Dynastic Home Equity*

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Abstract

Using a nationally-representative panel of consumer credit records for the US from 1999 to 2021, we document a positive correlation between child and parent homeownership. We propose a new mechanism behind this relationship – parents extract home equity to help finance their child's home purchase – and we quantify it using fixed effect, event study, local projection, and instrumental variable methods. We find that children whose parents extract equity: (i) are 60-80% more likely to become homeowners; (ii) have lower leverage at origination; and (iii) buy higher-valued homes and at a younger age. The effects are stronger when housing affordability is worse and children's financial constraints are more likely to bind. Dynastic home equity alone accounts for 20% of the decline in new homeownership for children of low-equity parents following the Global Financial Crisis and 5-10% of the homeownership gap between black and white young adults.

Keywords: Home equity, mortgages, household finance, family, inequality.
JEL Codes: D31, D64, E21, G5, G51

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1 Introduction

Rising home prices have been accompanied by a housing affordability "crisis" for young and credit-constrained households, potentially affecting their lifetime wealth accumulation and access to other benefits of homeownership.[1] At the same time, the increase in house values means that existing homeowners have accumulated historically high levels of home equity available for extraction.[2] Much of the discussion of equity extraction has focused on its use to finance consumption and how it may contribute to default risk, but for parents with adult children housing equity may be an important source of liquidity to help their child purchase a home.[3]

In this paper we study how parental equity extraction affects homeownership for their adult children. Specifically, we document how homeowner *parents* extract equity from their house to finance their *children's* house purchase, helping them buy a home earlier and with less leverage. We label this channel "*dynastic home equity*." Using a nationally-representative panel of consumer credit records that links children and parents in the US from 1999 to 2021 and employing several empirical strategies, we identify the importance of the dynastic home equity channel in generating intergenerational persistence in homeownership. We find that children whose parents extract equity are at least 60-80% more likely to become a homeowner as compared to children whose parents do not extract equity. The aggregate impact of this channel can be large. Exploiting the sharp decline in credit supply for home equity extraction after mid-2007, we show that lower equity extraction by parents with limited access to equity explains about 20% of the overall decline in homeownership for their children.

The dynastic home equity channel has important implications for policy discussions about

[1] See Chetty, Hendren and Katz (2016), Favilukis, Mabille and Van Nieuwerburgh (2019) and Mabille (2020) on the affordability crisis; and Piketty, Yang and Zucman (2019), Kuhn, Schularick and Steins (2020) and Bernstein and Koudijs (2020) on the role of housing in wealth accumulation.

[2] In 1965, home equity was about 2 percent of US GDP while in 2023, home equity was about 4.5 percent of GDP. See https://fred.stlouisfed.org/series/OEHRENWBSHNO.

[3] See Mian and Sufi (2011), Adelino, Schoar and Severino (2012), Acolin, Bricker, Calem and Wachter (2016), Bhutta and Keys (2016), and Kumar (2018) among others.

inequality by emphasizing the role played by housing equity itself in perpetuating unequal access to opportunities across generations. Furthermore, dynastic home equity is likely to become more important over time as housing affordability worsens and rising house prices leave parents much wealthier than their working-age children.

We start the analysis by documenting an economically and statistically significant positive correlation in homeownership across generations. We find that children with parents that are homeowners are about one percentage point more likely to be a homeowner by the age of 25 and about 1.7 percentage points by the age of 30, compared to similar children whose parents are not homeowners. These differences amount to 8-16% of the corresponding average homeownership rate. This correlation holds across all age groups and across all years, and is robust to a rich set of borrower-level characteristics as well as business cycle and zip-code level economic conditions.

We then delve into our main channel of interest behind the intergenerational correlation in homeownership. We focus on the sample of children whose parents are homeowners and use variation in equity extraction by parents for identification. In our data, about 11% of the transitions to new homeownership by children are associated with parents extracting equity, suggesting a potentially important link between equity extraction and homeownership.[4]

We first estimate a linear probability model to understand the relation between parent equity extraction and the likelihood of their children becoming new homeowners. Controlling for the effects of birth cohort, zip code, age, and credit quality of parents and children, we find that children whose parents extract equity are about 0.6 percentage point more likely to become homeowners than children whose parents do not extract equity. Given an average annual flow into ownership rate of about one percentage point, the estimates imply that having a parent who extracts equity increases the probability a child becomes a homeowner by about 60%. The magnitude is almost identical when we include children fixed effects,

[4]A simple back-of-the-envelope calculation based on this ratio, the median amount of equity extracted by parents, the average downpayment by first-time-buyers, and the annual frequency of new ownership, shows that parent equity extraction could have facilitated up to 25% of yearly first-time-buyer sales since the Global Financial Crisis.

thereby only exploiting variation within a child over time based on parents equity extraction.[5]

We then explore how the dynastic home equity channel varies across parent and child characteristics using the richness of our data. We find that dynastic home equity is more important when local housing affordability is worse, as well as when financial constraints are more likely to bind for children either due to macroeconomic reasons (like the financial crisis) or due to children being too young to have accumulated substantial assets for a downpayment. Turning to parent heterogeneity, we find that dynastic home equity is more important when parents have better access to credit (higher credit card limits and credit scores, and lower credit card utilization) and if they are relatively young. This could suggest that the parents did not have the time to accumulate enough non-housing wealth to help their children so that they tap into their home equity instead.

We find a sharp timing of parental equity extraction and their children's transition into homeownership, consistent with our argument that parents are using equity extraction to help their children buy a home. Specifically, we estimate a model with leads and lags around the parent's equity extraction event and find that almost the entire increase in child homeownership occurs in the year when parents extract equity. The effects in the years before or after parental equity extraction are statistically insignificant and close to zero. This implies that the equity extraction event itself is facilitating the child's transition into ownership. We also find that half of the effect of parent equity extraction on the likelihood of being a new homeowner is still present three years after the extraction, and about a third of the effect persists five years after the event, suggesting that the effect on homeownership does not reverse and comes from several years in the future.

The results of the event study suggest that children respond to the equity extraction of parents. However, the result could be driven by parents coincidentally timing their extraction to precede their children's planned purchase of a new house. We employ several additional

[5]Interestingly, our estimated effect is very similar to Berger, Turner and Zwick (2020), who study a $20 billion stimulus program to support the U.S. housing market. They find that the program increased the likelihood of being a first-time homeowner by over 50% by relaxing down payment requirements and liquidity needs. Hence, the impact of parental equity in the US housing market can be compared to a large stimulus program.

empirical approaches to isolate a causal effect of parental equity extraction on the probability of a child becoming a new homeowner: a local projection difference-in-differences model and a quasi-experimental instrumental variable.[6]

First, we estimate the effect of parents equity extraction on children homeownership using a local projection difference-in-differences approach to account for the staggered nature of the treatment across children-parents pairs and the potentially heterogeneous effects (Dube, Girardi, Jorda and Taylor (2023)). Intuitively, we compare children whose parents extract equity to children whose parents have not yet extracted equity. We find that parental equity extraction is associated with a statistically significant 0.8 percentage point increase in the likelihood that a child becomes a new homeowner, larger than the magnitude from the event study. This research design, however, still leaves open the possibility that child homeownership may be associated with parental equity extraction for spurious reasons. For example, if children of typical home-buying age happen to have parents likely to finance a kitchen remodel with home equity, we might find a positive correlation despite there being no causal relationship. As a check against this threat, we conduct a placebo test and randomly match children to adults similar to their true parents and re-estimate the effect of equity extraction. This placebo guards against the possibility that children purchasing a property are associated with parents likely to extract equity due to spurious demographic reasons and shows that our treatment effect is well outside the bands of what we would expect due to spurious correlation.

Second, we adapt to our context an identification approach from the literature on the refinancing channel of monetary policy, which faces an identification challenge similar to ours.[7] Specifically, we exploit the fact that the collapse of the private-label mortgage-backed

[6]As an additional check, we employ a propensity score matching model to construct a control group for children who are treated by parent equity extraction. This allows us to better account for potentially nonlinear relationships between control variables and the probability of becoming a homeowner. We estimate an average treatment effect on the treated of about 0.6 percentage point, which is almost identical to the average treatment effect. Overall, all these empirical approaches point to similar economically and statistically significant impacts of parental equity extraction on children new homeownership.

[7]See Di Maggio, Kermani, Keys, Piskorski, Ramcharan, Seru and Yao (2017), Beraja, Fuster, Hurst and Vavra (2019), Abel and Fuster (2021), Agarwal, Amromin, Chomsisengphet, Landvoigt, Piskorski, Seru and

security (MBS) market in mid-2007 and subsequent decline in house prices significantly constrained access to equity extraction, especially for households with relatively low levels of equity. This suggests that parents with low levels of equity became less likely to extract equity to help their children after mid-2007 relative to parents with higher levels of equity. Therefore, we use the lag of a parent's loan-to-value ratio and the timing of the collapse in the mortgage market as an instrumental variable for equity extraction so as to recover its causal effect on the probability of a child becoming a new homeowner. Our identification assumptions here are that the collapse in credit supply was unexpected (no anticipation) and differentially affected low-equity parents (relevance), the trends in children's demand for new homeownership are uncorrelated with the parent's LTV before and after the housing collapse (parallel trend assumption), and the only change in how a parent's LTV affects a child's new homeownership after, relative to before, the crisis is through the change in equity extraction (exclusion restriction).

We find that equity extraction rates by high- and low-equity parents move in parallel before the financial crisis and then, after a sharp decline in low-equity parents' extraction rates throughout 2008, continue to move in parallel through 2012. This suggests that the crisis caused a material and persistent reduction in credit supply to extract equity for low-equity parents relative to high-equity parents. We also find that new homeownership rates for the children of high- and low-equity parents moved in parallel before the crisis, but after the crisis began a gap emerges, with the children of low-equity parents significantly less likely to become homeowners. Furthermore, after the gap emerges the ownership rates still move in parallel, consistent with the assumption that the trends in child demand for homeownership are uncorrelated with parental LTV.

Using parent's lagged LTV interacted with a post-crisis indicator as an instrument for equity extraction, we find that parent equity extraction increases the likelihood that their children buy their first home by about 4 percentage points. We show that this large estimate is likely driven by low-equity parents being more likely to use extracted equity to

Yao (2023).

help their children purchase their first home. This suggests that the drop in credit supply disproportionately reduces equity extraction among parents likely to be extracting to help their children, pushing up the local average treatment effect. A simple back-of-the-envelope calculation suggests that the decline in equity extraction by parents with low equity can explain about 20% of the overall decline in the homeownership rate of their children during the global financial crisis.

We next explore different mechanisms through which parents' equity extraction affects child homeownership. First, we look at the children's leverage at origination when they purchase a new home. We find that children whose parents extract equity have lower loan-to-value (LTV) at origination, consistent with parental equity relaxing leverage. Children whose parents extracted equity are also about 4.4 percentage points (6% relative to the mean) less likely to have an LTV greater than 80%, above which borrowers are typically required to buy costly mortgage insurance and underwriting constraints become tighter. Second, we find that, conditional on buying, children whose parents extract equity buy a home at a younger age. Third, we find that, conditional on buying, children whose parent extract equity: (i) have a lower probability of moving in the next three years, and (ii) buy higher-priced homes. Overall, our results show that parental help not only increases the likelihood of children becoming new homeowners, but also lowers the cost of homeownership for children, by decreasing leverage at origination and potentially increases the quality of the match the child finds in the housing market.

Finally, we present back-of-the-envelope calculations of the effect of parental equity extraction on the black-white homeownership gap. A large literature has studied disparities in wealth across black and white households, their persistence over time, and their connection to the persistent gap in homeownership (Charles and Hurst (2002), Brandsaas (2021), Derenoncourt, Kim, Kuhn and Schularick (2022)). We document that the racial housing gap is even larger when looking at young adults in both absolute and relative terms, suggesting that differential factors early in life matter significantly for access to homeownership. We use our empirical estimates of the effect of parent equity extraction on children's new home-

ownership in a statistical model capturing transition probabilities from renting to owning for young adults to provide a simple quantification of the cumulative effect of dynastic home equity on inequality in homeownership.

We match the white homeownership rate at age 35 and compute the fraction of homeowners by age 35 as a function of: (i) differences in homeownership rate of the parents; (ii) differences in equity extraction rates of the parents, all else equal.[8] We find that dynastic home equity via extraction alone explains 5-10% of the 29 percentage point racial homeownership gap in the data for young adults. Thus, our results show that the racial gap in homeownership can be partially explained by pre-existing differences in parental access to housing equity.

Overview. The rest of the paper is organized as follows. The remainder of the section discusses the relevant literature. Section 2 describes the data. Section 3 presents results on the relationship between parents' and children homeownership. Section 4 presents the main result on the effects of parents' equity extraction on child homeownership, while Section 5 shows the results of additional empirical strategies. Section 6 explores the mechanisms. Section 7 shows the implications of dynastic home equity for the racial housing gap. Section 8 concludes.

1.1 Related Literature

Our paper contributes to the literature on the housing and mortgage markets, especially with an emphasis on borrowing constraints, equity extraction and housing affordability. Since the 2008 financial crisis a large body of work has been devoted to studying the rise and fall in household leverage and its implications for house prices and homeownership (Mian and Sufi (2011), Adelino et al. (2012), Acolin et al. (2016), Fuster and Zafar (2016)). Most related to our work are the papers focusing on mortgage refinancing and home equity extraction, which

[8] We make two simplifying assumptions in our calculation: (i) all children at age 18 are renters and that once they become homeowners, they do not transition back to renting (i.e., homeownership is an absorbing state); and (ii) the probability of a renter child becoming a homeowner each year is a constant function of the parental homeownership status and equity extraction behavior.

document the important role played by interest rate and house price changes (Hurst and Stafford (2004), Bhutta and Keys (2016)); household demand for liquidity (Chen, Michaux and Roussanov (2020)); as well as the effects of equity extraction on households leverage, consumption and default (Mian and Sufi (2011), Kumar (2018), Beraja et al. (2019), Agarwal et al. (2023)).

Our work also focuses on home equity extraction, but critically differs from previous papers by providing a new inter-generational dimension to equity extraction. We study potentially long-run effects of parental equity extraction on their children's outcomes (for example, homeownership, leverage), thus complementing previous papers that focus on short-run effects of home equity extraction on outcome variables (for example, car purchases, default) of the extracting household. One important distinction is that, to the extent that housing is an asset in addition to being a source of housing services for consumption, we demonstrate the use of equity extraction to facilitate the investment in housing assets by the children in the household.

Our findings on the correlation in homeownership across generations and our identification of a new mechanism behind this correlation are related to the literature on intergenerational persistence. Within this large literature, some papers have focused on the housing market, given the importance of housing for wealth-building (Piketty and Zucman (2014), Englund, Jansson and Sinai (2014), Sodini, Van Nieuwerburgh, Vestman and von Lilienfeld-Toal (2016), Bernstein and Koudijs (2020), Wold, Aastveit, Brandsaas, Juelsrud and Natvik (2023)). Most related to our work are studies looking at how parental transfers (or reported wealth as a proxy of financial assistance) can facilitate homeownership, leading to shorter times to save for downpayment, higher downpayment and more expensive homes (see Engelhardt and Mayer (1998), Charles and Hurst (2002), and Lee, Myers, Painter, Thunell and Zissimopoulos (2020) for the US; Guiso and Jappelli (2002) for Italy; and Blickle and Brown (2019) for Switzerland). These papers are mainly based on survey data available at a yearly or lower frequency, and typically do not explicitly address the endogeneity of transfers thus

leaving the causality of the relationship for further investigation.[9] We contribute to this literature using large administrative data in the US and implementing several identification approaches, which are made possible by the ability to build a panel dataset with linked parents and children information at an annual frequency. Furthermore, the large cross-section of our data allows us to study rich heterogeneity across both parents and children characteristics, while preserving statistical precision. Finally, we examine parental equity extraction as a specific source of the total (unobserved) inter-vivo intra-family potential transfer, quantifying a new mechanism that operates entirely within the housing market.

The combination of stricter lending standards, stagnating income and increasing house prices have spurred a large debate about the trade-offs between tighter credit markets regulation and limited access to homeownership, especially for credit-constrained or lower-income households (DeFusco and Mondragon (2020), DeFusco, Johnson and Mondragon (2020) Mabille (2020), Benetton (2021), Acharya, Bergant, Crosignani, Eisert and McCann (2022)). A booming literature has explored, using both cross-country and administrative micro-level data, the heterogeneous effects of macro-prudential policies, which have been adopted by more than 60 countries since 1990 (for a review, see Claessens (2015) and Alam, Alter, Eiseman, Gelos, Kang, Narita, Nier and Wang (2019)). We show that households can sometimes manage their leverage in the housing market dynastically, trading off higher leverage for parents with lower leverage for the children. This suggests that focusing on the impact of leverage regulations at the individual household level may give an incomplete picture of the effects of these policy interventions. In line with our results, a recent paper shows an increase in parents mortgage co-signing in response to booming house prices and macroprudential policies in Canada (Allen, Carmichael, Clark, Li and Vincent (2024)).

[9] A notable exception is Blickle and Brown (2019) who uses intra-family deaths as an instrument for the exogenous receipt of wealth transfers. While important, this approach rules out inter-vivos transfers, the objects of analysis in our paper.

2 Data

2.1 Construction of Intergenerational Records in the FRBNY Consumer Credit Panel/Equifax Data

The primary data for our analysis are from the New York Federal Reserve Bank Consumer Credit Panel/Equifax (CCP). The CCP is an individual-level panel dataset that contains detailed records of borrowing on a quarterly basis. The data we use cover the period from 1999Q1 to 2021Q4. The core of the CCP is a five percent random sample of all U.S. consumers with a credit record. These individuals constitute the primary sample. In addition, for each reporting period the CCP has information about individuals who reside at the same address as individuals in the primary sample.[10] Using this information, we link individual records to a household and then use individuals' ages to identify children's and parents' records as we describe below. Despite the need to reconstruct family relationships, the advantage of the CCP relative to survey data is its large sample size and accurate measurement of credit outcomes.

To link children and parents, we combine individual records that correspond to the same mailing address into household records. The earliest age an individual is included in the CCP is typically 18. We refer to the individuals for whom we have records at age 18 as children. We refer to an individual who resides in a household with an 18-year-old child and is at least 36 years old as a parent (at least 18 years older than the "child"). The adult might not be a genetic parent of the child.[11] To decrease the probability of capturing nontraditional living arrangements such as military bases, we restrict our analysis to the individuals who at the age of 18 live in households with at most 10 members. We further restrict the sample to children who at age 18 reside with at most two parents. The resulting dataset contains 1,083,176 records for individuals whom we define to be children. Having identified children

[10] Lee and van der Klaauw (2010) provide an excellent description of the CCP data with additional details.

[11] Ghent and Kudlyak (2016), Dettling and Hsu (2018) use the household dimension of the CCP data to study debt and parental co-residence among young adults.

and their parents from the household identifiers at the time when children are 18 years old, we follow the individual records over time even when children and their parents no longer reside in the same household. While our procedure limits us to children that live with their parents at age 18, a high fraction of young adults do live with their parents at age 18.[12] Admittedly, our data do not contain information on individuals without any credit activity, which likely leads to under-representation of lower-income individuals.

For our analysis that exploits leverage constraints, we rely on the Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data. These dataset matches consumers in the CCP data to mortgage servicing data that allow us to observe an individual's loan-to-value (LTV) ratio at both the loan's origination and contemporaneously as long as the loan is reported in the servicing data.[13] While this match reduces the size of our sample, it allows us to construct an accurate measure of the leverage constraint faced by a borrower in the mortgage market. We also use county-level unemployment rates, employment growth, and wage growth from the Bureau of Labor Statistics. We measure house prices with the Corelogic house price index at the zip-code level.

2.2 Definition of Variables

We classify an individual (parent or child) as a homeowner at time T in the data if one of the following is true for any period $t \leq T$: the number, payment amount, total balance or maximum observed level of mortgage, home equity installment or home equity revolving loans is greater than 0 and takes a non-missing value. If an individual owns the house without ever having had a mortgage and does not have an equity line of credit, our analysis

[12] In 2015, a third of young people, or 24 million of those aged 18 to 34, lived under their parents' roof. (See: https://www.census.gov/library/stories/2017/08/young-adults.html). In 2020, more than half (58%) of adults ages 18 to 24 lived in their parental home. (See: https://www.census.gov/newsroom/press-releases/2020/estimates-families-living-arrangements.html). This percentage is likely to be even higher for 18-years-old, which is the age we pick to identify children and their parents.

[13] The contemporaneous LTV is constructed using county-level house price indexes from Corelogic and the borrower's reported loan balance.

will erroneously classify such individuals as non-homeowners.[14]

We identify equity extractions as instances when a borrower's outstanding mortgage debt increases by more than 5 percent over a one-year period, with a minimum increase of $1,000, as in Bhutta and Keys (2016). Additionally, we group the parents within a household into a single parental entity, aggregating variables if appropriate. If two parents no longer live in the same location, we assign the parental location for their child at random. Thus each child will only have one set of variables representing the aggregated characteristics of at most two parents.

Finally, we construct an annual panel of CCP variables by using data for households from the last quarter of each year. So, any debt balances, for example, are the debt at the end of the reported year. The resulting dataset is an annual panel where the basic unit of observation is a child and all of the child's credit bureau information is tracked along with the relevant variables from the identified parents. Thus, we can observe if parents extract equity and their child's transitions into homeownership.[15]

2.3 Sample Description

Table 1 presents summary statistics for our CCP sample. Panel A shows the summary statistics at the child level. First, only five percent of children are homeowners by the age of 25. The rate of homeownership rises rapidly, with about 16 percent of children having a mortgage by the age of 30. Overall, the children in our sample have an annual probability of becoming a homeowner of about one percentage point. The average child in our sample is 22 years old and has a credit score of 660 (because we observe only younger adults in the most recent cohorts). Conditional on buying, the average value of a new home is about $270,000

[14]The ACS reports that about 63% of homeowners currently have a mortgage, but this does not include the fraction of homeowners who ever had a mortgage, both of which will be captured by our measure. Our measure will also mistakenly categorize people who used to have a home with mortgage debt but who no longer own a home as homeowners.

[15]When we match these data to the loan servicing data, we collect loan variables from the earliest reported month in that calendar year, typically January. We take this approach because we want to minimize the likelihood loan observables from the loan servicing data are missing because a matched loan was paid off earlier in the year while the new loan was not matched to the CCP.

Table 1: Summary Statistics

	Mean	SD	p10	p50	p90
Panel A: Child level					
Homeowner by 25	0.05	0.22	0.00	0.00	0.00
Homeowner by 27	0.09	0.29	0.00	0.00	0.00
Homeowner by 30	0.16	0.37	0.00	0.00	1.00
New Homeowner	0.01	0.11	0.00	0.00	0.00
Age	22.16	4.21	18.00	21.00	28.00
Credit score	659.29	82.67	542.00	671.00	754.00
New home value	270385	284203	105995	214996	475155
LTV at origination	86.27	16.48	69.57	90.23	98.19
Panel B: Parent level					
Homeowner	0.76	0.43	0.00	1.00	1.00
Age	51.93	6.38	43.00	52.00	61.00
Credit score	707.92	105.21	553.00	736.00	821.00
lagged LTV	58.35	31.67	21.43	57.15	93.08
lagged LTV (2 period MA)	59.38	31.10	22.87	58.09	93.87
Equity extraction	0.08	0.27	0.00	0.00	0.00
Extraction amount	5269	41152	0.00	0.00	0.00
Extraction amount (> 0)	72984	136079	7197	32056	176244

Note: Summary statistics for the main variables from the main sample used in the analysis constructed from the FRBNY Consumer Credit Panel/Equifax data as described in the text. Credit score is the Equifax credit score. Extraction amount is the total household extraction amount, where extraction is identified by the change in parents' aggregate mortgage balance.

and the LTV at origination is about 86%.

Panel B of Table 1 shows the summary statistics at the parent level. The average homeownership rate at the parent level is about 65%, which is in line with aggregate statistics for the US population (See also Figure A1 in the Appendix). The average parent in our sample is 52 years old and has a credit score of 708. Conditional on owning a house, the average outstanding LTV is about 60%. About 8 percent of identified parents report extracting equity in an average year, comparable to estimates from Bhutta and Keys (2016) despite our longer window. Conditional on extracting, the average amount extracted is about $74,000, while the median amount is about $33,000.

3 Descriptive Evidence on Intergenerational Homeownership

We begin our analysis by documenting a positive link between parent and child homeownership. First, we examine correlations between homeownership rates of children and the homeownership status of their parents. Figure 1 shows the fraction of children that are homeowners at ages 25, 27, and 30 as a function of the homeownership status of the parents over 2006-2021.[16] The solid lines show the homeownership rate of children whose parents are homeowners, and the dashed lines show the homeownership rate of children whose parents are not homeowners.

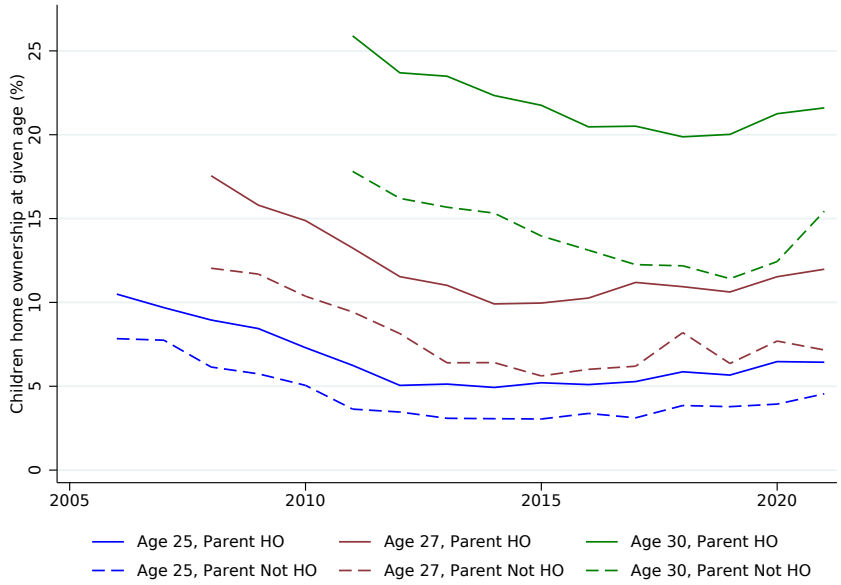
Three patterns emerge. First, homeownership increases with the child's age as shown in Table 1. Second, homeownership rates among young adults have been falling since the housing boom in the early 2000s. In 2006, the average homeownership rate of children at age 25 was about 8-9%, it had fallen to below 5% by 2013. This large decline is consistent with the aggregate patterns for young homeowners more broadly.[17] Third, Figure 1 shows that children of parents who are homeowners are more likely to be homeowners across all age groups and across all years. For example, in 2020 the homeownership rate of 27-years-old children with homeowner parents is more similar to 30-years-old children with non-homeowner parents and about 5-percentage-points higher than children of the same age, but with non-homeowner parents.

We estimate two linear probability models of the relationship between child and parent homeownership using individual-level data. First, we estimate the relationship between children being homeowners at a given age and their parents' homeownership status. This approach is directly comparable to Figure 1 and allows us to quantify the cumulative effect of parental homeownership on child homeowernship. Specifically, we estimate the following

[16] Figure A2 in the Appendix shows the fraction of children that become new homeowners at ages 25, 27, or 30 as a function of the homeownership status of the parents over 2006-2021.

[17] Figure A1 in the Appendix shows home ownership rate for individuals below 35 years old has declined over time in the Census data.

Figure 1: Parent Homeownership Status and Children's Homeownership



Note: The figure shows the fraction of children that are homeowners as a function of the homeownership status of their parents. The solid lines show the average homeownership rate of children whose parents are homeowners. The dash lines show the average homeownership rate of children whose parents are not homeowners. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

linear probability regression:

$$HO_{ialt}^{Child} = \alpha HO_{ialt}^{Parent} + \theta X_{ialt} + \gamma_{lat} + \epsilon_{ialt}, \tag{1}$$

where HO_{ialt}^{Child} is the indicator equal to one if child i of age a living in location l at time t is a homeowner; HO_{ialt}^{Parent} is the indicator equal to one if any of the parents of individual i own a house in period t; X_{ialt} is the vector of children and parental controls; γ_{lat} captures child's location, age and time fixed effects. Our main coefficient of interest is α, which captures the correlation between parents' homeownership and child homeownership. We estimate equation (1) separately for different children's age, pooling across multiple years.

Panel A of Table 2 presents the results for age $a = 25$.[18] In column (1) we show the estimate of the model without any controls. We find a positive and significant relationship between parent and child homeownership. Children whose parents are homeowners have a 1.8 percentage points higher probability of being homeowners than children whose parents are not homeowners. Given the average homeownership rate of about 6% at age 25, the estimate implies that having a homeowner parent is associated with a 30% higher probability of being a homeowner at age 25.

In the remaining columns of Table 2, we control for a variety of factors that can affect homeownership. In column (2) we add year fixed effects and controls for deciles of children and parent credit scores, which proxy for access to credit. We add state and zipcode fixed effects for the child's location in columns (3) and (4), respectively.[19] In column (5) we add interacted fixed effects for year and zip code. Conditional on age, calendar year and living in the same zip code, children whose parents are homeowners are approximately one percentage point more likely to be homeowners than children whose parents are not homeowners, which corresponds to a 16% increase relative to the mean probability of being a homeowner.[20]

Second, we estimate the relationship between children becoming first-time homeowners at an age a and their parents' homeownership status. This flow perspective of homeownership allows us to exploit the timing of transitions into homeownership to identify the effects of equity extraction on those transitions, which we explore in Section 4. We estimate the following specification:

$$NewHO_{ialt}^{Child} = \alpha HO_{ialt}^{Parent} + \theta X_{ialt} + \gamma_{lat} + \epsilon_{ialt}, \tag{2}$$

where $NewHO_{ialt}^{Child}$ is the indicator equal to one if individual i living in location l becomes a

[18] In the Appendix, Table A1, we replicate the analysis at ages 27 and 30.

[19] Previous studies have documented significant variation across US states and zip codes in house prices and affordability, which are key determinants of homeownership (Quigley and Raphael (2004), Saiz (2010)).

[20] Our estimates are in line with the findings of Englund et al. (2014) for Swedish households. Controlling for a rich set of parental and children characteristics, they find that children of homeowner parents are about 10 percentage points more likely to own their own house, which corresponds to a 20% increase relative to an average homeownership rate of 50% in their sample.

Table 2: Intergenerational Homeownership

	(1)	(2)	(3)	(4)	(5)
Panel A: "Stock" model	Dep Var: Child is home owner by age 25				
Parent homeowner	1.834***	1.473***	1.185***	1.037***	0.954***
	(0.163)	(0.225)	(0.158)	(0.119)	(0.157)
Controls (parent age, parent and child credit)	No	Yes	Yes	Yes	Yes
Year f.e.	No	Yes	Yes	Yes	Yes
State f.e.	No	No	Yes	No	No
Zipcode f.e.	No	No	No	Yes	No
Group f.e.	No	No	No	No	Yes
Mean Y	6.02	6.02	6.02	6.02	6.02
Observations	505508	505508	505508	505508	505508
Panel B: "Flow" model	Dep Var: Child becomes home owner at age 25				
Parent homeowner	0.675***	0.329***	0.260***	0.193***	0.157**
	(0.075)	(0.075)	(0.059)	(0.061)	(0.078)
Controls (parent age, parent and child credit)	No	Yes	Yes	Yes	Yes
Year f.e.	No	Yes	Yes	Yes	Yes
State f.e.	No	No	Yes	No	No
Zipcode f.e.	No	No	No	Yes	No
Group f.e.	No	No	No	No	Yes
Mean Y	2.12	2.12	2.12	2.12	2.12
Observations	430076	430076	430076	430076	430076

Note: The table reports the estimates of equations (1) and (2). In Panel A the dependent variable is the dummy equal to one hundred if the individual is a homeowner at age 25 and zero otherwise. In Panel B the dependent variable is the dummy equal to one hundred if the individual becomes an homeowner at age 25 and zero otherwise. Parent homeowner is the dummy equal to one if the parents of the individual are homeowners. Controls are parents age and age squared, and deciles of credit score for both children and parents. Group f.e. are interacted fixed effects for year and zip code. Standard errors are clustered at the state of the parents level. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

homeowner for the first time in period t at age a, and all other variables are as in equation (1). Our main coefficient of interest is α, which captures the correlation between parents' homeownership status and a child's inflow into homeownership.

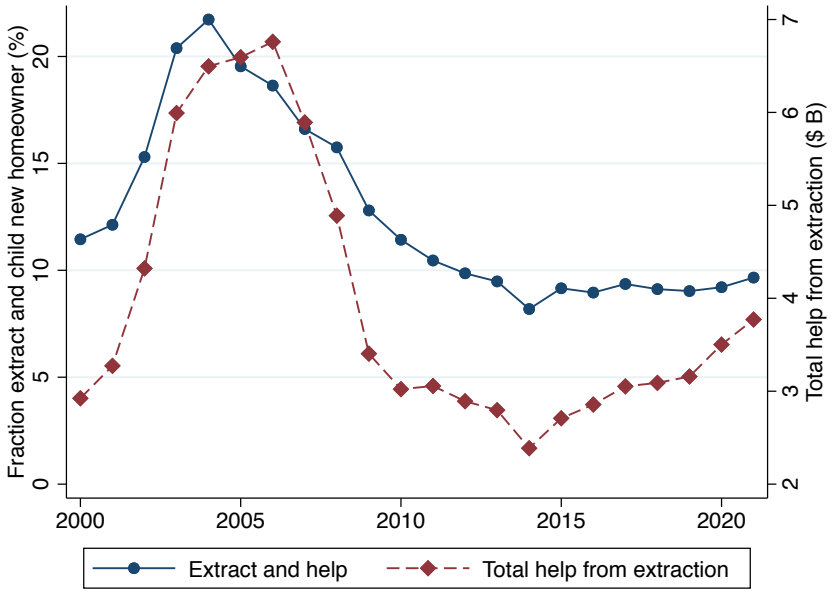
Panel B of Table 2 shows the results of estimating model (2) for individuals becoming first-time homeowners at age 25. In column (1) we show the unconditional estimates. Children whose parents are homeowners have a 0.6 percentage point higher probability of becoming a homeowner than children whose parents are not homeowners. Given the flow rate into ownership of 2.1%, the estimates imply that having a homeowner parent increases the likelihood a child transitions into homeownership by about 30%. The magnitude declines somewhat as we control for other characteristics and location fixed effects. As in Panel A of Table 2, column (5) shows the estimate from the most restrictive specification with interacted fixed effects for year and zip code. Within this more homogeneous group, we find that children whose parents are homeowners have a 0.16 percentage point higher probability of becoming a homeowner than children whose parents are not homeowners, which amounts to an 8% increase relative to the average flow into ownership. Together, these results show that there is a robust correlation in homeownership rates across generations even when conditioning on a broad set of controls.

4 Dynastic Home Equity and Children's New Homeownership

We now turn to studying the effect of parent equity extraction on child homeownership. We begin by presenting results from a linear probability model which relates the probability of a child becoming a new homeowner to the timing of parental equity extraction. We then discuss heterogeneity in the effects of dynastic home equity across a number of dimensions.

Before presenting the regression results, we compute two summary measures to gauge the potential importance of parents' equity extraction for children flow into homeownership. First, we examine the total number of periods in which children become a new homeowner and parents extract equity relative to all periods in which children become new homeowner. Across our sample about 11% of the transitions to new homeownership for a child are associated with parents extracting equity. The solid line in Figure 2 shows this ratio over time. The time series pattern resembles that of aggregate parent equity extraction documented in

Figure 2: Parent Equity Extraction and Children Transition to Homeownership



Note: The solid line shows the ratio of the total number of periods in which children become new homeowner and parents extract equity relative to all periods in which children become new homeowner. The dash line shows ratio of new homeownership that is associated with parents extracting equity (the solid line in the figure), multiplied by the annual frequency of new homeownership and the median amount extracted, and scaled up by the number of adults between 35 and 64 years old. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

previous work (Bhutta and Keys (2016)).[21]

Second, we compute an upper bound on the amount transferred from parents to children via equity extraction each year. We take the ratio of new homeownership that is associated with parents extracting equity (the solid line in Figure 2) and multiply it by the annual frequency of new homeownership and the median amount extracted. We then scale up the number by the number of adults between 35 and 64 years old. We estimate that parents use equity extraction to pass up to $4 billion a year to their children for home purchases.[22] To

[21] Figure A3 in the Appendix shows parent equity extraction over time.

[22] A 2016 survey estimated individuals *total* borrowing from from family and friends for downpayment on a home at almost $70 billion (See https://www.finder.com/americans-borrow-friends-and-family-household-debt).

put this numbers into perspective, given an average down payment by first-time-buyers of about $9,000, parent equity extraction helped the purchase of about 440,000 homes.[23] After the global financial crisis, the annual volumes of sales to first-time-buyers has oscillated around 1.75 million. Hence, parental equity via equity extraction could be contributing to 25% of all first-time-buyers sales.

4.1 Main Result

In this section, we focus on the sample of children whose parents are homeowners and exploit variation in parental equity extraction to study its relationship with children's new homeownership. We estimate the following linear probability model:

$$NewHO_{ialt}^{Child} = \alpha Extract_{ialt}^{Parent} + \theta X_{ialt} + \gamma_{lat} + \epsilon_{ialt}, \tag{3}$$

where $NewHO_{ialt}^{Child}$ is the indicator of whether individual i living in location l becomes a homeowner for the first time in period t at age a; $Extract_{ialt}^{Parent}$ is the indicator equal to one if any of the parents of individual i extract equity from the house in year t;[24] and all other variables are as in equation (1). We also estimate a version of (3) with children fixed effects, to capture all unobservable time-invariant children-level characteristics. Our main coefficient of interest is α, which captures the correlation between recent parental equity extraction and children transitioning into homeownership.

Table 3 presents the results. In column (1), we show the unconditional correlation between parental equity extraction and the child's transition rate into homeownership. Children whose parents extract equity are about 0.46 percentage point more likely to become a homeowner in the subsequent period relative to children whose homeowner parents do not extract equity. Given the average flow into ownership rate of about 1 percentage point, having a parent who extracts equity increases the probability a child becomes a homeowner by about 46%. The effect is robust to adding controls for child and parent characteristics

[23] See: https://www.self.inc/info/first-time-homebuyer-statistics/.

[24] Specifically, we check if the parent extracted equity in the period between between $t-1$ and t.

Table 3: Parental Equity Extraction and Children's Probability of Becoming a Homeowner

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parent Equity Extraction	0.457***	0.597***	0.613***	0.617***	0.626***	0.600***	0.606***
	(0.059)	(0.064)	(0.063)	(0.028)	(0.018)	(0.073)	(0.080)
Year F.E.	No	Yes	Yes	Yes	Yes	No	No
Child State F.E.	No	No	Yes	No	No	No	No
Child County F.E.	No	No	No	Yes	Yes	No	No
Child Zipcode F.E.	No	No	No	No	No	No	No
Group F.E.	No	No	No	No	No	Yes	No
Child F.E.	No	No	No	No	No	No	Yes
Age F.E.	No	Yes	Yes	Yes	Yes	No	Yes
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Mean Y	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Observations	3978941	3978941	3978941	3978941	3978941	3978941	3969759

Note: The table shows the estimates of equation (3) in the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parents age and age squared, lagged deciles of credit score for both children and parents, and 3-year parent-county home price growth. Group f.e. are interacted fixed effects for year, children age, and zip code. Standard errors are clustered at the state of the parents level. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

and granular fixed effects for locations.

In column (6), we estimate equation (3) with interacted fixed effects for year, age and zip code. Within these more homogeneous groups, we find that children whose parents extract equity are 0.60 percentage point more likely to become a homeowner than children whose homeowner parents do not extract equity, slightly larger than the unconditional estimate in column (1).

Finally, in column (7) of Table 3 we show the results of a specification with children fixed effects. This way we control for all observable and unobservable characteristics at the child level and only exploit the variation jointly across children and over time in parent equity extraction and transition into homeownership. We find that children whose parents extract equity are 0.60 percentage point (or 60% relative to average flow into homeownership) more

likely to become a homeowner than children whose homeowner parents do not extract equity, almost identical to the estimates in column (6).[25]

4.2 Heterogeneity Analysis

We re-estimate our baseline regression given by equation (3) within each of several splits of the full sample based on children's, parents' and joint characteristics to help illuminate when and for whom dynastic home equity appears to be an important mechanism for homeownership. We summarize and discuss the results using Table 4 in the main text and report more details in Appendix B.

Children-related characteristics. Columns (1) to (4) in Table 4 report the result splitting by children characteristics. First, we explore if the importance of equity extraction varies with the number of siblings in the family. Intuitively, if there are multiple children present in the family, then the same amount of home equity will be less useful for helping transition into homeownership. We classify children as an only child, a child with one sibling, and a child with more than one sibling. We find that only-children and children with one sibling have similar estimates of the effects of equity extraction on new homeownership. However, children with more than one sibling in the household show a much smaller relationship between equity extraction and child homeownership, despite the fact that transitions to homeownership occur at about the same rate for all groups. This suggests that housing wealth is less helpful for financing homeownership for children to the extent that it becomes spread across larger numbers of children.

Second, we study how the role of parental equity extraction changes with the age of the child by splitting the sample into three groups: when children are younger than 26, between

[25]The magnitudes of our estimates are larger than the ones from previous work that studies intergenerational transfers. For example, Lee et al. (2020), using US survey data, find that young adults between 25 and 44 year old who receive a transfer of over $5000 from their parents are about 15% more likely to buy a home. Our larger effect may be due to our focus on younger adults - 18 to 35, for whom parental help may be even more important. Guiso and Jappelli (2002) study Italian households and find that the average transfer to recipients increases the hazard rate of becoming a homeowner by about 20% relative to the mean. Blickle and Brown (2019) study Swiss households and find that receipt of a wealth transfer increases the propensity of consumers to transition from renters to homeowners by about 35% relative to the mean.

26 and 30, and older than 30. Scaling the point estimates by the mean transitions into homeownership, we find that parent equity extraction is relatively more important when children are younger. The ability to access financing via parent equity extraction being relatively more important for younger children is consistent with these children likely having less savings available for a downpayment.

Third, we split counties into quartiles based on the median house price at the children's location. Estimated effects are large and positive across all of the subsamples, but increase with the price of housing. This shows that access to parental home equity may become important as housing becomes more expensive and children are more likely to be constrained by downpayment requirements.

Finally, we look at different measures of children's access to and usage of credit. We find that parent equity extraction is relatively more important for children with lower credit card limit and relatively lower credit card utilization. We do not find a clear pattern with respect to children credit score. These results suggest that parents' help through equity extraction plays a similar role for children irrespective of their access to and usage of credit.

Parent-related characteristics. Columns (5) to (8) in Table 4 report the result splitting by parent characteristics. First, we find that for parents with one or two children the effect of equity extraction on the probability to become homeowner is similar. Similarly, for parents with more than two children the effect drops from about 60% of the average flow to about 40%, echoing the results for children with many siblings.[26]

Second, scaling the point estimates by the mean transitions into homeownership, we see that the effect of parent equity extraction is stronger when parents are younger. Hence, while parent of different ages are likely to help their children to buy a home, the source of parents help varies across the life cycle. Younger parents are more likely to extract equity from their home to help their children, while older parents may rely on additional savings or other form of non-housing wealth.

Third, we split counties into quartiles based on the median house price for parents'

[26]Note that these results will not be identical due to split households.

Table 4: Heterogeneity Across Children and Parents

	Children				Parent			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Number of siblings/children	1	2	>2		1	2	>2	
Parent Equity Extraction	0.580***	0.625***	0.414***		0.585***	0.613***	0.422***	
	(0.031)	(0.039)	(0.063)		(0.031)	(0.039)	(0.058)	
Scaled effect	0.58	0.62	0.42		0.59	0.60	0.42	
Age group	<26	26-30	>30		<46	46-60	>60	
Parent Equity Extraction	0.558***	1.493***	1.573***		0.673***	0.748***	1.126***	
	(0.033)	(0.117)	(0.227)		(0.103)	(0.044)	(0.157)	
Scaled effect	0.91	0.54	0.54		1.39	0.64	0.58	
House value quartiles	1	2	3	4	1	2	3	4
Parent Equity Extraction	0.486***	0.486***	0.623***	0.696***	0.485***	0.505***	0.595***	0.698***
	(0.035)	(0.036)	(0.047)	(0.064)	(0.035)	(0.037)	(0.047)	(0.065)
Scaled effect	0.468	0.468	0.604	0.775	0.463	0.490	0.579	0.775
Fico Score quartiles	1	2	3	4	1	2	3	4
Parent Equity Extraction	0.287***	0.328***	0.498***	1.247***	0.225***	0.467***	0.595***	0.985***
	(0.029)	(0.029)	(0.032)	(0.071)	(0.031)	(0.037)	(0.038)	(0.055)
Scaled effect	0.599	0.621	0.577	0.578	0.324	0.486	0.561	0.765
Credit limit quartiles	1	2	3	4	1	2	3	4
Parent Equity Extraction	0.225***	0.358***	0.565***	1.268***	0.290***	0.577***	0.584***	0.788***
	(0.017)	(0.043)	(0.036)	(0.076)	(0.039)	(0.043)	(0.035)	(0.047)
Scaled effect	0.734	0.749	0.688	0.507	0.360	0.551	0.546	0.729
Credit usage quartiles	1	2	3	4	1	2	3	4
Parent Equity Extraction	0.308***	1.167***	0.914***	0.741***	0.649***	0.745***	0.531***	0.384***
	(0.019)	(0.232)	(0.056)	(0.043)	(0.050)	(0.046)	(0.038)	(0.067)
Scaled effect	0.713	0.673	0.528	0.547	0.616	0.651	0.522	0.487

Note: The table shows the estimates of equation (3) for children whose parents are homeowners and splitting the sample according to different children and parents characteristics. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are as in Table 3. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

location. Estimated effects are large and positive across all of the subsamples, but increase monotonically with the price of housing. This result resembles the same split based on children location, suggesting that common location choices of parents and children could play a role.

Finally, we look at different measures of parent access to and usage of credit. We estimate a large effect of parental equity extraction for parents with higher credit limit, lower credit usage, and higher credit score. All the results point to an important role of access to credit for parents to be able to help their children. The difference in the heterogeneity between children and parents on the credit score is informative. While all children benefit similarly from parental help irrespective of their credit conditions, parents with low credit scores, lower credit limits and higher credit utilization seem to have a more limited ability to help than parents with high credit scores and limits and lower utilization.

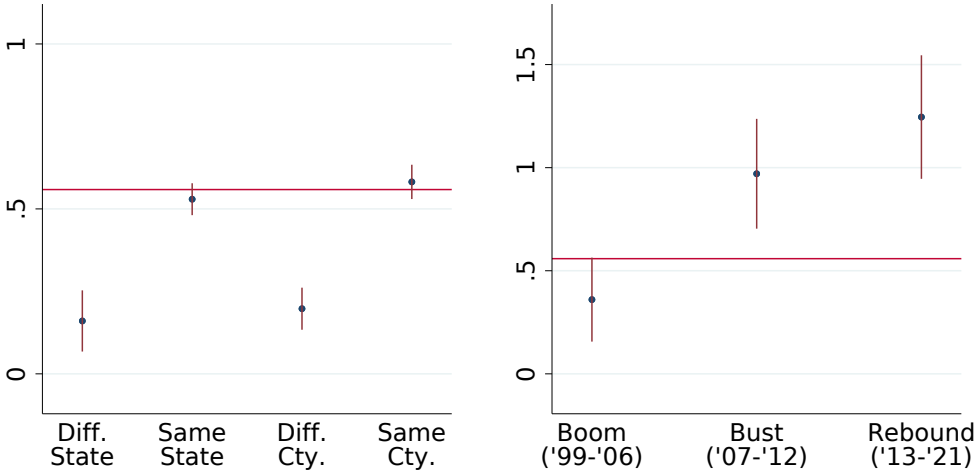
Heterogeneity across space and time. We also study the impact of dynastic home equity: (i) across parent and child locations; and (ii) over time—during the boom, bust and rebound period of the 2008 housing crisis. Figure 3 shows the results.

We find that the effect of dynastic home equity is weaker for children living in different counties (states) from their parents. Children moving to different counties (or states) could be more economically successful and financially independent, thus distance reduces the demand for parents' help. Similarly, parents might be more willing to extract equity from their own home to help children buy if their children decide to live close to them. Distance then reduces the supply of parental help.

Finally, we split our sample into three periods based on the recent housing cycle: boom (pre-2007), bust (2007-2012), and recovery (post-2012), following Chodorow-Reich, Guren and McQuade (2021).[27] We find that dynastic home equity matters relatively less in the pre-2007 boom period, when credit was abundant and low-downpayment mortgages widely available (Mian and Sufi (2011)). The scaled effects show that parent equity extraction

[27]We re-estimate our baseline regressions (equation (3)) within each of these period and also fixing the age of the children, to separate the effect of time-series variation from child's cohort effect.

Figure 3: Heterogeneity Across Space and Over Time



(a) Distance (b) Business Cycle

Note: The figure shows the estimates of equation (3) for different sample splits based on children and parents location and the time of mortgage extraction and flow into homeonwnership. We report the point estimates and 95% confidence interval on the coefficient α that captures the effect of parent equity extraction divided by the average flow into homeownership in each subsample. The solid red line shows the estimate of α in the full sample divided by the average flow into homeownership in the full sample. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

became more important for child homeownership after the housing bust, perhaps as a result of the tightening in credit standards following the crisis. Dynastic home equity has continued to play an important role in recent years, as increases in house prices (relative to income) have reduced housing affordability for young adults and credit standards have remained high.

Overall, our heterogeneity analysis suggests that dynamic home equity is particularly important when: (i) affordability is worse because of high house values; (ii) financial constraints are more likely to be binding for the children whether for macroeconomic reasons (like the financial crisis) or because children are too young to have accumulated substantial assets for down payment; and (iii) parents have access to credit (higher credit card limits and credit scores, and lower credit card utilization) but they are likely too young to have sufficient other means to help their children.

5 Dynastic Home Equity: Alternative Empirical Strategies

Our analysis of Section 4 shows a statistically significant and economically large relationship between parental equity extraction and the probability that their children become homeowners. While equity extraction is nominally a decision by the parents, it may still be correlated with unobservable variables that also affect children's homeownership decision. Suppose, for example, that parents with higher saving propensities are more likely to extract equity and they are also more likely to invest in a child's education. Both of these channels would affect the child's future income and propensity to buy a house. In this case our estimates of the effect of parent equity extraction in Table 3 will be biased upward. On the other hand, the direction of causation between saving propensity and equity extraction is not obvious. Parents with higher saving propensity might be less likely to extract equity, but still more likely to invest in children education. In this case our estimates will be biased downward. At the same time, potentially many equity extraction events may happen to occur at the same time the child buys a home but have nothing to do with helping the child purchase the home. These kind of events would tend to bias our estimate down and threaten its causal interpretation.

For these reasons, in this section we test the robustness of our results using alternative empirical strategies to validate the causal interpretation of the estimate: (i) an event study of parental equity extraction and children transitions to homeownership; (ii) a local projection based difference-in-differences approach; and (iii) an instrumental variable strategy.[28]

5.1 Event Study

We estimate a version of our linear probability model given by equation (3) with leads and lags for parent's equity extraction. We focus only on the sample of parents who extracted equity during our sample period to restrict the comparison to a more homogeneous group

[28]We also employed a propensity score matching estimated to try and account for any non-linear effects from covariates on the likelihood to extract equity. These results are reported in Online Appendix C.

of parents. This allows us to test more directly if the timing of parental equity extraction coincides with the timing of children becoming homeowners or if children whose parents extract equity tend to exhibit higher homeownership rates in general. We estimate the following model:

$$NewHO_{ialt}^{Child} = \sum_{k=-K}^{K} \alpha_k Extract_{ialt+k}^{Parent} + \theta X_{ialt} + \gamma_{lat} + \epsilon_{ialt}, \tag{4}$$

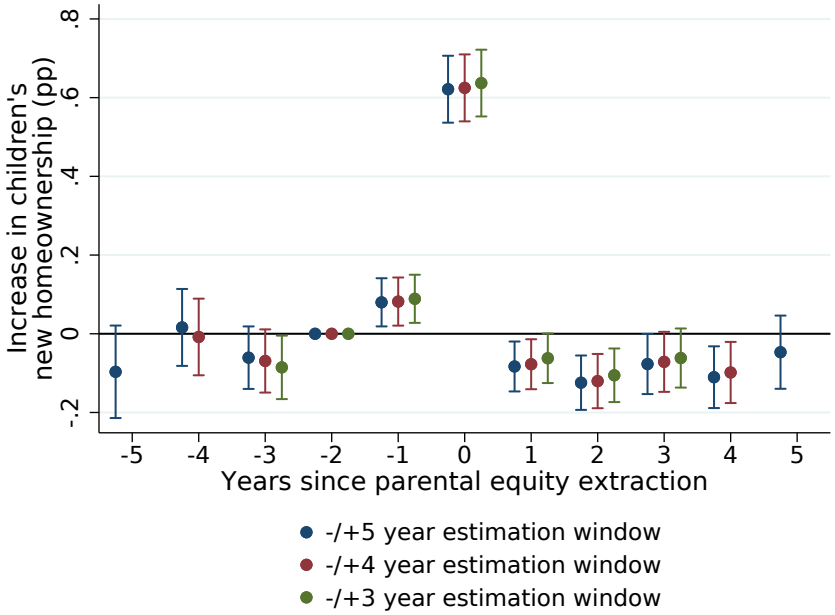
where $Extract_{ialt\pm k}^{Parent}$ is the indicator equal to one if any of the parents of individual i extract equity from the house in year $t + k$; and all other variables are as in equation (3). We set the period two-years prior to equity extraction as the omitted category, so all estimates can be interpreted as relative to the two years before we measure the extraction event.

We plot the coefficients α_k in Figure 4, for different intervals around the event ($K = 3, 4, 5$). We find that the child's transition to homeownership is only positively and statistically significantly associated with parental equity extraction in the same or preceding year.[29] The coefficients on the equity extraction in years surrounding the extraction event do not exhibit any pre-trend. At 0.6 percentage point, the effect on homeownership in the year when parents extract equity is comparable, if anything slightly larger, to that from column (6) of Table 3.

Finally, we explore if the higher flow into homeownership following parental equity extraction shown in Figure 4 is simply frontloading homeownership that would have occurred in the subsequent years. Table A2 in the Appendix shows the difference for each year after the parent equity extraction between the predicted child homeownership and the counterfactual in the absence of parent equity extraction. We find that half of the effect of parent equity extraction is still present three years after the extraction, and about a third of the effect persist five years after the event, consistent with some short-term front-loading but

[29] The slight increase in the year prior to equity extraction may just reflect the noise in estimating mortgage payoffs and equity extraction relative to new mortgages. We only record a cash out refinance once the credit bureau mortgage balances have been updated, which can often be several months after the extraction event took place.

Figure 4: Dynastic Home Equity - Event Study



Note: The figure shows the coefficients α_k^{lag} and α_k^{lead} estimated from equation (4) for $K = 3, 4, 5$ along with the 5th and 95th percentiles of estimates. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

mostly with a large and persistent increase in homeownership. Interestingly, the effect we document of parents' equity extraction on children transition into homeownership resembles both in magnitude and persistence the response of new homeownership to the First-Time Home-buyer Credit (FTHC) policy studied by Berger et al. (2020).[30]

Overall, the sharp timing of our estimated effects is strong evidence in favor of parental equity extraction having a direct effect on the child's transition into homeownership. For example, a correlation between parental propensity to extract equity and children's propensity to save and buy a house would be consistent with a positive average correlation between parent extraction and children new homeownership, but it would not imply the sharp timing we observe linking the two events. However, several concerns remain. First, this event study

[30]Berger et al. (2020) estimate that receiving the FTHC increased the likelihood of becoming a first-time homeowner by over 50% and that the effect on demand came from several years in the future.

approach may be subject to concerns about weighting since it is a setting with staggered treatments (Goodman-Bacon (2021) and De Chaisemartin and d'Haultfoeuille (2020)). Second, there still might be some mechanism jointly inducing parents to extract equity at the same time that their children buy a house. We address both of these concerns next.

5.2 Local Projection Difference-in-Difference

We follow recent developments in the difference-in-differences literature and estimate the effect of parent equity extraction on child homeownership using a local projection based difference-in-differences approach (LP-DiD in Dube et al. (2023)). In our setting the timing of the treatment (parent equity extraction) is staggered and the treatment effect can differ across groups of parent-child pairs, which might expose our estimates to the negative weight bias discussed in the literature.

We estimate the effect of parent extraction using the following LP-DiD specification:

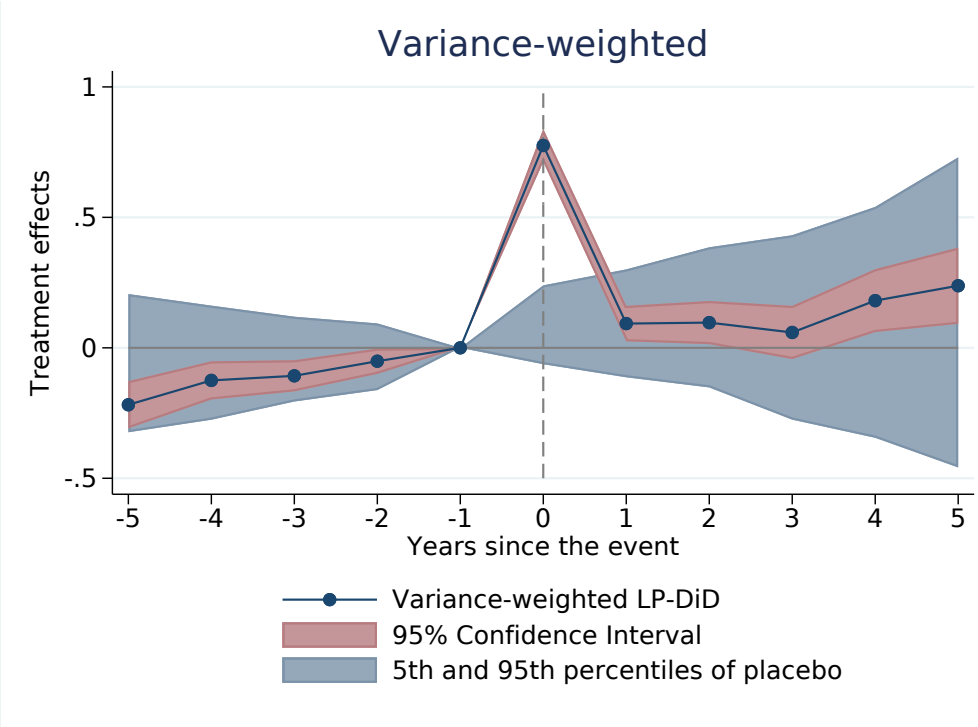
$$NewHO^{Child}_{ialt+h} - NewHO^{Child}_{ialt-1} = \alpha_h^{LP-DiD} Extract^{Parent}_{ialt} + \theta X_{ialt} + \gamma_{lat} + \epsilon_{ialt}, \tag{5}$$

restricting the sample to observations that are either treated in the current period or not treated as of the current period:

$$\begin{cases} \text{treatment:} \quad Extract^{Parent}_{ialt} = 1 \\ \text{control:} \quad Extract^{Parent}_{ialt+h} = 0. \end{cases} \tag{6}$$

This is called a "clean control" condition and it uses only untreated children as controls. While it is feasible to incorporate repeated treatments in this framework, we would need to specify the dynamic horizon of the treatment effect. Since the sample of children only treated once (or never) is very large, we do not lose much by dropping the repeated treatment sample. Also, child homeownership is likely to be an absorbing state, so the effects of repeated treatments are likely to take place on the intensive margin (such as house size), which we only observe for a smaller subsample.

Figure 5: Dynastic Home Equity - Local Projection



Note: The figure shows the coefficients α_h^{LP-DiD} from equation (5) along with the 5th and 95th percentiles of estimates from the placebo samples. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

Figure 5 reports the results by plotting the variance-weighted average treatment effect on the treated (ATT), which corresponds to the α_h^{LP-DiD} from (5). The estimates show a positive and large effect of parents' equity extraction on the probability of child transition into homeownership. The estimated effect of parent equity extraction is very precise and the magnitude is even larger than in Table 3 and Figure 4 with parental equity extraction associated with a 0.8 percentage point increase in the likelihood of the child becoming a new homeowner. This suggests there was some scope for a downward bias in the OLS weighting of the event study estimates.

To check if the correlation we find is spurious, we perform a simple placebo robustness exercise. When a child is 18 we randomly match them with a new parent living in the

same state and with a credit score in the same quintile as their actual parent in that same year. We do this for all of the children we can match and then re-estimate our specification 500 times. For every horizon we then plot the 5th and 95th percentiles of the estimated coefficients from these 500 samples in the shaded blue region in Figure 5. These placebo estimates show that our estimated effect at time zero are far beyond what would be expected from random correlation between children and parents with similar characteristics. The coefficients for periods other than the impact time are well-within the range one would expect from completely spurious variation. Together, these results suggest the large estimate of equity extraction on new homeownership at the time of impact is likely causal.

5.3 Instrumental Variable

Our results exploiting the timing of equity extraction suggest that our estimates are causal, but there are still risks to this interpretation. For example, assume that the age when a child buys a home is independent of parental help, but if parents have available equity then they extract it so that the child can purchase a larger house. In this hypothetical scenario, the true causal effect of equity extraction on the likelihood of becoming a homeowner is zero by assumption, but we would still estimate a positive relationship. Here we address this and related threats to our causal interpretation by adapting to our context an identification approach from the literature on the refinancing channel of monetary policy (Bhutta and Keys (2016), Di Maggio et al. (2017), Beraja et al. (2019), Abel and Fuster (2021), Agarwal et al. (2023)).

Specifically, we isolate plausibly exogenous variation in parental equity extraction by exploiting the collapse in credit supply at the onset of the GFC and its differential impact on parents with different levels of leverage. From 2004 to mid-2007, equity extraction rates were high, buoyed by high levels of home equity and easy access to credit even for borrowers with relatively high leverage. However, in mid-2007 the private-label mortgage-backed securities (MBS) market began to collapse in earnest, accompanied by the beginning of the decline in

house prices (Justiniano, Primiceri and Tambalotti (2022), Mian and Sufi (2022)).[31] After this point credit supply and equity extraction contracted sharply (Bhutta and Keys (2016), Mondragon (2018)). Critically, access to home equity was particularly tight for borrowers with low levels of home equity (Beraja et al. (2019)). Hence, we use the parent's predetermined leverage combined with the sudden collapse in credit supply as an instrument for parental equity extraction.

This identification approach rests on several assumptions. First, that the collapse in credit supply differentially affects access to equity extraction for low-equity parents relative to high-equity parents. This ensures that our variation is relevant for our first-stage outcome. Second, trends in the child's demand for homeownership are uncorrelated with the parent's LTV before and after the collapse in credit supply. This assumption allows us to use parents with high levels of equity to generate a counterfactual for parents with low levels of equity. Third, the only change in how a parent's LTV affects the rate of child new homeonwership after the crisis is through the change in the parent's equity extraction. This exclusion restriction assumption ensures that the entire effect we observe is actually due to the channel of interest: the decline in parental equity extraction used to help children finance a home.

We first provide some simple graphical evidence in support of these assumptions using our sample of children and parents, but now drawn at the quarterly frequency to better examine the trends. Panel (a) of Figure 6 shows regression-adjusted parent equity extraction rates from 2005 until the end of 2012 for parents with high equity (top tercile) and low equity (bottom tercile) as measured by their loan-to-value ratio one year earlier. Equity positions and extraction rates are likely to vary for demographic reasons like age and credit scores, so to isolate the interaction of leverage with the change in credit supply we regress parent equity extraction on risk score deciles, child age fixed effects, and quarter fixed effects. We then subtract the average of each group's residuals estimated from 2005Q1 to 2007Q2 to normalize the levels to be roughly zero in the pre-shock period. This procedure does not

[31] Figure 2 from Justiniano et al. (2022) shows that the private-label MBS market was very thin outside of the period 2000 to mid-2007, which corresponds to the most intense phase of the housing boom.

affect any trends before or after the crisis since it simply adjusts the levels within each group. The two groups of parents display remarkably similar trends with parallel spikes and troughs in extraction rates up until mid-2007. After 2007 all borrowers become significantly less likely to extract equity, but low equity borrowers are four percentage points less likely to extract equity, compared to high equity borrowers, who are about two percentage points less likely to extract equity. After opening up, the gap in equity extraction presists through at least 2012, which is when house prices start to recover. These patterns confirm that a parent's predetermined leverage was uncorrelated with trends in extraction before the crisis, but then more leveraged parents experienced a relatively sharp and persistent reduction in extraction after the contraction in credit supply.

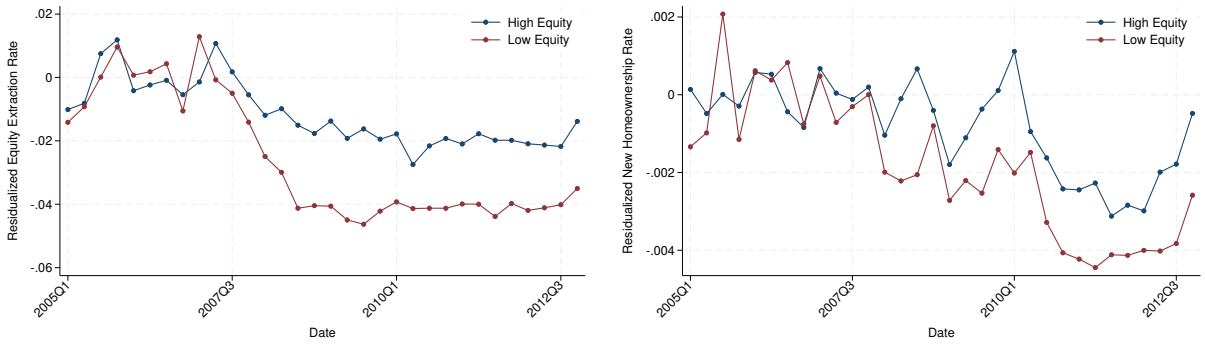
Panel (b) of Figure 6 repeats the same exercise looking at child new homeownership rates. Transitions into homeownership behave similarly for the two groups until about the third quarter of 2007, at which point they start diverging. Children whose parents have relatively low equity become homeowners at lower rates relative to children whose parents have high levels of equity. New homeownership rates decline by about 20 basis points for "high equity" children, and about 40 basis points for "low equity" children. After this gap opens up in 2008, it remains remarkably stable through the end of 2012. Apart from the opening up of the gap in late 2007, homeownership rates for both sets of children track each other closely before and after the onset of the crisis. This is particularly important because both series exhibit significant volatility with large spikes and troughs, indicating that shifts in the factors driving homeownership affected both sets of children in parallel.

Given these encouraging results, we use the variation from Figure 6 to generate an instrument for equity extraction at the parental level. The first-stage regression of our instrumental variable approach is given by:

$$Extract_{ialt}^{Parent} = \beta \overbrace{Post_t \times Available\ Equity_{ial}}^{Excluded\ instrument} + \theta X_{ialt} + \gamma_{lat} + \epsilon_{ialt}, \tag{7}$$

where $Post_t$ is a dummy equal to one after the second quarter of 2007; $Available\ Equity_{ial}$ is

Figure 6: Parental Equity Extraction and Children's New Homeownership



(a) Parent Equity Extraction

(b) Child New Homeownership

Note: The figures shows residualized parent equity extraction (a) and children new homeownership (b) over time. We regress each dependent variable on risk score, age, and quarter fixed effects for the entire sample and then subtract the 2005Q1-2007Q2 average of the residuals from each group to rebase the data to zero in the pre-period. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data and the Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data.

the one-year lagged LTV as a measure of available equity of the parents of children i; and all other variables are as in equation (3) with the additional inclusion of $Available\ Equity_{ial}$ and the post indicator as additional controls. Thus, we are only treating as exogenous the change in equity extraction coming from the change in how the parent's equity matters after the onset of the crisis. We present the results with both a continuous version of the exposure measure and a dummy version comparing the bottom tercile of equity access relative to others, which follows the specification in Beraja et al. (2019).

Distinct from the literature on the refinancing channel of monetary policy, which studies household consumption and default, our main outcome variable is the parent's "investment" in their child by helping to finance their first home. The second stage is then given by:

$$NewHO_{ialt}^{Child} = \alpha \widehat{Extract}_{ialt}^{Parent} + \theta X_{ialt} + \gamma_{lat} + \epsilon_{ialt}, \tag{8}$$

where $\widehat{Extract}_{ialt}^{Parent}$ is the instrumented parent equity extraction following equation (7).

Table 5 reports the results. In column (1) we report the OLS estimate of equation (3).

We include county and date fixed effects in all specifications to control for date- and county-specific trends that might be important for equity extraction and homeownership. The magnitude of the coefficient on parent equity extraction is similar to the full sample in Table 3, especially when adjusted for the shift from annual to quarterly frequency. It need not exactly match the full sample as we restrict the sample of analysis only to households where parents have LTV data, which reduces the sample significantly. Column (2) reports the estimates of the first stage using the one-year lag of the parent's LTV. We find that parents with less available equity (a higher LTV) are less likely to extract home equity after the onset of the crisis, in line with Figure 6. The point estimate is highly statistically significant and large in magnitude. In terms of magnitudes, moving from no leverage to 100% leverage implies about a five percentage point decline in the probability of extracting equity.

In column (3) we report the reduced-form relationship between our instrument and child new homeownership and find a very precisely estimated negative relationship. Children whose parents have high levels of leverage become less likely to transition to homeownership after the onset of the financial crisis. Notice that this effect is distinct from the effect of having parents with high leverage in general since that is controlled for directly. In column (4) we report IV estimate of the effect of equity extraction on child new homeownership. These estimates are statistically significant and large in magnitude. We find that parent equity extraction increases the likelihood that their children buy their first home by about 3.7 percentage points. Columns (5) to (7) repeat the analysis with the binary treatment and demonstrate that the results are robust to this alternative specification.

There are a number of potential reasons for the large difference between the OLS and IV point estimates. One possible explanation is that the larger IV estimate highlights the role of endogeneity in the OLS estimates.[32] Thus, the instrumental variable approach suggests that if anything our estimates from Table 3 are biased downward.

Alternatively, it may be that focusing on how variation in access to equity mattered

[32]Similar to our context, Blickle and Brown (2019) find that instrumenting for wealth transfer using family death increases the propensity of consumers to transition from renters to homeowners following a wealth transfer by about four times.

Table 5: Dynastic Home Equity - Instrumental Variable

	OLS	FS	RF	IV	FS	RF	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parent Equity Extraction	0.515***			3.706***			4.196***
	(0.041)			(1.255)			(1.585)
Post * Lagged LTV		-0.049***	-0.183***				
		(0.004)	(0.060)				
Post * Low Equity					-0.025***	-0.105***	
					(0.002)	(0.038)	
Post F.E.	No	Yes	Yes	Yes	Yes	Yes	Yes
Lagged LTV F.E.	No	Yes	Yes	Yes	No	No	No
Low Equity F.E.	No	No	No	No	Yes	Yes	Yes
County F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Y	0.39	0.05	0.39	0.39	0.05	0.39	0.39
Observations	1117824	1117824	1117824	1117811	1117824	1117824	1117811
F Statistic				137.16			124.80

Note: The table shows the estimates of equation (8) in the sample of children whose parents are homeowners. The dependent variable in columns (1), (3), (4), (6) and (7) is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. The dependent variable in columns (2) and (5) is a dummy equal to one if the parent extract equity in the current year. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Lagged LTV is the parent's LTV from one year earlier. Low Equity is a dummy equal to one if the parent's lagged LTV is on the top tercile. Column (1) reports the OLS estimates; columns (2) and (5) the first stage estimates; columns (3) and (6) the reduced form estimates; and columns (4) and (7) the instrumental variable estimates. Controls are parent's age and age squared, lagged deciles of credit score for both children and parents, child age fixed effects, and 1-year parent-county home price growth, the unemployment rates in the child and parent locations, and 1-year growth in wage and employment growth in child and parent locations. Standard errors are clustered at the state of the parents level. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data and the Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data.

across the crisis isolates a particular segment of the population for whom parental equity is extremely important for childrens' transitions into ownership. As a result, the local average treatment effect (LATE) that our IV recovers is different from the average effect estimated by OLS for the entire population. To investigate this possibility we compute the fraction of

parents' equity extraction events that are associated with child new homeownership during our estimation window. Figure A4 shows that extraction events from parents with low equity are five times more likely to be associated with a child's transition into homeownership relative to parents with much higher levels of equity. About one percent of extraction events of parents in the top quintile of the LTV distribution may be for helping a child with a home purchase, which is more than twice the rate of parents with an LTV in the fourth quintile, and about five times the rate of parents with an LTV in the bottom quintile. Parents with a lot of available equity may use it for a number of purposes (for example, consumption or renovation), while parents with limited available equity may prioritize helping their children with a first home purchase. So when access to equity for high-leverage parents declines in the crisis, it pushes out exactly those parents and children who are likely to depend on the dynastic equity channel, resulting in a large LATE.

As a simple back-of-the-envelope calculation of the potential macroeconomic impact of this mechanism, we ask how much of the total decline in new homeownership rates for children from low-equity parents can be explained by the decline in access to equity extraction. Our residualized estimates of the transition rate into new homeownership from Figure 6 show that homeownership for children from low-equity parents declined by about 40 basis points after the crisis. We calculate the total effect of the loss of access to equity by combining the point estimate of about four percentage points for the effect of equity extraction on the probability of becoming a new homeowner (columns (4) and (7) from Table 5) with a differential decline in extraction of two percentage points for parents with low equity (column (5)). This generates a decline in new homeownership of about eight basis points, which accounts for about 20% of the overall decline in new homeownership for children of low-equity parents. This decline in homeownership among children from relatively lower-income families may have had important implications for lifetime wealth considering that they were less able to buy housing exactly at the moment when house prices were historically low. This mechanism also suggests that house price declines may amplify declines in the demand for housing to the extent that some housing demand depends on the ability to leverage existing equity.

6 Dynastic Home Equity: Additional Channels

The analyses in Sections 4 and 5 focus on the effect of parents equity extraction on the probability of children becoming new homeowners. In this section, we explore other effects of parents equity extraction on the child's housing decision beyond the extensive margin. Specifically, we focus on children who bought a house and study how variation in parent equity extraction is associated with children's leverage at origination and with different proxies for housing match quality. In Online Appendix D, we also report additional results on children's age at origination.

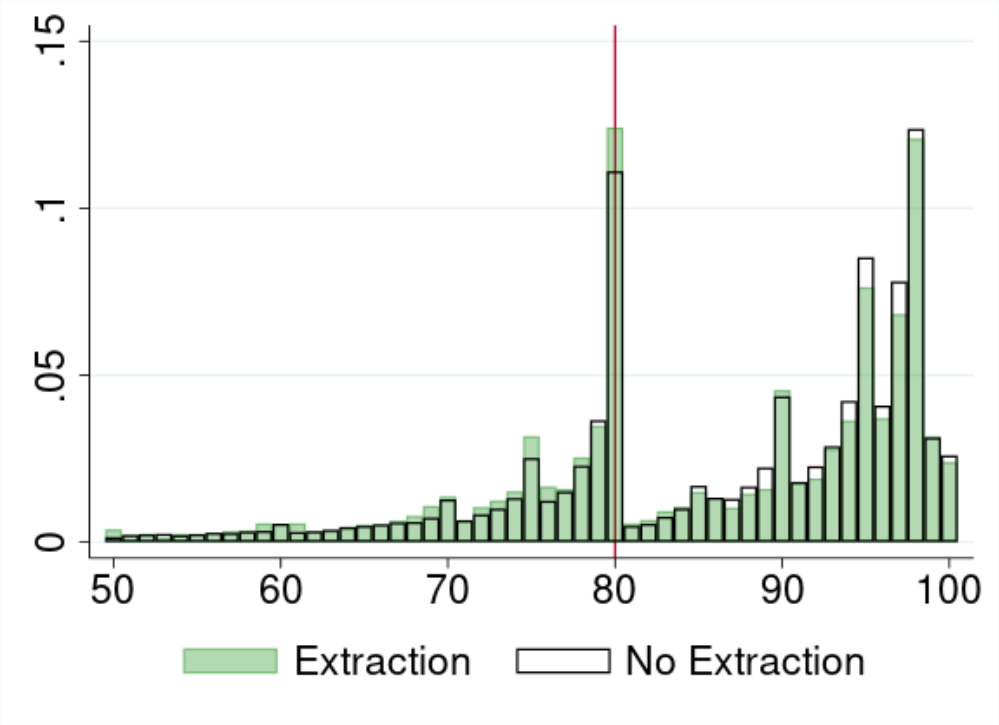
6.1 Parental Equity Extraction and Children's Leverage

One potential implication of our proposed channel is that, conditional on purchasing a home, children receiving help from their parents may be less leveraged than children not receiving help. This contrasts with some other potential explanations of the relationship between children's homeownership and parental equity extraction. For example, if both parents and children experience a booming housing market, it may induce them to leverage housing wealth through equity extraction and new homeownership, which could explain some of the relationship we find in Sections 4 and 5, even absent an inter-vivo transfer from the parents to their children. However, in this alternative explanation we would *not* expect the equity extraction of parents to be associated with less leverage by the children becoming new homeowners.

Figure 7 shows the distribution of the child's LTVs at origination, dividing the sample into children whose parents extract equity and children whose parents do not extract equity at the time of the purchase. The distribution for both children whose parents extract and those who do not display spikes at LTVs equal to 80%, 90%, 95%, and 98%, consistent with these being important underwriting thresholds in the mortgage market.[33] From a visual

[33]This sample is substantially smaller than our other samples as it relies on: (i) the child becoming homeowner; and (ii) the child's mortgage being present in the mortgage servicing data that we use.

Figure 7: Parental Equity Extraction and Children's Leverage



Note: The figure shows the distribution of children's LTV at origination by whether their parents extract equity or not. The green area is the distribution for children whose parents extract equity, and the black-outlined area is the distribution for children whose parents do not extract equity. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data and the Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data.

inspection, children whose parents extract in the year before they become new homeowners tend to have a higher mass at relatively lower LTVs (for example, 80%) than children whose parents do not extract.

We explore this relationship more formally using the following specification:

$$LTV_{ialt}^{Child} = \alpha Extract_{ialt}^{Parent} + \theta X_{ialt} + \gamma_l + \gamma_a + \gamma_t + \epsilon_{ialt}, \tag{9}$$

where LTV_{ialt}^{Child} is: (i) the child's LTV at origination; (ii) the indicator equal to one if the child has an LTV>80%; and (iii) the indicator equal to one if the child has an LTV>70%; γ_l,

Table 6: Parental Equity Extraction and Children's Leverage

	Continuous LTV		LTV> 80		LTV> 70	
	(1)	(2)	(3)	(4)	(5)	(6)
Parent Equity Extraction	-1.712***	-1.522***	-0.051***	-0.044***	-0.025***	-0.023***
	(0.325)	(0.311)	(0.009)	(0.008)	(0.006)	(0.006)
Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Age F.E.	Yes	Yes	Yes	Yes	Yes	Yes
County F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes
Mean Y	86.00	86.00	0.65	0.65	0.90	0.90
Observations	26948	26948	26948	26948	26948	26948
Adjusted R^2	0.11	0.14	0.12	0.16	0.05	0.05

Note: The table shows the estimates of equation (9) for children who become homeowners. Parent equity extraction is the dummy equal to one if a parent extracts equity in the current year. Controls include parent age and age squared, deciles of lagged credit score for both children and parents, unemployment rates for both children and parents, 3yr zip code home price growth for both children and parents, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents. Standard errors are clustered at the parent county level. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data and Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data.

γ_a γ_t are county, age and year fixed effects and all other variables are as in equation (3). We estimate models (9) on the sample of children who become homeowners and whose parents are homeowners.

Table 6 shows the results. Columns (1) and (2) report the results with the child's LTV as the dependent variable. Parent equity extraction is associated with a 1.7 percentage-point lower LTV, controlling for year, age, and county fixed effects. After adding our rich set of additional time-varying controls, parent equity extraction is associated with a 1.5 percentage-point lower LTV, essentially identical to the previous estimate. The effects are statistically significant and correspond to a little more than a 1% reduction in the average child's LTV.

Columns (3) to (6) of Table 6 show the results when using an indicator that the child has

an LTV>80% and LTV>70% as the dependent variable. In our most restrictive specification, we find that parent equity extraction is associated with a 4 percentage point lower probability that the child's LTV is greater than 80%. The effect is statistically significant and, relative to the mean, represents about a 6% decrease in the probability of having leverage greater than 80%. When we repeat the same analysis using the indicator for the child's LTV being greater than 70% as the dependent variable, we find smaller effects. Parent extraction is associated with about a 2 percentage point (or about 3% relative to the mean) lower probability that the child's LTV is greater than 70%.

Overall, the results suggest that parental help allows credit-constrained children to increase their down payment to the "standard" LTV of 80%, above which borrowers are typically required to buy costly mortgage insurance. For this reason popular financial advise websites encourage borrowers to use a 20% down payment.[34] This is consistent with the idea that dynastic home equity is more important for child borrowers that are on the margin of new homeownership, so that the additional equity is needed to qualify for a mortgage with significantly lower payments.

6.2 Parental Equity Extraction and Children's Housing "Quality"

We have shown so far that parental equity extraction increases the likelihood that children become homeowners and, conditional on buying a house with a mortgage, decreases the leverage at origination. We now explore if parental equity extraction also allows children to buy "better" houses, conditional on buying.

We explore this relationship with a specification like the one we used for children leverage in Section 6.1, as follows:

$$Housing\ Quality_{ialt}^{Child} = \alpha Extract_{ialt}^{Parent} + \theta X_{ialt} + \gamma_l + \gamma_a + \gamma_t + \epsilon_{ialt}, \tag{10}$$

[34]For example Nerdwallet suggests: "Try to clear at least the 80% LTV hurdle. Mortgage insurance premiums usually kick in if your LTV is above 80%. If you're close, try to make up the difference so that you clear the 80% mark. You'll save a good deal of money in the long run." (https://www.nerdwallet.com/article/mortgages/loan-to-value-calculator).

where $Housing\ Quality_{ialt}^{Child}$ is: (i) the likelihood that the children move within three years; and (ii) the (log) initial home value; and all other variables are as in equation (9). We estimate models (10) on the sample of children who become homeowners and whose parents are homeowners.

Table 7 shows the results. Columns (1) and (2) report the results using the likelihood that children move within three years as a proxy for housing quality. We find a significant negative effect of parent equity extraction on the probability that the child moves in the three years after becoming a new homeowner. The point estimates are large in magnitude. Parent equity extraction is associated with a 7.5 percentage-point lower probability of moving, which corresponds to about a 20% decline in the average moving probability within three years. While we cannot isolate the exact mechanism with our data, this result is consistent with parents helping children finding a higher-quality match in the housing market. For example, children may buy a home with an extra bedroom, rather than purchasing a smaller starter home and then needing to move up the property ladder a few years later. Thus, parent equity extraction allows children to save on search and transaction costs.

Columns (3) and (4) of Table 7 show the estimates of equation (10) using the log of initial home value. The results without individual controls are imprecise. After adding our rich set of additional time-varying controls and controlling for year, age, and county fixed effects, parent equity extraction is associated with a 4.4% increase in home value. This result again suggests that parents extracting equity are helping their children buy a larger and more expensive home.

7 Implications for the Racial Housing Gap

In this section, we use our estimates to provide back-of-the-envelope calculations of the effect of the dynastic home equity channel on the black-white homeownership gap. A large literature studies the black-white wealth gap in the US and its persistence over centuries (Derenoncourt et al. (2022)). Given the strong historical association between homeownership

Table 7: Parental Equity Extraction and Children's Housing "Quality"

	Moves within 3 years		Log initial home value	
	(1)	(2)	(3)	(4)
Parent Equity Extraction	-7.897***	-7.508***	0.001	0.044***
	(1.030)	(1.053)	(0.011)	(0.010)
Controls	No	Yes	No	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	35.72	35.72	12.28	12.28
Observations	18756	18756	18756	18756
Adjusted R^2	0.02	0.03	0.34	0.47

Note: The table shows the estimates of equation (10) for children who becomes homeowners. Parent equity extraction is the dummy equal to one if a parent extracts equity in the current year. Controls parents age and age squared, deciles of lagged credit score for both children and parents, unemployment rate for both children and parents, 3-year zip code home price growth for both children and parents, 3-year wage growth for both children and parents, 3-year employment growth for both children and parents. Standard errors are clustered at the parent county level. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data and Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data.

and wealth, it is likely that the racial wealth gap is linked to differences in housing wealth (Charles and Hurst (2002)). Recent studies have explored possible mechanisms for the existence of a gap in housing wealth and proposed policies in the housing market to address it (Gupta, Hansman and Mabille (2021); Kermani and Wong (2021)). In addition to its possible contribution to the wealth gap, the black-white homeownership gap is of independent interest, given the importance of homeownership in the US for access to credit and placed-based amenities, such as schools and jobs (Goodman and Mayer (2018)).[35]

We begin with some summary statistics on homeownership by race and age group in Table 8.[36] The average homeownership for white parents (defined as older than 35 years)

[35]The benefits of homeownership have been studied beyond the US context. For example Sodini et al. (2016) show that in Sweden homeownership causes wealth building via house price appreciation, increases consumption and improves consumption smoothing through a collateral effect.

[36]Data are from https://www.federalreserve.gov/econres/notes/feds-notes/disparities-in-wealth-by-race-and-ethnicity-in-the-2019-survey-of-consumer-finances-20200928.htmlfn10.

is about 78%, while the average homeownership for black adults is approximately 53%. Average homeownership for white young adults (defined as up to age 35) is about 46%, while for black young adults it is only 17%. Hence, the racial housing gap is even larger when looking at young adults in both absolute and even more in relative terms, suggesting that differential factors between black and white children early in life matter significantly for access to homeownership.

To isolate the effect of dynastic home equity on the racial housing gap of young adults, we calibrate a simple statistical model as follows. First, we assume all children at age 18 are renters and that once they become homeowners, they do not transition back to renting (that is, homeownership is an absorbing state). This assumption allows us to focus on the transition from renting to owning as a function of parental homeownership status and equity extraction behavior.[37]

Second, we compute the probability of a renter child becoming a homeowner each year as a function of the parental homeownership and equity extraction status, as follows:

$$\begin{aligned} p_{i,renter\to owner} \;=\; & \pi^{\text{parent owner \& extract}} \times p^{\text{parent owner \& extract}}_{i,renter\to owner} + \\ & \pi^{\text{parent owner no extract}} \times p^{\text{parent owner no extract}}_{i,renter\to owner} + \\ & \pi^{\text{parent renter}} \times p^{\text{parent renter}}_{i,renter\to owner}. \end{aligned} \tag{11}$$

We compute the probability of parents ownership status and extraction behavior directly from the data. We then calibrate the transition from renting to owning when parents are renters $p^{\text{parent renter}}_{i,renter\to owner}$ to match exactly the white homeownership rate at age 35 (which is 46% from column (3) of Table 8). We set $p^{\text{parent owner no extract}}_{i,renter\to owner} = p^{\text{parent renter}}_{i,renter\to owner} \times (1 + 15\%)$, where 15% is the higher transition to homeownership in the data for children of parents who are owners but do not extract relative to children of renters. Finally, $p^{\text{parent owner \& extract}}_{i,renter\to owner} =$

[37] Kermani and Wong (2021) find that distressed home sales (foreclosures and short sales) have an important effect on the racial gap in realized housing returns. Racial differences in income stability and liquid wealth explain a large share of the differences in distress. Understanding the role of parents over the course of the housing (and mortgage) tenure is an interesting avenue for future research.

Table 8: Dynastic Home Equity And The Racial Housing Gap

	Parents		Children		
Variable:	Homeownership	Extraction	Homeownership at 35		
Source:	data	data	data	model OLS	model IV
	(1)	(2)	(3)	(4)	(5)
White	78.5	9.0	46.0	46.0	46.0
Black	53.5	4.5	17.0	44.6	43.2
Δ Level	25.0	4.5	29.0	1.4	2.9
Δ %				5.0	9.8

Note: The table shows the homeownership rate and fraction extracting equity for black and white adults, define as older than 35 years, in the data. It also shows the homeownership rate for young adult at age 35 both in the data and in a statistical model calibrated to both the OLS and IV estimates. Authors' calculations using estimates in the paper and data from https://www.federalreserve.gov/econres/notes/feds-notes/disparities-in-wealth-by-race-and-ethnicity-in-the-2019-survey-of-consumer-finances-20200928.htmlfn10.

$p_{i,renter \to owner}^{\text{parent owner no extract}} + \alpha$, where α is our estimated coefficient on parent equity extraction.

While parsimonious, this calculation allows us to isolate the effect of dynastic home equity on the black-white ownership gap. By construction, the baseline transition probabilities are identical between black and white young adults. Thus, the difference in homeownership rate by race for young adults is only coming from differences in homeownership and equity extraction rates of the parents. In relation to equity extraction, we study a scenario where black parents extract at 50% the frequency of white parents. This is in line with the work by Conklin, Gerardi and Lambie-Hanson (2022), who document a large black-white denial rate gap for mortgage equity withdrawal products, concluding that minority homeowners do not have the same ability as white homeowners to access their accumulated housing wealth.

Columns (4) and (5) of Table 8 shows the results using the OLS and IV estimates for the effect of parent equity extraction, respectively. We find that the predicted homeownership for young black adults will be 44.6% (43.2%) using the OLS (IV) estimates relative to an homeownership rate for young white adults of 46.0%. Hence, dynastic home equity

via extraction alone is able to explain 5-10% of the 29-percentage-points racial homeownership gap observed in the data for young adults.[38] Our results show that the racial gap in homeownership can be partially explained by pre-existing differences in parental *access* to housing wealth, which can then be handed down from one generation to another.

8 Conclusions

We provide novel evidence that homeownership across generations is strongly positively correlated within a household. We then show that the positive relationship between parental homeownership and children homeownership can be partly explained by the role of housing equity itself. Households with access to housing equity in the form of equity extraction can use it to help their children enter into the housing market.

Our results have implications for the persistence of housing wealth and inequality across generations. To the extent that access to housing wealth is distributed unequally across socioeconomic groups, housing wealth helps perpetuate the unequal distribution of wealth by enabling earlier access to housing markets for the children of parents with housing wealth. Further work is needed to quantify the relative importance of all the factors behind the unequal distribution of housing wealth in the population. The fact that many households hold most of their wealth in housing suggests that this is an important channel for the perpetuation of wealth inequality across generations.

[38] Previous studies on the racial homeownership gap in the US consider the effect of overall parental wealth on children mortgage access and homeownership, without investigating the sources of parents wealth. For example, Charles and Hurst (2002) find that parental wealth contributes to about 25% of the racial gap in applications, and Brandsaas (2021) finds that parental transfers account for 30% of the black-white homeownership gap.

References

Abel, Joshua and Andreas Fuster, "How do mortgage refinances affect debt, default, and spending? Evidence from HARP," *American Economic Journal: Macroeconomics*, 2021, *13* (2), 254–291.

Acharya, Viral V, Katharina Bergant, Matteo Crosignani, Tim Eisert, and Fergal McCann, "The anatomy of the transmission of macroprudential policies," *The Journal of Finance*, 2022, *77* (5), 2533–2575.

Acolin, Arthur, Jesse Bricker, Paul Calem, and Susan Wachter, "Borrowing Constraints and Homeownership," *American Economic Review*, 2016, *106* (5), 625–29.

Adelino, Manuel, Antoinette Schoar, and Felipe Severino, "Credit supply and house prices: evidence from mortgage market segmentation," Technical Report, National Bureau of Economic Research 2012.

Agarwal, Sumit, Gene Amromin, Souphala Chomsisengphet, Tim Landvoigt, Tomasz Piskorski, Amit Seru, and Vincent Yao, "Mortgage refinancing, consumer spending, and competition: Evidence from the home affordable refinance program," *The Review of Economic Studies*, 2023, *90* (2), 499–537.

Alam, Zohair, Adrian Alter, Jesse Eiseman, Gaston Gelos, Heedon Kang, Machiko Narita, Erlend Nier, and Naixi Wang, "Digging Deeper–Evidence on the Effects of Macroprudential Policies from a New Database," *IMF Working Papers*, 2019, *2019* (066).

Allen, Jason, Kyra Carmichael, Robert Clark, Shaoteng Li, and Nicolas Vincent, "Housing Affordability and Parental Income Support," Technical Report, Bank of Canada 2024.

Benetton, Matteo, "Leverage regulation and market structure: A structural model of the UK mortgage market," *The Journal of Finance*, 2021, *76* (6), 2997–3053.

Beraja, Martin, Andreas Fuster, Erik Hurst, and Joseph Vavra, "Regional heterogeneity and the refinancing channel of monetary policy," *The Quarterly Journal of Economics*, 2019, *134* (1), 109–183.

Berger, David, Nicholas Turner, and Eric Zwick, "Stimulating housing markets," *The Journal of Finance*, 2020, *75* (1), 277–321.

Bernstein, Asaf and Peter Koudijs, "Mortgage Amortization and Wealth Accumulation," Technical Report, Stanford Graduate School of Business 2020.

Bhutta, Neil and Benjamin J. Keys, "Interest Rates and Equity Extraction during the Housing Boom," *American Economic Review*, 2016, *106* (7), 1742–74.

Blickle, Kristian and Martin Brown, "Borrowing Constraints, Home Ownership and Housing Choice: Evidence from Intra-Family Wealth Transfers," *Journal of Money, Credit and Banking*, 2019, *51* (2-3), 539–580.

Brandsaas, Eirik Eylands, "Illiquid Homeownership and the Bank of Mom and Dad," Working Paper, UW Madison 2021.

Chaisemartin, Clément De and Xavier d'Haultfoeuille, "Two-way fixed effects estimators with heterogeneous treatment effects," *American Economic Review*, 2020, *110* (9), 2964–2996.

Charles, Kerwin Kofi and Erik Hurst, "The Transition to Home Ownership and the Black-White Wealth Gap," *Review of Economics and Statistics*, 2002, *84* (2), 281–297.

Chen, Hui, Michael Michaux, and Nikolai Roussanov, "Houses as ATMs: Mortgage Refinancing and Macroeconomic Uncertainty," *The Journal of Finance*, 2020, *75* (1), 323–375.

Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz, "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment," *American Economic Review*, 2016, *106* (4), 855–902.

Chodorow-Reich, Gabriel, Adam M. Guren, and Timothy J. McQuade, "The 2000s Housing Cycle with 2020 Hindsight: A Neo-Kindlebergerian View," Technical Report, National Bureau of Economic Research 2021.

Claessens, Stijn, "An Overview of Macroprudential Policy Tools," *Annual Review of Financial Economics*, 2015, *7*, 397–422.

Conklin, James, Kristopher Gerardi, and Lauren Lambie-Hanson, "Can Everyone Tap Into the Housing Piggy Bank? Racial Disparities in Access to Home Equity," 2022.

DeFusco, Anthony A. and John Mondragon, "No Job, No Money, No Refi: Frictions to Refinancing In a Recession," *The Journal of Finance*, 2020, *75* (5), 2327–2376.

___ , Stephanie Johnson, and John Mondragon, "Regulating Household Leverage," *The Review of Economic Studies*, 2020, *87* (2), 914–958.

Derenoncourt, Ellora, Chi Hyun Kim, Moritz Kuhn, and Moritz Schularick, "Wealth of two nations: The US racial wealth gap, 1860-2020," Technical Report, National Bureau of Economic Research 2022.

Dettling, Lisa J. and Joanne W. Hsu, "Returning to the Nest: Debt and Parental Co-Residence among Young Adults," *Labour Economics*, 2018, *54*, 225–236.

Dube, Arindrajit, Daniele Girardi, Oscar Jorda, and Alan M. Taylor, "A Local Projections Approach to Difference-in-Differences Event Studies," Working Paper 31184, National Bureau of Economic Research 2023.

Engelhardt, Gary V. and Christopher J. Mayer, "Intergenerational Transfers, Borrowing Constraints, and Saving Behavior: Evidence from the Housing Market," *Journal of Urban Economics*, 1998, *44* (1), 135–157.

Englund, Peter, Thomas Jansson, and Todd Sinai, "How Parents Influence the Wealth Accumulation of their Children," Working Paper, The Wharton School, University of Pennsylvania 2014.

Favilukis, Jack, Pierre Mabille, and Stijn Van Nieuwerburgh, "Affordable Housing and City Welfare," Working Paper 25906, National Bureau of Economic Research 2019.

Fuster, Andreas and Basit Zafar, "To Buy or Not to Buy: Consumer Constraints in the Housing Market," *American Economic Review*, 2016, *106* (5), 636–40.

Ghent, Andra and Marianna Kudlyak, "Intergenerational Linkages in Household Credit," Working Paper 16-31, FRB San Francisco 2016.

Goodman-Bacon, Andrew, "Difference-in-differences with variation in treatment timing," *Journal of Econometrics*, 2021, *225* (2), 254–277.

Goodman, Laurie S and Christopher Mayer, "Homeownership and the American dream," *Journal of Economic Perspectives*, 2018, *32* (1), 31–58.

Guiso, Luigi and Tullio Jappelli, "Private Transfers, Borrowing Constraints and the Timing of Homeownership," *Journal of Money, Credit and Banking*, 2002, pp. 315–339.

Gupta, Arpit, Christopher Hansman, and Pierre Mabille, "Financial Constraints and the Racial Housing Gap," Technical Report, Available at SSRN 3969433 2021.

Hurst, Erik and Frank Stafford, "Home Is Where the Equity Is: Mortgage Refinancing and Household Consumption," *Journal of Money, Credit and Banking*, 2004, *36* (6), 985–1014.

Justiniano, Alejandro, Giorgio E Primiceri, and Andrea Tambalotti, "The mortgage rate conundrum," *Journal of Political Economy*, 2022, *130* (1), 121–156.

Kermani, Amir and Francis Wong, "Racial disparities in housing returns," Technical Report, National Bureau of Economic Research 2021.

Kuhn, Moritz, Moritz Schularick, and Ulrike I. Steins, "Income and Wealth Inequality In America, 1949–2016," *Journal of Political Economy*, 2020, *128* (9), 3469–3519.

Kumar, Anil, "Do Restrictions on Home Equity Extraction Contribute to Lower Mortgage Defaults? Evidence from a Policy Discontinuity at the Texas Border," *American Economic Journal: Economic Policy*, 2018, *10* (1), 268–97.

Lee, Donghoon and Wilbert van der Klaauw, "An Introduction the FRBNY Consumer Credit Panel," Staff Report 479, Federal Reserve Bank of New York 2010.

Lee, Hyojung, Dowell Myers, Gary Painter, Johanna Thunell, and Julie Zissimopoulos, "The Role of Parental Financial Assistance in the Transition to Homeownership by Young Adults," *Journal of Housing Economics*, 2020, *47*, 101597.

Mabille, Pierre, "The Missing Home Buyers: Regional Heterogeneity and Credit Contractions," Working Paper, NYU 2020.

Maggio, Marco Di, Amir Kermani, Benjamin J Keys, Tomasz Piskorski, Rodney Ramcharan, Amit Seru, and Vincent Yao, "Interest rate pass-through: Mortgage rates, household consumption, and voluntary deleveraging," *American Economic Review*, 2017, *107* (11), 3550–3588.

Mian, Atif and Amir Sufi, "House Prices, Home Equity-Based Borrowing, and the US Household Leverage Crisis," *American Economic Review*, 2011, *101* (5), 2132–56.

___ and ___ , "Credit supply and housing speculation," *The Review of Financial Studies*, 2022, *35* (2), 680–719.

Mondragon, John, "Household credit and employment in the Great Recession," *Kilts Center for Marketing at Chicago Booth–Nielsen Dataset Paper Series*, 2018, pp. 1–025.

Piketty, Thomas and Gabriel Zucman, "Capital Is Back: Wealth-Income Ratios in Rich Countries 1700–2010," *The Quarterly Journal of Economics*, 2014, *129* (3), 1255–1310.

___ , Li Yang, and Gabriel Zucman, "Capital Accumulation, Private Property, and Rising Inequality in China, 1978–2015," *American Economic Review*, 2019, *109* (7), 2469–96.

Quigley, John M. and Steven Raphael, "Is Housing Unaffordable? Why Isn't It More Affordable?," *Journal of Economic Perspectives*, 2004, *18* (1), 191–214.

Saiz, Albert, "The Geographic Determinants of Housing Supply," *The Quarterly Journal of Economics*, 2010, *125* (3), 1253–1296.

Sodini, Paolo, Stijn Van Nieuwerburgh, Roine Vestman, and Ulf von Lilienfeld-Toal, "Identifying the Benefits from Home Ownership: A Swedish Experiment," Technical Report, National Bureau of Economic Research 2016.

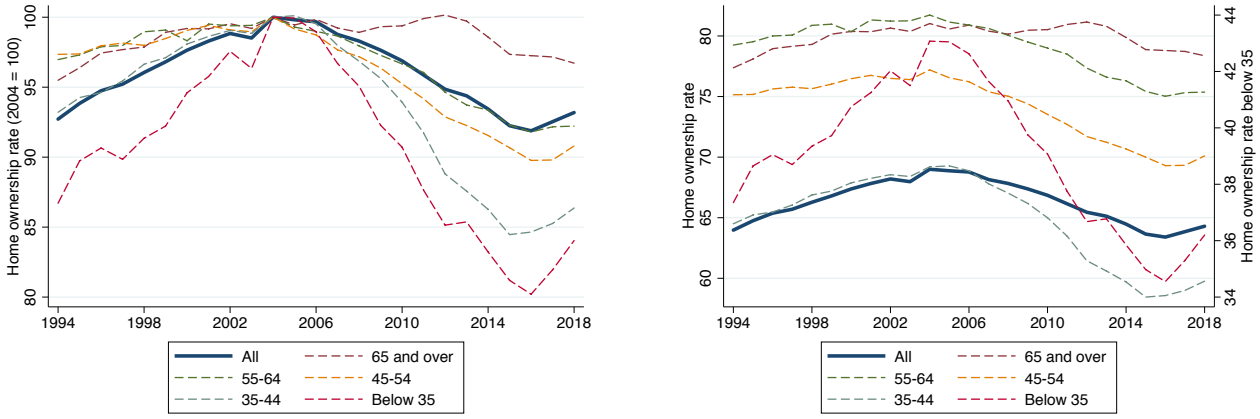
Wold, Ella Getz, Knut Are Aastveit, Eirik Eylands Brandsaas, Ragnar Enger Juelsrud, and Gisle Natvik, "The housing channel of intergenerational wealth persistence," Technical Report, Working Paper 16/2023, Norges Bank 2023.

Online Appendix

Appendix A shows additional results for the main analysis. Appendix B shows additional results for the heterogeneity analysis. Appendix C shows the results from a matching approach. Appendix D shows the results on the effects of parents equity extraction on children age at homeownership.

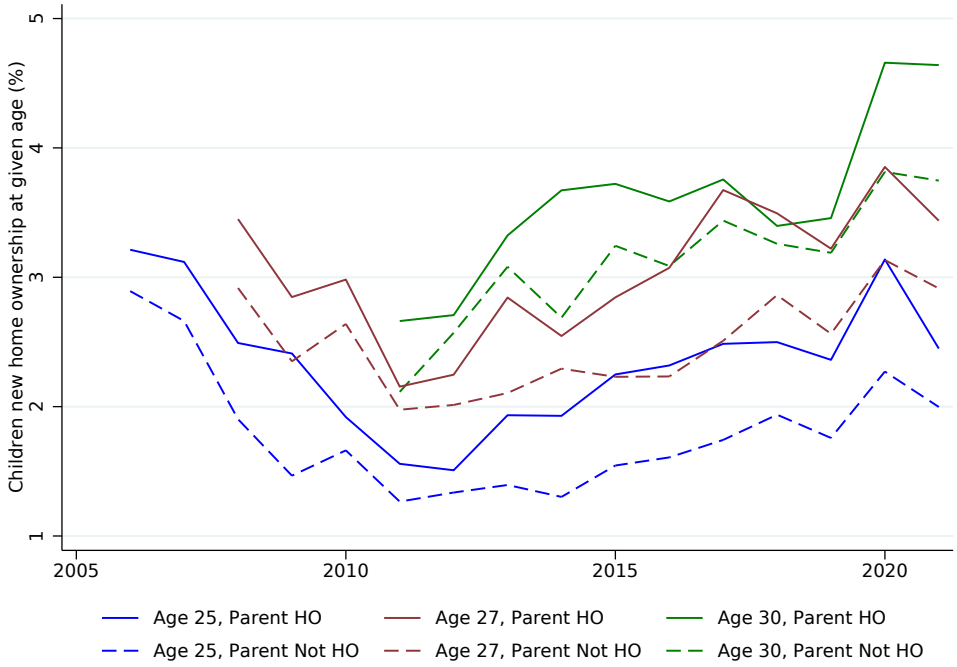
A Additional Results and Robustness

Figure A1: Home Ownership across Ages and Over Time



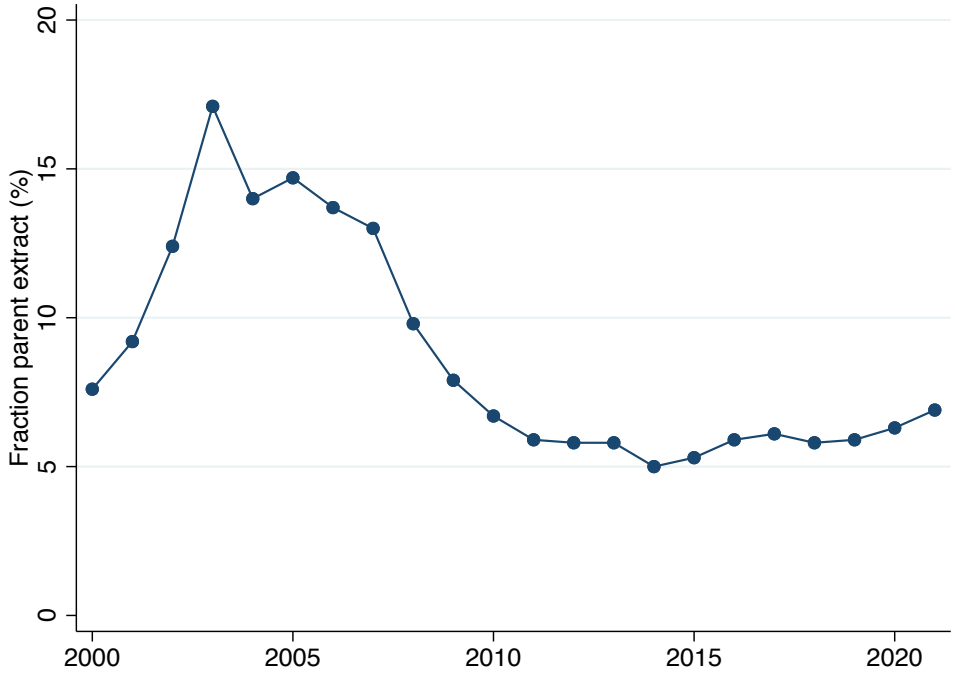
Note: The left panel shows the normalized home ownership rate for different age group. The right panel shows the home ownership rate for different age group. Authors' calculations using data from the U.S. Census Bureau, Current Population Survey/Housing Vacancy Survey.

Figure A2: Relationship between Children's Flow into Homeownership and Their Parents Homeownership Status



Note: The figure shows the fraction of children that become homeowners as a function of the homeownership status of their parents. The solid line shows the average share of children who become new homeowners and whose parents are homeowners. The dash line shows the average share of children who become new homeowners and whose parents are not homeowners. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

Figure A3: Parent Equity Extraction



Note: The figure shows the fraction of parents extracting equity. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

Table A1: Intergenerational Home Ownership, "Stock" Model, Ages 27 and 30

	(1)	(2)	(3)	(4)	(5)
Panel A: Homeowner by 27	Dep Var: Child is home owner at age 27				
Parent homeowner	3.253***	2.263***	1.940***	1.556***	1.519***
	(0.254)	(0.289)	(0.191)	(0.156)	(0.216)
Controls (parent age, parent and child credit)	No	Yes	Yes	Yes	Yes
Year f.e.	No	Yes	Yes	Yes	Yes
State f.e.	No	No	Yes	No	No
Zipcode f.e.	No	No	No	Yes	No
Group f.e.	No	No	No	No	Yes
Mean Y	11.26	11.26	11.26	11.26	11.26
Observations	325298	325298	325298	325298	325298
Panel B: Homeowner by 30	Dep Var: Child is home owner at age 30				
Parent homeowner	6.064***	3.318***	2.727***	1.921***	1.664***
	(0.310)	(0.456)	(0.228)	(0.188)	(0.286)
Controls (parent age, parent and child credit)	No	Yes	Yes	Yes	Yes
Year f.e.	No	Yes	Yes	Yes	Yes
State f.e.	No	No	Yes	No	No
Zipcode f.e.	No	No	No	Yes	No
Group f.e.	No	No	No	No	Yes
Mean Y	21.07	21.07	21.07	21.07	21.07
Observations	175740	175740	175740	175740	175740

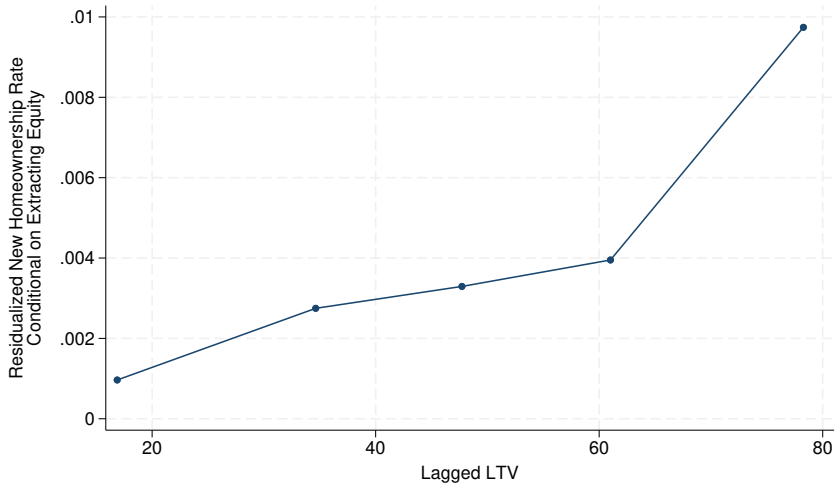
Note: The table reports the estimates of equations (1). In Panel A the dependent variable is the dummy equal to one hundred if the individual is an homeowner at age 27 and zero otherwise. In Panel B the dependent variable is the dummy equal to one hundred if the individual is an homeowner at age 30 and zero otherwise. Controls are parents age and age squared, and deciles of credit score for both children and parents. Group f.e. are interacted fixed effects for year and zip code. Standard errors are clustered at the state level. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

Table A2: Dynastic Home Equity - Event Study

Time	$\hat{\alpha}$				Children homeownership		
	Estimate	Std.	Lower bound	Upper bound	Predicted	Counterfactual	Cumulative
-5	-0.094	0.059	-0.209	0.022	1.720	1.813	.
-4	0.002	0.049	-0.094	0.098	1.461	1.459	.
-3	-0.063	0.041	-0.143	0.017	1.090	1.153	.
-2	0.000	0.000	0.000	0.000	0.911	0.911	.
-1	0.076	0.031	0.015	0.137	0.790	0.714	.
0	0.612	0.043	0.527	0.696	1.164	0.553	0.612
1	-0.072	0.032	-0.135	-0.010	0.426	0.499	0.539
2	-0.125	0.035	-0.194	-0.056	0.355	0.480	0.414
3	-0.087	0.038	-0.160	-0.013	0.368	0.455	0.328
4	-0.112	0.040	-0.190	-0.033	0.323	0.434	0.216
5	-0.037	0.048	-0.130	0.057	0.379	0.416	0.179

Note: The table reports the estimates from equation (4) for the parameter α and different leads and lags. We report point estimate, standard errors, lower and upper bounds. The table also reports predicted children homeonwership using the estimated coefficients from equation (4), countefactual children homeonwership setting α to zero, and the cumulative effect of parent equity extraction. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

Figure A4: Parental Equity Extraction For Children's New Homeownership By LTV



Note: The figure shows the residualized children new homeownership rate conditional parents extracting equity. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data and the Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data.

B Additional Results on Heterogeneity

This Appendix section shows additional results on the heterogeneity analysis of the effect of parental equity extraction on the child home purchase.

B.1 Children Characteristics

First, we explore if the importance of equity extraction varies with the number of siblings in the family. Intuitively, if there are multiple children present in the family, then the same amount of home equity will be less useful for helping transition into homeownership. To explore this dimension, we classify children as an only child, with one sibling, and with more than one sibling.[39] The fist panel of Figure A5 reports the results. Only-child and children with one sibling have similar estimates of the effects of equity extraction on new homeownership. However, cases which we identify as more than one sibling in the household show a much smaller relationship between equity extraction and child homeownership, despite the fact that transitions to home ownership occur at about the same rate for all groups. This suggests that housing wealth is less helpful for financing homeownership for children if it is spread across larger numbers of children, consistent with our mechanism of equity extraction helping to finance homeownership.

Second, we study how the role of parental equity extraction changes with the age of the child by splitting the sample into three groups: when children are younger than 26, between 26 and 30, and older than 30. These results are reported in the second panel of Figure A5. Scaling the point estimates by the mean transitions into homeownership, we see that parent equity extraction is relatively more important when children are younger. Having a parent who extracts equity increases the probability that a child below 26 y.o. becomes a homeowner by about 90% of the mean, while the effect is about half as large for older children. Hence, the ability to access financing via parent equity extraction is relatively more important for

[39] Importantly, these definitions are subject to the limitations of our algorithmic identification of siblings in the credit bureau data, which is likely to have measurement error.

younger children who are likely to have less savings available for a downpayment.

Third, we look at different measures of children's access to and usage of credit. Panels three to five of Figure A5 report the result for credit card limit, credit card usage and Equifax credit score, respectively. We find that parent equity extraction is relatively more important for children with higher credit card limit and relatively lower credit card utilization. These result suggest that parents' help through equity extraction is more important for children less likely to be more broadly financially constrained. We note that correlation in access to and usage of credit between parent and children can explain these results and explore the same heterogeneity across parents in the next subsection. We do not find large heterogeneity across children credit score, suggesting that dynastic home equity matters for both high and low-credit quality children.

Finally, we split counties into quartiles based on the median house price for children's location. These results are reported in the last panel of Figure A5. Estimated effects are large and positive across all of the subsamples, but appear to increase monotonically with the price of housing. This shows that access to parental home equity may becomes important as housing becomes more expensive and children become constrained by downpayment requirements.

B.2 Parents Characteristics

We explore heterogeneity in the role of dynastic home equity across parental characteristics. The first panel of Figure A6 shows that for parents with one or two children the effect of equity extraction on the probability to become homeowner is similar. However, for parents with more than two children the effect drops from about 60% of the average flow to about 40%, echoing the results for children with many siblings.

Second, we study how the role of parental equity extraction changes with the age of the parents by splitting the sample into three groups: when parents are younger than 45, between 45 and 60, and older than 60. These results are reported in the second panel of Figure A6. Scaling the point estimates by the mean transitions into homeownership, we see

that the effect of parent equity extraction is stronger when parents are younger, increasing the probability that a child becomes a homeowner by more than 100% of the mean. The effect is about half as large for older parents. Hence, while parent of different ages are likely to help their children buying a home, the source of parents help varies across the life cycle. Younger parents are more likely to extract equity from their home to help their children, while older parents may rely more on additional savings or other form of non-housing wealth.

Third, we look at different measures of parents access to and usage of credit. Panels three to five of Figure A6 report the result for credit card limit, credit card usage and Equifax credit score, respectively. We estimate a large effect of parental equity extraction for children transition to homeownership for parents with higher credit limit, lower credit usage, and higher credit score. All the results point to an important role of access to credit for parents – in terms of higher limit, lower utilization and higher credit score – to be able to help their children.

The difference in the heterogeneity between children and parents on the credit score is informative. The dynastic home equity coefficient for parents in the bottom quartile of the credit score distribution correspond to about 40% of the average flow, while for parents in the top quartile of the credit score distribution it jumps to 80%. Note that this is despite the fact that equity extraction is fairly similar for parents in the bottom and top quartile of the credit score distribution. While all children benefit similarly from parental help irrespective of their credit score (panel five of Figure A5), parents with low credit scores have a more limited ability to help than parents with high credit scores (panel five of Figure A6).

Finally, we split counties into quartiles based on the median house price for parents' location. These results are reported in the last panel of Figure A6. Estimated effects are large and positive across all of the subsamples, but appear to increase monotonically with the price of housing. This result resembles the same split based on children location (last panel of Figure A5), suggesting that common location choices of parents and children could play a role. We explore this dimension further in the next subsection.

B.3 Heterogeneity Across Locations and Over Time

In this subsection on heterogeneous effects, we study the impact of dynastic home equity: (i) across parents and children location; and (ii) over time during the boom, bust and rebound period of the 2008 housing crisis.

The first panel of Figure 3 shows the normalized effect of dynastic home equity for children-parents pairs living in different states, in the same state, in different counties, and in the same county. First, notice that the results from the sample of different states are noisier as the number of observations in this subset is considerably lower. As a result, we cannot reject the null hypothesis of no effect of parents equity extraction of children flow into homeownership in this subsample. The split by counties leave us with enough power in both subsamples. We find that the effect of dynastic home equity is weaker for children living in different counties from their parents. For children living in different counties from their parents the effect of dynastic home equity drops from about 60% of the average flow to about 40%. Children moving to different counties (or states) could be more economically successful and financially independent, thus distance reduces the demand for parents' help. Similarly, parents might be more willing to extract equity from their own home to help children buy only if they decide to live close to them. Distance then reduces the supply of parent' help.

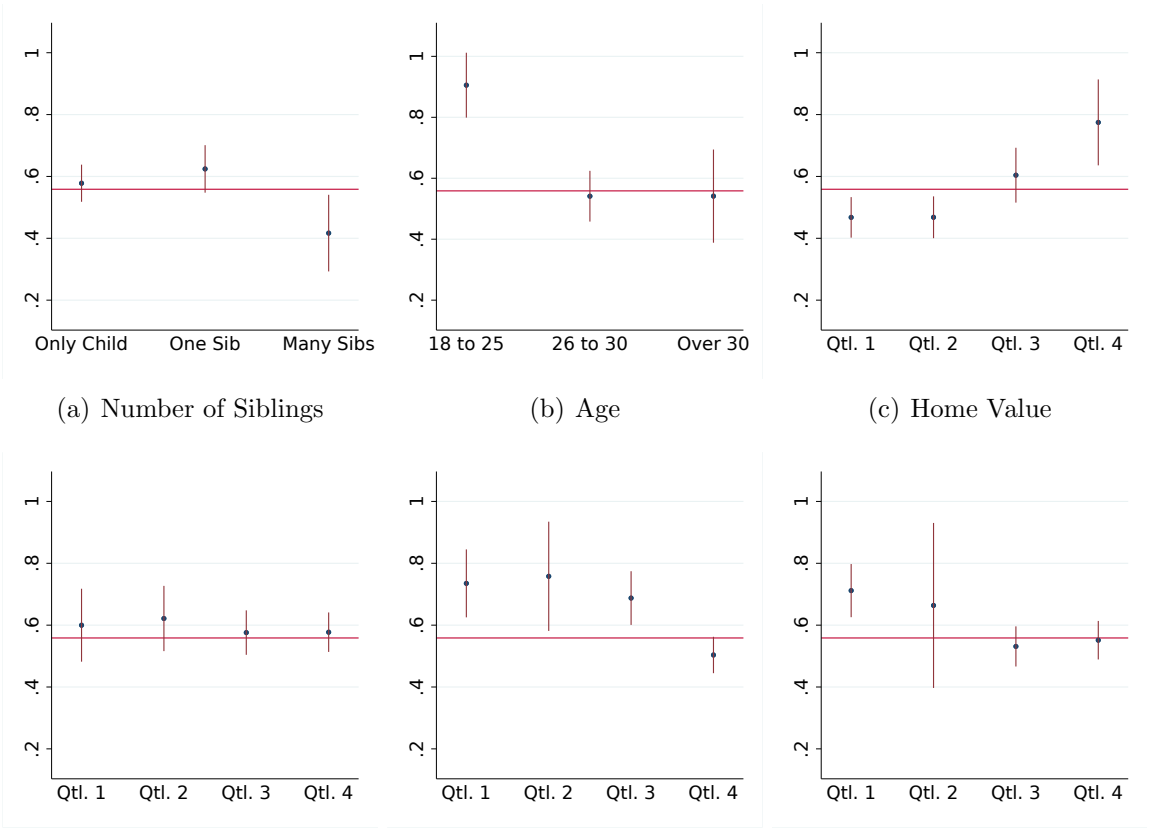
Finally, we split our sample into three periods based on the recent housing cycle: boom (pre-2007), bust (2007-2012), and recovery (post-2012), following Chodorow-Reich et al. (2021). We re-estimate our baseline regressions (equation (3)) within each of these period and also fixing the age of the children, to separate the effect of time-series variation from child's cohort effect, due to the construction of our merged children-parent dataset.

Figure 3 shows the result for children at age 22. We find that dynastic home equity matters relatively less in the pre-2007 boom period, when credit was abundant and low-downpayment mortgages widely available (Mian and Sufi (2011)). The scaled effects show that parent equity extraction became more important for children homeownership after the housing bust, perhaps as a result of the tightening in credit standards following the crisis.

Dynastic home equity has continued to play an important role in recent years, as increases in house prices (relative to income) have reduced housing affordability for young adults and credit standards have remained high.

Overall, our heterogeneity analysis suggests that dynamic home equity is particularly important when: (i) affordability is worse because of high house values; (ii) financial constraints are more likely to be binding for the children whether for macroeconomic reasons (like the financial crisis) or because children are too young to have accumulated substantial assets for down payment; and (iii) parents have access to credit (higher credit card limits and credit scores, and lower credit card utilization) but they are too young to have other means to help children, and therefore they tap into their home equity.

Figure A5: Children Heterogeneity

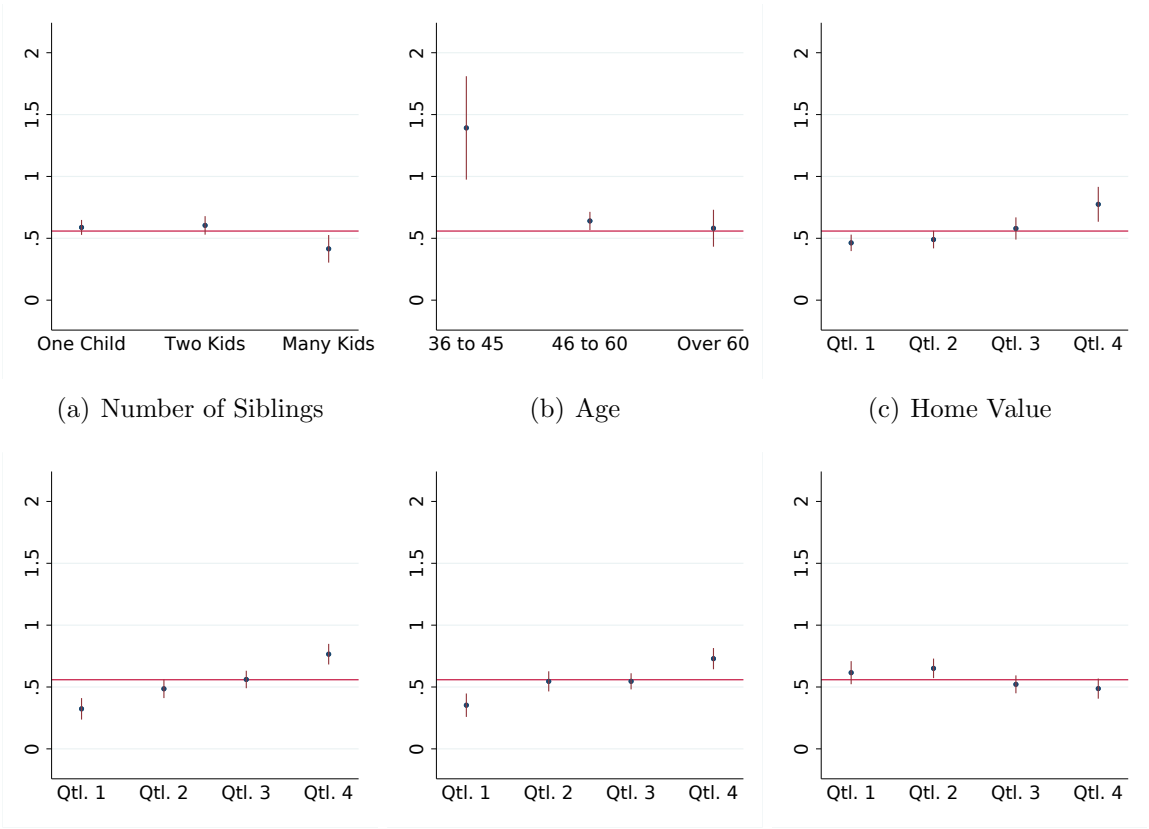


(a) Number of Siblings (b) Age (c) Home Value

(d) Equifax credit score (e) Credit limit (f) Credit usage

Note: The figure shows the estimates of equation (3) for different sample splits based on children characteristics. We report the point estimates and 95% confidence interval on the coefficient α that captures the effect of parent equity extraction divided by the average flow into homeownership in each subsample. The solid red line show the estimate of α in the full sample divided by the average flow into homeonwership in the full sample. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

Figure A6: Parents Heterogeneity



(a) Number of Siblings (b) Age (c) Home Value

(d) Equifax credit score (e) Credit limit (f) Credit usage

Note: The figure shows the estimates of equation (3) for different sample splits based on parents characteristics. We report the point estimates and 95% confidence interval on the coefficient α that captures the effect of parent equity extraction divided by the average flow into homeownership in each subsample. The solid red line show the estimate of α in the full sample divided by the average flow into homeonwership in the full sample. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

Table A3: Heterogeneity by Median County-Level Home Value Quartile: Children

	Qtl. 1	Qtl. 2	Qtl. 3	Qtl. 4
Parent Equity Extraction	0.486***	0.486***	0.623***	0.696***
	(0.035)	(0.036)	(0.047)	(0.064)
Scaled effect	0.468	0.468	0.604	0.775
Mean cty. median home val.	155,562	230,691	315,738	578,696
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	1.04	1.04	1.03	0.90
Observations	1234157	1175764	1169722	1185647
Adjusted R^2	0.02	0.02	0.02	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A4: Heterogeneity by Family Composition and Age: Children

Panel A: Number of siblings	Only Child	1 Sibling	Many Siblings
Parent Equity Extraction	0.580***	0.625***	0.414***
	(0.031)	(0.039)	(0.063)
Scaled effect	0.58	0.62	0.42
Controls	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes
Mean Y	1.00	1.00	0.99
Observations	3153903	1303284	309113
Adjusted R^2	0.01	0.02	0.02

Panel B: Age group	Younger than 26	Between 26 and 30	Older than 30
Parent Equity Extraction	0.558***	1.493***	1.573***
	(0.033)	(0.117)	(0.227)
Scaled effect	0.91	0.54	0.54
Controls	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes
Mean Y	0.62	2.76	2.91
Observations	1930593	592689	174134
Adjusted R^2	0.01	0.01	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A5: Heterogeneity by Fico Score: Children

	Qtl. 1	Qtl. 2	Qtl. 3	Qtl. 4
Parent Equity Extraction	0.287***	0.328***	0.498***	1.247***
	(0.029)	(0.029)	(0.032)	(0.071)
Scaled effect	0.599	0.621	0.577	0.578
Mean FICO Score	564	669	707	758
Mean Parent Extraction Rate (%)	10	11	11	10
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	0.48	0.53	0.86	2.16
Observations	1178565	1183044	1184776	1169275
Adjusted R^2	0.00	0.01	0.01	0.02

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A6: Heterogeneity by Credit Limit: Children

	Qtl. 1	Qtl. 2	Qtl. 3	Qtl. 4
Parent Equity Extraction	0.225***	0.358***	0.565***	1.268***
	(0.017)	(0.043)	(0.036)	(0.076)
Scaled effect	0.734	0.749	0.688	0.507
Mean Credit Limit	0	532	2,165	13,848
Mean Parent Equity Extraction	10	11	11	10
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	0.31	0.48	0.82	2.50
Observations	1891014	485089	1169621	1186855
Adjusted R^2	0.01	0.01	0.01	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A7: Heterogeneity by Credit Usage: Children

	Qtl. 1	Qtl. 2	Qtl. 3	Qtl. 4
Parent Equity Extraction	0.309***	1.178***	0.917***	0.741***
	(0.019)	(0.234)	(0.056)	(0.043)
Scaled effect	0.717	0.680	0.529	0.547
Mean Credit Usage	0	0	12	74
Mean Parent Equity Extraction	11	10	10	11
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	0.43	1.73	1.73	1.36
Observations	2317500	51310	1184291	1179255
Adjusted R^2	0.01	0.02	0.02	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A8: Heterogeneity by Median County-Level Home Value Quartile: Parent

	Qtl. 1	Qtl. 2	Qtl. 3	Qtl. 4
Parent Equity Extraction	0.485***	0.505***	0.595***	0.698***
	(0.035)	(0.037)	(0.047)	(0.065)
Scaled effect	0.463	0.490	0.579	0.775
Mean cty. median home val.	155,458	230,651	315,755	578,168
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	1.05	1.03	1.03	0.90
Observations	1236510	1174983	1171208	1182824
Adjusted R^2	0.01	0.01	0.01	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A9: Heterogeneity by Family Composition and Age: Parent

Panel A: Number of Children	1	2	> 2
Parent Equity Extraction	0.585***	0.613***	0.422***
	(0.031)	(0.039)	(0.058)
Scaled effect	0.59	0.60	0.42
Controls	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes
Mean Y	0.99	1.01	1.02
Observations	2978983	1424726	362593
Adjusted R^2	0.01	0.01	0.01

Panel B: Parent Age group	Younger than 46	Between 46 and 60	Older than 60
Parent Equity Extraction	0.673***	0.748***	1.126***
	(0.103)	(0.044)	(0.147)
Scaled effect	1.39	0.64	0.58
Controls	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes
Mean Y	0.48	1.17	1.94
Observations	174077	2138160	385180
Adjusted R^2	0.01	0.02	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A10: Heterogeneity by Fico Score: Parent

	Qtl. 1	Qtl. 2	Qtl. 3	Qtl. 4
Parent Equity Extraction	0.225***	0.467***	0.595***	0.985***
	(0.031)	(0.037)	(0.038)	(0.055)
Scaled effect	0.324	0.486	0.561	0.765
Mean Parent FICO Score	595	724	787	822
Mean Parent Extraction Rate (%)	8	12	13	9
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	0.69	0.96	1.06	1.29
Observations	1184461	1176937	1175814	1184165
Adjusted R^2	0.01	0.01	0.01	0.02

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A11: Heterogeneity by Credit Limit: Parent

	Qtl. 1	Qtl. 2	Qtl. 3	Qtl. 4
Parent Equity Extraction	0.290***	0.577***	0.584***	0.788***
	(0.039)	(0.043)	(0.035)	(0.047)
Scaled effect	0.360	0.551	0.546	0.729
Mean	2,207	17,337	37,663	81,277
Mean Parent Equity Extraction	7	10	12	13
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	0.81	1.05	1.07	1.08
Observations	1177133	1186129	1180334	1189062
Adjusted R^2	0.01	0.01	0.02	0.02

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A12: Heterogeneity by Credit Usage: Parent

	Qtl. 1	Qtl. 2	Qtl. 3	Qtl. 4
Parent Equity Extraction	0.647***	0.745***	0.530***	0.385***
	(0.049)	(0.046)	(0.037)	(0.033)
Scaled effect	0.613	0.650	0.521	0.489
Mean Parent Credit Card Limit Use (%)	1	9	35	86
Mean Parent Equity Extraction	9	12	13	9
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	1.05	1.15	1.02	0.79
Observations	1181048	1185682	1183187	1182776
Adjusted R^2	0.01	0.02	0.01	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A13: Heterogeneity Over the Business-Cycle

Panel A: Home Purchase at Age 22	Pre-2007	2007 - 2012	Post-2012
Parent Equity Extraction	0.322***	0.453***	0.591***
	(0.094)	(0.064)	(0.072)
Scaled effect	0.36	0.97	1.24
Controls	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes
Mean Y	0.90	0.47	0.48
Observations	93595	226942	252417
Adjusted R^2	0.01	0.01	0.01

Panel B: Home Purchase at Age 25	Pre-2007	2007 - 2012	Post-2012
Parent Equity Extraction	0.601	1.192***	1.180***
	(0.599)	(0.174)	(0.152)
Scaled effect	0.22	0.68	0.58
Controls	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes
Mean Y	2.77	1.76	2.03
Observations	6635	112838	174084
Adjusted R^2	0.02	0.01	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

Table A14: Different Child and Parent Locations

	Same State	Different State	Same County	Different County
Parent Equity Extraction	0.587***	0.613***	0.581***	0.822***
	(0.027)	(0.181)	(0.027)	(0.135)
Scaled effect	0.53	0.16	0.58	0.20
Controls	Yes	Yes	Yes	Yes
County f.e.	Yes	Yes	Yes	Yes
Year f.e.	Yes	Yes	Yes	Yes
Mean Y	1.11	3.83	1.00	4.16
Observations	5458408	183549	5287811	354369
Adjusted R^2	0.01	0.01	0.01	0.01

Note: The table shows the estimates of equation (3) on the sample of children whose parents are homeowners. The dependent variable is the dummy equal to one hundred if the individual becomes a homeowner and zero otherwise. Parent equity extraction is the dummy equal to one if the parents extract equity in the current year. Controls are parent's age and age squared, unemployment rate for both children and parents, 3yr zip code home price growth for both parents and children, 3yr wage growth for both children and parents, 3yr employment growth for both children and parents, and deciles of lagged child and parent credit scores. Standard errors are clustered at the parent-state level. Scaled effect is the parent equity extraction coefficient divided by the mean dependent variable in the regression sample. Authors' calculations using FRBNY Consumer Credit Panel/Equifax Data.

C Matching Approach

This Appendix section shows a complementary approach to construct a control group for children who are treated by parent equity extraction based on propensity score matching.

One concern with the approach given by (3) could be that children of homeowners parent who extract equity are different from those of homeowners parent who do not extract equity. In column (7) of Table 3 we addressed this issue with children fixed effects, thus controlling for all time-invariant unobservable differences across children and using only variation within child over time in parents extraction for identification.

A matching methodology provides two advantages in our setting. First, our treatment sample is restricted to children of parents who can extract equity. In our baseline analysis, parents with higher credit score or parents living in areas which experienced a higher appreciation in house prices may be compared to children with parents with low credit scores or low levels of equity. As a result, there may not be comparable children in the untreated group. Matching allows us to restrict comparisons to similar children. Second, a semiparametric matching procedure can better account for nonlinearities between control variables and the outcome, checking our dependence on the linearity assumption implied by the OLS specification (3).

Table A15 shows the characteristics that we used for matching. Most characteristics are comparable between the two groups after the matching. The magnitudes of any differences are small. For example, the average credit score for the parents of treated children is 734 and the equivalent score for the parents of control children is 736. Similarly, the average credit score of a treated child is 675 and the average credit score of a control child is 674.

Table A16 shows the results of the treatment effect of parents equity extraction on the flow of children into new homeownership using the matched sample of untreated children. In column (1) we show the the results based on the matched sample without any additional fixed effect. The average treatment effect on the treated (ATT) is about 0.44. Since the treated share is about 10%, we should be cautious of differing responses to parents extraction

Table A15: Dynastic Home Equity - Propensity Score Matching

	Mean		% Bias	t-test	
	Treated	Control		t	p-value
Parent age	52.451	51.798	11.5	35.76	0.000
Parent credit score	734.88	736.41	-1.7	-5.39	0.000
Children credit score	675.62	674.43	1.5	4.77	0.000
Parent HP growth 3yr	4.3425	5.7764	-20.7	-60.11	0.000
Child HP growth 3yr	4.337	5.7745	-20 .7	-60.26	0.000
Child county unemployment rate	5.7909	5.4956	12.0	38.68	0.000
Parent county unemployment rate	5.7919	5.4982	11.9	38.48	0.000
Child county 3yr wage growth	2.8814	3.0418	-8.8	-27.49	0.000
Parent county 3yr wage growth	2.8772	3.0378	-8.9	-27.60	0.000
Child county 3yr employment growth	.67611	.75336	-3.7	-11.35	0.000
Parent county 3yr employment growth	.67582	.75385	-3.7	-11.45	0.000

Note: The figure shows the balance tests for the matched sample using propensity scores. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data.

between treated and untreated children. These heterogeneous treatment effect can bias our estimate of the average treatment effect of the entire sample population of children. For this reasons we also report the average treatment effect on the untreated children (ATU). In our setting the ATU is about 0.46, which is very close to the ATT, suggesting that the heterogeneous treatment effect bias is small. As a result, the average treatment effect (ATE) is 0.46. Relative to an average flow into homeownership of about 1.27, parent equity extraction increase the flow into homeonwership by 35%.

In columns (2) to (4) of Table A16, we sequentially add stricter sets of fixed effect. In column (2) we add year and children age fixed effects; in column (3) we also include child state fixed effects; and in column (4) we also add child county fixed effects. The estimates are remarkably stable across columns. In column (4) we are comparing a child whose parent extract equity to another control child whose parent do not extract, in the same county in the same year at the same age and with minimal differences along other characteristics such as child and parent credit score. The ATT and the ATE are almost 0.6, which is almost identical to the results in Table 3 and Figure 4.

Table A16: Dynastic Home Equity - Propensity Score Matching

	(1)	(2)	(3)	(4)
Avg. Treatment on Treated	0.440***	0.571***	0.568***	0.565***
	(0.021)	(0.021)	(0.021)	(0.020)
Avg. Treatment on Untreated	0.462***	0.566***	0.572***	0.557***
	(0.021)	(0.020)	(0.019)	(0.021)
Treated Share (%)	10.27	10.27	10.27	10.27
Avg. Treatment Effect	0.46	0.57	0.57	0.56
Year Dmy.	No	Yes	Yes	Yes
Age Dmy.	No	Yes	Yes	Yes
Child State Dmy.	No	No	Yes	No
Child County Dmy.	No	No	No	Yes
Mean Y	1.27	1.22	1.22	1.23
Observations	1138373	1138371	1138376	1138377

Note: This table presents the estimated treatment effects from the propensity score matching. Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data.

Overall, all of our different empirical approaches point to an economically and statistically significant impact of parent equity extraction on child new homeownership. Most notably, children whose parents extract equity are about 60% more likely to become a homeowner immediately after parent equity extraction relative to similar children whose parents do no extract equity. In the next two sections we explore: (i) heterogeneity in the transmission of homeownership from parents to children via equity extraction; and (ii) different margins through which parents' equity extraction affects child homeownership.

D Parental Equity Extraction and Children's Age

Our estimates in Section 4 show that parents equity extraction allows children to become homeowner and this effects persist over time. In other words, the effect of parents equity extraction does not reverse immediately, as children whose parents extract equity remain more likely to have a higher flow into homeownership than children of parents who do not extract several years into the future. We now explore a related dimension. Conditional on actually purchasing a home as young adult, what is the age of homebuyers whose parents extract relative to the age of other homebuyers?

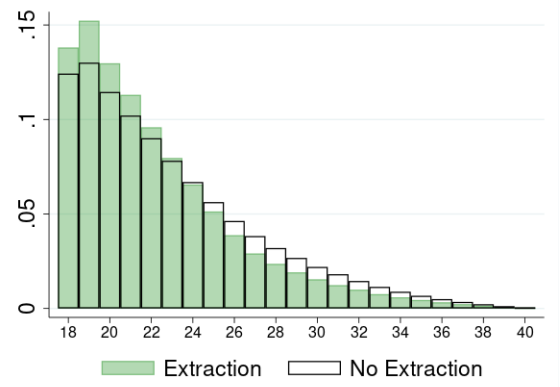
Figure A7 shows the distribution of the child age at origination, dividing the sample into children whose parents extract equity and children whose parents do not extract equity. Children whose parents extract in the year before they become new homeowners tend to be relatively younger than children whose parents do not extract. We explore this relationship more formally using the following specification:

$$Age_{ialt}^{Child} = \alpha Extract_{ialt}^{Parent} + \theta X_{ialt} + \gamma_l + \gamma_a + \gamma_t + \epsilon_{ialt}, \tag{12}$$

where Age_{ialt}^{Child} is the child's age at origination; and all other variables are as in equation (9). We estimate models (12) on the sample of children who become homeowners and whose parents are homeowners.

Figure A7 shows the results. Within the sample of children becoming homeowner, parents equity extraction is associated with children buying a house 1.5 years sooner. After adding our rich set of controls, the effect declines to 0.6, but remains statistically significant. Given an average age of young homebuyers of 26 in our sample, parents extraction lower the average age of young homebuyers by about 2.5%. Combining these estimates with the ones from Table 3, we find that parents equity extraction: (i) increases the children transition to homeownership relative to all children of parents who do not extract; and (ii) shifts this transition earlier in time relative to children who end up buying as young adults.

Figure A7: Parental Equity Extraction and Children's Age



	Child Age	
	(1)	(2)
Parent Equity Extraction	-1.473***	-0.633***
	(0.045)	(0.032)
Controls	No	Yes
County f.e.	Yes	Yes
Year f.e.	Yes	Yes
Mean Y	26.60	26.60
Observations	65845	65845
Adjusted R^2	0.05	0.46

Note: The figure shows the distribution of children's age at origination by whether their parents extract equity or not, 2006-2021. The green area is the distribution for children whose parents extract equity, and the black-outlined area is the distribution for children whose parents do not extract equity. The table shows the . Authors' calculations using data from the FRBNY Consumer Credit Panel/Equifax Data and the Equifax Credit Risks Insight Servicing McDash and Black Knight McDash Data.