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Liberty, Equality, Inheritance?

An empirical study of inheritance's impact on wealth inequality in Norway

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Abstract

The intention of this paper is to assess the short-term impacts of inheritance on wealth inequality in Norway. I apply Norwegian population-wide individual-level data from 1994-2013 to empirically estimate a direct mechanical - and a behaviour adjusted inheritance effect on inequality.

I find a substantial reduction in relative inequality, caused by a broad lift in net wealth. Despite the estimated equalising effect in relative terms, I find the absolute dispersion concurrently increases. This apparent paradox arises from the fact that the wealthy heirs inherit less *relative* to their initial net wealth, yet more in kroner.

When accounting for responses to inheritance, such as changes in investment -, saving -, and consumption, I find a reduced effect in terms of the Gini coefficient. This can be explained by that the less affluent consume a larger portion of their inheritance, and from heterogeneous investing behaviour and returns on investment.

My results align well with findings from comparable studies, apart from effect sizes being enlarged. However, after conducting various tests I discover that large parts of these size differences stem from differences in the characteristics and quality of the applied data.

Finally, in the full-period analysis (1996-2013), I show that the effect of inheritance on relative inequality is consistently equalising but declining over the years, while the picture for the effect on absolute dispersion is much more complex. These observed trends might be attributed to changes in the relative size of inheritances to net wealth, shifts in the distributional characteristics of inheritances, and potential impacts of a gradually rising economic inequality in Norway.

Keywords – Inheritance, Inequality

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1 Introduction

With economic inequality on the rise in Norway as well as in the majority of Western countries (SSB, 2021; Chancel et al., 2022), the topic of wealth accumulation and its fundamental drivers has received increasing attention from governments, academics, international organisations, and the general public alike. In a world where return on capital surpasses the growth rate of labour income, as famously exhibited by the French economist Thomas Piketty in his bestseller *Le Capital au XXIe siècle* from 2013, some hold it as unavoidable that inherited wealth will dominate the values a person creates with their lifetime labour effort, and that, consequently, the concentration of wealth will tower, potentially to an extent where it is incompatible with meritocratic values and social justice (Roine, 2014).

While the popular view is that inheritance has such disequalising properties, its true and exact impact is – *a priori* – unclear (Boserup et al., 2016, p.1). Inheritance within a family is predominantly distributed equally among the children and could just as well be thought to be disproportionately beneficial to the least affluent, *or* it could indeed be true that it primarily further increases the wealth of already rich heirs, and hence increase inequality.

As a matter of fact, empirical studies looking to estimate the impact of inheritances on wealth inequality have had ambiguous outcomes. One such major Scandinavian study was conducted by Elinder et al. (2018), which was the first to use individual-level population-wide data on inheritances and net wealth to estimate the causal effects of inheritances. They found that in Sweden between 2002-2004, inheritance in fact significantly *reduced* relative inequality, while at the same time *increased* absolute dispersion in net wealth. This apparent paradox arises from the fact that while the wealthy may inherit more in absolute terms, the inherited amounts may be smaller *relative* to their initial net wealth, than for the poorer parts of the population. The same tendency has been found in several studies from other Western countries (see e.g. Bönke et al., 2017; Klevmarken, 2004; Wolf and Gittleman, 2014; Wolf, 2002, 2003 & 2015).

In this paper, I apply methods from Elinder et al. (2018) in an attempt to estimate the causal short term effect of inheritance on wealth inequality in Norway. I use individual-level registry data from Statistics Norway in the years 2002-2004, in order to facilitate a comparison between the studies.

I estimate two effects: the Direct Mechanical Effect (DME) and the Behaviour Adjusted Effect (BAE). The DME captures the immediate impact of inheritances, obtained by adding the coming amount of inheritance to the net wealth of last year, before measuring inequality. This approach ensures the results are not affected by responses to inheriting. Secondly, I estimate the BAE, which incorporates how post-inheritance behaviour alters the estimated impact. Employing a difference-in-differences estimator, I compare pre-inheritance inequality of the inheriting cohort to the two subsequently inheriting cohorts, which serve as control groups. This approach mitigates biases stemming from e.g. macroeconomic events, which could confound the results. Plotting the developments in pre-inheritance inequality across cohorts display near perfectly parallel trends, strongly supporting a causal interpretation of the estimates.

My main results are that inheritances have a substantial equalising impact in terms of relative inequality, while simultaneously sharply increasing absolute dispersion. I find the DME to reduce the Gini coefficient by -23.4%, all the while absolute dispersion as measured by the interquartile range (IQR) concurrently rises by 37.1%. When accounting for behavioural responses, the effects are toned down, exemplified with the BAE as measured in the Gini coefficient to be -12.8% – almost half the size of the DME. Thus, coinciding changes in investment-, saving- and consumption is found to have a disequalising influence.

These results, apart from effect sizes being larger, align well with those from Elinder et al. (2018), which found the effect on Gini to be about -7%, and the increase in the IQR to be about 11%. By conducting various robustness and counterfactual tests I uncover that these size differences can largely be attributed to incomplete data on small inheritance transfers, and from differing measures of net wealth.

Although few other studies are directly comparable due to the novel approach in Elinder et al. (2018), one related study from Denmark using individual-level tax data finds that inheritances increase absolute dispersion, while nonetheless relative measures such as the top 1%' and the top 10%' share of total net wealth decline by respectively 6 and 10 percentage points (Boserup et al., 2016).

In addition to estimating the mentioned effects in 2002-2004 across five inequality measures, I aspire to extend the scope of the analysis conducted in Elinder et al. (2018) by applying the full range of available Norwegian data from 1994-2013, looking to detect trends and shifts in effects over time. I show that the equalising effect of inheritance on relative inequality is consistently positive although declining over the years. In absolute dispersion the pattern is more complex, initially falling, before turning and rising in the latter years, indicating an accelerating disequalising impact.

Where – to the best of my knowledge – the main analysis provides the first estimations of inheritance effects of this kind, using individual-level registry data in Norway, the extended analysis furthermore contributes to field of research by displaying how the impacts of inheritance might have evolved over time.

The rest of the paper is structured as follows. Chapter 2 presents an overview of previous theoretical results obtained from simulation models, as opposed to the empirical approach in this paper. Chapter 3 describes the institutional background, including aspects on inheritance law and - taxation. Chapter 4 presents the methodology, and Chapter 5 the applied data. Chapter 6 displays the results accompanied by running interpretations, discussions and critiques, before Chapter 7 presents the conclusions of the paper.

2 Theoretical models on inheritance

This chapter presents a brief overview of previous research results on the impact of inheritance on inequality, arising from theoretical simulation models.

As opposed to the empirical approach of this paper and others, several studies instead rely on simulation methods to model individuals' saving - and giving patterns to calibrate synthetic wealth - and inheritance distributions. Some advantages of such theoretical frameworks lie in their ability to isolate and study certain variables and mechanisms in detail, to be modifiable under various assumptions, and to provide generalisable results. Furthermore, they are not restricted to an often varying access to – and quality of – real-world data. However, critics often argue that such models might fall short of capturing the full complexity of real-world conditions.

One first group of such theoretical studies looks to construct exchange models, interpreting inheritance as a two-way transaction between the heir and the decedent (Bernheim et al., 1985; Cox, 1987). These papers find support for the idea that heirs with intent give their physical and psychological support to the decedent in exchange for inherited wealth at a later point in time, thereby questioning the altruism in such acts. Furthermore, since more resourceful children are better positioned to be more supportive, and consequently inherit more, inheritance forms a disequalising mechanism.

Other models on intergenerational transfers place a greater emphasis on how behavioural patterns within families affect distributional outcomes. An example is Gokhale et al. (2015), who develops an overlapping generations model (OLG), featuring realistic marriage - and fertility patterns, random death, assortative mating based on skills, heterogeneous skill endowments, as well as other key aspects of wealth determination within families. They argue that, while contrary to popular belief, the mechanisms underlying inheritance is to a large degree unrelated to differences in earnings, which they hold to constitute the main determinant for life cycle wealth accumulation. For this reason, they find inheritances to be wealth-equalising.

With conclusions along similar lines, Laitner (1979) develops an inheritance model with regards to the national distribution of wealth. In the model, a family's wealth is constituted by externally determined labour incomes, in addition to inheritances from the husband's and the wife's parents. He proves that despite the stochastic nature of wealth accumulation, there is at least one steady-state equilibrium. Interestingly though, he finds that there can never be a permanent division between wealth classes. He also argues that since both the level of consumption and inheritance bequests are increasing with wealth, the possibility of bequests lowers the consumption of the wealthy, but not as much for the poor. The theoretical results are as follows: there will always be a degree of wealth mobility, and that inheritance in itself has an equalising effect on the national distribution of consumption.

Nonetheless, the majority of models based on behavioural patterns of families have opposite outcomes, that inheritances are in fact disequalising.

One such result came from the life-cycle savings model of Atkinson (1971), demonstrating that life-cycle factors such as labour income could not explain the high wealth concentration in the upper tail of the wealth distribution, based on the contemporary context of Great Britain. Consequently he argued that inherited wealth then must have been a major contributor to wealth inequality. He argues that if life-cycle factors were important, inequality within sex - and age classes should be less than in the overall distribution, which empirical evidence contradicts. Thereby he concludes that it is inherited wealth that is driving concentration in wealth.

Davies and Shorrocks (1978) criticise Atkinson by stating his precise objective is unclear. At times, they say, he appears to be mainly concerned with the distribution of inherited wealth, suggesting that it differs from the actual distribution caused by life-cycle factors. Thus, they state, he draws inferences for inheritance from life-cycle factors, without explaining the connection between the two (Davies and Shorrocks, 1978, pp. 138-139). Davies and Shorrocks' refined life-cycle model does not succeed in adequately explaining inequality in wealth holdings, but nonetheless find that only about 45-89% of actual wealth inequality can be explained by age and earnings differences, depending on the choice of inequality measure. Their results hence imply that inheritance constitutes a major part of the residual.

A more nuanced outcome came with the exploration of models with a basis in contemporary U.S. parameters by Blinder (1973). He finds that since differences in fertility and family background correlation between spouses were not very pronounced, and inheritance was normally equally distributed among heirs, inheritance may have an equalising effect over time. This result is contrary to those from the above mentioned exchange models, which held that children compete over inheritance estates, furthermore having an disequalising impact. However, Blinder concurrently finds the impact changes sign if it is so that wealthier individuals receive higher returns on their capital, which a related study found to be a major factor explaining developments in wealth (Greenwood et al., 2015). Anyhow, he found that the impact from this difference in returns can be counterbalanced by a present progressive tax system, a finding also confirmed by (Greenwood et al., 2015). Due to the total level of complexity, Blinder draws no definitive conclusions over the overall impact of inheritance on inequality.

All in all, findings from these and other theoretical simulation model studies provide diverse insights into the relationship between inheritance and inequality, and sometimes with intriguing and conflicting perspectives. While the above discussion describes only a selection of an array of relevant studies, a sweeping generalisation is that they more often than not point to inheritance being an important source of wealth inequality (Elinder et al., 2018, p. 18)

3 Institutional background

This chapter presents key juridical aspects integral to interpreting the process of inheritance in Norway, and in turn how these conditions shape the applied data, analysis and results.

Inheritance in Norway is thoroughly regulated by The Norwegian Inheritance Act (2019), which establishes the rights and entitlements of eventual heirs. Having a comprehensive grasp of the legal intricacies of inheritance is important for fully understanding the applied data and its interpretation in the Norwegian context.

3.1 The heir's right to inherit

The inheritance from the decedent is normally, in the absence of a testament, divided between the eventual spouse and the decedent's direct lineal heirs (The Norwegian Inheritance Act, 2019, §§3-4). Direct lineal heirs refer to heirs in a downwards line of kinship from the decedent, meaning children, grandchildren, etc.

In the seldom cases where a decedent's debt surpasses its assets – i.e. its net wealth is negative – the heir(s) can opt to not receive the estate (The Norwegian Inheritance Act, 2019, §116). In practice this implies that an heir cannot inherit a negative amount; an equalising juridical mechanism having implications for also for estimation of inheritance effects.

The decedent can choose a different distribution of the inheritance than that which follows by Norwegian law, if a signed testament is present at the death of the decedent. Regardless of the eventual existence of a testament, the heirs have their rights to certain minimum amounts. Two thirds of the wealth is to be considered a compulsory portion to be inherited by the direct lineal heirs (The Norwegian Inheritance Act, 2019, §50). This compulsory portion is however limited to 15 times the national insurance scheme basic amount, which currently in 2023 amounts to approximately 1.74 million Norwegian kroner (hereafter denoted as *kroner*) (The Norwegian Inheritance Act, 2019, §50; Skatteetaten, 2023).

As in many countries, the spouse has a distinct juridical position in Norway, and the domain of inheritance is no exception. The decedent's spouse has a right to inherit a quarter of the wealth when the decedent also is leaving behind direct lineal heirs, and in the case where there are none, the right to inherit half of the wealth (The Norwegian Inheritance Act, 2019, §§8-9). If the decedent in addition to not having direct lineal heirs does not leave behind any parents, siblings nor children of siblings, the spouse inherits the wealth in its entirety. Nevertheless, in any of the above mentioned cases, he or she has the right to a minimum inheritance of four times the national insurance scheme basic amount, which in 2023 amounts to approximately 460,000 kroner (The Norwegian Inheritance Act, 2019, §8; Skatteetaten, 2023). This means that as long at the total wealth of the decedent exceeds this, the spouse is guaranteed the minimum amount.

Furthermore, the spouse is in the unique position of having the right to assume control over shared assets as undivided marital property, unless otherwise stated in testament (The Norwegian Inheritance Act, 2019, §14). In doing so the inheritance of remaining heirs are postponed. Assuming control over assets of separate estate is possible if this is agreed in a prenuptial agreement, by a giver or testator, or if the heirs gives their consent (The Norwegian Inheritance Act, 2019, §14).

To put it briefly, the majority of inheritance in Norway is passed on from the last surviving parent, to the children. The peculiar though frequent cases where the spouse of the first deceding parent temporarily inherits – or assumes control over the couple's assets – should be excluded from the samples of this thesis' estimations, as they do not represent intergenerational transfers. I will focus on parent to child transfers of inheritance, and for this reason attempt to exclude other forms of gifts and transfers.

3.2 Aspects on inheritance relating to time

The aspect of time when it comes to inheritance proves to be crucial, as in the applied data on gifts and inheritance, there is a lack of additional information about the giver or the nature of the transfer. The borderline between gifts and inheritance is therefore vague. To distinguish inheritance from other gifts, it is therefore necessary to incorporate death dates of parents along with the transferred amounts. Such an approach is necessary to derive a sample containing the desired parent-child transfers.

Concerning the timing of death, according to Norwegian law, the demise of an individual should be promptly reported to the District Court, which shall handle the estate of the deceased, if not a doctor has it registered to *Folkeregisteret* (the Norwegian Population

Register) (The Norwegian Inheritance Act, 2019, §89). All inheritance is deemed to have fallen at the time of death of the decedent, if not otherwise stated by law or testament (The Norwegian Inheritance Act, 2019, §66). Even though the death of the decedent is registered immediately and it marks the point of time where inheritance is deemed to have fallen, this does not imply that the process of distributing the inheritance is carried out immediately or even quickly. This has important implications for this thesis, as in the applied data, the time of death may differ from the time of received inheritance, creating challenges for the empirical analysis.

In addition to that in some cases the receival of the inheritance might be significantly delayed, in other cases a part of – or the whole inheritance – might be transferred *before* the death of the giver, as gifts. Indeed, gifts handed from a giver to their spouse, domestic partner, the givers or the spouses closest heir(s), any direct lineal heirs of both the giver and their spouse, or anyone with a right to inherit according to testament, is to be considered as inheritance, and hence was subject to inheritance tax, until it was abolished with effect from 2014 (The Norwegian Inheritance and Certain Gift Tax Act, 1964, §2). In the same paragraph it is specified that "the registration of the gift should find place when the giver has fully transferred their control over it". For these reasons, it is imperative to be precise when deriving the sample applied in this thesis, and furthermore to also consider the impact of advances on inheritance, which will be a part of the analysis.

3.3 Inheritance taxation

Throughout the period of study there was an enforced inheritance tax in Norway, regulated by the The Norwegian Inheritance and Certain Gift Tax Act (1964). Inheritance taxation was abolished in Norway with effect from January 1. 2014, meaning 2013 is the last year with complete data on inheritance. For this reason, 2013 marks the last year of study in this paper.

The inheritance tax scheme underwent several changes over time, both due to general price adjustments and as a result of political measures (NOU 2000:8). The tax regulations included specific deductions, such as allowances for funeral costs, ranging from 25,000 to 42,000 kroner between 1994-2013. Moreover, there was granted an additional deduction of about twice the size if the heir was under the age of 21.

There were two distinct set of tax rates for different heirs, where the children of the decedent were taxed more favorably than other heirs. As the focus in this paper is on the intergenerational transfers from parent to child, the latter cases are not relevant.

For child heirs there was a minimum deduction amount ranging from 200,000 in 1994 to 470,000 kroner in 2013. "Medium-size" inheritance amounts that exceeded the deduction, but falling below an upper limit ranging from 400,000 in 1994 to 800,000 in 2013 were subject to tax. This rate was at 8% until 2009, when the government lowered it to 6%. The tax rate for major amounts above the upper limit were 20% until 2009, also reduced to 10% in the same tax reform.

Nonetheless, the applied data in this thesis will be denoted in pre-tax values. The exception comes with the estimation of the Behaviour Adjusted Effect (BAE), where the post-inheritance net wealth will be affected by an eventual taxation of the inherited amount. This challenge will be addressed in this particular part of the analysis.

Apart from this specific case, tax aspects in general will not be taken into consideration in the analysis nor in the accompanied discussions, due to the constraints of the master thesis format. Nevertheless, the final results might certainly in themselves prove to be relevant with respect to the topic of inheritance taxation in Norway, if assessed with caution.

4 Methodology

This chapter introduces the frameworks of the empirical strategies applied in this thesis. First, there will be a description and a discussion on the measuring of wealth inequality. Thereafter comes a presentation of the techniques and logic applied in estimating and interpreting the two effects expressing the short-term inequality impact of inheritance. This includes the mathematical description of the applied regression model(s), as well as the delimitation of the control - and treatment group.

4.1 Measuring wealth inequality

There are several approaches to measuring and discussing economic inequality. The main – but not the only – parameter of interest in this thesis will be the Gini coefficient, which is the most commonly used inequality measure across the social sciences (Blesch et al., 2022). The Gini coefficient was named after the Italian statistician Corrado Gini (1884-1965), though the first sketch of the Gini index arguably first could be seen in a paper by the American economist Max Lorenz in 1905 (Gini, 1955; Lorenz, 1905).

To understand how the Gini index is formed, one must first understand what the Lorenz curve is. The Lorenz curve – in the case of monetary wealth – can be defined as the curve $y = L(p)$, where the poorest fraction p of the population has the fraction *L(p)* of total wealth in the economy. To provide an example, the expression $L(0.5) = 0.1$ informs us that the poorest 50% of the population holds 10% of the total wealth.

The Gini index is derived from the definite integral summarising how much the Lorenz curve of distribution for the specific sample at hand deviates from that of *perfect equitability*. A Lorenz curve of perfect equitability would be one where wealth is perfectly evenly distributed, implying $L(p) = p$ for all $p \in [0, 1]$. The mathematical expression for the Gini index is thus:

$$G := 2 \int_0^1 [p - L(p)]\, dp \tag{4.1}$$

Equation 4.1 demonstrates that the Gini index is defined as twice the area between the two curves. The multiplication by two is intentional, aiming to yield a readily understandable index that equals 0 for perfect equitability, and 1 for the opposite; the case where one individual possesses all wealth.

Gini has its advantages in being a consistent and comprehensible measure containing information about a whole economic distribution condensed into one single coefficient. One could say it's a simple, yet blunt way to summarise economic data (Farris, 2010, p. 851). As the Gini coefficient measures relative distribution and hence - inequality, it also allows more readily than other coefficients comparison between e.g. different countries.

Some researchers point to the extensive use of Gini as a self-sustaining feedback loop; the availability of the coefficient leads researchers to use it in their work, which in turn lead statistical agencies to continue providing it, and moreover policy makers trust the credibility and precision in the measure, possibly too much (Blesch et al., 2022). The widespread use of the Gini coefficient has received a substantial amount of critique for various reasons (Blesch et al., 2022).

One shortcoming lies in its disability to distinguish between distinct distributions that yield the same Gini coefficient (Sitthiyot et al., 2020). This stems from the way the Gini coefficient is computed. The index implicitly weighs amounts distributed to different parts of the wealth distribution differently. An example of this weighting is that an extra krone given to an individual of the 25th percentile has three times the weight of an extra krone given to a person of the 75th percentile (Atkinson, 2015). This weighting can justify e.g. a loss of three kroner for a gain of one krone if redistributed in such a manner.

There is another mentionable shortcoming highly relevant for this thesis. For the particular case of wealth inequality a good coefficient should ideally be able to fully consider the existence of negative values. While generally not a problem when considering income inequality, an individual's net wealth can indeed be negative, the only requirement being that total debts exceed total assets. By construction the Gini coefficient shows the distribution of total positive amounts in the sample, i.e. it cannot incorporate negative shares of a pie. For estimating the index correctly it is therefore strictly necessary to exclude negative observations or set them equal to zero, something which in turn neglects parts of the variation in the sample tail (Elinder et al., 2018, pp. 20-21). Due to the high frequency of negative values for net wealth at the lower part of the distribution, the Gini coefficient might for this reason not necessarily be particularly informative on its own

(Boserup et al., 2016, p. 7).

For the above mentioned reasons, the estimated inheritance effect in form of the Gini coefficients will in this thesis be complemented by several alternative measures. As in Elinder et al. (2018) these include relative inequality measures such as the effect on the bottom 50% - and the top 10% share of total net wealth. Furthermore, I quantify the effect on p90/p50, which is the relation between the individual disposing a net wealth at the 90th percentile and the individual at the 50th percentile, i.e. a multiple denoting how many times more wealthy a rich individual is than an average individual. Lastly I include an absolute inequality measure, namely the interquartile range (IQR), which is the difference between the individual in the 75th - and the 25th net wealth percentile, displaying absolute dispersion in kroner.

There are no measures on inequality without deficiencies, but it has been shown that assessing inequality in multiple parameters leads to better informed public decision making (Blesch et al., 2022; Sitthiyot et al., 2020).

4.2 Empirical framework

Following the empirical approach of Elinder et al. (2018), the analysis will be divided into two parts. The first part includes the estimation of the direct mechanical effect (DME) of inheritance on wealth inequality. The DME is computed by adding the pre-inheritance wealth for each individual inheriting to the upcoming inheritance, before subsequently measuring how that expected wealth increase immediately would affect inequality. Secondly, the behaviour adjusted effect (BAE) is estimated, which is an expansion of the DME, taking account for any eventual altered behaviour due to inheriting, such as changes in investment -, saving - and consumption, which in turn also impacts wealth.

The DME is my main estimator of interest as it represents the clearest channel from inheritance to change in inequality, while the BAE provides additional insight into behavioural responses to inheritance. Simultaneously estimating both the DME and the BAE is of key importance as they together enable us to quantify and dissect not only how intergenerational transfers affect inequality, but also to what extent this effect comes due to asymmetrical behavioural responses to inheriting.

4.2.1 The Direct Mechanical Effect: A simple estimation

The DME essentially denotes the change in the wealth distribution that would occur if the heirs save their received inheritance in its entirety, without any other change occurring (Elinder et al., 2018, p. 21).

The DME is found by estimating the following expression:

$$DME = D_{T-1}^{W+1} - D_{T-1}^{W} \tag{4.2}$$

In this equation D is a measure of wealth distribution and hence - inequality. The main parameter applied for this purpose will be the *Gini coefficient*, which was justified and described in section 4.1. Thus D_{T-1}^{W} is the Gini coefficient of net wealth at the end of the year before inheritance $T-1$. D^{W+1} is then that same net wealth the same point in time, only adding in the sum of the upcoming inheritance.

The DME enables the dissection of a simplistic but pure inequality effect of inheritance prior to any behavioural response from the heir. This is valuable as the response might to a certain degree alter the results. Furthermore, by assuming inheritance due to parental death happens abruptly, there is random sampling and hence minimal bias in the results.

Nonetheless, the estimation of the DME has a certain lack of precision, since I ideally would like to compare wealth *just* before inheriting, to the wealth immediately after inheritance, i.e. the day after. Yet there is no available data for the exact date of inheritance, only for the reported individual wealth at the 31. of December each year. It is for this reason my approach to estimating the DME could be slightly imprecise, as the pre-inheritance wealth is measured at the end of the year prior to receiving the inheritance, and hence could differ from the actual wealth at the exact time of receiving the amount. Nevertheless, the imprecision is expected to be minimal, and in any case, it remains unclear whether this distortion will tend to overestimate or underestimate the average individual's net wealth.

4.2.2 The Behaviour Adjusted Effect: Difference-in-difference

The BAE extends the scope by capturing the DME in addition to accounting for the influence that inheritances might have on other determinants of wealth, such as consumption, savings and investments (Elinder et al., 2018, p. 21). The idea is to take into consideration that an heir's wealth at the end of the year of inheritance is not only a sum of the previous year's wealth and the received inheritance, it is certainly also a function of other wealth determinants in that year.

Essentially then, the BAE differs from the DME by considering how the wealth of the heirs have changed throughout the year of inheritance, instead of conducting an estimation from a static point of view. This requires the data to be structured as panel data, which is readily achievable in Microdata.

The BAE is found by estimating the following expression:

$$BAE = D^W_{Pre} - D^W_{Post} \tag{4.3}$$

Where D^W_{Pre} and D^W_{Post} are the measures of the wealth distribution (Gini coefficient) in the period before, and after inheritance, respectively.

The estimation of the BAE does however raise some important challenges that do not apply for the DME. Whereas the DME is statically estimated at a certain point of time, the BAE is an effect measured over a period, using panel data. This can potentially lead to bias in the estimation, as the ceteris paribus assumption might not hold. E.g. might there occur macroeconomic events or policy changes during the period affecting the data, but that should not be interpreted as consequences of inheritance in itself, thus polluting the results.

To address and bypass such sources of bias, I aim to identify a control group that would be affected by just the same impulses as the treatment group, apart from the treatment in itself. In this way, one could study whether inheritance changes behaviour, in turn again affecting wealth. The chosen control group is the group of individuals which one knows *a posteriori* inherits in the year or two years after the individuals in the treatment group. I use the mean Gini outcome for each year of these two cohorts, as the control group. By expectation, these groups should be fairly similar in baseline characteristics, something which I inspect and confirm in Section 5.4. By using a Difference-in-Difference (DiD) approach, like in Elinder et al. (2018), the change in wealth distribution of the treatment group in excess of the control group, can be interpreted as the BAE. This can be formulated mathematically for each individual i with the equation (Woolridge, 2019, p.53):

$$Treatment\ effect_i = Y_i\,(Treatment\ group) - Y_i\,(Control\ group) \tag{4.4}$$

I am however most interested in the average treatment effect, and not the treatment effect for each and every individual. Furthermore, I would like to estimate the treatment effect on the treated individuals, meaning the effect of inheritance on the Gini coefficient, amongs those who inherit. This is called the Average Treatment Effect on the Treated (ATET), and can be defined as follows:

$$ATET = E[Y(Treatment\ group) - Y(Control\ group)|D_i = Treatment\ group] \tag{4.5}$$

Which in this case translates to:

$$BAE = E[Y(Treatment\ group) - Y(Control\ group)|D_i = Treatment\ group] \tag{4.6}$$

The ATET, which in this specific case is the BAE, will in this thesis sometimes be denoted simply as the *treatment effect*. The general logic of DiD is demonstrated visually in the figure below, where the treatment at $T = 0$ is the inheritance. The development of the treatment group in excess of the counterfactual represents the treatment effect.

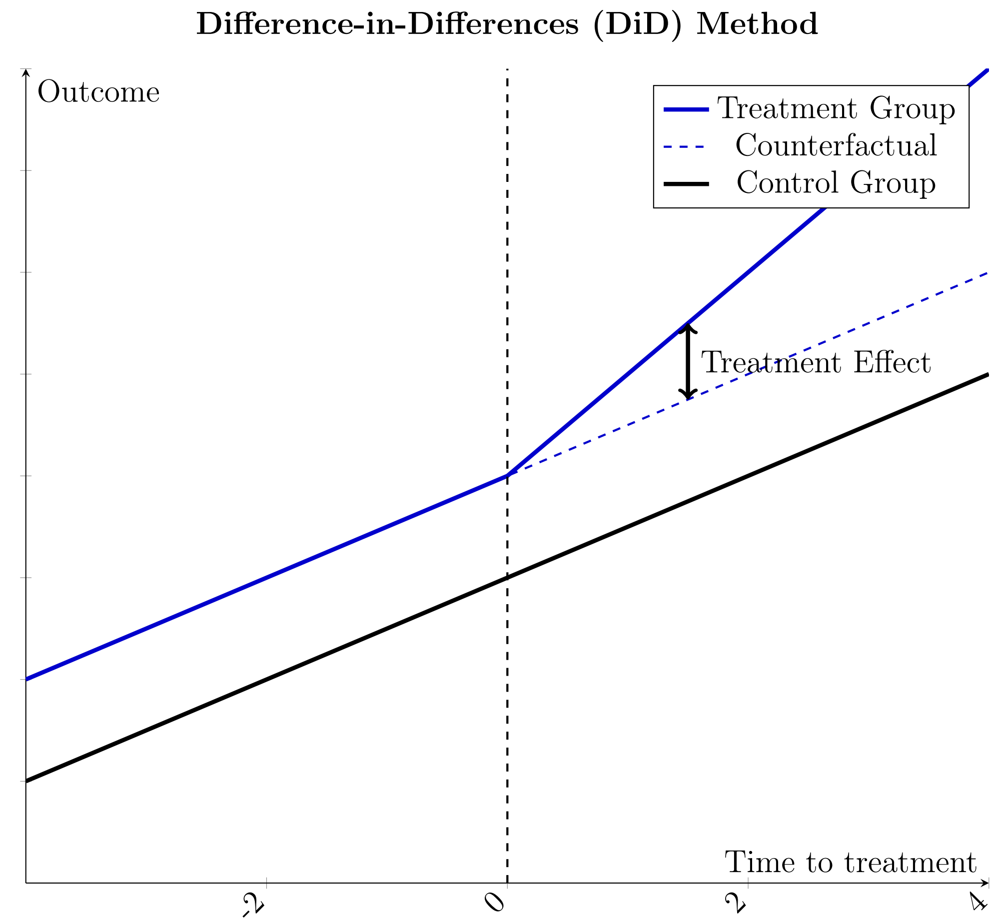

Figure 4.1: The framework of the Difference in Difference (DiD) method. The development of the treatment group after treatment, in excess of the development of the counterfactual, represents the treatment effect.

The key identifying assumption for the DiD method is that the outcome of the two groups would have evolved similarly in absence of the treatment, also known as the parallel trends assumption. This assumption cannot be directly tested, but can be inspected visually by plotting the trends in outcome for the two groups in the years before treatment. If the groups are similar in baseline characteristics, and their outcome evolved similarly before treatment, it is plausible they would continue to develop in a similar manner in absence of treatment. For the general case demonstrated above, this means that the blue and the black line should develop similarly (parallel to each other) before the treatment occurs. Inspection of pre-trends will be shown explicitly for the applied data in this thesis in section 6.1.2 and for all periods in A.

Like Elinder et al. (2018), I use the following empirical model in the estimation of the

BAE:

$$D^W_{c,y} = \delta \cdot PostInheritance_{c,y} + \lambda_y + \lambda_c + \epsilon_{c,y} \tag{4.7}$$

In this equation $D^W_{c,y}$ is the Gini coefficient amongst inheriting cohort c, in year y. *PostInheritance* is a dummy variable specific for every cohort, and equals one from the year of inheritance (treatment) and onwards. As in Elinder et al. (2018) I also include year - and cohort fixed effects, denoted $\lambda_y + \lambda_c$ respectively, to control for any time trends or fixed differences between cohorts. The last joint $\epsilon_{c,y}$ is the error term in the model.

In my regressions I add time controls manually. As for the cohort fixed effects, since Microdata by default estimates all regressions with a unit fixed effect, no further modification is needed (SSB and Sikt, 2023).

The particular process of data handling in Microdata is tedious though rather straightforward. For every inheriting cohort, I manually create a panel data set with the previously computed Gini-values for the treatment- and control group, including four years of pre-trends and the year of inheritance itself. After adding year fixed effects controls, I estimate the treatment effect using the built-in DiD functionality.

Important to note, the BAE is estimated as a *short-term effect*, as I cannot credibly evaluate changes over the many years after inheritance. The complexity arises from the fact that the mean outcome for the two cohorts that constitute the control group will be affected by these cohorts themselves inheriting in the year after, and then two years after, the treatment group. For this reason the final period in our regression analysis will be the year the treatment group inherits.

4.2.3 The interaction between the two effects

The estimation of the BAE and DME enables us to sort out and quantify how the impact of short-term behaviour from the direct inequality effect of inheriting. Since the BAE is constituted by the DME plus behavioural responses, we have:

$$Behavioural\ impact = BAE - DME \tag{4.8}$$

Being able to compare the sizes of the effects does however require that one has utilised the same samples in the estimation of both effects. This implies that the sample groups used in the estimation of the DME's are limited to what is chosen as the treatment group in the estimation of the BAE.

5 Data

This chapter presents the data applied in the empirical analyses of the paper. The service used for data handling and regressions called *Microdata* will be introduced in detail, followed by the delimitation and description of the main sample population of the paper. Finally there will be a short elaboration on the key applied variables.

5.1 A short introduction to Microdata

Microdata is a free Norwegian online service for accessing and processing data (Microdata, 2023). It provides access to Norwegian register data from Statistics Norway as well as from other sources, without any need for application. The service contains data on more than 11 million persons described by more than 400 variables, with the longest time series dating back to 1964 (Microdata, 2023). Importantly for this thesis, the service contains registries on population, employment, tax, wealth and income. The registries are linked through personal identification codes, before being anonymised.

As the service is widely accessible in Norway, and it provides access to personally sensitive information, Microdata has implemented several measures as to limit the possibility of linking the registry data to individuals. The most important measures include randomised noise, minimum population sizes, winsorisation, and hexbinplots instead of scatter plots (Microdata, 2023, pp. 140-143). For descriptive data there is an added stochastic randomised noise of $\pm$ 5 individuals, with an expectation of zero. However, since the lower population limit is set to 1,000 individuals, the misrepresentation is kept at a minimal level. Winsorisation censors the one percent highest and the one percent lowest values for numerical variables, setting them equal to the second highest and the second lowest values, respectively. One of the consequences of winsorisation is that the reported means and standard deviations may be lower than actual values. Anyway, for regressions, there are no anonymisation, as these results are impossible to link to any specific individual(s).

5.2 Sample

This section presents the main sample for the years 2002-2004 applied in the thesis, as well as brief explanations of the data handling procedure. Since the procedure for the remaining years is the same for every year, I explicitly display sample delimitation only for these years, as to provide an example. Nonetheless, descriptive statistics and sample sizes for each year of cohorts is to be found in Appendix A, as well as the complete set of commands from Microdata attached in Appendix B.

Table 5.1: Main sample

	2002		**2003**		**2004**	
	Observ.	Removed	Observ.	Removed	Observ.	Removed
(1) Received inheritance	58,019		60 100		66 952	
(2) Received > 100,000 kr	35,123	22,896	37,338	22,762	42,713	24,239
(3) Age > 18 years	34,970	153	37,193	145	42,548	165
(4) Lost parent this year	5,852	29,118	5,902	31,291	6,930	35,618
Final sample size	**5,852**		**5,902**		**6,930**	

The first step of the selection process (1) involves creating a dataset *($heir_pop)* before importing individuals receiving any sum of inheritance and/or gifts throughout the given year. Subsequently (2), I only keep the individuals receiving at least a total amount of 100,000 kroner in the given year. The justification for this exclusion is that only amounts above this threshold were subject to a mandatory reporting obligation (SSB, 2023). Nevertheless, there does indeed exist reported data points below 100,000 kroner, but due to a lack of sufficient credibility, they will be included only as an alternative sample in the robustness tests in section 6.3.

Moreover (3), I limit my scope to individuals above the age of 18 years as they are until then not legally in control over their wealth.

Finally, to sort out recipients of gifts not being final estate intergenerational transfers between parents and children, I only keep individuals having lost a parent in that same given year (4). This is done by creating a new dataset (*death_parent*) with the dates of death for the parents and merging it with the first dataset containing the heirs $heir_pop.

Thereafter I use an identification key for parents to merge parents dying in the given year with their children from $heir_pop. I chose to only include this year as to increase certainty that the received amounts are in fact inheritance. However, some heirs do receive inheritance somewhat delayed. As part of the robustness tests in section 6.3 I will investigate the effects of relaxing this constraint to also encompass the year preceding the actual reception.

Following this four-step procedure, I retain samples for each year with the individuals of legal age receiving more than 100,000 kroner of inheritance, the same year as they lost a parent.

5.3 Descriptive statistics

In this section the descriptive statistics of the main sample in the years 2002-2004 will be presented, including some prior years to inspect pre-trends. Descriptive statistics for the full period from 1994-2013 can be found in Appendix A.

As noted in section 4.2 on the empirical framework of the analysis, it is paramount that the subsequent cohorts are similar in baseline characteristics, as to be able to compare. Since they constitute each other's control groups, this is crucial as to minimise any other heterogeneity between cohorts than the impact of inheritance itself to be able to interpret my results causally.

Table 5.2: Mean characteristics of heirs and decedents

	Years					
	1999	**2000**	**2001**	**2002**	**2003**	**2004**
Decedents (parents)						
Age at death	78.4	79.0	79.6	80.2	80.6	80.6
Woman (%)	46.5	48.9	49.5	50.0	53.1	48.4
Married (%)	5.3	6.0	5.0	4.5	4.1	5.0
Divorced (%)	18.3	21.0	19.2	20.0	18.1	18.6
Widow/widower (%)	75.5	72.3	74.1	73.8	76.5	75.5
Never married (%)	0.4	0.0	0.8	0.5	0.0	0.4
Children	2.3	2.4	2.4	2.5	2.5	2.5
Net wealth T-1[a]	123,721	127,046	139,525	135,792	132,777	142,620
Heirs (children)						
Age at inheritance	44.7	45.4	46.2	46.7	47.5	47.7
Woman (%)	48.1	47.0	47.8	47.5	48.6	48.4
Married (%)	61.2	61.7	61.9	61.0	61.0	60.5
Taxable labour income	232,729	240,751	254,145	263,133	274,716	273,621
Net wealth T-1[b]	80,523	110,402	116,431	139,615	148,832	135,395
Gross inheritance[c]	360,346	387,081	403,189	408,775	417,442	460,833
Number of heirs	5347	5396	5499	5852	5902	6930

[a] Net wealth defined as taxable assets minus debt, where T-1 is in the year before decedence.
[b] Net wealth defined as taxable assets minus debt, where T-1 is in the year before inheritance.
[c] The gross sum of inheritance and gifts received through the year.

Table 5.2 shows that the baseline characteristics across the cohorts differ minimally, and if so, they follow fairly predictable patterns. Although the table encompasses the relevant cohorts for the estimation of the main results in 2002-2004, full tables for every cohort from 1996-2013 can be found in Appendix A.

For the decedents, we see the age of death rises slowly but steadily, in line with increasing life expectancy in Norway. The net wealth the year before inheritance clearly underscores the gross inheritance received by the heirs, which indicates an undervaluation at the reported tax value. This will be further discussed in section 5.4 on the applied variable for net wealth.

The majority of decedents are either widowers or divorced at the time of death. This seems reasonable, since as mentioned in section 3.1, an eventual surviving spouse often exercises the right to assume control over shared assets as undivided marital property, which postpones the passing of inheritance until the remaining spouse themselves die. As we are interested in the inequality effects of intergenerational transfers, the selected sample of decedents seems to have desired characteristics.

For the heirs, we see the baseline characteristics differ very little across cohorts, only following a modestly increasing and predictable trend in average age, income, net wealth, and received inheritance.

5.4 Data description

In the following subsection there will be a description of the variables that have been used in the analysis. As the data on an individual level is not visible in Microdata, it is beneficial to have a comprehensive grasp of how the variables are constructed and how they relate to the actual world.

5.4.1 Main variables defining the population

Variable on received inheritance

For the analyses I apply the variable *SKATT_ARV_GAVER*, which is the measure for the total amount of received inheritance and gifts throughout a year (Microdata, n.d.[f]).

The variable contains pre-tax values for the sum of received gifts and inheritance for each individual, from 1993 to today. From 1993-1999 there was a reporting obligation for sums of received amounts within a year exceeding 10,000 kroner, but from year 2000 this lower limit was increased to 100,000 kroner. There are reported values below the limit, but since there was not a reporting obligation, the data are likely not complete. If looking to compare the samples before and after 1999, one should consider to crop manually by equalising the lower limits to 100,000 kroner.

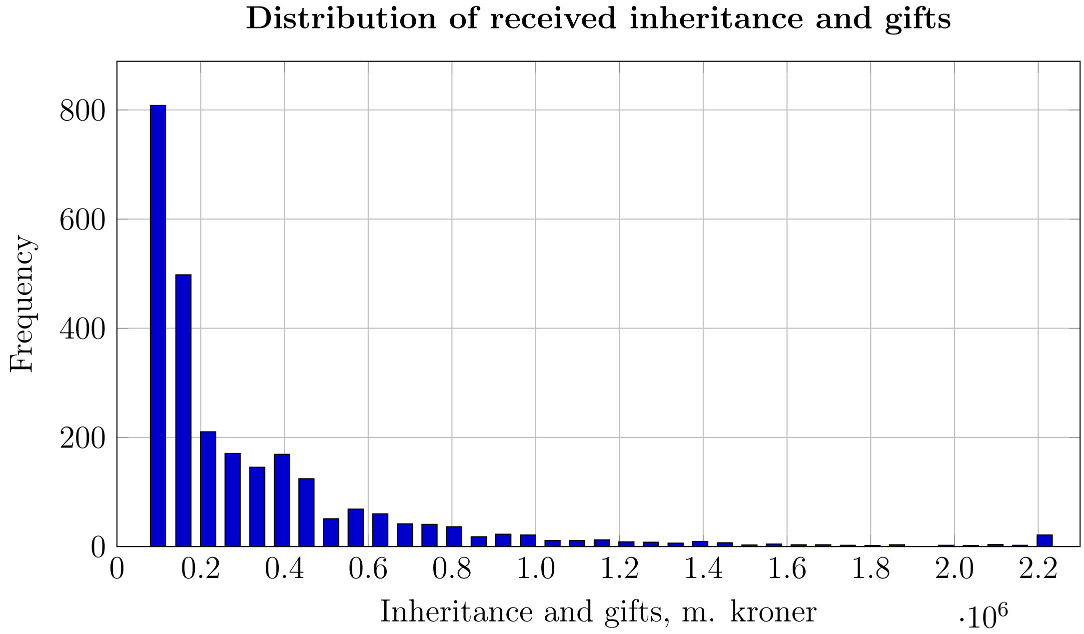

Figure 5.1: Histogram showing received amounts of inheritance and gifts averaged over cohort 2002-2004. The distribution has a defined skewness with most amounts close to the minimum reporting limit of 100,000 kroner. The average received sum was about 410,000 kroner, clearly exceeding the median of 280,000 kroner.

Nevertheless, a crucial deficiency with the variable is that it does not differ between gifts and inheritance. This presents several challenges for the empirical analysis since there are no other available variables in Microdata describing gifts and inheritances. This means that an individual seemingly receiving inheritance from a deceased parent in a given year, might have received a part of the amount as a gift from another source. In the analysis there will be made efforts to distinguish between gifts and inheritances; however, it is important to acknowledge that these efforts may not entirely overcome the obstacle. Therefore, this limitation represents a weakness in the subsequent analysis.

Identifiers for mother and father

In order to link each inheriting children to their deceased parent, the foreign keys BEFOLKNING_FAR_FNR for the father (Microdata, n.d.[c]) and BEFOLKNING_MOR_FNR for the mother (Microdata, n.d.[d]), has been imported. These variables are constructed from the parents' birth number and used as an identifiers.

Variable on date of death

To extract the actual year of death for a deceased parent the variable BEFOLKNING_ DOEDS_ DATO has been imported. It contains the eventual date of death for any individual (Microdata, n.d.[b]).

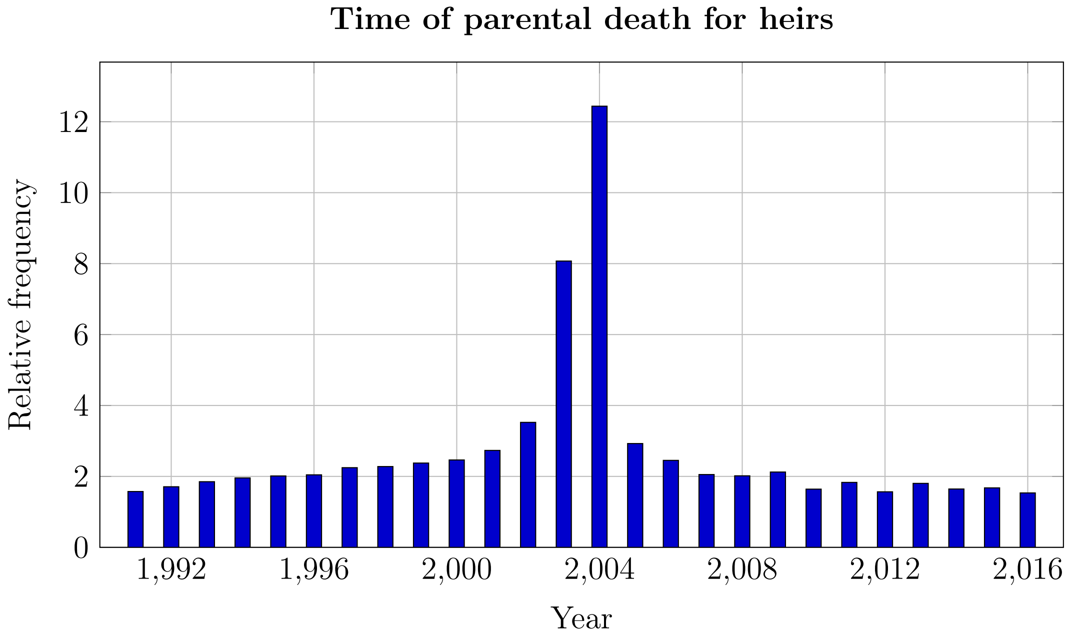

Figure 5.2: Histogram shows the year of death of parents of the cohort of heirs receiving >100,000 kroner in 2004. Averaged frequencies for mothers and fathers. Truncated axis at 1990 and 2016.

As to provide an example, Figure 5.2 shows a parent's (average of the mother and father) year of death for the 2004 cohort. In other words, it's based on the sample of 2004 in Table 5.1 *before* excluding on year of parental death.

One can see there is – as expected – a spike in frequency of death the same year as the heir receive the transfer. The distribution is nonetheless fairly flat, with non-negligible values for each year. This has a few obvious explanations, the first being that it could have been the other parent that triggered the inheritance, hence this parent could have passed away in any other year than 2004. To exemplify, imagine an heir's father passed away in 1995, but it was the mother passing away in 2004 that triggered the inheritance in this year.

Another explanation for the flat distribution can be that the transfer might have come from another relative, something which we cannot control for with the available data.

A third explanation is that transfer to the heir in 2004 was an advance on inheritance, implying the parent in fact passed away in a subsequent year. The practice of advances on inheritance can understate the amount an heir in fact receives from their parents, in turn distorting the estimated effects. This intervention will for this reason be addressed in the robustness tests in Section 6.3.

Besides the flatness of the distribution, one might also comment on the significant number of heirs losing a parent in 2003, the year before the transfer. A considerable part of these observations come due to the above mentioned explanations, but the rest are likely explained by a delayed inheritance process and - transfer. In the main analysis, I stick to heirs losing their parents in the same year as receiving, in order to go as far as possible in excluding other transfers than from parent to child. However, in the robustness tests in Section 6.3 I will also include the year prior to receiving, to examine whether this restriction affects the results.

5.4.2 Dependent variable

Gini Coefficient

The dependent variable of interest in this thesis is the Gini coefficient of distribution of taxable net wealth.

In Microdata, one can observe the Gini coefficient for a specific sample in a specific year. However, it is not possible to see its confidence interval or similar properties of the calculation. One can thus observe the development of the Gini coefficient for each sample, but not without further conduct analyses of the significance of these values. Another limitation is that one cannot directly apply the output of Gini coefficients in regressions. In the following calculations and regressions the values must therefore be registered manually before being plotted in to conduct the analysis.

Taxable net wealth

As the dependent variable is in fact calculated on the basis of another variable, the taxable net wealth, it deserves its own thorough description.

The choice of this particular measure is grounded on enabling comparison with resembling studies, like Elinder et al. (2018) and Boserup et al. (2016). In Microdata, taxable net wealth is denoted as SKATT_NETTOFORMUE (Microdata, n.d.[g]).

The variable is computed as taxable gross wealth less debts. Taxable gross wealth is the sum of gross financial capital and gross real capital, using taxable values for property. For the primary home – which is the main and only property for a majority of Norwegians – this is normally about 25% of market value (The Norwegian Tax Administration, 2023). For secondary homes the valuation has generally been higher, though varying with different schemes over time. Unlisted shares are normally at book value, which to a varying degree can lead to a misreprentation of net wealth. In particular this could be a problem for the most affluent, holding more shares on average.

This undervaluation of gross wealth, in turn affecting taxable net wealth, might distort the empirical analysis, as the reported values do not necessary convey the "true" wealth of an individual. In particular such distortion may become significant for individuals which due to the under-valued property and/or shares have a negative or close to zero taxable net wealth, while their net wealth using market values in fact would be positive.

Ideally I would want a wealth measure using market values. One such variable does in fact exist in Microdata, called INNTEKT_BER_BRFORM, but unfortunately this is available only from 2010 and onwards (Microdata, n.d.[a]). For this reason, I will stick to the selected dependent variable, but nonetheless include a robustness test in section 6.3 considering the impact of adjusting to market values, although only for the years where I have available data. I am in this last period therefore able to compute net wealth in market values, by subtracting the variable for total debt SKATT_GJELD (Microdata, n.d.[e]).

This challenge is however not unique to the case of Norway. In Sweden, Elinder et al. (2018) applied a net wealth measure with properties valued at about 75% of market value.

5.4.3 Variables for the DiD-regression

When estimating the BAE using a DiD approach on panel data, several additional variables are needed introduced to conduct the analysis.

For each inheriting cohort, I manually create a panel data set with the previously computed

Gini-values for the treatment- and control group, for four years of pre-trends and the year of inheritance. For the 2002 cohort then, the panel data set spans from and including 1998 to and including 2002.

As described in section 4.2 I control for time fixed effects through the introduction of year dummies for each year in period of study. These take on the value of 1 in a specific year, and 0 in every other year.

Furthermore I include a treatment-dummy taking on the value 1 for the year where the cohort at hand inherits, and 0 before this year. A group variable is also needed, taking on the value 1 for the treatment group and 0 for the control group. The DiD-estimator is hence given by the interaction between the treatment - and the group dummy.

In addition Microdata automatically introduces controls for unit fixed effects, ref. section 4.2.

6 Results

This chapter presents the results from the coefficient estimations, looking to explore the short-term effects of inheritance on wealth inequality. Following a thorough presentation and discussion on these estimates for the main period of study (2002-2004), I proceed to compare these results with the findings of Elinder et al. (2018) in Sweden. In order to fortify my findings I perform several robustness tests, where crucial assumptions and constraints will be tested for their impact on the results. In the final section I extend the scope, estimating inheritance effects for the full period of available data (1994-2013), looking to detect patterns and trends, shedding light on the topic from more angles.

6.1 Main estimation results

In this section, I present the results from the estimation of the effects for the years 2002-2004, accompanied by running discussions.

6.1.1 The Direct Mechanical Effect (DME)

As described in detail in Section 4.2, the DME is found by adding the pre-inheritance wealth for each individual inheriting to the upcoming inheritance, before subsequently measuring how that expected wealth increase immediately would affect inequality. I start by visually assessing the derived effect on the wealth distribution.

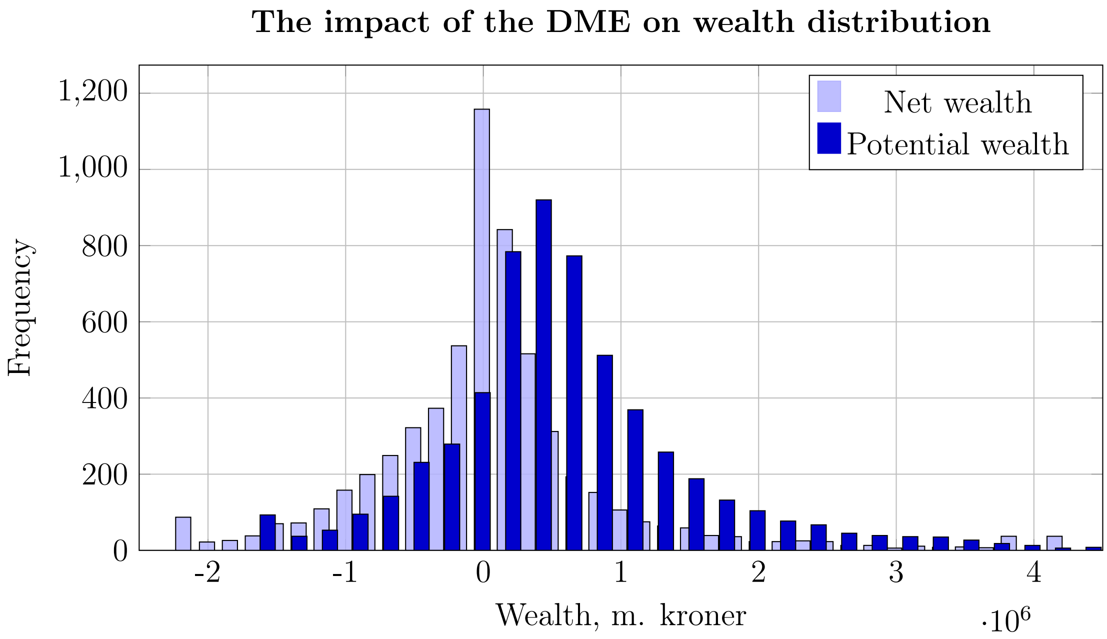

Figure 6.1: Histogram showing wealth distribution at 31. December the year before inheritance, averaged over cohort 2002-2004. Potential wealth equals net wealth plus inheritances in the subsequent year.

While one should exercise caution in drawing any definite conclusion from a simple diagram, it does nonetheless provide a compelling visual overview. Upon initial inspection of the figure, we see the wealth distribution shifts to the right as inheritance is added. Furthermore, one can remark the distribution not only shifting but also widening as richer individuals tend to inherit more, thereby increasing absolute dispersion in net wealth. Another notable observation is the shift of a considerable number of individuals from having negative or zero net wealth's to positive, albeit modest net wealth. This, in turn, contributes to a decrease in relative inequality measures, as will be presented in the forthcoming results table.

One can see the distribution of net wealth prior to inheritance is centered around zero, likely to be partially due to the under-valuation of assets, as described in Section 5.4. In the subsequent robustness tests of the estimated effects in Section 6.3, this misrepresentation will be addressed.

Table 6.1: Estimated impact of DME on dimensions of wealth inequality[a]

	(1)	(2)	(3)	(4)	(5)
	Gini	P90/P50	Top 10%	Bottom 50%	P75-P25 (IQR)
Inheritance effect (DME)	-0.179	-19.3	-0.802	1.13	191,160
Effect in %	-23.4	-84.9	-63.5	...[b]	37.1
Mean outcome T-1	0.763	22.7	1.26	-1.13	517,656

[a] Table displays average estimates over the samples of heirs from 2002-2004, a total of 17,253 individuals. [b] Coefficient not interpretable due to negative value at T-1.

The results presented in Table 6.1 quantify the impact following the same patterns as indicated by figure 6.1; a broad lift in net wealth for those around net-zero, but nonetheless accompanied by increased absolute spread between the least - and the most affluent.

We see measures of relative inequality decrease. The Gini coefficient falls from 0.763 to 0.584, a substantial 23.4% drop. This estimated equalising effect is larger than in previous studies, which will be further discussed in the subsequent sections.

As discussed in Section 4.1, the Gini coefficient has several shortcomings, in particular when handling negative values for net wealth, and due to its inherent heterogeneous weighting of values across the wealth distribution. As a single summary statistic generalising the properties of the whole distribution, it lacks the ability to inform on for instance how different subgroups of net wealth develop in relation to each other.

It is for these reasons it is crucial to also consider alternative measures of relative inequality. In fact, the outcomes along these measures are reassuring. They seem to follow the same pattern as did the effect in terms of the Gini coefficient, although more accentuated, as a consequence of the lower deciles' negative net wealth. The wealth ratio P90/P50 (the ratio between the wealth of a rich and that of an average individual) falls substantially from 22.7 to 3.4. Furthermore, the top 10%' share of total net wealth falls from 126% (it is more than 100% since the lower deciles have negative net wealth) to a less extreme 46.1%. The bottom 50% move from a -113% share of total net wealth to the almost positive share of

-0.3%. The sizes of these effects are large, and may due to the high frequency of negative net wealth's provide an inaccurate interpretation of the overall impact of inheritance, without considering the coming robustness tests. The pattern is however clear; the DME seems to reduce relative inequality

While measures of relative inequality fall, at the same time absolute dispersion actually increases. The difference in net wealth between an individual of the 75th - and the 25th percentile – the IQR – rises from 517,656 kroner to 708,816 kroner, an increase in spread of 37.1%. The overall inequality impact of inheritance thus depends on whether assigning most attention to relative - or absolute measures of inequality.

As the DME estimations do not arise as the outcomes of a regression model, I do not obtain standard deviations. This limits my ability to assess the statistical uncertainty associated with the estimated coefficients, constituting a weakness in the analysis. The results' credibility will however be fortified by thorough robustness tests and by comparing them with findings from Sweden.

In the attempt of explaining the equalising impact of the DME in relative terms, a key observation is that the distribution of inheritances is more equal than the initial net wealth of the heirs. It can be shown that wealth among older individuals is relatively more uniformly distributed than among the younger, in turn affecting inheritance transfers and their impact on inequality. This can readily be seen in the applied data, and aligns with the broader trend of increasing wealth inequality in Norway (SSB, 2021).

In an effort to further entangle the underlying dynamics, several mechanisms explaining the equalising impact of the DME are open for consideration. Examples of such explanations might be – but are not restricted to – that wealthier decedents might have more children and hence disperse their wealth, that they write more wills leading parts of their wealth to charity or other recipients than their children, or that they give more advances on inheritance than their less affluent part of the population, as theorised in Elinder et al. (2018). All these proposed factors might explain parts of the estimated equalising effect, but due to restrictions on time and data, they will not be tested explicitly in this thesis. The exception is however advances on inheritances, which will be examined in Section 6.4.

Furthermore, there is another distinct mechanism following from the construction of

Norwegian inheritance law, lying in the fact that an heir cannot inherit a decedent's debt (The Norwegian Inheritance Act, 2019, §116), as earlier noted in Section 3.1. When examining decedents' net wealth at the time of death in the applied data, I find this legal mechanism to consistently though modestly alter the effects from inheritance in the equalising direction, both in the relative and the absolute measures. Interestingly this legal aspect is the only mechanism Elinder et al. (2018) finds to be quantitatively important for the estimations, among the above mentioned mechanisms.

Lastly, we shift focus to explaining the estimated increase in absolute wealth dispersion as measured by the IQR. This result might appear less surprising and less difficult to explain, as it aligns with the conventional view that already wealthy heirs inherit more than their less affluent counterparts. This view is confirmed by the applied data. Hence there is a positive association between an heir's wealth and the amount of inheritance received, as has been shown in various other papers (e.g. Charles et al., 2003).

The perhaps paradoxical result of the estimated equalising effect in relative terms and the disequalising effect in absolute terms is explained by considering that even though richer individuals tend to inherit more in kroner, they inherit less *relative* to the net wealth they initially have.

In summary, the main results for the DME in the period 2002-2004 indicate a substantial reduction in relative inequality across several measures, all the while accompanied by a considerable increase in absolute dispersion. Some of the estimates on relative inequality might however be over-accentuated, as the high presence of values around and below zero net wealth inflates the multiples. Their credibility is also weakened by the absence of accompanying standard deviations. Nonetheless, after the subsequent section presenting the results from the estimation of the BAE, I seek to perform several robustness tests in order to highlight the certainty in the found estimates for the DME.

6.1.2 The Behaviour Adjusted Effect (BAE)

As elaborated in Section 4.2 the BAE is an expansion of the DME, taking into account any eventual altered behaviour due to inheriting, such as changes in investment -, saving - and consumption, which in turn also could impact net wealth at the end of the year.

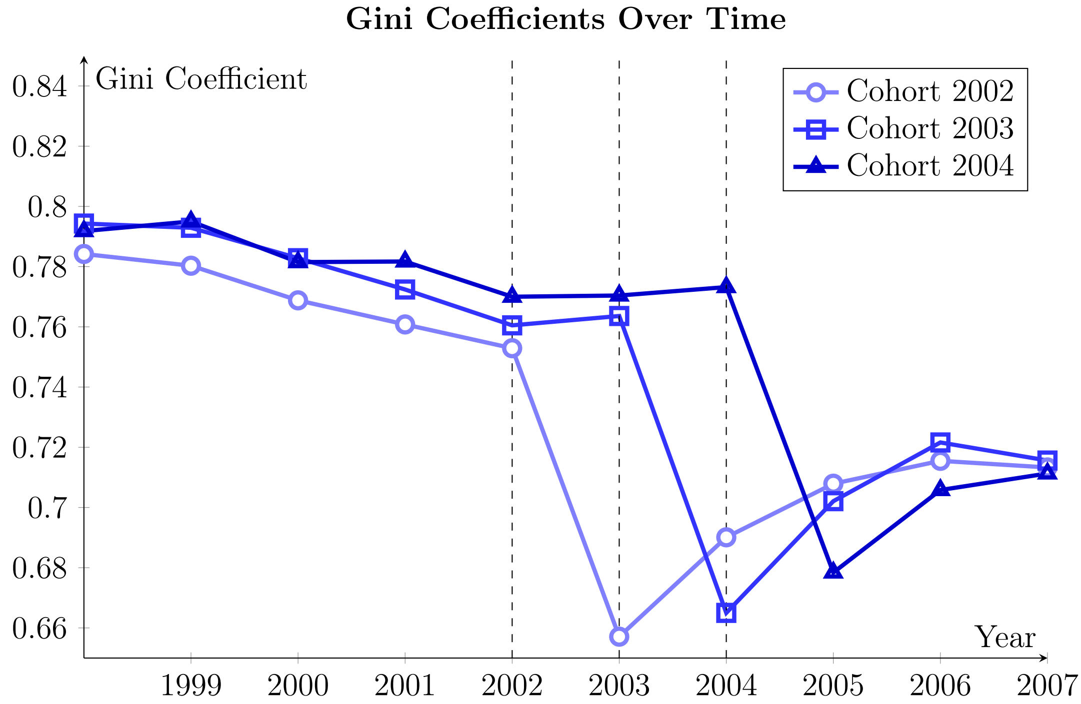

Figure 6.2: Diagram showing the trend in the Gini coefficients for net wealth. Cohorts inheriting in 2002-2004. Year of inheritance marked with a stapled line.

By inspecting pre-trends in the years prior to inheritance we see the development in Gini coefficients for the three cohorts display close to perfectly parallel trends. This strongly increases confidence in a causal interpretation of the estimated effects of inheritance. For all cohorts, the year of inheritance is characterised by a sharp drop in the Gini coefficient. Interestingly, this sudden drop is followed by a partial rebound, before the development seems to stabilise and flatten. I am however, as mentioned in Section 4.2, limiting my scope to estimating only the short-term effect, as the control groups – after the year of inheritance of the treatment groups – are invalid, as they themselves inherit.

Table 6.2: Estimated impact of BAE on wealth inequality

	(1)
	Gini
Inheritance effect (BAE)	-0.098
Effect in %	-12.8
DME in %	-23.4
Behavioural impact in % [a]	10.6

[a] Behavioural impact equals BAE - DME.

We see that the average BAE over the cohorts 2002-2004 is estimated to reduce the Gini coefficient by about -0.098, an impact of about -12.8%. Under the parallel trends assumption, this is the causal estimate of the short-term effect of receipt of inheritance on wealth inequality.

Although I obtain the BAE denoted in the main parameter of interest – the Gini coefficient – there is unfortunately no readily available approach to estimating the effect in terms of the alternative measures, due to software restrictions. This represents a weakness in this part of the analysis, although in Elinder et al. (2018) the estimated effects in these measures do not change the interpretation of the BAE: It has a similar impact as the DME, only moderated. Furthermore, the relative size of the DME and the BAE are similar in their results as in this thesis.

We see the BAE is clearly lower than the previously estimated DME, indicating that the behavioural responses in the year of inheritance absorbs a substantial part of the effect. The behavioral impact, driven by confounding changes in investment-, saving- and consumption behaviour, is hence estimated to 10.6%, reducing the initial equalising impact from the DME.

Since the two estimated effects differ, it suggests some individuals employ part of their newly increased capital in a way that alters reported net wealth at the end of the year.

Partially this could stem from the less affluent individuals consuming more of their inheritance than their more affluent counterparts, something which would reduce any initial equalising effect. This explanation is supported by earlier research showing that less wealthy heirs have a higher relative propensity to consume, and thus consume a larger portion of their inheritance (Druedahl et al., 2017).

Another explanation could stem from heirs heterogenously investing their increased funds in the year of inheritance, like in financial markets or in real estate. As already noted in Section 5.4, investing in assets can reduce reported net wealth due to valuation discounts.

Lastly, the influence of investment behaviour may become even more pronounced if the wealthier heirs receive higher returns on their investments and savings than the less wealthy counterparts do, as has been indicated in some studies (e.g. Andersen et al., 2010).

However, without complete data on consumption, savings and investment, these aspects are tough to credibly assess, although there will be a robustness check regarding the impact of asset valuation in Section 6.3.

Apart from the influences merely stemming from the behavioural responses of the heirs, one should also note that there was a present inheritance tax throughout these years (as mentioned in Section 3.3). However, due to non-existing data on the amount of deemed inheritance tax per individual, and the complex nature of the taxation scheme with various rates and deductions, the applied post-inheritance wealth values are not gross of inheritance tax, as opposed to in the calculations of the DME. This implies that if the key interest lies in estimating tax-free effects, which is the focus of this thesis, the outcome of the BAE could be skewed due to the deducted inheritance tax. Arguably, this skewness would represent a slight *overestimation* (in absolute value) of the found equalising BAE, due to the fact that the inheritance taxation scheme was progressive. Since the largest inheritances were in fact taxed, the after-tax net wealths are likely *more* evenly distributed than they would have been in absence of the tax.

Conversely, if one aims to assess the effects while encompassing the significance of the specific tax regime, it is the DME that might be skewed due to the negligence of the tax, whereas the found BAE remains correctly estimated. In this scenario, the DME would arguably be *underestimated*, since an added tax effect would enhance the equalising impact.

For both cases, this means that a consistent handling of the tax aspect might have yielded a larger difference between the estimated BAE and the DME. Nonetheless, since the tax scheme at the time involved a minimum deduction was 250,000 kroner, a maximum tax rate of 20% applying only to transfers surpassing 550,000 kroner (NOU 2000:8), the inaccuracy following from the negligence of inheritance taxation is arguably not very large.

All in all, the estimated BAE of -12.8% indicates an equalising impact from inheritance as measured by the Gini coefficient. However, the impact is substantially smaller than the estimated DME, which indicates that the simultaneous influence from consumption -, saving-, and investment behaviour in the year of inheritance has a disequalising impact.

6.2 Comparison with Sweden

In this section I proceed to compare my results with those from Sweden, with an aim to understand and explain the similarities and differences between them. My estimates from the preceding analysis correspond to those for the children-only-sample in Elinder et al. (2018), meaning the sample excluding other transfers than parent-child.

Table 6.3: Estimation results[a] comparison with Elinder et al. (2018)

	(1)	(2)	(3)	(4)
	Gini	P90/P50	Top 10%	P75-P25 (IQR)
DME in %				
Norway	-23.4	-84.9	-63.5	37.1
Sweden	-7.53	-18.8	-7.10	11.3
BAE in %				
Norway	-12.8	...[b]	...	...
Sweden	-4.60	-10.5	5.02	10.1

[a] Coefficients for bottom 50% are not displayed as they are uninterpretable due to negative value at T-1. [b] For the BAE other coefficients than Gini are not possible to compute in Microdata.

Briefly put, Elinder et al. (2018) obtain estimates along the same patterns and directions as in this thesis, although with substantially smaller effect sizes. They draw the same conclusions, that the short-term effect of inheritance reduces measures of relative inequality, all the while increasing absolute dispersion.

In terms of the DME, their main result is that relative inequality measured by the Gini coefficient falls by -7.53%, as opposed to this thesis' -23.4%, an effect about a third the size. They estimate the effect on absolute dispersion as measured by the IQR to an increase of 11.3%, as opposed to 37.1% in this thesis, also a relative effect size of about a third.

When accounting for behavioural responses, they find the BAE to reduce the Gini coefficient by -4.6%, again about a third of the estimated fall of -12.8% in this paper. The relative size of the BAE compared to the DME is about 0.61 for Sweden whereas it is 0.55 for Norway, demonstrating that the proportion between the sizes of the two estimated effects are more or less within the same order of magnitude. The behavioural impact thus seems to reduce the equalising effect of inheritance in a similar manner in the two countries.

Along the alternative measures of inequality, the difference in effect sizes are even more pronounced than in the ratio 1:3, but not contradictory to the overall pattern.

The disparity in results are likely explained by difference between the two samples, as they differ in multiple ways. First and foremost, the mean amount of received inheritance in the Norwegian sample was 410,000 Norwegian kroner as opposed to 97,000 Swedish kroner in the Swedish sample, which at the time corresponded to about 116,000 Norwegian kroner[1]. Apart from country differences in overall wealth, this difference in means is likely much due to the exclusion of values below 100,000 kroner in the Norwegian sample, as that was the minimum reporting limit. In the Swedish sample, a large part of observations were in fact below this threshold (Elinder et al., 2018, p. 20), naturally causing the impact of inheritances to appear smaller than for the Norwegian sample. This restriction in my analysis, as earlier mentioned, will be relaxed and thoroughly analysed in Section 6.3.

Alongside disparate applied data on inheritance amounts, a second reason for the different results could stem from the way net wealth is measured. As noted in Section 5.4, the valuation discount on properties in Norway leads to an underestimation of net wealth, since the taxable value is about 25% of market value. Elinder et al. (2018) also has this issue with Sweden, although less severe, as the applied Swedish data has property valued at about 75% of market value. Anyhow, I will in the robustness tests – as they also do – attempt to consider how an adjustment of the net wealth values to incorporate market values would have impacted the results in this paper. However, although this might not hold true for the Norwegian case, they find that such an adjustment has a negligible impact on their estimates (Elinder et al., 2018).

Another explanation might come from the fact that some values are censored in Microdata, as winsorisation averages out the top 1% and bottom 1% of observations, slightly skewing the results. It does however not appear clear in which direction this would pull the results, since both net wealth and inheritance transfers are censored this way. Regardless, winsorisation only impacts the DME estimation, as regression outputs are unaffected (SSB and Sikt, 2023).

Remaining explanations might be based on country differences. Although the demographics of Sweden and Norway are highly similar, there might nonetheless be various dissimilarities

[1]The Swedish/Norwegian krone exchange rate was about 1.2 between 2002-2004 (Statmuse, 2023).

between the countries affecting the results.

6.3 Robustness tests on main results

As noted, several of the assumptions and delimitations conducted in the initial stages of the empirical analysis can have a considerable impact on the estimated effects of this thesis. The aim of this section is to highlight and evaluate how sensitive the results are to changes in these conditions.

The first figure, Table 6.4, presents the results from various robustness tests and counterfactuals for the main analysis for the years 2002-2004. It demonstrates how different alterations impact the inheritance effects as measured by the DME – our main effect of interest – along the previously applied five measures of inequality.

Table 6.4: Robustness tests and counterfactuals

	(1)	(2)	(3)	(4)	(5)
	Gini	P90/P50	Top 10%	Bottom 50%	P75-P25 (IQR)
(A): Original sample					
Inheritance effect	-0.179	-19.3	-0.802	1.13	191,160
Effect in %	-23.4	-84.9	-63.5	...	37.1
(B): Including <100,000					
Inheritance effect	-0.129	-13.5	-0.656	0.967	136,765
Effect in %	-17.3	-76.9	-56.2	...	33.1
(C): Relax. death year req.					
Inheritance effect	-0.173	-16.1	-0.731	1.03	195,095
Effect in %	-22.8	-82.4	-61.2	...	36.6
(D): Gift adj. 20%					
Inheritance effect	-0.223	...	-2.93	4.29	179,703
Effect in %	-27.6	...	-88.0	...	34.0
(E): Gift adj. 50%					
Inheritance effect	-0.267	...	...	...	121,785
Effect in %	-31.3	...	...	...	20.8

[a] Certain estimates are not shown due to negative pre-inheritance net wealth values, making the outcomes uninterpretable.

For the majority of tests, we can see considerable as well as interesting changes occurring.

(B): Including small inheritances

In Panel (B) in Table 6.4 we see that by including inheritance transfers below the reporting limit of 100,000 kroner, inheritance effects denoted in all five measures are moderately lowered. The equalising effect in terms of Gini falls from -23.4% to -17.3%, approaching the estimates in Elinder et al. (2018). The other relative measures follow the same pattern. The disequalising impact on absolute dispersion falls from 37.1% to 33.1%.

We see all estimates are reduced in absolute size, which is a naturally explained by the fact that when including small inheritance amounts, the average overall impact of inheritance will appear smaller. The reason why this result is not fully trustworthy is however that there was not a reporting obligation for amounts below the limit, making the data incomplete. It is not unlikely that small amounts are underreported in the data, implying that the true impact of including values below the threshold might be understated in this robustness check. This is an important remark, as if I had complete data for all amounts of inheritance, the estimated effects might have been even closer to that of similar studies, such as Elinder et al. (2018) and Boserup et al. (2016).

(C): Relaxing parental death requirement

In Panel (C) I study the impact of sample delimitation with respect to the time of death of the decedent.

In the attempt to isolate parent-child transfers from other gifts, I previously selected parents dying in the same year as their child received a transfer. However, as seen in Section 5.4, it became evident that some inheritance settlements were delayed by up to a year, so that the transfer came in the year after the decedent passed away. This could constitute a problem if it is so that those inheritance processes enduring for longer have different properties than the shorter processes. This could represent a bias, skewing the results.

When considering the results of this sample expansion it becomes apparent that the restriction had a minimal impact on the estimated coefficients. If any, the relaxation has a marginal and evenly distributed reducing impact on the estimates across the measures. The DME denoted by the Gini coefficient falls from -23.4% to -22.8%, and by the IQR we see a reduction from 37.1% to 36.6%. However, it is not unlikely that this small difference is a result solely of random variation.

(D & E:): Adjusting for advances on inheritance

In Panel D and E, I attempt to test the estimated coefficients sensitivity to the inclusion of gifts as advances on inheritances.

Gifts can represent a considerable challenge concerning the topic of inheritance. Indeed, when studying intergenerational transfers, it is important to bear in mind that the total sum of these transfers consist of inheritance passed on at the time of death, and gifts given during the lifetime of the giver, i.e. *inter vivos* transfers (Elinder et al., 2018, Appendix B.3.3).

If it is so that a substantial part of a decedent's wealth is transferred as *inter vivos* gifts, an estimation of a causal effect relying merely on the inheritance received at the time of death might lead to an underestimation of the full effect. Even more so could this constitute a problem if it is true that wealthier parents have different giving patterns than the less wealthy, since this would mean that the isolated inequality effect of inheritance would be biased. A solid analysis should hence also consider the broader definition of intergenerational transfers when studying inheritance.

Bearing this in mind, the data applied in this thesis has its shortcomings. As earlier noted i Section 5.4, the applied data does not enable any distinction between inheritance and gifts, since only the sum for received amounts are registered per individual per year. Firstly, this means that when considering an inherited amount for an heir in the year of losing a parent, it is *likely* that the amount is inheritance, but we cannot know for certain the source of the transfer. Secondly, it is impossible to know the extent to which the heir from before has received *inter vivos* gifts from that same parent. This comes as a consequence not only of the data spanning no further back in time than 1994, but most importantly from that it is not possible to link gifts to givers in any credible way, as there are no available identifiers.

To address this challenge, I perform tests by assuming certain levels of *inter vivos* gifts and then calculating its impact on the results. More specifically, I follow Piketty and Zucman (2015) who argue that inter vivos gifts can be approximated as a fixed share of the inheritance estate. I compute two gift approximations, one at 20% of the inheritance – which equals the reported size of such gifts in relation to inheritance in Sweden in 2002-2004 (Ohlsson et al., 2014) – and one equal to 50 percent of the inheritance. I subtract those approximated values from the pre-inheritance net wealth, while I add them to potential wealth (the measure including inheritance). This approach can be criticised as it does not take into consideration how the value of the inter vivos gifts might have changed over time due to e.g. inflation or return on capital. This simplification is however necessary as there is no available data on when the eventual inter vivos gifts were given, i.e. if they were given the year before the main inheritance, or decades before.

The results from these tests are nonetheless intriguing. By assuming inter vivos gifts on average amount to 20% of the inheritance estate, we see in Panel (D) that the equalising DME in terms of the Gini coefficient rises from -23.4% to -27.6%. The estimates along the alternative relative inequality measures move in the same direction, but are hardly interpreted due to the high presence of pre-inheritance negative values. Moreover, the impact on absolute dispersion pulls in the same direction: Accounting for gifts at the 20%-level reduces the disequalising effect of inheritance on absolute dispersion. In terms of the IQR it falls slightly from the initial impact of 191,160 kroner, to 179,703 kroner, nonetheless still representing a substantial disequalising effect of 34.0%.

Moving on to Panel (E) where I assume gifts account for 50% of the inheritance bequest, I find similar tendencies. The results pull in the same equalising direction in Panel (D), only to a further extent. The equalising effect in terms of the Gini increases to -31.3%, and the effect on absolute dispersion is reduced to 20.8%

To summarise the results from the gift adjustment tests, it seems that accounting for inter vivos gifts affects the estimated effects from inheritance in the equalising direction. One explanation for this is that since inheritance is more equally distributed than pre-inheritance net wealth, scaling it up increases this equalising aspect. These results differ from those found by Elinder et al. (2018), who had available data on actual transferred gifts 10 years before the inheritance, and after thoroughly testing and discussing, concluding that advances on inheritance play no important role for their main findings. Without further data on the actual occurrence and magnitude of gifts as advances on inheritance, it is difficult to conclude on their overall impact in this paper, e.g. if the frequency of such gifts differ across the wealth distribution. If anything, however, my test results point to that the estimated inheritance effects from the original sample might provide a too disequalising picture of the nature of inheritance in Norway.

The impact of applying market values

Table 6.5: Impact on estimated effects of market value adjustment [a]

	(1)	(2)	(3)	(4)	(5)
	Gini	P90/P50	Top 10%	Bottom 50%	P75-P25 (IQR)
(A): Original sample					
Mean outcome T-1	0.731	11.8	0.967	-0.755	1,073,612
Inheritance effect	-0.137	-8.28	-0.500	0.745	376,338
Effect in %	-18.7	-69.9	-51.7	... [b]	34.9
(B): Adj. to market values					
Mean outcome T-1	0.576	3.31	0.402	0.046	2,130,741
Inheritance effect	-0.086	-0.679	-0.062	0.107	223,990
Effect in %	-15.0	-20.5	-15.5	...	10.5

[a] Based on average effect sizes for group of cohorts inheriting in 2011-2013.
[b] Effect in % non-interpretable due to negative mean outcome at T-1.

Having covered several robustness tests for the main results in 2002-2004, one important aspect still remains to be studied in detail. As previously noted, the applied data on net wealth is denoted in reported taxable values, encompassing a challenge with the valuation discounts on assets, more specifically on property and unlisted company shares. Testing for this intervention in the main period is however not possible, as there is no available data on market value of property nor on shares, or variables on wealth in market values. Such data is available only from 2011 onwards, meaning I will perform an alternative test using data from 2011-2013.

Before assessing the impact of the market value adjustment, it is worth noting that the initial inheritance effects in every five of the applied measures is smaller in absolute sizes for the years 2011-2013 than in the main period. This, and more, will be further discussed in the subsequent section presenting results for the full period.

Regardless, when running the effect estimations using the available wealth variables in market values, the impact is quite substantial. Not only are inheritance effects across all five measures smaller when using market values, the mean outcomes in the year before inheritance are also much altered, as the measuring of wealth is dissimilar. Adjusting to market values moves the net wealth distribution to the right, leaving fewer individuals with negative - or close to net zero wealth. In turn this makes the inequality multiples turn out more sensible and easier to interpret. Using market values we see the relation between a high net wealth and a medium net wealth – the P90/P50 – is 3.31, the top 10%' share of total net wealth becomes 40.2%, whereas the bottom 50%' holds 4.6% of total net wealth. The IQR naturally increases significantly, in fact it doubles, mainly as a result of those individuals with previously under-valued assets now shift to the right in the distribution, making it wider.

Moving on to studying the inheritance effects however, we see the equalising effect in terms of the Gini coefficient is reduced from -18.7% to a more moderate -15.0%. The changes in terms of the other relative inequality measures are even more pronounced. For instance, the drop in the top 10%' share of total net wealth is only 6.2 percentage points, heading from 40.2% to 34%, as compared to the 50 percentage points drop from 96.7% to a 46.7% share in the original sample. All in all, basing the analysis on net wealth in market values reduces the magnitude of the equalising effect sizes in relative terms. The explanation behind is that when the unlisted shares and property are readjusted to market values, pre-inheritance net wealth rises, resulting in a diminished impact from the inheritance transfer.

This diminishing is at least as present when it comes to absolute dispersion. The adjustment leads to a much smaller disequalising effect in terms of IQR, where the inheritance effect falls from 34.9% in the original sample, to 10.5% in the market value adjusted sample. This change is driven by two factors, the first being that the mean pre-inheritance outcome of IQR is about doubled, as mentioned above. Secondly, the inheritance effect in absolute size is interestingly reduced by 152,348 kroner. This implies that the distribution of net wealth has changed in such a way that the distribution of inheritance is more evenly distributed. An explanation for this can be that since real estate constitutes the main part of Norwegian households' wealth (SSB, 2020), and more so for the middle class than for the most wealthy, the readjustment to market values leads predominantly to a shift to the right for average households. Consequently, inherited wealth is more evenly distributed across the adjusted wealth distribution compared to on the previous distribution, reducing the inheritance effect as measured by the IQR.

Overall, the estimated effects – both in relative and absolute terms – are reduced in size by an adjustment to market values. This leads the results closer to those found in e.g. Elinder et al. (2018), explaining a part of the difference between the studies.

Furthermore, as noted in the beginning of this section, including inheritance amounts below the limit of 100,000 kroner also seemed to moderate the estimated effects. However, when including amounts below 100,000 kroner in the market value adjusted sample of 2011-2013, this has no clear impact on the estimated effects sizes. When included, the DME in terms of the Gini coefficient turns out to be 14.6%, as compared to 15.0% when keeping the restriction. The reason why this restriction appears to not have any significance while using market values is likely due to a large fraction of such "small" amounts not being reported, as they were not obligated to be so by law. Furthermore, this might seem more plausible considering that amounts below 100,000 kroner would have appeared less considerable in 2011-2013 than in 2002-2004. Since we cannot credibly trust these data points to provide a complete picture, one should exercise caution in concluding that the exclusion of small amounts has no impact on the results for this sample. However one might on the other hand state that there is no evidence for the exclusion to indeed have a significant impact on the results.

In summary, the robustness tests enhance confidence in the results, as they remain relatively stable when altering key assumptions and delimitations. Furthermore, the tests indicate that the inclusion of small inheritance transfers, as well as using market values instead of taxable values, explain a large part of the difference in estimates between the results in Elinder et al. (2018) and those in this paper – a finding that seems plausible as these were in fact the main differences between the two applied samples.

6.4 Estimation results for the full period

Having thoroughly investigated inheritance effects for the 2002-2004 period, compared these with similar findings in Sweden, and tested their robustness, I aspire to go further than in Elinder et al. (2018) by estimating effects for the full period of available Norwegian data. In doing so I look to detect any trends in changes over time, possibly highlighting the topic from more angles.

While data for the relevant variables spans from 1994 to 2013, the empirical estimation of effects is constrained to the period 1996-2013. The reason is that I group cohorts in threes and obtain six groups of cohorts, including that of 2002-2004. To ensure a minimum of three observations for inspecting pre-trends, the first group must therefore span from 1996-1998. Furthermore, the results for the last group, containing the 2011-2013 cohorts, are partially incomplete as the BAE cannot be calculated for years 2012 and 2013. This limitation arises from the composition of the control group, which contains the two preceding inheriting cohorts. Unfortunately, the data for these cohorts is unavailable for the years 2014 and 2015, due to the abolition of the inheritance tax from 2014.

The key identifying assumption for the DiD-estimation of the BAE is the parallel trends assumption, as informed in Section 4.2.2. Inspecting pre-trends from every group of cohorts from 1996-2013, one can clearly see that the developments in the Gini coefficient display close to perfectly parallel trends across cohorts prior to treatment. In other words, it looks as if the measure of inequality would have developed similarly in absence of treatment. I am therefore confident in making a causal interpretation of the estimated effects of inheritance. The pre-trend plots can be found and assessed in Appendix A, accompanied by descriptive statistics for each particular cohort in the period of study.

For this extended analysis I focus mainly on the DME and BAE in terms of the Gini coefficient. The other relative inequality measures do however exhibit a similar pattern, aligning with the main results in Section 6.1. Nonetheless, I do include the DME in terms of the IQR as to provide additional insight in the dimension of absolute dispersion.

Table 6.6: Inheritance effects for 1996-2013

	(1)	**(2)**	**(3)**	**(4)**
	Gini, DME (%)	Gini, BAE (%)	Behavioural impact (%)	IQR, DME (%)
Group of cohorts [a]				
1996-1998	-27.3	-13.7	13.5	43.6
1999-2001	-25.7	-13.8	11.9	42.5
2002-2004	-23.4	-12.8	10.6	37.1
2005-2007	-20.6	-11.6	9.02	31.5
2008-2010	-20.0	-11.1	8.87	33.1
2011-2013	-18.7	-12.2 [b]	6.54	34.9

[a] Average effect sizes for each group of cohorts. [b] BAE effect size based solely on the value for 2011.

We see that the interpretation of inheritance effects from the main analysis, concerning the DME, BAE, and DME denoted by the IQR, remains consistent when examining the entire available data period. In the short run, inheritance seems to have a marked equalising effect when considering relative inequality measures, while simultaneously demonstrating a very notable disequalising effect in absolute terms.

When considering the numbers more closely, one can identify several trends. It becomes evident that the size of the DME has been declining consistently throughout the period. From a level of -27.3% in the first years, it declines to -23.4% as found in the main results of 2002-2004, to a more moderate -18.7% in the last years before the abolition of the inheritance tax. Nonetheless, the equalising effects were in all years substantial, not to mention exceeding those found in comparable studies (Elinder et al., 2018; e.g. Boserup et al., 2016).

The BAE also declines over the years, although less accentuated, with a flattening and even a partial rebound in the latter years. Interestingly, this results in a convergence between the DME and the BAE over time. In other words, the DME – statically calculated at the end of the year before inheritance – approaches the BAE, which is calculated on a basis of the actual values of reported taxable net wealth before and after inheritance.

The observed convergence between the effects is synonymous with a decline in the behavioural impact, as evident in Column 3 in Table 6.6. The disequalising behavioural impact is estimated at 13.5% in the first years, declining steadily to about half the size, 6.54% in the last period. This clearly conveys that the impact of behaviour in the year of inheritance, absorbing part of the equalising DME, seems to diminish in importance over time.

Also in terms of absolute dispersion, the results display interesting tendencies. The inheritance effect on the IQR follows a similar diminishing in size as that of the relative measures for the first ten years, indicating that the overall importance of inheritance for wealth inequality was on the decline. However, for the last groups of cohorts, this pattern breaks, as the trend turns and the effect on absolute dispersion rises steadily, ending at a new high of about 39% in 2013.

This means that while for about half of the extended period of study, the general impact of inheritance seems to approach zero in both relative - and absolute terms, but for the last half, the effects have a progressively more disequalising impact on the wealth distribution.

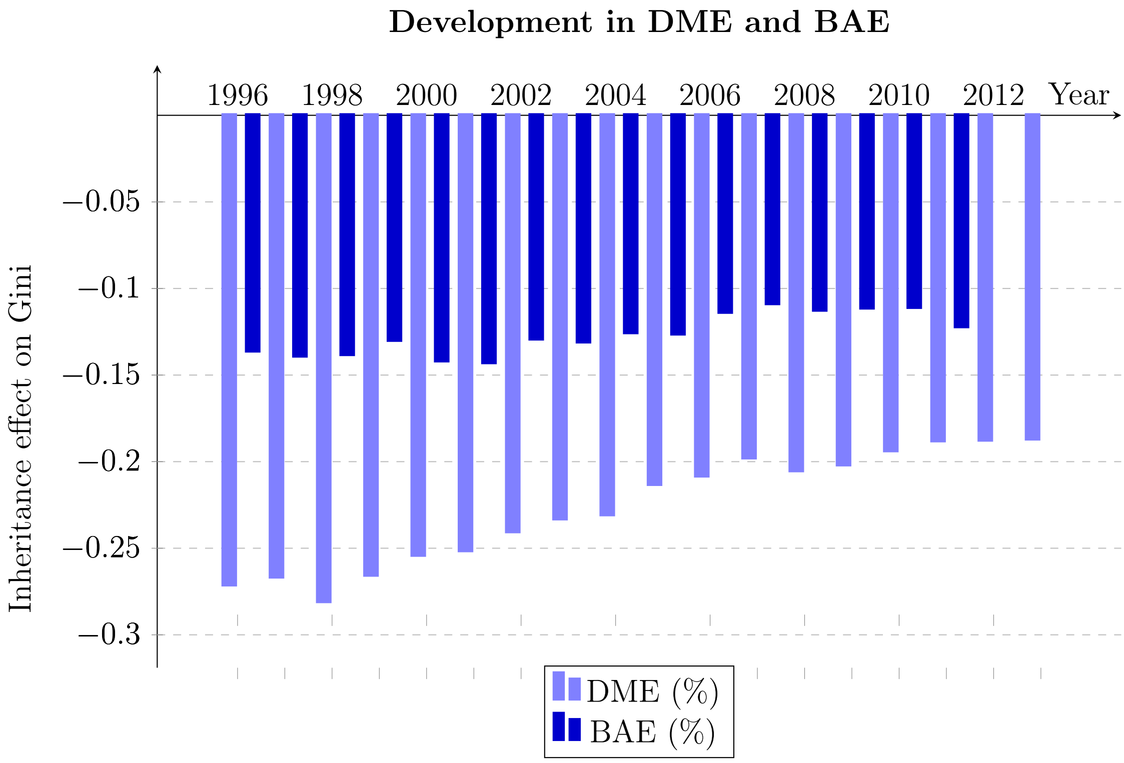

Figure 6.3: Grouped bar chart denoting estimated effect sizes of DME and BAE in terms of the Gini coefficient between 1996-2013. The equalising impact is substantial and consistent, all the while on a downward trend throughout the period.

The reasons behind the above mentioned trends in effect sizes are not obvious, but there are some possible explanations.

Regarding the decline of the DME over time in relative terms, one explanation can be that it stems from a change in the relative magnitude of inheritances in relation to net wealth over the years. In the initial years of this study, the average pre-tax inheritance amount was about 5-7 times the average net wealth. However, in the last years, this ratio is diminished to about 2-3. It appears that the growth in net wealth for heirs has outpaced the growth in inheritance bequests, potentially influencing the short-term impact of inheritance. It is important to acknowledge that this might also be due to the way net wealth is measured, which in this case relies on reported taxable values, meaning they do not necessarily fully capture an heirs true net worth. If net wealth in market values had been available for the full period, it might have revealed that the difference in growth rate for inheritances in relation to heirs' net wealth was smaller. This, in turn could have altered the negative trend in the DME effect sizes throughout the period. Unfortunately such data is not at hand, and it is therefore difficult to further conclude on this remark.

In addition to observing the reduction in the overall ratio between inheritance bequests and net wealth, one cannot refrain from exploring explanations stemming from changes in the distributional characteristics of inheritances. The gradual fall in DME over time could be explained by an overall tendency of rising economic inequality in Norway, like in the vast majority of Western countries (e.g. SSB, 2021; Piketty, 2013). When wealth over time becomes less evenly distributed, it is plausible that inheritance bequests follow the same pattern, leading to a decline in the previously found equalising effects of inheritance. It is well known that there is a correlation between prosperity within families and across generations (e.g. Charles et al., 2003; Szydlik, 2004), implying that an overall rise in wealth inequality in the society not unlikely could affect the impact of inheritance in a disequalising direction.

The decline in behavioural impact is mainly due to the marked diminishing of the DME over time, as the BAE stays relatively stable. Although difficult to explain with certainty, it might be that as the average pre-inheritance net wealth over time moves further up from around zero, the impact from e.g. investing the acquired inheritance in assets – thereby concealing a portion of one's wealth – declines. As mentioned above, if I had available data on net wealth in market values, one might have seen the DME be smaller, and hence the behavioural impact would turn out as smaller. The downward trend, however, might still be attributed to the gradual inflating of the inheritance to net wealth ratio.

Moving on to discussing the particular pattern in the effects on absolute dispersion, there might be several explanations. A major reason behind the decline from 1996 until the inflection point in 2006 is likely to be the fact that the relative growth in net wealth outpaced the growth in inheritances, meaning the effect on IQR in % would diminish over time. The rise in the latter years, however, is not due to an overall increase in inheritance compared to net wealth; in fact this ratio consistently is on the decline. The explanation then, must be that the inheritances are distributed less equally over time, outweighing the impact from the receding inheritance to net wealth ratio. This finding aligns, as mentioned, with the trend of an overall growing inequality in Norway.

In summary, the results for the full period show a consistent though declining equalising effect from inheritance in terms of the DME over time. However, the decline is slower in the BAE, leading to a convergence between the two effects. Hence the behavioral impact diminishes, indicating a decreasing influence of actions like investing inherited wealth, often triggering valuation discounts. While the change in the effect in terms of IQR also follows a downward trend in the first half of the period, it rises in the latter years, indicating a more disequalising impact on the wealth distribution. Changes in the relative size of inheritances in relation to net wealth, shifts in the distributional characteristics of inheritances, and potential impacts of rising economic inequality in Norway might be reasons for the observed trends.

7 Conclusions

The results of this paper indicate that inheritances have complex and ambiguous short-term impacts on wealth inequality.

Firstly, I find a substantial reduction in relative inequality, resulting from a broad lift in net wealth, particularly at the lower levels close to net zero. This direct mechanical effect causes the Gini coefficient to fall from 0.763 to 0.584, a decline of -23.4%, with effects in other relative inequality measures following along.

However, despite the estimated equalising effect in relative terms, I find that absolute dispersion concurrently increases. The interquartile range expands from 517,656 kroner to 708,816 kroner – representing a 37.1% increase in spread. This apparent paradox arises from the fact that the wealthy inherit less *relative* to their initial net wealth, yet receive more in kroner.

When accounting for behavioural responses to inheritance, the effect on the Gini coefficient is reduced to -0.098, an impact of -12.8% – clearly lowered. Thus, coinciding changes in investment -, saving - and consumption behaviour have a disequalising impact.

Based on these findings, a conclusion on whether the overall impact of inheritance is mostly equalising or mostly disequalising, depends on the relative importance one assigns to respectively relative - and absolute inequality measures.

My results do, however, apart from effect sizes being enlarged, align well with findings from comparable studies. Moreover, after conducting various tests I uncovered that large parts of these differences likely stem from absence of small inheritance transfers in the data, and from the applied variable of taxable net wealth, as opposed to net wealth in market values.

The full-period analysis (1996-2013) shows a consistent but declining equalising effect from inheritance over time, in relative terms. In absolute dispersion the pattern is more complex, initially falling, before turning and rising in the latter years, indicating an accelerating disequalising impact. These observed trends might be attributed to changes in the relative size of inheritances to net wealth, shifts in the distributional characteristics of inheritances, and potential impacts of a gradually rising economic inequality in Norway.

Since the effects are by construction short-term, they convey only a limited perspective on the topic. For this reason, studying the corresponding long-term effects would have been an enlightening addition. Other suggestions for further research could be to also consider other transfers than solely parent-child, delving into inheritances' impact on social mobility, not to mention analysing and discussing inheritance taxation with regards to the identified inheritance effects.

The results should be interpreted with caution, as the estimated coefficients are weakened by their uncertain statistical validity, by the deficiency of the Gini coefficient when faced with negative values, and by the partial incompleteness of the applied data. However, with an awareness of their limitations, the findings can provide valuable insights for policy makers on the interaction between inheritance and inequality in Norway.

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Appendices

A Supplementary figures and tables

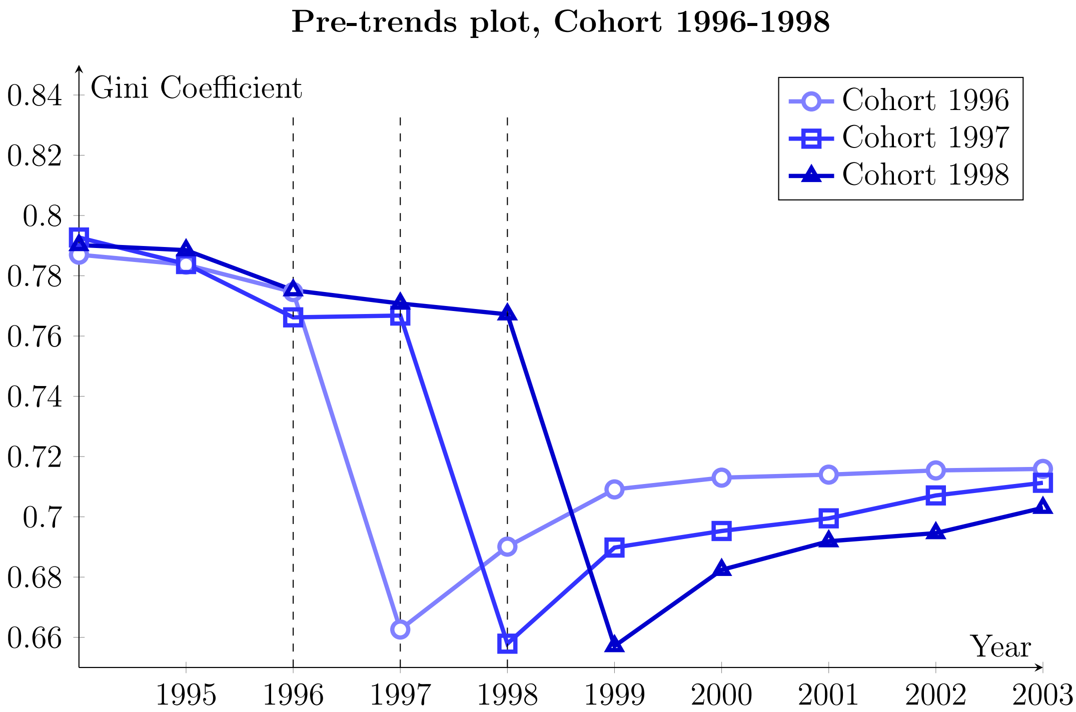

Figure A.1: Diagram showing the trend in the Gini coefficients for net wealth. Cohorts inheriting in 1996-1998. Year of inheritance marked with a stapled line.

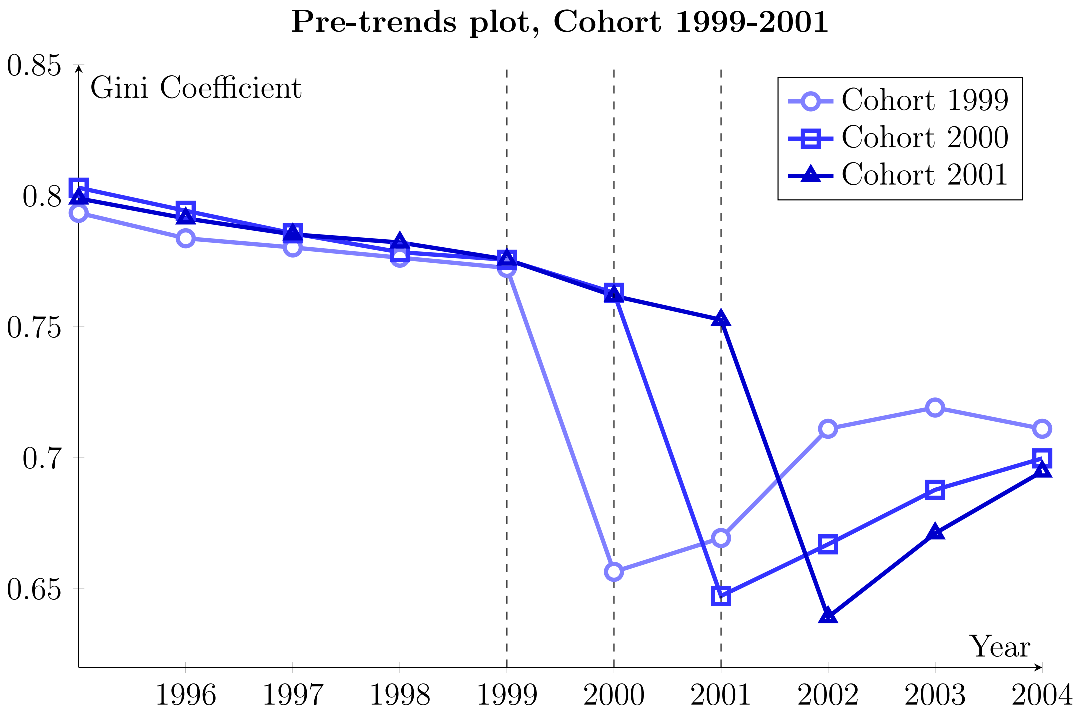

Figure A.2: Diagram showing the trend in the Gini coefficients for net wealth. Cohorts inheriting in 1999-2001. Year of inheritance marked with a stapled line.

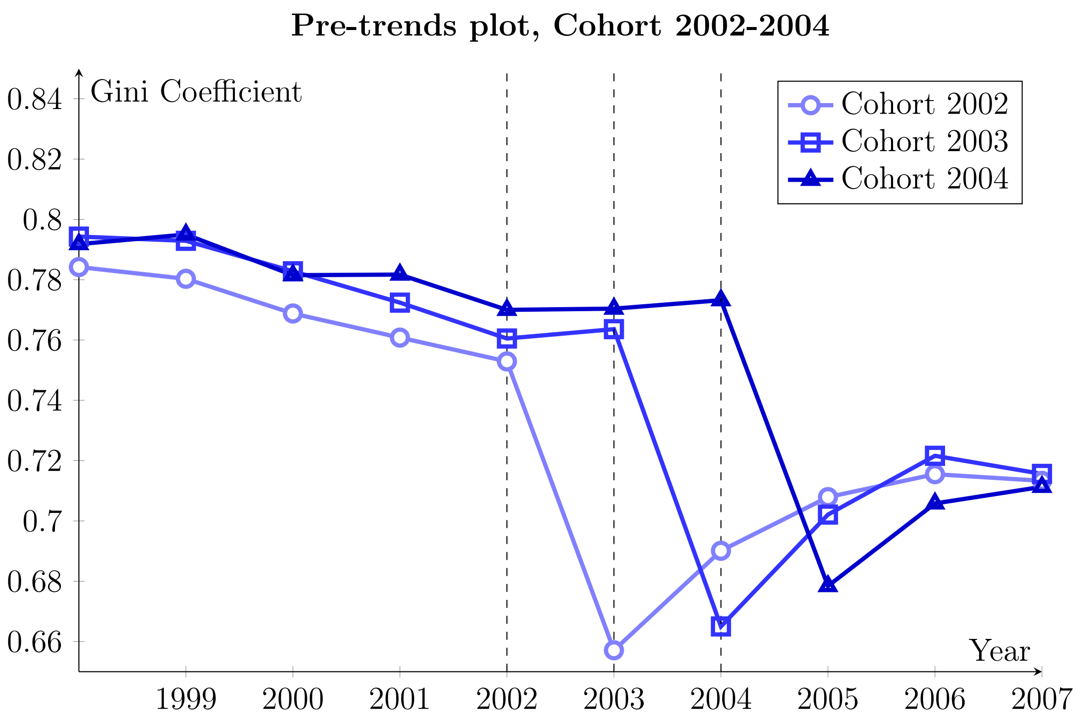

Figure A.3: Diagram showing the trend in the Gini coefficients for net wealth. Cohorts inheriting in 2002-2004. Year of inheritance marked with a stapled line.

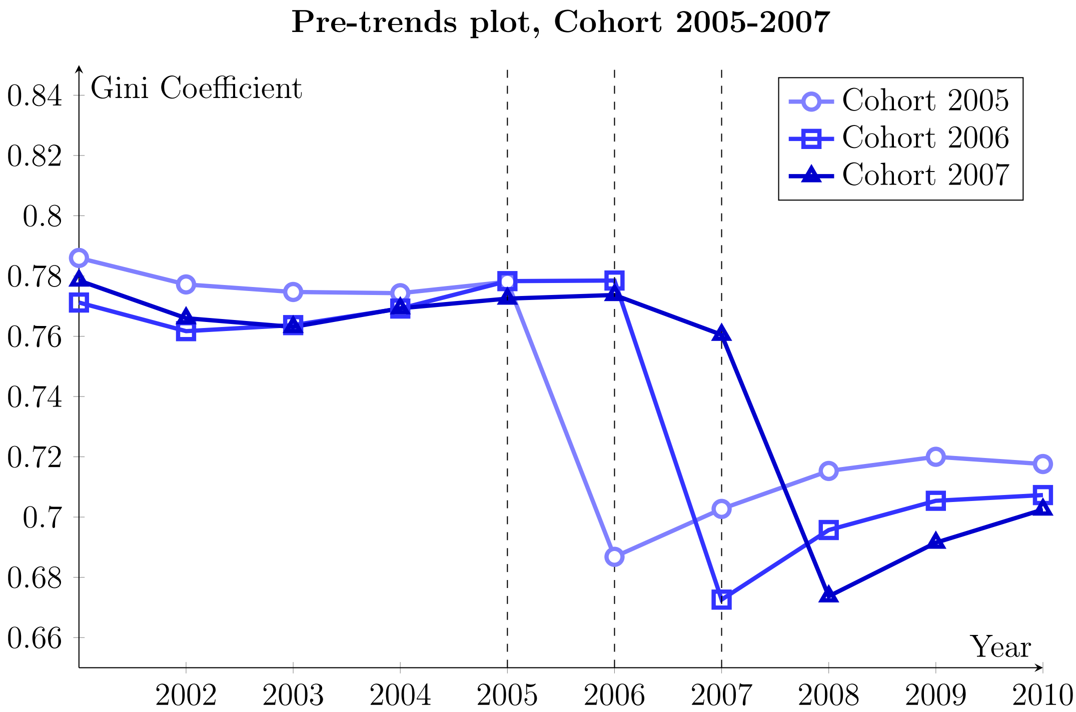

Figure A.4: Diagram showing the trend in the Gini coefficients for net wealth. Cohorts inheriting in 2005-2007. Year of inheritance marked with a stapled line.

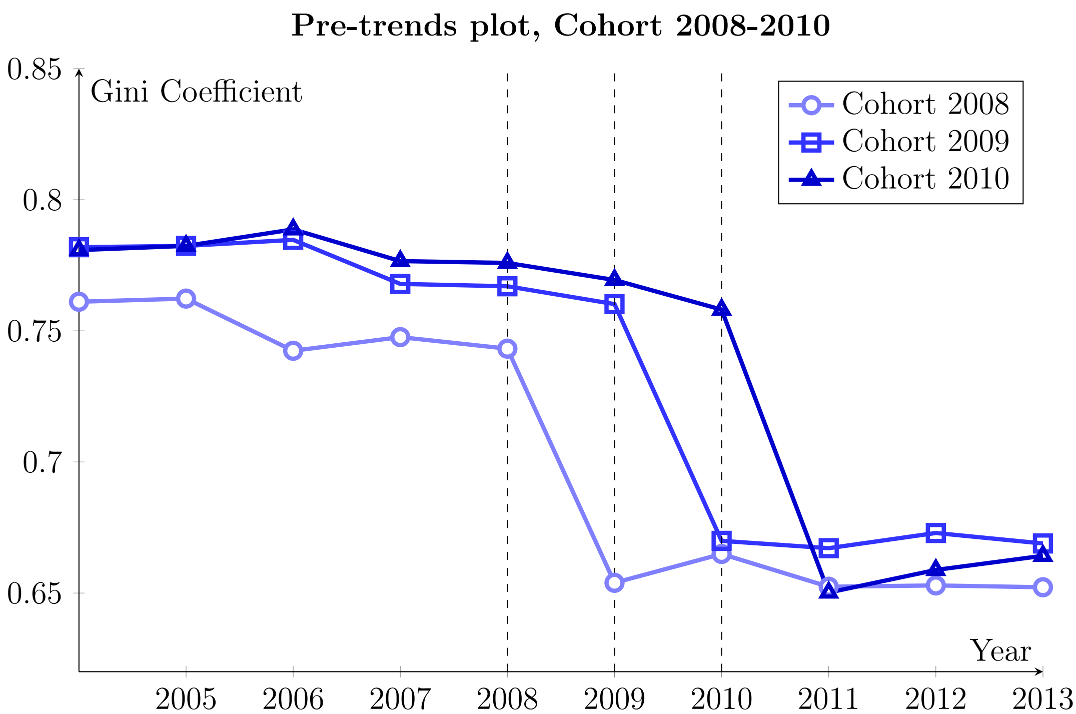

Figure A.5: Diagram showing the trend in the Gini coefficients for net wealth. Cohorts inheriting in 2008-2010. Year of inheritance marked with a stapled line.

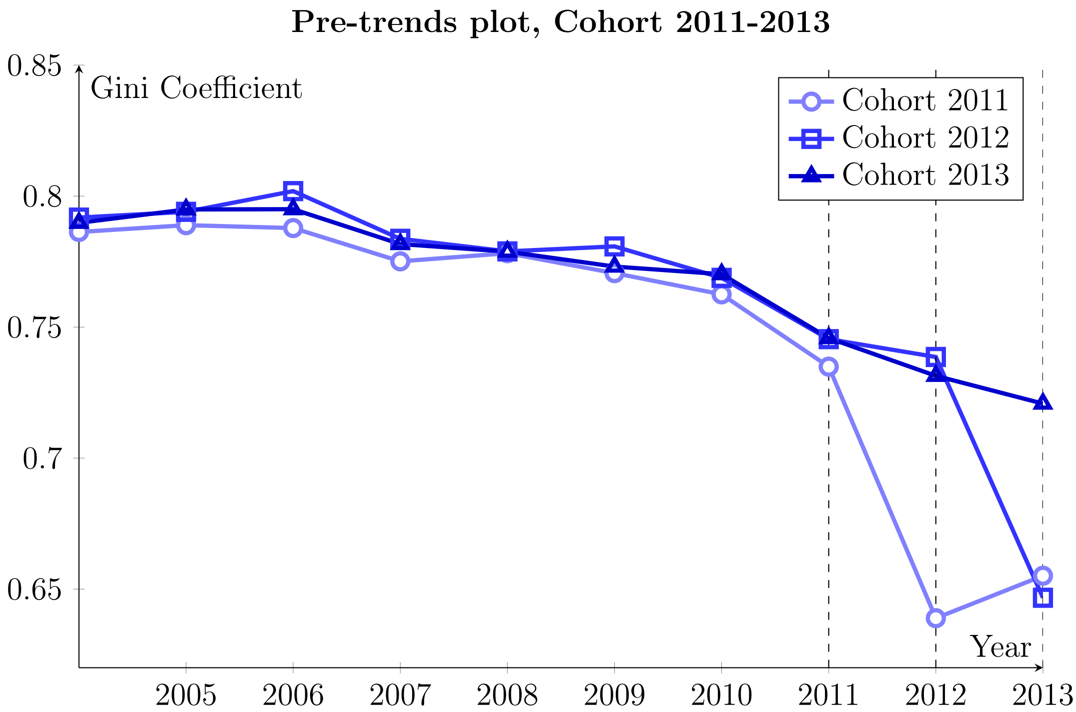

Figure A.6: Diagram showing the trend in the Gini coefficients for net wealth. Cohorts inheriting in 2011-2013. Year of inheritance marked with a stapled line.

Table A.1: Mean characteristics of heirs and decedents 1994-1998

	Years				
	1994	**1995**	**1996**	**1997**	**1998**
Decedents (parents)					
Age at death	75.6	76.4	76.7	77.0	77.9
Woman (%)	45.0	46.4	46.8	47.4	49.6
Married (%)	9.3	3.9	6.5	7.6	6.2
Divorced (%)	17.4	19.9	17.9	18.1	23.5
Widow/widower (%)	72.2	74.1	75.8	72.6	69.5
Never married (%)	0.0	1.1	0.0	0.0	0.0
Children	2.1	2.1	2.2	2.2	2.3
Net wealth T-1[a]	136,347	137,751	146,621	146,955	116,182
Heirs (children)					
Age at inheritance	41.5	42.7	42,8	43.1	44.2
Woman (%)	44.0	44.2	44.8	43.1	47.2
Married (%)	61.3	61.2	59.7	58.6	62.1
Taxable labour income	180,925	182,022	200,348	207,826	215,999
Net wealth T-1[b]	40,514	49,196	66,504	69,711	65,003
Gross inheritance[c]	280,103	292,961	321,094	326,830	326,564
Number of heirs	2705	2885	3469	3720	4710

[a] Net wealth defined as taxable assets minus debt, where T-1 is in the year before decedence.
[b] Net wealth defined as taxable assets minus debt, where T-1 is in the year before inheritance.
[c] The gross sum of inheritance and gifts received through the year.

Table A.2: Mean characteristics of heirs and decedents 1998-2004

	Years					
	1999	**2000**	**2001**	**2002**	**2003**	**2004**
Decedents (parents)						
Age at death	78.4	79.0	79.6	80.2	80.6	80.6
Woman (%)	46.5	48.9	49.5	50.0	53.1	48.4
Married (%)	5.3	6.0	5.0	4.5	4.1	5.0
Divorced (%)	18.3	21.0	19.2	20.0	18.1	18.6
Widow/widower (%)	75.5	72.3	74.1	73.8	76.5	75.5
Never married (%)	0.4	0.0	0.8	0.5	0.0	0.4
Children	2.3	2.4	2.4	2.5	2.5	2.5
Net wealth T-1[a]	123,721	127,046	139,525	135,792	132,777	142,620
Heirs (children)						
Age at inheritance	44.7	45.4	46.2	46.7	47.5	47.7
Woman (%)	48.1	47.0	47.8	47.5	48.6	48.4
Married (%)	61.2	61.7	61.9	61.0	61.0	60.5
Taxable labour income	232,729	240,751	254,145	263,133	274,716	273,621
Net wealth T-1[b]	80,523	110,402	116,431	139,615	148,832	135,395
Gross inheritance[c]	360,346	387,081	403,189	408,775	417,442	460,833
Number of heirs	5347	5396	5499	5852	5902	6930

[a] Net wealth defined as taxable assets minus debt, where T-1 is in the year before decedence.
[b] Net wealth defined as taxable assets minus debt, where T-1 is in the year before inheritance.
[c] The gross sum of inheritance and gifts received through the year.

Table A.3: Mean characteristics of heirs and decedents 2005-2009

	Years				
	2005	**2006**	**2007**	**2008**	**2009**
Decedents (parents)					
Age at death	80.9	81.9	82.4	83.2	83.4
Woman (%)	50.4	48.7	51.2	52.7	48.8
Married (%)	5.1	6.7	5.4	6.5	3.11
Divorced (%)	19.6	24.1	19.8	21.6	20.2
Widow/widower (%)	74.7	69.2	72.6	71.2	76.2
Never married (%)	0.8	0.0	0.0	0.0	0.0
Children	2.6	2.6	2.7	2.7	2.7
Net wealth T-1[a]	139,352	165,121	172,696	163,054	187,049
Heirs (children)					
Age at inheritance	48.2	49.1	49.8	50.5	51.0
Woman (%)	48.4	47.9	50.1	50.0	50.1
Married (%)	59.4	60.6	59.9	58.6	57.7
Taxable labour income	283,767	300,805	329,746	346,830	356,790
Net wealth T-1[b]	88,496	66,564	126,186	172,727	202,957
Gross inheritance[c]	477,171	515,891	560,694	499,170	634,585
Number of heirs	7585	6942	6763	6143	7103

[a] Net wealth defined as taxable assets minus debt, where T-1 is in the year before decedence.
[b] Net wealth defined as taxable assets minus debt, where T-1 is in the year before inheritance.
[c] The gross sum of inheritance and gifts received through the year.

Table A.4: Mean characteristics of heirs and decedents 2010-2013

	Years			
	2010	**2011**	**2012**	**2013**
Decedents (parents)				
Age at death	83.6	84.1	84.4	84.5
Woman (%)	50.9	47.9	52.4	52.9
Married (%)	4.9	5.4	5.3	5.3
Divorced (%)	17.0	22.3	17.8	22.2
Widow/widower (%)	77.5	71.8	76.5	71.3
Never married (%)	0.0	0.0	0.0	0.0
Children	2.7	2.8	2.8	2.8
Net wealth T-1[a]	185,504	205,102	210,561	237,903
Heirs (children)				
Age at inheritance	51.2	51.8	52.4	52.7
Woman (%)	50.7	50.6	50.6	52.0
Married (%)	58.8	58.9	58.7	56.3
Taxable labour income	372,950	384,281	397,152	396,568
Net wealth T-1[b]	232,627	326,217	375,336	398,838
Gross inheritance[c]	682,690	711,106	721,655	792,053
Number of heirs	7985	8465	8658	7275

[a] Net wealth defined as taxable assets minus debt, where T-1 is in the year before decedence.
[b] Net wealth defined as taxable assets minus debt, where T-1 is in the year before inheritance.
[c] The gross sum of inheritance and gifts received through the year.

B Set of Commands from Microdata

Estimating the Direct Mechanical Effect (DME)

```
// Connecting to the SSB database

require no.ssb.fdb:24 as ds

// Creating new dataset with death dates of the decedents (parents
   )

create-dataset parent_pop
import ds/BEFOLKNING_DOEDS_DATO as deathdate
generate deathyear_father = int(deathdate/10000)
generate deathyear_mother = int(deathdate/10000)

// Activating loop-functionality in order to repeat the script for
    heirs for each year in our period of study

configure alpha
for year in 1996 -> 2013

// Creating dataset with the heirs (children)

let heir_pop = heir_pop+$year
create-dataset $heir_pop

// Creating a loop variable for dates and years
let januarydate = date_fmt($year)
let yearbefore = $year - 1

// Importing received inheritance and gifts

let received = received + $year
import ds/SKATT_ARV_GAVER $januarydate as $received

// Remove those not receiving
drop if sysmiss($received)

// Removing all amounts under 100,000 kroner as that was the
   minimum limit from 1999
keep if $received >= 100000
summarize $received

// Importing population and cropping: Keeping all living
   individuals that have a Norwegian person identification number
   in the given year.

import ds/BEFOLKNING_MRK_FNR as person_id
```

```
keep if person_id == '1'

let status = status + $year
import ds/BEFOLKNING_STATUSKODE $januarydate as $status
drop if $status == '5'
drop if sysmiss($status)
tabulate $status

// Removing individuals under the age of 18 in the specified year,
    as they are not of legal age and, therefore, not in control
   over the estate.

import ds/BEFOLKNING_FOEDSELS_AAR_MND as birthdate
generate birthyear = int(birthdate/100)
let age = age + $year
generate $age = $year - birthyear
keep if $age >= 18

histogram $age, discrete
summarize $age

// Attempting to sort out only those that inherit on the basis of
   a parent dying

// Importing parents ID
import ds/BEFOLKNING_FAR_FNR as father_ID
import ds/BEFOLKNING_MOR_FNR as mother_ID

// Attaching parents to children

use parent_pop
merge deathyear_father into $heir_pop on father_ID
merge deathyear_mother into $heir

use $heir_pop
histogram deathyear_mother, discrete
histogram deathyear_father, discrete

//Sorting out parental deaths in the given year

generate deathdummy_father = 0
replace deathdummy_father = 1 if deathyear_father == $year
generate deathdummy_mother = 0
replace deathdummy_mother = 1 if deathyear_mother == $year

//Generating a dummy for losing either parent in a year

generate deathdummy_parent = 0
replace deathdummy_parent = 1 if (deathdummy_father | deathdummy_
   mother)

tabulate deathdummy_parent
tabulate deathdummy_father deathdummy_mother
```

```
keep if deathdummy_parent == 1


//Observing the impact on key variables

histogram $received, percent
summarize $received

histogram $age, discrete
summarize $age


//Importing net wealth, at 31. December the year prior to
   inheritance.

let decemberbeforedate =  date_fmt($yearbefore, 12, 31)
let netwealth = netwealth + $yearbefore

import ds/SKATT_NETTOFORMUE $decemberbeforedate as $netwealth

histogram $netwealth

summarize $netwealth $received


//Now we can generate the measure for potential wealth, as to
   calculate the effect on gini

let potentialwealth = potentialwealth + $yearbefore
generate $potentialwealth = $netwealth + $received

histogram $netwealth, percent
histogram $potentialwealth, percent

//Assessing the change in on the IQR (P75-P25)

summarize $netwealth $potentialwealth, iqr

//Computing net wealth deciles in order to find the p90/p50 ratio,
    and the top 10% and bottom 50% shares of total net wealth.

generate quantile_net = quantile($netwealth, 10)
tabulate quantile_net

generate quantile_pot = quantile($potentialwealth, 10)
tabulate quantile_pot

tabulate quantile_net, summarize($netwealth) sum
tabulate quantile_pot, summarize($potentialwealth) sum

//Computing gini coefficients. In order to calculate the gini
   correctly, one must replace negative net wealths with 0

replace $potentialwealth = 0 if $potentialwealth < 0
```

```
replace $netwealth = 0 if $netwealth < 0

summarize $netwealth $potentialwealth, gini

histogram $netwealth, percent
histogram $potentialwealth, percent

end


//Finding the DME in market values (only done as a test for
   2011-2013)


import ds/INNTEKT_BER_BRFORM $decemberbeforedate as marketvalue
import ds/SKATT_GJELD $decemberbeforedate as debt
replace marketvalue= 0 if sysmiss(marketvalue)
replace debt = 0 if sysmiss(debt)

//Net wealth

generate netmarketvalue = marketvalue - debt

//Potential wealth

generate potentialwealth = netmarketvalue + $received

//IQR

histogram netmarketvalue
summarize netmarketvalue potentialwealth, iqr

//Gini calculations with market values

replace netmarketvalue = 0 if netmarketvalue < 0
replace potentialwealth = 0 if potentialwealth < 0

summarize netmarketvalue potentialwealth, gini iqr

histogram netmarketvalue, percent
histogram  potentialwealth, percent
```

Estimating the Behaviour Adjusted Effect (BAE)

```
//Connetcting to the SSB database
require no.ssb.fdb:24 as ds

//Activating loop-functionality

configure alpha
for year in 1996 -> 2012
```

```
//Creating dataset

let bae_pop = bae_pop+$year
create-dataset $bae_pop

//Creating a loop variable for date
let januarydate = date_fmt($year)

//Importing gender in order to sort our population into two groups
   : The treatment group and the control group. Let 0 denote the
   control group and 1 denote the treatment group.

import ds/BEFOLKNING_KJOENN as gender
generate group = 1 if gender == '1'
replace group = 2 if gender == '2'

tabulate group
destring gender

//Collapsing as to keep only two observations per year

collapse(mean) gender -> grouping, by(group)
replace grouping = 0 if grouping == 1
replace grouping = 1 if grouping == 2

tabulate grouping

// Inserting gini-values manually, as found in the DME estimations
    (this script shows example values from the 2011 cohort)

// Cohort 2011
generate gini2004 = 0.7908 if grouping == 0
replace gini2004 = 0.7863 if grouping == 1

generate gini2005 = 0.79445 if grouping == 0
replace gini2005 = 0.7889 if grouping == 1

generate gini2006 = 0.79845 if grouping == 0
replace gini2006 = 0.7878 if grouping == 1

generate gini2007 = 0.7827 if grouping == 0
replace gini2007 = 0.7751 if grouping == 1

generate gini2008 = 0.77885 if grouping == 0
replace gini2008 = 0.7782 if grouping == 1

generate gini2009 = 0.77695 if grouping == 0
replace gini2009 = 0.7706 if grouping == 1

generate gini2010 = 0.7695 if grouping == 0
replace gini2010 = 0.7625 if grouping == 1

generate gini2011 = 0.7456 if grouping == 0
```

```
replace gini2011 = 0.7349 if grouping == 1

generate gini2012 = 0.735 if grouping == 0
replace gini2012 = 0.6389 if grouping == 1

//Transform into paneldata

reshape-to-panel gini
summarize-panel gini

//Balancing the panel data set
drop if sysmiss(grouping) | sysmiss(gini)

//Generating treatment
generate treatment = 0
replace treatment = 1 if date@panel >= 2012

//Controlling for year fixed effects

generate d01 = 0
replace d01 = 1 if date@panel == 2001

generate d02 = 0
replace d02 = 1 if date@panel == 2002

generate d03 = 0
replace d03 = 1 if date@panel == 2003

generate d04 = 0
replace d04= 1 if date@panel == 2004

generate d05 = 0
replace d05 = 1 if date@panel == 2005

generate d06 = 0
replace d06 = 1 if date@panel == 2006

generate d07 = 0
replace d07 = 1 if date@panel == 2007

generate d08 = 0
replace d08 = 1 if date@panel == 2008

generate d09 = 0
replace d09 = 1 if date@panel == 2009

generate d10 = 0
replace d10 = 1 if date@panel == 2010

generate d11 = 0
replace d11 = 1 if date@panel == 2011

generate d12 = 0
replace d12 = 1 if date@panel == 2012
```

```
//Running DiD regression

summarize-panel gini if grouping == 0
summarize-panel gini if grouping == 1

regress-panel-diff gini grouping treatment d04 d05 d06 d07 d08 d09
    d10 d11 d12

end
```

Producing descriptive statistics

```
//Insert this script at the tail of the DME script to produce
   descriptive statistics

let decemberdate = date_fmt($year, 12, 31)

//Heirs
use $heir_pop
import ds/BEFOLKNING_KJOENN as gender
import ds/SIVSTANDFDT_SIVSTAND $decemberdate as civstatus
import ds/INNTEKT_WLONN $decemberdate as labourincome

//Keeping zero-values
replace labourincome = 0 if sysmiss(labourincome)
replace $netwealth = 0 if sysmiss($netwealth)

//Decedents

//Counting number of children for decedents

use mothers
merge childcountmother into $heir_pop on mother_ID
use fathers
merge childcountfather into $heir_pop  on father_ID

use $heir_pop

generate childcountsum = 1
replace childcountsum = childcountmother
summarize childcountsum
replace childcountsum = childcountfather if sysmiss(childcountsum)
summarize childcountsum
replace childcountsum = (childcountmother + childcountfather) if !
   sysmiss(childcountmother) & !sysmiss(childcountfather)
summarize childcountsum
replace childcountsum = 0 if sysmiss(childcountsum)
generate childcountmean = childcountsum / 2
summarize childcountmean
```

```
//Importing descriptive statistics to parent_pop and then merging
   them into heir_pop

//Age of decedents

use parent_pop

let age_father = age_father + $year
let age_mother = age_mother + $year
generate $age_father = $year - birthyear
clone-variables $age_father -> $age_mother

//Civil status of decedents

let civstatus_father = civstatus_father + $year
let civstatus_mother = civstatus_mother + $year

import ds/SIVSTANDFDT_SIVSTAND $decemberdate as $civstatus_father
clone-variables $civstatus_father -> $civstatus_mother

//Net wealth for decedents

use parent_pop
let netfather = netfather + $year
let netmother = netmother + $year

import ds/SKATT_NETTOFORMUE $decemberdate as $netfather
clone-variables $netfather -> $netmother

//Merging descriptive statistics into heir_pop

use parent_pop

merge $age_father into $heir_pop on father_ID
merge $age_mother into $heir_pop on mother_ID

merge $civstatus_father into $heir_pop on father_ID
merge $civstatus_mother into $heir_pop on mother_ID

merge $netfather into $heir_pop on father_ID
merge $netmother into $heir_pop on mother_ID

//Finding means/sums for the measures

use $heir_pop

generate agesum = 1
replace agesum = $age_father
replace agesum = $age_mother if sysmiss(agesum)

generate netsum = 1
replace netsum = $netfather
summarize netsum
replace netsum = $netmother if sysmiss(netsum)
```

```
replace netsum = 0 if sysmiss(netsum)
summarize netsum


generate civstatus_tot =  $civstatus_mother
replace civstatus_tot = $civstatus_father if sysmiss(civstatus_tot
   )

tabulate civstatus_tot
```