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A FLYING START

THE LONG-RUN EFFECTS OF INTER VIVOS
TRANSFERS

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Abstract

This study demonstrates how *inter vivos* transfers alter the life trajectories of young adults by (i) directly raising wealth levels and (ii) indirectly supporting wealth accumulation by impacting interest rates, borrowing, entrepreneurship, and spending. A unique Danish policy setting allows me to identify intergenerational wealth transfers channeled through initial housing market entries. I find that new entrants receiving a transfer face lower interest rates on non-mortgage debt than general entrants. The advantageous credit position enables recipients to increase their borrowing, used to finance spending and make career-based investments, reflected in a higher propensity to select into entrepreneurship. The treatment effects on borrowing are heterogeneous across gender and education levels, indicating that the impact of transfers on economic and financial outcomes depends on the life situation of the recipient.

Keywords: Intergenerational transmission; wealth; inter-vivos transfers; credit
JEL codes: D31; G51; J62

1 Introduction

Recent studies document a causal link between the wealth of parents and their adult children, suggesting that a significant portion of the correlation can be attributed to the transmission of assets or money, rather than inherited abilities or preferences (Daysal, Lovenheim, and Wasser, 2023, Fagereng, Mogstad, and Rønning, 2021, Black et al., 2020). In this process, intergenerational transfers can directly raise wealth levels of recipients or indirectly support wealth accumulation by influencing financial and socioeconomic variables (Fagereng, Mogstad, and Rønning, 2021). A growing prominence of inter vivos transfers[1] – gifts received during the grantor's life – raises the necessity of understanding the indirect channels at play. In particular, inter vivos transfers are often received during early and financially constrained stages of the life cycle, implying that their impact can differ from that of end-of-life bequests, which have been the main focus in prior research (Nekoei and Seim, 2023, Druedahl and Martinello, 2022). Documenting their effects on wealth-enhancing variables is key to modelling the contribution of lifetime transfers to dynastic wealth persistence.

In this study, I use detailed administrative data from Denmark to explore how inter vivos transfers alter the life trajectories of recipients by changing their economic opportunities. There is a limited understanding of how financial support from the family impacts economic and behavioral outcomes, such as credit market positions, occupational choices, or spending patterns. Especially, an important question is if such support solely influences the immediate (level) financial standing of recipients, or also the slope of their economic advancement. If the latter is true, it suggests that economic models should incorporate a dynamic, rather than static, role of transfers when explaining intergenerational correlations in net worth.

Prior research have struggled with documenting the effects of inter vivos transfers for two reasons. First, such analyses require detailed information on the size and timing of intra-family wealth transactions, which is rarely observed in the data due to tax-based incentives for keeping transfers informal. Second, even when transfers are observed, parents' financial support is inherently endogenous to other forms of investment (such as time, human or social

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[1]Survey evidence show that 45% of young adults in the U.S. have received substantial financial support from their parents in the past 12 months (Barroso, Parker, and Fry, 2019). The corresponding share in Sweden is 50% (SBAB, 2023).

capital investments), making it difficult to distinguish the effect of the first from the second.

I examine the impact of parents' inter vivos transfers on the wealth-enhancing variables of their adult children by utilizing a inheritance tax-loophole in the Danish property markets. Similar to most datasets, the Danish registers lack direct information on financial gifts between family members. However, a unique institutional setting makes it possible to overcome this issue by identifying wealth transfers channelled through initial housing market entries. Specifically, a legal rule allows for property to be sold forward within the immediate family at a discount, where the discounted amount can be considered a tax-free gift.[2] The rule generates a popular tax loophole for intergenerational transfers, which can be precisely traced in timing and size in the administrative data. By linking new housing market entrants to their parents, it is possible to separate entrants of intra-family forward sales (treated) from general entrants (controls).[3]

Combining the transfer information with full-population wealth register data in years 1995-2020 for individuals entering the housing market in ages 20-35, I document the long-run (10-year) effect of such transfers on the interest rates paid, borrowing, entry into entrepreneurship and spending of recipients. The outcome variables have been chosen for their instrumental role to long-run wealth accumulation. Interest rates serve as indicators of individual credit strength, where lower rates enable greater investment returns for the same borrowing expenditure, thereby amplifying adjusted wealth returns. Borrowing behavior signals individuals' financial tendencies, reflecting their willingness or aversion to utilize the credit markets. Entrepreneurship captures occupational choice, and represents a financial investment recognized for its significance in supporting wealth accumulation (Cagetti and De Nardi, 2006). Finally, spending represents a measure of individual welfare, as well as an indicator for (non-)savings behavior. Accordingly, if inter vivos transfers significantly affect these outcomes, it suggests the presence of indirect channels linking such transfers to long-run wealth accumulation.

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[2]The discount of 15 % applies to a government-assessed value of the property, which if typically different from the market price. The maximum size of the tax-free transfer varies with the ratio of the market price of housing and the reference value being discounted by families, the market-to-public (MTP) value ratio. Importantly, this ratio has increased substantially over time, as shown in Online Appendix Figure B.8, facilitating large dynastic transfers through the housing market.

[3]One drawback of my study is that I cannot observe financial transfers other than the ones captured though the policy framework of intra-family sales. The gift tax framework in Denmark generally limits large direct transfers between family members, and research underscore that households adjust their gifts and bequests in response to tax based incentives (Escobar, Ohlsson, and Selin, 2023). Furthermore, Kolodziejczyk and Leth-Petersen, 2013 confirm in their study that general transfers from parents to children at housing market entries in Denmark is limited.

The estimation is conducted in an event-study framework using a dynamic two way fixed effects (TWFE) model, where the outcome variables are regressed on treatment leads and lags [-10: +10] years in relation to housing market entry (arrival of inter vivos transfer). The average treatment effects (ATEs) are obtained as weighted averages of post-treatment period coefficients, with weights equal to the share of treated units in each event year. I assess whether pre-trends are parallel by testing whether the lead coefficients significantly differ from zero.

I find that parents give their children a "flying start" by transferring wealth at the early stages of their adult lives, as indicated by an average jump in net wealth of 609.000 DKK (USD $93.000) in the year of entry, depicted in Figure 1. The wealth transactions impact the financial trajectories of recipients in several ways, which is observable already in the descriptive mean event study plots depicted in Figure 2, and confirmed by the estimation results in Figure 3. Firstly, new entrants receiving a transfer face 0.4 percentage point lower interest rates on non-mortgage debt than general entrants in the year after entry, with rates remaining significantly lower in the following three years. Secondly, recipients increase their non-mortgage borrowing by 9% (13.000 DKK, or USD $2.000) on average over the 10-years following entry. Thirdly, transfers nearly double recipients' annual propensity to select into entrepreneurship, increasing their annual entry rate by 1.7 percentage points. Finally, recipients increase their annual long-run spending by 15% (36.000 DKK, or USD $5.500) on average following the transfer. This upturn is influenced partly by credit expansions of mortgage and non-mortgage debt, and partly by a reduction in financial expenses.

In the empirical estimation of my treatment effects, one concern is that recipients (treated) are not comparable to general entrants (controls), as indicated by the significant pre-trends for borrowing and spending in the main estimation results. Notably, transfers are likely to be correlated with unobserved time-varying factors related to family background, like ability or preferences, or other forms of transfers that impact the outcome variables in the long run. Estimating treatment effects using the full-population sample, even conditional on individual fixed effects, may therefore capture other characteristics in the treatment estimates. To account for this, I limit the control group to siblings of the treatment group who also enter the housing market, but not through an intra-family sale.[4] The purpose of this exercise is to harmonize the

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[4]Note that the probability of siblings receiving significant transfers at the point of entry is low, wih due to the gift tax regulation in place.In Denmark, individuals are allowed to receive tax-free transfers from their

average of time-varying heterogeneity factors related to parental background, such as upbringing or inherited characteristics, between treated and controls.

Figure 4 highlights that the results are robust to the use of siblings as controls. Although this exercise reduces the size and persistence of the treatment effect on interest rates, signalling a pass-though of parents' financial position in the credit markets, the initial drop remains significant. The effects on remaining outcomes are slightly reduced for spending and entrepreneurship entry, and amplified for borrowing. This suggests that a portion of the effects across all outcome variables persists even after accounting for variations in upbringing or parental characteristics between treated and controls.

Turning to heterogeneity in responses to transfers, Figure 5 illustrates differences in the ATE and relative treatment effect (RTE) on borrowing across subgroups for the full sample. I find that transfers have opposing effects on men and women: while men use transfers to increase leverage by 16%, women use them to reduce dependence on the credit markets, decreasing their borrowing by 10% on average. I also find amplified responses amongst individuals without a college degree, who typically face greater limitations in their ability to borrow due to lower earnings growth. Overall, the results underscore that the impact of transfers on financial outcomes differ depending on the life situation of the recipient.

An important factor underpinning the documented effects is a shift in the composition of assets and debt, as illustrated by the difference in the average debt-equity ratio between treated and controls at the point of entry, shown in Figure 6. Individuals receiving a transfer purchase higher-value homes on average. Although their debt levels mirror those of typical entrants, they possess a greater portion of illiquid assets in the debt-equity mix, granting them the flexibility to access equity or secure additional borrowing against a higher collateral. This, in turn, impacts the interest rates they incur on debt, as well as their potential to extract equity from their illiquid wealth holdings. Previous evidence indicate that debt overhang limit business ownership (Morazzoni, 2021), and that the possibility to extract home equity increases selection into entrepreneurship (Jensen, Leth-Petersen, and Nanda, 2022). Accordingly, it is likely that the positive effect of inter vivos transfers on entrepreneurship also runs through

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immediate family members up to a specified amount each year. Transfers exceeding the exemption amount are subject to a gift tax, where immediate family members are subject to a gift tax rate of 15%.

illiquid wealth holdings allowing for additional leverage and hence the possibility to start a business.

The main realization from the study is that inter vivos transfers not only contribute to recipients' level of financial standing, but also to the slope of their economic advancement. There is an ongoing debate amongst policymakers and economists on how to develop inheritance tax frameworks to minimize wealth disparities (Gale et al., 2020, Perret, 2018, Piketty and Saez, 2013). My results are informative to this discussion, suggesting that policies targeting large inter vivos gifts may have different effects on dynastic wealth persistence than those targeting end-of-life bequests. Importantly, the former is likely to influence persistence by limiting the indirect effects of transfers, as opposed to the direct effect on wealth.

My results contribute to the growing literature on intergenerational wealth correlations and the transfers of ability, behavior and money within dynasties (Palomino et al., 2022, Adermon, Lindahl, and Waldenström, 2018, Pfeffer and Killewald, 2018, Charles and Hurst, 2003). A surge in dynastic wealth inequality has sparked discussions about the impact of transfers on intergenerational wealth transmission. Existing evidence targeting this gap falls into two categories: one assesses the contribution of transfers to dynastic wealth persistence (see Daysal, Lovenheim, and Wasser, 2023, Fagereng, Mogstad, and Rønning, 2021, Black et al., 2020, Boserup, Kopczuk, and Kreiner, 2018 and Boserup, Kopczuk, and Kreiner, 2016), while the other more directly estimates the impact of transfers on the financial outcomes (see Nekoei and Seim, 2023, Druedahl and Martinello, 2022, Hwang, 2020 and Andersen and Nielsen, 2011).

The findings of this paper complement the first strand of studies by highlighting the significance of inter vivos transfers in shaping the long-run wealth of recipients. Specifically, my documented effects address the large unexplained residuals identified in several studies lacking access to transfer data (such as Daysal, Lovenheim, and Wasser, 2023 and Boserup, Kopczuk, and Kreiner, 2018). Moreover, they align with the limited existing evidence on the indirect effects of financial gifts (Fagereng, Mogstad, and Rønning, 2021), illustrating how these support wealth accumulation by influencing interest rates, borrowing, entrepreneurship, and spending.

My results further contribute to the second strand of literature by documenting the long run impact of receiving large intergenerational transfers *inter vivos*, and not in the form of

end-of-life bequests. Arguably, the behavioral reaction or impact of the former may differ from that of the latter for two reasons. Firstly, the majority of transfers caused by parental death are received at a rather late stage in the life cycle, where the impact on behavior may be different than in early life stages. Secondly, in the case of unexpected inheritances amongst young adults, the behavioral effects may be confounded by other life-changing aspects related to loosing a close family member. Very few studies observe inter vivos transfers directly. The exceptions use survey data where the size of the transfer is typically not observed or the wealth variables of recipients cannot be traced over time (Brandsaas, 2018 and Poterba, 2001). In cases where transfers are directly observable (Andersen, Johannesen, and Sheridan, 2020), they are often small in size, implying that their direct impact on financial outcomes or opportunities is limited. By identifying transfers that are channeled through home purchases, I capture a large and important type of inter vivos transfer which is common in most advanced economies today. The empirical design allows for a nuanced analysis regarding the impact of such transfers on the economic and financial life-trajectories of recipients.

The remaining part of the paper is structured as follows. Section II describes the Danish institutional context and the identification of inter vivos transfers. Section III describes the data and the main outcome variables. Section IV outlines the empirical strategy used to estimate the effect of receiving a wealth transfer, as well as the additional exercise using siblings as controls. Section V presents the results from the main and siblings sample, and discusses heterogeneous effects. Section VI concludes.

2   Institutional context

2.1   The Danish tax framework for inheritances and gifts

The existing tax policy framework generally limits large intergenerational transfers in Denmark. Individuals are allowed to receive tax-free transfers from their immediate family members up to a specified amount each year[5]. Transfers exceeding the exemption amount are subject to

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[5]Immediate family includes children, step-children, parents, step-parents, grandparents and spouses cohabiting for +2 years. The reference amount was DKK 58.700 (USD$ 8.980) in 2010, and is adjusted yearly to account for inflation.

a gift tax of 15% (36.25% for relatives outside the closest family), which is equivalent to the tax rate for end-of-life bequests (Inheritance law, § 22, 1995).[6] The tax, which is paid by the giver, introduces a transfer constraint which is particularly binding in scenarios where transfers are needed to support large purchases, such as housing market entries.[7] Financial gifts are registered in a digital system governed by the Danish tax authorities, where taxes must be paid on the same date as the gift is transferred. Non-compliance with the tax obligation leads to significant fines in less serious cases and imprisonment for more severe instances, if discovered.

2.2   Identifying inter vivos transfers via initial home purchases

I focus on housing market entries of young adults to identify inter vivos transfers from parents to children. Theoretically, financial assistance from the family plays an important role in mitigating constraints during the process of the initial home purchase (Kolodziejczyk and Leth-Petersen, 2010). This prediction has been empirically confirmed by several studies (see Boileau and Sturrock, 2023, Benetton, Kudlyak, and Mondragon, 2022 and Scanlon, Whitehead, and Blanc, 2017). Furthermore, financial support into down-payment of housing has increased in importance over time (Brandsaas, 2018).

Restricting transfers to those linked with housing market entries offers two key advantages. Firstly, the gifted amounts are typically substantial, which allows me to trace the effect of one sizable transaction, as opposed to multiple smaller transfers, simplifying the inference process. Secondly, the purpose of the transfer is clear and roughly similar across all treated individuals. The fact that the incentives underpinning the transfer are harmonized on average reduces the risk of unobserved motives influencing the outcomes.

Below, I outline how I exploit a specific yet common way for parents to assist their children to become homeowners in Denmark: through intra-family forward sales.

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[6]The tax framework for end-of-life bequests is similar to that of gifts. Following the death of a deceased person, the estate duty is determined based on the total value of assets left behind. If the total value of the inherited estates exceeds a specific amount, the close family members are subject to a 15% inheritance tax (Inheritance law, Chapter V, 1995).

[7]Kolodziejczyk and Leth-Petersen, 2013 confirm in their study that general wealth transfers from parents to children at housing market entries in Denmark is limited.

2.2.1 Intra-family forward sales

The size and timing of transfers are largely governed by tax incentives (Escobar, Ohlsson, and Selin, 2023). Leveraging this insight, I identify inter vivos wealth transfers through a inheritance tax loophole in the Danish housing markets. Given the transfer constraint derived from the institutional setting outlined in section 2.1, a prevalent strategy among parents in Denmark to assist their children in becoming homeowners is to acquire a property themselves and subsequently forward-sell the unit to their adult child. Since 1982, a legal framework has permitted forward sales of family-owned property below or above market value (Inheritance law, §6, 1982). Specifically, family members can forward-sell property to their children at $\pm$ 15% of the government-listed reference value (public valuation) of the home. This introduces a inheritance tax loophole, which can be precisely traced in timing and size through the danish housing register, described in detail under section 3. To illustrate, if a parent owns an apartment with a reference value of USD \$100,000, the unit can be sold forward to the child for USD \$85,000 or \$115,000. The difference between the market value and the purchase price is considered a tax-free gift. The illiquid inter vivos transfer can be obtained as the market value $(P_{i,t}^M)$ of the property, subtracted the purchase price paid $(P_{i,t}^P)$ by child i at time t:

$$Transfer_{i,t} = P_{i,t}^M - P_{i,t}^P \tag{1}$$

Importantly, due to the structure of the discount rule, $P_{i,t}^P$ is subject to a lower and upper bound based on a proportion of the public valuation of the unit $(P_{i,t}^{PUB})$, such that $P_{i,t}^{PUB}*1.15 \leq P_{i,t}^P \geq P_{i,t}^{PUB}*0.85$. This places a cap on the tax-free parental transfer amount feasible through the purchase.

I define individuals receiving substantial inter vivos transfers (treated) as those entering the housing market through a forward sale from their parents, involving a positive discount, such that $(Transfer_{i,t} > 0)$[8]. The transfer amount for general entrants (controls) equal 0. The average share of entrants in the main sample receiving parental transfers following this definition was between 5-8% 1995-2020, with the yearly share over time depicted in Online

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[8] Forward-sales involving a negative or no discount (implying transfers from children to their parents) are excluded from the analysis

Appendix Figure .

3   Data

I utilize Danish administrative population, housing and income registers from Statistics Denmark to identify parental transfers and estimate their long-run effect on financial outcomes. A unique personal identification number (CPR) is assigned to all Danish citizens. The population registry also list the corresponding id of parents, allowing me to map dynastic links for all individuals born after 1962. This dataset is subsequently linked to other public administrative registers providing information on annual income, wealth, debt, interest rate payments as well as demographic variables.

3.1   Recipients of inter vivos transfers

To identify the treated population - entrants of intra-family forward sales - I obtain data on housing market entrants using the ownership registry which includes information on all housing units in Denmark as well as their year-specific owner. An individual is considered to have entered the housing market if their CPR is linked to their living unit in the ownership registry in a given year. Additionally, I label an entry as an intra-family sale (treated) when the previous owner of the unit is identified as a parent of the entrant. All remaining entrants are considered general entrants (controls). Finally, price information is obtained for each individual property transaction $(P_{i,t}^{P})$, allowing for a calculation of the size of inter vivos transfers as the difference between the realized price and the market price $(P_{i,t}^{M})$ for intra-family sales, as outlined in equation (1). Since intra-family forward sales are not traded in the general property markets, the market price of the unit needs to be estimated. I impute market prices of housing following the method of Andersen et al., 2021, with the full procedure outlined in the Online Appendix section A.

3.2 Main variables

The analysis centers on four key outcome variables: the i) annual interest rate on non-mortgage debt, ii) non-mortgage borrowing, iii) entry into entrepreneurship and iv) spending. While the interest rate is used as a proxy for the strength of individuals' credit market position, non-mortgage debt and spending level proxy their financial investment-savings behavior. Finally, entry into entrepreneurship is levered as an indicator for both occupational and investment decisions. The developments of the four main outcome variables over time are depicted in Online Appendix Figure B.9.

The variables included in the analysis are defined as follows:

Net wealth. Net wealth is calculated as the sum of deposits, savings and assets (stocks and housing) subtracted any liabilities (mortgage and non-mortgage debt). Data on debt, stocks and deposits is obtained from the tax-income register (SKAT). Housing wealth is estimated as the market price of housing times the ownership share of units. Market prices are estimated following the method of Andersen et al., 2021, with the full procedure outlined in the Online Appendix section A.

Interest rates on non-mortgage debt. To calculate interest rates on the person level, I utilize the register for individual loans, listing end-of-year outstanding debt amounts as well as interest rate payments for all bank loans 2004-2020. Interest rates on non-mortgage debt for individual i in year t are estimated following Kreiner, Leth-Petersen, and Willerslev-Olsen, 2020 as $r_{i,t} = \frac{R_{i,t}}{D_{i,t}}$, where $R_{i,t}$ equal the total interest payments and $D_{i,t}$ denotes the outstanding balance at the end of each year. The analysis is restricted to interest rates in the span of 0.5% to 15%, for accounts with an outstanding debt of at least 5.000 DKK (USD $765). Two histograms showing the distribution of interest rates across the treated (Family help) and control (No help) population before versus after housing market entry are depicted in Online Appendix Figure. B.10.

Debt. Data on debt is directly obtained from SKAT, and corresponds to the outstanding amount in December each year. I focus on non-mortgage debt in the main analysis, which includes debt from financial institutions, pension funds, insurance and financing companies, debit card schemes, as well as student loans. Non-mortgage debt is often used to finance

consumption or investments that are not secured through an underlying asset. Accordingly, the willingness or aversion of taking on such debt is informative about individual preferences for holding liabilities.

Mortgage debt is excluded from the main analysis since it is directly dependent on the homeownership of individuals and thereby correlated with the treatment (inter vivos transfer at housing market entry). However, a separate estimation on the effect on mortgage debt and equity extraction is shown in Online Appendix Figure B.11.

Spending. There is no official measure of spending available in the administrative registers. I therefore impute consumption in the spirit of Browning and Leth-Petersen, 2003 as $C_{i,t} = I_{i,t} - \Delta(W_{i,t})$, where $I_{i,t}$ is disposable income of individual i at time t and $\Delta W_{i,t}$ is the change in net wealth between t and $t-1$. Data on disposable income, wealth and debt variables is obtained from SKAT.

Entry into entrepreneurship. I define an entrepreneur as an individual with an annual income from self-employment exceeding 50,000 DKK (USD\$ 7.650). Entry into entrepreneurship is defined as a variable which equals one in the year an individual exceeds the defined threshold, and zero otherwise.

Other variables:

Education. I categorize individuals into 5 education categories based on the level of completed studies: i) primary and lower secondary, ii) high school, iii) tertiary and college (BA), iv) college (MA), and v) Ph.D. The categories are included as dummies in the main specification.

Disposable income. Disposable income is obtained directly from the SKAT, and corresponds to the yearly individual income after tax. This variable is included as yearly quintiles in the main specification.

Marital status. I categorize individuals as married or single depending on if they were registered as married in December in a given year.

3.3   Sample selection

The main sample is limited to individuals aged 18-45 with at least one living parent who entered the housing market at a maximum age of 35 during the years 1995-2020. I follow the outcomes of entrants described in section 3.2 in the 10 years before and after their first home purchase, resulting in a maximum span of 20 event years per individual in the sample. Renters are excluded from the analysis.[9] The maximum entry-age restriction combined with the overall age restriction implies that individuals are observed in ages 18-45.[10] The analysis considering the effect on interest rates are limited to years 2004-2020 due to limited data availability before 2004. All monetary variables are expressed in thousands of DKK and are inflated to 2020 levels. Whenever expressed in \$USD, I adopt the 2020 exchange rate ($\frac{DKK}{\$USD} = 6.54$).

Table 1 lists the averages of variables in the main sample, split by general entrants (control sample, "No help") and intra-family sales entrants (treated sample, "Family help"). There are in total 11,087,378 observations (758.388 individuals), out of which 686,291 (40.695 individuals) correspond to the intra-family sales sample. The two groups are similar in terms of age and education, but differ substantially in terms of several financial variables. Specifically, entrants receiving transfers have lower interest rates, lower salary income, higher net wealth and total debt, and are more likely to be entrepreneurs. The central question is whether the observed differences stem from the entry-associated inter vivos transfer or if such distinctions would have existed in the absence of the transfer.

4   Empirical design

4.1   Baseline specification

I employ a dynamic two-way fixed effects (TWFE) design with staggered adoption to estimate the treatment effect of inter vivos transfers on the outcomes outlined in section 3.2:

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[9]The average share of homeowners in Denmark (ages 18-35, years 1995-2020) equals 24%, implying that I include 1/4 of all Danish young adults in my study.

[10]The imposition of age restrictions leads to an unbalanced sample. To safeguard against potential biases stemming from the sample composition, I conduct several robustness exercises involving variations in age cutoffs. For instance, I incorporate observations before age 18 into the pre-trends in one exercise. In another, I eliminate the age 35 cutoff to consider entrants aged 18 to 45. The results remain robust to these exercises.

$$y_{i,t} = \alpha_i + \lambda_{t,a} + \sum_{\substack{\tau=-6 \\ \tau \neq -1}}^{10} \gamma_\tau \mathbf{1}(T_{i,t} = \tau) \quad +$$

$$\sum_{\substack{\tau=-6 \\ \tau \neq -1}}^{10} \theta_\tau (\mathbf{1}(T_{i,t} = \tau) \times \mathbf{I}_i) + \beta X_{i,t} + \epsilon_{i,t} \tag{2}$$

Where $y_{i,t} = r_{i,t}, D_{i,t}, C_{i,t}, E_{i,t}$ denotes the interest rate, outstanding debt, consumption or entry into entrepreneurship of individual i at time t. $\lambda_{t,a}$ is a vector of year-age fixed effects and τ denotes years relative to housing market entry ([-10] to [+10]), where I exclude $\tau = -1$ and $\tau < -6$ to avoid multicollinearity (Borusyak, Jaravel, and Spiess, 2021). $T_{i,t}$ denotes the date relative to housing market entry of individual i and $\mathbf{1}(T_{i,t} = \tau)$ represents presence of period $T_{i,t}$. $\mathbf{I}_i$ is an indicator for treatment and is equal to one if the entry of individual i was through an intra-family forward sale, and zero otherwise. Once interacted with the treatment lags, it signals the housing market entry of treated individuals who receive a transfer at $\tau = 0$. θ_τ accordingly captures the treatment coefficients of interest, signalling the additional effect on $y_{i,t}$ from entering the housing market with the help of a substantial transfer. Event study coefficients are expressed in relation to the linear trend arising from the inclusion of the two normalizations. $\epsilon_{i,t}$ is an error term assumed to be independently identically distributed (iid).

To account for time-invariant variation in my sample, I include person fixed effects α_i. This ensures that results are not influenced by variations in individual-specific, time-invariant characteristics like gender, IQ, or genetic traits. Furthermore, $X_{i,t}$ is a vector of controls, which includes quintiles of disposable income and dummies for completed education and marital status in all regressions. In regressions where the interest rate is the dependent variable, quintiles of outstanding debt are included as additional controls[11].

The average treatment effect (ATE) is recovered as a weighted average of the post-treatment coefficients θ_τ from specification (2), with weights equal to the share of the treated units in each cohort:

$$ATE = \sum_{\tau=1}^{10} \omega_\tau \times \theta_\tau \tag{3}$$

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[11]The interest rate is negatively related to outstanding debt in the data. Accordingly, I control for debt size to avoid picking up this effect in the treatment coefficients.

Where ω_τ correspond to treatment weights, equalling the share of treated units in each event year.

4.2   Identification

The identification of θ_τ in Equation (2) hinges on the identifying assumption of parallel trends. The assumption posits that, in the absence of the transfer, treated and control units would have followed comparable trajectories over time. This implies that, on average, unobserved time-varying characteristics do not systematically differ between treated and controls. I assess the validity of this assumption by including a set of lead indicators in the main specification to test whether pre-trends show any significant difference in outcomes between treated and controls prior to treatment $\tau = 0$. Results from F-tests on the pre-event coefficients are presented in the Online Appendix Table B.3. Additionally, I conduct a distinct analysis where I limit the control group to siblings of the entrants, outlined in Section 4.2.1 below. This approach helps evaluate how treatment effects change when accounting for unobserved time-varying heterogeneity stemming from parental background.

The results from the testing of pre-trends are discussed in greater detail in section 5.2.

4.2.1   Siblings

One potential concern within the empirical design is that treated individuals differ from controls in terms of unobserved time-varying characteristics. There is a risk that unobserved differences between recipients of transfers and general entrants are confounding the results. One potential difference relates to parental background: parents engaged in forward-selling properties to their children may possess a higher level of financial literacy. This proficiency could motivate their children to actively bargain their interest rates, extract credit or pursue entrepreneurship more than the broader population, potentially introducing a bias to the estimated coefficients.[12] Such a scenario would challenge the identifying assumption underpinning the validity of the estimated coefficients in equation 2 — that outcomes for entrants receiving transfers would have evolved similarly to controls in the absence of the transfer.

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[12]Note that the inclusion of person fixed effects does not account for this difference between treated and controls, since the spill-over of parents' financial literacy can be time-varying and interact with the transfer treatment.

To address this concern, I employ an additional exercise where I restrict the controls to siblings of the treated who also enter the housing market in the sample period. The use of siblings as controls is a widely adopted method in empirical studies attempting to reduce confounding bias of estimates (see Sjölander, Frisell, and Öberg, 2022 for a review of existing evidence). In the context of this study, employing siblings ensures a more comparable baseline between treatment and control units in terms of inherited ability and shared upbringing. Siblings are included in the restricted sample if they share at least one parent with an intra-family sales entrant. Although siblings are likely to also receive some financial assistance from the parents as they enter the housing market, the amount is on average much smaller than the amount received by the intra-family sales entrants. Considering that the control group is likely also exposed to transfers, the coefficients derived from this exercise should be interpreted as a conservative estimate, representing a lower bound on the effects of inter vivos transfers.

Restricting the control group to siblings of the entrants limits the analysis sample size to 440.668 observations (37.582 individuals). Online Appendix Table B.2 lists the main descriptive variables for the restricted treatment and control group. The analysis is then conducted by estimating equation 2 on this sample.

5   Results: The long run effects of inter vivos transfers

5.1   Full population sample

The average direct and long-run impact of the transfer on the net wealth of recipients is depicted in Figure 1. General entrants ("No help") have zero net wealth holdings during the 10 years prior to becoming owners, and then start accumulating wealth shortly after entry. In contrast, recipients of transfers ("Family help") have slightly positive net wealth already in the years prior to entry, and then experience a jump by 609,000 DKK (USD \$93,000) at event year $\tau = 0$, illustrating the direct effect of the transfer. The net wealth development after entry is u-shaped over the 10 year horizon, where recipients of transfers first decrease their net wealth by 100,000 DKK (USD \$15,300), and then begin to raise net worth levels again 5 years after entry.

The transfers indirectly affect wealth trajectories of recipients by influencing their financial

and behavioral outcomes. The main estimation results, shown in Figure 3, underscore a substantial impact of inter vivos transfers on the wealth-enhancing variables of new homeowners. Entrants receiving a transfer face significantly lower the interest rates (panel a), have higher borrowing (panel b), are more likely to enter into entrepreneurship (panel c), and enjoy higher spending (panel d) after housing market entry, compared to general entrants.

Interest rate. Panel a shows that the interest rate on non-mortgage debt drops by 0.4 percentage points on average for recipients of transfers in the year following entry, and then increases in subsequent years, reaching the level of general entrants 4 years after entry. Importantly, the effect is underpinned by a shift in the median rate, rather than in the tails, as illustrated by the histogram before and after entry, shown in Online Appendix Figure B.10. There are no signs of pre-trends, which is confirmed by the F-test results in Online Appendix Table B.3 (F-statistic $= 1.56$, p-value $= 0.17$). This implies that recipients of transfers face lower prices on credit in the non-mortgage markets, granting them access to greater borrowing for the same monthly payment as general entrants in the short and medium run. The possible reasons for this result are several. Firstly, the size of wealth holdings signal the repayment potential of borrowers, which is likely to influence the interest rate they face on debt. Looking at the debt-equity-ratio in the year of entry, shown in Figure 6, it is evident that the property-related net wealth holdings of recipients is far higher than that of general entrants. Accordingly, the wealth effect resulting from the transfer might lower interest rates by reducing the credit risk associated with the recipient. Secondly, parents who make transfers are likely to have beneficial customer relations with their bank, which may spillover on their children. In Denmark, it is common for banks to offer larger customers the possibility to extend their associated benefits, like lower interest rates on debt, to their family members. If this is the case, the observed effect on interest rates represents a network effect, rather than a wealth effect.

Borrowing. Recipients of transfers increase their non-mortgage debt incrementally after entry, such that they end up with 13,000 DKK (USD $2,000) higher debt on average following the transfer, as evident in panel b. The overall subsequent increase in borrowing across the post-treatment periods is 9% higher compared to general entrants. Looking at average levels across event years (see panel b of Figure 2), borrowing stays flat for general entrants in the 10 years after entry, while it rises for recipients of transfers. This underscores a significant

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underlying borrowing constraint, which is alleviated among intra-family sales entrants via the wealth transfer. A plausible explanation is that individuals without financial support maximize their loan-to-value (LTV) ratio at the point of entry, as is illustrated by Figure 6.

Importantly, there is a clear negative pre-trend in the lead coefficients on non-mortgage borrowing. The reason is that a larger share of recipients of transfers own no debt at the point of entry, while it is more common amongst recipients to accumulate debt in previous years. This relates to the discussion in Section 4.2, highlighting that entrants of family sales may differ from the controls in terms of unobservable characteristics. Accordingly, we continue to discuss pre-trends together with the results from the siblings estimation results in Section 5.2.

The results from the estimation on mortgage borrowing and equity extraction are shown in Online Appendix Figure B.11. Recipients of transfers increase their mortgage borrowing by 42% more than general entrants following the transfer, and are 87% more likely to extract equity.

Selection into entrepreneurship. Panel c shows that the propensity to select into self-employment increases by 1.7 percentage points following entry (95% in reference to the baseline average), signalling a direct and persistent effect of parental transfers on the occupational choice of their children. The lead coefficients reveal only modest divergence before entry, followed by a pronounced increase in the treatment year. Prior research by Andersen and Nielsen, 2012 suggests that individuals who become entrepreneurs due to eased credit constraints tend to under-perform compared to the average business owner. Hence, one implication of this result is that large inter vivos transfers might contribute to an overall lower quality of new entrepreneurs.

Spending. Finally, the surge in debt aligns with a 15% increase in annual spending in the years following the transfer on average, which can be seen in panel d. Consumption experiences a significant spike in the year following entry[13], later stabilizing around 30 000 DKK per year (USD $4.590). The lead coefficients show no clear sign of pre-trends, yet the F-test results from Online Appendix Table B.3 indicate that they are significantly different from zero, which is likely underpinned by the diverging pre-trends in borrowing. There are two separate forces underpinning the effect: an increase in disposable income and a rise in borrowing which is not

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[13]It is likely that the initial jump reflect recipients' direct spending on renovations or housing-related investments.

met by an increase in investments. The disposable income increases from the drop in interest rate expenses associated with the purchase. This finding is consistent with previous research showing that household expenditures respond to eased liquidity constraints (Leth-Petersen, 2010), and that this effect is particularly pronounced among young households.

5.2 Siblings

The results derived from the exercise using siblings as controls, presented in Figure 4, highlight several important aspects. Firstly, looking at treatment effects, the coefficient on interest rates in the year after entry drops from 0.4 to 0.2 percentage points (panel a) when compared to the results from the main sample, and the effect is less persistent in the post-treatment years. This indicates a transmission of parental background in the credit markets: siblings of intra-family sales entrants also face lower interest rates on their debt following housing market entry. The reduced treatment coefficient may stem from a strengthened bargaining position facilitated by family-associated advantages with certain banks. It can also signal that the sibling is receiving other informal transfers that I cannot observe, thereby strengthening their credit position and reducing the interest rates they encounter.

Moving to panel b, the treatment effect on borrowing intensifies, increasing from 9% in the main sample to 11% in the siblings sample. Additionally, panel c shows that siblings who receive a transfer witness a 67% upswing in entrepreneurship entry. Although this increase is slightly lower than that observed in the main estimations, the treatment coefficients exhibit a sharp jump precisely at the point of entry, sustaining a stable impact on self-employment among transfer recipients over the subsequent 10 years. The average rise in spending stands at 6%, and this effect diminishes over the years, eventually aligning with the spending patterns of siblings in the control group six years after entry (panel c). This suggests that siblings receiving transfers share similar consumption patterns but differ in their investment behavior. Overall, the results suggest that the treatment effects on interest rates, borrowing, spending and entrepreneurship cannot be explained by differences in upbringing or parental characteristics between treated and controls.

Secondly, Online Appendix Table B.3 shows that restricting the controls to siblings results

in less significant lead coefficients, as indicated by the larger F-statistics and p-values in row 3-4, compared to row 1-2. This indicates that the siblings exercise improves harmonization of time-invariant characteristics across treated and controls. In particular, there are no significant pre-trends evident in the event study estimations using interest rate and entrepreneurship as dependent variables. However, some pre-trends remain in the estimations of borrowing and spending. This indicates that, even amongst siblings, recipients of transfers may differ from general entrants in some characteristic that I cannot observe.

5.3   Heterogeneous treatment effects

The results from section 5 highlight a significant and robust effect of inter vivos transfers on the interest rate, borrowing, spending and entrepreneurship of recipients. As a next step, I investigate how the treatment effects on borrowing vary with the socioeconomic characteristics of entrants. The analysis involves estimating the main specification of Equation (1) separately for eight sub-samples, categorizing recipients into groups based on their age (young/old), gender (female/male), marital status (married/single), and education level (high/low). Figure 5 displays the results from the estimations, where ATEs (circles) are illustrated together with their corresponding 95% confidence interval, as well as the RTEs (diamonds).

The effect of transfers on leveraging does not vary significantly with the age of recipients.[14] Non-mortgage borrowing increases by 9% for individuals who receive a transfer below the age of 30, and 11% for older individuals. However, significant differences emerge when distinguishing the analysis by gender. While males increase their long-term debt by 16% more than general entrants following a transfer, women exhibit a contrasting trend by *reducing* their debt by 10%. This result is complementary to the recent finding by Black et al., 2022, showing that gifts and bequests are more important sources of income for women than for men. Especially, it shows that, while women use the transfers to ease existing constraints, men use the funds as a means to generate additional income or wealth, which may explain why the ratio of transfers over total income is larger for women than for men. The result further aligns with the evidence supporting that women are on average more risk-averse in their financial positions (Hibbert,

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[14]The categorizations are defined within the main sample, which is restricted to individuals entering the housing market before age 36. The "old" entrants are hence defined as individuals becoming homeowners in the age span 30-35, while "young" are entrants below the age of 30.

Lawrence, and Prakash, 2013) and in their willingness to take on debt (Sena, Scott, and Roper, 2012 and Nitani, Riding, and Orser, 2020).

Turning to borrowing responses by marital status, married individuals experience a substantial increase in borrowing by 13%, surpassing the corresponding 7% increase observed among singles. This suggests that recipients of transfers utilize the illiquid funds not only to alleviate their own credit constraints, but also to address credit needs within their relationship. One important implication from this is that inter vivos transfers may have large spillover effects, especially on the spouse of the recipient. Finally, I find no significant difference in borrowing behavior among individuals with high education, while a significant effect of 12% is documented for those with low education. This difference may be attributed to the higher income growth of individuals with high education, resulting in less restrictive borrowing constraints over the life cycle. Consequently, the transfer itself may not play a pivotal role in enhancing credit market access for this group. In contrast, my findings highlight that the transfer significantly influences credit market access for individuals with low education, thereby impacting their borrowing behavior.

6   Conclusion

This study empirically documents the long-run impact of inter vivos wealth transfers on recipients' interest rates, non-mortgage borrowing, entrepreneurship entry, and spending. I identify transfers from parents to children by exploiting a tax loophole within the Danish housing markets, comparing the outcome variables of recipients who receive a transfer at entry to those of general entrants. My findings demonstrate that recipients of transfers experience lower interest rates, heightened borrowing, increased entrepreneurship entry, and elevated spending in comparison to general entrants. The impact on interest rates persist up to 4 years after entry, while the effects on other outcome variables remain significant over the 10-year post-treatment period. The treatment effects on borrowing are heterogeneous across gender and education, with more pronounced effects observed among men and individuals with lower educational attainment. The results are robust to limiting the controls to siblings of the entrants, leading to a reduction in the treatment effect on interest rates, spending, and entrepreneurship entry, but

an increase in the case of borrowing. Overall, the findings support that inter vivos transfers received at early stages of the life cycle alter life-trajectories of individuals' by enhancing their financial and economic opportunities.

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	No help (1)	Family help (2)
Age	29.27	28.81
Has college degree (%)	32.80	33.62
Salary income	276.31	237.63
Purchase price	1624.54	1627.18
Market value of house	1694.47	2251.00
Ownership share (%)	60.26	78.79
Net wealth	80.43	354.26
Interest rate on non-mortgage debt (%)	6.75	6.67
Non-mortgage debt	127.21	123.61
Mortgage debt	513.11	650.73
Spending	223.66	233.13
Entrepreneurship (%)	2.84	5.65
Parent transfer sum		608.74
Observations	10,501,087	586,291
Number of entrants	758,388	40,695

Table 1: Summary statistics (Main sample)

Notes: The table presents averages of financial and demographic variables for the main sample across the 20 [-10:+10] event years. Variables are observed at annual frequency. Column 1 and 2 distinguishes between averages for treated individuals who entered the housing market through an intra-family forward sale (Family help) and controls who are general entrants (No help). The sample is limited to ages 18-45 for all variables, covering the years 1995-2020 for debt, spending, and self-employment, and the years 2004-2020 for interest rates. All financial variables are expressed in thousands of DKK and are inflated to 2020 levels. Interest rates on non-mortgage debt are estimated following Kreiner, Leth-Petersen, and Willerslev-Olsen, 2020 as end-of-year aggregate interest rate payments divided by outstanding debt. Spending is imputed following the method developed by Browning and Leth-Petersen, 2003. Total obs for all variables except for interest rate: 11,087,378. Obs for interest rate sample: 4,537,948. Data is obtained from Danish administrative registers (Statistics Denmark).
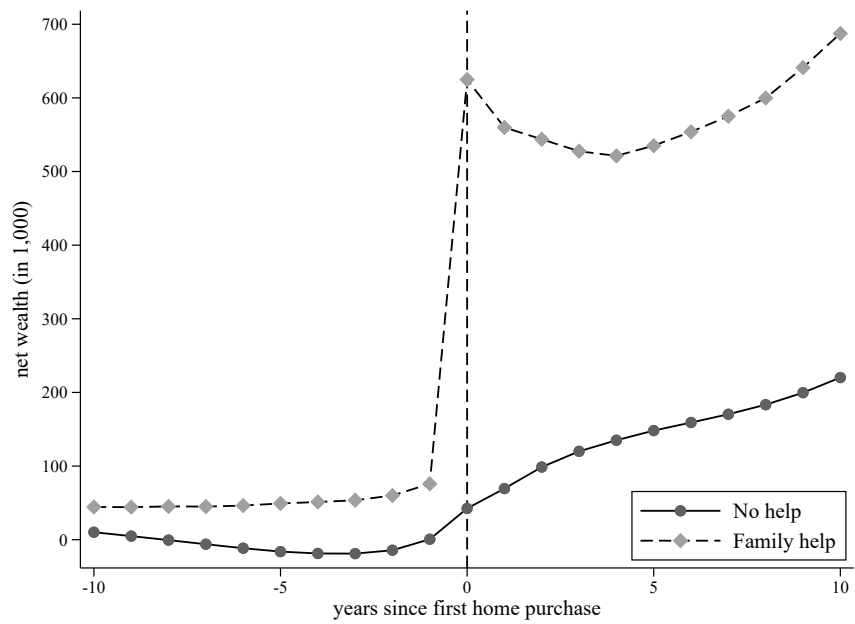
Figure 1: Net wealth (The flying start)

Notes: The Figure shows the average net wealth in DKK, defined as total assets minus debt, for treated (Family help) and controls (No help) 10 years before and after housing market entry. An individual is defined as receiving help if they entered the housing market through an intra-family sale. Sample include ages 18-45, years 1995-2020. Obs: 600,442 for treated and 10,826,517 for controls. Data is obtained from Danish administrative registers (Statistics Denmark).

(a) Interest rate

(b) Non-mortgage borrowing

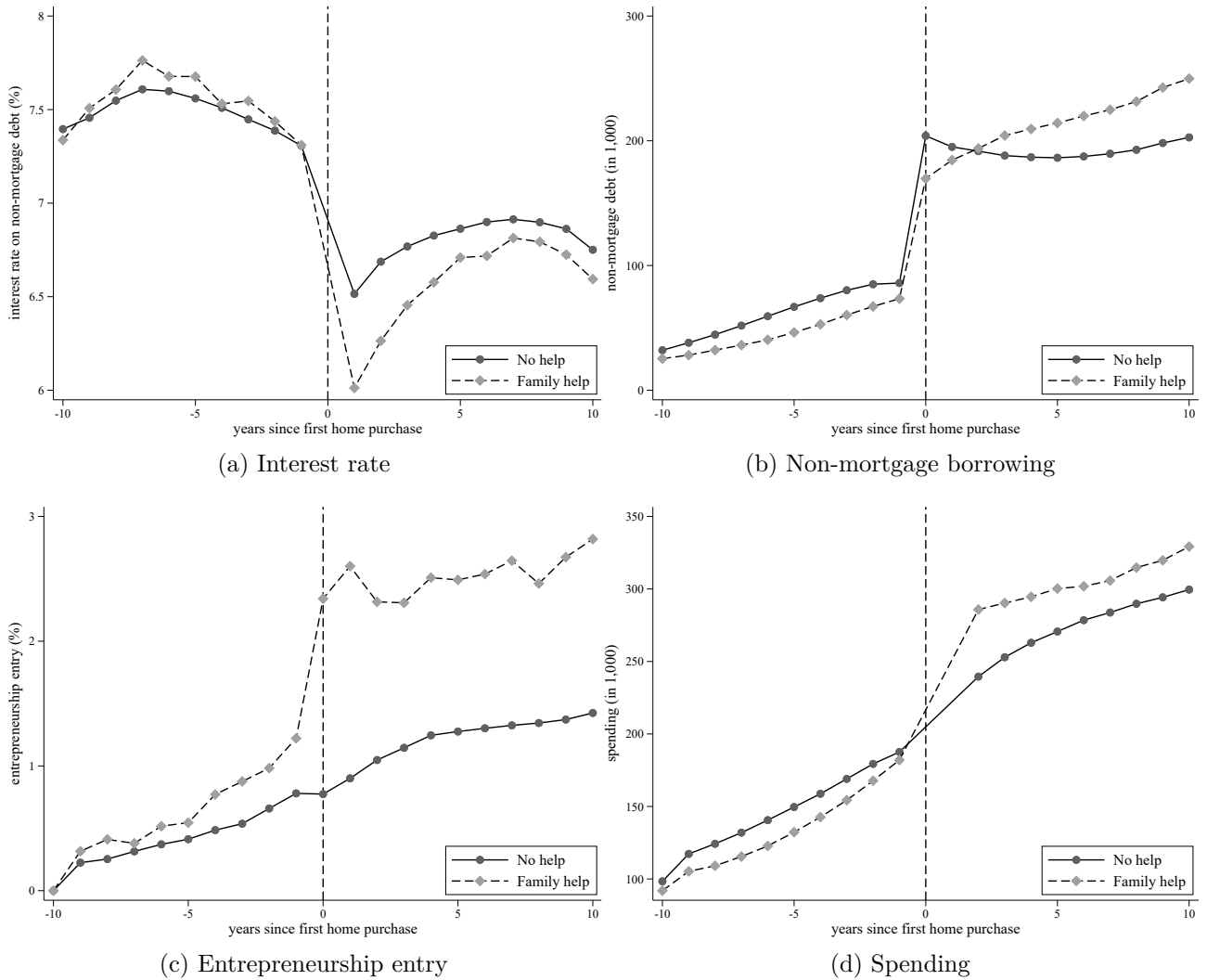(c) Entrepreneurship entry

(d) Spending

Figure 2: Averages of main outcome variables across event years

Notes: This Figure reports descriptive averages across event years for the interest rate (panel a), non-mortgage debt (panel b), entry into entrepreneurship (panel c) and spending (panel d). Obs for estimation on interest rates: 4,537,948. Obs for remaining variables: 11,087,378. Data is obtained from Danish administrative registers (Statistics Denmark).

(a) Interest rate   (b) Non-mortgage borrowing
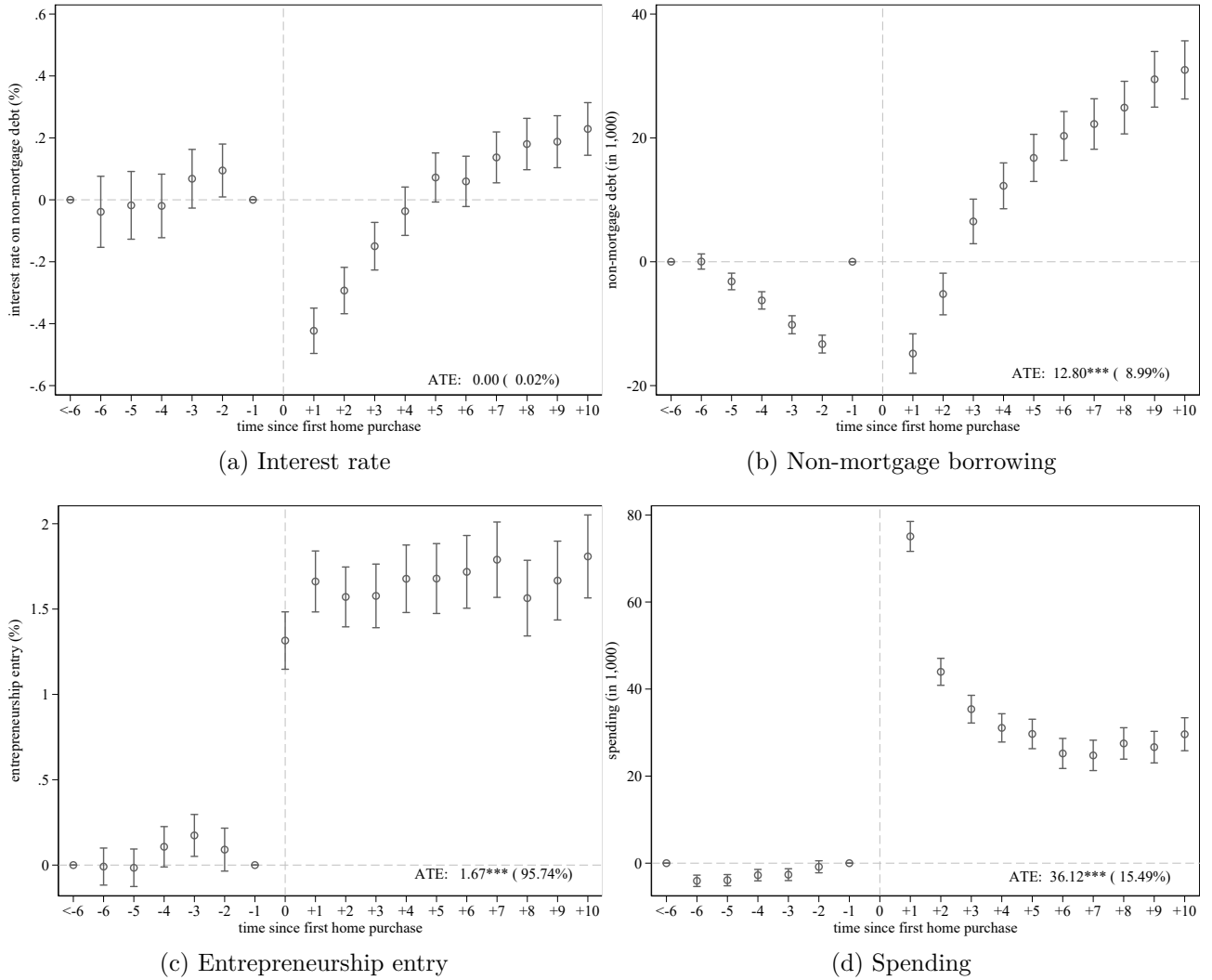
(c) Entrepreneurship entry   (d) Spending

Figure 3: Estimation results, main sample

Notes: This Figure reports the main estimation results from specification (2) for the full sample. The dependent variables are interest rate (panel a), non-mortgage debt (panel b), entry into entrepreneurship (panel c) and spending (panel d). Treatment group are individuals receiving a large wealth transfer upon housing market entry, and controls are general entrants. The regression includes year-age fixed effects and individual fixed effects. Included time-varying controls are education, marital status, income rank. Debt rank is included as an additional control in the interest rate regressions. The ATE, reported in the bottom right corner of each panel, is calculated as a weighted average of post-treatment period coefficients, with weights equal to the share of treated units in each event year. Treatment coefficients at $\tau = 0$ have been removed from the figures of panel a, b and d due to sharp changes in the dependent variables upon housing market entry, resulting in distorted estimates. Obs for estimation on interest rates: 4,537,948. Obs for estimation on debt, spending and entrepreneurship entry: 11,087,378. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Data is obtained from Danish administrative registers (Statistics Denmark).

(a) Interest rate

(b) Non-mortgage borrowing

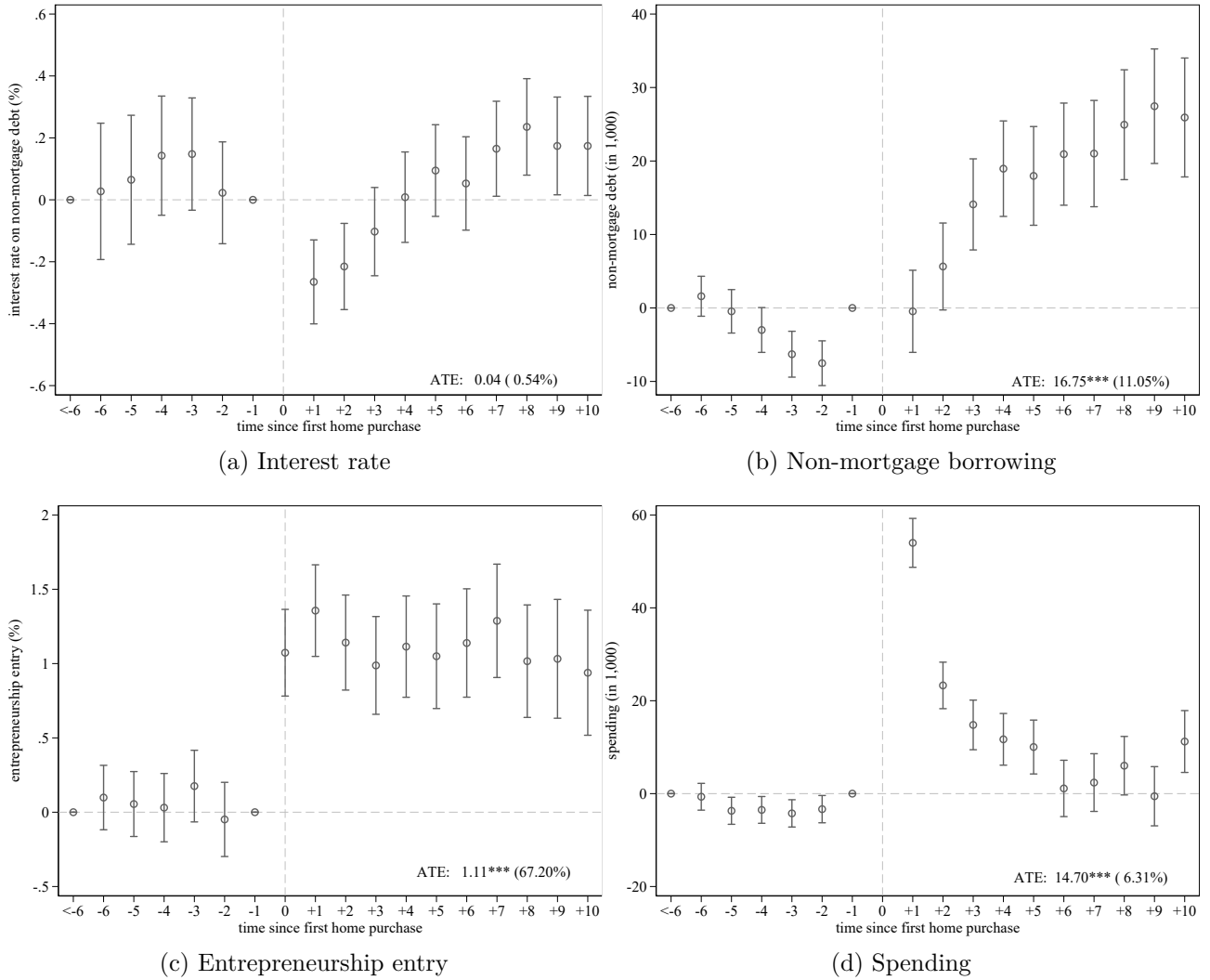(c) Entrepreneurship entry

(d) Spending

Figure 4: Estimation results, siblings sample

Notes: This Figure reports the main estimation results from specification (2) for the sample restricted to siblings. The dependent variables are interest rate (panel a), non-mortgage debt (panel b), entry into entrepreneurship (panel c) and spending (panel d). Treatment group are individuals receiving a large wealth transfer upon housing market entry, and controls are general entrants. The regression includes year-age fixed effects and individual fixed effects. Included time-varying controls are education, marital status, income rank. Debt rank is included as an additional control in the interest rate regressions. The ATE, reported in the bottom right corner of each panel, is calculated as a weighted average of post-treatment period coefficients, with weights equal to the share of treated units in each event year. Treatment coefficients at $\tau = 0$ have been removed from the figures of panel a, b and d due to sharp changes in the dependent variables upon housing market entry, resulting in distorted estimates. Obs for estimation on interest rates: 144,953. Obs for estimation on debt, spending and self-employment: 450,936. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Data is obtained from Danish administrative registers (Statistics Denmark).
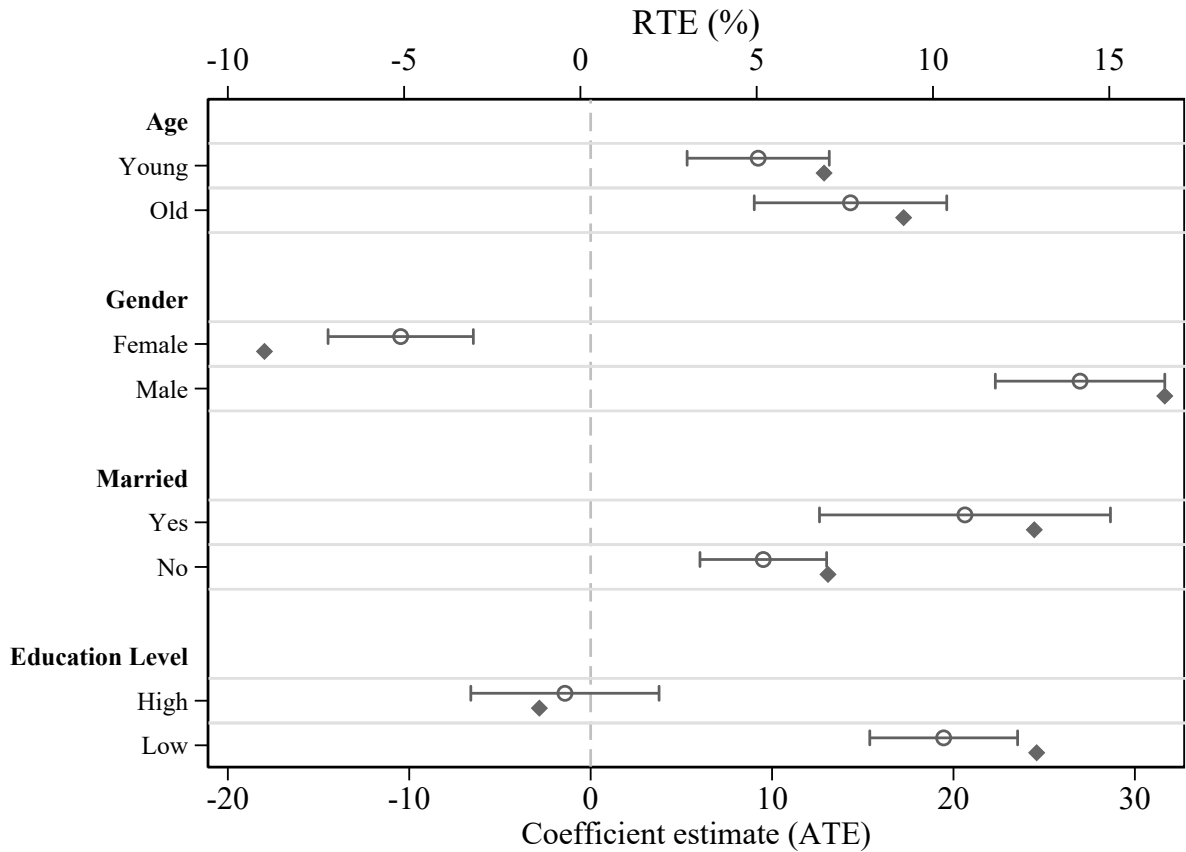
Figure 5: Heterogeneity in treatment effect on borrowing

Notes: The figure is showing the average treatment effects (ATE) for the non-mortgage debt specification (panel b of Figure 3) across four dimensions of heterogeneity for the main sample. Estimations are conducted separately for individuals below (young) and above (old) the age of 30; females and males; married and unmarried as well as with high and low education. ATEs are obtained as a linear combination of the 10 post-treatment lags, with weights equal to the share of the treated population in each event year. Coefficients are presented together with the corresponding 95% confidence intervals (circles). Relative treatment effects (RTE) (diamonds) are calculated as the ATEs divided by the baseline subgroup average across event years [-10:+10]. Obs: 11,087,378. Data is obtained from Danish administrative registers (Statistics Denmark).
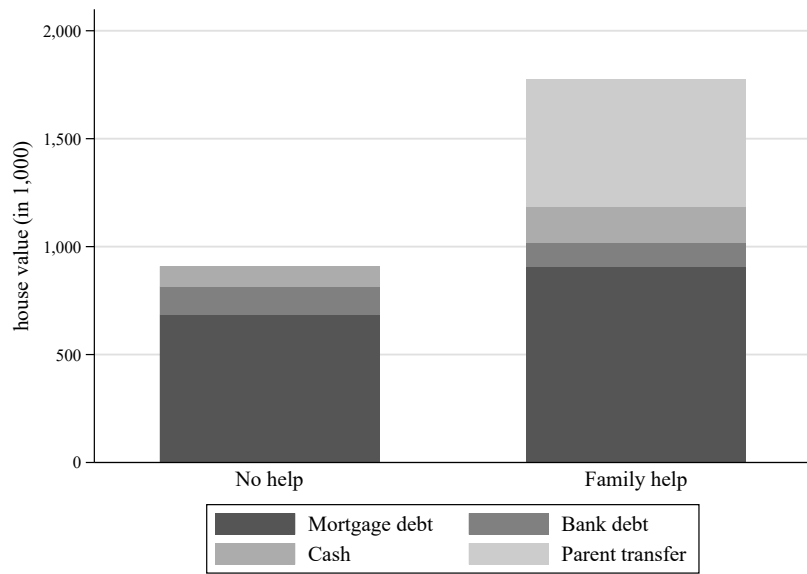
Figure 6: Financing sources at entry

Notes: The Figure depicts the average house value the year of housing market entry for treated (Family help) and controls (No help), divided into mortgage debt, bank debt (non-mortgage debt), cash and parental transfers. Cash, which reflects the down payment of the unit, is imputed by taking the market price of the purchased unit, subtracting the change in debt at the year of entry. Obs: 11,087,378. Data is obtained from Danish administrative registers (Statistics Denmark).

A   Online Appendix: Imputing market prices of housing

To impute the market value of housing, I follow the method developed by Andersen et al., 2021.
The procedure is summarized as follows.

1. Obtain the transaction price and tax based (public listed) values of housing, as well as information on square meters.

2. Restrict the sample to private transactions, one-family homes, traded no more than twice per year, 25-750 square meters, prices between 100,000 and 25,000,000 DKK, square meter prices between 1,000 and 200,000 DKK.

3. Calculate sales price per square meter and tax value per square meter. Winsorize both at the 2.5th percentile and the 97.5th percentile.

4. Calculate an adjustment factor for each municipality and year by dividing the total sales price per square meter by the total tax values per square meter.

5. Adjust all housing units in within the same municipality using the same adjustment factor

B   Online Appendix: Additional Tables and Figures

	No help (1)	Family help (2)
Age	28.91	29.20
Has college degree (%)	37.10	31.51
Salary income	269.11	244.15
Purchase price	1778.63	1650.27
Market value of house	1877.64	2116.49
Net wealth	129.52	266.02
Interest rate on non-mortgage debt (%)	6.62	6.79
Non-mortgage debt	124.86	135.47
Mortgage debt	567.07	647.22
Spending	225.00	232.89
Entrepreneurship (%)	3.51	5.32
Parent transfer sum		503.75
Observations	239,168	315,642
Number of entrants	15,858	21,724

Table B.2: Summary statistics (Siblings sample)

Notes: The table presents averages of financial and demographic variables for the siblings sample across the 20 [-10:+10] event years. Variables are observed at annual frequency. Column 1 shows values for general entrants (No help) while Column 2 depict values who individuals who entered the housing market through an intra-family forward sale (Family help). The sample is limited to ages 18-45 for all variables, covering the years 1995-2020 for debt, spending, and self-employment, and the years 2004-2020 for interest rates. All financial variables are expressed in thousands of DKK and are inflated to 2020 levels. Interest rates on non-mortgage debt are estimated following Kreiner, Leth-Petersen, and Willerslev-Olsen, 2020 as end-of-year aggregate interest rate payments divided by outstanding debt. Spending is imputed following the method developed by Browning and Leth-Petersen, 2003. Total obs for all variables except for interest rate: 554,810. Obs for interest rate sample: 212,182. Data is obtained from Danish administrative registers (Statistics Denmark).

Dependent var:	Interest rate (1)	Borrowing (2)	Entrepreneurship (3)	Spending (4)
Main sample				
F-statistic	1.56	67.90	2.32	12.27
p-value	0.17	0.00	0.04	0.00
Siblings sample				
F-statistic	0.74	5.76	0.67	2.82
p-value	0.59	0.00	0.64	0.01

Table B.3: F-tests for treatment leads

Notes: The table presents the results from F-tests of the 5 treatment lead coefficients from Equation (2) with the dependent variable being the interest rate (column 1), borrowing (column 2), Entrepreneurship (column 3) and Spending (column 4). Results are presented for the main sample and the sample restricted to siblings. Data is obtained from Danish administrative registers (Statistics Denmark).
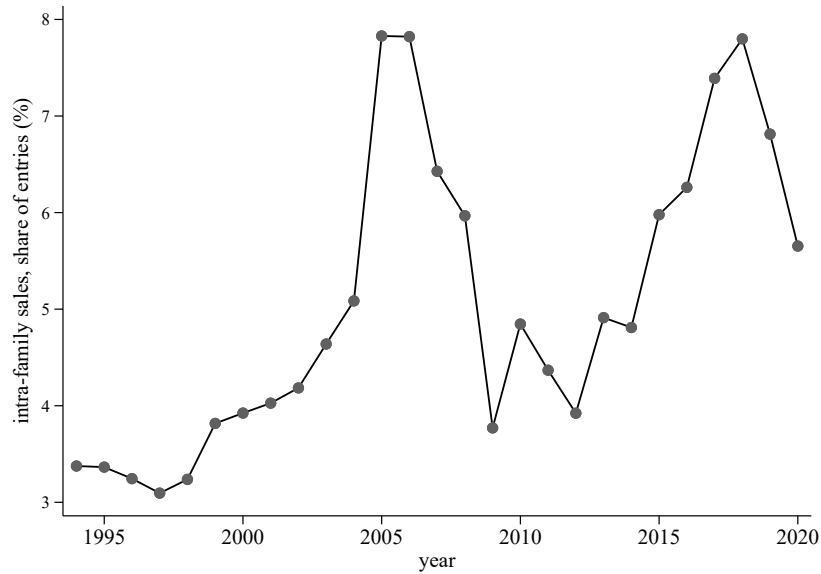
Figure B.7: Intra-family sales (inter vivos wealth transfers) over time

Notes: The Figure shows intra-family forward sales as a share of total housing market entries in the main sample in the time period 1995-2020. Data is obtained from Danish administrative registers (Statistics Denmark).
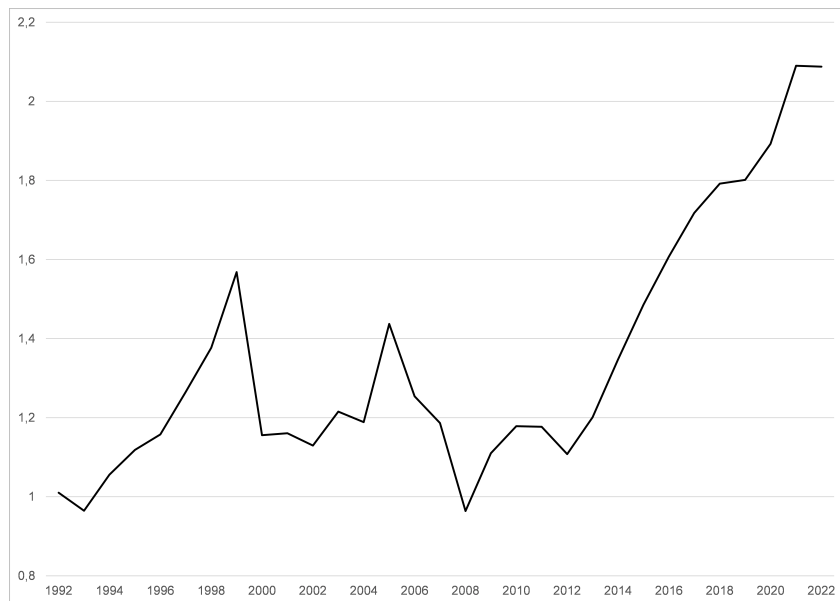

Figure B.8: Market-to-public value ratio

Notes: The Figure depicts the average market-to-public (MTP) value ratio across all housing units in Denmark year 1992-2022. The ratio is directly related to the potential size of the tax-free wealth transfer that can be made as part of an intra-family sale. The public (tax-based) value of housing stopped being updated in 2011, explaining the sharp increase in the MTP post 2011. Data is obtained from Danish administrative registers (Statistics Denmark).
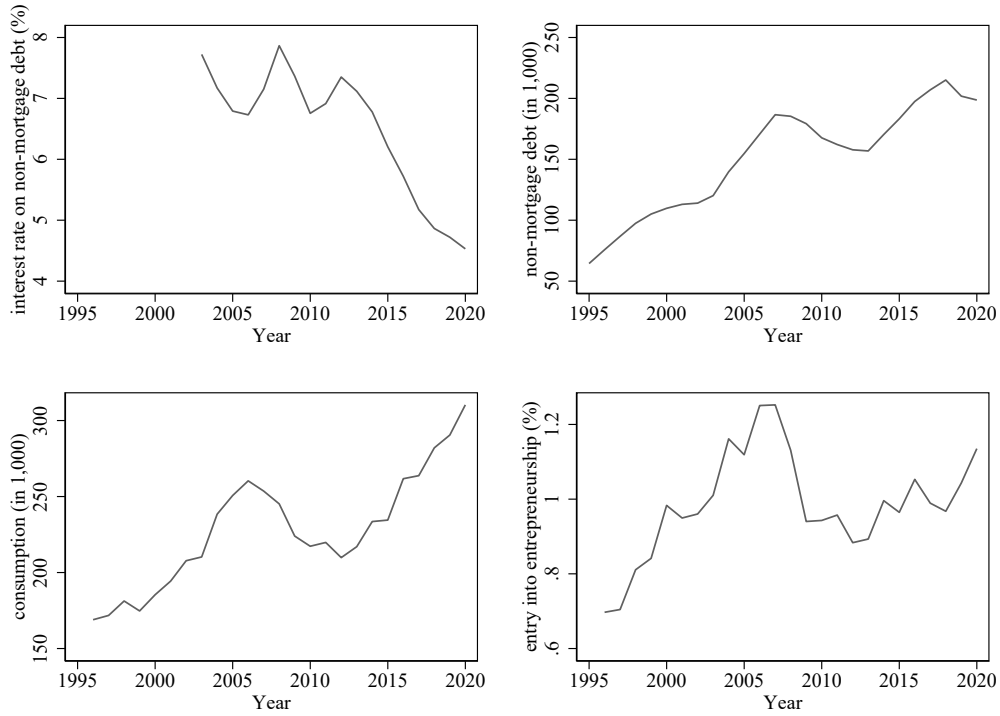
Figure B.9: Main outcome variable averages over time

Notes: The Figure depicts the main outcome variables across the sample years 1995-2020. The variables are interest rate on non-mortgage debt (top left), non-mortgage debt (top right), consumption (bottom left) and entry into entrepreneurship (bottom right). Data is obtained from Danish administrative registers (Statistics Denmark).
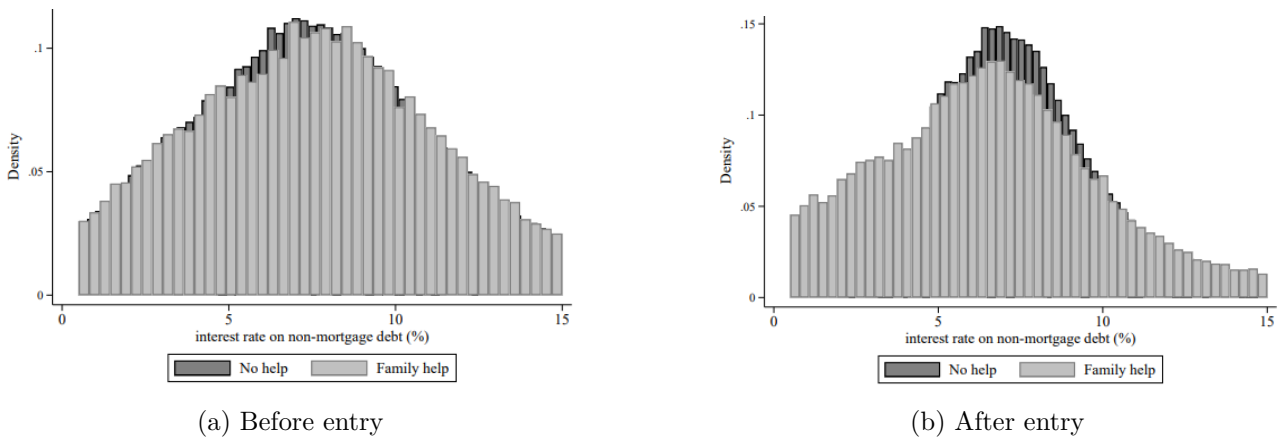

(a) Before entry

(b) After entry

Figure B.10: Distribution of interest rates before and after entry

Notes: This Figure shows the density histogram for annual interest rates on non-mortgage debt for treated ("Family help") and controls ("No help") respectively. Panel a) shows the distribution of rates prior to housing market entry, in event years $\tau = -10$ to $\tau = -1$. Panel b) shows the distribution of rates after housing market entry, in event years $\tau = +1$ to $\tau = +10$. Individual interest rates are estimated following the method of Kreiner, Leth-Petersen, and Willerslev-Olsen, 2020 as interest rate payments divided by outstanding debt at end of year. Data is obtained from Danish administrative registers (Statistics Denmark).

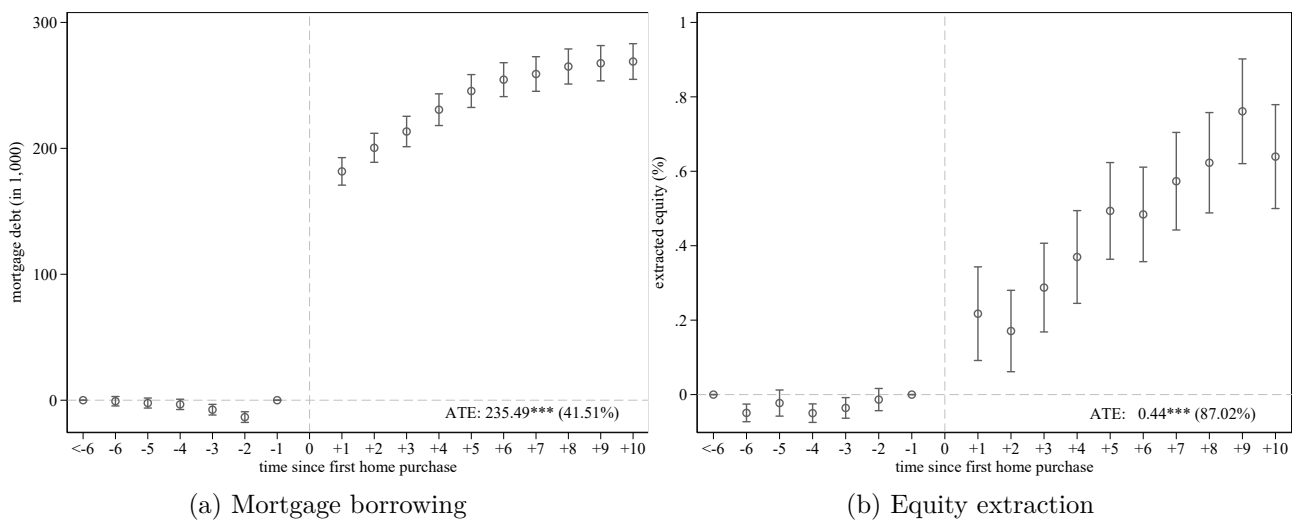(a) Mortgage borrowing   (b) Equity extraction

Figure B.11: Estimation results: Mortgage borrowing and equity extraction

Notes: This Figure reports the main estimation results from specification (2) for the full sample. The dependent variables are mortgage debt (panel a), and equity extraction debt (panel b). The regression includes year-age fixed effects and individual fixed effects. Included time-varying controls are education level, marital status and disposable income. The ATE, reported in the bottom right corner of each panel, is calculated as a weighted average of post-treatment period coefficients, with weights equal to the share of treated units in each event year. Obs: 11,087,378. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Data is obtained from Danish administrative registers (Statistics Denmark).