2003 cohort experiences a similarly large mobility increase, and, another year later, the 2004 cohort experiences the same relatively large increase in mobility (the mobility increase is marginal in absolute terms, but, because the other two cohorts experience substantial decreases in the same period, the effect can be stated as a relative increase).

![Figure 6. Evolution of Wealth Mobility (Shorrocks-Prais Mobility Index).](image)

The points in the graph indicate the Shorrocks-Prais mobility index, as calculated for transition matrices with two-year transitions in the wealth status of heirs.

To be more precise in determining the magnitude of the BAE, we estimate the effect using the difference-in-differences model of Equation 3.31 The results in Table 5 show that overall mobility increases by 19 percent (a treatment effect of 0.048 compared with the average pre-inheritance Shorrocks-Prais index of 0.260). Although significant, this effect is less than half the DME reported in Table 4. When examining leaving probabilities across wealth quintiles

31 Rather than controlling for year fixed effects, we now include transition period fixed effects.
(columns 2–6), almost no difference in mobility is found across the distribution, with mobility increases between 13 and 21 percent depending on the part of the distribution that is considered. The change in Spearman rank correlations exhibits once again a similar pattern as the mobility index, showing a decrease in correlation in the periods after inheritances are received, and the effect is also smaller than in the DME analysis.

We also estimate the BAE on mobility for the Children sample. The results, reported in Appendix B.5.2, display a similar pattern to those for the full sample.

In Appendix B.5.3, we attempt to see whether the mobility effect is persistent up to five years after inheriting. That analysis suggests, however, that the mobility effect is short-lived; it seems to last only two to three years.

### Table 5

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Shorrocks-Prais</th>
<th>Probability of leaving nth quintile after inheriting</th>
<th>Spearman’s rank correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inheritance effect ($\delta$)</td>
<td>0.048**</td>
<td>0.022***</td>
<td>0.054***</td>
</tr>
<tr>
<td>(0.016)</td>
<td>(0.007)</td>
<td>(0.015)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Mean in $T - 1$</td>
<td>0.260</td>
<td>0.170</td>
<td>0.255</td>
</tr>
<tr>
<td>Effect in %</td>
<td>19</td>
<td>13</td>
<td>21</td>
</tr>
</tbody>
</table>

*Notes: The estimates are based on 21 observations (3 cohorts [2002–2004] over 7 transition periods) using data on 475,120 heirs. $\delta$ is the PostInheritance coefficient in Equation (4). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. Effect in % is calculated as $(\text{Inheritance effect ($\delta$)} / \text{Mean of outcome } T - 1) \times 100$.

Two important messages emanate from the mobility analysis presented here. The first is that inheritances substantially increase wealth mobility. In particular, many of the heirs who were among the poorest before inheriting rise in wealth rank. The second message is that inheritances set off increased mobility in the first years after inheriting, but that effect does not seem to be persistent in the longer run.

5. **INHERITANCE TAXATION AND WEALTH INEQUALITY**

In this section, we present the first empirical analysis of inheritance taxation on wealth
inequality using individual-level register data. The distributional consequences of taxation on intergenerational transfers have received relatively little attention in the previous literature. Theoretical models that address this issue implement diverse analytical approaches, but most of them predict that inheritance (or estate) taxes increase wealth inequality (e.g., Stiglitz 1978; Becker and Tomes 1979; Atkinson 1980; Davies 1986). While these models typically focus on general equilibrium and long-term consequences of inheritance taxation, our analysis instead examines short-term consequences that are associated with the repeal of Sweden’s inheritance tax.

We begin by examining how the DMEs change due to the tax payments by the heirs. To estimate the effect of the tax, we calculate the difference between the DMEs using inheritances net-of-inheritance-tax payments (as in Table 2) and DMEs using inheritances before tax payments. The estimated effects are economically relevant as the repeal was effectively unexpected, announced just a few months before the repeal actually occurred. However, it should be noted that our analysis is limited by being mechanical and short-term. It does not account for any behavioral adjustments to inheritance taxation that donors or heirs may make over the longer run.

The results are reported in Table 6 and should be interpreted as the effect of a repeal of the inheritance tax on wealth inequality. The tax repeal effect suggests that the inheritance tax increases relative inequality but decreases absolute dispersion. However, the magnitudes of these effects are very small. For example, the Gini coefficient falls by an additional 0.002 points due to the tax repeal. This relatively small effect is reasonable, given the rather small amounts of inheritance and gift tax payments in the early 2000s.

32 Empirical findings of the distributional consequences of transfer taxation are quite scarce. In calibration studies that use statistical parameters based on U.S. data, Castaneda, Diaz-Gimenez and Rios-Rull (2003), Cagetti and DeNardi (2009) and Benhabib, Bisin and Zhu (2011) conclude that abolishing the estate tax would lead to increases in wealth inequality, with the exact size depending on specific modeling assumptions.

33 For overviews of central issues related to the taxation of intergenerational transfers, see Davies (1986), Cremer and Pestieau (2011) and Kopczuk (2013).
Table 6

Effect of Inheritance Tax Repeal on Wealth Inequality

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(1) Gini</th>
<th>(2) P90/P50</th>
<th>(5) Top 10%</th>
<th>(6) Bottom 50%</th>
<th>(8) P75–P25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax repeal effect</td>
<td>–0.002***</td>
<td>–0.024***</td>
<td>–0.001***</td>
<td>0.001***</td>
<td>12,382***</td>
</tr>
<tr>
<td></td>
<td>(0.00006)</td>
<td>(0.004)</td>
<td>(0.0001)</td>
<td>(0.00002)</td>
<td>(417)</td>
</tr>
<tr>
<td>Mean of outcome T–1</td>
<td>0.804</td>
<td>6.665</td>
<td>0.559</td>
<td>–0.015</td>
<td>767,262</td>
</tr>
<tr>
<td>Effect in %</td>
<td>–0.2</td>
<td>–0.4</td>
<td>–0.2</td>
<td>–</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Notes: Estimates show the estimated differences between the DMEs obtained with net-of-tax inheritances (as in Table 2) and DMEs obtained with gross inheritances. The estimates are based on data on 475,120 heirs (2002–2004 cohorts). Bootstrapped standard errors are presented in parentheses (1,000 repetitions). Effect in % is calculated as (Tax repeal effect) / Mean of outcome T – 1) × 100. Standard errors are presented in parentheses. * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level.

To explain what causes the disequalizing effect of the inheritance tax, Figure 7 displays the average level of inheritance and gift tax payments by the heirs’ pre-inheritance wealth levels. Wealthier heirs pay more in taxes in absolute terms but less relative to their initial wealth. This finding implies that, for the wealthiest heirs, both their inheritances and inheritance taxes are relatively insignificant in relation to their pre-inheritance wealth, while both inheritances and tax payments are substantial relative to the pre-inheritance wealth of the less wealthy. We thus interpret the results of the test as evidence that the equalizing effect of inheritances would have been slightly stronger without the inheritance tax.
Figure 7. Absolute and Relative Inheritance Tax Payments by Pre-Inheritance Wealth Decile. Wealth (SEK 1,000) and inheritance tax (SEK 1,000) are presented in 2003 constant prices. Wealth deciles 1–3 are omitted because of negative values for wealth.

The analysis has hitherto only considered the tax payments and not the possible uses of the tax revenues. To facilitate the interpretation of our results and put them into perspective, we show the possible redistributive role that the tax receipts can play. Second, we examine whether our results reflect the specific structure of the Swedish inheritance tax institutions of the early 2000s by assessing what would have happened if a confiscatory tax had been levied instead. Table 7 reports DME estimations under these extensions.

In Panel A, we show DMEs under the hypothetical scenario, that the actual inheritance tax revenues are redistributed as lump sum transfers according to three alternative redistributive schemes: giving to all heirs, giving to heirs with below-median wealth and giving to heirs with wealth in the bottom quartile of the wealth distribution. The results indicate that redistribution can strongly counteract the disequalizing effect of the inheritance tax found in Table 6. When the revenues are redistributed among all heirs, the equalizing effect of the inheritances increases (instead of decreases, as it did when we only considered tax payments). Directing revenues to heirs in the bottom half or the bottom quartile of the wealth distribution leads to further equalization. Under all three redistribution schemes, the relative inequality falls more than in the
baseline case. The absolute dispersion is also reduced as a consequence of redistributing tax revenues.

In Panel B of Table 7, we simulate the redistribution effects under a fully confiscatory tax to determine how much the results are due to the specific institutional structure of the Swedish inheritance tax in the 2000s. Of course, the case of an imagined 100 percent inheritance tax would most likely have implications for wealth accumulation and the amount of inherited wealth. However, we prefer this scenario for two reasons. First, it represents an upper level for the redistributive impact of inheritance taxation, and milder variants will thus lead to outcomes within this case and the baseline cases. Second, it reflects an interesting counterfactual to our main analysis, namely, the case of literally “no inheritance”, whereas our baseline analysis compares the treatment of inheriting with an “inheriting later” counterfactual.

Panel B of Table 7 reports the results from this exercise under the same three redistributive schemes as in Panel A. Redistributing the revenues from a confiscatory tax clearly has a sizable impact on the distribution: giving to everyone almost doubles the equalizing effect of inheritance, from the baseline of –7 percent to –13 percent. When applying the directed redistributive schemes, the equalizing effect grows even more, reducing the Gini coefficient by up to almost 22 percent.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(1) Gini</th>
<th>(2) P90/P50</th>
<th>(3) Top 10%</th>
<th>(4) Bottom 50%</th>
<th>(5) P75–P25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline DME</td>
<td>-0.056***</td>
<td>-1.122***</td>
<td>-0.036***</td>
<td>0.035***</td>
<td>63,822***</td>
</tr>
<tr>
<td>Group receiving transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>-0.068***</td>
<td>-1.276***</td>
<td>-0.043***</td>
<td>0.042***</td>
<td>63,884***</td>
</tr>
<tr>
<td>Below median W</td>
<td>-0.076***</td>
<td>-1.245***</td>
<td>-0.044***</td>
<td>0.049***</td>
<td>41,915***</td>
</tr>
<tr>
<td>Lowest W quartile</td>
<td>-0.079***</td>
<td>-1.155***</td>
<td>-0.044***</td>
<td>0.050***</td>
<td>44,929***</td>
</tr>
</tbody>
</table>

Notes: Estimates are based on differences between the wealth distribution in \( T - 1 \) and the distribution of the sum of inheritances and wealth in \( T - 1 \), using data on 475,120 heirs. Bootstrapped standard errors are presented in parentheses (1,000 repetitions). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level.

In summary, inheritance taxation alone does not seem to equalize wealth; instead, it slightly reverses the equalizing impact of inheritances. However, when inheritance tax revenues
are also considered and used for redistributive purposes, the total effect may be increased equality.

6. CONCLUDING DISCUSSION

Our findings of an equalizing impact of inherited wealth have implications for our understanding of the intergenerational transmission of resources and for economic inequality in general.

First, if the poor tend to consume new wealth and the rich are more likely to save it, then the theory predicts the transmission impact to be one of disequalization, as noted by Scholz (2003). Our results are consistent with such behavioral responses, shown by the difference between the larger DMEs and smaller BAEs. However, these responses are not quantitatively large enough to balance the main equalizing impact, and the equalizing impact persists at least a few years after the inheritance treatment.

Second, historical circumstances and the institutional context of Sweden may have specific bearing on the detected patterns. Inequality in marketable wealth in a country with an extensive welfare state is not necessarily directly comparable to inequality in countries in which people are more reliant on their own savings. However, since Sweden is no longer exceptional in terms of tax revenues as share of GDP (ranked seventh in 2014), our results could be well generalized to many other countries. It should be noted, though, that a major part of the inherited wealth analyzed was generated during the 1960s, 1970s and 1980s, a period in the Swedish history with peaking egalitarian welfare-state policies and relatively compressed income and wealth distributions. The years thereafter saw both liberalized policies and widening gaps. Could it be that these historical trends in inequality and redistribution are reflected in the equalizing impact of inheritance documented in the study, and thus that heirs not only inherited wealth but effectively also the previous, more equal wealth distribution? At this point, we can only speculate, but such an interpretation would be in line with Nybom and Stuhler’s (2014) recent theoretical work on the mechanisms of intergenerational transmission, showing that past institutions and institutional change in a parental generation can have long-lasting effects and eventually affect the offspring generation through the transmission process. On the other hand, our findings are in line with the previous results from Europe, Japan, and the United States, suggesting that inheritances equalize the wealth distribution in many countries.

Moreover, the fact that the inheritance law stipulates that heirs do not inherit any debts the decedent may have upon death also contributes to the equalizing effects of inheritances that
we find. The Swedish inheritance law is, however, not unique in this feature. In most countries, debts are not passed on to the heirs and even in countries where they are (e.g., Spain and Japan), the heir can refuse the inheritance.

Third, our focus on the inequality of personal wealth leaves out other relevant distributional dimensions. One closely related outcome is lifetime resources which is the sum of lifetime earnings and all gifts and bequests. Lifetime earnings are more evenly distributed and much larger than the sum of gifts and bequests, and this could make the distributional consequences of inheritances markedly different from what we observe (although early simulation studies by Blinder (1973) and Davies (1982) do not indicate such marked differences). From a more general perspective, investigating how inheritances affect other aspects of inequality, such as income, leisure, consumption and health, would be interesting.

ACKNOWLEDGEMENTS

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REFERENCES


Appendix for Inheritance and Wealth Inequality: Evidence from Population Registers

Mikael Elinder, Uppsala University and IFN
Oscar Erixson, Uppsala University
Daniel Waldenström, Uppsala University, CEPR, IZA and IFN

March 2018
Appendix A: Additional data description

The starting point for our analyses is the population of Swedish residents who passed away during the three years 2002-2004 and how the wealth they left behind affected the distribution of wealth among the heirs.

According to Statistics Sweden, the number of deaths per year in Sweden during this period were 278,502 (95,009, 92,961, and 90,532, per respective year). In the Belinda database, there are 278,805 unique decedents listed for these three years (2002: 94,944, 2003: 92,883, and 2004: 90,978). The correspondence between the two registers is thus nearly perfect.


From this initial population we deliberately exclude some decedents and heirs. Table A1 shows how many heirs and decedents that are excluded due to each criteria. Note that any individual heir or decedent may be excluded due to more than one of these criteria. Applying all exclusion criteria leaves us with an analysis sample of 475,120 heirs. In addition, the table reports the total amount of estate wealth that is affected by each criteria.

First, we exclude all decedents who passed away between 17th and 31st of December 2004 and their heirs, because these heirs were ex-post exempted for inheritance taxation due to the extraordinary event of the Asian Tsunami.

Second, we exclude heirs who are spouses, registered partners or cohabiter with the decedent. With this restriction we focus the analysis on the final estate division following the last surviving spouse. A surviving spouse’s right to inheritance precedes that of common children as well as that of the decedent’s parents, siblings and siblings’ offspring. These heirs are remaindermen to the decedent’s estate, which means that they become entitled to the inheritance from the decedent only when the surviving spouse eventually passes away. Remaindermen are not part of the study population. However, children of the decedent, who are not children of the surviving spouse are not remaindermen as they receive the inheritance immediately following the parent’s demise. These children are therefore part of the study population and included in the analyses.

Third, we exclude heirs who do not receive any direct inheritance but only so called cedes,

i.e. when another heir pass on some of the inherited amount to his or her children. We make this exclusion because this transfer is the choice of the heir and not of the decedent. The ceded amount is added back to the ceding heir’s inheritance.

Fourth, we exclude heirs younger than 18 years at the time of the inheritance. This is because these heirs do not have full ownership of their wealth. However, in some of the robustness analyses, we include also these heirs.

Fifth, we also exclude organizations since they do not contribute to the distribution of personal wealth.

Sixth, we exclude heirs who are not registered as living in Sweden the 31st of December of the year before the decedent passes away. Most of these heirs are likely to be infants, foreigners, or Swedish citizens who have emigrated.

While our study population contains 560,784 heirs, we lack some key information on some of them which leaves us with an unbalanced panel containing 475,120 heirs, referred to as Analysis sample. Below, we describe the two additional exclusions that we make (referred to as criteria 7 and 8 in Table A1).

First, we exclude individuals for whom there is no correspondence between the inherited amount, the succession rules and the estate of the deceased. A number of heirs are reported as having inherited zero wealth although the deceased donor passed away with a positive estate. For 73% of these cases we can calculate the correct value of the inheritance by following the succession law. For the remaining cases we cannot determine the estate distribution (e.g. because the decedent has a will) and, hence, the correct value of the inheritance and these cases are therefore excluded from the analyses.

Second, we exclude heirs for whom a Swedish personal identity number (PIN) was not reported in the deceased’s estate inventory report. Without this identifier, we cannot merge the data on personal wealth to the inheriting individuals. One potential reason that individuals may lack a PIN is because he or she is not a Swedish resident. Missing PINs for non-Swedish residents is not an issue as these individuals do not contribute to the wealth distribution in Sweden. Misreporting is another potential source of a missing PIN. While the law requires that all individuals mentioned in the estate division have a PIN in the estate inventory report, we cannot exclude the possibility that some have failed to comply with this requirement. One may worry that heirs lacking a PIN differ systematically from heirs with a PIN, especially if they would be

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35 Some heirs pass away during the study period and some lack wealth data for a specific year, e.g. because they have emigrated.
extremely wealthy. We have investigated this issue by comparing some descriptive statistics of the two groups, heirs with and without a PIN (in Study population), using only the variables in the Belinda database (note that we cannot link data from other registers to the heirs when there is no PIN). The results indicate that heirs with PIN receive on average SEK 76,539 (USD 11,597) from the current decedent and heirs without PIN SEK 58,428 (USD 8,853). This, admittedly crude, comparison indicates that heirs without PIN are somewhat less wealthy than the average heir with PIN. The other main difference between the groups is that heirs without PIN are much less likely to be the child of the decedent (7% vs. 58%). Instead, they are often a sibling or nephew/niece of the decedent (56%) or a relative outside the succession order, a friend or similar (15%).
<table>
<thead>
<tr>
<th>Exclusion criteria</th>
<th>No. of heirs</th>
<th>No. of decedents</th>
<th>Total estate wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial population:</td>
<td>1,080,888</td>
<td>276,017</td>
<td>88,732,857,657</td>
</tr>
<tr>
<td>Exclusion criteria:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 17 - 31 Dec 2004</td>
<td>15,029</td>
<td>4,627</td>
<td>1,940,301,842</td>
</tr>
<tr>
<td>2 Spouses and remaindernen</td>
<td>312,939</td>
<td>80,770</td>
<td>24,380,371,203</td>
</tr>
<tr>
<td>3 Only cedes</td>
<td>197,686</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4 Under 18 years old</td>
<td>60,942</td>
<td>1,357</td>
<td>249,258,112</td>
</tr>
<tr>
<td>5 Organization</td>
<td>12,314</td>
<td>2,015</td>
<td>958,903,122</td>
</tr>
<tr>
<td>6 Not living in Sweden</td>
<td>12,790</td>
<td>536</td>
<td>143,648,576</td>
</tr>
<tr>
<td>Fulfills any of (1)-(6)</td>
<td>520,104</td>
<td>95,287</td>
<td>32,315,407,607</td>
</tr>
<tr>
<td>Study population</td>
<td>560,784</td>
<td>180,730</td>
<td>56,417,450,050</td>
</tr>
<tr>
<td>7 No inheritance data</td>
<td>28,380</td>
<td>5,739</td>
<td>526,752,126</td>
</tr>
<tr>
<td>8 No PIN</td>
<td>62,070</td>
<td>7,298</td>
<td>3,125,090,206</td>
</tr>
<tr>
<td>Fulfills any of (7)-(8)</td>
<td>85,664</td>
<td>12,509</td>
<td>10,058,315,355</td>
</tr>
<tr>
<td>Analysis sample</td>
<td>475,120</td>
<td>168,221</td>
<td>52,831,593,274</td>
</tr>
</tbody>
</table>
Appendix B: Complementary results

B.1 Complement to Section 2.3 “Descriptive statistics”

Table B1
Heirs’ relationship to the decedent, by cohort

<table>
<thead>
<tr>
<th>Cohort:</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total class 1</td>
<td>64.5</td>
<td>65.3</td>
<td>63.5</td>
</tr>
<tr>
<td>Child</td>
<td>58.8</td>
<td>59.5</td>
<td>57.7</td>
</tr>
<tr>
<td>Grandchild</td>
<td>5.5</td>
<td>5.6</td>
<td>5.6</td>
</tr>
<tr>
<td>Great grandchild</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Others in class 1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Total class 2</td>
<td>31.7</td>
<td>30.8</td>
<td>32.4</td>
</tr>
<tr>
<td>Father</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Mother</td>
<td>1.0</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Sibling</td>
<td>8.8</td>
<td>8.8</td>
<td>8.9</td>
</tr>
<tr>
<td>Nephew/niece</td>
<td>17.4</td>
<td>16.5</td>
<td>17.6</td>
</tr>
<tr>
<td>Grandchild of sibling</td>
<td>2.6</td>
<td>2.6</td>
<td>2.9</td>
</tr>
<tr>
<td>Others in class 2</td>
<td>1.1</td>
<td>1.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Total class 3</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Grandmother</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Grandfather</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Uncle</td>
<td>&lt;0.1</td>
<td>0.1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Aunt</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Outside succession order</td>
<td>3.8</td>
<td>3.8</td>
<td>3.9</td>
</tr>
<tr>
<td>Child of partner</td>
<td>0.1</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>Foster child</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Stepcchild</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Others</td>
<td>3.3</td>
<td>3.3</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Number of observations 165,641 160,387 149,092

Notes: Variables are expressed in percent

B.2 Complement to Section 3.1.1 “Estimation results: DME”

In this section, we report results from the tests discussed in Section 3.1.1. All the results are presented for a larger set of distributional measures. In addition to the five main measures that we have presented hitherto, we also show results for the P99/P50 ratio, the wealth share held by the top 1%, the coefficient of variation (CV) and an additional measure of absolute dispersion, P99–P1. In Table B2, Panel A, we start by reporting the baseline estimates, reproduced from Table 2, Panel A. The DMEs with respect to the additional measures (P99/P50, Top 1%, CV and P99–P1) display a pattern that is akin to that for the main measures, reinforcing the
conclusion that relative inequality decreases and absolute dispersion increases because of inheritances.

B.2.1 The role of young heirs

One possible concern is that our main finding may be driven by the small group of relatively young heirs who, for standard life-cycle reasons, have almost no own wealth and thus dramatically change status when they inherit (the decedents who are associated with these heirs may also be relatively wealthy if they pass away earlier than expected).

We examine whether relatively “poor” young heirs drive the equalizing inheritance effect by removing all heirs who are younger than 40 from the analysis. The result, shown in Table B2 Panel B, show that the equalizing effect is less pronounced when we exclude young heirs. The qualitative conclusion remains, but some estimates become statistically insignificant.

Overall, we conclude that young heirs do not drive the main inheritance effect. However, we do find that the effect is larger among younger heirs, which likely stems from these individuals lacking wealth and the relatively younger decedents having somewhat higher wealth than older decedents. However, it is simply a fact of life rather than a measurement problem that some heirs are young, which our population-wide data that cover all decedents and all heirs can establish for the first time.

We also do a robustness test in which we, instead of excluding young heirs, include also minors i.e. heirs under 18 years old. The results are presented in Table B2 Panel C and show no important differences when compared with our baseline results.

B.2.2 Undervaluation of recorded Assets

Consumer durables (i.e., the values of assets such as vehicles, furniture, and machines) are not reported in the Swedish Wealth Register. In fact, consumer durables are not part of the official personal wealth definition in the United Nations’ System of National Accounts, but this exclusion is partly at odds with the economic reality in many households, where these goods can be important, not least in relative terms in less wealthy households. To assess how sensitive our results are to potential undervaluation of assets, we adjust the asset values in the following two ways.

First, we add, to heirs’ wealth, SEK 10,000 plus ten percent of the total value of the reported the assets in the portfolio. We motivate this adjustment with reports from aggregated data that consumer durables amounted to about ten percent of total household assets in Sweden in the early 2000s (Waldenström 2016) and that even individuals without recorded assets are
likely to own some assets with a marketable value. We believe that this adjustment of the wealth levels (which is admittedly somewhat arbitrary) brings us closer to the true values of the heirs’ marketable wealth. The results, reported in Table B2 Panel D, are consistent with our main results. The decrease in the Gini coefficient is slightly lower when the imputed values of durables are added, which is expected because durables are relatively more important in the lower part of the distribution. The impact on the other measures of inequality is also unaffected, both in terms of size and statistical significance, by this adjustment.

Second, we use information from the population-wide Car Register (CR) and list prices (LP) of new cars from 1993 and onwards provided by the Swedish Tax Authority to estimate car values for all heirs in the following way. First, for a random sample of 500 heirs in the 2004 cohort we manually add prices of cars (when new) from LP to CR. Second, on this sample we estimate a flexible price model (using dummies for brand, horsepower, weight, fuel type and 4wd). Third, we use this model to predict car values for all heirs in our data. Fourth, we use a depreciation model provided to us by David Seim (and used in Seim 2017) to account for the age of the cars. Finally, we deflate all values to the price level of 2003.

To assess the robustness of the DME with respect to underreporting of durables, we simply add the car value to the heirs’ wealth. While, the baseline inequality, measured by the Gini coefficient, falls from 0.80 to 0.77, the effect of inheritances on inequality (measured by Gini and the other unidimensional measures) does not change much. Detailed results are presented in Table B2, Panel E.

In sum, we conclude that our results are robust to the inclusion of consumer durables in the heirs’ portfolios.

**B.2.3 Market value adjustment of inheritances**

The inheritances used in the calculation of the DMEs in section 3.1 are in tax values. In what follows, we describe how we adjust inheritances to market values and how the adjustment affects the DMEs.

The main issue is that we do not know the asset components of the inheritance receipts. If we did, we could adjust each asset to its market value. Neither do we have information on the asset components of the estates for all decedents. If we had, we could adjust each asset to its market value and then distribute the adjusted wealth to the heirs according to their inheritance shares. Our solution to these problems is to use the Wealth Register to get information
on the decedents’ assets and debts at the end of the year prior to the demise.  

The Wealth Register details the assets and debts that enter the definition of net wealth that we use in the main analysis. The objective is to calculate an adjustment factor for each decedent that will then be used to adjust the heirs’ inheritances to market values. The adjustment factor is calculated as the ratio between net wealth at market value and net wealth at tax value. In the Wealth Register debts are reported at market values and were assessed so, also in the calculation of the inheritance tax. Regarding the assets, these are divided into the categories: *real assets* and *financial assets*. *Real assets* contain classes such as stand-alone houses, holiday homes, agricultural property, etc., and are reported in market values and in tax values, corresponding to the tax values used in the inheritance tax calculations. 

*Financial assets* contain classes such as bank holdings, stocks, bonds, etc., and are reported in market values. For each asset class, we calculate the inheritance tax value of the asset class, using the market value and knowledge about inheritance tax valuation rates. For instance, stocks registered at the Stockholm Stock Exchange main list (A-listan) were assessed at 75 percent of the market value in the calculation of the inheritance tax and so, we calculate the tax value of these stocks by multiplying the value of these stocks with the tax factor 0.75. 

We then calculate net wealth at market value by taking the sum of assets (financial, real, and additional) at market value minus debts (at market value). For decedents were debts exceed the assets, we set the net wealth at market value to zero. This is to account for the fact that heirs do not inherit debts. Similarly, we calculate net wealth at tax value by using assets (financial, real, and additional) at tax value and debts (at market value), and set negative values to zero. For each decedent, we calculate the adjustment factor by taking the ratio between net wealth at market value and net wealth at tax value. For decedents with zero net wealth at tax value, we set the adjustment factor to one. The mean of the adjustment factor is 1.27.

For each heir we multiply the reported inheritance by the adjustment factor to get the inheritance at market value. The DMEs are calculated using Equation 1, in which we replace the inheritance at tax value with inheritance at market value. Table B2, Panel F, shows the results. With this adjustment relative inequality in the baseline is slightly lower (8.1% instead

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36 The assumption we make in the calculations is that the asset composition in the end of the year prior to the demise is the same as that at death. This could be seen as controversial given that Kopczuk (2007) reports that much tax planning with respect to estate taxation occurs shortly before death. However, Erixson and Escobar (2018) uses the same data as in the current paper and show that decedents do not appear to increase their holdings of tax beneficial assets prior to death in response to the Swedish inheritance tax.
of 7%, as measured by the Gini coefficient), but DMEs do not change much due to this adjustment.

B.2.4 Inequality in asset types

In the previous analysis, we studied the impact of the total receipt of inheritance on the distribution of total net wealth. We now continue by dissecting these two economic variables into their components and test for the impact of inheritance of financial assets and real assets (housing and land) on the distributions of financial and real assets. We observe the components of the heir’s wealth and could categorize them into real and financial assets. However, we do not observe the components of the inheritance receipt directly. Neither, do we observe the components of the decedent’s estate. Instead, we proxy the inheritance of real and financial assets using information on the components of the decedent’s net wealth at the end of the year prior to the demise. For example, for a decedent with 300,000 SEK in financial assets and 700,000 SEK in real assets, the share of financial assets and real assets are 0.3 and 0.7 respectively. We then calculate the inheritance receipts of the two asset types by multiplying the actual inheritance by these two shares. This means that, an heir inheriting 100,000 SEK from the decedent described above is assumed to receive 30,000 SEK in financial assets and 70,000 SEK in real assets. We then calculate the DME using Equation 1, in which we substitute the net wealth with the asset type (financial or real) and the inheritance with the imputed asset value.

In Figure B1, we display the values of real and financial assets, as well as debts, in the year before the demise over the distribution of net wealth for decedents (left panel) and heirs (right panel). For the decedents, the values of real and financial assets are similar across the distribution, implying that the heirs typically inherit equal amounts of real and financial assets. Regarding the debts, these are negligible except in the ends of the distribution. Looking at the right panel, we see that, for the heirs, real assets generally make up a substantially larger fraction of the total assets than financial assets.

In Table B2, Panel G and Panel H, we report the estimates of the DMEs with respect to the unidimensional measures of relative inequality and dispersion. The first thing to note from the table is that baseline relative inequality is higher and dispersion is lower in real assets than in financial assets. Regarding the DMEs, the general pattern, for both asset classes, is similar to what we found for net wealth; relative inequality decreases while absolute dispersion increases as consequence of inheritances. Interestingly, however, is that the percentage effect is substantially larger for financial assets than for real assets.
Figure B1. Composition of Net Wealth of Decedents and Heirs by Wealth Deciles. Wealth (SEK 1,000) is presented in 2003 constant prices.
### Table B2
Robustness tests and additional results

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Gini</th>
<th>P90/P50</th>
<th>P99/P50</th>
<th>Top 1%</th>
<th>Top 10%</th>
<th>Bottom 50%</th>
<th>CV</th>
<th>P75-P25</th>
<th>P99-P1</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Baseline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>-0.056***</td>
<td>-1.122***</td>
<td>-4.024***</td>
<td>-0.016***</td>
<td>-0.036***</td>
<td>0.035***</td>
<td>-0.891***</td>
<td>63,822***</td>
<td>261,788***</td>
</tr>
<tr>
<td>Effect %</td>
<td>-7.0</td>
<td>-16.8</td>
<td>-19.1</td>
<td>-8.2</td>
<td>-6.4</td>
<td>.</td>
<td>-11.4</td>
<td>-8.3</td>
<td>-4.7</td>
</tr>
<tr>
<td>B: Excluding young heirs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>-0.048***</td>
<td>-0.712***</td>
<td>-2.523***</td>
<td>-0.012***</td>
<td>-0.030***</td>
<td>0.030***</td>
<td>-0.272***</td>
<td>54,562***</td>
<td>290,294***</td>
</tr>
<tr>
<td>Effect %</td>
<td>-6.3</td>
<td>-12.7</td>
<td>-14.5</td>
<td>-7.2</td>
<td>-5.7</td>
<td>.</td>
<td>-8.2</td>
<td>-6.5</td>
<td>-4.9</td>
</tr>
<tr>
<td>C: Including minors</td>
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<td></td>
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</tr>
<tr>
<td>Inheritance effect</td>
<td>-0.057***</td>
<td>-1.241***</td>
<td>-4.413***</td>
<td>-0.016***</td>
<td>-0.037***</td>
<td>0.035***</td>
<td>-0.924***</td>
<td>66,597***</td>
<td>266,550***</td>
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<tr>
<td>Effect %</td>
<td>-7.1</td>
<td>-17.9</td>
<td>-20.1</td>
<td>-8.3</td>
<td>-6.5</td>
<td>.</td>
<td>-11.6</td>
<td>8.9</td>
<td>4.8</td>
</tr>
<tr>
<td>D: Adding consumer durables, approximation</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>-0.047***</td>
<td>-0.847***</td>
<td>-3.050***</td>
<td>-0.013***</td>
<td>-0.030***</td>
<td>0.029***</td>
<td>-0.769***</td>
<td>55,480***</td>
<td>263,504***</td>
</tr>
<tr>
<td>Effect %</td>
<td>-6.1</td>
<td>-13.8</td>
<td>-15.9</td>
<td>-7.2</td>
<td>-5.6</td>
<td>.</td>
<td>-10.1</td>
<td>6.4</td>
<td>4.3</td>
</tr>
<tr>
<td>E: Adding consumer durables, car values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>-0.051***</td>
<td>-0.890***</td>
<td>-3.143***</td>
<td>-0.014***</td>
<td>-0.032***</td>
<td>0.031***</td>
<td>-0.816***</td>
<td>58,013***</td>
<td>274,029***</td>
</tr>
<tr>
<td>Effect %</td>
<td>-6.5</td>
<td>-14.6</td>
<td>-16.7</td>
<td>-7.7</td>
<td>-5.968</td>
<td>.</td>
<td>-10.9</td>
<td>7.3</td>
<td>4.8</td>
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<tr>
<td>F: Market value adjustment of inheritances</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>-0.065***</td>
<td>-1.310***</td>
<td>-4.607***</td>
<td>-0.015***</td>
<td>-0.041***</td>
<td>0.040***</td>
<td>-1.050***</td>
<td>91,070***</td>
<td>403,758***</td>
</tr>
<tr>
<td>Effect %</td>
<td>-8.1</td>
<td>-19.6</td>
<td>-21.9</td>
<td>-7.9</td>
<td>-7.3</td>
<td>.</td>
<td>-13.4</td>
<td>11.9</td>
<td>7.2</td>
</tr>
<tr>
<td>Panel G: Financial assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>-0.056***</td>
<td>-3.845***</td>
<td>-17.837***</td>
<td>-0.035***</td>
<td>-0.060***</td>
<td>0.027***</td>
<td>-3.341***</td>
<td>57,172***</td>
<td>223,147***</td>
</tr>
<tr>
<td>Effect %</td>
<td>-7.1</td>
<td>-35.6</td>
<td>-40.6</td>
<td>-13.4</td>
<td>-9.5</td>
<td>.</td>
<td>-17.7</td>
<td>26.7</td>
<td>9.7</td>
</tr>
<tr>
<td>H: Real assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>-0.017***</td>
<td>-0.258***</td>
<td>-0.950***</td>
<td>-0.005***</td>
<td>-0.012***</td>
<td>0.013***</td>
<td>-0.136***</td>
<td>33,139***</td>
<td>84,031***</td>
</tr>
<tr>
<td>Effect %</td>
<td>-2.4</td>
<td>-5.1</td>
<td>-6.4</td>
<td>-3.3</td>
<td>-2.5</td>
<td>.</td>
<td>-4.0</td>
<td>4.4</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Notes: The estimates provide the difference between the unidimensional measure for the wealth distribution in \( T - 1 \) and the unidimensional measure for the distribution of the sum of wealth in \( T - 1 \) and the inheritance. The estimates in Panel A are based on data on 475,120 heirs (2002–2004 cohorts). The estimates in Panel B are based on data on 404,852 heirs (2002–2004 cohorts). The estimates in Panel C are based on data on 484,725 heirs (2002–2004 cohorts). The estimates in panels D–H are based on data on 475,120 heirs (2002–2004 cohorts). Bootstrapped standard errors are presented in parentheses (1,000 repetitions). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. Effect in % is calculated as \((\text{Inheritance effect} / \text{Mean of outcome} \cdot T - 1) \times 100\).
B.3 Complement to Section 3.1.2 “How can the equalizing effect be explained?”

B.3.1 Because the rich have more children?

If the rich chose to have more children, it would mean that larger estates are distributed among a larger number of heirs. In Figure B2, the left panel, we examine the potential of this mechanism in driving the equalizing effect by depicting the average number of children by the level of the decedents’ estate size. The graph shows that, in the bottom eight deciles, the average number of children hovers at approximately 1.8, then falls to around 1.5 in the ninth estate decile and to 1.3 in the highest estate decile. Even when only considering the estates of decedents with children, the top estates do not have more children than the overall average. The right panel of Figure B2 shows the positive relationship between estate size and heirs’ wealth. Of course, there are many factors behind this pattern, but the analysis nevertheless offers evidence against that the wealthy, on average, have more children and that this would explain the equalizing effect of inheritances.

Another, more direct, way of showing that variation in the number of children does not drive our results, is to perform a counterfactual analysis in which observations, in the Children sample (278,781 observations) are weighted, so that the number of children per estate equals the sample mean, 2.25 children. The weight is calculated as $weight = \text{mean number of children/number of children in the family}$ and inheritances are adjusted as follows: $\text{Adjusted inheritance} = \text{Actual inheritance} \times (1/weight)$. By doing this, we mimic a situation in which all heirs who are children to the decedent receive an inheritance of the size they would get had all families had the same number of children. In Table B3 Panel A, we show that the results from this exercise are nearly identical to our main results (c.f. Panel A of Table 2). In other words, these tests all suggest that the variation in the number of children cannot account for the equalizing effect of inheritances found in our main analysis.

B.3.2 Because the rich testate their wealth to charity?

Differential giving behavior among rich decedents represents another potential driver of the equalization result. If the rich bequeath a large fraction of their wealth to charity or by writing wills to non-children heirs, this could contribute to the equalizing effect of inheritances. Thanks to the Swedish inheritance register data, we are able to shed some light on this issue.

Charitable bequests can be observed since the data include also legal entities, i.e. organizations who are recipients of inheritances. We know the identity of the organization; whether it is a charity, a government institution, religious organization or alike. From the perspective of the donor, it is reasonable to assume that bequests to all of these organizations are charitable in a wider sense.37

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37 Trust funds are extremely rare in Sweden, and even more so in the early 2000’s. This is not surprising, given that trust funds were liable to inheritance taxation. From the names of the funds in our data, the size of the inheritances
In Figure B3, we plot the fraction of decedents giving to charity by estate decile (left axis). It can be noted that the fraction increases in estate size. However the fraction giving to charity is very small: ranging from zero in the first decile to eight percent in the top decile. The right axis of the figure displays how the share of the estate that is transferred to charity varies across the estate distribution. While the share admittedly increases in estate size it is only around two percent for the top decile. This conclusion is also supported by a counterfactual analysis in which we hypothetically assume that bequests to organizations are distributed among the heirs (Analysis sample, 475,120 observations) according to the proportions they receive of the estate (net of charitable bequests). The results are presented in Table B3 Panel B. Again, the results are nearly identical to the main results. We are, therefore, confident that charitable bequests, among the rich, are not contributing much to the finding that inheritances lead to lower relative inequality.

Figure B3. Fraction Giving to Charity and Share of Estate Given to Charity, by Estate Deciles.

they receive and the taxes they pay we are confident that we have a negligible amount of inheritance transferred to trust funds in our data.
B.3.3 Because the rich testate wealth to more heirs?

Wills give decedents a legal right to distribute the estate to others than their children (who are legally entitled to at least half of what they would receive in the absence of a will). We observe wills in the inheritance register, and test the role of wills by hypothetically distributing the estate according to the default succession rule, ignoring all the executed wills. The results, obtained from the Children sample (278,781 observations) are presented in Table B3 Panel C. Once again, the results are nearly identical to our main results. If anything, the equalizing effect is smaller than the baseline DME (c.f. Panel B of Table 2).

B.3.4 Because rich heirs get large inter vivos gifts?

Intergenerational transfers consist of both inheritances at death and gifts that the decedents give to their heirs during lifetime, i.e., \textit{inter vivos}. While we cannot (and do not attempt to) estimate the distributional effects of all \textit{inter vivos} transfers, if substantial amounts were transferred during the years just prior to the inheritance, our results would be affected, as our empirical strategy does not capture this part of pre-inheritance responses in the wealth distribution. In principle, gifts over a certain threshold were subject to a gift tax at the same rate as if they had been received as an inheritance, but some gifts may not have been reported to the tax agency. In this section, we present the results from three empirical tests that aimed to elucidate the role played by gifts in our main findings.

Our data contain information about the sum of the taxable gifts made to the respective heir over the ten years prior to the decedent’s death, and these data are used in our first test. Our calculations show that the aggregate value of these gifts corresponds to 3.6 percent of the aggregate value of net-of-tax inheritances, which is clearly a lower bound of the share of actual gifts, indicating that many gifts have not been reported to the tax agency. Nevertheless, we subtract the sum of these taxable gifts from the heirs’ pre-inheritance wealth to obtain an appraisal of how much wealth the heir had before receiving such gifts and then perform the main analyses again. When estimating the DMEs, we also add the gift value to the received inheritance value, as though the gift were considered an inheritance instead. The results, shown in Table B3 Panel D, show that the inheritance effect with respect to the Gini coefficient and the other measures of inequality are nearly identical to the main effects in Table 2. Taken together, these results suggest that reported taxable \textit{inter vivos} gifts play no important role in our main findings.
The second test seeks to capture the impact of potentially existing gifts (in addition to the reported taxable ones). For this purpose, we follow Piketty and Zucman (2015), who argue that, absent actual data on *inter vivos* gifts, these transfers can be approximated as a fixed share of the bequeathed wealth. Following this suggestion, we compute two different gift amounts for each heir, one equal to 20 percent of the inheritance (which roughly corresponds to the level used for Sweden in the 2000s by Ohlsson et al. 2014) and one equal to 50 percent of the inheritance. Table B3 Panel E and Panel F present the results from this exercise. Here, the inequality-reducing effect of inheritance increases compared to when we use the observed (and possibly understated) gifts.

In the third test, we impute gift values for all heirs, exploiting information about actual gifts to the heirs who have received gifts. Here, our assumption is that, conditional on estate size, decedents *without* reported gifts still made gifts of the same size as decedents *with* reported gifts. More specifically, we divide the decedents *with* reported gifts into estate size deciles and calculate the median gift amount within each decile. Figure B4, displays the relationship between estate size and gift amount for the decedents who report gifts. We then divide the decedents *without* gift reports into ten estate groups using the same decile thresholds as we use for those with reports, assigning the non-giving decedents the decile-specific median value of gifts and distributing that amount among their heirs in equal proportions. Finally, we follow the same procedure as in the previous tests and subtract the imputed gift(s) from the heirs’ pre-inheritance wealth and perform the main analysis again. In the analysis, we also add the imputed gift value to the inheritance value. The results of this third test, reported in Table B3 Panel G, suggest that the equalizing effect is once again larger than that in the main results and is similar to the estimates from the second gift test. In fact, the estimates closely resemble the estimates that we calculated in the test that made a 50-percent gift amount adjustment. The aggregate *imputed* gift value as a share of total inheritance is 53 percent, which may explain the similarity between these two results. However, unlike the previous test, which assumed that all heirs received the same proportion, the current test recognizes that gifts are not necessarily proportional to inheritances, which becomes evident when we again examine Figure B4. Wealthier decedents have obviously made larger gifts in absolute terms than decedents with lower estate values, but the ratio of gifts to estates decreases with the estate size. In other words, compared with those with larger estates, decedents with smaller estates make smaller gifts in absolute terms, but they give away larger shares of their wealth during their lifetimes. Figure B4 can thus explain why we find that the equalizing effect of inheritance increases when we adjust
the analysis to account for imputed gifts.

Figure B4. Absolute and Relative Size of Gifts, by Estate Deciles. The values are based on decedents with reported gifts. Gifts and estates (SEK 1,000) are presented in 2003 constant prices.

B.3.5 Because heirs adjust their savings in expectation of inheritances?

Here, we present new tests that are designed to assess how expectations about future inheritances may influence heirs’ pre-inheritance wealth levels. A first test is based on the idea that if decedents (in the years before the demise) suddenly become richer (poorer) and heirs adjust their savings in response to changes in the expected size of inheritances, we expect that the heirs will respond by dissaving (saving) an offsetting amount of wealth. In particular, we estimate a simple heir-decedent regression (at the heir level), in which we test whether changes in the expected size of inheritances, measured as the change in the decedent’s wealth from \( T - 3 \) to \( T - 1 \) (adjusted by the number of heirs), lead to an offsetting change in wealth among the heirs. The hypothesis posits that, if the expected inheritance increases by one SEK, the wealth of the heirs will decrease by one
The regressions that we estimate (using OLS) are of the following form:

\[
\Delta W_{i,c}^h = \alpha + \beta \frac{\Delta W_{i,c}^d}{H_{i,c}} + \gamma_c + \epsilon_{i,c},
\]

where the dependent variable \(\Delta W_{i,c}^h\) is the change in wealth of heir \(i\) of inheritance cohort \(c\) \((c = 2002, 2003, 2004)\) between \(T-3\) and \(T-1\), \(\Delta W_{i,c}^d\) the change in wealth of the decedent of heir \(i\) between \(T-3\) and \(T-1\), \(H_{i,c}\) the number of heirs of the decedent (of heir \(i\)), \(\gamma_c\) a cohort fixed effect, and \(\epsilon_{i,c}\) an idiosyncratic error term. Standard errors are clustered at the heir–decedent level.

In Table B4 Column 1 reports the regression results based on heirs of the 2002–2004 inheritance cohorts (less of heirs of decedents that had non-positive wealth in \(T-1\)), in total 373,615 observations.\(^{38}\) It can be seen that the estimate of \(\beta\) is statistically insignificant at conventional levels, implying that an increase in expected inheritance has no detectable impact on the heirs’ wealth. This suggests that short-term behavioral expectation effects are not quantitatively important.

In a second test, we exploit the idea that heirs may respond more strongly to changes in the decedent’s wealth in the years before inheritance if the decedent passes away as a result of a terminal illness rather than passing away suddenly. To investigate this idea more carefully, we use data from the Cause of Death Register to identify heir-decedent pairs in which the decedent has passed away suddenly. The classification of sudden deaths (natural and unnatural) follows the classification in Andersen and Nielsen (2011). When we perform the previous test again using only heir-decedent pairs in which the decedent passed away because of a terminal illness (299,809 observations; we again find that an increase in the expected inheritance amount has no impact on the heir’s wealth, see Table B4 Column 2 for results. Consequently, neither this test nor the previous variant of the test provide evidence of responses in the heirs’ wealth prior to inheritance.

\(^{38}\) This analysis is based on a dataset in which we have access to cause of death, but not the identity of organizations, why the sample selection is slightly different from the rest of the analyses.
<table>
<thead>
<tr>
<th>Outcome</th>
<th>(1) Gini</th>
<th>(2) P90/P50</th>
<th>(3) P99/P50</th>
<th>(4) Top 1%</th>
<th>(5) Top 10%</th>
<th>(6) Bottom 50%</th>
<th>(7) CV</th>
<th>(8) P75-P25</th>
<th>(9) P99-P1</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Imposing equal number of children per estate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.059^{***}$</td>
<td>$-1.135^{***}$</td>
<td>$-3.991^{***}$</td>
<td>$-0.016^{***}$</td>
<td>$-0.038^{***}$</td>
<td>$0.037^{***}$</td>
<td>$-0.900^{***}$</td>
<td>$62,487^{***}$</td>
<td>$246,663^{***}$</td>
</tr>
<tr>
<td>Effect %</td>
<td>$-7.5$</td>
<td>$-17.9$</td>
<td>$-20.2$</td>
<td>$-8.2$</td>
<td>$-6.8$</td>
<td></td>
<td>$-11.3$</td>
<td>$7.2$</td>
<td>$4.0$</td>
</tr>
<tr>
<td>B: Distributing charitable bequests among heirs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.057^{***}$</td>
<td>$-1.128^{***}$</td>
<td>$-4.035^{***}$</td>
<td>$-0.016^{***}$</td>
<td>$-0.036^{***}$</td>
<td></td>
<td>$0.035^{***}$</td>
<td>$-0.901^{***}$</td>
<td>$64,948^{***}$</td>
</tr>
<tr>
<td>Effect %</td>
<td>$-7.1$</td>
<td>$-16.9$</td>
<td>$-19.2$</td>
<td>$-8.2$</td>
<td>$-6.5$</td>
<td></td>
<td></td>
<td>$-11.5$</td>
<td>$8.5$</td>
</tr>
<tr>
<td>C: Ignoring wills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.058^{***}$</td>
<td>$-1.306^{***}$</td>
<td>$-4.202^{***}$</td>
<td>$-0.004$</td>
<td>$-0.031^{***}$</td>
<td>$0.038^{***}$</td>
<td>$-1.393^{***}$</td>
<td>$91,405^{***}$</td>
<td>$529,645^{***}$</td>
</tr>
<tr>
<td>Effect %</td>
<td>$-7.1$</td>
<td>$-18.9$</td>
<td>$-18.9$</td>
<td>$-1.7$</td>
<td>$-5.3$</td>
<td></td>
<td></td>
<td>$-14.3$</td>
<td>$11.8$</td>
</tr>
<tr>
<td>D: Gift adj. 1: observed gifts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.058^{***}$</td>
<td>$-1.130^{***}$</td>
<td>$-4.055^{***}$</td>
<td>$-0.016^{***}$</td>
<td>$-0.037^{***}$</td>
<td></td>
<td>$0.036^{***}$</td>
<td>$-0.914^{***}$</td>
<td>$66,925^{***}$</td>
</tr>
<tr>
<td>Effect %</td>
<td>$-7.2$</td>
<td>$-16.9$</td>
<td>$-19.3$</td>
<td>$-8.3$</td>
<td>$-6.5$</td>
<td></td>
<td></td>
<td>$-11.8$</td>
<td>$8.8$</td>
</tr>
<tr>
<td>E: Gift adj. 2: 20%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.075^{***}$</td>
<td>$-1.442^{***}$</td>
<td>$-5.170^{***}$</td>
<td>$-0.020^{***}$</td>
<td>$-0.047^{***}$</td>
<td>$0.046^{***}$</td>
<td>$-1.129^{***}$</td>
<td>$82,274^{***}$</td>
<td>$301,197^{***}$</td>
</tr>
<tr>
<td>Effect %</td>
<td>$-9.2$</td>
<td>$-20.6$</td>
<td>$-23.3$</td>
<td>$-10.3$</td>
<td>$-8.2$</td>
<td></td>
<td></td>
<td>$-14.0$</td>
<td>$11.0$</td>
</tr>
<tr>
<td>F: Gift adj.: 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.111^{***}$</td>
<td>$-1.988^{***}$</td>
<td>$-7.130^{***}$</td>
<td>$-0.028^{***}$</td>
<td>$-0.065^{***}$</td>
<td>$0.068^{***}$</td>
<td>$-1.513^{***}$</td>
<td>$100,324^{***}$</td>
<td>$307,716^{***}$</td>
</tr>
<tr>
<td>Effect %</td>
<td>$-13.0$</td>
<td>$-26.4$</td>
<td>$-29.6$</td>
<td>$-13.6$</td>
<td>$-11.1$</td>
<td></td>
<td></td>
<td>$-17.9$</td>
<td>$13.7$</td>
</tr>
<tr>
<td>G: Gift adj. 4: imputed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inheritance effect</td>
<td>$-0.102^{***}$</td>
<td>$-2.116^{***}$</td>
<td>$-7.577^{***}$</td>
<td>$-0.028^{***}$</td>
<td>$-0.067^{***}$</td>
<td>$0.070^{***}$</td>
<td>$-1.464^{***}$</td>
<td>$76,129^{***}$</td>
<td>$278,330^{***}$</td>
</tr>
<tr>
<td>Effect %</td>
<td>$-12.0$</td>
<td>$-27.6$</td>
<td>$-30.8$</td>
<td>$-13.8$</td>
<td>$-11.3$</td>
<td></td>
<td></td>
<td>$-17.3$</td>
<td>$10.1$</td>
</tr>
</tbody>
</table>

Notes: The estimates provide the difference between the unidimensional measure for the wealth distribution in \( T-1 \) and the unidimensional measure for the distribution of the sum of wealth in \( T-1 \) and the inheritance. Bootstrapped standard errors are presented in parentheses (1,000 repetitions). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. Effect in % is calculated as \((\text{Inheritance effect} / \text{Mean of outcome} \times 100)\). The estimates in Panel A are based on the Children sample, 278,781 observations (2002–2004 cohorts). The estimates in Panel B are based on Analysis sample, 475,120 heirs (2002–2004 cohorts). The estimates in Panel C are based on the Children sample, 278,781 observations (2002–2004 cohorts). The estimates in panels D–G are based on the Analysis sample, 475,120 heirs (2002–2004 cohorts).
Table B4
Testing if Heirs’ Respond to Changes in Expected Size of Inheritances.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All heirs</td>
<td>Heirs of decedents that passed away due to terminal illness.</td>
</tr>
<tr>
<td>( \beta )</td>
<td>0.052 (0.041)</td>
<td>0.068 (0.056)</td>
</tr>
<tr>
<td>Number of clusters</td>
<td>122,771</td>
<td>98,884</td>
</tr>
<tr>
<td>Number of observations</td>
<td>373,615</td>
<td>299,809</td>
</tr>
</tbody>
</table>

Notes: Standard errors, clustered at the heir–decedent level, errors in parentheses. * significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level.
B.4. Complement to Section 3.2.1 “Estimation results: BAE”

B.4.1 Placebo test for the non-parametrical illustration of the BAE on the wealth distribution

Figure B5. Placebo Test for the Non-Parametrical Illustration of the BAE on the Wealth Distribution, 2002 and 2004 Cohorts. The graph (solid) displays the difference in densities (using bins of size SEK 250,000) between the difference in densities of the wealth distributions in $T - 3$ (1999) and $T - 1$ (2001) for the 2002 cohort and the difference in densities of the wealth distributions in $T - 5$ (1999) and $T - 3$ (2001) for the 2004 cohort. The estimates are based on data on 314,733 heirs (165,641 [2002 cohort] and 149,092 [2004 cohort]). The confidence bands (dashed) are based on bootstrapped standard errors (1000 reps). Wealth (SEK 1,000) in 2003 constant prices.
B.4.2 Robustness of BAE on wealth inequality

In this section, we show that our main findings—that inheritances reduce relative inequality and increase absolute dispersion—are robust across several dimensions. All the robustness results are presented for a larger set of distributional measures. In addition to the five measures that we have presented hitherto, we also show results for the P99/P50 ratio, the wealth share held by the top 1%, the coefficient of variation (CV) and an additional measure of absolute dispersion, P99–P1. We assess the robustness across five dimensions: (1) excluding heirs who are not the decedents’ children, (2) examining whether the results are driven by very young and “penniless” heirs, (3) including minors in the population, (4) adjusting our measure of wealth to account for the potential undervaluation of asset values, (5) adjusting for potential *inter vivos* gifts that could be considered part of the inheritance. The results are reported in Table B5.
<table>
<thead>
<tr>
<th>#</th>
<th>Outcome:</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Baseline BAE</td>
<td>-0.037***</td>
<td>-0.701***</td>
<td>-2.135**</td>
<td>-0.019*</td>
<td>-0.028***</td>
<td>0.020***</td>
<td>-3.621</td>
<td>77,386***</td>
<td>342,523***</td>
</tr>
<tr>
<td>2</td>
<td>Children only</td>
<td>-0.042***</td>
<td>-0.884***</td>
<td>-2.497</td>
<td>-0.023</td>
<td>-0.032***</td>
<td>0.023***</td>
<td>-4.624</td>
<td>102,270***</td>
<td>408,230**</td>
</tr>
<tr>
<td>3</td>
<td>Excl. young heirs</td>
<td>-0.027***</td>
<td>-0.426***</td>
<td>-1.179*</td>
<td>-0.005</td>
<td>-0.016***</td>
<td>0.017***</td>
<td>0.039</td>
<td>56,669***</td>
<td>333,776***</td>
</tr>
<tr>
<td>4</td>
<td>Incl. minors</td>
<td>-0.039***</td>
<td>-0.832***</td>
<td>-2.474**</td>
<td>-0.020*</td>
<td>-0.030***</td>
<td>0.022***</td>
<td>-3.665</td>
<td>77,395***</td>
<td>363,047***</td>
</tr>
<tr>
<td>5</td>
<td>Durables, approx.</td>
<td>-0.033***</td>
<td>-0.566***</td>
<td>-1.753**</td>
<td>-0.019*</td>
<td>-0.026***</td>
<td>0.018***</td>
<td>-3.473</td>
<td>74,347***</td>
<td>349,255***</td>
</tr>
<tr>
<td>6</td>
<td>Durables, car values</td>
<td>-0.035***</td>
<td>-0.616***</td>
<td>-1.841**</td>
<td>-0.019*</td>
<td>-0.027***</td>
<td>0.020***</td>
<td>-3.485</td>
<td>68,852***</td>
<td>343,968***</td>
</tr>
<tr>
<td>7</td>
<td>Gift adj. 1 (observed)</td>
<td>-0.038***</td>
<td>-0.708**</td>
<td>-2.082**</td>
<td>-0.020*</td>
<td>-0.029***</td>
<td>0.021***</td>
<td>-3.652</td>
<td>80,553***</td>
<td>369,850***</td>
</tr>
<tr>
<td>8</td>
<td>Gift adj. 2 (20 %)</td>
<td>-0.054***</td>
<td>-0.999***</td>
<td>-3.034**</td>
<td>-0.024**</td>
<td>-0.038***</td>
<td>0.031***</td>
<td>-3.852</td>
<td>94,671***</td>
<td>393,700***</td>
</tr>
<tr>
<td>9</td>
<td>Gift adj. 2 (50%)</td>
<td>-0.087***</td>
<td>-1.463***</td>
<td>-4.688**</td>
<td>-0.031**</td>
<td>-0.055***</td>
<td>0.051***</td>
<td>-4.229</td>
<td>113,388***</td>
<td>388,775***</td>
</tr>
<tr>
<td>10</td>
<td>Gift adj. 3 (imputed)</td>
<td>-0.088***</td>
<td>-1.584***</td>
<td>-5.059***</td>
<td>-0.032**</td>
<td>-0.057***</td>
<td>0.053***</td>
<td>-4.190</td>
<td>89,554***</td>
<td>375,429***</td>
</tr>
</tbody>
</table>

Notes: See text in sections B.2 and B.3 for the details of the respective test. The estimates are based on 24 observations (3 cohorts [2002–2004] and 8 years) using data on 475,120 heirs (rows 1), 278,781 heirs (row 2), 404,852 heirs (row 3) 404,852 heirs, 484,725 heirs (row 4), 475,120 heirs (rows 5–10) * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level.
B.4.3 Is the equalization effect lasting?

Figure B6 shows a graph which is similar to Figure 5 of Section 3.2.1., but differs in two ways. First, two cohorts that inherit later are added. Second, the underlying sample is slightly different, as will be explained in detail below.

The purpose of this graph is to assess whether the equalizing effect found in the BAE analysis is persistent beyond the first few years. By adding two cohorts which inherit in 2006 and 2008, we can get an idea of whether the effect is still present up to five years after inheriting.

The 2006 cohort is the latest cohort for which we can observe wealth in the year after they inherit. The 2008 cohort inherits in the year after the wealth register was abolished. By comparing the evolution in the Gini of the cohorts inheriting 2002-2004 with the 2006 and 2008 cohorts, we can get an indication of whether the equalizing effect is persistent. It is clear that both the 2006 and the 2008 cohorts follow similar trends as the other cohorts before inheriting. Moreover, the Gini of the 2006 cohort falls markedly in 2006 when they inherit, a pattern displayed also by the earlier cohorts. If we use the 2006 and 2008 cohorts as counterfactual for the 2002 cohort, we see that the equalizing effect seems to be present up to five years after inheriting. This assessment suggests that relative inequality decreases in the short to medium run, but cannot answer whether the effect decreases or increases over a longer time period.

To create the cohorts appearing in Figure B6, we start from a population register that contains information on all individuals registered in Sweden at years end. The reason is that our original dataset does not contain information about heirs who inherit decedents who passed away in 2006 or 2008. We construct the population to as similar as possible to our original data and focus on individuals present in the register during the period 2002–2008, as our objective is to identify those individuals who lost their second parent in each of these years. For this exercise, we exploit the Multi-Generation Register which provides links between children and their parents (biological or adoptive). The Multi-Generation Register covers the full population of individuals that have been registered in Sweden any time since 1962 and who were born in 1932 or later, so called index persons. From the population register, we therefore exclude all individuals born before 1932. We then identify the parents’ (biological or adoptive) year of death, available from the tax registers. We keep individuals for which we have information on:

- Both parents’ year of death
- One of the parent’s year of death is 2002-2004, 2006 or 2008.
- The other parent had died earlier

The children of these decedents constitute the units of observations underlying the calculations.
in Figure B6. This sample is similar to the *children only* sample used for analyses in section 3.1.1, but due to restrictions in the Multi-Generational Register (primarily that decedents who were born before 1932 are not included), the sample is 30 percent smaller. Still both the average age (54.5 vs. 53) and wealth (682,400 SEK vs. 640,200 SEK) is very similar in both samples (2002-2004 cohorts).

Figure B6. Is the inequality effect lasting?
B.5 Complement to Section 5 “Inheritance and wealth mobility”

B.5.1 Shorrocks-Prais 10 quartiles

Table B6
DME on Wealth Mobility: 10 quartiles

<table>
<thead>
<tr>
<th>Outcome</th>
<th>(1) Shorrocks-Prais</th>
<th>(2) 1st</th>
<th>(3) 2nd</th>
<th>(4) 3rd</th>
<th>(5) 4th</th>
<th>(6) 5th</th>
<th>(7) 6th</th>
<th>(8) 7th</th>
<th>(9) 8th</th>
<th>(10) 9th</th>
<th>(11) 10th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inheritance effect</td>
<td>0.144***</td>
<td>0.056***</td>
<td>0.186***</td>
<td>0.280***</td>
<td>0.188***</td>
<td>0.157***</td>
<td>0.134***</td>
<td>0.112***</td>
<td>0.095***</td>
<td>0.067***</td>
<td>0.037***</td>
</tr>
<tr>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.001)</td>
<td>(0.036)</td>
<td></td>
</tr>
<tr>
<td>Mean in T - 1</td>
<td>0.382</td>
<td>0.226</td>
<td>0.350</td>
<td>0.337</td>
<td>0.433</td>
<td>0.441</td>
<td>0.4352</td>
<td>0.411</td>
<td>0.367</td>
<td>0.298</td>
<td>0.162</td>
</tr>
<tr>
<td>Effect in %</td>
<td>37.8</td>
<td>24.6</td>
<td>53.2</td>
<td>83.2</td>
<td>43.4</td>
<td>35.7</td>
<td>30.8</td>
<td>27.3</td>
<td>25.8</td>
<td>22.4</td>
<td>22.6</td>
</tr>
</tbody>
</table>

Notes: The estimates provide the difference between the mobility measure for the transition period from T - 2 to T - 1 (with the inheritance) and the mobility measure for the transition period from T - 2 to T - 1 (without the inheritance). The estimates are based on data on 475,120 heirs (2002–2004 cohorts). Bootstrapped standard errors are presented in parentheses (1,000 repetitions). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. Effect in % is calculated as (Inheritance effect / Mean of outcome T - 1) × 100.
<table>
<thead>
<tr>
<th>Outcome</th>
<th>Shorrocks-Prais</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>Probability of leaving n-th quintile after inheriting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inheritance effect (δ)</td>
<td>0.066***</td>
<td>0.020**</td>
<td>0.027**</td>
<td>0.106***</td>
<td>0.085***</td>
<td>0.080**</td>
<td>0.072**</td>
</tr>
<tr>
<td></td>
<td>(0.020)</td>
<td>(0.007)</td>
<td>(0.010)</td>
<td>(0.016)</td>
<td>(0.023)</td>
<td>(0.028)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>Mean in T−1</td>
<td>0.382</td>
<td>0.226</td>
<td>0.350</td>
<td>0.337</td>
<td>0.433</td>
<td>0.441</td>
<td>0.435</td>
</tr>
<tr>
<td>Effect in %</td>
<td>17.3</td>
<td>8.8</td>
<td>7.7</td>
<td>31.5</td>
<td>19.6</td>
<td>18.1</td>
<td>16.6</td>
</tr>
</tbody>
</table>

Notes: The estimates are based on 21 observations (3 cohorts [2002–2004] over 7 transition periods) using data on 475,120 heirs. δ is the PostInheritance coefficient in Equation (4). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. Effect in % is calculated as \( \frac{\text{Inheritance effect (δ)}}{\text{Mean of outcome T−1}} \times 100 \).
### B.5.2 DME and BAE for mobility on children sample

**Table B8**

DME on Wealth Mobility, Children sample

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Shorrocks-Prais</th>
<th>Probability of leaving n-th quintile after inheriting</th>
<th>Spearman’s rank correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inheritance effect</td>
<td>0.121***</td>
<td>0.102***</td>
<td>0.157***</td>
</tr>
<tr>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Mean in $T - 1$</td>
<td>0.260</td>
<td>0.171</td>
<td>0.254</td>
</tr>
<tr>
<td>Effect in %</td>
<td>47</td>
<td>60</td>
<td>62</td>
</tr>
</tbody>
</table>

**Notes:** The estimates provide the difference between the mobility measure for the transition period from $T - 2$ to $T - 1$ (with the inheritance) and the mobility measure for the transition period from $T - 2$ to $T - 1$ (without the inheritance). The estimates are based on data on 278,781 children heirs (2002–2004 cohorts). Bootstrapped standard errors are presented in parentheses (1,000 repetitions). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. Effect in % is calculated as (Inheritance effect / Mean of outcome −1) × 100.

**Table B9**

BAE on Wealth Mobility, Children sample

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Shorrocks-Prais</th>
<th>Probability of leaving n-th quintile after inheriting</th>
<th>Spearman’s rank correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inheritance effect ($\delta$)</td>
<td>0.051**</td>
<td>0.019</td>
<td>0.057*</td>
</tr>
<tr>
<td>(0.021)</td>
<td>(0.013)</td>
<td>(0.022)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>Mean in $T - 1$</td>
<td>0.261</td>
<td>0.173</td>
<td>0.256</td>
</tr>
<tr>
<td>Effect in %</td>
<td>20</td>
<td>11</td>
<td>22</td>
</tr>
</tbody>
</table>

**Notes:** The estimates are based on 21 observations (3 cohorts [2002–2004] over 7 transition periods) using data on 278,781 children heirs. $\delta$ is the PostInheritance coefficient in Equation (4). * significant at the 10-percent level, ** significant at the 5-percent level, *** significant at the 1-percent level. Effect in % is calculated as ($\text{Inheritance effect (}\delta\text{)} / \text{Mean of outcome } T - 1\times 100$.}
B.5.3 Is the mobility effect lasting?

Figure B7 is similar to Figure 6 but differs in two ways. First, two cohorts that inherit later are added. Second, the underlying sample is slightly different, as explained in Appendix B.4.3.

The purpose of this graph is to assess whether the mobility effect is short-run in nature or whether reshuffling of positions continue also several years after inheriting. By adding two cohorts which inherit in 2006 and 2008, we can get an idea of whether the effect is still present up to five years after inheriting.

It is clear that both the 2006 and the 2008 cohorts follow similar trends as the other cohorts before inheriting. Moreover, the Shorrocks-Prais index of the 2006 cohort falls markedly in 2006 when they inherit, a pattern displayed also by the earlier cohorts. If we use the 2006 and 2008 cohorts as counterfactual for the 2002 cohort, we see that the mobility effect seems to last only two to three years. The mobility between 2003 and 2004 in the 2002 cohort is almost down to the pre-inheritance level of the 2006 and 2008 cohort. This analysis therefore suggests that the mobility effects is short-lived.
Figure B7. Is the mobility effect lasting?
References


