Appendix for Online Publication

Identifying the Benefits from Home Ownership: A Swedish Experiment

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A Privatization Process

A.1 Market-wide Conversion Statistics

To illustrate the size of the co-op conversion movement, Table A.1 reports on the composition of the stock of apartments in the municipality of Stockholm in 1990, 2000 and 2004. Between 1990 and 2000, the stock of municipally-owned apartments declined by 8,000 units. Privatizations accelerated between the years 2000 and 2004 with another 8,000 units converted into co-ops. In addition to the three large municipal landlords, private landlords also massively converted apartment, accounting for three-quarters of the co-op conversions (31,000 out of 47,000). Between 2000 and 2004, co-op-owned apartments increased by 34,400 units. Over the longer 1990 to 2004 period, the ownership share of co-ops increased from 25% to 43%. Table A.2 zooms in on co-op conversions in the period 1999-2004. Municipal landlords privatized 12,200 apartments in Stockholm. Municipal landlord conversions ramped up dramatically in the year 2000 and peaked in 2001 at 5,500 units.

Table A.1: Apartments by ownership, 1990-2004, Municipality of Stockholm

Year	Co-ops	Municipal landlords	Private landlords	Total
1990	84,200	118,000	141,700	343,900
	25%	34%	41%	100%
2000	125,000	110,600	126,300	361,900
	34%	31%	35%	100%
2004	159,400	102,500	110,900	372,800
	43%	27%	30%	100%

Notes: The table reports the number and share of apartments in the municipality of Stockholm by type of ownership. Source: Utrednings- och statistikkontoret i Stockholms stad (2005, p. 11) and *http://statistik.stockholm.se/images/stories/excel/b085.htm*.

A.2 The Steps of the Privatization Process

The process of co-op conversion requires a series of formal steps. The first step is for the tenant association to register a home owner co-operative with Bolagsverket, the agency responsible for

Table A.2: Transactions of apartments by ownership, 1999-2004, Municipality of Stockholm

	1999	2000	2001	2002	2003	2004	1999-2004
Municipal landlords	200	3,500	5,500	2,100	400	500	12,200
Other landlords	5,300	4,700	5,300	4,900	5,000	4,100	29,300
Total	5,500	8,200	10,800	7,000	5,400	4,600	41,500

Notes: The table reports the number of apartment sales by year by type of ownership. Source: Utrednings- och statistikkontoret i Stockholms stad, 2005.

registering all limited liability companies in Sweden. A co-op needs at least three members. The co-op board consists of at least three and at most seven board members.

Once registered, the co-op can submit a letter to the district court indicating its interest in purchasing the property. This gives the co-op a right of first purchase for two years. Around the same time, the co-op contacts the landlord to express interest in acquiring the property. We refer to this date as the date of first contact. Below we describe the price formation process for privatizations executed by the three municipal landlords.

If the landlord is interested in selling the property, she must decide on an asking price. The landlord hires an appraisal firm to value the property and orders a technical inspection. Based on the inspector's and appraiser's reports, the landlord settles on an asking price for the property as a whole. This is a take-it-or-leave-it offer. How each individual apartment is priced is left to the discretion of the co-op. The landlord communicates the asking price to the co-op, along with a deadline.

Upon a favorable reply, the co-op has to submit an "economic plan," detailing how it will finance the purchase. Typically, the purchase is financed through a combination of one-time conversion fees paid in by co-op members, and a mortgage. The mortgage is a liability of the co-op and collateralized by the property. After conversion, the co-op uses the cash flows generated by the building to service the mortgage. The cash flows consist of co-op dues, rents from apartments from tenants who did not participate in the conversion and whose apartment is now owned by the co-op, and rental income from commercial tenants (e.g., retail or offices located in the building) if applicable.

Once the mortgage loan and the economic plan are in place, the tenants meet and vote on the proposed conversion. At least 2/3 of all eligible votes must be in favor for the conversion to go ahead. It is possible to submit a written vote. Only primary renters are allowed to vote, subtenants are not. The municipal landlord verifies that only eligible votes are taken into account. In a few instances, the landlord stopped the process and asked for a re-vote because some votes were deemed eligible by the tenant association but not by the landlord. The 2/3 majority is a minimum requirement. We have some observations where the vote exceeded 2/3, yet the purchase did not go through. Presumably, some co-op board decided it wanted or needed an even larger majority

to go ahead. Upon a favorable vote, the co-op board communicates the vote tally and the minutes of the meeting to the landlord. Unfortunately, we cannot use this 2/3 threshold as an alternative RDD-based identification strategy, as we observe bunching on the right hand side of the threshold. This bunching might reflect unobserved heterogeneity across co-ops and their tenants that is possibly correlated with our outcome variables of interest.

At this point, a private landlord would be free to approve the contract and sell the real estate. Until April 1^{st} 2002, the same was true for municipal landlords. After that date, the Stopplag applies, and municipal landlords must seek approval for the sale from the County Board.

A.3 Denials by the County Board

We use the passage of the Stopplag as an exogenous shock to the likelihood of approval of a co-op conversion. Conditional on having signed a contract with the landlord, the Stopplag reduced the likelihood of conversion from 100 percent to 33 percent. Unconditionally (taking the sample of all initiated privatization attempts), the likelihood of success was reduced from 50 percent to 17 percent. These numbers are calculated as follows. The municipal landlord Svenska Bostäder reports that 244 co-op associations initiated the conversion process during 1998-2002. Of those, 117 were sold representing a success rate of 48 percent. Among the 244 properties, 38 contracts were screened by the County Board. The Board approved 10, a success rate of 26 percent. Stockholmshem reports similar statistics: 59 conversions out of 120 applications. Nine properties with sales contracts were subject to the Stopplag and the County Board approved three. Familjebostäder finished privatizations prior to April 1st 2002 when the Stopplag became effective.

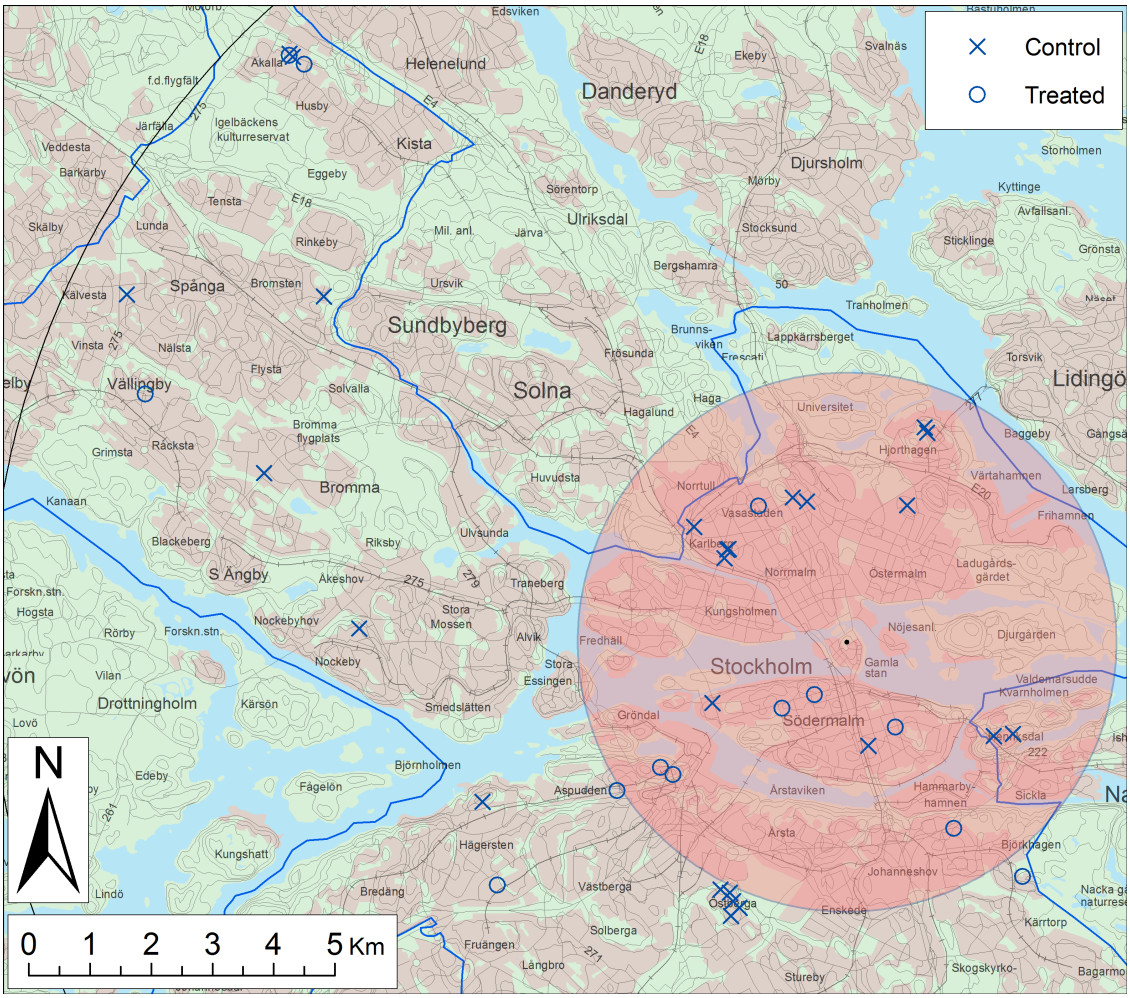
Stopplag resulted in the random denial of some co-op conversion attempts that were (i) initiated well before Stopplag was on the horizon, and (ii) fully approved by the municipal landlord and the tenant association. Out of 46 buildings (38 co-ops), 44 (36) of the attempts were initiated before November 2001. The other two were initiated before Stopplag became effective in April 2002. The conversion attempt of the Akalla complex, described in detail in Appendix A.4, serves as a good example of the random nature of the County Board decision. A detailed reading of minutes from the County Board confirms that the other denials were predominantly because a small share of apartments in the co-op had unique characteristics. Aside from the Akalla complex, reasons for denial in our sample include:

- The four-bedroom apartments in the building are unique to the neighborhood.
- The studios of size 17 to 25 square meters in the building are unique.
- The only remaining municipal building in the neighborhood has no elevator and has two fewer floors.
- The two-bedroom apartments in the building are unique to the neighborhood.

- The studios in the building are unique to the neighborhood.
- Two five-bedroom apartments in the building are unique to the neighborhood.
- There is one very large one-bedroom apartment in the building (54 square meters) which is unique to the neighborhood.

Figure A.1 plots the 38 co-ops on a map of the municipality of Stockholm; with circles denoting approvals and crosses denials. It also plots a shaded circle of five kilometer distance from the Royal Castle. Distance to the city center is measured as distance to the Royal Castle.

Figure A.1: Location of the Stopplag Sample



Notes: The map displays the location of the 38 privatization attempts in our Stopplag sample. Circles indicate approved co-ops (treated) and crosses indicate denied co-ops (control). The red circle has a radius of 5 kilometers distance from the center of Stockholm. The center is defined as the Royal Castle in the Old Town and it is indicated by a small black dot. The blue border indicates the municipality of Stockholm.

A.4 Example: Akalla Conversion

An example may help to further clarify the main quasi-experiment in home ownership that this paper studies. The Akalla complex consists of four co-ops located in a northern suburb of Stockholm, Akalla. Akalla is located in the district Kista, which is part of the Stockholm metropolitan area. Located only ten miles from the city center, it is served by the subway. It takes under 25 minutes to get to Stockholm's central train station by metro and about 35 minutes by car. The subway stop is a five minute walk from the co-ops. The district Kista was initially a working-class area, but starting in the 1970s an industrial section was constructed that housed several large IT companies which later became units of Ericsson and IBM. Ericsson has had its headquarters in Kista since 2003. Kista hosts departments of both the Royal Institute of Technology and Stockholm University. It is sometimes referred to as the Silicon Valley of Sweden. The area where the co-ops are located is a middle-class area at the time of our experiment.

Each of the four co-ops consists of several low- and mid-rise buildings adjacent to each other. Figure A.2 shows aerial and street views of the four properties, showing their geographic proximity. The entire Akalla complex was constructed in 1976, one year after the subway line to Akalla opened. All properties are owned by Svenska Bostäder, one of the large municipal landlords in Stockholm. Table A.3 provides details on the four properties. In addition to their extreme geographic proximity, identical year of construction, and identical ownership, the four co-ops' properties share several more characteristics. All co-ops have about the same floor area, with the vast majority of square meterage going to apartments and only a small fraction devoted to commercial use. They also have about the same distribution of apartments in terms of number of rooms, with the vast majority 3- and 4-room apartments (i.e., one- and two-bedroom apartments).

The four co-op conversion attempts display striking similarity, as shown in Table A.3. All co-ops registered around the same time. The date of initial contact is the date on which the co-op sends a letter to the landlord indicating interest in the purchase of the building, thereby starting the conversion process. The first two co-ops approached Svenska Bostäder within two weeks from one another in June 2001. The last two co-ops sent their request within one week at the end of September 2001. After the requests were made, the landlord hired an appraisal firm to determine the value of the property. The appraisals for all four buildings were done by the same appraisal firm, around the same time (September and November 2001), and using the exact same methodology. The landlord then made the formal offer with the asking price to the co-op. The co-ops voted on the offer at their tenant association meeting. The meetings at the first two co-ops took place on the same day, April 21, 2002. The next two votes took place less than two months later on June 17 and 19, 2002. All four tenant associations voted for conversion, i.e., for accepting the price offered by the landlord, by essentially the same margin: 68-74% of the vote in favor. Having exceeded the voting threshold of 2/3, all four co-ops decided to go ahead with the conversion. Upon verification of the vote, the landlord conditionally approved all four votes and the sale of all four buildings on September 5 and 9, 2002. If Stopplag had not been in effect yet, that approval would have been the end of the process, and all four conversions would have gone ahead.

However, given that the Stopplag was approved just a few months earlier (in March 2002, going into effect on April 1, 2002), the sale to the four Akalla co-ops required an additional layer of approval from the County Administrative Board of Stockholm. The County Board ruled on all four co-ops on the same day, February 21, 2003. The Board ruled that the inner courtyard of the Akalla complex, which contained townhouses belonging to each of the four co-ops, represented a unique kind of residential housing among the municipal landlords' overall stock of housing. For the purposes of determining the rent on those types of units in that geography, the Board decided that it could not let all four co-ops convert. It decided that only two of the four transactions could be approved. There was no established rule for which of the co-ops to give priority. The Board had to make up a rule at the meeting and decided to give priority to the two co-ops that voted first. Different rules could have been employed, such as approval based on the date when the contract was signed or the voting share among the tenants. Either of these two alternative rules would have resulted in a different outcome. Practically, this decision meant that the two co-ops that voted in April 2002 (ten months before the decision of the Board) won approval while the two that had voted in June 2002 (eight months before the decision of the Board) were denied. We argue that the decision to approve conversion was random in nature, since (i) the dates of the vote where within two months of each other, (ii) Stopplag was not even being discussed when the co-ops first registered in June 2001 and therefore could not have been anticipated, (iii) any other rule applied by the Board would have resulted in a different outcome, and (iv) the number of townhouse apartments was essentially the same in each co-op. The transfer of the property title for the buildings that gained approval took place at the end of May in 2003.

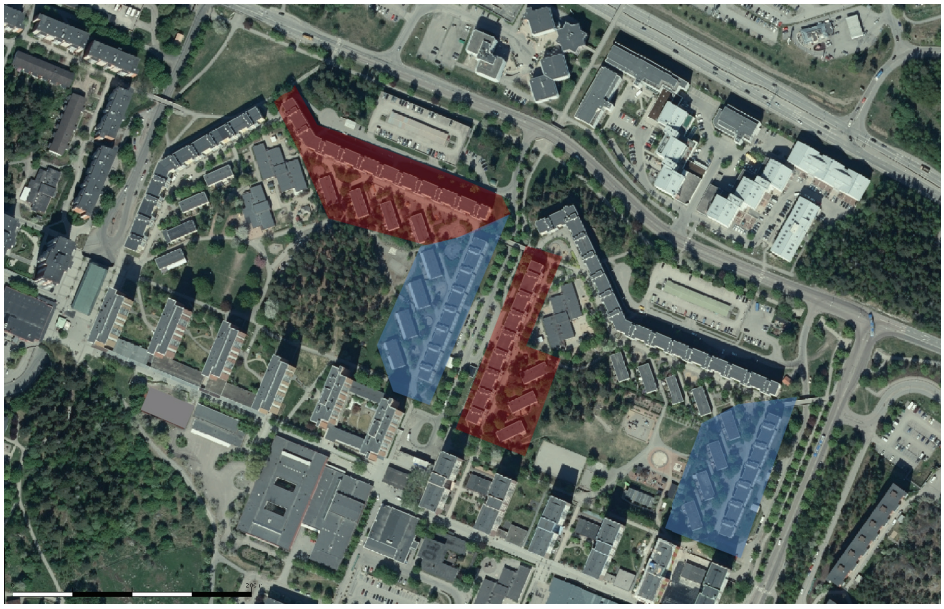
Table A.3: Akalla Coop Conversions

	Panel A: Property Details								
Property	built	sqm comm	sqm apts	apt units	1/2	3	4	4 TH	5 TH
Nystad 5	1976	228	6055	77	1	50	10	16	0
Sveaborg 5	1976	227	6775	87	1	60	10	16	0
Sveaborg 4	1976	254	10321	133	0	103	13	16	1
Nystad 2	1976	97	7204	95	8	65	10	12	0
	Panel B: Conversion Process								
Property	registration	contact	appraisal	vote	vote %	accepted	County	decision	transfer
Nystad 5	16-May-01	14-Jun-01	24-Sep-01	21-Apr-02	67.9%	9-Sep-02	21-Feb-03	approval	26-May-03
Sveaborg 5	27-Sep-00	28-Jun-01	14-Sep-01	21-Apr-02	73.6%	9-Sep-02	21-Feb-03	approval	27-May-03
Sveaborg 4	27-Sep-00	26-Sep-01	5-Nov-01	17-Jun-02	68.6%	9-Sep-02	21-Feb-03	denial	– –
Nystad 2	17-Jul-01	1-Oct-01	5-Nov-01	19-Jun-02	70.5%	5-Sep-02	21-Feb-03	denial	– –

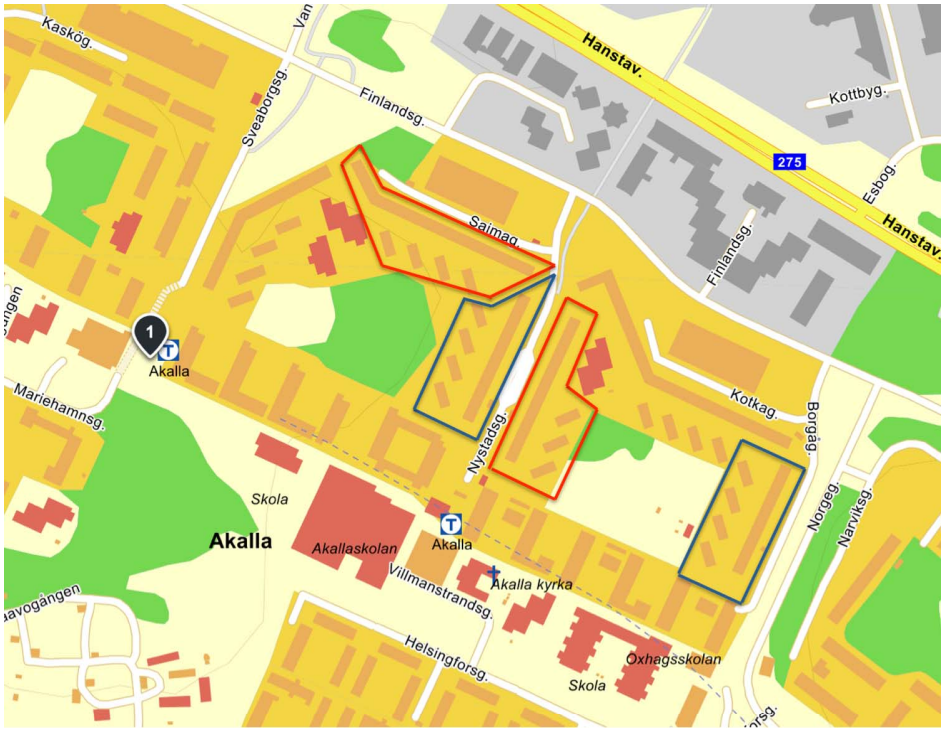
Notes: The table reports property characteristics (Panel A) and details on the co-op conversion process (Panel B) for the four buildings in the Akalla sample. Nystad 5 is located at Borgagatan 2-44, Sveaborg 5 is located at Nystadsgatan 2-46, Sveaborg 4 is located at Saimagatan 1-53, and Nystad 2 is located at Nystadsgatan 1-39. Panel A reports the name of the co-op, the name of the property, the address of the property, the year of construction, the total square meters of commercial space, the total square meters of apartments, the number of apartment units, and a breakdown of the number of apartments into 1- or 2-room, 3-room, 4-room, 4-room townhouse (TH), and 5-room TH units. Panel B lists the date of registration of the co-op, the date of initial contact between the co-op and the landlord (initiation of the conversion process), the date of appraisal, the date of the vote of the tenant association to approve the conversion, the fraction of votes that voted for conversion, the date the landlord approved the sale conditional on District approval, the date of the District approval decision, and the actual decision, and finally the date of the transfer of the property (closing) from the landlord to the co-op (for the approved conversions only).

Figure A.2: Akalla Complex

(a) Aerial photograph



(b) Street view



Notes: Panel (a) shows an aerial photograph and panel (b) a street view of the Akalla complex where the buildings colored/boxed blue were accepted and the buildings colored/boxed red were denied for co-op conversion. From northwest to southeast, the buildings are Sveaborg 4, Sveaborg 5, Nystad 2, and Nystad 5, respectively. The T with a circle indicates the nearest metro stop. The townhouse apartments are the buildings in the courtyard.

B Model

B.1 The landlord's pricing policy

The political directive of the municipality of Stockholm is to set the conversion price equal to the net present value of the operational profit of the landlord. Let ω_t denote the rent and ϕ_t the operating expenses. The landlord's asking price is given by:

$$(1-\tau)P_0 = \sum_{t=0}^{\infty} \omega_t R^{-t} - \sum_{t=0}^{\infty} \phi_t R^{-t} \tag{10}$$

where P_0 denotes the co-op market price and τ denotes the discount offered to the tenants relative to that market price.

B.2 The household's consolidated budget constraint

Consider a household that lives from $t = 0$ to $t = T \leq \infty$. The household can save and borrow in the asset a_t with rate of return r and where $R = (1 + r)$. Every period the household receives income y_t. The household consumes non-housing consumption c_t.

B.2.1 The renter's consolidated budget constraint

If a household does not partake in a privatization, it remains in its apartment from period 1 to period T. Denote a renter's consumption series by c_t^r. The period-0 budget constraint reads:

$$c_0^r + a_0 + \omega_0 = y_0 + \hat{a} \tag{11}$$

where $\hat{a}$ denotes net wealth in the beginning of period 0 and where ω_0 denotes the rent paid to the landlord. The intertemporal budget constraint from $t = 1$ to $t = T - 1$ reads:

$$c_t^r + a_t + \omega_t = y_t + a_{t-1}R \tag{12}$$

An equivalent formulation is:

$$a_{t-1} = (c_t^r + a_t + \omega_t - y_t)R^{-1} \tag{13}$$

In the terminal period T the renter cannot leave any debt, so that $a_T = 0$. Hence, the terminal period's budget constraint reads:

$$a_{T-1} = (c_T^r + \omega_T - y_T)R^{-1} \tag{14}$$

Consolidating the one-period budget constraints (11) and (13), one obtains:

$$\sum_{t=0}^{T-1} c_t^r R^{-t} + \sum_{t=0}^{T-1} \omega_t R^{-t} + a_{T-1} R^{-T+1} = \sum_{t=0}^{T-1} y_t R^{-t} + \hat{a} \tag{15}$$

Substituting (14) into (15) delivers:

$$\sum_{t=0}^{T} c_t^r R^{-t} + \sum_{t=0}^{T} \omega_t R^{-t} = \sum_{t=0}^{T} y_t R^{-t} + \hat{a} \tag{16}$$

where $\sum_{t=0}^{T} \omega_t R^{-t}$ denotes the net present value of rents.

B.2.2 The homeowner's consolidated budget constraint

Let P_0 denote the price of the apartment at $t = 0$ on the private co-op market. The conversion price is $(1-\tau)P_0$. Conditional on privatizing in year 0, the budget constraint reads:

$$c_0^o + \phi_0 + a_0 + (1-\tau)P_0 = y_0 + \hat{a} \tag{17}$$

where $\hat{a}$ denotes net wealth in the beginning of period 0 and ϕ_0 denotes the co-op fee, which the owner pays to the co-op to pay for operational expenditures. Homeowner consumption is denoted by c_t^o.

From period 1 to T, the household remains in its housing unit as a homeowner. The budget constraint reads:

$$c_t^o + \phi_t + a_t = y_t + a_{t-1} R \tag{18}$$

An equivalent formulation is:

$$a_{t-1} = (c_t^o + \phi_t + a_t - y_t) R^{-1} \tag{19}$$

The homeowner consumes and pays the co-op fee for the last time in T. The household sells its apartment in the beginning of $T+1$ at price P_{T+1}. The terminal condition is $a_T = 0$ ($a_T > 0$ is sub-optimal, $a_T < 0$ is not allowed). Hence, the terminal budget constraint reads:

$$a_{T-1} = (c_T^o + \phi_T - y_T - P_{T+1} R^{-1}) R^{-1}, \tag{20}$$

where the proceeds from the apartment sale is discounted to T.

Consolidating intra-temporal budget constraints (17) and (19), we obtain:

$$(1-\tau)P_0 + \sum_{t=0}^{T-1} c_t^o R^{-t} + \sum_{t=0}^{T-1} \phi_t R^{-t} + a_{T-1} R^{-T+1} = \sum_{t=0}^{T-1} y_t R^{-t} + \hat{a} \tag{21}$$

Substituting (20) into (21):

$$(1-\tau)P_0 + \sum_{t=0}^{T-1} c_t^o R^{-t} + \sum_{t=0}^{T-1} \phi_t R^{-t} + (c_T^o + \phi_T - y_T - P_{T+1}R^{-1})R^{-T} = \sum_{t=0}^{T-1} y_t R^{-t} + \hat{a} \tag{22}$$

Rearranging:

$$(1-\tau)P_0 + \sum_{t=0}^{T} c_t^o R^{-t} + \sum_{t=0}^{T} \phi_t R^{-t} = \sum_{t=0}^{T} y_t R^{-t} + \hat{a} + P_{T+1}R^{-T-1} \tag{23}$$

B.2.3 Defining the wealth shock

The wealth shock, W_0, is the difference between the present discounted value of consumption for a household that participates in the privatization and becomes a homeowner in year 0 and for that same household that is denied privatization and rents.

$$W_0 = \sum_{t=0}^{T} c_t^o R^{-t} - \sum_{t=0}^{T} c_t^r R^{-t}$$

Subtracting equation (16) from (23) we obtain:

$$(1-\tau)P_0 + \sum_{t=0}^{T} c_t^o R^{-t} - \sum_{t=0}^{T} c_t^r R^{-t} + \sum_{t=0}^{T} \phi_t R^{-t} - \sum_{t=0}^{T} \omega_t R^{-t} = \sum_{t=0}^{T} y_t R^{-t} - \sum_{t=0}^{T} y_t R^{-t} + P_{T+1}R^{-T-1} \tag{24}$$

Under the (empirically validated) assumption that income is unaffected by treatment, the difference simplifies to:

$$(1-\tau)P_0 + \sum_{t=0}^{T} c_t^o R^{-t} - \sum_{t=0}^{T} c_t^r R^{-t} + \sum_{t=0}^{T} \phi_t R^{-t} - \sum_{t=0}^{T} \omega_t R^{-t} = P_{T+1}R^{-T-1} \tag{25}$$

Hence, the wealth shock equals:

$$W_0 = P_{T+1}R^{-T-1} - (1-\tau)P_0 + \sum_{t=0}^{T} (\omega_t - \phi_t)R^{-t} \tag{26}$$

Imposing the pricing policy Substituting the pricing policy of the landlord, as given by equation (10), into (26), we obtain:

$$W_0 = P_{T+1}R^{-T-1} - \sum_{t=0}^{\infty} (\omega_t - \phi_t)R^{-t} + \sum_{t=0}^{T} (\omega_t - \phi_t)R^{-t}, \tag{27}$$

which simplifies to:

$$W_0 = P_{T+1}R^{-T-1} - \sum_{t=T+1}^{\infty} (\omega_t - \phi_t)R^{-t} \tag{28}$$

Put differently,

$$W_0 = R^{-T-1}(P_{T+1} - \sum_{t=T+1}^{\infty} (\omega_t - \phi_t)R^{T+1-t}) \tag{29}$$

Rearranging once more:

$$W_0 = R^{-T-1}(P_{T+1} + \sum_{t=T+1}^{\infty} \phi_t R^{T+1-t} - \sum_{t=T+1}^{\infty} \omega_t R^{T+1-t}) \tag{30}$$

which is the difference between the cost of owning and the cost of renting from period $T+1$ onwards, discounted back to today. Equation (30) says that the wealth shock today depends on the evolution of the rent control system. If it were announced at time 0 that the rent control system would be abolished at time T, the wealth shock W_0 would be 0 (by equation (10) applied at $T+1$ with $\tau = 0$).

Assuming that the rent regulation remains in place until $T+1$, we can evaluate equation (10) at time $T+1$ and compute its present value as of $t = 0$, and then substitute into (30):

$$W_0 = R^{-T-1}\left(P_{T+1} - (1-\tau)P_{T+1}\right), \tag{31}$$

or

$$W_0 = \tau P_{T+1}R^{-T-1}. \tag{32}$$

The wealth shock is the wedge between the value of the building in the private market and in the hands of the municipal landlord at time $T+1$, discounted back to time 0. The reason that the wealth shock is lower than the wedge measured at time zero is that the renter enjoys discounted rents, which are lower than the market rents (as implied by the market price), and are subtracted out.

Imposing a house price process House prices evolve as follows:

$$P_{t+1} = P_t R_h, \tag{33}$$

where $R_h = 1 + r_h$. From period 0 to $T+1$, house prices appreciates as follows:

$$P_{T+1} = P_0 R_h^{T+1}, \tag{34}$$

implying that equation (32) can be written as:

$$W_0 = \tau P_0 \left(\frac{R_h}{R}\right)^{T+1}. \tag{35}$$

This equation illustrates that there is cross-sectional variation to be explored for τ at the co-op level and for T at the household level.

B.3 Solving for the spending response

We assume that the household has decreasing marginal utility and that its subjective discount factor, β, is equal to R^{-1}. This ensures that households desire to hold per-period consumption constant over time. Renters' consumption is $c_t^r = c^r$ and homeowners' consumption is $c_t^o = c^o$. Then the wealth shock

$$\begin{aligned} W_0 &= (c^o - c^r)\sum_{t=0}^{T} R^{-t} \\ &= (c^o - c^r)\sum_{t=0}^{T} \frac{1}{(1+r)^t} \\ &= (c^o - c^r)\frac{1+r}{r}\left(1 - \frac{1}{(1+r)^{T+1}}\right) \end{aligned} \tag{36}$$

So the consumption response is the annuity value of the wealth shock

$$c^o - c^r = W_0 \left(\frac{r}{1+r}\right)\left(1 - \frac{1}{(1+r)^{T+1}}\right)^{-1}. \tag{37}$$

Substituting in equation (35) we see that the consumption response depends on four factors:

$$c^o - c^r = \left(\frac{r}{1+r}\right)\left(1 - \frac{1}{(1+r)^{T+1}}\right)^{-1} \tau P_0 \left(\frac{R_h}{R}\right)^{T+1}. \tag{38}$$

The first factor is the perpetuity factor $r/(1+r)$. The second factor is an adjustment of the first factor for a finite horizon of T years. That is, the annuity factor for T years is the product of the first two factors. The third factor is the landlord's discount relative to the co-op market price. The fourth factor is an adjustment taking into account that the household is entitled to regulated rents for the next T years. This is equation (4) in the main text. We define the product of the first three terms as $\widetilde{W}$.

B.4 Numerical Example

To solve for the consumption levels of renters and homeowners, we make additional assumptions. The operationalize the model, we choose parameter values as detailed below.

B.4.1 Assumptions

Assume that rent to price and net rent to price ratios are constant, implying that $\omega_t = \omega P_t^h h_t$ and $\phi_t = \phi P_t^h h_t$, where P_t^h is the price per square meter and h_t the number of square meters. Assume that the household stays in its current apartment ($h_t = h_0,\ \forall t \in \{0, \cdots, T\}$) and that the household has constant income, $y_t = y$ over the same period.

Renters' consumption can be computed from (16). After some algebra, we get:

$$c^r = y + \left(\frac{r}{1+r}\right)\left(1 - \frac{1}{(1+r)^{T+1}}\right)^{-1}\left[\hat{a} - \omega P_0^h h_0 \frac{1 - \left(\frac{R_h}{R}\right)^{T+1}}{1 - \left(\frac{R_h}{R}\right)}\right] \tag{39}$$

Owners' consumption can be computed from (23). It follows that:

$$c^o = y + \left(\frac{r}{1+r}\right)\left(1 - \frac{1}{(1+r)^{T+1}}\right)^{-1}\left[\hat{a} - \phi P_0^h h_0 \frac{1 - \left(\frac{R_h}{R}\right)^{T+1}}{1 - \left(\frac{R_h}{R}\right)}\right] + P_0^h h_0 \left(\frac{R_h}{R}\right)^{T+1} - (1-\tau)P_0^h h_0 \tag{40}$$

B.4.2 Calibration

We calibrate the model as reported in Table B.1. The return on financial wealth, house price growth, the net rental yield, and the net rent to price ratio are consistent with the post-1950s and post-1980s equity return and net rental yield values for Sweden reported in Jordà et al. (2019). The values for disposable income, apartment values, and initial financial wealth are consistent with averages reported in Table 1 for our quasi-experiment.

Disposable income, apartment value, and initial financial wealth are only required to solve for the level of the renter's and homeowner's consumption (equations (39) and 40).

Figure B.1 illustrates the model implications based on equation (38). Panel (a) shows spending responses for four different time horizons T, which can be thought of as four different households leaving the Stockholm housing market after differing lengths of residency. Spending responses are stronger for shorter T. Panel (b) shows the spending response out of the wealth shock, $\widetilde{W}$, which is household- and building-specific. The response coefficient is the perpetuity factor $r/(1+r)$. In our empirical work, we exploit cross-sectional variation in $\widetilde{W}$ to disentangle the effect of home

Table B.1: Model parameters

	Notation	Value
Gross return on financial wealth	R	1.0700
Subjective discount factor	β	0.9346
House price growth	R_h	1.0200
Rent to price ratio	ω	0.0678
Maintenance to price ratio	ϕ	0.0210
Net rent to price ratio	$\omega - \phi$	0.0468
Time horizon	T	40.00
Fractional discount	τ	0.4600
Disposable income	y	163.87
Apartment value on co-op market	$P_0^h h_0$	1353.45
Initial financial wealth	$\hat{a}$	85.43

Notes: The table presents the parameter values of the model. Values for the last three rows are in SEK 1,000s.

ownership from the wealth shock.

B.5 Equilibrium net rental yield

This section derives a parameterized expression for $\left(\frac{R_h}{R}\right)$ using the first order conditions of owner and renter. We use this expression in equation (35), as well as in the calibration of the model. We assume a per-period utility function $u(c_t, h_t)$ and that households live until $T \leq \infty$. Let u_c denote the partial derivative with respect to the first argument and u_h the partial derivate with respect to the second argument.

The renter's problem In the renter's budget constraint ω is redefined as the rent-to-price ratio. The budget constraint reads:

$$c_t + a_t + \omega P_t^h h_t = y_t + a_{t-1} R \tag{41}$$

with $a_T = 0$ so that the budget constraint is analogous to equations (11)-(14).

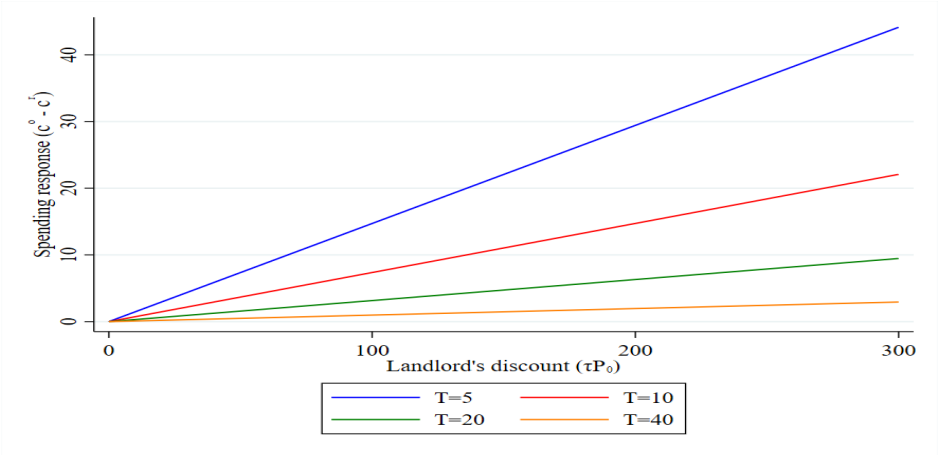
The renter's problem is:

$$\max_{c_t, a_t, h_t} \sum_{t=0}^{T} \beta^t u(c_t, h_t)$$

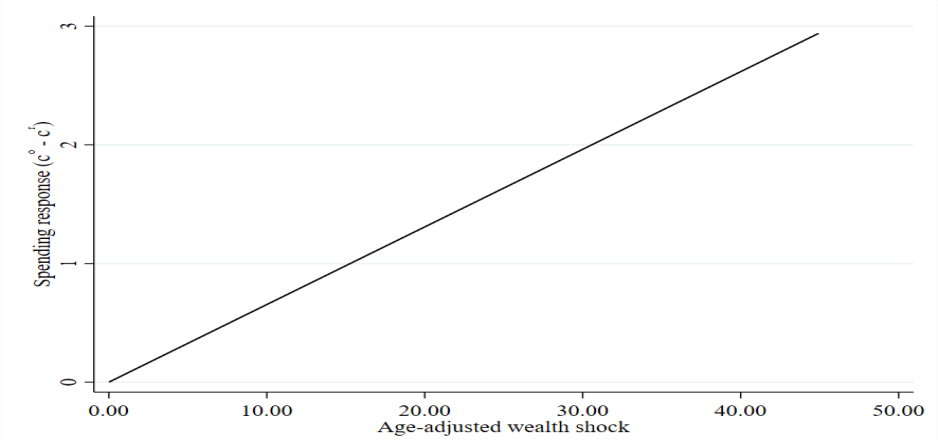
subject to (41).

Figure B.1: Model implications

(a) Spending response as a function of the discount



(b) Spending response as a function of the wealth shock



Notes: Panel (a) depicts the spending response ($c^o - c^r$) as a function of the landlord's discount, τP_0, for four different time horizons, T. Panel (b) depicts the spending response as a function of thewealth shock, $\widetilde{W}$. The slope of that line is $r/(1+r)$.

The first-order condition with respect to h_t is:

$$\frac{u_h^t}{u_c^t} = \omega P_t^h. \tag{42}$$

Notice that for the renter this optimally condition is static. The first-order condition with respect to a_t is the standard Euler equation:

$$R^{-1} = \beta \frac{u_c^{t+1}}{u_c^t} \tag{43}$$

The homeowner's problem Let us assume that the homeowner optimizes housing consumption every period so that the first-order condition always holds. That is, the homeowner purchases and

sells housing every period. Let ϕ define the maintenance-to-price ratio. Let R^h define house price appreciation, $P_t^h = P_{t-1}^h R^h$. The budget constraint of the homeowner reads:

$$c_t + a_t + (1+\phi)P_t^h h_t = y_t + a_{t-1}R + P_{t-1}^h h_{t-1} R^h \tag{44}$$

There are no transaction costs so one can think of the owner as buying its house every period and paying one period of maintenance ($\phi P_t^h h_t$) upfront. In the next period the house is sold at $P_{t-1}^h h_{t-1} R^h = P_t^h h_{t-1}$. Equation (44) is the analogue to equations (17)-(20) aside from the housing terms which appear every period and which is going to be a choice variable.

The homeowner's problem is:

$$\max_{c_t, a_t, h_t} \sum_{t=0}^{T} \beta^t u(c_t, h_t)$$

subject to (44).

The first-order condition w.r.t. h_t is

$$P_t^h = \frac{u_h^t}{u_c^t} - \phi P_t^h + \beta \frac{u_c^{t+1}}{u_c^t} P_{t+1}^h. \tag{45}$$

If owner and renter agree on the (shadow) value of housing services, equation (42) can be substituted into (45) to obtain:

$$1 = \omega - \phi + \beta \frac{u_c^{t+1}}{u_c^t} R^h \tag{46}$$

The homeowner's first-order condition w.r.t. to a_t is identical to equation (43). Substitute (43) into (46) and rearrange:

$$\frac{R^h}{R} = 1 + \phi - \omega = 1 - (\omega - \phi) \tag{47}$$

This equation provides a parameterized expression for $\frac{R^h}{R}$. It is determined by the wedge between the rent and the operating cost, $\omega - \phi$. Notice that it should be interpreted as the net rental yield.

C Construction of variables

This appendix describes construction of all variables except for housing wealth, $dHousing$, and the buffer.

Demographics For each tenant, we obtain data on age, gender, number of children, total family size, marital status, and location. The *Age* of the household is the age of the oldest adult in the household. We limit our sample to households whose *Age* is less than 65 in RY(-1). *Partner* takes on the value of one for married individuals, those with registered partnerships, and for unmarried couples with a child.

Income We consider two different income concepts. *Labincind* measures a household's labor income per adult. It is a comprehensive measure of all income derived from work: wages, salaries, income from sole proprietorships and active business activity, unemployment benefits, and employer-provided benefits such as a company car, sick leave, and continued education. *Numwork* is the number of adults in the workforce. *Labinchh* is total household income, the product of the labor income per adult (intensive margin) and the number of working adults (extensive margin). Our second income variable *Income* is a broader measure of income that enters the household budget constraint; it is after-tax. The construction procedure for *Income* is described below in Section C.1.

Debt We observe total household-level debt, *Debt*. We have no separate information on mortgage debt. Mortgage debt accounts for 2/3 of total household debt in Sweden in the 2002-04 period according to the Riksbank's 2004 Financial Stability Report. *Interest* is the interest paid on *Debt*. When a household participates in a co-op conversion, buys her apartment and increases debt to do so, the increase in housing wealth and in debt does not always occur in the same year. This timing issue occurs when the real estate transaction occurs around year-end.

Financial wealth A unique feature of the Swedish data is the granular financial asset information. We have information for every stock, mutual fund, and money market fund for every individual in our sample. We also have information on the total value invested in bonds for each individual. End-of-year values of each asset are reported administratively (not self-reported) for the computation of the wealth tax. Because the wealth tax was abolished starting in 2008, we end our sample in 2007. We label the sum of these risky financial assets *Risky*. Financial wealth *Financial* contains four more components: *Nonhouse*, *Bank*, *CapIns*, and *Pension*. *Bank* is the balance of all bank accounts. Reporting requirements on bank accounts vary over time, and are based on interest income earned for the period from 1999 to 2005 and based on bank balances in 2006–07. Appendix C.3 provides more detail on our bank account imputation procedure, which further improves on Calvet, Campbell and Sodini (2007). For the capital insurance accounts, we observe the

year-end balance but not the asset mix. We assume a 50-50 mix of equity and bonds. For pension accounts, we observe contributions made in the year. Withdrawals are included in $Income$.

Changes in risky assets *dRisky* measure only active changes. For each asset, we take the invested amount at the end of the prior tax year and apply the cum-dividend return over the course of the current tax year. Constructing $dRisky$ requires collecting price appreciation and dividend data on thousands of individual financial assets. For bonds, we do not have such price information, and we apply a (cum-coupon) bond index return to the individual bond positions to calculate the passive value. If the value at the end of the current tax year deviates from the passive value, we label the difference an active change. We aggregate active changes across all risky assets in *dRisky*. Like for real estate, this ensures that unrealized gains and losses do not affect the change-in-wealth measure and therefore consumption. The change in financial wealth *dFin* is the sum of *dRisky*, *dBank*, *dCapIns*, *dPension*, and *dNonhouse*. A positive value for *dFin* measures household savings, while a negative value measures dissaving.

Appendix D describes how we construct $dHousing$.

Consumption As explained below, the wealth and income data are so comprehensive and precisely measured that they allow us to compute high-quality measures of household-level consumption spending, a rarity in this literature that usually relies on proxies for consumption (car or credit card purchases) or on survey-based measures of consumption. Consumption is measured as the right-hand side of the budget constraint:

$$Cons = dDebt - dHousing - dFin + Income \tag{48}$$

Consumption is high when households increase borrowing, sell housing or financial assets, or earn high income, all else equal. A purchase of an apartment which is fully funded with a mortgage has no implications for consumption. We define *Savings* as *Income* minus *Cons*.

Our consumption measure is a measure of total annual spending. As such, it includes outlays on durables rather than the service component from durable spending. The method does not allow us to break down consumption any further into its subcategories. Appendix J compares our consumption measure to that in the Swedish household budget survey. It also discusses a breakdown of consumption categories for households who newly purchased an apartment. Koijen, Van Nieuwerburgh and Vestman (2014) discuss the benefits and drawbacks of registry-based consumption data and compare registry-based consumption to standard survey-based consumption for the same set of households. Four minor sources of measurement error are: imputation of apartment wealth for stayers, measurement issues with bank accounts, coarse imputation of returns on bonds based on a bond index, and lack of knowledge of the exact asset mix of the capital insurance accounts.

The rest of this appendix describes in detail how $dDebt$, $dFin$, and $Income$ are constructed.

C.1 Construction of Income

Disposable income includes interest income from fixed income securities, dividend income from stocks and mutual funds, rental income from properties, as well as realized capital gains from the sale of financial assets and real estate properties. Since financial income and capital gains are part of our measure of financial wealth we subtract them from disposable income to avoid double counting these items. From disposable income we also deduct net increases in student loans, which are part of the change in debt. The tax values for each of these types of income are also reported separately and are added back in the calculation. We are left with a broad measure of mostly labor income after taxes and transfers, which we call $Income$. Consumption increases with $Income$.

C.2 Construction of dDebt

The debt level is observed in the wealth registry for all individuals and at the end of each year. Debt refers to student loans, mortgages and consumer loans. Consumption increases with a positive change in debt (when an individual borrows more) and decreases with a negative change in debt (when loans are paid off).

Simple debt change for the current year is calculated as the difference between the level of debt at the end of the current year and the value at the end of the previous year; call this variable dD. The variable $dDebt$ is constructed as:

$$dDebt = dD - Interest + \underbrace{0.7 \times Interest \times Adjfactor}_{after-tax\ mortgage\ interest} \tag{49}$$

Prior to the treatment year RY0, the adjustment factor $Adjfactor = 0$. That is, the amount of interest paid on loans is subtracted from the simple debt change to obtain dDebt. Conceptually, this prevents interest payments made for past (durable) expenditures to be counted as consumption in the current year. Since our consumption measure is a total expenditure measure, we account for the (durable) expenditures fully in the year of the outlay. Including the interest expense on the debt would lead one to overstate the true consumption expenditure. On SCB's server, interest expenses are not available for years 2001 and 2002. In this case we calculate the average interest rate individuals paid for their loans in 2000 and 2003 and we apply this rate to the debt levels in 2001 and 2002.

After the treatment year RY0, we proceed the same way ($Adjfactor = 0$) as long as a household is not a home owner. For households that become homeowners after RY0, things become more complicated. For housing, we want to measure the service flow of owned housing because we do not want to treat renters and owners asymmetrically. Failing to capture this service flow would systematically understate consumption for homeowners and thus create mechanical effects

in the measurement of consumption for the treatment versus the control groups. Our consumption measure automatically includes housing consumption for renters (rent payments). If we do not include the mortgage interest expense for owners, total consumption for owners would only reflect part of housing consumption, namely home maintenance expenses and co-op fees. Therefore, for all household-year observations after RY0 in which a household in the treatment or in the control group is a home owner, we add back the mortgage interest debt service. This ensures that this component of housing consumption for owners is included in *Consumption*. A complication is that we only see total debt, which is the sum or mortgage debt, student loans, and consumer loans. We proxy the share of mortgage debt in total debt as $Adjfactor = [Debt_k - Debt_{-1}]/Debt_k$, where $k \geq 0$, and apply this mortgage share to the total interest expense to proxy for the mortgage interest expense. A final detail is that we only want to add back 70% of the mortgage interest expense since 30% of the mortgage interest expense can be deducted from income for tax purposes. A similar approach is followed by Eika, Mogstad and Vestad (2017).

C.3 Construction of dFin

The change in financial wealth is the sum of changes in the risky portfolio, capital insurance accounts, non-residential real estate, and imputed bank accounts, plus contributions made to pension accounts.

The yearly change in the *risky asset portfolio* is calculated as the sum of active changes in the stocks, mutual funds, Swedish money market funds and bonds individual portfolios. End of year holdings are observable and thus we construct a measure that only considers active rebalancing of these portfolios.

We treat stocks, mutual funds and Swedish money market funds separately and we calculate the current year return of each portfolio based on the holdings at the end of the previous year. The active change is thus calculated as the difference between the portfolio's value at the end of year and last year's value multiplied by the weighted portfolio return, or:

$$Pv_t - Pv_{t-1} R_{holdings\,in\,t-1,t}$$

where Pv is the portfolio value and $R_{holdings\,in\,t-1,t}$ is the cum-dividend portfolio return calculated using last year's asset weights. If an asset does not have prices during the next year (i.e. delisting, mergers), we assume that the asset value is distributed proportionally to the other assets in the portfolio and the weights are scaled accordingly.

For the portfolio of bonds, we replace the return from the holdings with the return of a one year bond index. This return is cum-dividend, that is, inclusive of coupon income.

Finally, the total change in the risky asset portfolio is calculated as the sum of the active changes in the stocks, mutual funds, money market funds and bonds portfolios. Consumption decreases

when the change in risky assets is positive.

For *capital insurance accounts* we observe the end of year level of the account without knowing how the assets are allocated. We assume that the portfolio allocation is a 50-50 mix of bonds and stocks and we calculate the change in capital insurance accounts using benchmark Swedish bond market and equity market index returns.

Non-residential real estate consists of different kinds of property, such as farm houses, vacation homes, apartment buildings, real estate abroad, industrial real estate, agricultural real estate, land for own home, land for vacation home and real estate holdings classified as "other". For any given year in our sample period we can observe the market value for each of these kinds of property. The market value is imputed by Statistics Sweden and is calculated as the tax value $\times$ a regional factor which is based on transaction values in the region during the year.

We consider that a property is sold during the current year if it appears in the wealth registry with zero market value and the market value at the end of the previous year was positive. Alternatively, a property is bought if its market value in the current year is positive, while its corresponding value was zero in the previous year. Thus, the change in real estate wealth for a type of property can be equal to either the market value of the current year in the case of an acquisition, or to minus last year's value in the case of a sale. To identify transactions each kind of property is tracked by itself from year to year. Thereafter, we sum the market values of all kinds to obtain the total change in non-residential real estate:

$$dNonhouse = \sum_{j} Hnr_{j,t} - Hnr_{j,t-1}, \; \textit{if } Hnr_{j,t} = 0 \textit{ or } Hnr_{j,t-1} = 0$$

where $Hnr_{j,t}$ is the market value of non-residential real estate type j at time t.

Change in bank accounts. We observe the total amount individuals have in their bank accounts at the end of the year when this amount exceeds a certain level. For years 1999 to 2005, bank accounts are reported if the earned interest is greater than 100 SEK, while for years 2006 and 2007 they are reported if the total balance of an account is greater than 10,000 SEK. The change in 2006 results in significantly more visible accounts. If the level or interest earned condition is not met, the observed balance is zero. In these cases we use an improved version of the bank account imputation procedure developed first by Calvet, Campbell and Sodini (2007), which relies on the subsample of individuals for which we observe the bank account balance.

We start by dropping the extra bank accounts that become visible in 2006 after the regulation change in order to have a consistent imputation across all years (i.e. we drop visible accounts that earn less than 100 SEK interest). We regress the log bank account balance on the following characteristics: log of financial assets other than bank account balances and Swedish money market funds, log of Swedish money market fund holdings, log of residential real estate, log of non-residential real estate, household size, log of debt, square of log debt, disposable income decile dummies, parish decile dummies ranked on average disposable income, 5-year wide age group

dummies, education level dummies and a series of demographics dummies such as married man, married woman, single individual, single father and single mother.

We use the regression to estimate the account balances of each individual. In this procedure, we adjust the intercept of the imputation regression so that the average value of observed and imputed bank account balances in our population matches the average bank account balance of the household sector reported by Statistics Sweden.

The yearly change in bank accounts is calculated as the difference between the balance at the end of the current year and the balance at the end of the previous years. Consumption decreases with the change in bank accounts.

D Construction of Housing Wealth and $dHousing$

From the Wealth Registry (Förmögenhetsregistret) data, we observe the market value of apartments, single-family houses, second homes, investment properties, and commercial real estate. We define the variable housing wealth as the sum of the apartment and single-family housing wealth. It only contains properties that are intented for permanent residency according to the tax authority (Skatteverket), that is co-op apartments and single-family houses (småhus). All additional residential or commercial real estate is part of financial wealth. Because the value of owned apartments is imputed by Statistics Sweden with substantial measurement error, we construct apartment wealth using our own methodology, as described below.

D.1 Apartment wealth

We proceed in two stages for each apartment: identification of apartment ownership and the corresponding apartment value. We use a different methodology depending on whether the apartment has been sold by 2017, or not.

D.1.1 Valuation of apartments prior to the last sale

We are able to identify the ownership of apartments whose sales appear in the tax form for sale of a co-op apartment (Överlåtelse av bostadsrätt, KU55). The KU55 data record the seller, the organization number of the co-op, and the date, sale price, prior purchase price, ownership share, and transaction type of both the prior acquisition and the current sale. Conditional upon a sale, we know the exact period during which the seller owned the apartment. We can also tie the apartment to its co-op, including the 13 treated co-ops. To impute the corresponding apartment value, we first use the price and ownership share information to calculate the value of the apartment at date of purchase and at date of sale. Second, we use the apartment price index at the most detailed geographical level available (either county, municipality or parish; see Appendix H) to impute the value of the apartment after the purchase date and prior to the sale date.

D.1.2 Valuation of apartments never transacted or after the last sale

We identify apartment ownership after the apartment has been last sold in KU55 (or if the apartment never appears in KU55) utilizing information from the Total Population Register (Register över totalbefolkningen, RTB, 1999-2017), Apartment Registry (Lägenhetsregistret, 2012-2017), and the tax form for property values of co-op shares (Förmögenhetsvärde för bostadsrätt, KU56, 2003-2007). The Total Population Register contains the official address of each individual and a property identifier. The properties can be classified into different categories such as rental units, co-op ownership, and private ownership (Hyresrätt/Bostadsrätt/Äganderätt) using the Apart-

ment Registry. Thus, we have a list of individuals residing in co-op properties up to the end of 2017. We can identify owners and renters by using KU56, which only contains information on owners of apartments. We assume the ownership started from the first year that the individual was registered in the property. Finally, the individual ownership share is distributed according to the number of registered adults in the household (100 percent if single adult, 50 percent if two adults).

The value of ownership of unsold apartment is imputed using the apartment floor area in square meters multiplied by the apartment price per square meter at the smallest geographical area available (see Appendix H). Apartment size is retrieved from the Apartment Registry when available. For owners not observed in the Apartment Registry, we predict the apartment square meters using KU56, since this registry reports the co-op ownership share which is typically proportional to the size of the apartment, and we are able to retrieve the total square meters in the co-op association using the Apartment Registry.

D.1.3 Improvements for apartments in our privatized buildings

For households in the 13 converted co-ops that did not sell their apartment before 2017 according to KU55, we use the residual tenants' classification methodology, see Appendix E.

In our sample we have additional information on each apartment's size (i.e, square meters) from the tenant lists obtained from landlords. We use this information together with every transaction in each building to calculate the price per square meter for each individual building. We use the mean square meter price per building in every year to value the apartments in our sample. For years when there are no transactions, we calculate the appreciation using the apartment price index for each parish to value the apartments (see Appendix H). This is how we obtain square meter prices in all years after the privatization, including relative year $k = 0$, denoted by p_0 in Section 3. The product of square meters and p_0 is denoted by P_0. (Its model-equivalent is denoted by P_0.)

D.2 Construction of dHousing

Because of the detailed nature of the Swedish data, we are able to observe the real estate wealth of individuals in great detail. In order to construct an accurate measure of the change in real estate wealth, we include information on several types of properties taken from the Wealth Registry (Förmögenhetsregistret). These properties are grouped into properties intended for permanent residency (i.e, single-family houses and co-op apartments) and other real estate and are treated separately.

Consumption decreases with positive changes in real estate wealth (acquisitions) and increases with negative changes in real estate (sales). dHousing includes houses and apartments and is the

sum of dHouse and dApartments. Other forms of real estate are included in dFin.

D.2.1 dHouse

In order to calculate the change in wealth invested in houses, we turn to the Wealth Registry. We observe the total imputed market value of an individual's owned single-family houses. We also observe the geographic location (municipality) of upto two single-family houses for each individual in our sample.

We define a house as acquired if housing wealth changes from zero in the past year to a positive value at the end of the current year, and the opposite in the case of a sale. When housing wealth is positive both at the end of current and the prior year, we consider there to be an acquisition of housing wealth during the year if the number of houses owned increases, and vice versa. In addition, we consider there to be both an acquisition and a sale during the year if the number of house(s) owned is the same but the municipality of at least one of the housing properties changes. Similarly, we identify transactions when we observe people moving to a different property in the Total Population Register, even though they have positive wealth in residential house(s) located in the same municipality in the current and the prior year. This special case captures acquisitions and sales when house owners move within the municipality. In such scenarios of both a sale and a new purchase, we assume that the houses are sold at last year's market value and the houses are bought at the market value at the end of the current year. The change in house real estate, dHouse, is defined as the difference between the value in the current year and the past year.

When we do not observe housing transactions, either because homeowners continue to own or renters continue to rent during the year, dHouse is zero.

D.2.2 dApartments

We use values from KU55 for the acquisitions and sales of apartments sold before the end of 2017 as described in section D.1. We only include arm's length transactions in dApartment, i.e. entries in KU55 in which individuals transfer their entire ownership share of an apartment, thus excluding donations, transfers between spouses, and inheritances. For owners that did not sell their apartment before the end of 2017, we use the imputed apartment wealth value for the acquisition.

Improvements for apartments in our privatized buildings For apartments that belong to our privatized buildings we are especially careful to account for the cash-flow generated by the privatization itself. From KU55 tax forms of sellers, we calculate the conversion price per square meter, denoted by p_0^c. We compute the median value for each building and apply it to every household.

E Classification of residual tenants

We use four pieces of information to classify residual tenants: co-ops' annual reports (Bolagsverket, 2018), co-ops' lists of residual tenants submitted to Statistics Sweden (Co-op boards, 2014), the change in debt to income of a household, and information about households' sales of co-op apartments up until 2017.

From the co-ops' annual reports we collect the total number of apartments in the building, the number of apartments owned by co-op members, and the number of apartments that the co-op rents out. According to the earliest available reports just after the privatization and transfer of ownership title from the landlord to the co-op, there are 848 apartments of which 736 are owned by co-op members and 111 are rented out (i.e., 13 percent).[59]

We proceed in two main steps in the classification of purchasers and residual tenants, described in Sections E.1 and E.2.

E.1 Procedure to classify purchasers and residual tenants in a provisional sample

First, we construct a provisional sample of households that only is used to classify residual tenants. The sample represents the households whose official address coincides with the building address at the time of the transaction between the landlord and the co-op. That is, we select households that according to their recorded address live in the building at the time of the transaction.[60] For these households we construct the change in debt from the year before the transaction to the end of the transaction year. We scale the change by disposable income at the end of the transaction year to obtain a proxy for the change in debt-to-income. We rank households co-op by co-op by their change in debt-to-income, from high to low, and use the largest changes to provisionally classify the set of purchasers within each co-op. That is, we define a cut-off value such that the number of households above the cut-off (i.e., the number of households with large changes in debt-to-income) are equal to the number of apartments owned by co-op members according to the annual report. The cut-off is co-op-specific.

Table E.1 reports diagnostics at the co-op level based on this procedure. Two sources of information are used in the validation. First, six co-ops have supplied complete or partial lists of their residual tenants.[61] For these co-ops, we count how many households that are above the cut-off

[59] In 2 out of 13 instances the first annual report is more than one year later than the transaction year which makes the analysis less reliable (Bondesonen 21, Stencilen 2). In one instance, the building contains a hotel with studios rented out. The hotel was sold to the co-op as well but the tenants of the hotel were not allowed to buy their studio. We report statistics separately for this building.

[60] For households that appear in the tenant lists and hence are part of the fixed sample we form households according to the fixed sample. For other households we use Statistics Sweden's household identifier. Hence, there are more households in the sample than apartments as reported in the co-ops' annual reports.

[61] In one case (Nystad 5) the residual tenant list is contradictory to sales information in KU55. We take KU55 as the truth and modify the residual tenant lists accordingly. One Nystad 5 tenant observed in KU55 actually belongs to a HH in another building. This individual is excluded from the sample to avoid complexity. This means that one household

value do not appear on the residual tenant lists (column (6)) and do appear (column (7)). In total, 207 households are above the cut-off and only 7 of them appear on the residual tenant lists. We also check how many households that are below the cut-off value appear on the residual tenant list (column (9)). There are 21 households of this kind. Hence only 7 out of 28 residual tenants are misclassified. We conclude that the procedure is accurate at classifying purchasers and residual tenants.

E.2 Classification of purchasers and residual tenants in the fixed sample

In a second step, we classify purchasers and residual tenants in the fixed sample. The fixed sample is based on the tenant lists provided by the landlords and date stamped around the time when the privatization attempts are initialized (i.e., when tenants contact the landlord and express interest in buying the building).

Since the fixed sample is formed 1–2 years before the transactions – and since not all of the households in the fixed sample remain in the buildings until the time of the transaction, it is impossible to know exactly how many residual tenants there are in it. Our method does however ensure that there are approximately as many residual tenants as reported in the annual reports and that all possible corrections have been made. Table E.2 summarizes the procedure.

As reported in column (1), there are in total 747 households in the fixed sample.[62] This represents 88 percent (747/848) of all apartments.

To classify households as purchasers or residual tenants in the fixed sample we proceed in the following steps. First, we sort households by change in debt-to-income ratio in the transaction year and apply the same cut-off values as in the provisional sample of the first step. At this stage, there are 139 households below the cut-off values compared to 111 residual tenants according to the co-ops' annual reports (column (3) versus column (4)).

We then apply five corrections:

1. We use the residual tenant lists and the KU55 forms to correct our classification. This reduces the number of residual tenants from 139 to 110 (column (4) versus column (5)).

2. For Reservoaren 2, we identify two late buyers that subsequently sold their co-op shares. Since the first annual report states that there are two residual tenants at the beginning we classify the late buyers as being the two residual tenants.

3. We notice that one household in Reservoaren 2, Reservoaren 4 and Mimer 9 have negative

fewer should be classified as a residual tenant compared to the annual report. In three cases (Korpen 13, Slalomsvängen 2, and Mullvaden Andra 30), the residual tenant lists are incomplete because the number of households are fewer than the number of apartments rented out according to the annual reports.

[62] The fixed sample reported in Table E.2 includes 12 more households than the final sample in the analysis. These 12 additional households are not present in the final sample because their primary address is not equal the co-ops' address between 1999 and the household formation year.

(adjusted) disposable income but large increases in debt. We reclassify these three households as purchasers.

4. Finally, we correct our statistics in column (5) for households that move out of the building before the transaction year. For the purpose of comparison with annual reports they should neither be counted as purchasers or residual tenants.

5. For Reservoren 4, we notice that two classified residual tenant households have large decrease in financial wealth and bank account balance. They are reclassified as purchasers.

After these corrections we arrive at our final sample of residual tenants, reported in column (6). We classify 93 households as residual tenants in the fixed sample. Relative to the total number of residual tenants, this represents 84 percent of the number of all residual tenants (93/111). Hence, the shares of purchasers and residual tenants in the fixed sample are very close to the shares in the annual reports.

Table E.1: Summary statistics and response upon apartment purchase

Building names	Apartments (reports) (1)	Residual tenants (reports) (2)	Purchasers (reports) (3)	Cut-off value (4)	HHs above cut-off (5)	HHs above cut-off & not in residual tenant list (6)	HHs above cut-off & in residual tenant list (7)	HHs in sample that are on residual tenant list (8)	HHs below cut-off & in residual tenant list & not in KU55 (9)
Nystad 5*	77	16	60	0.21	59	58	1	11	10
Sveaborg 5*	88	12	76	0.00	88	80	8	11	3
NATTSLÄNDAN 3*	24	4	20	0.17	20	20	0	3	3
Total	189	32	156	-	167	158	9	25	16
Korpen 13**	31	3	28	-3336.00	28	27	1	1	0
Slalomsvängen 2**	30	6	24	1.17	24	24	0	2	2
Total	61	9	52	-	52	51	1	3	2
MULLVADEN ANDRA 30	25	8	17	0.12	17	-	-	-	-
ROSENDAL MINDRE 30	78	21	57	0.16	57	-	-	-	-
MIMER 3 / MIMER 9	59	8	51	0.00	51	-	-	-	-
RESERVOAREN 2	135	2	133	0.00	133	-	-	-	-
DUGGREGNET 8	79	12	67	0.09	67	-	-	-	-
Total	376	51	325	-	325	-	-	-	-
BONDESONEN 21***	30	0	30	0.25	30	-	-	-	-
Stencilen 2***	68	9	59	0.06	59	-	-	-	-
Total	98	9	89	-	89	-	-	-	-
RESERVOAREN 4****	124	10	114	0.60	114	-	-	-	-
Total	848	111	736	-	748	209	10	28	18

Notes: (*) Complete residual tenant lists. (**) Incomplete residual tenant lists. (***) First annual report of co-op is more than one year after the transaction. (****) Has about 100 studios in the form of a hotel.

Table E.2: Summary statistics for the fixed sample using the DTI method

Building name	Total households (1)	Apartments (reports) (2)	Residual tenants (reports) (3)	Classified residual tenants before corrections (4)	Classified residual tenants (5)	Classified residual tenants (additional corrections) (6)
Nystad 5*	71	77	16	22	9	9
Sveaborg 5*	80	88	12	9	11	11
NATTSLÄNDAN 3*	20	24	4	4	3	3
Total	171	189	32	35	23	23
Korpen 13**	29	31	3	0	1	1
Slalomsvängen 2**	28	30	6	11	8	7
Total	57	61	9	11	9	8
MULLVADEN ANDRA 30	21	25	8	6	6	5
ROSENDAL MINDRE 30	73	78	21	23	23	23
MIMER 3 / MIMER 9	46	59	8	6	6	3
RESERVOAREN 2	112	135	2	7	6	2
DUGGREGNET 8	74	79	12	11	10	8
Total	326	376	51	53	51	41
BONDESONEN 21***	28	30	0	4	4	3
Stencilen 2***	61	68	9	10	8	7
Total	89	98	9	14	12	10
RESERVOAREN 4****	104	124	10	30	18	11
Total	747	848	111	143	113	93

Notes: (*) Complete residual tenant lists. (**) Incomplete residual tenant lists. (***) First annual report of co-op is more than one year after the transaction. (****) Has about 100 studios in the form of a hotel.

F Household Formation

Our data set starts from the sample of all individuals who live in the co-ops of interest in the household formation year. The household, not the individual, is the relevant unit for consumption, housing, and savings decisions. Thus, we form households from the individual data. Household income, consumption, wealth, debt, etc. in a given year are aggregated up across all the household members in that year.

We primarily use Statistics Sweden's original family id variable (familjeidentitet) available in Total Population Register (Swedish: "Register över totalbefolkningen, RTB") to identify households. According to Statistics Sweden's definition, household composition is dynamically adjusted to account for four major life changes, both before and after the household formation year. First, children are added as they are born into a household. Second, if a grown child leaves the house and forms its own single or married household, we add a household to the sample and adjust the original household. Third, if a married couple divorces, two new households are formed each with a new household identifier. The old household unit is dropped starting in the year of the divorce. Fourth, if two singles marry or have a first child together, the single households are dropped from the sample in the years after marriage or child birth and a new married household is added in those years. This approach results in strictly more household observations in every year before and every year after the household formation year than in the household formation year itself.

Our sample of study starts from all households and their members in the household formation year and drops all household-year observations for households whose adult composition changes before or after the household formation year. In this fixed household subsample, no new households are added before or after the household formation year. In all years before and after that year, the number of households in the Fixed sample is strictly smaller than in the household formation year. The Fixed sample drops all singles who marry before the household formation year and all married households who divorce after the household formation year. Specifically, if they are single in the household formation year, the Fixed sample drops all household-year observations when they are married. If instead they are married in the household formation year, the Fixed sample drops all household-year observations when they are single. While this sample design prevents us from studying the effect of co-op conversion on life outcomes such as marriage and divorce, it focuses on a more stable sample for which results are easier to interpret. In previous versions of this paper, we found no evidence of significant treatment effects on such life outcomes.

Since, Statistic Sweden's family id variable is derived from family relationships and registered location at a building , not apartment, we cannot identify whether adults that do not have children together and are living in the same building are cohabiting in the same apartment or not.[63] By using the tenant lists and rental contracts, we are able to correct Statistic's Sweden's household

[63] See "Bakgrundsfakta - Historic population register, Statistics Sweden, 2006".

composition under the principle that one household should only have one rental contract and one rental contract should only correspond to one household. The corrections are as follows.

First, when two single adults with different family identifiers rent the same apartment according to tenant list, we assume these two adults belong to one household in the formation year and combine them together. Second, when more than one adult with the same family identifier in the formation year have different rental contracts, we assume each tenant belongs to a separate household and split the original households. Finally, we eliminate from the sample the parent of one registered tenant, since she appears to be living only temporarily at her daughter's apartment. Indeed she is not in the rental list of the building and moves out after formation year. We keep the daughter as single household in the sample, as she is a registered tenant in the household formation year. We end up with a fixed sample of 2,455 rental apartments and unique households in the household formation year.

G Co-op annual reports

We extract information from co-ops' annual reports for those co-ops that privatize as part of our quasi-experiment (Bolagsverket, 2018). We use this information for three purposes.

First, we perform a simple validation of the conversion price per square meter (p_0^c), which is calculated based on households' tax forms but which also can be approximated from from co-ops' book equity value and residential area. Second, we use information about the co-ops' monthly fee per square meter together with other information to compute the housing cost of staying households before and after treatment. Third, we investigate the relationship between renovations that the co-op undertakes and households' monthly co-op fee.

G.1 Validation of the conversion price per square meter

We use information about the co-ops' book equity and residential area to compute book equity per square meter. Table G.1 summarizes our analysis. We take book equity and co-ops' mortgages from the earliest annual report (columns (3) and (4)). The sum of this value is similar to landlord's asking price which we obtained from minutes of the landlords' boards (column (2)).[64] Co-ops typically report how many square meters belong to the members. if not, we approximate based on the total residential area and the number of residual tenants. We report the total residential area in column (5) and the area that belongs to co-op members in column (6). We then compute book equity per co-op members' total residential area (column (9)). This value can be compared with the conversion price obtained from KU55 tax forms (column (10)). We report the difference between these values in column (11). The largest deviation is 16 percent. The correlation between the two measures is 0.989.

[64] There can be differences between the actual transaction value and the value stipulated in the minutes of landlords' board meetings for several reasons, such as vacancies and information about the state of the building that is revealed in the due diligence process.

G.2 Co-ops' renovations and the households' monthly fee

We consider relative year 0 to relative year 4 for the 13 co-ops that belong in the treatment group. This means that we sometimes include 2008 to obtain more observations. We obtain 52 co-op year observations on co-op fees per square meter, depreciation, and repairs. this sample is smaller than the theoretical maximum sample of 65 co-op-year observations:

1. We are able to obtain 56 out of 65 annual reports.
2. We exclude relative year 0 if the expense item "Depreciation" is set to zero in the first annual report.
3. We exclude relative year 0 if the transaction happens very late in the year (December) because then it is difficult to reliably annualize the co-op fee per sqm.
4. It is quite often the case that the first report covers more than 12 months. If the first report considers relative year 0 and 1 in combination then data is annualized and only data for RY1 is used when doing so.

The average annual co-op fee per square meter for relative years 1 to 4 is as follows: 532 SEK, 564 SEK, 561 SEK, and 575 SEK. The co-op fee increases only by 8% points cumulatively during our sample period. Given the typical apartment size of around 70 square meters, it cannot account for much of the observed increase in consumption.

Nevertheless, to investigate further whether there is any indication that co-ops' renovation of common areas (such as gardens and staircases, storage space, laundry rooms, basement and attic spaces, etc) contributes to higher co-op fees, we estimate the following regression:

$$\Delta \log(\text{co-op fee}_{it+k}) = \beta_0 + \beta_1 \Delta \log(\text{Improvements}_{it}) + \beta_2 X_{it} + \varepsilon_{it}, \tag{50}$$

where co-op fee$_{it}$ is the co-op fee per square meter and year and Improvements$_{it}$ is a measure of the co-ops' expense. It is important to use the fee per square meter and not the co-op's total revenues from fees because many co-ops gradually expand, either as residual tenants move or buy or by converting common areas to new apartments. The variable Improvements$_{it}$ is the sum of depreciation of assets and repairs. Depreciation measures the annual cost of capital expenditures, as they are written off according to the accounting rules. The variable X_{it} is the log change in the co-op's total number of square meters for its members apartments (i.e., total residential area minus the area of residual tenants). It is an important control variable since expanding the co-op's total number of apartments is the most common investment.

Table G.2 reports the estimates corresponding to equation (50) for $k = \{1, 2, 3\}$. The overall finding is that improvements display no relationship with increases in co-ops' monthly fees. The elasticity is small and insignificant over 1, 2, and 3 years. In contrast, a one percentage point

Table G.1: Book equity and the conversion price

Building name	Transfer date (1)	Landlord's ask (2)	Equity (3)	Debt (4)	Residential area (5)	Area of co-op members (6)	Landlord's ask per sqm (7)	Debt per sqm (8)	Equity per sqm (9)	Conversion price per sqm (p_0^c) (10)	% Difference (11)
Nattsländan 3	2003-02-18	16 800	10 120	7 727	1 172	920	18,26	8,40	11,00	11,00	0,0%
Korpen 13	2004-09-01	23 965	20 183	8 431	1 964	1 719	13,95	4,91	11,74	11,19	-4,7%
Slalomsvängen 2	2003-06-04	34 650	15 916	20 662	1 941	1 553	22,31	13,31	10,25	9,85	-3,9%
Bondesonen 21	2003-12-03	23 500	17 132	10 568	1 307	1 307	17,98	8,09	13,11	13,40	2,2%
Duggregnet 8	2003-05-21	54 000	33 025	24 726	5 006	4 246	12,72	5,82	7,78	7,75	-0,4%
Mimer 3 / Mimer 9	2004-06-21	93 000	52 125	45 621	4 009	3 465	26,84	13,16	15,04	14,14	-6,0%
Mullvaden Andra 30	2003-12-16	9 000	6 458	4 174	693	471	19,11	8,86	13,71	15,01	9,5%
Nystad 5	2003-05-26	33 000	13 193	25 764	6 055	4 797	6,88	5,37	2,75	2,61	-5,2%
Reservoaren 2	2004-04-27	95 000	74 981	38 725	10 342	10 342	9,19	3,74	7,25	8,41	16,0%
Reservoaren 4	2004-05-04	135 300	71 878	74 501	9 389	8 632	15,67	8,63	8,33	8,38	0,6%
Rosendal Mindre 30	2003-05-16	126 300	65 826	65 279	5 802	4 240	29,79	15,40	15,53	15,51	-0,1%
Stencilen 2**	2002-11-10	55 000	39 612	21 006	5 936	5 150	10,68	4,08	7,69	7,93	3,1%
Sveaborg 5	2003-05-27	36 000	15 761	25 599	6 775	5 826	6,18	4,39	2,71	2,58	-4,5%

Notes:
The landlord's asking price is taken from the landlords' board meeting minutes. The actual transaction value is sometimes adjusted for vacancies, and new information (such as the state of the building). Per square meter values have been divided by the area of co-op members. The conversion price per square meter is obtained from KU55 tax forms (see Appendix D). All values in SEK 1,000s.
*) The first annual report is in 2006.
**) This first annual report is in 2005.

Table G.2: Co-op fees and co-op improvements

	(1)	(2)	(3)	(4)	(5)	(6)
	$k=1$		$k=2$		$k=3$	
$\Delta_k$log(Improvements$_{it}$)	-0.035	-0.024	0.054	-0.001	-0.122	0.026
	(1.23)	(-0.85)	(-1.14)	(-0.02)	(-1.32)	(0.26)
$\Delta_k$log(Co-op sqm$_{it}$)		-0.932**		-1.486**		-2.22**
		(-2.08)		(-2.72)		(-2.46)
Constant	0.035	0.048	0.080	0.118	0.115	0.217
	(3.32)	(4.04)	(4.44)	(5.54)	(3.46)	(4.34)
N	39	39	26	26	14	14
R-squared	0.039	0.142	0.052	0.282	0.127	0.436

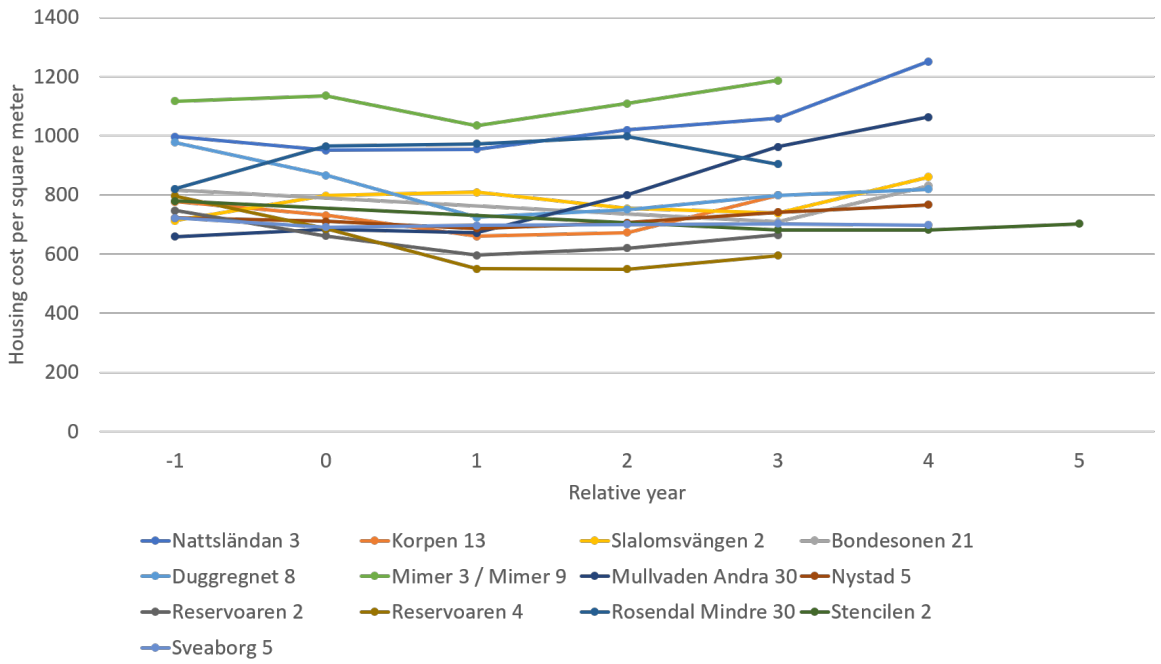
Notes: The table presents estimates based on the regression specification in equation (50). The dependent variable is the k-year difference in the logarithm of the co-op's fee per square meter. The covariates are k-year differences over the same time period. t-statistics in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

increase in the co-ops' residential area is associated with a decrease of similar magnitude in the monthly fee per square meter.

G.3 Stayers' housing cost

We construct the housing cost for households that stay in their housing unit throughout the treatment period. We use information about (i) rents and square meters from tenant lists, (ii) monthly fees per square meter from annual reports, and (iii) the after-tax mortgage interest expense derived in Appendix C. The housing cost for relative year 0 is based on a linear interpolation between the co-op fee and the rent, factoring in the transaction date of each co-op. Figure G.1 reports the housing cost per square meter for each relative year. Overall, housing costs show little change before and after treatment. In particular, there is no evidence that the monthly housing cost of treated households increases.

Figure G.1: Housing costs



Notes: The figure displays the housing cost per square meter and year for each approved co-op. The housing cost consists of the rent and co-op fee per square meter for each approved co-op. For relative year 0 and onwards, the after-tax mortgage interest expense is added as well. Rents are obtained from landlords' tenant lists. Co-op fees are obtained from annual reports. The value for relative year 0 is based on a linear interpolation between the co-op fee and the rent, factoring in the transaction date. See Appendix C for construction of the after-tax mortgage interest expense. For the figure, we summed up all stayers' mortgage interest expenses per co-op and divided by the sum of the square meters that the stayers own.

H Construction of price indices

The detailed nature of the Swedish data enables us to construct local real estate price indices and estimates of average price per square meter at various levels of geographical aggregation. We create three variables defined at the apartment level – value, geographical location and number of square meters, using two datasets provided by Statistics Sweden: the KU55 register (Överlåtelse av Bostadsrätt), and the Apartment Register (Lägenhetsregistret, Apartment Register (2017)). In addition, we use a commercial dataset maintained by Svensk Mäklarstatistik, which has information on real estate transactions in Sweden obtained directly from real estate agents (Svensk Mäklarstatistik, 2020).

H.1 Data selection

In Sweden, apartment buildings are owned by co-op associations whose shares give right to live in the apartment units. All transfers of co-op shares are reported to the tax authorities through form SKV 2324 and are available in the KU55 register. The data reports observations of the type of transaction, the acquisition price, the sale price, the date of sale and the ownership share being transacted. In order to build price indexes, we apply a number of filters to the data. First, we keep only sales of the entire property, and thus exclude partial sales, gifts or bequests. Second, we exclude all observations for which form SKV 2324 is not filled in accordance with the official rules, as outlined in the taxation brochures published annually by Skatteverket (SKV 378). For example, we exclude observations with missing fields (e.g. missing acquisition date or transaction price), or when the sum of the transferred ownership shares does not sum up to 100%. Third, we drop transactions which took place less than a year after the conversion of a rental building to co-op (Hittabrf, 2013), as acquisition prices at the time of conversion do not represent market valuations. Fourth, we exclude transactions with abnormally low prices (less than 1,000 SEK) and with holding periods of fewer than 90 days to filter out non arm's length transactions, distressed sales, and transactions by professional flippers. Finally, we exclude observations which have experienced extreme price growth in a short period of time, as they are likely to have transaction prices which do not reflect market values.[65]

H.2 Index estimation

We use the cleaned KU55 dataset to create local apartment price indices from 1999 to 2017. The local price indices are estimated using a standard repeat sales methodology by running an OLS regression of log purchase and log sale prices on area-by-year fixed effects and KU55 observation fixed effects. The area-by-year fixed effect coefficients are then converted into local annual index

[65] More precisely, we run a regression of holding log returns on holding periods and exclude observations with Cook's distance that exceeds 4/(n-1), where n is the sample size. In total, we drop 4.45 percent of the observations due to extreme price growth.

levels. We build indices at the county, municipality, and parish level. Parish and municipality indices are missing when we do not have enough observations to estimate the area-year fixed effect for all years between 1999 and 2017.

We also use the cleaned data to create price per square meter estimates. Sweden is divided into 250×250 meter geographical units called rutor that are linked to apartment property identifiers (lägenhetsbeteckning). Since property identifiers are available in the Apartment Register and not in the KU55 register, we link the two databases by using a matching procedure that uses the personal identifiers (personnummer) of transaction parties, and the organization number of the co-op association. In turn, we merge the KU55 register and the Svensk Mäklarstatistik dataset by using the co-op association organization number, the transaction price, and the transaction date. The combined data set allows us to assign apartment size to KU55 observations from the Svensk Mäklarstatistik dataset and, when missing, the Apartment Registry.

H.3 Predicted neighborhood prices – p_0^{nbd}

Our instrumental variable regression relies on the construction of the neighborhood market price for both approved and denied co-ops. Section 3 denotes this variable by p_0^{nbd}. We apply the method below to construct the variable.

Price per square meter data for each neighborhood, containing a building in the treated or control group, are created by centered expansions around the 250×250 meter block (rutor) where the properties are located. If the block contains fewer than 10 co-op share transactions, then it is enlarged by 250 meters in each direction. We exclude from the calculation of average prices the buildings that are part of the quasi-natural experiment considered in this study either as part of the treatment or as part of the control group. The enlarged square sizes are 750×750 meter, 1250×1250 meter, and 2250×2250 meter. The average price per square meter is computed as the equally-weighted average of square meter prices among all apartments located in the square. Table H.1 reports summary statistics on square size for buildings in the treatment and control groups. Panel A reports the smallest neighborhood size with any transaction and panel B the selected neighborhood size after the criterion that 10 transactions exist has been applied. Figure H.1 displays the selected neighborhood size, as a shaded square, for each co-op in our sample.

To estimate a price index for the neighborhoods we run the following OLS regression on these transaction data:

$$p_{t,i}^h = \beta_0 + \sum_{k=2002}^{2007} \beta_k D_{it}(t = k) + \gamma \text{Distance to Center}_i + \varepsilon_{a,t} \tag{51}$$

where $p_{t,i}^h$ is the log of the square meter market price of apartment i that transacts in year t, $D_{it}(t = k)$ is a calendar year fixed effect indicating the year of the transaction, and Distance to Center$_i$ measures the distance between the apartment and the city center (Royal Palace). The coefficients

Table H.1: Apartment transactions in neighborhoods (2001–2007)

Panel A: Smallest neighborhood sizes with transactions

	250 × 250		**750× 750**		**>750× 750**		**Total**
	Co-ops	Transact.	Co-ops	Transact.	Co-ops	Transact.	Co-ops
Treatment group	8	134	5	83	0	-	13
Control group	20	224	10	83	3	226	33

Panel B: Selected neighborhood sizes for price level estimation

	250 × 250		**750× 750**		**>750× 750**		**Total**
	Co-ops	Transact.	Co-ops	Transact.	Co-ops	Transact.	Co-ops
Treatment group	8	134	4	103	1	72	13
Control group	19	235	11	77	3	244	33

Notes: The table reports the average number of transactions per neighborhood. For estimation a minimum of 10 apartment transactions in the neighborhood is required (see Panel B). Otherwise, the neighborhood area is expanded by another 250 meters in all directions. The maximum neighborhood size in Panel A is 1750×1750 meters. The maximum neighborhood size in Panel B is 2250× 2250 meters.

on the year dummy variables, β_k, measure price growth relative to the year 2001. Table H.2 reports the results. Apartment prices increase steadily over the sample period, displaying a cumulative rate of growth of 55.8 log points between 2001 and 2007. Apartment prices are 10.4 log points lower for each kilometer further away from the city center. With a R^2-statistic of 0.59, a substantial share of the variation in log price per square meter is explained. We use this regression to construct the neighborhood market price per square meter for the housing units in our sample, denoted by $p_{0,i}^{\text{nbd}}$ in Section 3:

$$p_{0,i}^{\text{nbd}} = \exp\left\{\hat{\beta}_0 + \hat{\beta}_k D_{it}(t=0) + \hat{\gamma}\text{Distance to Center}\right\}, \tag{52}$$

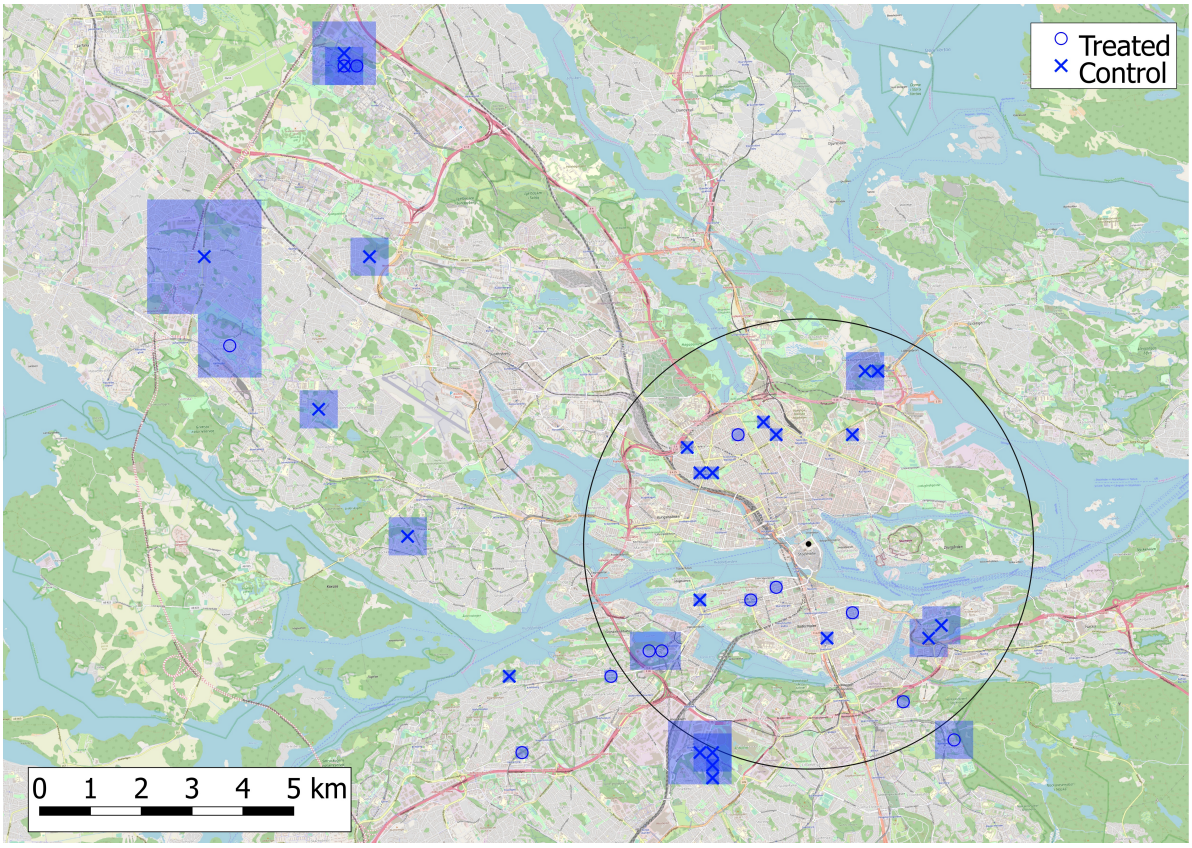
where $D_{it}(t=0)$ is the calendar year of treatment for household i (approvale/denial).

H.4 Predicted conversion prices – $p_0^{c,\mathbf{nbd}}$

In addition to the neighborhood-level market prices per square meter, p_0^{nbd}, our instrumental variable regression relies on the construction of predicted conversion prices per square meter for both approved and denied co-ops, denoted by $p_0^{c,\text{nbd}}$. The prediction is based on the following regression:

$$p_{0,j}^{c} = \beta_0 + \gamma\text{Distance to Center}_j + \varepsilon_j \tag{53}$$

Figure H.1: Neighborhood co-op prices



Notes: The map displays the location of the 38 privatization attempts in our Stopplag sample. Circles indicate approved co-ops (treated) and crosses indicate denied co-ops (control). Each shaded square illustrate the neighborhood from which we retrieve transactions.

where $p^{c}_{0,j}$ denotes the median conversion price per square meter (in kSEK) for approved co-op j and Distance to Center$_j$ is the distance to center of co-op j measured in kilometers. Figure H.2 shows the fit. The R^2-statistic is 0.771, $\hat{\beta}_0$ is 15.33 and $\hat{\gamma}$ is -0.792 ($p < 0.01$), meaning that the conversion price declines by 792 SEK per kilometer further away from the center.

We use these estimates for constructing $p^{\text{c,co-op}}_{0,j}$ in an (out-of-sample) prediction for both apartments in the treatment and control groups:

$$p^{c,co-op}_{0,j} = \exp\left\{\hat{\beta}_0 + \hat{\gamma}\text{Distance to Center}\right\}. \tag{54}$$

In a last step, we assign the predicted co-op level conversion price to the households living in that co-op, $p^{c,nbd}_{0,i} = p^{c,co-op}_{0,j} \mid (i \texttt{ lives in } j)$ for each household i and co-op j. Finally, we calculate the hypothetical fractional discount in the neighborhood:

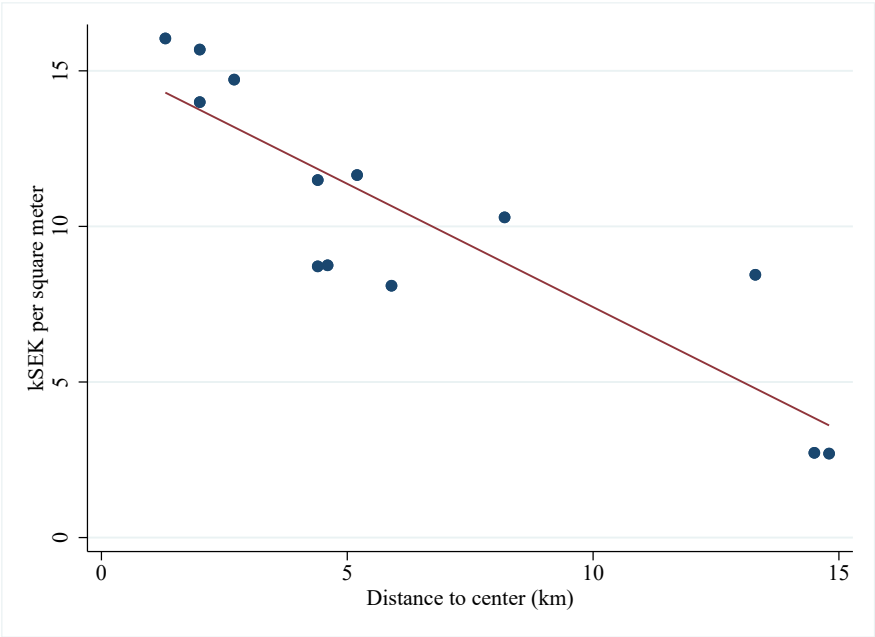
$$\tau^{nbd}_i = (p^{\text{nbd}}_{0,i} - p^{c,nbd}_{0,i})/p^{\text{nbd}}_{0,i}. \tag{55}$$

Table H.2: Estimation of log square meter prices based on selected neighborhoods (2001–2007)

	(1)
Constant	10.43***
	(0.028)
$D_{it}(t = 2002)$	0.0262
	(0.0354)
$D_{it}(t = 2003)$	0.0883***
	(0.0313)
$D_{it}(t = 2004)$	0.165***
	(0.0305)
$D_{it}(t = 2005)$	0.236***
	(0.0288)
$D_{it}(t = 2006)$	0.447***
	(0.0285)
$D_{it}(t = 2007)$	0.558***
	(0.0283)
Distance to Center	−0.104***
	(0.002)
Observations	4,429
R^2	0.590

Notes: The table reports the regression results for neighborhood price level estimation as reported in equation (51). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure H.2: Conversion price per square meter for approved co-ops



Notes: The figure shows a scatter plot of the conversion price per square meter in SEK 1,000, p_0^c, against distance to center for the 13 approved co-ops. The regression line corresponds to equation (53).

I Construction of the household's buffer

This appendix defines and details the construction of the household's buffer. Section I.1 define the relevant borrowing constraints. Section I.2 describes the implementation in the data. Section I.3 provides institutional details and parameter values.

I.1 Borrowing constraints

The borrowing capacity for collateralized debt is determined by a LTV constraint and an affordability constraint. The borrowing capacity for uncollateralized debt is determined only by the affordability constraint.

I.1.1 The affordability constraint

The affordability constraint is also known as a "left-to-live-on" constraint. It is similar to a debt service-to-income constraint. See Section I.3 for institutional details.

The affordability constraint is common to both collaeralized and uncollateralized debt. It states that, after a new debt contract is initiated, the household should be left with weakly positive resources after essential consumption expenditures have been met :

$$y_{it} - \underline{c}_{it} - r^{M}_{\text{DSTI}} M_{it} - r^{D}_{\text{DSTI}} D_{it} \geq 0 \tag{56}$$

where y_{it} is disposable income, $\underline{c}_{it}$ denotes the level of subsistence consumption which depends on household size (see Section I.3 for details), M_{it} denotes mortgage debt, D_{it} denotes uncollateralized debt, and r^{M}_{DSTI} and r^{D}_{DSTI} denote stressed interest rates plus amortization rates.

I.1.2 The LTV constraint

For collateralized debt (i.e., mortgages) there is a standard LTV constraint. It says that at the time of mortgage origination the mortgage balance must satisfy:

$$\mathrm{M}_{it} \leq (1-\delta) \cdot P^{h}_{t} h_{it}, \tag{57}$$

where $P^{h}h_{it}$ is the market value per square meter of the housing unit at t, h_{it} is the size of the apartment in square meters, and δ is the minimum down-payment. We set $\delta = 0.1$ which is consistent with lending standards at the time of our quasi-experiment.

For mortgage debt, both affordability and LTV constraint must be satisfied. This implies that

at the time of origination the maximum mortgage balance is given by:

$$\overline{M}_{it} = \min\left\{\frac{y_{it} - \underline{c}_{it}}{r^M_{\text{DSTI}}}, (1-\delta)\cdot P^h_t h_{it}\right\}. \tag{58}$$

I.2 Implementation in the data

In the data, we observe only total debt, denoted by $M_{it} + D_{it}$. We therefore assume that homeowners exhaust their collateralized borrowing capacity before they take on any uncollateralized debt.

I.2.1 Homeowners

Given the assumption that homeowners exhaust their collateralized debt capacity the two cases for the homeowner are as follows.

Case 1 If $(1-\delta)\cdot P^h_t h_{it} < \frac{y_{it}-\underline{c}_{it}}{r^M_{\text{DSTI}}}$ then the homeowner's total debt capacity is:

$$\overline{M}_{it} = (1-\delta)\cdot P^h_t h_{it} \tag{59}$$

$$\overline{D}_{it} = \min\left\{\max\left\{\frac{y_{it} - \underline{c}_{it} - r^M_{\text{DSTI}}\cdot \overline{M}_{it}}{r^D_{\text{DSTI}}}, 0\right\}, 2\cdot y_{it}\right\}. \tag{60}$$

where $\underline{c}_{it}$ depends on the composition of the household (see Section I.3 for further details). The outer bracket in (60) imposes that the homeowner can borrow at most twice her disposable income in additional uncollateralized debt.

Case 2 If $(1-\delta)\cdot P^h_t h_{it} \geq \frac{y_{it}-\underline{c}_{it}}{r^M_{\text{DSTI}}}$ then the homeowner's total debt capacity is:

$$\overline{M}_{it} = \max\left\{\frac{y_{it} - \underline{c}_{it}}{r^M_{\text{DSTI}}}, 0\right\} \tag{61}$$

$$\overline{D}_{it} = 0. \tag{62}$$

I.2.2 Renters

The renter's total debt capacity is given by:

$$\overline{M}_{it} = 0 \tag{63}$$

$$\overline{D}_{it} = \min\left\{\max\left\{\frac{y_{it} - \underline{c}_{it}}{r^D_{\text{DSTI}}}, 0\right\}, 2 \cdot y_{it}\right\}. \tag{64}$$

where the outer bracket in (64) implies that the renter, at origination, can borrow at most twice her disposable income in uncollateralized debt.

I.2.3 Remaining debt capacity

For both renters and homeowners, let $M_{it} + D_{it}$ denote total debt which is observed in the data. Remaining debt capacity is then for both homeowners and renters given by:

$$\text{Remaining debt capacity}_{it} = \max\left\{\overline{M}_{it} + \overline{D}_{it} - (M_{it} + D_{it}), 0\right\}. \tag{65}$$

I.2.4 The buffer

For all households the buffer, denoted by Buffer_{it}, equals the remaining debt capacity, as defined above, plus liquid financial wealth:

$$\text{Buffer}_{it} = \text{Financial wealth}_{it} + \text{Remaining debt capacity}_{it}. \tag{66}$$

I.3 The affordability constraint – institutional details

The DSTI constraint in Sweden is also known as an affordability constraint. The Swedish acronym for the constraint is KALP as in "Kvar Att Leva På." By law, mortgage lenders are required to calculate borrowers' debt capacity and as a practical consequence of this requirement, mortgage lenders perform a standardized calculation to check if the DSTI constraint is violated. This constraint only needs to hold at the time of origination of the mortgage. Banks' algorithm for this calculation has been monitored by the Swedish Financial Supervisory Authority (Finansinspektionen) since 2008. Since 2008, Finansinspektionen publishes reports on their monitoring activities. Correspondence with bank representatives indicates that the algorithm has remained essentially unchanged since at least the early 2000s.[66] The components in the algorithm are: (i) the stressed interest rate, (ii) required amortization rates, (iii) housing cost, and (iv) cost of living, which depends on household composition.

[66] E-mail conversations with Anne-Charlotte Ringberger at Nordea and phone conversation with Klas Flodmark, controller at Handelsbanken.

I.3.1 Parameter values in 2008

Finansinspektionen (2008) reports the input parameters in 2008 for the eleven largest banks in Sweden:[67]

- Average stressed interest rate: 7.5% (Minimum: 6.25%, Maximum: 8.8%)
- Average required amortization: 0.9% (Minimum: 0%, Maximum: 2.0%)
- Estimated housing cost for single-family house: SEK 3,600 (Minimum: 3,000, Maximum: 4,000)
- Cost of living for two adults and two children: SEK 15,900 (Minimum: 15,000, Maximum: 17,500)

I.3.2 Cost of living from the Swedish Consumer Agency

For the cost of living, all banks more or less follow the recommended budgets from the Swedish Consumer Agency. Their budgets are updated each year.[68] The budgets should be viewed as quite tight, leaving no room for luxuries.

I.3.3 Mortgage lending at Nordea in 2002–2007

In an e-mail, Nordea provided the following information on their inputs to the calculation in years 2002–2007:

- Stressed interest rate: the 5-year fixed mortgage rate plus three percentage points with a floor at 8%.
- Mortgage principals has an amortization rate of 2% per year (principal paid back in 50 years) and uncollateralized debt an amortization rate of 10% per year (credit paid back in 10 years).
- Estimated housing cost varies by the type of home. Over a long period of time the following inputs were used: SEK 4,000 per month for houses and SEK 750 plus the co-op's monthly fee for apartments.
- Cost of living according to the Swedish Consumer Agency. It includes the standard costs (e.g. food, hygiene, medicine, etc.) as well as the cost for a car (if the household has one), costs for day care (if there are children), commuting costs, and costs for having lunch out if household members are of working age.

[67] Finansinspektionen (2008), Utvecklingen påbolånemarknaden, Report 2008:6, Dnr 07-12625-399.

[68] See for instance Konsumentverket (2004), Skäliga levnadskostnader – Beräkningar av Konsumentverket, PM 2004:10. We also obtained scanned budget tables for 2002–2007 from Ingrid Eriksson at the Swedish Consumer Agency.

I.3.4 Uncollateralized debt

With regards to uncollateralized debt, the lenders are required to employ a similar calculation but there is greater variation in their input parameters. The algorithms are not as closely monitored by Finansinspektionen. Typically, higher stressed interest rates are employed but the exact rate often depends on the credit amount. Today, websites offer uncollateralized debt contracts of up to SEK 500,000 or 600,000.[69] But in the time period of our study, unsecured credit was not as easy to obtain. Based on our conversations with bankers and regulators, a restriction that limits uncolateralized debt at twice annual income is a good assumption for our sample period.

I.3.5 Our input parameters

Based on the above discussion, we choose the following parameters for the calculation of the buffer for our sample households.

Mortgages

- Minimum down-payment at origination (δ) of 10%
- Stressed interest rate of 8%.
- Amortization rate of 2% per year.
- Subsistence consumption consists of housing cost (rent or co-op fee) and cost of living according to the Swedish Consumer Agency.

Uncollateralized debt

- Stressed interest rate of 10%.
- Amortization rate of 5% per year.
- Subsistence consumption determined as it is for mortgage debt.
- In addition, mortgage debt burdens calculation with stressed interest rate and amortization rate as stated above.

[69] See for instance www.advisa.se, https://www.freedomfinance.se, or https://www.icabanken.se.

J Consumption in the Household Survey and Sample Restrictions

J.1 First-time apartment buyers

Table J.1 reports summary statistics from the consumption expenditure survey (Statistics Sweden, 2007*b*). The data are for annual waves between 2003 and 2007, corresponding to our treatment years. In the full sample average consumption expenditure equals 181 kSEK with a minimum at 11.8 kSEK and a maximum at 1121 kSEK per adult equivalent. The table breaks down total spending into various consumption subcategories of interest.

The table also reports estimates from the regression:

$$c_{it} = \omega_0 + \sum_{k=0}^{2} \delta_k \text{ApartmentBuyer}_{it-k} + \omega X_{it} + \psi_t + \varepsilon_{it} \tag{67}$$

where c_{it} denotes an expense item in kSEK per adult equivalent, X_{it} is vector of dummy variables that characterizes the household head in terms of age, civic status, education, country of residence, as well as the disposable income of the household. The variable $\text{ApartmentBuyer}_{it-k}$ is equal to one if the household changed primary address in year $t-k$ and owns a co-op apartment in t. The fifth to seventh columns of Table J.1 report the coefficients δ_k. The eighth to tenth columns report the same coefficients for households that did not own an apartment before the change of primary address. These households are referred to as first-time apartment buyers. This latter group is most similar to the treated households in our sample, who were not home owners at the time of treatment.

First-time apartment buyers spend 39 kSEK more in the year of the purchase and 29 kSEK in the subsequent year. Two years after the purchase there is no noticeable difference with other households. Reassuringly, these consumption responses are broadly in line with the estimates from our experiment. This helps with external validity.

Furniture, household appliances, and regular maintenance of the home account for 27 percent of the total expenditure increase in both the year of purchase and the year after, substantially above their 6.2% average expenditure share.

Interest expenses account for about as much in the year after the purchase but less in the year of purchase or two years after. Expenditures on rent, which include monthly co-op fees for owners, and utilities increase in the year of purchase. Both interest expenses and rent/utilities are housing-related expenditures, separate from renovations or furniture purchases.

Importantly, there are increases in consumption categories such as clothes and footwear, health care, communication, and restaurants and hotels. All told, non-housing related spending categories account for more than half of the consumption increase (52%) in the year of purchase and more than one-third in the year after (34.6%).

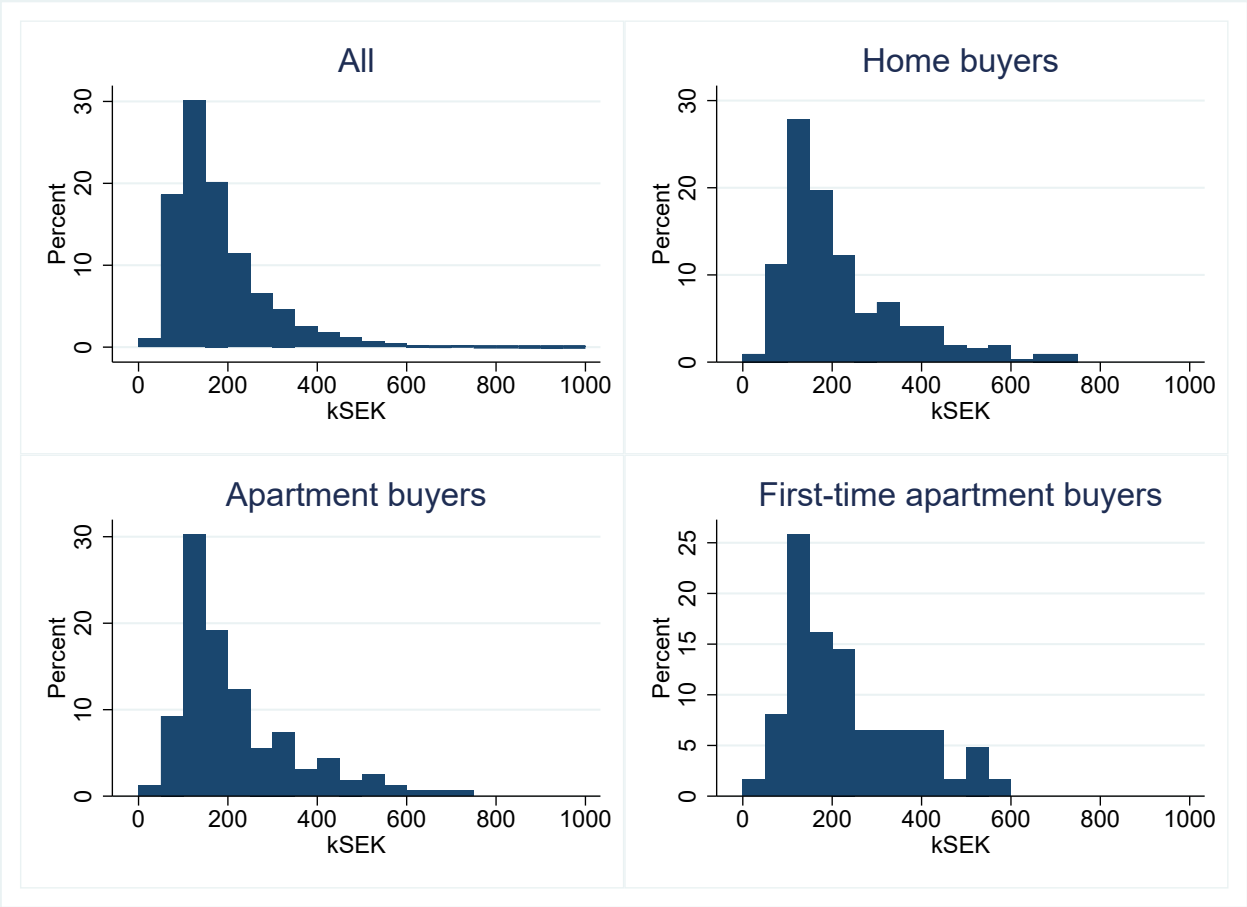
Table J.1: Summary statistics and response upon apartment purchase

					Apt. buyer in relative year $-k$			First-time apt. buyer in relative year $-k$		
	Mean	Std.	Min	Max	$k=0$	$k=1$	$k=2$	$k=0$	$k=1$	$k=2$
01. Food and nonalcoholic beverages	21.77	12.69	0.00	147.49	-0.32	-2.34	0.04	1.48	-1.62	0.30
02. Alcoholic beverages and tobacco	4.25	6.87	0.00	90.60	-0.14	-0.31	-0.05	-0.58	-0.55	-1.07
03. Clothes and footwear	9.53	17.10	0.00	255.63	1.65	3.04	2.47	6.72**	0.91	0.02
04. Rent and utilities	34.82	24.09	0.00	628.88	3.06	3.15	0.26	7.31*	2.94	5.80
05. Furniture, appliances, and maintenance	11.17	18.83	-55.00	334,81	5.38**	5.96**	4.50**	10.51***	8.12**	-2.45
051. Furniture	4.37	10.36	-60.00	232.06	5.26***	4.18***	1.10	7.93***	4.64**	-1.21
053. Household appliances	1.72	4.81	-5.88	132.50	0.41	1.54**	1.17**	0.09	2.32***	0.14
056. Regular maintenance of the home (goods and services)	1.28	2.02	0.00	53.42	-0.19	-0.03	0.39*	-0.16	0.14	-0.16
06. Health care	4.20	13.02	0.00	260.00	-1.47	3.15*	-1.01	-0.23	4.02*	-1.16
07. Transportation	26.81	44.61	-172.35	699.67	-1.47	3.32	-2.24	1.63	3.59	0.24
08. Communication	6.00	4.68	0.00	51.60	0.46	-0.07	0.81*	1.24*	-0.04	0.96
09. Recreation and culture	25.40	31.09	-63.60	508.16	-5.30	2.67	3.19	2.71	4.57	5.60
10. Education	0.08	2.15	0.00	144.68	-0.02	-0.07	0.01	-0.01	-0.11	-0.17
11. Restaurants and hotels	7.80	12.80	0.00	174.23	1.90	3.44**	5.22***	4.39*	-0.10	0.26
12. Other goods and services	10.95	12.28	0.00	409.34	-1.98	-0.15	-0.05	0.87	1.31	-1.74
21. Unemployment insurance and union membership fee	2.09	2.71	0.00	82.02	-0.19	-0.16	-0.08	0.32	-0.20	0.04
22. Interest expenses	9.58	16.72	0.00	360.00	-0.71	6.55***	5.01***	0.87	8.08***	3.33
23. Tax on vehicles	1.15	1.20	0.00	18.40	-0.13	-0.00	-0.05	-0.25	-0.00	-0.10
24. Gifts	1.43	8.25	0.00	377.00	-0.10	-0.36	-0.14	0.12	-1.01	0.10
25. Second homes (cabins)	1.29	4.97	0.00	144.23	-0.20	0.52	0.35	0.08	0.86	-0.55
30. Taxable benefits	0.83	3.46	0.00	65.15	-0.52	-0.24	-0.22	-0.22	-0.72	-0.13
Total expenditure	181.43	111.21	11.77	1,121.24	0.55	26.53**	17.88*	38.85**	29.25*	8.80

Notes: The table reports summary statistics and regression estimates from the household expenditure survey for 2003–2007. All values are in SEK 1000 per adult equivalent. The total number of observations is 5581. Four observations with negative total expenditure have been dropped. The last six columns report estimates of γ_0, γ_{-1} and γ_{-2} from regression equation (**??**) using each item as the dependent variable. $* = p < 0.10, ** = p < 0.05, *** = p < 0.01$

Figure J.1 displays histograms for four samples from the household expenditure survey. The top left panel reports the distribution for all households in the survey for 2003–2007. The mode is at only 100-150 kSEK but the distribution is highly right-skewed. Households that buy a single-family house or co-op apartment (top right panel) are a lot more likely to spend more than 300 kSEK compared to households in the full sample. A thick right tail in the consumption distribution is also present for apartment purchasers (bottom left panel) and first-time apartment purchasers (bottom right panel).

Figure J.1: Spending According to the Survey



Notes: Top left panel: all households in the household expenditure survey for 2003–2007. The total number of observations is 5,581. Four observations with negative total expenditure have been dropped. Top right panel: households that change primary address and own a single-family house or co-op apartment at the end of the year. Bottom left panel: households that change primary address and own a co-op apartment at the end of the year. Bottom right panel: households that change primary address and own a co-op apartment at the end of the year and that did not own a single-family house or apartment before the change of address. All values are in SEK 1,000 per adult equivalent.

J.2 Sample restrictions based on the distribution of imputed spending

Table J.2 reports percentiles for spending in the survey and for the imputed spending measure in our sample. Approximately five percent of the observations for the imputed spending measure are negative. This is in line with the statistics reported in Koijen, Van Nieuwerburgh and Vestman (2014). Furthermore, the right tail of the distribution is a bit more skewed than in the survey. About 0.5 percent of the observations exceed 1,000 kSEK. Consequently we choose to exclude observations for which spending exceeds percentile 99.5 (1,010 kSEK). We also choose to exclude observations with negative values to facilitate the transition between levels and logs of the variable.

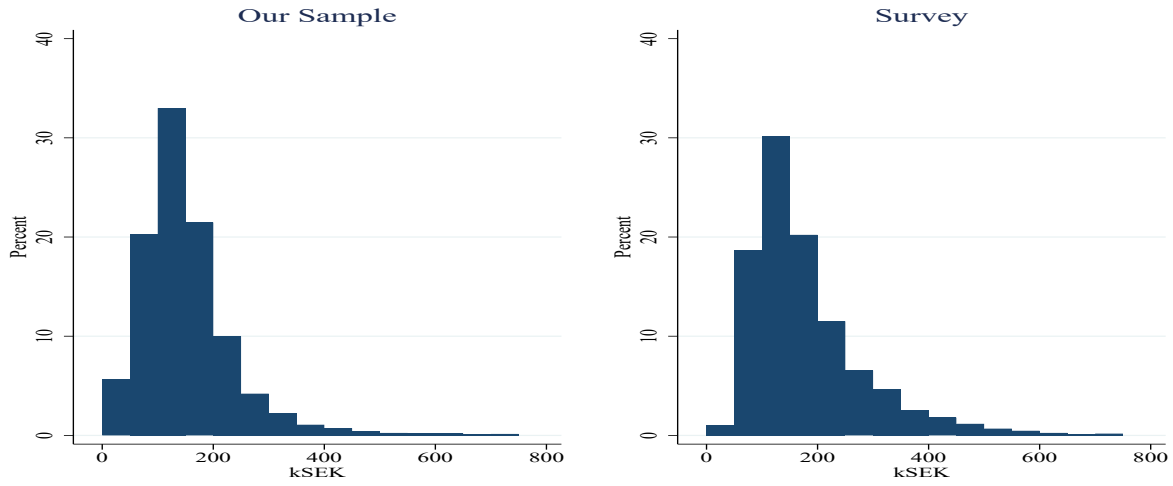
Table J.2: Distributions of Spending – Survey and Imputed Measure

Percentile	Survey	Imputed spending
0.5	39.68	-715.30
1	49.84	-429.06
2.5	59.59	-145.61
3	61.02	-100.73
5	69.01	-18.50
10	82.77	44.50
25	108.20	92.66
50	150.68	131.61
75	221.01	179.81
90	318.47	246.02
95	399.46	316.16
97	454.55	387.87
97.5	472.62	419.57
98	501.95	463.95
98.5	536.53	559.66
99	581.02	712.14
99,5	692.55	1,010.79
N	5,581	17,640

Notes: The table reports percentile values for total expenses according to the household expenditure survey for 2003–2007 and for imputed spending in our sample, including those that are 65 years and older. All values are in SEK 1000 per adult equivalent.

Figure J.2 displays two histograms, one for consumption in our sample after the sample restrictions have been imposed and one for consumption in the survey. The distributions are similar.

Figure J.2: Consumption in Our Sample and in the Survey



Notes: Left panel: imputed consumption in our sample. Right panel: consumption in the survey. All values are in SEK 1,000 per adult equivalent.

K External Validity

We discuss external validity in several realms. The first two exercises compare the income distributions of our sample households to the broader Stockholm renters and the consumption distribution of our households to that in the Swedish household budget survey. The next sections discuss Sweden in international context with regards to its homeownership and house price growth, mortgage market and home equity dynamics, rent regulation, and the broader welfare state.

K.1 Comparisons with Stockholm renters

Table K.1 reports averages of a selection of socioeconomic variables reported in Table 1 for households in our Stopplag sample and for all renter households in the municipalities of Stockholm and Nacka.

Figure K.1 shows the distribution of income, as defined in equation (5) and Table 1, for households in our Stopplag sample and for all renter households in the municipalities of Stockholm and Nacka.

K.2 Consumption Distribution

Appendix J.2 compares the consumption distribution in our sample to that in the Swedish household budget survey.

K.3 Homeownership and House Price Growth

During our period of study (1999-2007), the Swedish home ownership rate was nearly identical to that in the United States, at 66.5%. Just like in the U.S., it peaked in 2006-07 (69.5% in Sweden and 69% in the U.S.), and then fell back down during the GFC (to 64.1% in 2018 in Sweden and 63% in 2016 in the U.S.). The Stockholm housing market for owner-occupied housing is also similar to that in other major European cities with strict supply restrictions due to zoning (e.g., height restrictions, historical districting, etc.).

The Swedish housing market displayed robust house price growth during our period of study, like most countries around the world at that time. According to the BIS comparative international house price data set, annual nominal HPA between 2000.Q1 and 2007.Q4 was 9.1% in Sweden. This is close to HPA in the United States (7.8%), Canada (8.2%), the U.K. (10.7%), Australia (10.7%), as well as several European countries such as Denmark (8.6%), Norway (7.8%), Finland (6.8%), Belgium (8.4%), France (10.7%), Ireland (8.8%), and Spain (12.2%) over the same period. Unlike in the U.S., Spain, Ireland, and Denmark, but like in several other European countries, Swedish house prices slowed but did not crash in the GFC. Over the period 2007.Q4-2010.Q4, nominal HPA

Table K.1: Socioeconomic Variables for the Stopplag Sample and Stockholm Renters

	Stopplagen Sample	Stockholm Renters
Age	43.46	38.97
	(10.36)	(11.87)
High school	0.43	0.39
	(0.50)	(0.49)
Post high school	0.45	0.47
	(0.50)	(0.50)
Partner	0.33	0.18
	(0.47)	(0.39)
Unemployed	0.16	0.13
	(0.37)	(0.33)
Income shock -25% (Z_{it})	0.09	0.07
	(0.28)	(0.25)
Homeowner	0.04	0
	(0.19)	(0)
Apartment wealth	8.68	0
	(105.09)	(0)
Housing wealth	20.37	0
	(165.86)	(0)
Financial wealth	84.62	138.88
	(222.95)	(3249.34)
Debt	91.63	126.85
	(172.62)	(527.02)
Net worth	54.69	86.54
	(326.13)	(3514.45)
Risky share (uncond.)	0.23	0.25
	(0.30)	(0.33)
Income	157.04	143.11
	(75.45)	(157.79)
Observations	5548	969988

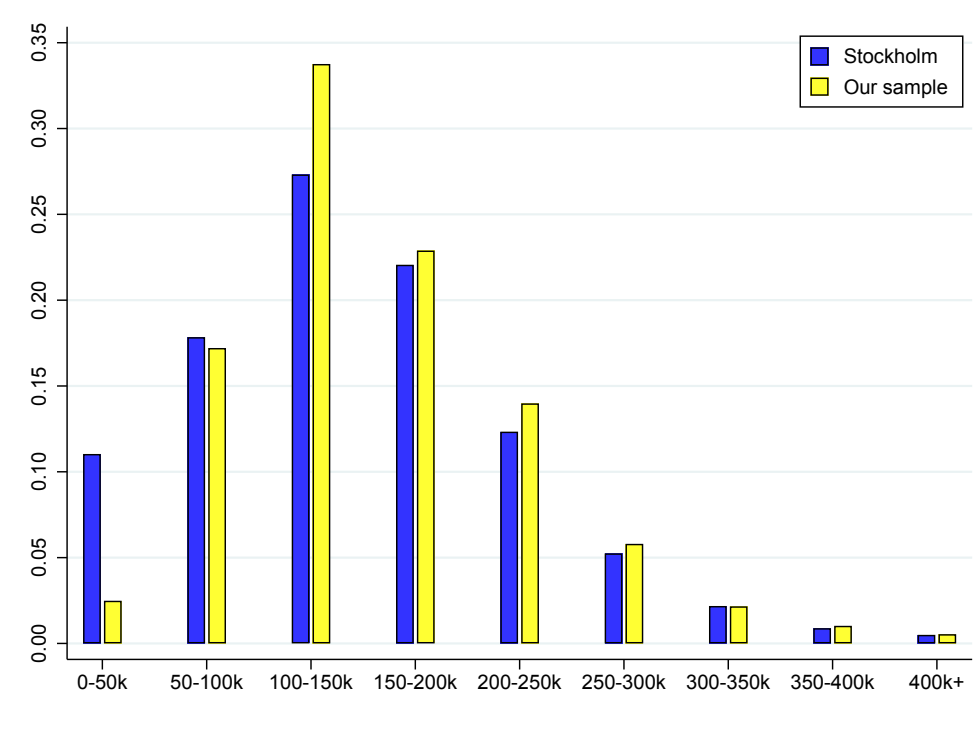
Notes: The table presents averages of variables for the Stopplagen sample and for all renter households in the municipalities of Stockholm and Nacka. For the Stopplagen sample, the average is taken for relative years -1 and earlier (2000–2004). For the broader sample of Stockholm renters, the years included are 1999–2002. In this sample, a household is defined as a renter if it has no apartment wealth and no single-family house. Standard deviations are in parentheses. With the exception of variables per individual or in ratios, all variables are denominated in SEK 1,000 per adult equivalent according to the OECD formula and deflated by the consumer price index.

in Sweden was 3.3% per year, similar to Norway (3.5%), Finland (2.0%), and Belgium (3.5%), to name a few. Our study period seems like a good period to investigate the effect of home ownership and housing wealth changes on consumption. It is relevant for the past decade from 2010–2020 which, just like 1999–2007 period, also witnessed strong house price growth. Swedish house price growth was 5.1% per year over this period.

K.4 Mortgage Market

The next point of comparison concerns the mortgage markets at the time of our study. The typical first-lien mortgage in Sweden is up to about 70% of the value of the house and interest-only (non-

Figure K.1: Distribution of income in our sample and among all renters in Stockholm



Notes: The histogram depicts income, as defined in equation (5) and Table 1, for households in our sample and for all renter households in the municipalities of Stockholm and Nacka. A household is defined as a renter if it has no apartment wealth and no single-family house. For the Stopplagen sample, the average is taken for relative years -1 and earlier (2000–2004). For the broader sample of Stockholm renters, the years included are 1999–2002. All values are in thousands of SEK and scaled by adult equivalents.

amortizing). The second (junior) mortgage covers an additional 10-25% of the value of the house and must be amortized over 10-15 years. Those 80-95% combined LTV (CLTV) levels and less-than-full amortization schedules were common in the U.S. and in many other countries at that time. Indeed, Amromin et al. (2018) shows that in the U.S. 18% of mortgages were interest-only or negative amortization (4%). Many more subprime mortgages had low initial interest rates (teaser rates) for an initial period before full amortization started. Lea (2010) documents that IO mortgages were available in 10 European countries, with 79% of all mortgages outstanding in 2009 that were IO in the Netherlands, 50% in Denmark, and 43% in the U.K. and in South Korea. In sum, the amortization schedule of Swedish mortgages was not that unusual.

Like in the U.K. and in most European countries, but unlike Denmark and the U.S., the typical mortgage is an adjustable-rate mortgage.

Mortgage underwriting considers debt service coverage, loan-to-value, and credit scores just like in any other market. Lending standards were loose at the time of our experiment, just like in many other countries, but not quite as lax as in the U.S.

How can there be much tapping into home equity when mortgages do not amortize much? The answer is twofold: Our treated households had a lot of free debt capacity to borrow against as a result of the experiment, and subsequent house price growth created substantial additional home equity. We refer to the available debt capacity plus financial wealth as the buffer; it is constructed as detailed in Appendix I. As shown in the bottom right panel of Figure 1, the buffer increases substantially in the year of treatment as well as afterwards due to healthy house price appreciation. The initial buffer arises because households can purchase their home at a substantial discount to the market value. While the typical new homeowner with a mortgage during our period of study in Sweden almost certainly did not have as much home equity as our treated households, the situation of ample and rising home equity is actually quite representative of the average homeowner in the average country in the typical rising house price environment. For example, U.S. households collectively own 66% of the value of their homes at the end of 2020, a number that has expanded from about 50% in 2010, as house prices have risen over the past decade. The same rising house price environment created home equity for Swedish home owners both during our sample of study and in the more recent housing market expansion. Paradoxically, our experiment is more relevant to the typical homeowner in the average place and time than it would have been if we had observed the average new home buyer in Stockholm in our period of study.

K.5 Rental Market and Privatization

The Stockholm rental market has substantial rent regulation. But so do many other OECD countries. Looking at the 20 richest OECD countries from 2002, a majority of countries have rent controls today; see the OECD Affordable Housing Database (PH6.1.1) and the *Tenancy Law and Housing Policy in Multi-level Europe* report. Ex-ante rent control comes in two different varieties. A small number of countries, such as Luxembourg and Switzerland, have absolute level controls based on maximum rental yields. The majority of countries tie rents to those on comparable apartments, in Germany via *Der Mietspiegel* or in Sweden with the point system. The OECD Affordable Housing Database (PH6.1.1) reports that 14 OECD members have caps on rent increases while 8 have caps on initial rent levels. Nearly all European countries have strong protections for tenants in place, making it difficult for landlords to evict tenants. Large U.S. cities such as New York and San Francisco have long had strong rent control; see Favilukis, Mabille and Van Nieuwerburgh (2021) and Diamond and McQuade (2019) for additional discussion.

Our privatization experiment is not unique. In other countries like the U.K., large privatization waves under Thatcher in the early 1980s are similar to the experiment we study in Sweden in the early 2000s. The U.S. is undergoing major rent regulation reform right now. California and Oregon passed state-wide rent control laws limiting the annual percentage increase in rents in 2019. Similarly, New York State passed the largest rent regulation reform since 1974 in June 2019. California, New York, New Jersey, Maryland, Oregon, and the District of Columbia now all have rent

control laws with similar legislative pushes underway elsewhere. Our paper, which studies the effects of a privatization——and hence a weakening of rent control— can be informative about the effects of a strengthening of rent regulation observed in the U.S. today. The strong push towards expansion of rent control over the past three years in the United States has made our setting, if anything, more relevant.

K.6 Social Insurance and Self-Insurance

The Swedish "welfare state" provides strong social insurance. That said, Sweden is similar to various other developed countries. Among the 20 richest OECD countries, Sweden is ranked 12th by GDP per capita, 6th by life expectancy, 10th by health care expenditures, and 9th by employment protection. There are several other European countries with similar levels of income inequality after government taxes and transfers. Data for 2013 on the income Gini coefficient across OECD countries from the 2017 OECD publication "Government at a Glance" show that Sweden is right in the middle of the European countries when it comes to income inequality after taxes and transfers. Nine countries have lower inequality after transfers and taxes, including all other Scandinavian countries (Norway, Denmark, Finland, and Island), but also Belgium, Austria, Slovenia, and the Czech Republic. Luxembourg, the Netherlands, Germany, and France are all close. Sweden's Gini coefficient of 0.281 is not that far below the OECD average of 0.311. Also, before tax-and-transfer inequality is not that unusual in Sweden. Again, nine OECD countries have lower before tax-and-transfer inequality than Sweden. Finally, if we define social insurance provision by the log difference between the pre-government and post-government income Gini coefficient, 17 OECD countries provide more social insurance than Sweden. The presence of robust social insurance in Sweden makes our housing collateral effect–where we show that owners are able to smooth through an income shock whereas renters are not–all the more interesting.

Finally, when it comes to the importance of self-insurance, Kaplan, Violante and Weidner (2014) compare the share of hand-to-mouth households in the United States, Canada, Australia, the United Kingdom, Germany, France, Italy, and Spain. This share is around 30%. Andersson and Vestman (2021) extend this comparison to Sweden and find a similar share of hand-to-mouth households. This shows that Swedes do not have more financial wealth at their disposal to insure against events and shocks not covered by social insurance than households in other countries. That said, the generosity of the social insurance system implies that Swedes may have fewer events and shocks not covered by social insurance to worry about.

L Additional results

This sections provides further details on our results.

L.1 Summary statistics for sub-groups

Table L.1 reports the same kind of summary statistics as Table 1 for additional sub-groups of the sample.

L.2 Main consumption results

Table L.2 reports all coefficient estimates corresponding to Table 2.

Table L.1: Averages Characteristics Before Treatment

	Treated	Control	Young	Old	Stayers	Movers	Movers (Owner)	Movers (Renter)
Panel A: Sociodemographics								
Age	45.06	43.95	33.28	50.88	45.54	40.83	39.67	41.61
High school	0.43	0.44	0.44	0.44	0.45	0.41	0.36	0.44
Post high school	0.48	0.42	0.46	0.43	0.42	0.49	0.56	0.44
Partner	0.40	0.31	0.30	0.36	0.33	0.34	0.48	0.25
Number of workers per hh	1.44	1.32	1.28	1.40	1.33	1.42	1.56	1.33
Unemployed	0.14	0.16	0.19	0.13	0.15	0.15	0.12	0.18
Income shock 25% (Z_{it})	0.09	0.10	0.13	0.08	0.09	0.11	0.08	0.12
Move	0.01	0.01	0.02	0.01	0.00	0.05	0.01	0.07
Panel B: Balancesheets								
Homeowner (D(Own)$_i$)	0.04	0.04	0.04	0.04	0.04	0.05	0.11	0.01
Housing wealth	29.03	24.48	32.41	21.92	22.55	34.92	77.66	5.92
Financial wealth	86.28	85.06	64.50	97.97	89.73	73.59	92.23	60.95
Debt	95.48	91.34	107.20	83.82	81.55	122.95	156.71	100.04
Net worth	78.35	57.35	10.39	95.57	72.33	39.75	82.62	10.65
Buffer	424.46	407.03	372.07	436.35	415.91	402.20	454.87	366.47
Risky share (uncond.)	0.21	0.19	0.20	0.19	0.19	0.20	0.26	0.16
Risky share (cond.)	0.35	0.34	0.35	0.34	0.35	0.34	0.37	0.32
Panel C: Cashflows								
Income	161.51	161.13	154.12	165.51	159.95	164.79	173.25	159.05
Consumption	143.17	146.14	140.99	147.80	140.59	158.08	166.00	152.71
Panel D: Apartments								
Distance to center (km)	7.89	7.01	6.97	7.45	7.28	7.25	7.64	6.99
Area (m^2)	72.40	74.75	69.53	76.74	74.94	71.56	73.89	69.97
Rent per year	38.80	42.71	39.81	42.58	42.19	39.75	37.90	41.01
Vote share	0.73	0.74	0.74	0.73	0.74	0.74	0.74	0.74
Panel E: Approved coop								
Conversion price per m^2 (p_0^c)	8.67		8.68	8.67	8.50	9.05	8.59	9.96
Market price per m^2 (p_0)	18.21		18.87	17.92	17.87	18.97	18.16	20.57
Discount fraction (τ)	0.54		0.55	0.53	0.54	0.54	0.55	0.52
Wealth shock ($\widetilde{W}$)	85.16		37.26	107.08	90.18	74.06	62.21	97.51
Apartment value (P_0)	813.14		770.99	833.50	803.81	834.82	795.15	905.76
Panel F: Neighborhoods								
Predicted conv. price per m^2 ($p_0^{c,nbd}$)	9.08	9.78	9.81	9.42	9.56	9.59	9.28	9.79
Predicted market price per m^2 (p_0^{nbd})	18.79	19.57	19.68	19.13	19.34	19.31	18.86	19.61
Predicted wealth shock ($\widetilde{W}^{nbd}$)	86.06	88.73	38.76	117.40	94.08	71.00	62.61	76.69
Predicted apartment value (P_0^{nbd})	866.99	992.67	923.23	974.01	971.89	908.43	858.03	942.63
Number of households	529	1235	661	1103	1294	470	190	280

Notes: The table presents averages of variables for the Fixed sample, as Table 1, but broken down into various subgroups. all Fixed sample households (first columns) and separately for households in successful privatization attempts (treated; second column) and failed attempts (control; third column) in the household formation year $k = -1$. Age and education refer to the highest age or education level among the household members. Partner refers to households with two adults who are married, have a civil partnership, or at least one child together. Unemployed refers to a dummy variable that indicates if any unemployment insurance was received by any household member during the year. Risky share (cond.) refers to the share of risky assets out of financial wealth conditional on stock market participation in the year of household formation. The construction of the neighborhood variables in Panel F is described in Appendix H. With the exception of variables per individual or in ratios, all variables are denominated in SEK 1,000 per adult equivalent according to the OECD formula and deflated by the consumer price index.

Table L.2: Reduced form estimates corresponding to Table 2

	(1) Log cons.	(2) Cons.	(3) Income	(4) dHouse	(5) dDebt	(6) dFin
Priv.$_i$ × RY$_{it}$(Pre)	0.032	2.431	-1.425	-6.661	-2.391	0.369
	(0.04)	(5.40)	(2.39)	(4.43)	(6.11)	(6.07)
Priv.$_i$ × RY$_{it}$(0)	0.078**	14.462**	2.281	319.737***	321.203***	-10.738**
	(0.04)	(5.23)	(1.64)	(57.68)	(61.78)	(4.77)
Priv.$_i$ × RY$_{it}$(Post)	0.185***	29.680***	0.784	-31.284**	-0.603	1.821
	(0.05)	(5.61)	(2.80)	(12.11)	(7.03)	(5.06)
RY$_{it}$(Pre)	-0.031	-5.881*	2.103	-5.864	-8.463	5.305
	(0.03)	(3.38)	(2.02)	(6.06)	(5.70)	(4.76)
RY$_{it}$(0)	0.025	2.407	0.888	4.370	6.546	0.719
	(0.03)	(5.54)	(1.53)	(6.39)	(8.60)	(4.27)
RY$_{it}$(Post)	-0.001	3.109	2.217	-16.217	-14.460	0.947
	(0.05)	(9.57)	(2.50)	(23.33)	(22.94)	(6.23)
PreTreat_Mean	4.78	142.49	157.03	-1.18	4.61	20.26
PreTreat_SD	0.64	88.63	75.44	52.99	60.84	69.00
Observations	12857	12857	12857	12857	12857	12857
R^2	0.45	0.43	0.80	0.27	0.30	0.31

Notes: The table presents all coefficient estimates of Table 2. Year and household fixed effects are included but not reported. Outcomes are the consumption components of equation (5). All values are in SEK 1,000 and expressed per adult equivalent. Standard errors are clustered at the co-op level and reported in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Figure L.1 displays difference-in-difference estimates corresponding to the cash-flow components of Table 2

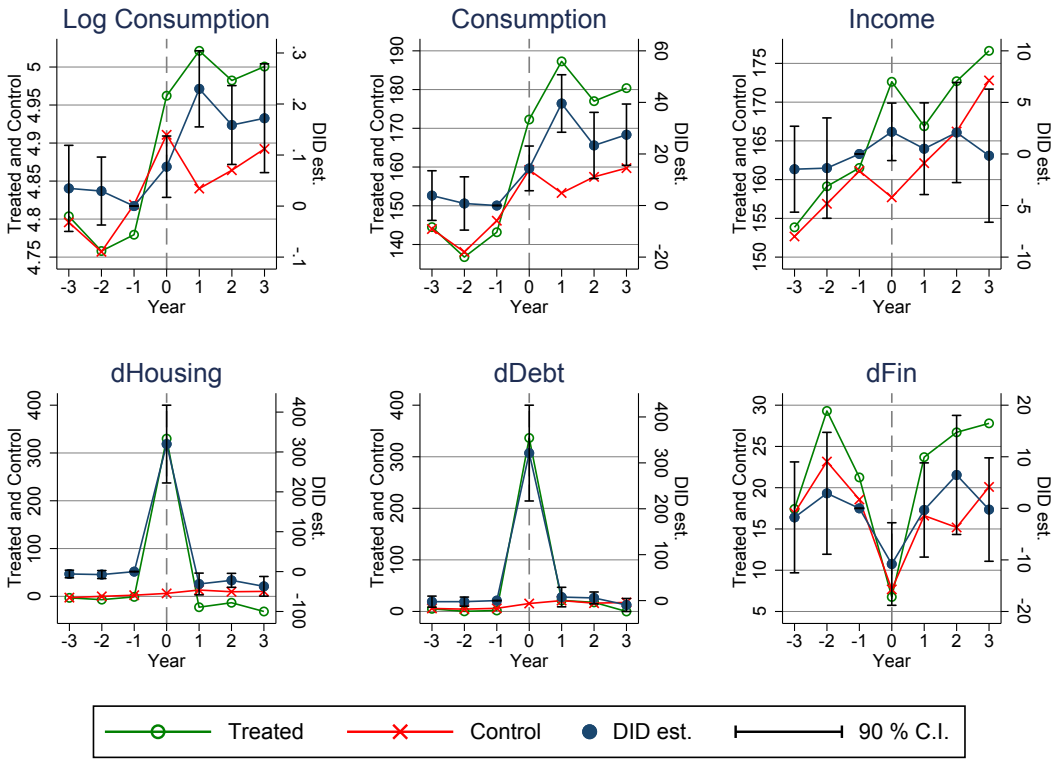
L.3 Labor supply

Table L.3 reports estimates for labor income and various labor market-related outcome variables (gross labor income, parental and sick leave benefits, unemployment benefits, distance from work, transitions to more or less volatile industries, etc.).

L.4 The instrumental variable regressions

Table L.4 reports the reduced-form estimates with the neighborhood wealth shock as the instrument, as in equation (7).

Figure L.1: Difference-in-Difference Estimates of Cash-Flows



Notes: The figure displays estimates corresponding to the cash-flow responses reported in Table 2. The panels depict the effects on cash-flows for the treatment and control groups (left vertical axes) and difference-in-difference estimates (right vertical axes). The difference-in-difference estimates are based on the regression specification in equation (6). All values are in SEK 1,000 and scaled by adult equivalents. Confidence intervals based on clustering at the co-op level.

Table L.3: Labor supply responses

	Panel A: Labor income and transfers				
	Labor income	Number of workers	D(Unemployment)	D(Sick leave or parental leave)	D(Adult in educ.)
Priv.$_i$ × RY$_{it}$(Pre)	0.598	0.011	-0.002	-0.013	0.010
	(3.71)	(0.02)	(0.02)	(0.03)	(0.01)
Priv.$_i$ × RY$_{it}$(0)	3.316	0.012	-0.010	0.014	-0.025**
	(4.20)	(0.02)	(0.02)	(0.03)	(0.01)
Priv.$_i$ × RY$_{it}$(Post)	2.832	0.020	0.001	-0.053	-0.017
	(5.08)	(0.04)	(0.02)	(0.04)	(0.01)
PreTreat_Mean	192.86	1.36	0.16	0.34	0.07
N	12426	12857	12857	12857	12857
r2	0.80	0.77	0.49	0.47	0.67

	Panel B: Employers				
	D(Change of employer)	D(Entrepreneur)	Distance between work-home (km)	D(Change to more volatile sector)	D(Change to less volatile sector)
Priv.$_i$ × RY$_{it}$(Pre)	0.014	0.013	0.203	0.003	0.011
	(0.02)	(0.01)	(2.79)	(0.01)	(0.01)
Priv.$_i$ × RY$_{it}$(0)	0.051*	-0.010	-3.475	0.002	0.012
	(0.02)	(0.01)	(2.84)	(0.01)	(0.02)
Priv.$_i$ × RY$_{it}$(Post)	0.026	0.013	-2.968	-0.003	0.005
	(0.02)	(0.01)	(3.11)	(0.01)	(0.01)
PreTreat_Mean	0.15	0.08	12.64	0.03	0.03
Observations	12857	12857	9040	12857	12857
R^2	0.26	0.76	0.47	0.16	0.16

Notes: The table presents reduced form effects on labor income, transfers and the likelihood of going to post-high school training (Panel A), and effects on matches with employers (Panel B). The regression estimates a complete difference-in-difference specification (equation (6)), but only the estimates associated with the treated are reported. Standard errors, clustered at the level of the co-op, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Table L.4: Reduced form estimates: neighborhood wealth shock

	(1)	(2)	(3)	(4)	(5)	(6)
	Log cons.	Cons.	Income	dHouse	dDebt	dFin
Priv.$_i$ × RY$_{it}$(Pre)	0.055	10.095*	-1.209	8.573	4.673	-15.208**
	(0.04)	(5.49)	(3.01)	(5.71)	(7.21)	(4.50)
Priv.$_i$ × RY$_{it}$(0)	0.030	10.494	2.323	176.063***	183.581***	-0.687
	(0.05)	(7.58)	(2.14)	(42.55)	(46.31)	(5.03)
Priv.$_i$ × RY$_{it}$(Post)	0.225***	34.385***	0.463	-8.252	15.018**	-10.583**
	(0.05)	(6.55)	(2.98)	(8.91)	(5.84)	(4.51)
$\widetilde{W}^{\text{nbd}}$ × Priv.$_i$ × RY$_{it}$(Pre)	-0.000	-0.097**	-0.013	-0.180***	-0.065	0.199**
	(0.00)	(0.04)	(0.02)	(0.04)	(0.05)	(0.07)
$\widetilde{W}^{\text{nbd}}$ × Priv.$_i$ × RY$_{it}$(0)	0.000	0.035	0.004	1.702***	1.656***	-0.076
	(0.00)	(0.08)	(0.02)	(0.20)	(0.25)	(0.06)
$\widetilde{W}^{\text{nbd}}$ × Priv.$_i$ × RY$_{it}$(Post)	-0.001	-0.075	-0.008	-0.303**	-0.194***	0.175**
	(0.00)	(0.06)	(0.03)	(0.11)	(0.05)	(0.07)
PreTreat_Mean	4.78	142.49	157.03	-1.18	4.61	20.26
PreTreat_SD	0.64	88.63	75.44	52.99	60.84	69.00
Observations	12857	12857	12857	12857	12857	12857
R^2	0.454	0.430	0.806	0.312	0.343	0.310

Notes: The table presents estimates based on the regression specification in equation (7). All values are in SEK 1,000 and scaled by adult equivalents. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Table L.5 reports first-stage estimates for column (3) of Table 3. Table L.6 reports first-stage estimatess for column (5) of Table 3. Table L.7 reports all coefficient estimates corresponding to Table 3.

Table L.5: First-stage estimation for column (4) of Table 3

	(1)	(2)	(3)	(4)
Dependent variable:	$\text{own}_i \times \text{RY}_{it}(0)$	$\text{own}_i \times \text{RY}_{it}(\text{Post})$	$\widetilde{W} \times \text{RY}_{it}(0)$	$\widetilde{W} \times \text{RY}_{it}(\text{Post})$
$\widetilde{W}^{\text{nbd}} \times \text{Private}_i \times \text{RY}_{it}(\text{Pre})$	-0.000	0.000	-0.002	-0.006
	(0.00)	(0.00)	(0.00)	(0.02)
$\widetilde{W}^{\text{nbd}} \times \text{Private}_i \times \text{RY}_{it}(\text{R0})$	-0.000	0.000	0.668***	0.012*
	(0.00)	(0.00)	(0.07)	(0.01)
$\widetilde{W}^{\text{nbd}} \times \text{Private}_i \times \text{RY}_{it}(\text{Post})$	-0.000	-0.000	0.004	0.673***
	(0.00)	(0.00)	(0.00)	(0.08)
$\text{Priv.}_i \times \text{RY}_{it}(\text{Pre})$	0.001	0.010*	0.025	-0.061
	(0.00)	(0.01)	(0.37)	(0.63)
$\text{Priv.}_i \times \text{RY}_{it}(\text{R0})$	0.837***	0.009*	15.816***	-0.215
	(0.02)	(0.00)	(3.93)	(0.44)
$\text{Priv.}_i \times \text{RY}_{it}(\text{Post})$	0.002	0.852***	-0.270	16.282***
	(0.00)	(0.02)	(0.29)	(4.23)
$\widetilde{W}^{\text{nbd}} \times \text{RY}_{it}(\text{Pre})$	-0.000	0.000*	-0.001	-0.011
	(0.00)	(0.00)	(0.00)	(0.03)
$\widetilde{W}^{\text{nbd}} \times \text{RY}_{it}(\text{R0})$	0.000	-0.000	-0.000	0.019
	(0.00)	(0.00)	(0.01)	(0.03)
$\widetilde{W}^{\text{nbd}} \times \text{RY}_{it}(\text{Post})$	0.000*	-0.000	-0.046	0.044
	(0.00)	(0.00)	(0.06)	(0.06)
$\text{RY}_{it}(\text{Pre})$	-0.000	-0.032**	0.384	-0.417
	(0.00)	(0.01)	(0.31)	(2.21)
$\text{RY}_{it}(\text{R0})$	0.036**	0.031**	-0.920	-0.409
	(0.01)	(0.01)	(1.52)	(2.01)
$\text{RY}_{it}(\text{Post})$	-0.059**	0.098***	1.404	-1.976
	(0.02)	(0.02)	(3.37)	(2.86)
Observations	12857	12857	12857	12857
F-stat on excluded instruments	337.57	457.36	38.75	44.55

Notes: The table reports the first-stage estimates corresponding to column (4) of Table 3. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Table L.6: First-stage estimation for column (6) of Table 3

	(1)	(2)	(3)	(4)
Dependent variable:	$\tau P_{0,i} \times \text{RY}_{it}(0)$	$\tau P_{0,i} \times \text{RY}_{it}(\text{Post})$	$\text{own}_i \times \text{RY}_{it}(0)$	$\text{own}_i \times \text{RY}_{it}(\text{Post})$
$\tau P_0^{\text{nbd}} \times \text{Priv.}_i \times \text{RY}_{it}(\text{Pre})$	0.009	0.006	0.000	-0.000
	(0.01)	(0.01)	(0.00)	(0.00)
$\tau P_0^{\text{nbd}} \times \text{Priv.}_i \times \text{RY}_{it}(\text{R0})$	0.559***	0.010	-0.000*	0.000
	(0.09)	(0.01)	(0.00)	(0.00)
$\tau P_0^{\text{nbd}} \times \text{Priv.}_i \times \text{RY}_{it}(\text{Post})$	0.012*	0.555***	0.000	-0.000
	(0.01)	(0.09)	(0.00)	(0.00)
$\text{Priv.}_i \times \text{RY}_{it}(\text{Pre})$	-5.405	-3.528	-0.002	0.010
	(4.58)	(4.25)	(0.00)	(0.01)
$\text{Priv.}_i \times \text{RY}_{it}(\text{R0})$	122.444***	1.502	0.857***	0.004
	(34.04)	(5.46)	(0.03)	(0.01)
$\text{Priv.}_i \times \text{RY}_{it}(\text{Post})$	-4.309	126.036***	-0.000	0.867***
	(4.16)	(34.80)	(0.00)	(0.03)
$\tau P_0^{\text{nbd}} \times \text{RY}_{it}(\text{Pre})$	-0.007	0.014	-0.000	0.000
	(0.01)	(0.04)	(0.00)	(0.00)
$\tau P_0^{\text{nbd}} \times \text{RY}_{it}(\text{R0})$	0.024	0.002	0.000	-0.000
	(0.02)	(0.04)	(0.00)	(0.00)
$\tau P_0^{\text{nbd}} \times \text{RY}_{it}(\text{Post})$	0.005	0.027	0.000	0.000
	(0.06)	(0.05)	(0.00)	(0.00)
$\text{RY}_{it}(\text{Pre})$	5.728	-18.264	0.002	-0.026
	(4.47)	(21.40)	(0.00)	(0.02)
$\text{RY}_{it}(\text{R0})$	-19.694	7.394	0.032*	0.028
	(16.28)	(16.40)	(0.02)	(0.02)
$\text{RY}_{it}(\text{Post})$	-17.279	-2.917	-0.046*	0.087**
	(24.56)	(19.86)	(0.03)	(0.03)
Observations	12857	12857	12857	12857
F-stat on excluded instruments	37.38	49.78	385.72	410.90

Notes: The table reports the first-stage estimates corresponding to column (6) of Table 3. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Table L.7: Instrumental variable estimates on consumption (corresponding to Table 3)

	(1)	(2)	(3)	(4)	(5)
$\text{own}_i \times \text{RY}_{it}(0)$	14.775**		1.560		-15.384
	(6.47)		(10.95)		(15.31)
$\text{own}_i \times \text{RY}_{it}(\text{Post})$	32.439***		32.906***		20.054
	(6.63)		(8.99)		(16.69)
$\widetilde{W}^{\text{nbd}} \times \text{RY}_{it}(\text{Pre})$	-0.141***	-0.137**	-0.140***		
	(0.04)	(0.05)	(0.04)		
$\widetilde{W}^{\text{nbd}} \times \text{RY}_{it}(0)$	0.028	-0.007	0.005		
	(0.07)	(0.08)	(0.07)		
$\widetilde{W}^{\text{nbd}} \times \text{RY}_{it}(\text{Post})$	0.054	0.025	0.092		
	(0.09)	(0.09)	(0.08)		
$\text{RY}_{it}(\text{Pre})$	7.936	8.989	7.785	17.946**	15.096*
	(5.00)	(6.26)	(5.01)	(8.57)	(8.63)
$\text{RY}_{it}(0)$	-0.346	3.756	2.990	-3.966	2.676
	(6.87)	(6.91)	(6.74)	(9.26)	(11.03)
$\text{RY}_{it}(\text{Post})$	-2.427	6.300	-4.329	-10.519	-13.493
	(12.54)	(12.78)	(12.85)	(19.72)	(20.08)
$\widetilde{W}^{\text{nbd}} \times D(t = 2000)$	0.361**	0.371**	0.398***		
	(0.11)	(0.11)	(0.10)		
$\widetilde{W}^{\text{nbd}} \times D(t = 2001)$	0.300**	0.310**	0.337**		
	(0.10)	(0.11)	(0.10)		
$\widetilde{W}^{\text{nbd}} \times D(t = 2002)$	0.198**	0.211**	0.235**		
	(0.09)	(0.09)	(0.09)		
$\widetilde{W}^{\text{nbd}} \times D(t = 2003)$	0.142*	0.164**	0.182**		
	(0.07)	(0.08)	(0.08)		
$\widetilde{W}^{\text{nbd}} \times D(t = 2004)$	0.116**	0.117**	0.116**		
	(0.04)	(0.04)	(0.04)		
$\widetilde{W}^{\text{nbd}} \times D(t = 2005)$	0.097**	0.096**	0.097**		
	(0.03)	(0.03)	(0.03)		
$\widetilde{W}^{\text{nbd}} \times D(t = 2006)$	-0.012	-0.012	-0.011		
	(0.04)	(0.04)	(0.04)		
$\widetilde{W}_i \times \text{RY}_{it}(0)$		0.157**	0.152		
		(0.08)	(0.12)		
$\widetilde{W}_i \times \text{RY}_{it}(\text{Post})$		0.208***	-0.006		
		(0.06)	(0.08)		
$\tau P_{0,i} \times \text{RY}_{it}(0)$				0.039**	0.067*
				(0.01)	(0.03)
$\tau P_{0,i} \times \text{RY}_{it}(\text{Post})$				0.062***	0.025
				(0.02)	(0.04)
$\tau P_0^{\text{nbd}} \times \text{RY}_{it}(\text{Pre})$				-0.044**	-0.041**
				(0.02)	(0.02)
$\tau P_0^{\text{nbd}} \times \text{RY}_{it}(0)$				0.012	0.004
				(0.02)	(0.02)
$\tau P_0^{\text{nbd}} \times \text{RY}_{it}(\text{Post})$				0.034	0.039
				(0.04)	(0.04)
$\tau P_0^{\text{nbd}} \times D(t = 2000)$				0.116**	0.110**
				(0.04)	(0.04)
$\tau P_0^{\text{nbd}} \times D(t = 2001)$				0.105**	0.099**
				(0.04)	(0.04)
$\tau P_0^{\text{nbd}} \times D(t = 2002)$				0.077**	0.073*
				(0.04)	(0.04)
$\tau P_0^{\text{nbd}} \times D(t = 2003)$				0.046*	0.048*
				(0.03)	(0.02)
$\tau P_0^{\text{nbd}} \times D(t = 2004)$				0.027*	0.028*
				(0.02)	(0.02)
$\tau P_0^{\text{nbd}} \times D(t = 2005)$				0.021*	0.022*
				(0.01)	(0.01)
$\tau P_0^{\text{nbd}} \times D(t = 2006)$				-0.019*	-0.019*
				(0.01)	(0.01)
Observations	12857	12857	12857	12857	12857
Kleibergen-Paap F-stat	329.75	35.44	39.70	32.55	13.92

Notes: The table presents all coefficient estimates of column (2)-(6) in Table 3. Year and household fixed effects are included but not reported. Estimates are based on the regression specification in equation (9). Standard errors in parentheses.The Kleibergen-Papp F-statistic reports on the test for weak instruments (see Kleibergen and Paap (2006) and Andrews, Stock and Sun (2020) for discussion). The terms $\text{own}_i \times \text{RY}_{it}(0)$, $\text{own}_i \times \text{RY}_{it}(\text{Post})$, $\widetilde{W}_i \times \text{RY}_{it}(0)$, $\widetilde{W}_i \times \text{RY}_{it}(\text{Post})$, $\tau P_{0,i} \times \text{RY}_{it}(0)$, and $\tau P_{0,i} \times \text{RY}_{it}(\text{Post})$ are instrumented. First-stage estimates for columns (4) and (6) are reported in Tables L.5 and L.6. Standard errors are clustered at the co-op level. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

L.5 Robustness to Choice of R_h/R and T

We recall that R_h is the real price gain on housing, which has historically been small, while R is the total return on investments. R can be thought of as the total return on housing, an interpretation that arises from equation (47) in the model which connects the ratio R_h/R to the price-rent ratio adjusted for maintenance and depreciation. The difference between R and R_h is then the rental yield on housing, which accounts for the bulk of the total housing return in the data. The historical evidence suggests a 7% housing return ($R = 1.07$), a 2% house price growth rate ($R_h = 1.02$) and hence a 5% rental yield (Giglio et al., 2021; Jordà et al., 2019). A 7% total return on investments is also a reasonable number for the expected return on a broader portfolio of financial assets. We consider two robustness checks with a lower and higher value for R: 1.02 and 1.09 or equivalently $R_h/R = 1.0$ and $R_h/R = 0.9358$, straddling our benchmark value of 0.9533. After accounting for a 2.1% maintenance rate, these alternative values result in a lower (11.7) and a higher (47.6) value for the price-rent ratio, which span the historical experience. We note that for the case $R_h/R = 1.0$, the wealth shock equals the landlord discount: $W_0 = \tau P_0$.

The horizon T, which enters in the expression for the wealth shock, indicates the horizon over which we assess the cost difference between owning and renting. Equivalently, it captures the number of years the renter enjoys regulated rents relative to the owner. We argue in the main text that the relevant consideration for T is how long the household remains in the Stockholm housing market. We proxy this empirically as 85 minus current age, and use the actual treated households' age when implementing equation (3). Here, we consider two robustness checks with lower values for T: 65 minus current age and 20. Using smaller values for T lowers the value of the rent control option, and lowers the wedge between the instantaneous wealth shock τP_0 and the total wealth shock W_0 in equation (3): $W_0 = \tau P_0 (R_h/R)^{T+1}$. For example, for the baseline values of R and R_h, lowering T from 40 to 20 changes the wealth shock from 0.14 times the instantaneous housing wealth change τP_0 to 0.37 times τP_0. This has a similar quantitative effect as lowering R from 1.07 to 1.045 while keeping $T = 40$.

Table L.8 present regression coefficients for the regression with consumption growth in a post-period year as the dependent variable and the wealth shock $\tilde{W}$ as the independent variable, where the different columns use a different value for $(R_h/R)^{T+1}$ in $\tilde{W}$. The first column reports the result for the baseline values of R and T. All other columns indicate negative slope coefficients, just like in the baseline. None of the four alternative choices results in a positive and significant coefficient estimate.

Table L.9 repeats the IV estimation in Table 3 of the main text, column (4). Again, the results for the baseline choices of R and T are repeated in column (1). It continues to find no significant positive association between the wealth shock and the consumption response post-treatment in the IV regression.

Table L.8: Consumption vs. wealth shocks – alternative assumptions on T and R

	(1)	(2)	(3)	(4)	(5)
$\widetilde{W}$	–0.127**	–0.026	–0.011**	–0.064**	–0.221**
	(0.055)	(0.041)	(0.005)	(0.031)	(0.090)
Constant	54.110***	48.810***	48.802***	54.782***	53.087***
	(5.208)	(7.363)	(4.345)	(5.680)	(4.879)
T	max(85-age_i, 0)	max(65-age_i, 0)	20	max(85-age_i, 0)	max(85-age_i, 0)
R	1.07	1.07	1.07	1.02	1.09
Observations	1824	1824	1824	1824	1824
R^2	0.006	0.000	0.006	0.005	0.006

Notes: The table reports OLS estimates. The dependent variable is as in Figure 2: $c_{i,k} - c_{i,k-1}$ for $k \geq 0$. Column (1) displays the estimates based on the benchmark assumptions for T and R, corresponding to the left panel in Figure 2. The remaining columns vary T or R for the computation of $\widetilde{W}$. All estimates keep $R_h = 1.02$.
$* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

L.6 Cross-sectional variation in MPCs

To study the cross-sectional variation in the consumption response, we define a marginal propensity to consume out of the landlord discount (τP_0) plus the subsequent capital gains on the apartment ($P_0 \cdot r_{h,0,k}$ where h is the neighborhood of household i and $r_{h,0,k}$ the gross cumulate house price appreciation between period 0 and k):

$$MPC_{i,k} = \frac{c_{i,k} - c_{i,-1}}{\tau P_0 + P_0 r_{h,0,k}}, k = 1, 2, 3, 4 \tag{68}$$

The numerator compares consumption in the post-period to relative year -1. We omit the consumption response in year zero from this calculation since the treatment year is an unusual year, which may not reflect the medium-run response to home ownership accurately. For each household, we average the responses over the various years in the post period.

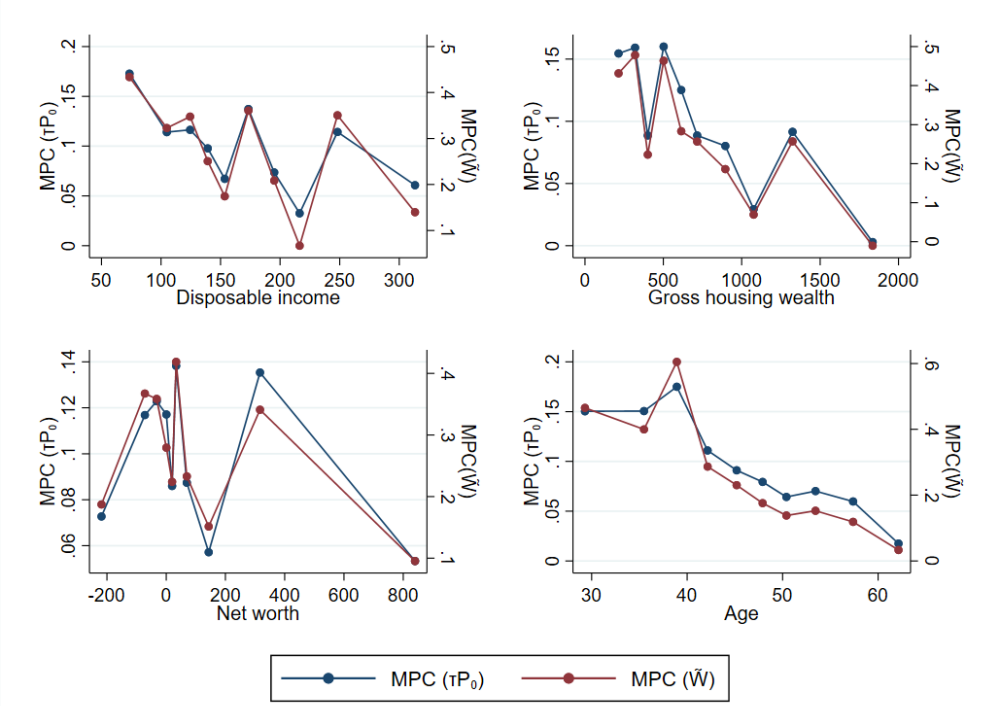
The four panels of Figure L.2 report the cross-sectional variation in the MPC measure by income, housing wealth, net worth, and age. The MPC measure defined in (68) is plotted against the left axis. A similar measure that replaces τP_0 by $\tilde{W}$ in the denominator is plotted against the right axis. The results are similar, both qualitatitvely and quantitatively to the predictions of the incomplete-markets model of Berger et al. (2018), plotted in their Figure 3(b).

Table L.9: IV estimates on consumption – Alternative assumptions on T and R

	(1)	(2)	(3)	(4)	(5)	(6)
own$_i$ × RY$_{it}$(0)	1.560	–15.384	6.847	–2.180	4.118	-15.384
	(10.95)	(15.31)	(8.56)	(12.22)	(9.96)	(15.31)
own$_i$ × RY$_{it}$(Post)	32.906***	20.054	34.508***	30.894**	33.993***	20.054
	(8.99)	(16.69)	(6.78)	(10.44)	(8.12)	(16.69)
$\widetilde{W}$ × RY$_{it}$(0)	0.152	0.139	0.020	0.092	0.240	
	(0.12)	(0.07)	(0.02)	(0.07)	(0.22)	
$\widetilde{W}$ × RY$_{it}$(Post)	–0.006	0.052	–0.002	0.006	–0.029	
	(0.08)	(0.08)	(0.01)	(0.05)	(0.12)	
$\tau P_{0,i}$ × RY$_{it}$(0)						0.067*
						(0.03)
$\tau P_{0,i}$ × RY$_{it}$(Post)						0.025
						(0.04)
R	1.07	1.07	1.07	1.02	1.09	1.07
T_i	max(85-age_i, 0)	max(65-age_i, 0)	20	max(85-age_i, 0)	max(85-age_i, 0)	max(85-age_i, 0)
Observations	12857	12857	12857	12857	12857	12857
Kleibergen-Paap F-stat	39.70	13.92	35.20	30.08	53.44	13.92

Notes: Column (1) reports the estimates of column (4) in Table 3 and column (6) reports the estimates of column (6) in Table 3. The remaining columns present instrumental variable estimates based on alternative assumptions for R and T_i:
(1) and (6) are the default assumptions in the paper, where R = 1.07, T_i = max(85-age_i, 0).
(2) is the alternative assumption with T_i = max(65-age_i, 0).
(3) is the alternative assumption with T_i = 20.
(4) is the alternative assumption with R = 1.02.
(5) is the alternative assumption with R = 1.09.
Standard errors are clustered at the co-op level. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Figure L.2: Cross-sectional variation in MPCs



Notes: The measure of MPC is based on the average response in relative years 1 and later, as defined in equation (68). The blue line depicts the response relative to $\tau P_0 + P_0 r_{0,i,k}$ (left axis). The red line is the corresponding metric with $\widetilde{W} + P_0 r_{0,i,k}$ in the denominator (right axis). Observable characteristics are from relative year -1, except housing wealth which is from relative year 0. Each dot represents one decile. All values in SEK 1,000 per adult equivalent.

L.7 Consumption smoothing across time

Table L.10 reports all coefficient estimates corresponding to Table 4.

Table L.10: Consumption Smoothing Across Time (corresponding to Table 4)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Cash-flows				Mobility	
	Log cons.	Cons.	Income	dHouse	dDebt	dFin	Move	Move up
Priv.$_i$ × RY$_{it}$(Pre)	0.082	6.681	-0.327	6.384	3.722	-9.609	0.016	-0.004
	(0.07)	(8.30)	(5.15)	(7.70)	(7.83)	(6.45)	(0.01)	(0.01)
Priv.$_i$ × RY$_{it}$(0)	0.065	14.007*	2.398	247.714***	254.699***	-4.645	-0.030	-0.023**
	(0.06)	(8.24)	(4.10)	(43.41)	(46.28)	(6.94)	(0.02)	(0.01)
Priv.$_i$ × RY$_{it}$(Post)	0.309***	47.562***	-2.546	-24.422	19.350*	-6.281	0.047**	0.044***
	(0.08)	(8.22)	(4.27)	(14.67)	(10.22)	(5.18)	(0.02)	(0.01)
RY$_{it}$(Pre)	-0.025	-10.394	1.463	-11.751	-19.942**	3.503	-0.014	-0.006
	(0.05)	(6.65)	(3.41)	(7.01)	(8.82)	(6.40)	(0.01)	(0.01)
RY$_{it}$(0)	0.086	12.264*	-1.004	6.544	18.695*	-0.983	0.002	0.015*
	(0.05)	(6.66)	(3.16)	(7.75)	(9.71)	(4.88)	(0.02)	(0.01)
RY$_{it}$(Post)	0.036	13.153	-0.887	-27.164	-9.475	3.828	0.029	0.008
	(0.07)	(17.65)	(4.56)	(28.36)	(29.25)	(8.82)	(0.04)	(0.02)
Priv.$_i$ × RY$_{it}$(Pre)	-0.070	-6.183	-1.832	-19.058**	-8.528	14.724	-0.021	0.006
D(Old)$_i$	(0.07)	(8.22)	(4.97)	(8.55)	(8.71)	(9.10)	(0.01)	(0.01)
Priv.$_i$ × RY$_{it}$(0)	0.021	1.365	-0.216	107.066*	99.870*	-8.782	-0.001	0.022**
D(Old)$_i$	(0.07)	(10.46)	(4.51)	(56.23)	(54.79)	(8.32)	(0.02)	(0.01)
Priv.$_i$ × RY$_{it}$(Post)	-0.176**	-24.897**	4.878	-8.380	-25.909**	12.214	-0.046**	-0.037**
D(Old)$_i$	(0.07)	(8.65)	(4.44)	(16.78)	(12.20)	(7.51)	(0.02)	(0.01)
D(Old)$_i$ × RY$_{it}$(Pre)	-0.011	6.332	1.122	8.873	15.957*	2.000	0.016	0.002
	(0.06)	(8.54)	(3.92)	(7.17)	(9.31)	(9.84)	(0.01)	(0.01)
D(Old)$_i$ × RY$_{it}$(0)	-0.089	-14.329	2.890	-3.322	-18.248*	2.189	0.023	-0.009
	(0.08)	(9.70)	(3.72)	(11.15)	(10.80)	(7.81)	(0.03)	(0.01)
D(Old)$_i$ × RY$_{it}$(Post)	-0.045	-14.100	4.539	20.755	-3.356	-5.605	0.008	-0.004
	(0.08)	(14.92)	(5.46)	(33.64)	(30.34)	(12.76)	(0.04)	(0.02)
Observations	12857	12857	12857	12857	12857	12857	12857	12857
R^2	0.4503	0.4284	0.8042	0.2768	0.3082	0.3065	0.1585	0.1671

Notes: The table presents all coefficient estimates of Table 4. Year and household fixed effects are included but not reported. Move is an indicator variable that takes the value of one if a household changes address in the current year and is zero otherwise. Move up is an indicator variable that takes the value of one if the household moves to a parish with higher average housing wealth per household and is zero otherwise. The regression corresponds to equation (7) where D = D(Old)$_i$ which indicates whether the household head is older than 40. The average age conditional on being younger than the cut-off value is 33 years. The average age conditional on being older than the cut-off value is 51 years. Additional mobility outcomes are reported in Table L.17. Standard errors are clustered at the co-op level and reported in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

L.8 Consumption smoothing across states

Table L.11 reports all coefficient estimates corresponding to Table 5.

Table L.11: Consumption Smoothing Across States: All Households (corresponding to Table 5)

	(1)	(2)	(3)	(4)	(5)	(6)
	Log cons.	Cons.	Income	dHousing	dDebt	dFin
Priv.$_i$ × RY$_{it}$(Pre)	0.026	2.564	-1.579	-5.388	-2.154	-0.957
	(0.04)	(5.44)	(2.02)	(4.66)	(6.60)	(6.09)
Priv.$_i$ × RY$_{it}$(0)	0.064	12.200*	2.226	317.011***	314.299***	-12.708**
	(0.04)	(6.11)	(1.68)	(58.50)	(62.12)	(5.50)
Priv.$_i$ × RY$_{it}$(Post)	0.167***	26.921***	1.238	-31.138**	-3.770	1.728
	(0.05)	(5.06)	(2.71)	(11.82)	(7.42)	(5.00)
Z_{it} × Private$_i$ × RY$_{it}$(Pre)	0.073	-0.897	1.315	-16.320	-2.588	15.988
	(0.11)	(13.29)	(6.51)	(20.36)	(15.53)	(19.45)
Z_{it} × Private$_i$ × RY$_{it}$(0)	0.135	21.318	3.174	29.203	68.218	20.866
	(0.14)	(20.23)	(8.34)	(47.01)	(52.97)	(13.15)
Z_{it} × Private$_i$ × RY$_{it}$(Post)	0.192*	29.940*	-3.746	-2.743	31.950**	0.916
	(0.10)	(16.20)	(8.82)	(26.70)	(11.25)	(13.80)
RY$_{it}$(Pre)	-0.039	-7.590**	1.862	-5.202	-8.552	6.012
	(0.03)	(3.63)	(1.86)	(6.34)	(5.68)	(5.09)
RY$_{it}$(0)	0.034	4.059	1.002	5.600	9.394	0.796
	(0.04)	(6.25)	(1.38)	(6.45)	(8.98)	(4.32)
RY$_{it}$(Post)	0.001	3.108	2.557	-14.169	-13.298	0.399
	(0.05)	(9.41)	(2.19)	(23.12)	(22.55)	(6.20)
Z_{it} × RY$_{it}$(Pre)	0.103	19.093**	5.176	-7.027	1.039	-5.763
	(0.09)	(8.00)	(4.69)	(7.89)	(8.86)	(6.97)
Z_{it} × RY$_{it}$(0)	-0.112	-17.544	-3.759	-10.922	-25.235*	-0.485
	(0.10)	(11.46)	(4.99)	(9.35)	(13.17)	(8.61)
Z_{it} × RY$_{it}$(Post)	-0.067	-5.913	-8.011	-15.087*	-6.252	6.775
	(0.06)	(6.86)	(5.53)	(8.69)	(8.06)	(8.73)
Z_{it}	-0.174**	-18.187**	-27.390***	6.241	3.836	-11.617**
	(0.05)	(5.29)	(4.25)	(6.05)	(6.71)	(5.57)
Observations	12857	12857	12857	12857	12857	12857
R^2	0.45	0.43	0.81	0.27	0.30	0.31

Notes: The table presents all coefficient estimates of Table 5. Year and household fixed effects are included but not reported. The dummy variable Z_{it} takes on the value one if the income fluctuation is -25 percent or greater in magnitude. Estimates are based on the regression specification in equation (6), extended so that all covariates are interacted with Z_{it}. Standard errors, clustered at the co-op level, in parenthesis. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

L.8.1 Details on the income fluctuations

This sections provides further details on the analysis of responses to income fluctuations.

Panel A of Table L.12 reports estimates from the regression

$$\begin{aligned} Z_{it} = \gamma_0 + \gamma_1 \text{D(Parental leave)}_{it} + \gamma_2 \text{D(Sick leave)}_{it} + \gamma_3 \text{ D(In education)}_{it} \\ + \gamma_4 \text{D(Change of employer)}_{it} + \gamma_5 \text{D(Unemployed)}_{it} + \beta X_{it} + \nu_{it}, \end{aligned} \tag{69}$$

where Z_{it} is the dummy variable that indicates whether household i experiences a negative income fluctuation in year t. The coefficients γ_1, γ_2,...,γ_5 pick up common variation between parental

leave benefits, sick leave benefits, whether an adult household member is in schooling, whether an adult household member changed employer since last year, and whether a household member receives unemployment benefits. Columns (1) to (5) of report estimates. Parental leave, sick leave, schooling and unemployment contribute to the smaller income fluctuations (up to -15%) . Schooling, change of employer, and unemployment contribute to the larger income fluctuations (-30%).

Panel B of Table L.12 reports estimates from the regression specified in equation (6) with Z_{it} as the dependent variable. The table shows no evidence of treatment effects, meaning that the income fluctuations do not seem to depend on treatment.

Table L.12: Income fluctuations – relation to observables and test of treatment response

	A. Relation to observables				
Income fluctuation:	$\Delta Y \leq -10\%$	$\Delta Y \leq -15\%$	$\Delta Y \leq -20\%$	$\Delta Y \leq -25\%$	$\Delta Y \leq -30\%$
Parental Leave	0.057**	0.043**	0.035**	0.018	0.004
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Sick leave	0.032**	0.018*	0.002	-0.008	-0.015**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Adult in Education	0.090**	0.084**	0.091***	0.094***	0.086***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)
Change of Employer	-0.012	-0.016	-0.016	-0.012	-0.016**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Unemployment	0.195***	0.193***	0.177***	0.163***	0.146***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Observations	12857	12857	12857	12857	12857
R^2	0.238	0.246	0.243	0.244	0.247
	B. Reduced form responses				
Income fluctuation:	$\Delta Y \leq -10\%$	$\Delta Y \leq -15\%$	$\Delta Y \leq -20\%$	$\Delta Y \leq -25\%$	$\Delta Y \leq -30\%$
Priv.$_i$ $\times$ RY$_{it}$(Pre)	0.032	0.012	0.012	-0.002	-0.005
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Priv.$_i$ $\times$ RY$_{it}$(0)	0.015	0.020	0.012	0.010	-0.001
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Priv.$_i$ $\times$ RY$_{it}$(Post)	0.026	0.019	0.019	0.007	0.006
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Pre-treatment mean	0.15	0.12	0.10	0.08	0.07
Observations	12857	12857	12857	12857	12857
R^2	0.22	0.22	0.22	0.22	0.22

Notes: Panel A reports regressions estimates from equation (69). Panel B reports regression estimates from equation (6) with Z_{it} as the dependent variable, constructed based on different threshold values for the income shock (ΔY). Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

L.8.2 Smoothing across states for stayers

Table L.13 reports estimation results corresponding to Table 5 when the sample is restricted to households that stay.

Table L.13: Consumption Smoothing Across States: Stayers

	(1)	(2)	(3)	(4)	(5)	(6)
	Log cons.	Cons.	Income	dHousing	dDebt	dFin
Priv.$_i$ × RY$_{it}$(Pre)	0.007	0.978	-2.219	-6.452	-2.868	0.365
	(0.04)	(4.72)	(2.52)	(3.87)	(5.82)	(4.69)
Priv.$_i$ × RY$_{it}$(0)	0.038	7.924	-0.230	323.639***	315.798***	-16.011**
	(0.04)	(6.38)	(2.18)	(58.84)	(62.26)	(4.68)
Priv.$_i$ × RY$_{it}$(Post)	0.115**	15.640**	3.162	-1.283	2.685	-8.463**
	(0.04)	(5.23)	(3.10)	(4.15)	(4.54)	(3.19)
Z_{it} × Private$_i$ × RY$_{it}$(Pre)	0.011	-1.936	3.702	13.410*	2.578	-5.160
	(0.14)	(19.17)	(5.04)	(7.42)	(10.45)	(15.51)
Z_{it} × Private$_i$ × RY$_{it}$(0)	0.221*	28.230	13.064	36.367	73.961	22.532*
	(0.12)	(17.38)	(9.08)	(48.21)	(49.23)	(12.06)
Z_{it} × Private$_i$ × RY$_{it}$(Post)	0.127	14.812	9.072	15.101*	33.762**	12.859
	(0.09)	(10.51)	(6.21)	(7.65)	(15.07)	(8.60)
RY$_{it}$(Pre)	-0.012	-2.776	2.311	-1.526	-4.824	1.716
	(0.04)	(3.87)	(1.58)	(3.54)	(5.35)	(3.94)
RY$_{it}$(0)	0.064*	9.385	3.214*	-4.785	4.267	2.944
	(0.04)	(6.30)	(1.61)	(8.00)	(9.63)	(5.31)
RY$_{it}$(Post)	0.042	7.487	3.697	-39.782	-30.607	5.452
	(0.05)	(7.10)	(2.51)	(24.13)	(25.93)	(7.11)
Z_{it} × RY$_{it}$(Pre)	0.058	9.656	3.635	3.764	3.772	-5.949
	(0.10)	(9.12)	(5.98)	(4.94)	(8.42)	(8.07)
Z_{it} × RY$_{it}$(0)	-0.193*	-23.397**	-10.575	-7.726	-23.225**	-2.741
	(0.10)	(11.19)	(6.86)	(7.02)	(8.36)	(10.89)
Z_{it} × RY$_{it}$(Post)	-0.085	-11.832	-6.951	3.019	-2.593	-0.724
	(0.08)	(8.80)	(6.58)	(5.10)	(8.82)	(5.93)
Z_{it}	-0.154**	-11.918**	-25.950***	-6.162**	-3.052	-10.914**
	(0.06)	(5.53)	(5.49)	(2.94)	(5.31)	(4.93)
Observations	9438	9438	9438	9438	9438	9438
R^2	0.46	0.44	0.83	0.47	0.42	0.40

Notes: The table presents reduced form effects on the consumption components of equation (5) for the Stayers sample. It is based on the same regressions as Table 5. The dummy variable Z_{it} takes on the value one if the income fluctuation is -25% or greater in magnitude. Estimates are based on the regression specification in equation (6), extended so that all covariates are interacted with Z_{it}. Standard errors, clustered at the co-op level, in parenthesis. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

L.8.3 Robustness to shock size

Table L.14 reports estimates equivalent to Table 5 for different threshold values for Z_{it}.

L.8.4 Smoothing across states for young and old

Table L.15 reports heterogenous effects of consumption smoothing across states for young and old. All covariates of the regression specification in Table 5 have been interacted with the dummy variable D(Old)$_i$ which is equal to 1 if the household is older than 40 years.

Table L.14: Income fluctuations – robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$\Delta Y \leq -10\%$		$\Delta Y \leq -15\%$		$\Delta Y \leq -20\%$		$\Delta Y \leq -30\%$	
	Cons	dDebt	Cons	dDebt	Cons	dDebt	Cons	dDebt
$Z_{it} \times \text{Private}_i \times \text{RY}_{it}(\text{Pre})$	-6.075	-5.715	2.842	-3.407	-1.054	-2.740	-11.667	-5.101
	(10.85)	(9.88)	(13.71)	(11.58)	(10.99)	(13.97)	(11.74)	(16.74)
$Z_{it} \times \text{Private}_i \times \text{RY}_{it}(0)$	4.569	-14.589	3.069	39.157	15.406	81.975	5.318	65.237
	(14.96)	(56.80)	(16.26)	(40.53)	(17.28)	(48.84)	(20.40)	(45.83)
$Z_{it} \times \text{Private}_i \times \text{RY}_{it}(\text{Post})$	12.092	18.064*	16.415	14.533	24.060	29.539**	27.843	25.436**
	(10.09)	(9.56)	(11.08)	(8.81)	(14.60)	(11.11)	(17.29)	(12.31)
Z_{it}	-15.313**	-1.972	-12.730**	0.141	-14.943**	4.560	-16.452**	5.439
	(4.55)	(4.33)	(4.97)	(6.29)	(5.18)	(6.26)	(5.29)	(6.83)
Observations	12857	12857	12857	12857	12857	12857	12857	12857
R^2	0.43	0.30	0.43	0.30	0.43	0.30	0.43	0.30

Notes: The table presents estimates analogous to Table 5 for alternative definitions of Z_{it} (i.e., alternative threshold values of the magnitude of the income fluctuation ΔY). Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

L.9 Accumulation of net worth

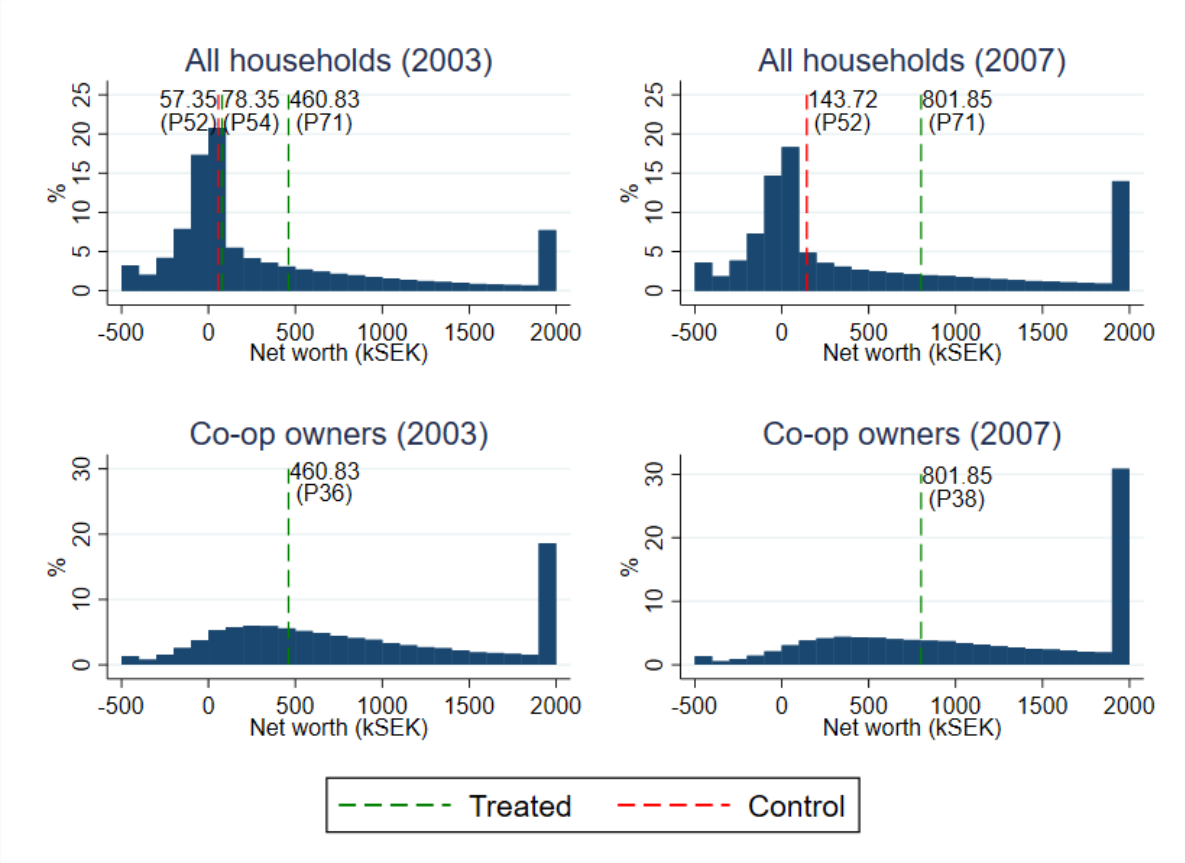
The top left panel of Figure L.3 shows the distribution of households' net worth in Stockholm in 2003. The labels indicate the amount of net worth and the percentile of net worth in the net worth distribution for the control group (P52, red dashed line) and the treatment group (P54) in relative year -1. It also shows the treatment group's position in relative year 0, after privatization (P71, green dashed line). The top right panel shows the distribution of households' net worth in 2007 and the two groups' positions in the 2007 wealth distribution. The bottom panels show the corresponding distributions for households that own co-op shares, i.e., the wealth distribution among homeowners. The green line again indicates the position of the average treated household in the distribution.

Table L.15: Heterogenous responses to income fluctuations depending on age

	(1)	(2)	(3)	(4)	(5)	(6)
	Log cons.	Cons.	Income	dHousing	dDebt	dFin
Z_{it}	-0.007	-6.188	-17.251***	0.400	9.660	-1.840
	(0.05)	(7.63)	(2.95)	(10.75)	(10.76)	(7.50)
$Z_{it} \times D(Old)_i$	-0.282**	-20.117*	-17.317**	13.177	-7.132	-17.460*
	(0.09)	(10.35)	(7.75)	(13.11)	(12.79)	(9.75)
Priv.$_i \times$ RY$_{it}$(0)	0.218	22.732	-2.193	66.788	116.877**	25.070
$\times Z_{it}$	(0.18)	(23.27)	(12.69)	(46.40)	(52.18)	(19.68)
Priv.$_i \times$ RY$_{it}$(Post)	0.188	41.559	-8.037	-8.674	41.474**	0.436
$\times Z_{it}$	(0.16)	(27.00)	(9.63)	(37.66)	(16.79)	(22.99)
Priv.$_i \times$ RY$_{it}$(0)	-0.127	-1.426	9.635	-103.575	-135.669**	-20.899
$\times Z_{it} \times D(Old)_i$	(0.28)	(37.04)	(20.56)	(73.70)	(62.05)	(21.99)
Priv.$_i \times$ RY$_{it}$(Post)	-0.025	-25.652	7.290	7.822	-23.065	2.115
$\times Z_{it} \times D(Old)_i$	(0.17)	(29.38)	(13.69)	(59.49)	(30.46)	(35.30)
Observations	12857	12857	12857	12857	12857	12857
R^2	0.46	0.43	0.82	0.28	0.31	0.31

Notes: The table presents estimates analogous to Table 5 but extended to include interactions with a dummy variable, $D(Old)_i$, that indicates age above age 40 in relative year -1. The variable Z_{it} is one if the income fluctuation is -25 percent or greater in magnitude. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Figure L.3: Positions in the net worth distribution



Notes: The figure shows the distribution of net worth of all households in the municipality of Stockholm in 2003 and 2007 and the distribution of net worth of co-op owners in the municipality of Stockholm in 2003 and 2007. Green vertical lines indicate average net worth of treated households. Red vertical lines indicate the average net worth in the control group. The vertical lines in 2003 refer to relative year -1 and relative year 0. The vertical lines in 2007 refer to relative year 4. The sample includes households whose heads are between 25 and 65 years old. All values in SEK 1,000 per adult equivalent.

L.9.1 Wealth Counterfactuals

This section uses the estimated balance sheet and cash flow response coefficients to answer the question what the wealth-building effect of homeownership would have been had house price appreciation (HPA) been different from the observed one in our sample. It also explores the effect of different mortgage rates. These counterfactuals quantify the sensitivity of the wealth building effect in a way that is consistent with dynamic budget constraints. The exercise assumes that the average propensity to consume out of wealth gains is invariant to the HPA (mortgage rate). As the difference between the observed and the hypothetical HPA (mortgage rate) grows, this assumption becomes stronger.

Baseline We take an average treated household whose housing wealth in market value terms (P_0) increases by 662.9 kSEK (T-C) from 20.4 to 683.3 kSEK in RY(0). Over the next four years, her housing wealth grows by a further 187.6 kSEK (T-C in post period) to 870.6 kSEK. Given that the active annual change in housing wealth in the post period is $dHouse = -31.28$ (T-C from Table 2), we back out the annual HPA that is necessary to grow housing wealth from 683.3 to 870.8 over four years after accounting for $dHouse = -31.28$ each year. The implied HPA is 10.45% per year.

With this HPA, we can compute four-year cumulative HPA $r_{0,4} = (1 + HPA)^4$ and $\tau(P_0 - P_0^-) + P_0 r_{0,4}$, using the average landlord discount $\tau = 0.54$ reported in Table 1, where P_0^- is the value of pre-treatment housing wealth, $(P_0 - P_0^-) = 662.9$, and $P_0 = 683.3$. This number is 691.7 kSEk for the average treated household, consisting of 356.0 in landlord discount (51% share) and 335.7 kSEK in subsequent capital gains (49% share). The annual consumption response in the post period of 29.68 kSEK (dC from Table 2) implies a $MPC = 0.0429 = 29.68/691.7$, meaning 4.29 cents per dollar per year.

Debt increases by 303.8 kSEk (T-C estimate) in RY(0) and then falls to 252.4 kSEK (T-C) above the pre-treatment level by RY(4). This implies that the debt of treated households goes up from 91.6 in the year before treatment to 395.4 kSEk in RY(0) before falling back to 344.0 in RY(4). We set the mortgage rate equal to $RMORT = 5\%$, a good assumption for our sample period. We can then back out the annual mortgage paydown rate that reduces the mortgage balance of the treated households from 395.4 kSEK to 344.0 kSEK over four years, considering the mortgage interest rate and the active change in debt is $dDebt = -0.603$ each year in the post period (from Table 2). The implied paydown rate is $AMOR = 8.26\%$ per year. It captures the total mortgage paydown rate, including both interest payment (5%) and principal reduction (3.26%).

Financial wealth of the treated falls from 84.6 in RY(-1) to 76.7 kSEK in RY(0) (-7.9 is the estimated T-C coefficient) and then rises to 101.8 by RY(4) (based on T-C estimate). Given that the active financial savings are $dFin = 1.821$ each year in the post period (from Table 2), this evolution of the financial wealth implies an annual return on financial wealth of $RFIN = 5.2\%$ per year.

Computing net worth or wealth as housing wealth plus financial wealth minus debt, net worth

is 13.3 kSEk in RY(-1), 364.5 in RY(0), and 628.6 in RY(4). The increase between RY(0) and RY(4) is 264.1 kSEK. This is the increase in net worth that forms the baseline for comparison in the counterfactual scenarios.

Counterfactual 1: Zero HPA We are now ready to assess the impact of different rates of HPA. In this exercise, we hold $(MPC, AMORT, RFIN, RMORT)$ fixed. A different HPA impacts the evolution of housing wealth from RY(0) to RY(4). It does not change the fact that the treated households already received the initial wealth shock in RY0 (landlord discount of 356 kSEK). When HPA=0, then that is the only wealth increase. The annual consumption response out of this wealth increase is 15.36 ($= 0.0429 \times 356.0$). This implies that households maintain 91.7% of their baseline consumption (157.86 kSEK versus 172.18 kSEK) in the counterfactual. Since households spend 14.32 kSEK less each year compared to the baseline (29.68-15.36), they must be saving more by the same amount in order to satisfy the budget constraint in the counterfactual. We assume that their savings are in the form of additional debt pay-down to the tune of 14.32 kSEK each year. The active change in debt is now $dDebt = -0.603 - 14.32 = -14.92$. The faster debt paydown results in a change in debt between RY(0) and RY(4) that is -105.9 kSEK in the counterfactual versus -51.4 kSEK in the baseline, a difference of 54.5 kSEK. Because the active change in housing wealth is $dHouse = -31.28$ and HPA is zero, the change in housing wealth between RY(0) and RY(4) is -125.1 kSEK in the counterfactual compared to +187.6 kSEK in the baseline. The change in net worth between RY(0) and RY(4) is -19.2 kSEK in the counterfactual compared to +264.1 kSEK in the baseline. The difference-in-difference is 283.3 kSEk. This number is smaller than the 333.7 kSEK in capital gains we eliminated in this counterfactual relative to the baseline.

Counterfactual 2: 5% HPA In the second counterfactual exercise, we set HPA=5%, again holding $(MPC, AMORT, RFIN, RMORT)$ fixed at their baseline values. The initial landlord discount remains 356 kSEK but the subsequent capital gain is now 149.2 kSEk. This capital gain is enough to offset the active selling of housing wealth by the treatment group, so that housing wealth rises modestly (+12.4 kSEK). The annual consumption response out of the landlord discount plus the house price appreciation is 21.68 ($= 0.0429 \times 505.2$). Households maintain 95.4% of their baseline consumption. Since households spend 8.00 kSEK less each year compared to the baseline (29.68-21.68), the active debt change becomes $dDebt = -0.603 - 8.00 = -8.60$. The faster debt paydown results in a change in debt between RY(0) and RY(4) that is -81.9 kSEK in the counterfactual versus -51.4 kSEK in the baseline, a difference of 30.4 kSEK. Housing wealth changes between RY(0) and RY(4) by +12.4 kSEK in the counterfactual compared to +187.6 kSEK in the baseline. The change in net worth between RY(0) and RY(4) is 94.3 kSEK in the counterfactual compared to +264.1 in the baseline. The difference-in-difference is 169.8 kSEk. This is smaller than the 186.5 kSEK in capital gains we eliminated in this counterfactual relative to the baseline.

Counterfactual 3: 7% mortgage rate In the third counterfactual exercise, we set the mortgage rate $RMORT = 7\%$ compared to 5% in the baseline, while holding $(MPC, AMORT, RFIN, HPA)$ fixed at their baseline values. The consumption response is the same as in the baseline ($29.68 = 0.0429 \times 691.7$). The higher mortgage rate results in slower debt paydown and a larger outstanding mortgage balance at the end of RY(4). The change in debt between RY(0) and RY(4) is -21.9 kSEK in the counterfactual versus -51.4 kSEK in the baseline, a difference of 29.5 kSEK. The change in net worth between RY(0) and RY(4) is +209.5 kSEK in the counterfactual compared to +264.1 in the baseline. The difference-in-difference is 54.6 kSEk. The alternative assumption that is also consistent with the budget constraint, which is to reduce consumption each period by the additional debt service, would result in a very similar change in net worth between RY(0) and RY(4).

L.10 Mobility

L.10.1 Moving probabilities for households in Stockholm

Table L.16 reports estimates from the following OLS regression for the muncipalities of Stockholm and Nacka where the Stopplag sample is located:

$$Move_{it} = \beta_0 + \beta_1 D(\text{Old})_i + \beta_2 D(\text{Own})_i + \beta_3 D(\text{Old})_i \times D(\text{Own})_i + \varepsilon_{it} \tag{70}$$

where $Move_{it}$ is an indicator variable that is equal to 1 if the household undertakes a specific kind of move, $D(\text{Old})_i$ is equal to 1 if the oldest household member is 40 years or more, and $D(\text{Own})_i$ is equal to 1 if the household owns an apartment or a single-family house.

L.10.2 Additional moving outcomes in our sample

The last two columns of Table L.10, with outcome variables Move and Move up, report all coefficient estimates corresponding to the last two columns of Table 4.

Table L.17 reports additional mobility outcomes, starting with the two main outcome variables from the main text, Move and Move up.

Table L.16: Mobility in Stockholm (1999–2007)

	(1)	(2)	(3)	(4)
	Move*	Move	Move up*	Move up
$D(\text{Old})_i$	-0.069***	-0.047***	-0.024***	-0.016***
	(0.00)	(0.00)	(0.00)	(0.00)
$D(\text{Own})_i$	0.010***	0.006***	0.004***	0.003***
	(0.00)	(0.00)	(0.00)	(0.00)
$D(\text{Old})_i \times D(\text{Own})_i$	-0.027***	-0.017***	-0.009***	-0.006***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.127***	0.091***	0.040***	0.028***
	(0.00)	(0.00)	(0.00)	(0.00)
Observations	3585368	3585368	3585368	3585368
R^2	0.02	0.01	0.01	0.00

Notes: The table presents OLS estimates based on regression equation (70) for every household that resides in the Stockholm and Nacka municipalities (1999–2007). Move* is equal to 1 if all household members change official address during the year, and 0 otherwise. Move is equal to 1 the first time all household members change official address, and 0 otherwise. Move up* is equal to 1 if all household members move to a parish where households' housing wealth on average is greater, and 0 otherwise. Move up is equal to 1 the first time all household members move to a parish where households' housing wealth on average is greater, and 0 otherwise. $D(\text{Old})_i$ is equal to 1 if the oldest household member is 40 years or older. $D(\text{Own})_i$ is equal to 1 if the household owns an apartment or a single-family house. Standard errors, clustered at the household level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Table L.17: Mobility for young and old

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Move	Move up (parish)	Move all HH	Move up Y (muni)	Move up Y (parish)	Move up (muni)	First move (owner)	First move (renter)
Priv.$_i$ × RY$_{it}$(Pre)	0.016	-0.004	0.025	-0.001	-0.005	-0.002	0.006	0.010
	(0.01)	(0.01)	(0.03)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Priv.$_i$ × RY$_{it}$(0)	-0.030	-0.023**	-0.019	-0.015**	-0.027**	-0.010*	-0.009	-0.021
	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Priv.$_i$ × RY$_{it}$(Post)	0.047**	0.044***	0.041	0.024**	0.039**	0.021**	0.064***	-0.017
	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Priv.$_i$ × RY$_{it}$(Pre)	-0.021	0.006	-0.029	0.002	0.008	0.003*	-0.007	-0.014
D(Old)$_i$	(0.01)	(0.01)	(0.04)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Priv.$_i$ × RY$_{it}$(0)	-0.001	0.022**	-0.001	0.014**	0.026**	0.009*	0.013	-0.014
D(Old)$_i$	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Priv.$_i$ × RY$_{it}$(Post)	-0.046**	-0.037**	-0.031	-0.022**	-0.033**	-0.019**	-0.050***	0.005
D(Old)$_i$	(0.02)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Observations	12857	12857	12857	12857	12857	12857	12857	12857
R^2	0.1585	0.1671	0.2066	0.1756	0.1687	0.1788	0.1672	0.1526
PreTreat_Mean	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00
F_TR0_B0_B2	0.00	0.95	0.13	0.2	0.93	0.21	0.34	0.00
F_TPost_B0_B2	0.92	0.11	0.49	0.33	0.16	0.25	0.02	0.15

Notes: The table presents reduced form effects on mobility for young and old households. All terms of regression equation (7) have been interacted with a dummy variable, D(Old)$_i$, that indicates whether the household head is older than 40. The average age conditional on being younger than the cut-off value is 33 years. The average age conditional on being older than the cut-off value is 51 years. The variable Move is equal to 1 in the year that household moves out from the original apartment. Move up (muni) and Move up (parish) is a dummy variable equal to 1 if the household moves out of the original apartment and if the move involves a move to a neighborhood, defined as municipality or parish, with higher average disposable income. The variable Move all HH is a dummy variable equal to 1 in every year when the household moves. Move up (muni) is a dummy variable equal to 1 if the household moves out of the original apartment and if the move involves a move to a munipality with higher average housing wealth per household. Move up Y is a dummy variable equal to 1 if the household moves out of the original apartment and if the move involves a move to a munipality or parish with higher average disposable income per household. First move (owner) is a dummy variable equal to 1 if the household moves out from the original apartment and if it at the end of that year continues to be an owner of an apartment or single-family house (i.e., Move$_i$ × D(Own)$_i$). First move (renter) is dummy variable equal to 1 if the household moves out from the original apartment and if it at the end of that year does not own an apartment or single-family house (i.e., Move$_i$ × $(1 - \text{D(Own)}_i)$). Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

L.11 Stayer versus Mover results

Table L.18 reports all coefficient estimates corresponding to Table 6.

Table L.18: Heterogenous Treatment Effects for Stayers and Movers (corresponding to Table 6)

	(1) Log cons.	(2) Cons.	(3) Income	(4) dHouse	(5) dDebt	(6) dFin
RY_{it}(Pre)	-0.031	-6.187*	2.208	-5.156	-8.585	4.889
	(0.03)	(3.47)	(2.03)	(5.72)	(5.43)	(4.61)
RY_{it}(0)	0.028	3.010	0.652	2.601	5.895	1.000
	(0.03)	(5.46)	(1.50)	(5.93)	(8.12)	(4.19)
RY_{it}(Post)	0.001	3.521	1.936	-17.990	-15.200	1.290
	(0.05)	(9.49)	(2.39)	(22.14)	(21.68)	(6.08)
Priv.$_i$ × RY_{it}(Pre)	0.029	4.494	-1.160	-5.668	-1.854	-1.855
	(0.04)	(4.48)	(2.67)	(3.61)	(5.56)	(3.99)
Priv.$_i$ × RY_{it}(0)	0.069*	13.909**	1.698	327.804***	325.017***	-15.004**
	(0.04)	(4.85)	(1.95)	(59.65)	(63.23)	(4.44)
Priv.$_i$ × RY_{it}(Post)	0.144**	18.363**	4.788	-2.173	3.417	-7.953**
	(0.04)	(5.18)	(3.12)	(4.32)	(4.74)	(2.91)
Priv.$_i$ × RY_{it}(Pre)	0.073	-2.291	1.161	-3.549	-4.468	2.139
×D(MoveRent)$_i$	(0.10)	(10.09)	(5.78)	(10.72)	(8.73)	(15.61)
Priv.$_i$ × RY_{it}(0)	0.057	-0.721	-3.880	25.991	40.683	11.388
×D(MoveRent)$_i$	(0.06)	(6.69)	(4.59)	(77.15)	(75.41)	(11.31)
Priv.$_i$ × RY_{it}(Post)	0.019	18.813	-30.628**	-182.497***	-70.927**	62.167**
×D(MoveRent)$_i$	(0.09)	(12.31)	(9.12)	(48.84)	(27.36)	(21.02)
Priv.$_i$ × RY_{it}(Pre)	-0.042	-12.038	0.175	16.900	15.957	11.308
×D(MoveOwn)$_i$	(0.10)	(11.47)	(6.64)	(18.52)	(14.21)	(17.47)
Priv.$_i$ × RY_{it}(0)	-0.058	-9.532	8.708**	-72.717	-70.848	20.100
×D(MoveOwn)$_i$	(0.11)	(15.92)	(4.08)	(73.29)	(67.21)	(16.51)
Priv.$_i$ × RY_{it}(Post)	0.184**	41.868**	-1.019	-78.582**	-17.143	18.529
×D(MoveOwn)$_i$	(0.09)	(14.65)	(6.30)	(29.41)	(23.98)	(12.56)
PreTreat_Mean	4.78	142.49	157.03	-1.18	4.61	20.26
PreTreat_SD	0.64	88.63	75.44	52.99	60.84	69.00
Observations	12857	12857	12857	12857	12857	12857
R^2	0.45	0.43	0.81	0.29	0.32	0.31

Notes: The table presents all coefficient estimates of Table 6. Year and household fixed effects are included but not reported. The variable D(MoveRent)$_i$ is equal to 1 in the year that household moves out from the original apartment. The variable D(MoveOwn)$_i$ is consistent with the definition of homeownership, i.e. the variable is equal to 1 if the household owns an apartment or single-family house at the end of the year. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Table L.19 reports a specification with a simple Stayer/Mover split, where we also include the indicator variable D(Move)$_i$ interacted with the relative year effects and Priv.$_i$, so that stayers in the treatment group can be compared to stayers in the control group, and similarly for movers. Columns (7) and (8) correspond to columns (3) and (4) in Table 7.

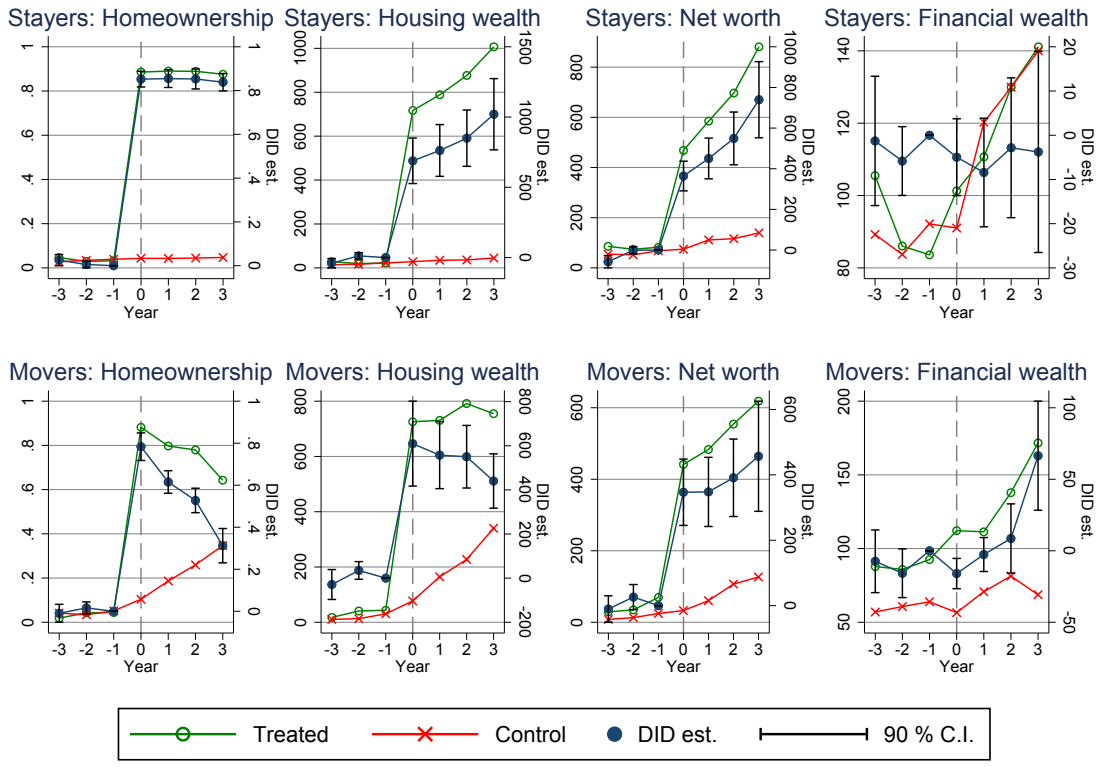
Figure L.4 reports the raw data on stayers' and movers' balance sheet items as well as the dynamic difference-in-difference estimates.

Table L.19: Cash-flows and Portfolio Choice for Stayers and Movers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash-flows						Portfolio choice	
	Log cons.	Cons.	Income	dHousing	dDebt	dFin	RS (uncond.)	RS (cond.)
Priv.$_i$ × RY$_{it}$(Pre)	0.008	0.786	-1.942	-5.410	-2.624	0.037	0.004	0.009
	(0.04)	(4.53)	(2.72)	(3.83)	(5.78)	(4.22)	(0.01)	(0.02)
Priv.$_i$ × RY$_{it}$(0)	0.056	10.408*	0.376	327.257***	323.104***	-14.190**	0.012	0.015
	(0.04)	(5.77)	(2.18)	(59.43)	(63.19)	(4.39)	(0.01)	(0.02)
Priv.$_i$ × RY$_{it}$(Post)	0.125**	16.924**	3.732	0.145	5.758	-7.538**	0.037**	0.051**
	(0.04)	(5.34)	(3.25)	(3.96)	(4.72)	(3.06)	(0.01)	(0.02)
RY$_{it}$(Pre)	-0.009	-2.031	2.291	-1.373	-4.547	1.081	-0.012	-0.019
	(0.04)	(3.57)	(1.88)	(3.77)	(5.60)	(3.71)	(0.01)	(0.02)
RY$_{it}$(0)	0.049	7.459	2.819	-5.518	1.942	2.877	0.004	0.002
	(0.04)	(5.71)	(1.83)	(8.40)	(9.82)	(5.06)	(0.01)	(0.02)
RY$_{it}$(Post)	0.040	6.841	3.796	-39.555	-31.148	5.430	0.000	-0.019
	(0.05)	(7.25)	(2.87)	(24.42)	(26.32)	(7.05)	(0.02)	(0.03)
Priv.$_i$ × RY$_{it}$(Pre)	0.085	5.888	2.402	1.599	3.490	-1.682	0.011	0.018
×D(Move)$_i$	(0.07)	(8.75)	(4.82)	(11.81)	(11.44)	(12.61)	(0.02)	(0.03)
Priv.$_i$ × RY$_{it}$(0)	0.065	13.118	7.455*	-23.119	-6.963	10.429	-0.008	0.005
×D(Move)$_i$	(0.09)	(11.32)	(4.14)	(58.68)	(57.45)	(10.57)	(0.02)	(0.03)
Priv.$_i$ × RY$_{it}$(Post)	0.196**	40.553***	-9.047	-103.804**	-24.705	29.470*	-0.055**	-0.081**
×D(Move)$_i$	(0.07)	(9.92)	(5.90)	(34.09)	(21.18)	(15.01)	(0.02)	(0.03)
D(Move)$_i$ × RY$_{it}$(Pre)	-0.094	-17.887	0.356	-18.902	-18.796	18.280	-0.014	-0.013
	(0.06)	(11.36)	(6.63)	(22.58)	(17.50)	(14.07)	(0.02)	(0.02)
D(Move)$_i$ × RY$_{it}$(0)	-0.100	-20.792	-8.728	39.093*	18.298	-8.707	-0.013	-0.039
	(0.07)	(12.94)	(5.22)	(22.78)	(20.58)	(13.40)	(0.02)	(0.03)
D(Move)$_i$ × RY$_{it}$(Post)	-0.173*	-16.809	-8.538	89.191	63.761	-17.096	0.000	-0.016
	(0.09)	(19.33)	(6.56)	(59.42)	(52.32)	(24.64)	(0.03)	(0.04)
Observations	12857	12857	12857	12857	12857	12857	12857	7232
R^2	0.4502	0.4302	0.8044	0.2779	0.3045	0.3077	0.7590	0.6506

Notes: The table presents reduced form effects on cash-flows and portfolio choice for stayers and movers. The regression corresponds to equation (7) where $D_i = \text{D(Move)}_i$, which indicates whether the household is moving in the post years. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Figure L.4: Effects on Homeownership and Balance Sheets for Stayers and Movers



Notes: The top panels depicts the effects on balance sheets for stayers in the treatment and control groups (left vertical axes) and difference-in-difference estimates for them (right vertical axes). The difference-in-difference estimates are based on the regression specification in equation (6). The bottom panels shows the corresponding statistics for movers in the treatment and control groups. All values are in SEK 1,000 and scaled by adult equivalents. Confidence intervals are based on clustering at the co-op level.

L.12 Balance sheets and portfolio choice

Table L.20 reports estimated effects on balance sheet items and portfolio choice based on equation (7) (i.e., corresponding to Table 2).

Table L.20: Balance Sheet Variables and Portfolio Choice

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Balance sheets						Portfolio choice	
	Own	Housing w.	Debt	Fin. w.	Net w.	Buffer	RS (uncond.)	RS (cond.)
Priv.$_i$ × RY$_{it}$(Pre)	0.007	–16.842	–4.345	–5.496	–22.900**	–15.538**	0.007	0.014
	(0.01)	(17.70)	(9.95)	(4.62)	(10.96)	(7.02)	(0.01)	(0.02)
Priv.$_i$ × RY$_{it}$(0)	0.831***	659.263***	303.233***	–8.079**	353.851***	235.182***	0.010	0.017
	(0.02)	(90.55)	(59.69)	(3.76)	(41.10)	(23.22)	(0.01)	(0.01)
Priv.$_i$ × RY$_{it}$(Post)	0.735***	780.179***	270.353***	5.539	540.461***	338.257***	0.021*	0.027
	(0.02)	(104.91)	(47.25)	(8.59)	(74.01)	(32.51)	(0.01)	(0.02)
PreTreat_Mean	0.03	20.36	91.63	84.61	54.69	398.02	0.23	0.39
PreTreat_SD	0.18	165.86	172.62	222.94	326.13	340.15	0.29	0.29
Observations	12857	12857	12857	12857	12857	12857	12857	7232
R^2	0.81	0.74	0.69	0.89	0.84	0.87	0.76	0.65

Notes: The table presents reduced form estimates based on the regression specification in equation (6). Outcomes are balance sheet items and portfolio choice. All values are in SEK 1,000 and scaled by adult equivalents. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Table L.21 reports estimated effects on balance sheet items for young and old households. The regression specification corresponds to columns (1) and (2) of Table 7. Table L.22 reports estimated effects on balance sheet items for stayers and movers. The regression specification corresponds to columns (3) and (4) of Table 7.

Table L.21: Balance sheets for young and old

	(1)	(2)	(3)	(4)	(5)	(6)
	Own	Housing w.	Debt	Fin. w.	Buffer	Home equity
Priv.$_i$ × RY$_{it}$(Pre)	0.000	-7.460	-1.879	-4.395	-2.647	-5.580
	(0.01)	(13.43)	(13.12)	(6.15)	(14.29)	(10.58)
Priv.$_i$ × RY$_{it}$(0)	0.781***	551.854***	243.893***	-0.709	210.419***	307.960***
	(0.03)	(75.96)	(48.47)	(5.44)	(26.79)	(35.17)
Priv.$_i$ × RY$_{it}$(Post)	0.657***	651.331***	232.640***	1.539	264.288***	418.691***
	(0.03)	(103.21)	(44.28)	(8.47)	(38.41)	(63.91)
Priv.$_i$ × RY$_{it}$(Pre)	0.016	-10.842	-1.193	-3.139	-24.175	-9.649
×D(Old)$_i$	(0.01)	(30.24)	(20.19)	(10.99)	(18.65)	(20.69)
Priv.$_i$ × RY$_{it}$(0)	0.093**	192.958**	110.143**	-13.843	40.034*	82.816**
×D(Old)$_i$	(0.04)	(78.96)	(51.45)	(10.29)	(20.37)	(31.95)
Priv.$_i$ × RY$_{it}$(Post)	0.144**	232.110**	74.688**	4.946	124.070**	157.422***
×D(Old)$_i$	(0.04)	(68.38)	(36.62)	(11.43)	(39.94)	(43.67)
Observations	12857	12857	12857	12857	12857	12857
R^2	0.8120	0.7443	0.6935	0.8944	0.8718	0.7246

Notes: The table presents reduced form effects on mobility for young and old households. The regression corresponds to equation (7) where $D = \text{D(Old)}_i$, which indicates whether the household is older than median in relative year -1. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

Table L.22: Balance Sheets for Stayers and Movers

	(1)	(2)	(3)	(4)	(5)
	Own	Housing w.	Debt	Fin. w.	Buffer
Priv.$_i$ × RY$_{it}$(Pre)	0.016	-16.053	4.213	-3.354	-20.621**
	(0.01)	(16.65)	(8.96)	(6.25)	(8.10)
Priv.$_i$ × RY$_{it}$(0)	0.852***	682.916***	316.457***	-4.969	244.117***
	(0.02)	(94.00)	(58.86)	(5.19)	(24.88)
Priv.$_i$ × RY$_{it}$(Post)	0.847***	893.999***	304.913***	-4.794	384.887***
	(0.02)	(128.17)	(59.62)	(9.73)	(40.95)
Priv.$_i$ × RY$_{it}$(Pre)	-0.015	15.442	-22.778	-7.937	26.575
D(Move)$_i$	(0.02)	(21.30)	(18.12)	(14.48)	(18.44)
Priv.$_i$ × RY$_{it}$(0)	-0.069	-74.969	-47.213	-11.085	-22.891
D(Move)$_i$	(0.04)	(91.80)	(58.13)	(9.17)	(24.74)
Priv.$_i$ × RY$_{it}$(Post)	-0.389***	-393.672***	-133.503**	35.427**	-146.860***
D(Move)$_i$	(0.04)	(95.20)	(63.10)	(14.66)	(35.61)
Observations	12857	12857	12857	12857	12857
R^2	0.8206	0.7494	0.6990	0.8943	0.8719

Notes: The table presents reduced form effects on balance sheets for stayers and movers. The regression corresponds to equation (7) where D_i = D(Move)$_i$, which indicates whether the household is moving in the post years. Standard errors, clustered at the co-op level, in parentheses. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.

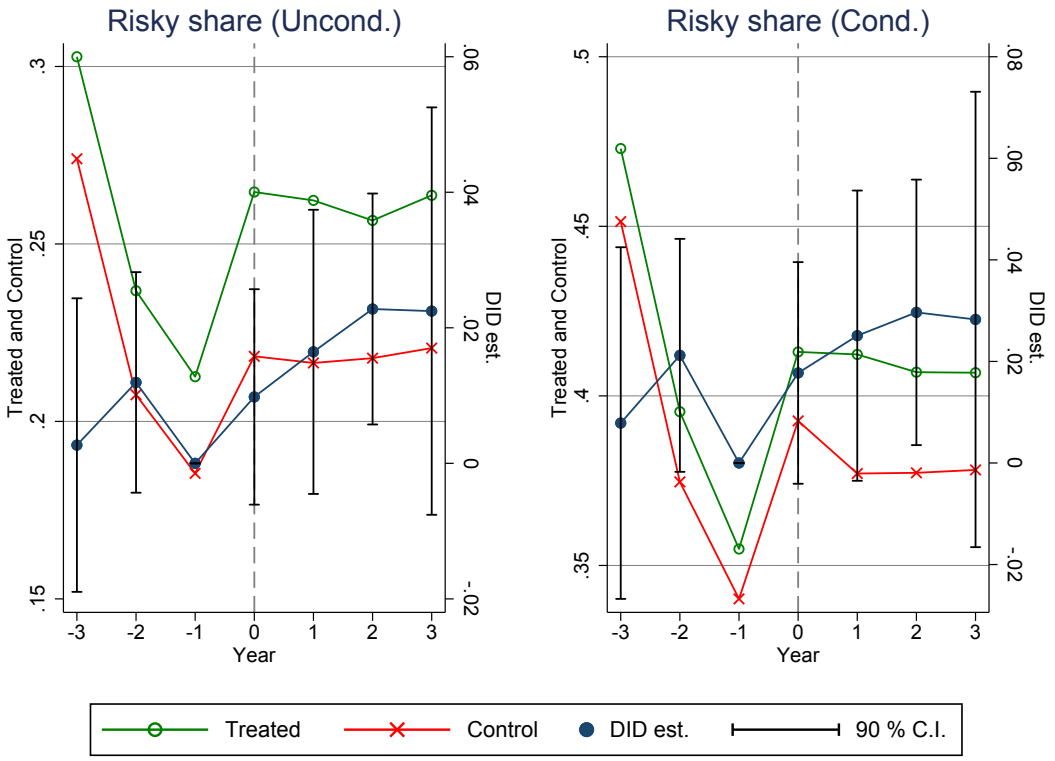
Figure L.5 reports the raw data on the risky share for treated and control households as well as the dynamic difference-in-difference estimates.

L.13 Tax-deductible home improvements and renovations

In the household registry-based data we have two measures of home improvements and renovations. First, households that sell are taxed on their realized capital gains. Home improvements in the last five years are deductible (on tax form K6). We therefore observe home improvements for each household that sell up until 2007. Second, Sweden introduced subsidies for households that hire craftsmen such as carpenters and painters for maintenance and renovation of homes. The labor cost of craftsmen was subsidized by 50 percent up to SEK 5,000.[70] The program was called ROT and was in place between April 15 2004 and June 30 2005. Table L.23 reports reduced form effects for these outcome variables. The responses on theses variables are small relative to the overall consumption response reported in Table 2. In the Fixed sample, the average effect on ROT is 0.0461 kSEK, or 46 SEK per household and year. This can be contrasted to the 29.68 kSEK which is our estimated response on total consumption in the post years. Even if we were to adjust for the limited duration of the ROT program (15 months), the conclusion would still be that the expense on craftsmen upon treatment is small relative to the total consumption response. Tax deductible home improvments is concentrated to the sample movers (column (5)). In this group, home improvements amount to 2.47 kSEK per year in the post years. Again, this amount, less than ten percent, relative to the total consumption.

[70] Source: https://sv.wikipedia.org/wiki/Rot-programmet

Figure L.5: Effects on Portfolio Choice



Notes: The figure depicts the effects on the unconditional and conditional risky share for the treatment and control groups (left vertical axes) and difference-in-difference estimates (right vertical axes). The difference-in-difference estimates are based on the regression specification in equation (6). Confidence intervals are based on clustering at the co-op level.

Table L.23: Renovations and home improvements

	(1)	(2)	(3)	(4)	(5)
	Fixed sample		Stayers	Movers	
	ROT	K6	ROT	ROT	K6
Priv.$_i$ × RY$_{it}$(Pre)	-0.001	-0.016	-0.002	-0.002	-0.402*
	(0.00)	(0.33)	(0.00)	(0.00)	(0.20)
Priv.$_i$ × RY$_{it}$(0)	0.002	-2.224	0.001	0.003	4.012***
	(0.01)	(3.75)	(0.01)	(0.01)	(0.86)
Priv.$_i$ × RY$_{it}$(Post)	0.046**	0.291	0.034**	0.070**	2.474**
	(0.02)	(0.72)	(0.02)	(0.03)	(0.70)
Observations	12857	12857	9438	3419	3419
R^2	0.16	0.20	0.14	0.17	0.48

Notes: The table presents reduced form effects for subsidies for craftsmen (ROT) and costs for home improvments in the last five years which are tax deductible upon a sale of the apartment (tax form K6). All values are in SEK 1,000 and scaled by adult equivalents. Standard errors, clustered at the co-op level, in parenthesis. $* = p < 0.10$, $** = p < 0.05$, $*** = p < 0.01$.