

# The Intergenerational Transmission of Housing Wealth\*

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## Abstract

Persistent wealth inequality has spurred an increased interest in understanding how and why wealth is correlated across generations. We exploit plausibly exogenous variation in housing wealth driven by home value changes in different areas to isolate the causal impact of parental housing wealth during different childhood periods on children's long-run wealth accumulation. Using population-level Danish administrative data, we find that 27% and 25% of each Krone of parental housing wealth change during early-childhood is transmitted to children's overall and housing wealth in adulthood, respectively. The corresponding transmission rates for parental housing wealth changes during middle-childhood are 25% and 15%, with a transmission to non-housing wealth of 10%. There is little evidence of transmission of parental housing wealth changes that occur during the teenage years. Examining mechanisms, we find that direct transfers and asset allocation are unlikely to be significant and that earnings and educational attainment can explain only 20-30% of the intergenerational transmission of parental wealth gains. We argue that the transmission of parental housing wealth changes in childhood are driven in large part by changes to unobserved household environment and parental behaviors that are passed on to children and shape their savings behavior in adulthood.

Keywords: Intergenerational wealth transmission, housing wealth

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# 1 Introduction

Persistent and high levels of wealth inequality has led to a heightened interest in understanding how and why wealth is transmitted across generations. Starting with the seminal study of Charles and Hurst (2003), prior research has shown in numerous settings that the wealth of children is positively correlated with the wealth of their parents (e.g., Fagereng et al., 2021; Black et al., 2019; Adermon et al., 2018; Boserup et al., 2018; Clark and Cummins, 2015; Arrondel and Grange, 2006). Parent and child wealth could be positively correlated due to pre-determined correlated characteristics of parents and children, such as ability, that drive wealth accumulation for both groups (selection) or because parental wealth impacts the actions of parents that are important in children’s accumulation of wealth (causation). Wealthy parents, for example, may directly transfer their wealth to their children, increase investments in child human capital accumulation and earnings capacity, or may shape child traits that determine future savings and investments.

Understanding the relative importance of selection versus causation in the intergenerational correlation of wealth is important for crafting policies to support wealth accumulation across generations. If wealth accumulation is driven by pre-determined correlated characteristics across generations, then policies focused on building wealth among parents may have little effect on their children’s wealth levels. Conversely, if wealth increases among parents cause more wealth accumulation among children, policies designed to help parents build wealth when children are young could have large long-run impacts on children and on wealth inequality.

In this paper, we exploit plausibly exogenous variation in housing wealth driven by home price changes in different areas to isolate the causal impact of parental housing wealth changes on children’s wealth in adulthood. We focus on housing wealth for a number of reasons. First, housing wealth is far more evenly distributed across the population than is other forms of non-retirement wealth (Daysal et al., 2022). For all but the wealthiest households, the main source of wealth is the home. Wealth from equities and business investments typically is isolated to a small set of very advantaged households. Second, housing wealth is relatively liquid, with households extracting between 20-25% of home equity increases to fund current expenditures (De Stefani and Hviid, 2018; Mian and Sufi, 2011). In the long run, parents can downsize once children leave the home, which increases the liquidity of housing assets. Finally, recent decades have witnessed large increases in

the volatility and liquidity of housing wealth. There is independent interest in understanding the intergenerational implications of this variation.

A particularly novel feature of our research design is our ability to investigate the effects of parental housing wealth changes occurring in distinct time periods of childhood. Specifically, we use population-level Danish administrative data covering the 1985 and 1987-1989 birth cohorts to study how parental housing wealth changes during early childhood (ages 0-5), middle childhood (ages 6-11), and teenage years (ages 12-17) impact children’s overall wealth, housing wealth, and non-housing wealth at ages 29-33.<sup>1</sup> Thus, not only are we able to show new evidence on the transmission of parental housing wealth shocks, we also show how such transmission varies by the age of the child. This evidence is important for policymakers in targeting programs that can support asset accumulation among parents with different-aged children. Variation in transmission by child age also helps inform potential mechanisms.

We begin by estimating the correlation between parental housing wealth at the beginning of each childhood period and children’s wealth outcomes at ages 29-33. We document that parental housing wealth is strongly correlated with offspring total wealth at birth (0.63), age 6 (0.74), and age 12 (0.51). Consistent with the rank-rank correlations in Daysal et al. (2022), we find that the correlation between parental housing wealth and the housing wealth of the next generation increases across the childhood developmental stages: 0.16 at birth, 0.30 at age 6, and 0.38 at age 12. The differences between the total wealth and housing wealth correlations are due to non-housing wealth, which is decreasingly correlated with parental housing wealth across developmental periods.

We next move beyond these raw correlations to estimate the effect of parental housing wealth changes during different childhood periods on long-run wealth outcomes of adult children. We focus on children whose parents own a single residential property at the time of the child’s birth and use the changes in the value of this childbirth home as an instrument for actual parental housing wealth changes. This allows us to abstract from concerns about endogenous mobility and property acquisition. Because homeowners obtain all the wealth from an increase in home value, this method isolates the role of housing wealth changes per se rather than correlated characteristics of parents and children. In order to alleviate concerns that changes in home values could be related to corre-

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<sup>1</sup>Housing data for the 1986 birth cohort are not available. Despite the relatively young ages of the children, 51.4% own a home when we observe them as adults.

lated characteristics of parents and children, we control for a rich set of observable characteristics, including birth cohort fixed effects, municipality fixed effects interacted with both parental housing wealth at birth and parental net wealth at birth, parental characteristics measured at childbirth (income, education, and marital status), child birth parity, and gender. We thus isolate variation in home values that is orthogonal to baseline wealth, municipality, and parental background (e.g., socioeconomic status).

Our results suggest that a significant portion of the parental housing wealth changes occurring in early- and middle-childhood are passed on to children later in life. We find that 27.2% and 25.3% of each Danish Krone of parental housing wealth increase during early (aged 0-5) and middle childhood (aged 6-11) is passed on to children in the form of higher wealth in adulthood, respectively. In contrast, we find no evidence that changes in parental housing wealth during teenage years impact child wealth in adulthood. Our results also suggest that parental housing wealth changes occurring in different childhood periods impact child wealth differently. Parental housing wealth gains during early childhood primarily influence child housing wealth, with 24.7% of each Danish Krone of parental housing wealth gain during early childhood transmitted to child’s housing wealth at ages 29-33. The effects of parental housing wealth gains during middle childhood, on the other hand, affect both housing and non-housing wealth accumulation: transmission to housing wealth is 15.2% and transmission to non-housing wealth is 10.1%.

Interpreting these estimates as representing the causal impact of parental housing wealth changes relies on an assumption that, conditional on the controls, variation across homeowners in the growth of the value of the childbirth home is uncorrelated with potential future wealth of children. This is a non-trivial assumption and it would be violated if, for example, parents who experience higher growth in home values have unobserved characteristics that also are correlated with long-run wealth outcomes of children. Similarly, we may be concerned about a potential bias from unobserved neighborhood improvements that are correlated with home price increases.<sup>2</sup>

While this assumption cannot be tested directly, we bring several pieces of suggestive evidence on its plausibility. First, we show that parental household characteristics are not systematically

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<sup>2</sup>Our sample includes 273 municipalities. The median (mean) municipality has a population of 9,723 (18,565) residents. In comparison, Census Tracts in the US have between 2,500 and 8,000 residents. These municipalities are smaller than the commuting zones and counties used to study neighborhood effects in the US setting (Chetty and Hendren, 2018).

correlated with changes in the value of the childbirth home, conditional on the fixed effects in the model. Second, we show that our results are robust to controlling for other variables that independently correlate with parental wealth, such as father’s industry, educational attainment, occupation, and parental income changes. The baseline results also are not sensitive to controlling for lags of housing wealth, municipality-by-cohort fixed effects, or changes in the share of college-educated residents in the municipality (which should be correlated with changes in neighborhood quality). Third, we show that our results are robust to dropping the wealthiest families in our sample, who are the most likely to have other assets that they can transfer to their children. Fourth, to directly address concerns related to potentially confounding neighborhood effects, we implement a falsification test using renters. We exploit aggregate cross-municipality variation in home values and show that there is no relationship between changes in municipality-average home values and long run wealth outcomes of renters’ children. Finally, we conduct a similar exercise among homeowner families and use aggregate annual variation in home values at the municipality level as an instrument for home price changes among our homeowner sample. The estimates are not precisely estimated but the magnitudes are very similar to the baseline results, especially for child housing wealth. While none of these tests is individually sufficient to claim the validity of the key identification assumption, taken together they provide consistent evidence that this assumption is likely to hold in our context.

In the last part of the paper, we shed light on the mechanisms behind our results. We propose a simple conceptual framework that shows that the effects could be driven by: i) direct effects of wealth (i.e., transfers), ii) effects on asset allocation (other wealth), iii) increased child educational attainment, iv) changes to child labor market earnings, and v) changes to parental behaviors that shape children’s saving and investment behavior.

We provide evidence suggesting that the first two channels are not empirically relevant in our setting. Using an event study analyses surrounding the purchase of the child’s first home, we find no evidence that parental wealth is reduced. This indicates that parents are unlikely to help their kids purchase homes. In addition, we show that our results are robust to excluding children with positive net wealth at age 12, which is a strong indicator of receiving wealth transfers from parents (Boserup et al., 2018). We also show that our results remain unchanged when we exclude intra-family home sales, and that parental housing wealth changes do not influence the likelihood of co-owning a home

with one’s parents. Finally, to explore whether parental ability to serve as guarantors mediates wealth transmission, we examine heterogeneity in the effect of parental housing wealth on child home-ownership (at ages 29–33) by quartiles of parental debt-to-income measured when the child is 27–28. We find no evidence of stronger effects among less leveraged parents. These results also align with the robustness of our estimates to dropping the wealthiest households, who have the most scope for direct intergenerational transfers, and with prior research showing that parents in Denmark do not help children with down payments (Kolodziejczyk and Leth-Petersen, 2013).<sup>3</sup>

The administrative data allow us to directly examine the effects on educational attainment and earnings, and we show that parental housing wealth changes during childhood impact both of these outcomes.<sup>4</sup> However, we find that these two mechanisms can explain at most 20-30% of the transmission of parental housing wealth changes during early-to-mid childhood to long-run child wealth. We attribute the large unexplained residual to changes in unobserved household environment and parental behaviors, which are passed down to children and affect their saving habits and investment behavior. Our lack of a finding of transmission from parental housing wealth shocks during the teenage years also is consistent with this interpretation, as younger children likely are more malleable with respect to parental behaviors and the household environment than are teens. These household factors act as within-household public goods, since they are non-rival and non-excludable. An implication of this feature of wealth transmission is that the effects should not diminish much with the number of children. Consistent with this interpretation, we find that the effects change little with the number of children in the household. This would not be the case if the main mechanisms involved direct expenditures by parents on their children.

Our paper contributes to a growing literature in economics that examines wealth correlations across generations. The magnitudes of correlations between parental housing wealth and child wealth we estimate align with prior estimates of the intergenerational transmission of net wealth (Black et al., 2019; Boserup et al., 2018; Charles and Hurst, 2003), the intergenerational transmission

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<sup>3</sup>Parental housing wealth could mechanically increase children’s wealth in the longer-run due to bequests. However, children in Denmark tend to be much older than 33 (the age of the oldest offspring in our data) when their parents die. Our approach examines the transmission of parental housing wealth shocks that operate through mechanisms other than bequests, which emphasizes the role of behavior rather than of direct wealth transfers.

<sup>4</sup>Estimates from the US, where college requires far more direct outlays among families than is the case in Denmark, show positive effects of housing wealth on educational attainment (Lovenheim 2011; Lovenheim and Reynolds 2013; Hotz et al. 2023). Nonetheless, postsecondary attendance in Denmark still includes substantial opportunity cost in terms of foregone earnings, which may make parental resources important for these investment decisions.

of equity market participation (Black et al., 2017), and the intergenerational transmission of debt default (Kreiner et al., 2020).

Prior literature investigating the role of selection versus causation in driving these correlations has mainly relied on adoptee designs.<sup>5</sup> Black et al. (2017) and Black et al. (2019) examine adoptees in Sweden, while Fagereng et al. (2021) examines Korean-born children adopted by Norwegian parents. This empirical design allows researchers to separate the roles of nature versus nurture. All three studies document a much larger role for the adopted parents than the biological parents, suggesting that nurture is more powerful than nature (i.e., genetics) in driving wealth correlations across generations.

We add to this literature in three ways. First, we examine the causal impact of parental housing wealth changes, relying on plausibly exogenous variation in the value of one’s childbirth home. We argue that focusing on housing wealth is important because it is much more evenly distributed across the population than other forms of wealth. As such, our estimates are arguably easier to generalize to the broader population. Second, we provide novel evidence on how parental wealth changes at different childhood periods affect longer-run wealth accumulation. To the best of our knowledge, we are the first to investigate the relative productivity of parental wealth changes occurring in different periods of childhood.<sup>6</sup> Third, our results speak to how wealth shocks experienced in childhood are mediated by changes to the household environment that are then passed down to children. Adoption studies (e.g., Fagereng et al., 2021) show that household factors form a key set of mechanisms that shape future wealth outcomes of children. We add to this literature by presenting evidence that these household factors are influenced by wealth shocks, and the resulting changes are passed down to children in ways that impact their wealth accumulation.

The causal effects of parental housing wealth changes we document suggest that the relative im-

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<sup>5</sup>There is a small literature that examines intergenerational effects of wealth shocks driven by lottery winnings (Bulman et al., 2021; Cesarini et al., 2016). These papers focus on educational attainment and health outcomes of children and do not examine wealth transmission.

<sup>6</sup>Notable exceptions include Carneiro et al. (2021) and Carneiro et al. (2022). Carneiro et al. (2021) examine the relationship between the timing of parental income during childhood years and adult outcomes of children (education and earnings at age 30). Using administrative data from Norway, they show that conditional on permanent income and parental income in late childhood, higher income early in the child’s life is more productive. Carneiro et al. (2022) show that disruptions to the household environment from involuntary job separations through mass layoffs have adverse effects on child educational and labor market outcomes and that the effects are largest for those experiencing parental layoffs in the teenage years. These papers highlight that the relative importance of the timing of shocks may differ depending on the nature of the shock. Our work complements these studies by focusing on parental wealth changes. This is an important distinction. As noted by Black et al. (2019), wealth may capture economic success better than income as it directly impacts consumption and investment possibilities.

portance of selection in driving the intergenerational correlations depends on when parental wealth is measured. In particular, we find that much of the correlation between child wealth outcomes and parental housing wealth measured during a child’s teen years represents selection, while a substantial portion of correlations relying on parental wealth at early and middle childhood reflect the causal impact of parental wealth changes. The importance of early-life parental wealth changes in generating long-run child wealth aligns with extensive empirical research highlighting the role of early childhood environments in long-run socio-economic outcomes (e.g., Almond et al., 2018; Currie and Almond, 2011). The fact that we find a significant role for parental wealth changes during middle childhood speaks to an emerging literature that emphasizes opportunities for high-return investments in children beyond the early-childhood period (e.g., Hendren and Sprung-Keyser, 2020).

Our paper also adds to a handful of papers examining the mechanisms behind the causal impact of parental wealth on children’s long-run wealth accumulation. Fagereng et al. (2021) conduct a mediation analysis and show that adult children’s education, income, financial literacy, and direct transfers of wealth from parents can explain at most 40% of the causal impact on children’s accumulation of wealth from wealthier families. In their sample of adoptees, child education and income are not the most important mediators. We document that parental wealth changes have modest effects on child education and earnings, and consistent with Fagereng et al. (2021) these mediators explain at most 20-30% of the transmission of parental housing wealth changes during early-to-mid childhood to adult wealth. Additionally, Wold et al. (2023) show evidence from Norway that wealthier parents support wealth accumulation among their children by assisting them in purchasing homes through direct transfers and through intra-family property transfers. We show that these mechanisms are not prevalent in Denmark, which allows us to isolate the role of childhood housing wealth changes on adult wealth outcomes that occurs through mechanisms other than direct wealth transfers.

We interpret our results as indicating unobserved household environment and parental behaviors shaping child saving and investment behavior as the most critical mechanism driving the intergenerational transmission of wealth. Two additional papers provide supporting evidence of the critical role of parents and the household for long-run wealth accumulation. Boserup et al. (2018) show that children with higher wealth in childhood have higher wealth as adults. Wealth in childhood reflects early life transfers from parents, which affects only a small percentage of wealthy families.



These transfers tend to be too small to independently drive later-life wealth accumulation, so they argue that the empirical relevance of this wealth reflects the intergenerational correlation of savings behavior. Kreiner et al. (2020) further demonstrate that parents who default on debt have children who are more likely to default. This is not driven by household finances but rather by inherited financial behavior. In contrast to the rest of the literature, we argue that shocks to parental housing wealth during childhood affect the household environment in important ways, and these changes are then passed down to children and lead to higher wealth accumulation as adults. Prior research has demonstrated the importance of the household environment but not how wealth shocks can change that environment in ways that are passed down to children and impact their long-run outcomes.

Persistently-high intergenerational wealth correlations that have been documented in a wide variety of settings underscore the importance of understanding how and why wealth is transmitted across generations. This study advances our understanding of the drivers of intergenerational wealth transmission, which is essential to crafting policies that can support more equal wealth accumulation across the population. Overall, our results suggest that policies that support wealth accumulation (and more specifically housing wealth accumulation) among parents when children are young would lead to higher wealth accumulation of their children when they are young adults.

## 2 Conceptual Framework

In this section, we present a simple model that articulates the different mechanisms through which wealth can be transmitted across generations. Let  $W^c$  be the total wealth of the child in adulthood. Aligned with our empirical approach, we consider three child ages,  $a_1$ ,  $a_2$ , and  $a_3$ . In our context, these refer to ages 0-5, 6-11, and 12-17, although it would be easy to extend the model to other ages or to consider more age ranges.

We model wealth of the child in adulthood ( $W^c$ ) as a function of parental housing wealth at each age ( $H^{pa_1}$ ,  $H^{pa_2}$ ,  $H^{pa_3}$ ), other (i.e., non-housing) parental wealth at each age ( $OW^{pa_1}$ ,  $OW^{pa_2}$ ,  $OW^{pa_3}$ ), educational attainment ( $E^c$ ), income of the child in adulthood ( $I^c$ ), and a sequence of unobserved household/parental characteristics and preferences,  $X$ .<sup>7</sup> These include factors like

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<sup>7</sup>One could more simply combine parental housing and non-housing wealth together and focus on total wealth. We separate them because of our interest in understanding how parental housing wealth per se affects wealth formation of the next generation.

propensity to save, preferences over different asset classes, and risk tolerance. Without loss of generality, assume there are  $N$  such factors and they are related to adult wealth through the function  $g : g(X_1, X_2, \dots, X_N)$ . The function  $f()$  maps these factors into adult wealth:

$$W^c = f(H^{pa_1}, H^{pa_2}, H^{pa_3}, OW^{pa_1}, OW^{pa_2}, OW^{pa_3}, E^c, I^c, g(X_1^{a_1}, \dots, X_N^{a_1}; X_1^{a_2}, \dots, X_N^{a_2}; X_1^{a_3}, \dots, X_N^{a_3})) \quad (1)$$

Changes in parental housing wealth at age  $a_s$  ( $s \in \{1, 2, 3\}$ ) affects adult wealth of the children as follows:

$$\begin{aligned} \frac{\partial W^c}{\partial H^{pa_s}} = & \frac{\partial f()}{\partial H^{pa_s}} + \frac{\partial f()}{\partial OW^{pa_s}} \frac{\partial OW^{pa_s}}{\partial H^{pa_s}} + \frac{\partial f()}{\partial E^c} \frac{\partial E^c}{\partial H^{pa_s}} + \frac{\partial f()}{\partial I^c} \frac{\partial I^c}{\partial H^{pa_s}} \\ & + \frac{\partial f()}{\partial g()} \left( \sum_{j=1}^N \left( \frac{\partial g()}{\partial X_j^{a_s}} \frac{\partial X_j^{a_s}}{\partial H^{pa_s}} \right) \right) \end{aligned} \quad (2)$$

Equation (2) shows the different pathways through which housing wealth changes can be transmitted to child wealth in adulthood.<sup>8</sup> The first piece is the direct effect: parents can provide transfers to their children from their own housing wealth. The second part of equation (2) reflects potential shifts in parental assets when their housing wealth changes that also could be passed down directly to children. When housing wealth increases, it could induce parents to shift assets towards or away from other assets. These other assets could affect children's total wealth later in life. The third piece of equation (2) operates through changes to educational attainment of the child. Parents can use their housing wealth to make human capital investments in their children (e.g., Lovenheim 2011; Lovenheim and Reynolds 2013; Hotz et al. 2023), which can lead to more financial acumen. Higher parental wealth also provides some insurance against risk, which could support postsecondary investments. It additionally could lead to higher income or earnings, which is shown in the fourth part of equation (2). We separate the earnings and educational attainment channels because they can operate independently. For example, housing wealth can influence the networks to which

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<sup>8</sup>Missing from equation (1) is child or adult health. We exclude health measures in youth because prior work shows that home price changes in Denmark have no effect on health at birth or in early childhood (Daysal et al., 2021). We exclude health as an adult because health should largely affect wealth through income, which we examine directly.

children have access, helping them find better jobs or jobs in higher paying industries/occupations, thus increasing their income without necessarily affecting their education.

The final term in equation (2) reflects the possibility that housing wealth changes could influence the household environment and parents' unobserved behaviors that impact child traits related to saving and investment behavior. As discussed above, prior research has shown the importance of these factors in explaining intergenerational wealth correlations. To the extent that they are influenced by housing wealth *changes*, they may impact overall wealth accumulation of children as well as the relative importance of housing and non-housing wealth in the next generation.

In our empirical application below, we focus on estimating the total effect,  $\frac{\partial W^c}{\partial H^{pas}}$ , on total, housing, and non-housing wealth. The administrative data allow us to directly examine the effects on educational attainment and earnings. We show that there is little evidence to support direct transfers as a key mechanism, which aligns with the findings in Kolodziejczyk and Leth-Petersen (2013) showing that parental transfers are unimportant for the housing market in Denmark. The 29-33 year-old adults we study also are too young to receive direct bequests from parents.<sup>9</sup> Based on these results and features of our sample, we argue that  $\frac{\partial f(\cdot)}{\partial W^{pas}} = 0$  and  $\frac{\partial f(\cdot)}{\partial OW^{pas}} \frac{\partial OW^{pas}}{\partial H^{pas}} = 0$ .<sup>10</sup> We are unable to observe  $\frac{\partial f(\cdot)}{\partial g(\cdot)} \left( \sum_{j=1}^N \left( \frac{\partial g(\cdot)}{\partial X_j^{as}} \frac{\partial X_j^{as}}{\partial H^{pas}} \right) \right)$  in the register data. We instead attribute the remainder of the effect after we account for the observed mechanisms in equation (2) to these unobserved parental behaviors that shape children's saving and investment behavior.

### 3 Data and Sample

We use register data from Denmark for the period 1985 to 2018. The data include individual-level records with unique personal identifiers, allowing us to follow the entire population over time and to link children to their parents.

**Outcome Variables.** Our primary outcome variable consists of wealth in early adulthood, obtained from the *Income Statistics Register*. These data are based on tax records collected by the Danish Tax Agency and provide information on asset holdings and liabilities of all individuals mea-

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<sup>9</sup>99.5% of children in our sample have at least one alive parent when we measure their outcomes. When children are aged 29-33, the average mother is 59.3 (s.d. 4.37) years old and the average father is 61.9 (s.d. 4.94) years old.

<sup>10</sup>We also show that our results are robust to dropping the top 5% of wealthiest households; households below the top 5% typically are not wealthy enough to provide substantial transfers to their children.

sured on the last day of the calendar year. Data on asset holdings include the cash value of real estate owned by the individual as well as the value of deposits, stocks, bonds, and deposited mortgages.<sup>11</sup> Data on liabilities include the aggregate value of mortgage credit debt, credit and debit card debt, student debt, debt to Hypotekbanken (a public institution), debt to financial corporations, debt to the Danish municipalities, and other debt (e.g. outstanding tax payments). We measure wealth when the child is aged 29-33.

In addition to total wealth, we separately examine effects on the next generation’s housing and non-housing wealth. We measure housing wealth using the average cash value of owned properties when the child is aged 29-33, which is the cash value of all real estate holdings weighted by the ownership share of each holding. For the sole owner of one home, this is just the public valuation of the house. We believe this is the ideal measure for housing wealth, as the cash value reflects the long-run wealth associated with the home.<sup>12</sup> An alternative measure would be home equity, but the register data do not contain information on the equity an individual has in their home. We refer to this cash value as “housing wealth” throughout this analysis. Average non-housing wealth at ages 29-33 is calculated as the difference between gross wealth (total assets) and housing wealth.

Finally, we use additional outcome variables, measured when children are 29-33 years old, to assess the mechanisms underlying the intergenerational transmission of housing wealth. These include the highest level of completed schooling and average earnings.

**Parental Housing Wealth.** Our main independent variables are derived from the *Income Statistics Register* and measure the change in the cash value of all real estate holdings of parents at different developmental stages of the child: ages 0-5, 6-11, and 12-17. We focus on these ages because they reflect pre-schooling years, middle childhood years, and teenage years, respectively.

In order to address concerns of endogenous mobility and property acquisition, we instrument for changes in parental housing wealth using simulated wealth changes based on changes in the public

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<sup>11</sup>The data do not include information on pension wealth. Self-reported information on car values, boat values, caravan values, premium bonds, cash deposits, and stocks are available until 1996, when taxpayers had to declare these as a requirement of the Danish wealth tax. Such items are not included in the calculations after the abolishment of the wealth tax in 1996. Similarly, values of cooperative dwellings are not included in the post-1996 period. The cash value of houses is assessed by the Danish Tax Authority using public valuations. If an individual co-owns a property, the cash value only reflects their share. For more details, see Leth-Petersen (2010) and Boserup et al. (2016).

<sup>12</sup>The public valuation can differ from the market value of the home, however Daysal et al. (2021) show that on average public valuations match closely with sales prices and with housing values that are adjusted for local sales prices.

valuation of the house the parents owned at the time of the birth of the child, regardless of their future mobility or property acquisition.<sup>13</sup> We obtain this information from the *State's Sales and Valuation Register*, a property-level dataset with information on public valuations, ownership, and housing type. Public valuations take into account an extensive set of observable housing characteristics, such as geographic location, year of construction, size, type of heating, and type of roof, and they are used as the taxable value for properties observed in the *Income Statistics Register*.<sup>14</sup> We winsorize both changes in parental housing wealth and changes in simulated parental housing wealth at the 1st and 99th percentiles of the distribution of changes within each age bin to reduce the influence of outliers.

**Control Variables.** Using data from the formerly-described registers as well as the *Population Register*, we include a rich set of child and parent characteristics. The Population Register provides a snapshot of demographics on all Danish residents as of January 1st of each year, allowing us to control for birth cohort fixed effects and municipality fixed effects. In our preferred specification, we interact the municipality fixed effects with parental net wealth at birth and housing wealth at birth. In addition, we control for child gender, parity, mother's and father's years of schooling, age, and marital status at childbirth. Finally, we control for mother's and father's gross personal income in the year preceding the child's birth.

All monetary variables are in 100,000 Danish Kroner (DKK) deflated to 2018 prices using the consumer price index (CPI). Taking into account differences in purchasing power, the exchange rate in 2018 is 0.148.<sup>15</sup>

**Analysis Sample.** To construct our analysis sample, we begin with the universe of 222,173 children born in 1985 and between 1987 and 1989 in Denmark (data on housing wealth at birth for the 1986 cohort are unavailable). We focus on these birth cohorts because housing valuation data first become available in 1984, and after the 1989 birth cohort the children are too young to observe their adult outcomes with contemporaneous data. We make a number of restrictions to construct

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<sup>13</sup>Daysal et al. (2021) use simulated housing wealth changes to examine the effect of housing wealth changes on fertility and early life health outcomes in Denmark.

<sup>14</sup>Very few properties, such as churches, are exempt from public valuations. All privately-owned properties are valued in uneven years and adjusted in even years, yielding estimated values in every year. The public valuations occur in January of the prior year until the end of 2003. Afterwards, they occur in October of the prior year.

<sup>15</sup>Exchange rates can be found at: <https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm>.

our analysis sample. First, we exclude children whose parents were renters at the time of the child’s birth. Second, we only include children whose parents owned a single residential property at child’s birth. Third, we exclude children with incomplete data on parental housing wealth and missing parental control variables. Online Appendix Table A.1 shows the number of children excluded due to each of these conditions, while Online Appendix Table A.2 shows how our sample restrictions affect the number of houses included in the analysis. With these sample restrictions, our final analysis sample contains 91,475 children and 87,777 houses.

**Descriptive Statistics.** Table 1 and Figures 1 - 4 present descriptive statistics on some of the key variables used in our analysis. Panel A of Table 1 shows means and standard deviations of family background characteristics in the base year of the childhood periods on which we focus. Panel B presents characteristics of children and their long-run outcomes measured at ages 29-33.

The average parent in our sample has some college attainment and relatively high income that grows as children age. This is expected, as the sample is positively selected in terms of socioeconomic status because of the requirement that parents are homeowners at childbirth. Average parental income in the year preceding childbirth is 324,020 DKK, which is approximately \$47,955. By age 12, average parental income rises to 593,450 DKK, or \$87,830. Parental housing wealth also grows over time, from 535,550 DKK (\$79,261) at childbirth to 1,012,240 DKK (\$149,812) at age 12.<sup>16</sup>

The main source of variation used in our empirical analysis is the change in simulated parental housing wealth over different periods of time, which is the change in cash value of the home the parents owned at childbirth. To help visualize the variation in this variable, we first plot in Figure 1 the evolution of average home values from 1985 through 2006. This period covers the different childhood periods of the cohorts included in our analysis sample. The solid line shows the values of all residential properties in Denmark, while the dashed line shows the values of the residential properties included in our analysis sample. Aggregate home values are flat through the mid-1990s, and they rise considerably during the period of the housing boom. While the housing boom provides extensive variation, it is important to note that this period comes after the early-childhood years of any of our birth cohorts. Hence, the early childhood estimates are identified prior to the housing

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<sup>16</sup>Appendix Table A.3 presents summary statistics for all new parents in the 1985 and 1987-1989 birth cohorts without conditioning on homeownership. The analysis sample is broadly similar to the full population but has higher income and wealth. About 59% of births occur to parents who own a home, and conditional on homeownership, 96% of new parents own exactly one residential property when their child is born.

boom when aggregate home values are more stable.

In Panel A of Table 1, we show the average simulated parental housing wealth in the base year of each childhood period, while in Figure 2 we show the distribution of this variable. Consistent with Figure 1, the aggregate distribution of simulated parental housing wealth varies little between the first two childhood periods but rises substantially when children are teenagers. This is due to the overlap between the teenage years in our sample and the housing boom. Despite the relative stability of simulated parental housing wealth at younger ages, Figure 2 shows that there is a wide distribution of parental home values in each childhood period.

Panel A of Table 1 also presents means and standard deviations of the change in simulated parental housing wealth at different childhood age ranges. Between birth and age 5, the average parent in our sample experiences a small negative change in simulated housing wealth. The large standard deviation, however, indicates that many parents experience sizable increases or decreases in housing wealth when their children are young. Turning to the two older childhood periods, simulated parental housing wealth universally rises: it increases by 276,600 DKK (\$40,937) on average during middle childhood, while it increases by 366,730 DKK (\$54,276) on average during late childhood. These large average increases are driven in part by the housing boom. Again, there are large standard deviations that point to a significant amount of variation across families in home price growth.

In Figure 3, we demonstrate the central source of variation used in our empirical model (described in more detail below) – we regress the change in simulated parental housing wealth at different childhood periods on birth cohort and municipality fixed effects and plot the distribution of the residuals. The figure shows that the small mean reduction observed in the simulated parental housing wealth in early childhood masks considerable variation. The distribution of changes becomes even more dispersed in the middle childhood and teenage years. Overall, the figure demonstrates that there is substantial variation in simulated parental housing wealth changes at each developmental stage, even after location and time fixed effects are removed.

In Panel B of Table 1, we report means of outcomes of children in adulthood. Despite the relatively young ages at which the outcomes are measured, 51.37% of children own a home at ages 29-33, and these homes are quite high in value. Figure 4 presents the distribution of child housing wealth, both unconditionally and conditional on owning a home. There is a wide distribution of

housing wealth among children in adulthood. Panel B of Table 1 shows that child housing wealth is over four times larger than non-housing wealth at ages 29-33. Finally, Table 1 shows that children in our analysis sample have high levels of both earnings and educational attainment in adulthood. That the adult children of relatively advantaged parents have high incomes and wealth levels is not surprising given the evidence on the intergenerational correlation of socioeconomic status. In the next section, we turn to the intergenerational transmission of parental housing wealth to examine whether wealth shocks during childhood lead to higher wealth in adulthood.

## 4 Descriptive Analysis and Empirical Design

### 4.1 Intergenerational Wealth Correlations

We begin our investigation by estimating the elasticity of adult children’s wealth with respect to their parents’ housing wealth. In the spirit of former studies on the intergenerational transmission of wealth, we use population-level data and estimate the following age-adjusted regression:

$$WC_i = \delta_0 + \delta_1 HP_p^a + \delta_2 \mathbf{Age}_p^a + u_i, \quad (3)$$

where  $WC_i$  measures the average (total, housing, and non-housing) wealth of child  $i$  during ages 29-33,  $HP_p^a$  measures parents’ housing wealth at child age  $a$ , and  $\mathbf{Age}_p^a$  controls for mother’s and father’s age fixed effects at child age  $a$ . The coefficient of interest,  $\delta_1$ , measures the age-adjusted transmission of parental housing wealth.<sup>17</sup>

Table 2 presents these estimates for  $a = \{0, 6, 12, 29 - 33\}$ . Since total wealth is the sum of housing and non-housing wealth, we show results for total wealth (Panel A) and housing wealth (Panel B) in Table 2, with non-housing wealth estimates in Online Appendix Table A.4. The estimated correlations in Panel A suggest that parental housing wealth is strongly related to the total wealth of children in early adulthood – 0.63 (at birth), 0.74 (age 6), 0.51 (age 12). The correlations are large across all three developmental stages of childhood and are slightly higher than the magnitudes from prior literature documenting rank-rank wealth correlations that are between

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<sup>17</sup>In these regressions, renters are included with a housing wealth of zero. Hence, the results include both the extensive and intensive margin. Standard errors are clustered at the municipality level.



0.2 and 0.4 (Black et al., 2019; Boserup et al., 2018; Charles and Hurst, 2003).<sup>18</sup>

Panel B examines the correlation between parental housing wealth and the housing wealth of adult children. The results show that parental housing wealth during childhood years is meaningfully related to housing wealth of the next generation, and the correlation gets stronger across the three childhood developmental stages. These estimates are consistent with the rank-rank correlations in Daysal et al. (2022), where the correlation between parental and adult child housing wealth increases from 0.11 to 0.18 as children age. The correlation between parental housing wealth and non-housing wealth of children in adulthood, on the other hand, gets weaker as children grow, particularly once they are teenagers (see Appendix Table A.4).

The last row of each Panel in Tables 2 and A.4 provides the age-adjusted correlation between the child’s wealth in adulthood and the parents’ housing wealth when the child is an adult. We find that this correlation is much weaker across all measures of child wealth. The fact that offspring wealth is much more strongly correlated with parental housing wealth when children are young relative to when children are adults is suggestive of a causal role of parental wealth in generating wealth outcomes of their children. We next discuss the empirical strategy we use for directly estimating this causal relationship.

## 4.2 Empirical Strategy for Estimating the Causal Effects of Parental Housing Wealth Changes

Our empirical approach relates changes in parental housing wealth during different childhood periods to children’s long-run outcomes at ages 29-33. The baseline model takes the form:

$$Y_{ipmc} = \gamma_0 + \gamma_1 \Delta HP_{ipm}^{0-5} + \gamma_2 \Delta HP_{ipm}^{6-11} + \gamma_3 \Delta HP_{ipm}^{12-17} + \rho \mathbf{X}_{ip} + \tau_c + \psi_{m1} * HP_{ipm}^0 + \psi_{m2} * NP_{ipm}^0 + \eta_{ipmc}, \quad (4)$$

where  $Y_{ipmc}$  is the adult wealth measure (or intermediate outcome) for child  $i$  born in year  $c$  to parents  $p$  who owned a house in municipality  $m$ . The variables of interest are  $HP_{ipm}^{0-5}$ ,  $HP_{ipm}^{6-11}$ , and  $HP_{ipm}^{12-17}$ , which are changes in parental housing wealth.  $\mathbf{X}_{ip}$  is a vector of individual and family

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<sup>18</sup>We note that the correlations we show differ from prior correlations in focusing on parental housing wealth rather than overall wealth. Hence, some differences with prior studies are expected.

control variables measured at child's birth: indicator for the child being female, indicators for birth parity, indicators for mother's and father's years of schooling, indicators for mother's and father's age, and an indicator for parents being married or cohabiting. It also includes mother and father's gross personal income in the year preceding the child's birth. Our model includes birth cohort fixed effects ( $\tau_c$ )<sup>19</sup> as well as municipality fixed effects interacted with parental housing wealth at birth ( $\psi_{m1} * HP_{ipm}^0$ ) and parental net worth at birth ( $\psi_{m2} * NP_{ipm}^0$ ). The municipality fixed effects are important for our model because they account for systematic differences across households based on where they own a house at childbirth, which could be correlated with housing values they and their children face. Changes in housing wealth also are likely to be mechanically correlated with home values, and the distribution of home values differs across areas. To address these issues, we include interactions of the initial housing wealth with municipality fixed effects. We also control for the interactions of parental net wealth at childbirth with municipality fixed effects to account for differences in the distribution of non-housing wealth across areas. Finally,  $\eta_{ipmc}$  is an error term, and we cluster standard errors at the municipality level throughout the analysis.

A central concern in estimating the intergenerational transmission of housing wealth is endogenous mobility and home purchases. To address this concern, we construct simulated parental housing wealth changes based on changes in the value of the home parents owned at childbirth. These simulated instruments, denoted by  $\Delta simHP_{ipm}^a$ , show the change in housing wealth the family would expect if they did not move or acquire new property. The corresponding first-stage equations are given by:

$$\begin{aligned} \Delta HP_{ipm}^a = & \alpha_0 + \alpha_1 \Delta simHP_{ipm}^{0-5} + \alpha_2 \Delta simHP_{ipm}^{6-11} + \alpha_3 \Delta simHP_{ipm}^{12-17} + \lambda \mathbf{X}_{ip} \\ & + \tau_c + \psi_{m1} * HP_{ipm}^0 + \psi_{m2} * NP_{ipm}^0 + \nu_{ipm} \end{aligned} \quad (5)$$

where  $a$  denotes the three age groups on which we focus. There are three first-stage regressions, one for each age group. The reduced form equation is defined as:

$$\begin{aligned} Y_{ipmc} = & \pi_0 + \pi_1 \Delta simHP_{ipm}^{0-5} + \pi_2 \Delta simHP_{ipm}^{6-11} + \pi_3 \Delta simHP_{ipm}^{12-17} + \phi \mathbf{X}_{ip} \\ & + \tau_c + \psi_{m1} * HP_{ipm}^0 + \psi_{m2} * NP_{ipm}^0 + \mu_{ipmc}. \end{aligned} \quad (6)$$

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<sup>19</sup>Because we measure outcomes at specific ages, birth cohort fixed effects act as year fixed effects as well.

The key coefficients of interest are  $\beta_1$ - $\beta_3$  in the second stage model below:

$$Y_{ipmc} = \beta_0 + \beta_1 \widehat{\Delta H P_{ipm}^{0-5}} + \beta_2 \widehat{\Delta H P_{ipm}^{6-11}} + \beta_3 \widehat{\Delta H P_{ipm}^{12-17}} + \rho \mathbf{X}_{ip} + \tau_c + \psi_{m1} * H P_{ipm}^0 + \psi_{m2} * N P_{ipm}^0 + \varepsilon_{ipmc}. \quad (7)$$

We compare these estimates to the correlations in Table 2 to determine how much of these correlations reflect the impact of plausibly exogenous changes to parental housing wealth during childhood.

**Identifying Assumption.** The key identification assumption underlying the reduced form and IV models is that, conditional on the observed characteristics and fixed effects included in the model, the relationship between changes in home values during youth and the value of the child’s wealth in adulthood is driven by the home value changes rather than by any correlation between home value changes and household or neighborhood unobservables that also affect wealth.<sup>20</sup> There are two main sources of bias. First, there could be unobserved factors at the household level that are correlated with higher home price growth and with better long run wealth outcomes of children. Second, home price growth could be correlated with improvements in neighborhood quality, which has been shown to impact intergenerational economic mobility (Chetty and Hendren, 2018).

While we cannot directly test the main identification assumption, we provide several pieces of evidence that suggest neither source of bias is likely to drive our estimates. First, we examine whether observed characteristics of parents and children are systematically correlated with changes in home values during each age range. In particular, we estimate equation (7) excluding a series of key characteristics from the control set and instead use the covariates as outcomes. The results of these balance tests are presented in Table 3. Given the large sample size, several of the estimates are statistically significant at the 5% level, but they are small in magnitude. Importantly, they also tend to vary in sign across age groups, suggesting that any bias would not be in one direction. As we will discuss below, we find that a substantial part of parental housing wealth changes during early and middle childhood are transmitted to children’s wealth in adulthood, with no evidence of transmission of parental housing wealth changes occurring in teenage years. The rates of transmission from early and middle-childhood periods are similar in magnitude. The balance test results in Table 3, on

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<sup>20</sup>This identification strategy has been used previously to study outcomes such as education (Hotz et al., 2023; Lovenheim and Reynolds, 2013; Lovenheim, 2011), fertility (Daysal et al., 2021; Dettling and Kearney, 2014; Lovenheim and Mumford, 2013), adult health (Fichera and Gathergood, 2016), retirement behavior (Zhao and Burge, 2017), and consumer debt (Brown et al., 2015).

the other hand, show that covariates are generally negatively linked to parental wealth changes in early-childhood while they are positively associated with parental housing wealth changes in middle-childhood. The fact that observed characteristics, which are individually strongly correlated with child wealth outcomes, do not vary systematically with parental housing wealth changes at different ages supports our causal interpretation of the housing wealth transmission estimates.

In addition, we devote much of the results section to investigating the robustness of the results and to showing that unobserved neighborhood effects are unlikely to drive the results. For example, we show that the results are robust to including a range of additional variables that independently correlate with wealth, such as father’s industry and occupation, municipality-by-birth cohort fixed effects, and changes to parental income during each age range. Similarly, we show that our results are not driven by outliers in the variation of home values or by the wealthiest families in the sample. Our results additionally are robust to controlling for changes in the share of college graduates in the municipality, which should be strongly correlated with neighborhood quality. Finally, we show estimates that are based on municipality-level variation in the growth of home values (instead of the within-municipality and year, cross-household differences in home value changes we exploit in equation (7)). First, we provide a falsification check using renters to show that their children’s wealth outcomes do not respond to home price growth in the municipality. Second, we use municipality-level changes in home values as an instrument for individual-level housing wealth changes among homeowners. These results are very similar to our baseline estimates, indicating that our key findings are robust to using within- or between-municipality variation in home price changes.

## 5 Results

### 5.1 Baseline Results

We first document that simulated parental housing wealth changes are strongly related to parental housing wealth changes. Table 4 presents the first stage estimates. Each column corresponds to the first-stage regression of a different age group. The results show that the instruments are strong for each childhood period, with the strongest correlation between simulated and actual parental housing wealth changes occurring on the diagonals of the table with matching age groups. There is little evidence that increases during one period lead to reductions at future ages, suggesting that the

wealth variation off of which our models are identified is persistent. While some of the off-diagonal estimates are positive and significant, the point estimates are small in magnitude. These results indicate that there are modestly-sized trends in home value changes over time. We show below that our estimates are robust to controlling for lags of parental home value, which suggests that these trends are not inducing a bias in our estimates.

We provide further evidence on the persistence of parental housing wealth shocks in Table 5. In Column (1), we investigate the relationship between simulated parental housing wealth changes in different childhood periods and the simulated value of the parent’s house when the child is 18. In Column (2), we present IV estimates relating observed parental housing wealth change in different childhood periods to the observed parental housing wealth when the child is 18. Consistent with the first-stage estimates shown in Table 4, the estimates in Columns (1) and (2) all are above one and are statistically significant at the 1% level, indicating that parental housing wealth changes are persistent. Importantly, the magnitudes of the estimates across age groups suggest that there are no major differences in the persistence of the shocks.<sup>21</sup> Overall, the results in Table 5 underscore that our models are not identified off of transitory shocks.

We now turn to our baseline IV estimates in Table 6. Reduced form estimates are shown in Online Appendix Table A.5. Table 6 shows estimates for total wealth (Panel A) and housing wealth (Panel B), with non-housing wealth estimates shown in Appendix Table A.6.<sup>22</sup> Each column in each panel and table comes from a different regression. In order to shed light on the plausibility of our key identifying assumptions, we change the set of controls across columns. Column (1) presents results from a model controlling for municipality and birth cohort fixed effects as well as parental home value and net wealth at birth. This is our most basic model, as the design of our empirical approach requires these controls at a minimum. In Column (2), we add interactions between the municipality fixed effects and both parental housing wealth and net wealth at birth. The estimates

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<sup>21</sup>We also investigated the impact of parental housing wealth shocks on total parental wealth at child age 18. We find no evidence that housing wealth shocks crowd out non-housing wealth accumulation. We find some evidence of positive spillovers to parental non-housing wealth from housing wealth shocks occurring during early childhood. These spillovers are mainly driven by families in the top 5% of the distribution of parental net wealth when the child is born. This makes sense, as the median non-housing wealth in adulthood in our sample is quite small, at 36,900 DKK, while at the 95th percentile it is 382,000 DKK. In section 5.3, we confirm the robustness of our results to excluding the top 5% wealthiest households.

<sup>22</sup>We show non-housing wealth estimates in the Online Appendix throughout this analysis for two reasons: total wealth estimates are the sum of housing and non-housing wealth estimates, and non-housing wealth encompasses many different forms of wealth that are typically quite volatile.

change only modestly from the addition of these controls. Columns (3) and (4) then add child and parental observed characteristics at birth, respectively. Consistent with the balance tests in Table 3, the estimates change only slightly when these controls are added. We focus the remainder of our discussion on our preferred estimates in Column (4).

In Panel A of Table 6, the estimate corresponding to parental wealth changes during early childhood is 0.2718, meaning that 27.2% of each Danish Krone increase in parental housing wealth is transmitted to children in the form of higher wealth in adulthood. The estimate of the effect of parental housing wealth changes during middle childhood is similar, at 0.2532. These results are statistically significantly different from zero at the 1% level. The effect of parental housing wealth changes during teen years (0.0351), on the other hand, is almost an order of magnitude smaller than the effects of wealth changes during the early and middle developmental periods and is not significant at even the 10% level.

The results in Panel B document interesting differences in the importance of the timing of parental housing wealth shocks in the formation of adult children’s housing wealth. We find that parental housing wealth gains during early childhood are primarily transmitted to children in adulthood in the form of higher home values. The estimates in Panel B, Column (4) show that 24.7% of each Danish Krone increase in parental housing wealth during early-childhood are transmitted to children’s housing wealth in adulthood.

Parental housing wealth changes occurring during middle childhood exhibit a lower rate of transmission to adult children’s housing wealth: 15.19% of each Danish Krone increase in parental housing wealth during middle-childhood is transmitted to children’s housing wealth in adulthood. This is a more modest effect that is statistically significant at the 1% level. The effect of parental housing wealth gains in the teenage period is much smaller, at 0.21%, and is not statistically significant at even the 10% level. The upper bound of the 95% confidence interval for the teenage estimates suggests that we can rule out transmission rates to housing wealth larger than 4.6%. This null effect is particularly interesting because children in our sample, on average, experience larger home value increases from the housing boom during their teen years.<sup>23</sup>

Comparisons of these results with the age-adjusted correlations in Table 2 provide insight into

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<sup>23</sup>One may be concerned that this is an artifact of housing wealth being treated differently during the housing boom. However, the correlation in Table 2, Panel B is the largest for the age 12 sample, which similarly uses observations from the boom period.

how much of the correlations are driven by the causal effect of wealth. The IV estimates in Panel A of Table 6 suggest that roughly 35-45% of the correlations for early- and middle-childhood periods and about 7% of the correlation later in childhood reflect the causal effect of parental housing wealth on adult children’s total wealth. In addition, the age patterns of correlations between parental housing wealth and adult children’s housing wealth differ widely from the causal effects reported in Panel B. While the age-adjusted correlations in Table 2 point to an increasing transmission of parental housing wealth as children age, the IV estimates in Table 6 indicate a more important role for the causal effects of parental housing wealth changes in early and middle childhood. Finally, across all measures of adult child wealth, IV estimates suggest limited transmission from wealth gains occurring during the child’s teen years, while the age-adjusted correlations suggest economically large transmissions, especially for housing wealth. This means that the intergenerational correlation in late childhood is driven by factors other than the direct impact of parental wealth itself.

Overall, the results in Table 6 suggest that parental housing wealth increases in early to middle childhood ages are transmitted to children, whereas parental housing wealth gains experienced during the teenage years do not have an effect on wealth in adulthood. Put differently, the intergenerational wealth correlations shown in Table 2 represent a mix between the causal effect of wealth and other factors, and this mix varies with the age of the child. In addition, while the housing boom of the late 1990s-mid 2000s led to an historic increase in the value and liquidity of housing, the boom had a limited impact on the housing wealth of the children in our sample who were exposed to these changes in their teen years.

## 5.2 Robustness Checks

The main identification assumption we invoke when estimating equation (7) is that the controls in our model are sufficient to account for endogenous correlations between parental housing wealth changes in youth and child outcomes in adulthood. There are two key threats to this assumption: i) parents who experience higher growth in home values may have unobserved characteristics that lead to higher wealth among their children when they are adults, and ii) neighborhoods experiencing home price growth may be improving in ways that would lead to better adult outcomes. In this section, we assess the sensitivity of our main results to different specifications and sample restrictions

to assess the plausibility of our key identification assumption.<sup>24</sup>

Table 7 focuses on the robustness of the results to model specification. Panel A focuses on the effects on child total wealth, while Panel B presents the effects on child housing wealth in adulthood. Column (1) of the table shows baseline IV estimates from column (4) of Table 6. We first investigate whether the estimated impacts are sensitive to additional controls for parental socioeconomic status. In column (2), we add fixed effects for the father’s industry of employment, in column (3) we control for interactions between father’s industry fixed effects and father’s educational attainment, and in column (4) we control for father’s occupation fixed effects. Looking at the effects on total wealth in Panel A, we find that controlling for father’s occupation and industry increases the estimated effects of parental housing wealth changes in early childhood while the effects of parental housing wealth changes in middle childhood are still economically large but attenuated. These differences are driven by changes in the estimated effects of parental housing wealth changes on child non-housing wealth (see Online Appendix Table A.7). Results in columns (2)-(4) of Panel B show that the effects of parental housing gains on offspring housing wealth is virtually unchanged when we control for father’s industry and occupation: about 23-25% and 13-15% of each Danish Krone increase in parental housing wealth during early and middle childhood are transmitted to children’s housing wealth in adulthood, respectively. The effects of parental housing wealth changes in the late-childhood period remain small and are not statistically significant.

In column (5), we turn to the role of parental income and estimate horse races between changes in parental housing wealth and changes in parental income over each childhood age range. When we control for parental income changes, the estimated effects of parental housing wealth during middle and late-childhood periods remain remarkably similar to the baseline effects. Early-childhood parental housing wealth changes, on the other hand, have a larger impact on child wealth, mainly due to a rise in transmission to child housing wealth.<sup>25</sup>

In the remainder of the table we consider potential biases from unobserved neighborhood effects. Previous research has shown that neighborhood quality influences intergenerational mobility (Chetty and Hendren, 2018). As such, if home price changes are driven by changes in neighborhood quality,

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<sup>24</sup>In the remainder of the paper (except Table 12), we focus on IV models for ease of exposition and interpretation. Reduced form models yield similar results and are available from the authors upon request.

<sup>25</sup>While parents’ income changes are independently correlated with their children’s wealth in adulthood, we caution against interpreting the change in parental income estimates as causal, since we lack plausibly exogenous variation in parent income changes over time.



our findings on long-run child outcomes may be biased. We believe the scope for such a bias is limited in our context because municipalities in Denmark are quite small. In our sample of 273 municipalities, the mean municipality contains 18,565 people and the median contains 9,723 people. The population of municipalities in our sample ranges from 117 to 471,219 (Copenhagen). In comparison, Census Tracts in the US have between 2,500 and 8,000 residents. These municipalities are smaller than the commuting zones and counties used to study neighborhood effects in the US setting (Chetty and Hendren, 2018). In addition, we find no evidence of transmission of parental housing wealth changes occurring in late childhood. This result contradicts previous literature that has documented sizable effects of neighborhood quality on children in the age range of 12-17.

In order to further alleviate concerns of a bias from unobserved neighborhood effects, we implement three checks. In column (6), we investigate whether more sophisticated parents may be buying homes in areas where home values are growing more rapidly by including lags of housing wealth from the two years prior to the child’s birth. Recall that we control for housing wealth in the year of birth as well, so this specification includes three years of pre-treatment housing wealth. In column (7), we control for municipality by birth cohort fixed effects in order to account for any municipality-level shocks or policies that could affect specific cohorts as well as home values. In column (8), we check the robustness of the results to controlling for the change in the proportion of college graduates who live in each municipality in each age range. This speaks directly to concerns about a bias from unobserved neighborhood effects, since changes in neighborhood quality should be reflected in the composition of those who live there. Across all of these checks, we find that the effects of parental housing wealth gains occurring in middle and late childhood are very similar to baseline, while the effects of changes in early childhood on child wealth are larger. The increased transmission of early-life gains to adult child’s wealth is primarily driven by an increase in their housing wealth. This suggests that, if anything, our results represent a lower bound on the impact of changes in parental housing wealth on child wealth.

In Table 8, we turn to the robustness of our results to changes in the sample.<sup>26</sup> Column (1) reports the baseline estimates from column (4) of Table 6. In Column (2), we assess the role of outliers in driving our results. To do so, we drop all observations for which the change in housing wealth is in the 4th quartile of the distribution of housing wealth changes for that age group. Column

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<sup>26</sup>Estimates for non-housing wealth are shown in Online Appendix Table A.8.

(3) shows results from a sample that excludes parents in the top 5% of the wealth distribution when the child is born. This check allows us to probe the importance of direct transfers in our context. Families below the top 5% have few non-housing assets, which limits the opportunity for large direct transfers to children. In column (4) we exclude vacation homes, as these homes may be treated differently than primary homes with respect to future wealth accumulation. In column (5) we present estimates that exclude Copenhagen, as that is the largest city in Denmark and the housing market there may operate differently than in smaller cities, towns, and rural areas. Across all of these specifications, we find that the estimated effects of early-childhood parental housing wealth changes on child wealth are larger and that the increase in the estimates are primarily due to an increase in transmission to housing wealth. This finding mirrors those documented in Table 7 and again suggests that our baseline results for early-life parental housing wealth changes are conservative. Looking at columns (2)-(5) in Panel A, the estimated effects of parental housing wealth changes in middle-childhood generally are larger. However, much of this increase seems to be due to a rise in transmission to non-housing wealth of children: transmission of parental housing wealth gains during middle-childhood to child housing wealth in adulthood mirrors the baseline estimates in magnitude and statistical significance.

The estimates thus far exploit variation in the changes in value of the childbirth home across households within each municipality. We next turn to using a completely different source of variation to assess the sensitivity of our estimates to these concerns: aggregate cross-municipality variation in home values. First, in column (6) of Table 8, we perform a falsification test using the sample of those who were renters at the time of their child’s birth. If the main mechanism underlying our findings is from real wealth changes rather than unobserved neighborhood effects, then renters should be unaffected or negatively affected (as their cost of living rises with home prices but not their wealth). Alternatively, if our results reflect unobserved trends or shocks at the local municipality level that are correlated with changes in home values, then outcomes for the children of renters should be positively correlated with home price increases. Using changes in municipality-average home values during each child age range as the independent variable of interest, we find no relationship between housing value changes at the municipality level and long run wealth outcomes of renters’ children. In results available upon request, we find similar null effects when we exclude Copenhagen (which has a high share of renters). These results strongly support our identification assumptions and are

inconsistent with biases from neighborhood improvements that are not captured by our controls.

Finally, we use aggregate annual variation in home values at the municipality level as an instrument for home price changes among our homeowner sample. First-stage estimates are shown in Online Appendix Table A.9. The instrument is strong for each age group, with coefficients that are largest for same-age changes. This is consistent with the first stage estimates using within-municipality variation shown in Table 4. IV results are shown in Table 9 for total wealth (column (1)) and housing wealth (column (2)), with non-housing wealth effects shown in Online Appendix Table A.10. While the estimates are less precisely estimated and are not statistically significant, they align very closely with main effects, especially for housing wealth: 26.03% and 15.11% of each Danish Krone increase in parental housing wealth during early and middle-childhood are transmitted to children’s housing wealth in adulthood, respectively.

The key identifying assumption we invoke is ultimately untestable, and there may be scenarios under which it is violated that cannot be ruled out by our checks. However, the robustness of our results to using either within- or across-municipality variation in home value changes strongly suggests the plausibility of this assumption. It is unlikely that these models exhibit identical biases since they are based on such different sources of variation. The robustness of our results to the inclusion of additional controls and to the different ways of selecting the sample provides additional support for the causal interpretation of our main housing wealth transmission effects.

### 5.3 Mechanisms

In this section, we shed light on the role of the different mechanisms discussed in Section 2 that can explain the causal effects of parental housing wealth changes on the wealth of their offspring. In column (1) of Table 10, we show estimates of equation (7) where the dependent variable is the likelihood of owning a home. The estimates indicate a modest effect on home ownership: a 100,000 DKK increase in parental housing wealth during ages 0-5 (6-11) years increases the likelihood of homeownership at ages 29-33 by 2.1 (0.9) percentage points. Parental housing wealth changes occurring during teen years have a negative and close to zero impact.

Next, we examine the effects on years of educational attainment in column (2). As with the results in column (1), the effects of housing wealth gains occurring in early and middle childhood are positive and statistically significant. Each 100,000 DKK of parental housing wealth during these

periods leads to 0.06-0.07 more years of educational attainment, which is about 2-3% of a standard deviation (see Table 1). In column (3), we show results using adult earnings as the dependent variable. The effects of parental wealth gains in the first two age groups are again positive and statistically significant. Each 100,000 DKK of parental housing wealth during ages 0-5 and 6-11 leads to 5,630 DKK (\$833) and 3,380 DKK (\$500) higher annual earnings in adulthood, respectively, which is 1.1% and 1.9% of the mean. The effects of parental housing wealth changes in teen years are negative but economically small and only marginally significant. Overall, our results suggest that parental housing wealth gains occurring before adolescence have a modest positive impact on intermediate later life outcomes that can affect wealth accumulation. In the terminology of equation (2),  $\frac{\partial E^c}{\partial H^{pas}}$  and  $\frac{\partial I^c}{\partial H^{pas}}$  are positive for housing wealth changes at ages 0-5 and 6-11.

How do the effects on education and earnings impact the overall wealth transmission estimates? We follow Charles and Hurst (2003) and control for these intermediate factors, which effectively nets them out from the overall transmission effect. The results from this exercise are shown in Table 11 and Online Appendix Table A.11 (non-housing wealth). Column (1) presents baseline estimates from Column (4) of Table 6. In column (2), we control for fixed effects for years of completed education. We find that effects on education can account for at most 20% of the impact of early and middle childhood parental housing wealth gains: 14-15% of the overall wealth transmission and 15-20% of the transmission to housing wealth (as well as 5-20% of the transmission to non-housing wealth).<sup>27</sup> Column (3) presents estimates that control for earnings in adulthood, which explains slightly more of the aggregate wealth transmission. About 17% and 27% of the transmission to total wealth is explained by adult earnings, respectively, while earnings explain around 24% of the transmission for housing wealth.

Finally, we show the combined effect of educational attainment and earnings as intermediate mechanisms in Column (4) of Tables 11 and A.11. These two mechanisms explain 29% of the transmission to total wealth for early-life shocks and 21.5% for shocks occurring in middle childhood. These mechanisms operate mostly through the transmission to housing wealth: they explain 27.8% of the housing wealth transmission effect for housing wealth changes at ages 0-5 and 30.6% of the transmission of wealth changes at ages 6-11. The effect of controlling for intermediate mechanisms

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<sup>27</sup>Given the lack of effects from parental housing wealth shocks occurring during the teenage years, we only discuss the effects of the intermediate mechanisms for the two younger age groups. Estimates of shocks at ages 12-17 are shown in the table for completeness.

on the transmission to non-housing wealth is minor. Hence, education and earnings can explain at most 20-30% of the transmission of housing wealth changes during early-mid childhood to adult wealth. These results are consistent with Fagereng et al. (2021), who find that a substantial portion of the causal impact on children’s accumulation of wealth from wealthier families is unexplained by observable mediators, including child education, income, and financial literacy, as well as direct transfers from parents.

As discussed above, we argue that  $\frac{\partial f()}{\partial H^{pas}}$  and  $\frac{\partial f()}{\partial OW^{pas}} \frac{\partial OW^{pas}}{\partial H^{pas}}$  in equation (2) are zero in Denmark because of the age of our sample, the robustness of our results to a sample with little liquid wealth to transmit directly, and evidence that parents in Denmark do not assist their adult children with buying homes (Kolodziejczyk and Leth-Petersen, 2013). We provide several additional pieces of evidence to support this argument. First, if parents transfer money to their children to help them purchase homes, we should observe declines in parental wealth surrounding the date when their kids purchase their first house. Figure 5 shows event studies of parental wealth surrounding the first purchase of an adult child’s home. We examine both average and median parental net wealth and find no evidence of declines in the period surrounding the home purchase. In Panel (b) we show event studies by parental wealth quartile. There is a small wealth reduction several years prior to a child buying a house among parents in the top wealth quartile. Panels (c) and (d) show that this reduction is driven by those in the top 5% of the wealth distribution, and we showed above that our results are robust to dropping this group from our analysis sample. This pattern makes sense, as only wealthy households have sufficient liquid funds to transfer to children.

Second, we show in Online Appendix Table A.12 that our estimates are robust to dropping those with positive net wealth in childhood. Positive net wealth in childhood is generated by parental transfers (Boserup et al., 2018), meaning that those with such wealth are from families that are the most likely to continue to transfer wealth when the children are older. Estimates in Panel (A) are very similar to, if somewhat larger than, the baseline estimates. Third, parents in Denmark can transfer housing wealth by selling their home to their kids at a reduced price, with the price reduction acting as a tax-free gift (Colmsjö, 2024). Panel (B) of A.12 shows that our results are robust to dropping intra-family property transfers. Finally, parents can transfer resources to their children by co-owning a home or acting as guarantors in their mortgage applications. Co-owning a house with parents is rare in Denmark, reflecting fewer than 1% of sales. Online Appendix Table A.13

shows that there is no relationship between parental housing wealth changes during youth and the likelihood of co-owning a home with a parent. Our data do not include information on guarantors. To provide suggestive evidence on the potential importance of this channel, we examine whether the effect of parental housing wealth changes on the child’s likelihood of homeownership (at ages 29–33) varies by quartiles of the parental debt-to-income ratio, measured shortly before the child’s potential home purchase (specifically, averaged over the two years prior to age 29). Intuitively, parents with higher leverage may be less able to act as guarantors, so stronger wealth transmission among less leveraged parents could point to a role for direct resource transfers. The results in Appendix Table A.14 show no evidence of treatment effect heterogeneity along this dimension. Together, the results in Figure 5 and Tables A.12–A.14 support our claim that direct parental transfers are not a key mechanism driving our results.

We therefore interpret our results as reflecting the importance of unobserved parental behaviors in the intergenerational transmission of housing wealth. This is the most plausible mechanism that can explain the overall pattern of our results. Younger children are both more mutable in terms of the development of their preferences but also are exposed to the wealth treatment for longer. These factors will naturally make wealth increases early in life more impactful, which is what we find.

We provide further evidence in support of this interpretation in Table 12 (with non-housing results in Online Appendix Table A.15). One can conceptualize parental behaviors and preferences as within-household public goods, since they are non-rival and non-excludable. An implication of this interpretation is that the effects should not diminish much with the number of children. In contrast, if housing wealth transmission operates through direct expenditures, effects should differ with the number of children over whom the wealth is split. Table 12 presents reduced form estimates that include interactions between simulated parental housing wealth changes and the number of children ever born to the focal mother. Aligned with our hypothesis, we generally find that parental housing wealth effects do not vary with the number of children: the interaction estimates are close to zero and are not statistically significant. The only exception is the impact of parental housing wealth shocks in early childhood on offspring non-housing wealth in adulthood, suggesting that for younger children there is a role for increased childhood expenditures that lead to higher non-housing wealth.

The finding that changing parental behaviors are the main determinants of the intergenerational

transmission of wealth aligns with the prior research showing the importance of the home environment on later life outcomes. Boserup et al. (2018) show that those with higher childhood wealth have higher adult wealth, which they argue is driven by the intergenerational transmission of savings behavior. Kreiner et al. (2020) further demonstrate the intergenerational transmission of adverse credit outcomes, which is driven by correlated behaviors between parents and children in how they interact with debt. Our work strongly complements these results by demonstrating how parental housing wealth gains in childhood affect the development and transmission of savings behavior.

## 6 Conclusion

This paper extends the growing literature on the intergenerational transmission of wealth by examining how housing wealth shocks experienced during childhood translate to wealth in adulthood as well as the mechanisms that underlie this transmission. We focus on housing wealth because it is the single most important component of wealth for most households and is more evenly distributed across the population than are others forms of wealth. In addition, the past several decades have experienced historic volatility in the housing market, which underscores the importance of understanding the effect of this volatility on subsequent generations.

Using rich administrative data from Denmark, we exploit changes in home values experienced by the household during three distinct periods of childhood – ages 0-5, 6-11, and 12-17 – to isolate the causal impact of parental housing wealth changes on children’s wealth between the ages of 29 and 33. To abstract from endogenous mobility and property acquisition issues, we fix each child to the home in which they were born and then calculate the change in the value of this house over these three different child age ranges. Our empirical models include an extensive set of observable child and parent characteristics, including parental education and income, municipality and birth cohort fixed effects, as well as municipality fixed effects interacted with parental housing wealth at birth and parental net wealth at birth.

Our main results indicate that parental housing wealth changes experienced during youth are passed through to children but that the transmission happens differentially based on the child’s age of exposure. We find that 25-27% of each Danish Krone increase in parental housing wealth during early and middle childhood is transmitted to children in the form of higher wealth in adulthood.

While parental housing wealth gains in early childhood are primarily reflected in higher housing wealth of children, wealth gains during middle childhood affect both adult children’s housing and non-housing wealth. In contrast, we find no evidence that parental housing changes during teenage years affect later life wealth outcomes of children.

We present a simple model that shows the potential mechanisms through which parental housing wealth gains are transmitted across generations. Our model highlights the following factors: i) the direct effect of the housing wealth shock, ii) changes to parental asset allocations (other wealth), iii) higher educational attainment, iv) higher earnings of the child, and v) changes to unobserved parental behaviors that shape children’s savings and investment preferences in the future. We present evidence that the first two mechanisms are likely to be negligible in the Danish context. Our empirical examination of the role of earnings and education indicate that they explain between 20-30% of the transmission of parental housing wealth gains occurring before adolescence. Taking the evidence together, we argue that housing wealth changes during childhood alter parental behaviors that impact children’s housing wealth accumulation as adults. This interpretation of the evidence is supported by the larger transmission of parental housing gains occurring during early-to-middle childhood, as younger children are more likely to be influenced by their parents than are teens. Parental behaviors act as public goods within the household, and our conclusions are bolstered by the finding that the effects change little with the number of children in the household. Any mechanisms that require financial outlays by parents would not have this feature.

Our results have a number of important implications. First, from a policy perspective, they suggest that policies that support housing wealth accumulation of parents, especially among parents of young children, would foster higher wealth accumulation among children as they age. Second, our preferred interpretation of the results highlights the role of parental behaviors in driving the intergenerational transmission of wealth. These behaviors could be independently targeted by policy interventions, for example by helping develop financial literacy. Third, our estimates add to the evidence on the long-run impact of housing market volatility. In particular, the large fluctuations in home prices during the housing boom and bust are likely to meaningfully impact wealth accumulation among the next generation who were young children during this period. Subsequent work directly examining these cohorts and understanding how parental behaviors are shaped by wealth fluctuations would be of high value.



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Table 1: Summary Statistics

	(1)	(2)	(3)	(4)
	Ages 0-5	Ages 6-11	Ages 12-17	Ages 29-33
<i>Family Background Characteristics</i>				
Mother's Age	28.4975 (4.4227)	34.4975 (4.4227)	40.4975 (4.4227)	
Father's Age	31.2575 (5.1596)	37.2575 (5.1596)	43.2575 (5.1596)	
Mother's Education (years)	13.2646 (2.4772)	13.3675 (2.4914)	13.5343 (2.4924)	
Father's Education (years)	13.8798 (2.6700)	13.9437 (2.6832)	13.9837 (2.6881)	
Mother's Income	1.2586 (0.4596)	1.8902 (0.8057)	2.4420 (1.1187)	
Father's Income	1.9816 (0.9546)	2.7102 (1.7134)	3.4925 (2.8779)	
Parents are Married/Cohabiting	0.9866 (0.1152)	0.8531 (0.3540)	0.7702 (0.4207)	
Parental Net Wealth	0.2790 (7.1302)	0.5184 (10.5243)	1.5947 (8.8772)	
Parental Housing Wealth	5.3555 (2.7945)	5.5450 (3.2016)	10.1224 (8.3863)	
Change in Parental Housing Wealth	0.2531 (2.8429)	3.7634 (4.8859)	5.9924 (9.5000)	
Simulated Parental Housing Wealth	5.9711 (2.5811)	5.7891 (2.7520)	9.2976 (4.8261)	
Change in Simulated Parental Housing Wealth	-0.1759 (0.8928)	2.7660 (1.9674)	3.6673 (3.6498)	
<i>Child Characteristics and Outcomes</i>				
Female				0.4842 (0.4998)
Birth parity				1.7519 (0.7985)
Average Total Wealth				5.2596 (12.0052)
Average Housing Wealth				4.2149 (9.0140)
Average Non-housing Wealth				1.0447 (6.6596)
Pr(Homeowner)				0.5137 (0.4998)
Education (Max Years)				15.1219 (2.4163)
Average Earnings				3.0073 (1.9869)

Number of observations = 91,475 from the 1985 and 1987-1989 birth cohorts. Standard deviations in parentheses. Family background characteristics are measured in the base year for each age group. Child outcomes are measured at ages 29-33. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800).

Table 2: Intergenerational Wealth Correlations

	Panel A: Total Wealth			
	(1)	(2)	(3)	(4)
Parental housing wealth, age 0	0.6276*** (0.0267)			
Parental housing wealth, age 6		0.7420*** (0.0272)		
Parental housing wealth, age 12			0.5065*** (0.0057)	
Parental housing wealth, ages 29-33				0.0757*** (0.0001)
Observations	202,789	201,768	201,119	202,797
$R^2$	0.0043	0.0053	0.0388	0.6099
	Panel B: Housing Wealth			
	(1)	(2)	(3)	(4)
Parental housing wealth, age 0	0.1578*** (0.0107)			
Parental housing wealth, age 6		0.2972*** (0.0109)		
Parental housing wealth, age 12			0.3846*** (0.0022)	
Parental housing wealth, ages 29-33				0.0371*** (0.0007)
Observations	202,789	201,768	201,119	202,797
$R^2$	0.0024	0.0050	0.1348	0.0137

Each column of each panel is a separate regression that includes fixed effects for each parent's age in the first year of each age group. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 3: Instrumental Variables Estimates: Balance Tests

	(1) Mother's Income	(2) Father's Income	(3) Mother's Education	(4) Father's Education	(5) Mother's Age	(6) Father's Age	(7) Parity	(8) Gender	(9) Parents Cohabiting
Change in housing wealth, ages 0-5	0.0061 (0.0041)	0.0159* (0.0091)	-0.0417* (0.0251)	-0.0605* (0.0271)	-0.4425* (0.0469)	-0.5040*** (0.0530)	-0.0658*** (0.0078)	-0.0015 (0.0047)	-0.0023** (0.0011)
Change in housing wealth, ages 6-11	0.0271*** (0.0025)	0.0924*** (0.0056)	0.2024*** (0.0154)	0.2181*** (0.0167)	0.3867*** (0.0288)	0.3379*** (0.0326)	0.0427*** (0.0048)	0.0007 (0.0029)	0.0033*** (0.0007)
Change in housing wealth, ages 12-17	0.0085*** (0.0014)	0.0329*** (0.0030)	0.0970*** (0.0084)	0.1036*** (0.0090)	0.1741*** (0.0156)	0.1930*** (0.0177)	0.0048* (0.0026)	0.0002 (0.0016)	-0.0015*** (0.0004)
Municipality FE	X	X	X	X	X	X	X	X	X
Birth Cohort FE	X	X	X	X	X	X	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X	X	X	X	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X	X	X	X	X	X	X
Observations	91,475	91,475	91,475	91,475	91,475	91,475	91,475	91,475	91,475
Dep. Var. Mean	1.2586	1.9816	13.2646	13.8798	28.4975	31.2575	1.7519	0.4842	0.9866

Each column comes from a separate instrumental variables regression. The dependent variables in columns (1)-(6) and (9) are measured when the child is born. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 4: Instrumental Variables Estimates: First Stage

	(1)	(2)	(3)
	Change in Housing Wealth, Ages 0-5	Change in Housing Wealth, Ages 6-11	Change in Housing Wealth, Ages 12-17
Change in simulated housing wealth, ages 0-5	0.5577*** (0.0257)	0.0999*** (0.0215)	0.1928*** (0.0476)
Change in simulated housing wealth, ages 6-11	0.1539*** (0.0092)	0.5968*** (0.0146)	0.1359*** (0.0259)
Change in simulated housing wealth, ages 12-17	0.0092 (0.0061)	0.0136 (0.0110)	0.5634*** (0.0238)
Municipality FE	X	X	X
Birth Cohort FE	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X
Child Characteristics	X	X	X
Parental Controls at Birth	X	X	X
Observations	91,475	91,475	91,475
$R^2$	0.3054	0.1696	0.1555
F-stat	327.5947	413.3897	304.3756

Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 5: Persistence of Parental Housing Wealth Shocks

	(1) Reduced Form: Simulated Parental Housing Wealth	(2) Instrumental Variable: Parental Housing Wealth
(Simulated) Change in housing wealth, ages 0-5	1.1686*** (0.1251)	1.4004*** (0.1493)
(Simulated) Change in housing wealth, ages 6-11	1.7383*** (0.0546)	1.5280*** (0.0896)
(Simulated) Change in housing wealth, ages 12-17	1.4801*** (0.0786)	1.3477*** (0.0535)
Municipality FE	X	X
Birth Cohort FE	X	X
Municipality FE x Housing Wealth at Birth	X	X
Municipality FE x Net Wealth at Birth	X	X
Child Characteristics	X	X
Parental Controls at Birth	X	X
Observations	91,473	91,243
Dep. Var. Mean	14.8810	16.7105

The table presents reduced form (column 1) and IV estimates (column 2) of equation (4), where the outcome variables are the simulated value of the parents' home (column 1) and the observed parental housing wealth (column 2), both measured when the child is age 18. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects at birth, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 6: Effects of Parental Housing Wealth Shocks on Child's Wealth in Adulthood, IV Estimates

Panel A: Total Wealth				
	(1)	(2)	(3)	(4)
Change in housing wealth, ages 0-5	0.3762*** (0.1049)	0.3353*** (0.0936)	0.3085*** (0.0930)	0.2718*** (0.0925)
Change in housing wealth, ages 6-11	0.2854*** (0.0630)	0.2712*** (0.0576)	0.2893*** (0.0570)	0.2532*** (0.0559)
Change in housing wealth, ages 12-17	0.0680* (0.0359)	0.0303 (0.0312)	0.0320 (0.0313)	0.0351 (0.0330)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	5.2596	5.2596	5.2596	5.2596
Panel B: Housing Wealth				
	(1)	(2)	(3)	(4)
Change in housing wealth, ages 0-5	0.2504*** (0.0797)	0.3110*** (0.0641)	0.2900*** (0.0637)	0.2467*** (0.0632)
Change in housing wealth, ages 6-11	0.1969*** (0.0478)	0.1657*** (0.0395)	0.1803*** (0.0390)	0.1519*** (0.0382)
Change in housing wealth, ages 12-17	0.0336 (0.0273)	-0.0058 (0.0214)	-0.0043 (0.0214)	0.0021 (0.0226)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	4.2149	4.2149	4.2149	4.2149
Municipality FE	X	X	X	X
Birth Cohort FE	X	X	X	X
Housing Wealth at Birth	X			
Net Wealth at Birth	X			
Municipality FE x Housing Wealth at Birth		X	X	X
Municipality FE x Net Wealth at Birth		X	X	X
Child Characteristics			X	X
Parental Controls at Birth				X

Each column in each panel comes from a separate regression. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.



Table 7: Robustness Checks – Controls

	Baseline Effects	Father's Industry FE	Father's Education- Industry FE	Father's Occupation FE	Lags of Parental Housing Wealth	Municipality x Birth Cohort FE	Changes in Parent Income	Changes in Municipality Share College
Panel A: Total Wealth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in housing wealth, ages 0-5	0.2718*** (0.0925)	0.3791*** (0.0743)	0.3776*** (0.0766)	0.3970*** (0.0746)	0.4005*** (0.0819)	0.3710*** (0.0883)	0.3600*** (0.0881)	0.3707*** (0.1190)
Change in housing wealth, ages 6-11	0.2532*** (0.0559)	0.1469*** (0.0449)	0.1367*** (0.0462)	0.1318*** (0.0450)	0.2674*** (0.0626)	0.2632*** (0.0597)	0.2313*** (0.0592)	0.2605*** (0.1069)
Change in housing wealth, ages 12-17	0.0351 (0.0330)	0.0148 (0.0266)	0.0184 (0.0274)	0.0064 (0.0267)	0.0180 (0.0398)	0.0444 (0.0392)	0.0347 (0.0388)	0.0455 (0.0521)
Change in parental income, ages 0-5							0.2430*** (0.0462)	
Change in parental income, ages 6-11							0.2620*** (0.0269)	
Change in parental income, ages 12-17							0.0270*** (0.0197)	
Observations	91,475	88,046	86,702	88,437	65,656	91,475	91,475	91,466
Dep. Var. Mean	5.2596	5.2632	5.2665	5.2642	5.1077	5.2596	5.2596	5.2599
Panel B: Housing Wealth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in housing wealth, ages 0-5	0.2467*** (0.0632)	0.2305*** (0.0641)	0.2242*** (0.0661)	0.2398*** (0.0642)	0.3082*** (0.0499)	0.3023*** (0.0603)	0.2955*** (0.0646)	0.3018*** (0.0648)
Change in housing wealth, ages 6-11	0.1519*** (0.0382)	0.1408*** (0.0388)	0.1301*** (0.0399)	0.1321*** (0.0387)	0.1679*** (0.0382)	0.1573*** (0.0408)	0.1374*** (0.0460)	0.1550*** (0.0474)
Change in housing wealth, ages 12-17	0.0021 (0.0226)	0.0039 (0.0229)	0.0095 (0.0237)	-0.0022 (0.0229)	-0.0112 (0.0243)	0.0090 (0.0268)	0.0031 (0.0239)	0.0099 (0.0240)
Change in parental income, ages 0-5							0.1601*** (0.0493)	
Change in parental income, ages 6-11							0.1357*** (0.0281)	
Change in parental income, ages 12-17							0.0517** (0.0230)	
Observations	91,475	88,046	86,702	88,437	65,656	91,475	91,475	91,466
Dep. Var. Mean	4.2149	4.2415	4.2456	4.2403	4.0478	4.2149	4.2149	4.2152
Municipality FE	X	X	X	X	X	X	X	X
Birth Cohort FE	X	X	X	X	X	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X	X	X	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X	X	X	X	X	X
Child characteristics	X	X	X	X	X	X	X	X
Parental Controls at Birth	X	X	X	X	X	X	X	X

The table presents IV estimates of equation (7). Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Column (2) adds fixed effects for the father's industry of employment when the child is 18, whereas Column (3) includes fixed effects for the father's education and industry when the child is 18. In column (4), we add fixed effects for the father's occupation when the child is age 18. Column (5) includes two lags of parental housing wealth prior to the child's birth. Column (6) includes interactions between municipality and birth cohort fixed effects, while column (7) control for changes in parental income in each age range. Finally, in column (8) we control for municipality-level changes in the proportion of college graduate during each age range. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 8: Robustness Checks – Sample

	Baseline Effects	Drop 4th Quartile	Drop Top 5% of Housing and Net Wealth at Birth	Drop Vacation Homes	Drop Copenhagen	Renters
Panel A: Total Wealth						
	(1)	(2)	(3)	(4)	(5)	(6)
Change in housing wealth, ages 0-5	0.2718*** (0.0925)	0.3270 (0.2627)	0.3637*** (0.0616)	0.2424*** (0.0900)	0.3890*** (0.1201)	-0.0297 (0.1528)
Change in housing wealth, ages 6-11	0.2532*** (0.0559)	0.1937*** (0.0383)	0.3171*** (0.0531)	0.2984*** (0.0530)	0.2563** (0.1097)	-0.0593 (0.0678)
Change in housing wealth, ages 12-17	0.0351 (0.0330)	0.0141 (0.0241)	0.0203 (0.0319)	0.0191 (0.0323)	0.0430 (0.0544)	-0.0028 (0.0430)
Observations	91,475	43,914	83,625	89,546	89,500	43,162
Dep. Var. Mean	5.2596	4.9249	4.9776	5.2288	5.2658	3.1830
Panel B: Housing Wealth						
	(1)	(2)	(3)	(4)	(5)	(6)
Change in housing wealth, ages 0-5	0.2467*** (0.0632)	0.3114 (0.2394)	0.2998*** (0.0555)	0.2236*** (0.0582)	0.3216*** (0.0640)	-0.0391 (0.1456)
Change in housing wealth, ages 6-11	0.1519*** (0.0382)	0.1688*** (0.0332)	0.1651*** (0.0348)	0.1927*** (0.0343)	0.1518*** (0.0482)	-0.0529 (0.0644)
Change in housing wealth, ages 12-17	0.0021 (0.0226)	-0.0025 (0.0209)	-0.0163 (0.0209)	-0.0116 (0.0209)	0.0037 (0.0244)	0.0056 (0.0433)
Observations	91,475	43,914	83,625	89,546	89,500	43,162
Dep. Var. Mean	4.2149	4.0580	4.0679	4.1877	4.2258	2.5176
Municipality FE	X	X	X	X	X	X
Birth Cohort FE	X	X	X	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X	X	X	X
Child characteristics	X	X	X	X	X	X
Parental Controls at Birth	X	X	X	X	X	X

The table presents IV estimates of equation (7), except for column (5) that shows reduced form estimates akin to equation (4). Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, year of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Column (2) drops all observations where the changes in housing wealth for each age group is in the 4th quartile of the distribution of housing wealth changes for that age group. Column (3) drops observations where the parents are in the top 5% of both the net wealth distribution and the housing wealth distribution when the child is born (measured across all cohorts). Column (4) drops observations where the parents only own a vacation home at the birth of the child, and column (5) drops all observations in Copenhagen. Column (6) uses changes in average municipality-level simulated housing wealth among the families in the sample. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 9: Across-MSA Variation in Parental Housing Wealth Shocks on Child's Wealth in Adulthood, IV Estimates

	(1) Total Wealth, Ages 29-33	(2) Housing Wealth, Ages 29-33
Change in housing wealth, ages 0-5	0.2195 (0.3506)	0.2603 (0.2410)
Change in housing wealth, ages 6-11	0.1906 (0.2210)	0.1511 (0.1518)
Change in housing wealth, ages 12-17	0.0312 (0.0624)	-0.0145 (0.0429)
Avg. Municipality Housing Wealth in Birth Year	X	X
Municipality FE	X	X
Birth Cohort FE	X	X
Municipality FE x Housing Wealth at Birth		
Municipality FE x Net Wealth at Birth	X	X
Child Characteristics	X	X
Parental Controls at Birth	X	X
Observations	91,475	91,475
Dep. Var. Mean	5.2596	4.2149

Actual parental housing wealth changes are instrumented with changes in average municipality-level housing wealth. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 10: Instrumental Variables Estimates of Mechanisms

	(1)	(2)	(3)
	Pr(Homeowner)	Highest Education (Years), Ages 29-33	Average Earnings, Ages 29-33
Change in housing wealth, ages 0-5	0.0213*** (0.0046)	0.0556*** (0.0202)	0.0563*** (0.0179)
Change in housing wealth, ages 6-11	0.0090*** (0.0028)	0.0725*** (0.0122)	0.0338*** (0.0108)
Change in housing wealth, ages 12-17	-0.0038* (0.0016)	0.0090 (0.0072)	-0.0121* (0.0064)
Municipality FE	X	X	X
Birth Cohort FE	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X
Child Characteristics	X	X	X
Parental Controls at Birth	X	X	X
Observations	91,475	91,475	91,475
Dep. Var. Mean	0.5137	15.1174	3.0073

The table presents IV estimates of equation (7), with each potential mechanism as the outcome variable. All columns include controls for each parent's real income at birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Child characteristics include fixed effects for child gender and birth parity. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 11: Instrumental Variables Estimates with Endogenous Mechanisms

	Baseline Effects	Mechanisms: Education	Mechanisms: Earnings	Mechanisms: Education and Earnings
Panel A: Total Wealth				
	(1)	(2)	(3)	(4)
Change in housing wealth, ages 0-5	0.2718*** (0.0925)	0.2290** (0.0919)	0.1992** (0.0898)	0.1921** (0.0898)
Change in housing wealth, ages 6-11	0.2532*** (0.0559)	0.2172*** (0.0552)	0.2095*** (0.0540)	0.1987*** (0.0539)
Change in housing wealth, ages 12-17	0.0351 (0.0330)	0.0403 (0.0328)	0.0507 (0.0320)	0.0529* (0.0320)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	5.2596	5.2596	5.2596	5.2596
Panel B: Housing Wealth				
	(1)	(2)	(3)	(4)
Change in housing wealth, ages 0-5	0.2467*** (0.0632)	0.2091*** (0.0624)	0.1858** (0.0603)	0.1781*** (0.0602)
Change in housing wealth, ages 6-11	0.1519*** (0.0382)	0.1209*** (0.0375)	0.1153*** (0.0363)	0.1054*** (0.0361)
Change in housing wealth, ages 12-17	0.0021 (0.0226)	0.0082 (0.0223)	0.0152 (0.0215)	0.0188 (0.0214)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	4.2149	4.2149	4.2149	4.2149
Municipality FE	X	X	X	X
Birth Cohort FE	X	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X	X
Child Characteristics	X	X	X	X
Parental Controls at Birth	X	X	X	X

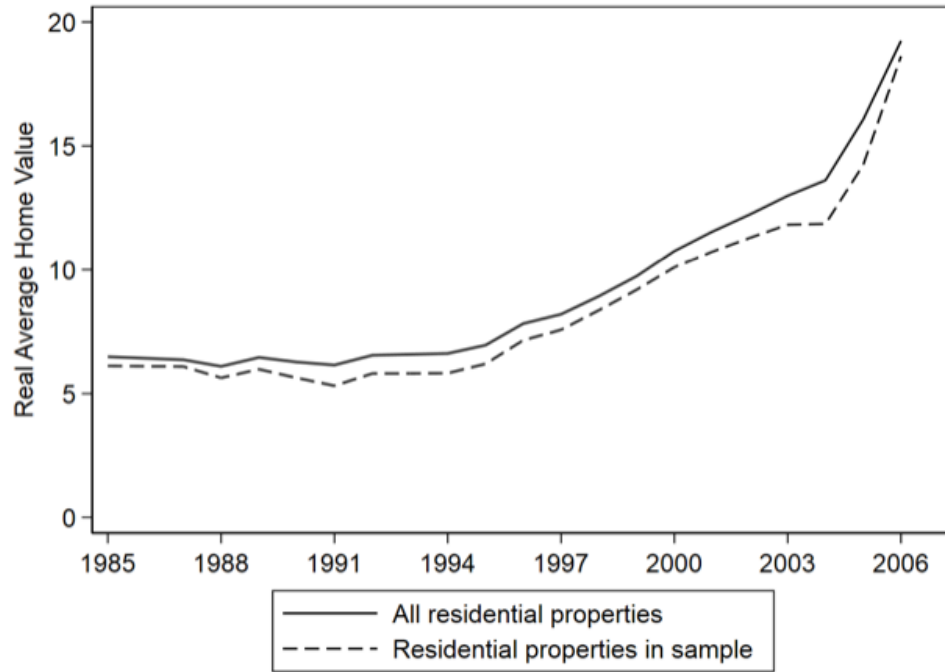
The table presents IV estimates of the transmission of housing wealth changes that control for endogenous mechanisms. Column 1 presents our baseline estimates. Column 2 controls for fixed effects for highest level of education (years) over ages 29-33. Column 3 controls for average real earnings for ages 29-33. Column 4 controls for both education and earnings. All columns include controls for each parent's real income at birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Child characteristics include fixed effects for child gender and birth parity. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table 12: Effects by Number of Children: Reduced Form

	(1)	(2)
	Total Wealth, Ages 29-33	Housing Wealth, Ages 29-33
Change in housing wealth, ages 0-5	0.5607*** (0.1567)	0.2678*** (0.0738)
Change in housing wealth, ages 6-11	0.2086** (0.0871)	0.2009*** (0.0606)
Change in housing wealth, ages 12-17	0.0873 (0.0531)	0.0434 (0.0356)
# children	-0.1296 (0.1204)	-0.0128 (0.0625)
Change in housing wealth, ages 0-5 x # children	-0.1543** (0.0722)	-0.0468 (0.0289)
Change in housing wealth, ages 6-11 x # children	-0.0031 (0.0393)	-0.0284 (0.0202)
Change in housing wealth, ages 12-17 x # children	-0.0256 (0.0167)	-0.0157 (0.0123)
Municipality FE	X	X
Birth Cohort FE	X	X
Municipality FE x Housing Wealth at Birth	X	X
Municipality FE x Net Wealth at Birth	X	X
Child characteristics	X	X
Parental Controls at Birth	X	X
Observations	91,475	91,475
$R^2$	0.3223	0.4361
Dep. Var. Mean	5.2596	4.2149

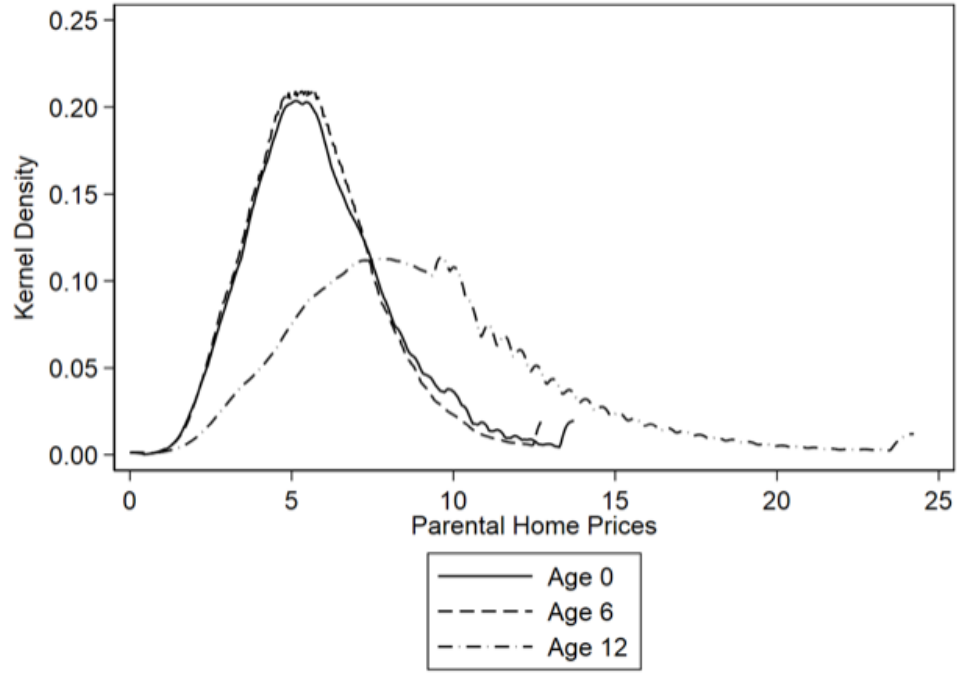
The table presents reduced form estimates of equation (4). All columns include controls for each parent's real income at birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Child characteristics include fixed effects for child gender and birth parity. The treatment variables are changes in the simulated housing wealth for each age group, where we interact the number of children born to the focal child's mother with changes in housing wealth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Figure 1: Average Value of Residential Properties, 1985-2006



Average value of residential properties in the full population (solid line) and our analysis sample (dashed line). Home values are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx \$14,800$ ).

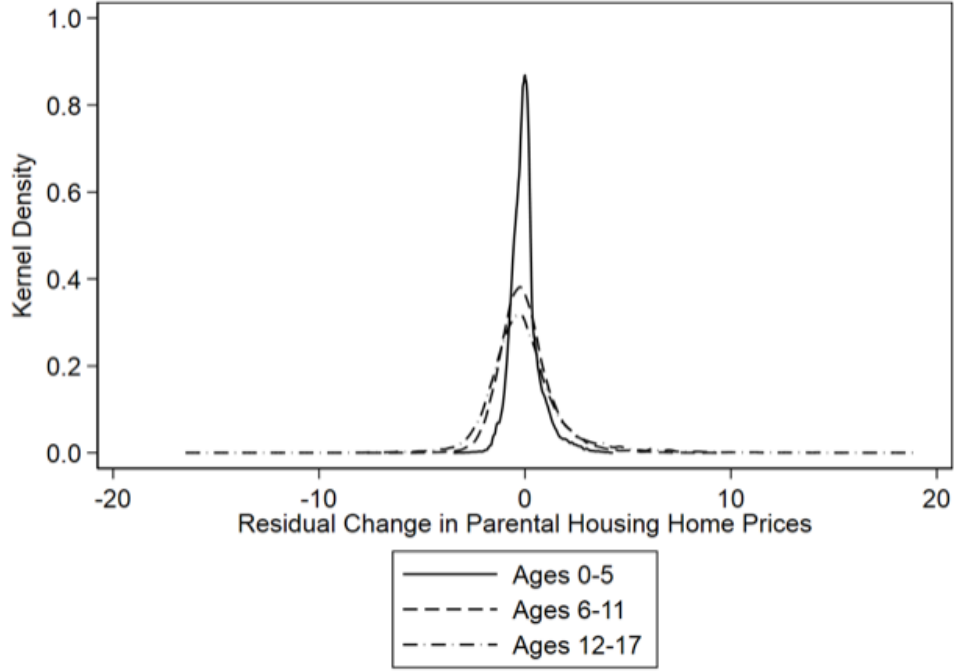
Figure 2: Distribution of Simulated Parental Housing Wealth



Kernel densities estimated using Epanechnikov kernel with optimal bandwidth. Simulated parental housing wealth levels are winsorized at the 99th percentile within each age group. Home prices are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800).

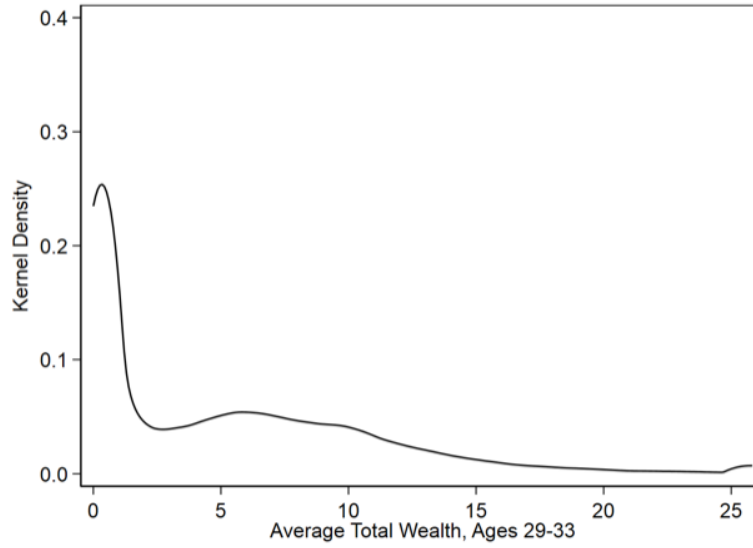


Figure 3: Distribution of Changes in Simulated Parental Housing Wealth

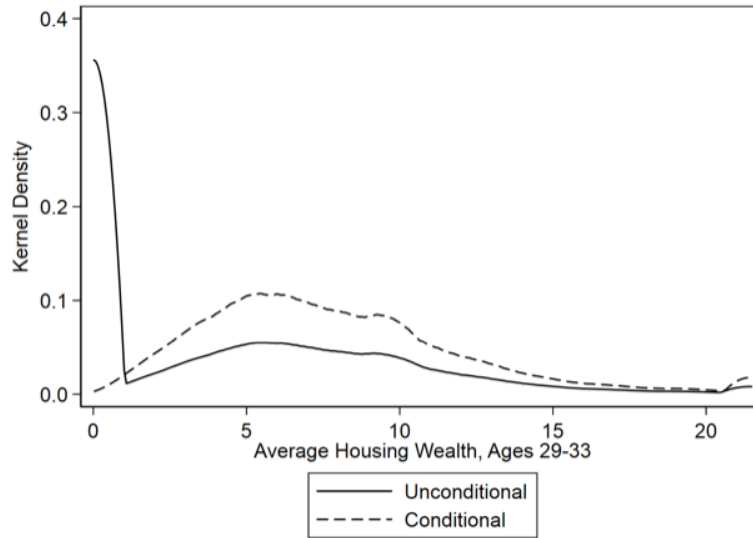


Kernel densities estimated using Epanechnikov kernel with optimal bandwidth. Simulated housing wealth is the value of the home in which the child was born. We residualize the change in simulated home prices with respect to birth cohort and municipality fixed effects. Changes in simulated home prices are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx \$14,800$ ).

Figure 4: Distribution of Housing Wealth of Children in Adulthood, Ages 29-33



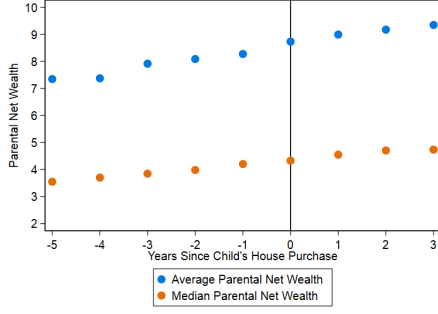
(a) Total Wealth



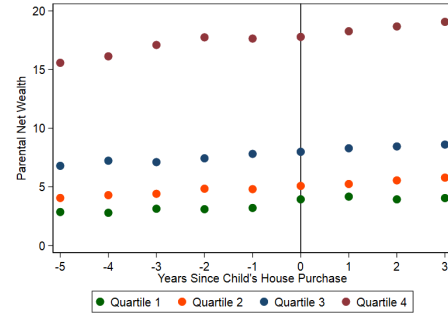
(b) Housing Wealth

Kernel densities estimated using Epanechnikov kernel with optimal bandwidth. Housing wealth level is winsorized at the 99th percentile. Housing wealth is in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800).

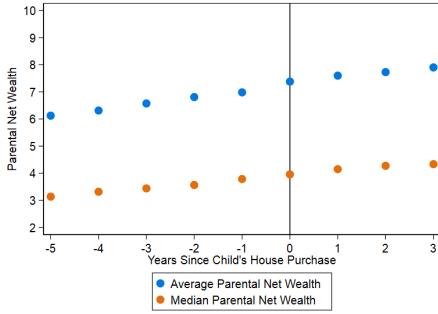
Figure 5: Parental Net Wealth Around Child's Home Purchase



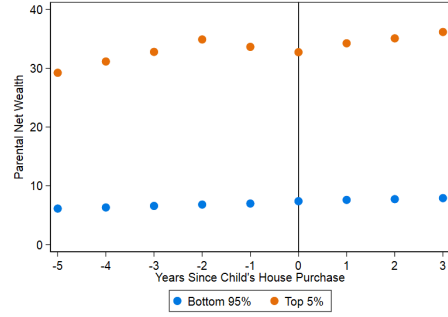
(a) Full Sample



(b) Quartiles of Net Wealth at Birth



(c) Drop Top 5% of Net Wealth at Birth



(d) Top 5% and Bottom 95% of Net Wealth at Birth

Event studies of average and median parental net wealth relative to child's first home purchase. Averages and medians calculated within each year. Net wealth is in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx \$14,800$ ).

## A Online Appendix

Table A.1: Sample Creation

	(1)
Births (1985-1989)	222,173
At least one parent owns a single house	97,443
With data on parental education, income, and age at birth	91,475

Data on home values at birth for the 1986 birth cohort are unavailable.

Table A.2: Housing Sample Creation

	Number of Houses
Houses owned by parents of 1985, 1987-1989 birth cohorts	125,125
With a single address	124,906
With non-negative valuations	124,566
Limited to families that own 1 house	120,908
Limited to primary residences and summer houses	101,295
With non-missing data when child is age 5	101,282
With non-missing data when child is age 6	101,280
With non-missing data when child is age 11	101,265
With non-missing data when child is age 12	101,259
With non-missing data when child is age 17	87,784
With non-missing data when child is age 18	87,777

Table A.3: Summary Statistics of Full Danish Population

	(1)	(2)	(3)
	Ages 0-5	Ages 6-11	Ages 12-17
Mother's Age	28.0645 (4.6795)	34.0645 (4.6795)	40.0645 (4.6795)
Father's Age	30.9567 (5.5817)	36.9567 (5.5817)	42.9567 (5.5817)
Mother's Education (years)	13.0303 (2.5358)	13.1887 (2.5835)	13.3833 (2.5978)
Father's Education (years)	13.5586 (2.7751)	13.6819 (2.8156)	13.7383 (2.8293)
Mother's Income	1.2056 (0.5419)	1.8378 (0.8096)	2.4003 (1.1703)
Father's Income	1.8533 (1.4618)	2.5067 (2.4404)	3.3083 (4.0986)
Parents are Married/Cohabiting	0.9556 (0.2059)	0.7905 (0.4070)	0.7088 (0.4543)
Parental Net Wealth	-0.0076 (11.2782)	0.1444 (15.4182)	1.4119 (20.3267)
Parental Housing Wealth	3.9003 (3.8156)	4.6205 (3.7549)	10.5551 (16.7918)
Own 1 House	0.5939 (0.4911)		
Own 1 House (Conditional on Homeownership)	0.9647 (0.1845)		

Number of observations = 190,244 from the 1985 and 1987-1989 birth cohorts with non-missing data on parental income and education. Standard deviations in parentheses. Family background characteristics are measured in the base year for each age group. Child outcomes are measured at ages 29-33. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800).

Table A.4: Intergenerational Correlation of Parental Housing Wealth with Child Non-housing Wealth

	Dependent Variable: Non-housing Wealth			
	(1)	(2)	(3)	(4)
Parental housing wealth, age 0	0.4698*** (0.0243)			
Parental housing wealth, age 6		0.4448*** (0.0247)		
Parental housing wealth, age 12			0.1219*** (0.0053)	
Parental housing wealth, ages 29-33				0.0515*** (0.0017)
Observations	202,789	201,768	201,119	202,797
$R^2$	0.0031	0.0029	0.0039	0.0059

Each column is a separate regression that includes fixed effects for each parent's age in the first year of each age group. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.5: Effects of Parental Housing Wealth Shocks on Child's Wealth in Adulthood, Reduced Form Estimates

Panel A: Total Wealth				
	(1)	(2)	(3)	(4)
Change in simulated housing wealth, ages 0-5	0.2400*** (0.0910)	0.2247** (0.0701)	0.2128*** (0.0693)	0.1836** (0.0684)
Change in simulated housing wealth, ages 6-11	0.2722*** (0.0537)	0.2573*** (0.0466)	0.2631*** (0.0464)	0.1977*** (0.0477)
Change in simulated housing wealth, ages 12-17	0.0718 (0.0491)	0.0430* (0.0208)	0.0439** (0.0208)	0.0257 (0.0226)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	5.2596	5.2596	5.2596	5.2596
Panel B: Housing Wealth				
	(1)	(2)	(3)	(4)
Change in simulated housing wealth, ages 0-5	0.1588** (0.0613)	0.1926*** (0.0395)	0.1832*** (0.0397)	0.1532*** (0.0356)
Change in simulated housing wealth, ages 6-11	0.1829*** (0.0226)	0.1749*** (0.0205)	0.1796*** (0.0206)	0.1289*** (0.0217)
Change in simulated housing wealth, ages 12-17	0.0407 (0.0407)	0.0146 (0.0133)	0.0155 (0.0135)	0.0055 (0.0134)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	4.2149	4.2149	4.2149	4.2149
Panel C: Non-housing Wealth				
	(1)	(2)	(3)	(4)
Change in simulated housing wealth, ages 0-5	0.0813 (0.0743)	0.0322 (0.0637)	0.0296 (0.0628)	0.0305 (0.0629)
Change in simulated housing wealth, ages 6-11	0.0893** (0.0414)	0.0825** (0.0355)	0.0835** (0.0353)	0.0688* (0.0379)
Change in simulated housing wealth, ages 12-17	0.0312** (0.0146)	0.0284*** (0.0102)	0.0285*** (0.0100)	0.0202* (0.0118)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	1.0447	1.0447	1.0447	1.0447
Municipality FE	X	X	X	X
Birth Cohort FE	X	X	X	X
Housing Wealth at Birth	X			
Net Wealth at Birth	X			
Municipality FE x Housing Wealth at Birth		X	X	X
Municipality FE x Net Wealth at Birth		X	X	X
Child Characteristics			X	X
Parental Controls at Birth				X

Each column in each panel comes from a separate regression. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.



Table A.6: Effects of Parental Housing Wealth Shocks on Child's Non-housing Wealth in Adulthood, IV Estimates

Dependent Variable: Non-housing Wealth				
	(1)	(2)	(3)	(4)
Change in housing wealth, ages 0-5	0.1258** (0.0584)	0.0243 (0.0606)	0.0186 (0.0602)	0.0251 (0.0600)
Change in housing wealth, ages 6-11	0.0885** (0.0350)	0.1055*** (0.0373)	0.1091*** (0.0369)	0.1013*** (0.0363)
Change in housing wealth, ages 12-17	0.0344* (0.0200)	0.0361* (0.0202)	0.0363* (0.0203)	0.0330 (0.0214)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	1.0447	1.0447	1.0447	1.0447
Municipality FE	X	X	X	X
Birth Cohort FE	X	X	X	X
Housing Wealth at Birth	X			
Net Wealth at Birth	X			
Municipality FE x Housing Wealth at Birth		X	X	X
Municipality FE x Net Wealth at Birth		X	X	X
Child Characteristics			X	X
Parental Controls at Birth				X

Each column comes from a separate regression. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.7: Robustness Checks, Non-housing Wealth – Controls

	Baseline Effects	Father's Industry FE	Father's Education- Industry FE	Father's Occupation FE	Lags of Parental Housing Wealth	Municipality x Birth Cohort FE	Changes in Parent Income	Changes in Municipality Share College
Dependent Variable: Non-housing Wealth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in housing wealth, ages 0-5	0.0251 (0.0600)	0.1485*** (0.0282)	0.1533*** (0.0292)	0.1572*** (0.0288)	0.0923 (0.0593)	0.0687 (0.0573)	0.0644 (0.1167)	0.0689 (0.1160)
Change in housing wealth, ages 6-11	0.1013*** (0.0363)	0.0062 (0.0171)	0.0066 (0.0176)	-0.0003 (0.0174)	0.0996** (0.0454)	0.1059*** (0.0387)	0.0939 (0.0894)	0.1055 (0.0922)
Change in housing wealth, ages 12-17	0.0330 (0.0214)	0.0109 (0.0101)	0.0089 (0.0104)	0.0087 (0.0103)	0.0293 (0.0289)	0.0354 (0.0254)	0.0316 (0.0350)	0.0356 (0.0359)
Observations	91,475	88,046	86,702	88,437	65,656	91,475	91,475	91,466
Dep. Var. Mean	1.0447	1.0217	1.0209	1.0239	1.0599	1.0447	1.0447	1.0447
Municipality FE	X	X	X	X	X	X	X	X
Birth Cohort FE	X	X	X	X	X	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X	X	X	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X	X	X	X	X	X
Child characteristics	X	X	X	X	X	X	X	X
Parental Controls at Birth	X	X	X	X	X	X	X	X

The table presents IV estimates of equation (7). Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Column (2) adds fixed effects for the father's industry of employment when the child is 18, whereas Column (3) includes fixed effects for the father's education and industry when the child is 18. In column (4), we add fixed effects for the father's occupation when the child is age 18. Column (5) includes two lags of parental housing wealth prior to the child's birth. Column (6) includes interactions between municipality and birth cohort fixed effects, while column (7) control for changes in parental income in each age range. Finally, in column (8) we control for municipality-level changes in the proportion of college graduate during each age range. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.8: Robustness Checks, Non-housing Wealth – Sample

	Baseline Effects	Drop 4th Quartile	Drop Top 5% of Housing and Net Wealth at Birth	Drop Vacation Homes	Drop Copenhagen	Renters
Dependent Variable: Non-housing Wealth	(1)	(2)	(3)	(4)	(5)	(6)
Change in housing wealth, ages 0-5	0.0251 (0.0600)	0.0156 (0.0758)	0.0639*** (0.0199)	0.0188 (0.0615)	0.0674 (0.1182)	0.0094 (0.0379)
Change in housing wealth, ages 6-11	0.1013*** (0.0363)	0.0249 (0.0152)	0.1520*** (0.0364)	0.1056*** (0.0362)	0.1046 (0.0946)	-0.0064 (0.0202)
Change in housing wealth, ages 12-17	0.0330 (0.0214)	0.0166* (0.0095)	0.0366* (0.0219)	0.0307 (0.0221)	0.0394 (0.0371)	-0.0083 (0.0103)
Observations	91,475	43,914	83,625	89,546	89,500	43,162
Dep. Var. Mean	1.0447	0.8669	0.9097	1.0124	1.0401	0.6654
Municipality FE	X	X	X	X	X	X
Birth Cohort FE	X	X	X	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X	X	X	X
Child characteristics	X	X	X	X	X	X
Parental Controls at Birth	X	X	X	X	X	X

The table presents IV estimates of equation (7), except for column (5) that shows reduced form estimates akin to equation (4). Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, year of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Column (2) drops all observations where the changes in housing wealth for each age group is in the 4th quartile of the distribution of housing wealth changes for that age group. Column (3) drops observations where the parents are in the top 5% of both the net wealth distribution and the housing wealth distribution when the child is born (measured across all cohorts). Column (4) drops observations where the parents only own a vacation home at the birth of the child, and column (5) drops all observations in Copenhagen. Column (6) uses changes in average municipality-level simulated housing wealth among the families in the sample. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.9: Across-MSA Variation Instrumental Variables Estimates: First Stage

	(1)	(2)	(3)
	Change in Housing Wealth, Ages 0-5	Change in Housing Wealth, Ages 6-11	Change in Housing Wealth, Ages 12-17
Change in average simulated housing wealth, ages 0-5	0.6494*** (0.0603)	-0.0386 (0.1012)	-0.2868 (0.1973)
Change in average simulated housing wealth, ages 6-11	-0.3381*** (0.0278)	0.7713*** (0.0467)	0.2885*** (0.0910)
Change in average simulated housing wealth, ages 12-17	-0.0304* (0.0155)	-0.0114 (0.0261)	0.8767*** (0.0509)
Avg. Municipality Housing Wealth in Birth Year	X	X	X
Municipality FE	X	X	X
Birth Cohort FE	X	X	X
Municipality FE x Housing Wealth at Birth			
Municipality FE x Net Wealth at Birth	X	X	X
Child Characteristics	X	X	X
Parental Controls at Birth	X	X	X
Observations	91,475	91,475	91,475
$R^2$	0.0061	0.0106	0.0097
F-stat	99.90	96.05	125.81

Dependent variables are changes in average municipality-level housing wealth among the families in the sample. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.10: Across-MSA Variation in Parental Housing Wealth Shocks on Child's Non-housing Wealth in Adulthood, IV Estimates

	(1) Non-housing Wealth, Ages 29-33
Change in housing wealth, ages 0-5	-0.0409 (0.2271)
Change in housing wealth, ages 6-11	0.0396 (0.1431)
Change in housing wealth, ages 12-17	0.0457 (0.0404)
Avg. Municipality Housing Wealth in Birth Year	X
Municipality FE	X
Birth Cohort FE	X
Municipality FE x Housing Wealth at Birth	
Municipality FE x Net Wealth at Birth	X
Child Characteristics	X
Parental Controls at Birth	X
Observations	91,475
Dep. Var. Mean	1.0447

Actual parental housing wealth changes are instrumented with changes in average municipality-level housing wealth. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.11: Instrumental Variables Estimates with Endogenous Mechanisms – Non-housing Wealth

	Baseline Effects	Mechanisms: Education	Mechanisms Earnings	Mechanisms: Earnings and Earnings
	Dependent Variable: Non-housing Wealth			
	(1)	(2)	(3)	(4)
Change in housing wealth, ages 0-5	0.0251 (0.0600)	0.0200 (0.0603)	0.0134 (0.0601)	0.0140 (0.0603)
Change in housing wealth, ages 6-11	0.1013*** (0.0363)	0.0963*** (0.0362)	0.0942*** (0.0362)	0.0933*** (0.0362)
Change in housing wealth, ages 12-17	0.0330 (0.0214)	0.0321 (0.0215)	0.0355* (0.0214)	0.0341 (0.0215)
Observations	91,475	91,475	91,475	91,475
Dep. Var. Mean	1.0447	1.0447	1.0447	1.0447
Municipality FE	X	X	X	X
Birth Cohort FE	X	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X	X
Child Characteristics	X	X	X	X
Parental Controls at Birth	X	X	X	X

The table presents IV estimates of the transmission of housing wealth changes that control for endogenous mechanisms. Column 1 presents our baseline estimates. Column 2 controls for fixed effects for highest level of education (years) over ages 29-33. Column 3 controls for average real earnings for ages 29-33. Column 4 controls for both education and earnings. All columns include controls for each parent's real income at birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Child characteristics include fixed effects for child gender and birth parity. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.12: Inter-vivos Transfers from Parents to Children

Panel A: Drop Children with Positive Net Wealth in Childhood			
	(1) Total Wealth, Ages 29-33	(2) Housing Wealth, Ages 29-33	(3) Non-housing Wealth, Ages 29-33
Change in housing wealth, ages 0-5	0.3599*** (0.0622)	0.2909*** (0.0549)	0.0689*** (0.0224)
Change in housing wealth, ages 6-11	0.2118*** (0.0406)	0.1619*** (0.0358)	0.0499*** (0.0146)
Change in housing wealth, ages 12-17	-0.0162 (0.0250)	-0.0225 (0.0221)	0.0063 (0.0090)
Observations	73,497	73,497	73,497
Dep. Var. Mean	5.0162	4.0407	0.9755
Panel B: Drop Intra-family House Sales			
	(1) Total Wealth, Ages 29-33	(2) Housing Wealth, Ages 29-33	(3) Non-housing Wealth, Ages 29-33
Change in housing wealth, ages 0-5	0.3585*** (0.0872)	0.3026*** (0.0579)	0.0559 (0.0586)
Change in housing wealth, ages 6-11	0.2249*** (0.0591)	0.1211*** (0.0393)	0.1037*** (0.0397)
Change in housing wealth, ages 12-17	0.0101 (0.0389)	-0.0240 (0.0258)	0.0341 (0.0261)
Observations	88,981	88,981	88,981
Dep. Var. Mean	5.0102	4.0082	1.0020
Municipality FE	X	X	X
Birth Cohort FE	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X
Child Characteristics	X	X	X
Parental Controls at Birth	X	X	X

Each column of each panel is a separate IV estimate with the indicated dependent variable. The sample in Panel A drops all children with positive net wealth by age 12 from the baseline sample. The sample in Panel B drops all children who purchased a home from a parent from the baseline sample. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.13: Likelihood of Co-owning a House with a Parent

	(1)
Change in average simulated housing wealth, ages 0-5	0.0003 (0.0008)
Change in average simulated housing wealth, ages 6-11	0.0005 (0.0005)
Change in average simulated housing wealth, ages 12-17	0.0012*** (0.0004)
Municipality FE	X
Birth Cohort FE	X
Municipality FE x Housing Wealth at Birth	X
Municipality FE x Net Wealth at Birth	X
Child Characteristics	X
Parental Controls at Birth	X
Observations	91,475
Dep. Var. Mean	0.0081

The dependent variable is an indicator for co-owning at least one home with at least one parent at any time between ages 18 and 33. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.



Table A.14: Likelihood of Owning a Home by Quartile of Parental Debt-to-Income Ratio

	(1) Quartile 1	(2) Quartile 2	(3) Quartile 3	(4) Quartile 4
Change in housing wealth, ages 0-5	0.0238** (0.0093)	0.0181* (0.0094)	0.0270*** (0.0072)	0.0198* (0.0106)
Change in housing wealth, ages 6-11	0.0025 (0.0048)	0.0120** (0.0060)	0.0118** (0.0050)	0.0073 (0.0061)
Change housing wealth, ages 12-17	-0.0041 (0.0039)	-0.0081** (0.0039)	-0.0019 (0.0044)	-0.0023 (0.0028)
Municipality FE	X	X	X	X
Birth Cohort FE	X	X	X	X
Municipality FE x Housing Wealth at Birth	X	X	X	X
Municipality FE x Net Wealth at Birth	X	X	X	X
Child Characteristics	X	X	X	X
Parental Controls at Birth	X	X	X	X
Observations	22,869	22,869	22,869	22,868
R2	-0.0008	-0.0113	-0.0058	-0.0018
Dep. Var. Mean	0.5088	0.5191	0.5155	0.5115

Each column is a separate IV estimate where the dependent variable is an indicator for the child owning a home at any time between ages 29 and 33. The columns correspond to quartiles of parental debt-to-income ratios measured as the average debt and income when the child is ages 27 to 28. Child characteristics include fixed effects for child gender and birth parity. Parental controls include each parent's real income in the year before child's birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.

Table A.15: Effects by Number of Children, Non-housing Wealth: Reduced Form

	(1) Non-housing Wealth, Ages 29-33
Change in housing wealth, ages 0-5	0.2929** (0.1278)
Change in housing wealth, ages 6-11	0.0078 (0.0485)
Change in housing wealth, ages 12-17	0.0439* (0.0242)
# children	-0.1168 (0.0998)
Change in housing wealth, ages 0-5 x # children	-0.1075* (0.0574)
Change in housing wealth, ages 6-11 x # children	0.0253 (0.0316)
Change in housing wealth, ages 12-17 x # children	-0.0100 (0.0076)
Municipality FE	X
Birth Cohort FE	X
Municipality FE x Housing Wealth at Birth	X
Municipality FE x Net Wealth at Birth	X
Child characteristics	X
Parental Controls at Birth	X
Observations	91,475
$R^2$	0.0733
Dep. Var. Mean	1.0447

The table presents reduced form estimates of equation (4). The estimates include controls for each parent's real income at birth, age fixed effects at birth, years of education at birth fixed effects, and an indicator for the parents being married and/or cohabiting at birth. Child characteristics include fixed effects for child gender and birth parity. The treatment variables are changes in the simulated housing wealth for each age group, where we interact the number of children born to the focal child's mother with changes in housing wealth. All monetary variables are in 100,000 Danish Kroner deflated to 2018 prices using the consumer price index ( $\approx$  \$14,800). Standard errors clustered at the municipality level in parentheses: significant at \*10%, \*\*5%, and \*\*\*1%.