RESEARCH REPORT

Affordable Homeownership

An Evaluation of Shared Equity Programs

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March 2017

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ABOUT THE SOCIAL INNOVATION FUND

This report is based upon work supported by the Social Innovation Fund (SIF) which unites public and private resources to evaluate and grow innovative community-based solutions with evidence of results. The Social Innovation Fund is a program of the Corporation for National and Community Service, a federal agency that engages millions of Americans in service through its AmeriCorps, Senior Corps, Social Innovation Fund, and Volunteer Generation Fund programs, and leads the President's national call to service initiative, United We Serve.

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Acknowledgments

This report was funded by Capital Impact Partners, with support from the Social Innovation Fund, the Ford Foundation, and the Annie E. Casey Foundation. We are grateful to them and to all our funders, who make it possible for Urban to advance its mission.

The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute's funding principles is available at www.urban.org/support.

This report was supported and managed by Grounded Solutions Network. We thank the Grounded Solutions staff who contributed to the development of this report by providing feedback, expertise, and research support: Tiffany Eng, Elizabeth Haney, Jenee Kresge Gaynor, Hong Ly, Rachel Silver, and Emily Thaden. We also thank Thane Maxwell and Rick Jacobus, independent consultants. A tremendous thank you to the staff and applicants at the shared equity programs for their support of the evaluation. And finally, thanks to Ellen Seidman and Douglas Wissoker for serving as technical reviewers for this report.

We also add a special mention to Ken Temkin, a coauthor on the baseline report for this study, and esteemed colleague who contributed substantively to this research and will be greatly missed.

Executive Summary

Owning a home has long been a meaningful milestone in many Americans' lives. Yet, because home prices continue to rise during the current economic recovery and since lending standards remain tight by historical standards, many renters view homeownership as an unattainable goal. Shared equity is a homeownership model that allows income-eligible families to purchase homes at below-market prices. In return for the subsidized purchase price, the owner's potential capital gains from home resale are restricted.

With the support of the Social Innovation Fund and the Ford Foundation, Capital Impact established the Cornerstone Homeownership Innovation Partnership (CHIP) in 2011. CHIP identifies and supports a set of leading nonprofit stewards of long-term affordable homeownership units, and helps build the evidence base around shared equity. Capital Impact commissioned the Urban Institute to evaluate housing outcomes for buyers under CHIP.

To date, there has been little empirical research on shared equity homeownership that evaluates results for homeowners. This study helps bridge this gap by examining the CHIP grantees, allowing us to explore what types of households they enable to buy homes, as well as financial and neighborhood outcomes.

Study Design and Program Applicants

In this study, we evaluated 9 shared equity programs made up of 683 people who applied to the programs and consented to participate in the research between June 2012 and June 2014. The programs are located in Austin, Texas; the Bay Area in California; Burlington, Vermont; Long Island, New York; Nashville, Tennessee; Park City, Utah; Seattle, Washington; South Florida (Broward and Palm Beach Counties); and Washington, DC. From intake application data, we learned that applicants share the following characteristics:

- An overwhelming share of applicants (96 percent) were not homeowners at the time of application, a requirement for many programs.
- Half of applicants had a bachelor's degree and roughly one-fifth had an associate's degree. These education levels were higher than for the overall US population.

- However, applicants had incomes that were on average 51 percent of their area's median family incomes—far lower than for many homeownership supports, which often target families at or above 80 percent of area incomes. Nearly half of all applicants were housing cost burdened, defined as spending more than 30 percent of their income on housing and utility expenses.
- Applicants had little net worth at the median, $712, but their credit scores were "good," with a median of 696.

Shared Equity Home Purchases

Many applicants in this study's sample purchased a shared equity home (36 percent). Some applicants who did not purchase through shared equity also purchased homes; about one-third of applicants who did not purchase a shared equity home (and 20 percent of all applicants) opted to purchase a home without participating in a CHIP program. The remaining 44 percent of applicants did not purchase a home during the study period.

At baseline, applicants who purchased a shared equity home during the study looked comparable to "other" purchasers who bought apart from the programs. Shared equity purchasers tended to be better off financially at baseline than those who did not purchase a home, however. For example, they were less likely to have nonmortgage delinquencies, accounts in collections, or past foreclosures. Their credit scores were higher and they had roughly twice as much saved for a home purchase.

Those who bought a home through a shared equity program received, relative to the unsubsidized market price of their home, on average the equivalent of 39 percent of its value in subsidies. The average unrestricted market value of purchased shared equity homes was roughly $241,000, with over $94,000 in subsidy. Borrowers contributed down payments worth an average of roughly $11,000 (5 percent of the unrestricted market value) and the remaining balance was financed by buyers (on average, approximately $138,000 and 57 percent of the unrestricted market value).

Shared Equity Buyer Outcomes

Using credit bureau data, we compared applicants who purchased a shared equity home with applicants who did not purchase a shared equity home. We also compared applicants who purchased a shared

equity home with the subset of applicants who purchased "other" non–shared equity homes. We made these comparisons at two different times: before the potential buyer applied to the program (June 2012 or June 2013) and at follow-up (June 2016). Finally, we also compared outcomes between shared equity buyers and a comparison group of nonapplicants who purchased a home during the study period, also using credit bureau data.

We found that shared purchasers had smaller mortgages than other applicant purchasers and that they had lower monthly payments on all credit accounts. There were no other differences in nonmortgage, mortgage, or neighborhood outcomes when comparing shared equity buyers to other applicants, or the subset of other applicants that purchased homes outside of the shared equity programs. When comparing shared equity purchasers to nonapplicant purchasers with similar observable characteristics, we again found that shared equity purchasers had smaller mortgages and had smaller monthly payments on all credit accounts. We also saw that they were less likely to have home equity lines of credit, and had higher accounts in collections. All these results were robust to adjustments accounting for tests of multiple outcomes. After making such adjustments, we did not see differences in other financial and neighborhood metrics. Apart from accessing smaller mortgages, more time may be needed to understand whether and how shared equity purchasers are better or worse off financially compared with other buyers.

Implications for Policy and Practice

Many applicants in this study's sample were able to buy shared equity homes, the average subsidies for the shared equity homes were sizeable, and shared equity buyers had incomes at baseline well below area medians. Together, these facts indicate that shared equity programs were serving their core mission of linking low- and moderate-income people with affordable owner-occupied housing.

A fairly high share of those who did not buy a shared equity home ended up purchasing a home outside the programs. This may be appropriate sorting: people who do not need all the help shared equity gives should not accept it, because they would be trading a sizable portion of the upside of their investment. The remainder of applicants who did not buy any home were no longer interested in purchasing a home or were not able to buy. It may be that some applicants would have benefited from greater help, for example, through financial coaching (Theodos, Simms et al. 2015).

Assessing the impacts of homeownership can be a challenging endeavor because randomization is rarely possible and a high degree of personal choice is involved in the decision to buy a home. However,

by combining all of these comparisons groups into one study and using a robust set of baseline controls, we have tested for links between shared equity programs and buyer outcomes.

Some important questions remain unanswered by this research, and warrant further study. Most important in our minds is whether the benefits of reduced mortgage costs redound in meaningful ways to owners over time. It is possible that these buyers will subsequently differentiate themselves from other buyers in their levels savings, debt, financial stress, and mortgage delinquency and foreclosure. This study was only able to observe buyers through June 2016; longer-term follow-ups would be useful. Further, neighborhood outcomes also merit further investigation. For some programs, it is plausible that shared equity approaches allow for low- and moderate-income households to buy homes in more expensive neighborhoods than they could otherwise afford. However, some programs in this study brought homes online through funding sources that may not have prioritized more affluent neighborhoods, or even that actively targeted distressed neighborhoods, such as the Neighborhood Stabilization Program.

Although questions about the long-term effects of shared equity remain, this study offers evidence that shared equity models provide homeownership opportunities to lower-income households with debt levels less than they could otherwise achieve. With the homeownership rate having fallen to its lowest level since 1965, exploring how to sustain and expand these models can be a part of making homeownership available to more American families.

Chapter 1. Introduction and Background

Determining how to create affordable, sustainable homeownership opportunities for low- and moderate-income households has been a critical policy issue for decades, both for ideological reasons—homeownership is part of the American Dream—and to promote household financial stability and wealth creation. Owning a home has long been a meaningful milestone in many American's lives. Yet as home prices continue to rise during the current economic recovery, many renters view homeownership as an unattainable goal. Shared equity programs aim to satisfy this unmet demand by maintaining a stock of affordable housing for generations of new homebuyers.

Shared equity is a homeownership model that allows income-eligible families to purchase homes at below-market prices. In return for the subsidized purchase price, the owner's potential capital gains from home resale are restricted. Nonprofit and municipal shared equity programs—the focus of this report—create a stock of homes that will remain priced within reach of lower-income households over successive resales, thereby serving more families per dollar of grants or forgivable loan subsidy. Such programs retain a portion of the property's capital gains when owners resell. These programs differ from the market-driven shared equity models that are beginning to emerge. In market-driven approaches, investors use private money to pay a share of the purchase price, and in exchange, the homeowner gives the investor a share in the appreciation of the home.[1]

This report is based upon work supported by the Social Innovation Fund, a program of the Corporation for National and Community Service. The Social Innovation Fund combines public and private resources to grow the impact of innovative, community-based solutions that show compelling evidence of improving the lives of people in low-income communities throughout the United States. Capital Impact Partners received a grant from the Social Innovation Fund to establish the Cornerstone Homeownership Innovation Program (CHIP). This effort supports the expansion of shared equity homeownership programs in nine sites located throughout the United States. Capital Impact Partners engaged the Urban Institute to analyze the programs funded by the Social Innovation Fund.

To date, there has been little empirical research on shared equity homeownership that evaluates results for homeowners. Most research simply describes the concept in theory, describes consumer attitudes toward shared equity programs, or uses formula-based projections. Two studies have measured outcomes from Vermont's Champlain Housing Trust, and a previous study by the Urban

Institute measured outcomes among seven affordable homeownership programs (Davis and Stokes 2009; Temkin, Theodos, and Price 2013). None of these studies uses a comparison group, however, and therefore do not provide insights into outcomes for shared equity buyers relative to the counterfactual of the experience of other similar households not participating in these programs.

The shared equity programs evaluated here received funding and technical assistance from CHIP to expand homeownership to families who may otherwise be unable to buy a home at market prices. Using both applicant and nonapplicant comparison groups, we examine these programs, exploring questions relating to the households who were able to use the program to buy homes, as well as these households' mortgage, financial, and neighborhood outcomes.

Background

At most recent count, 10 million renters are severely cost burdened; that is, they spend half or more of their monthly income on housing.[2] Making the transition from renter to owner, always difficult, is currently especially hard as the prices of starter homes, the most affordable in the market, have risen by 32 percent from 2012 to 2016, a growth rate higher than for "trade-up" or "premium" homes.[3] Homeowners in some markets who purchased their homes prior to the recession have been reluctant to move because they would take a loss on their home at its current market value, while others may be limited by an inability to support higher mortgage costs on relatively stagnant incomes.[4] Investor owned and real estate owned properties (the latter being a home owned by a lender after foreclosure) further limit the supply of starter homes available for purchase.

Following the end of the most recent economic recession in 2009, real median household income in the United States has begun to increase—although incomes are still below 2007 levels, and Latinos and Asians have done better than black and white households. Even so, homeownership remains stubbornly out of reach for many families because home prices have been increasing even more rapidly. To further exacerbate barriers to homeownership, rents have been growing much faster than wages in many cities, hindering renters' ability to save for a down payment (Ault, Sturtevant, Viveiros 2015). These recent trends are particularly problematic for families in high-cost markets, and for first-time homebuyers, who may also be burdened by student debt (Jacobus 2015).

Though a hypothetical homebuyer earning the national median income may be a convenient way to illustrate general trends, growing income inequality creates different realities among prospective homebuyers. Incomes for high-income households have grown more rapidly than for low-income ones.

Relative to current homeowners, first-time homebuyers tend to have lower incomes and less accumulated wealth. Homebuyers in the market for starter homes can expect to dedicate a substantially larger share of their income to mortgage payments than those in the market for trade-up and premium homes.[5]

Perhaps most important, potential buyers face possibly the tightest mortgage credit requirements in the past generation. By one estimate, there are over one million fewer owners each year since 2009 solely as a result of historically tight credit standards.[6] The median FICO credit score for new buyers is 739, 34 points higher than it was a decade ago (Urban Institute 2016). All this adds up to a falling homeownership rate—from a high of 69.2 percent in Q4 2004 to 63.5 percent in Q3 2016—a level not seen since 1965.[7]

Another trend is that the nonwhite share of the US population is growing and will continue to increase in coming years. Yet, differences in ownership by race/ethnicity are stark. Homeownership rates are appreciably lower for non-Hispanic black (41.5 percent), Hispanic (45.3 percent), and Asian/Native Hawaiian/Pacific Islander (55.7 percent) households than they are for non-Hispanic whites (72.1 percent).[8] And without policy changes, these differences are projected to continue (Goodman, Pendall, and Zhu 2015).

The confluence of these trends motivates policy and practice to support affordable homeownership for new buyers.

Shared Equity Homeownership

Barriers to home buying, such as down payments and closing costs, have made it difficult for families with limited financial resources to become homeowners. Maintaining a stock of affordable homes for purchase over time can open homeownership more broadly, preventing homeownership opportunities from being concentrated among communities' wealthier residents and encouraging economic integration.

Shared equity programs, which are usually administered by a nonprofit organization or a municipality, have three important features: (1) they lower the initial cost of purchasing a home; (2) they limit the gain a homebuyer can receive on resale, thus generating a relatively affordable price for a subsequent buyer; and (3) they frequently provide stewardship to maintain community values and help homeowners retain and maintain their homes. For example, community land trusts (CLTs) retain

ownership of the land on which a home is located, thus substantially lowering the initial cost of the property. This structure also protects subsequent owners from the effects of increasing land prices, an especially important benefit in fast-developing or gentrifying areas.

Shared equity homeownership, sometimes called long-term affordable homeownership, represents a small, innovative segment of the current housing market. Rather than providing homebuyers a one-time cash grant, these programs recycle subsidies over time, thus cost-effectively promoting homeownership for a greater number of low- and moderate-income homebuyers. Nonprofit or municipal organizations and agencies administer this homeownership model, making homes more affordable for generations of first-time buyers, who may have a poor credit history or lack the necessary down payment or monthly income to afford a market-rate home.

Shared equity programs provide homebuyers a way to bridge the gap between the mortgage they can afford and the actual market cost to own a home. The entity administering the program and the buyer split the market cost of the home, and the program keeps a share of the equity. The buyer is able to access a share of any appreciation, but the program will limit the resale price so the house remains affordable to other low-income homebuyers, passing the benefit of any initial subsidy to subsequent owners. Shared equity is a broad designation that includes the following types of programs:

- **Deed restrictions**, also called deed covenants, are written into the deed that conveys a property. These restrictions bind subsequent as well as current owners (Abromowitz and White 2006). Inclusionary zoning programs, which require new developments to allocate a set share of units as affordable, often employ deed-restricted mortgage.
- **Community land trusts** (CLTs) are private nonprofit organizations with a commitment to providing affordable housing. CLTs lease their land to homeowners who own the units on the land (Davis 2006).
- **Limited equity cooperatives** are typically multi-household developments in which occupants purchase shares in the cooperative rather than the units outright (as in a condominium). Prices for shares are determined by the cooperative's bylaws and can be structured to include affordability restrictions (Davis 2006).

Although each shared equity model is unique in its structure, all share the same goal of providing homeownership options to low- and middle-income communities and include mechanisms to preserve the affordability of these homes over time. Research into shared equity programs is limited, but results so far have been promising. A 2013 study of seven programs found that shared equity homebuyers

earned competitive returns on their housing investment while complying with long-term affordability restrictions. And as the homes were resold, they remained affordable to low-income homebuyers. Shared equity homebuyers also had low delinquency and foreclosure rates, and those who moved did so at rates near the national average, using the sales proceeds to purchase market-rate homes (Temkin, Theodos, and Price 2013). A 2009 performance evaluation of a shared equity program in Burlington, Vermont, found that this program was an effective asset-building strategy for lower-income households and that, compared with buyers of unrestricted market-rate homes, these buyers had lower foreclosure rates and were able to sustain homeownership longer (Jacobus and Davis 2010).

The Cornerstone Homeownership Innovation Program

In 2010 Capital Impact Partners created the Cornerstone Partnership. Between 2010 and 2015, Cornerstone Partnership worked with over 3,000 housing professionals to develop high-level guidelines for implementing effective shared equity homeownership programs, as well as to launch a series of tools, resources and technical assistance opportunities to support practitioners in the field.

With the support of the Social Innovation Fund and the Ford Foundation, Capital Impact Partners established CHIP in 2011. CHIP was designed to identify and support leading nonprofit stewards of affordable homeownership units by providing them with resources to help them build their organizational capacity and thereby support the expansion of shared equity homeownership. A twin goal was to use CHIP programs to help build the evidence base around shared equity, the function of this research. From 46 organizations, CHIP selected 10 partners that met baseline criteria[9] and underwent a comprehensive assessment.[10] One original program—a consortium led by the Community Asset Preservation Corporation in Newark, New Jersey—exited CHIP before the end of the baseline data collection period. Therefore, this research is based on 9 of the original 10 selected partners. CHIP grantees received funding from 2012 through 2016.

In 2014, Capital Impact Partners and its long-time partners at the National Community Land Trust Network began conversations about the best ways to leverage their work supporting affordable homeownership practitioners and policymakers in an expanding coalition. As a result of these conversations, Capital Impact released its Cornerstone Partnership initiative to join with the National Community Land Trust Network. As of January 2016, Cornerstone Partnership and the National Community Land Trust Network began operating as Grounded Solutions Network. As Grounded Solutions Network, the organization's expanded mission is to "cultivate communities—equitable,

inclusive and rich in opportunity—by advancing affordable housing solutions that last for generations."[11]

Research Approach

In this study, we estimate outcomes for homebuyers participating in the CHIP shared equity programs. To so do, we rely on intake surveys, program administrative data, and credit bureau records. Some program applicants purchased a home through the programs; others did not. Using credit bureau data, we compare buyers who purchased a shared equity home with those who did not (although some non–shared equity buyers may have purchased a home elsewhere). We make these comparisons at two different times: when the potential buyer applied to the program between June 2012 and June 2014 and at follow-up in 2016—with both baseline and follow-up measures coming from credit bureau records. We also compare shared equity buyers with other buyers to further explore mortgage performance, using the same time periods. In this way, we are estimating relatively near-term outcomes for shared equity participants

Between the start of data collection in June 2012 and the conclusion of the study enrollment period in June 2014, the programs received 683 applications. The participating shared equity programs received a greater number of applicants during this time period, but not all of them agreed to participate in this study. Further, the 683 applicants who consented to participating in this research were not screened for program eligibility, and therefore some applicants included may not have been qualified to purchase a home through the program.

As of July 2016, 244 of these applicants had purchased a shared equity home. We use information on applicants (program buyers versus other applicants) and on a separate comparison group to inform the following research questions:

- What portion of shared equity program applicants purchased shared equity homes? What portion of applicants purchased homes apart from these programs? As such, what can be said about whether those who bought shared equity homes were appreciably more likely to buy than other applicants?
- What were the baseline characteristics of applicants who purchased shared equity homes as compared with those who purchased homes apart from these programs and those who did not purchase homes at all?

- How did applicants who bought shared equity homes fare with regard to *nonmortgage* financial characteristics (e.g., credit score and revolving debt), relative to: a) applicants who did not purchase shared equity homes, b) applicants who bought homes apart from these programs, and c) a comparable group of nonapplicants who recently bought homes?
- How did applicants who bought shared equity homes fare with regard to *mortgage* characteristics (e.g., any 90- to 180-day mortgage delinquencies and having a home equity line of credit), relative to: a) applicants who bought homes apart from these programs and b) a comparable group of nonapplicants who recently bought homes?
- How did applicants who bought shared equity homes compare with regard to *neighborhood* characteristics (e.g. neighborhood median occupied home value), relative to: a) applicants who did not purchase shared equity homes, b) applicants who bought homes apart from these programs, and c) a comparable group of nonapplicants who recently bought homes?

Chapter 2. Shared Equity Program Models

In this chapter we describe key elements of shared equity models, and then profile the nine shared equity programs (or groups of programs in South Florida) included in the study (table 2.1). The information in this section draws from interviews with program staff, as described in our baseline report (Theodos, Temkin et al. 2015).[12] We synthesize key program information here. Please see the baseline report for expanded detail about each approach used by the shared equity organizations in this study.

TABLE 2.1

Shared Equity Programs

Location	Organization
Austin, TX	HomeBase
Bay Area (San Francisco), CA	Hello Housing
Burlington, VT	Champlain Housing Trust
Long Island (Hauppauge), NY	Long Island Housing Partnership
Nashville, TN	The Housing Fund Inc.
Park City, UT	Mountainlands Community Housing Trust
Seattle, WA	Homestead Community Land Trust
South Florida	Community Land Trust of Palm Beach County
	Delray Beach Community Land Trust
	Heartfelt Florida Housing of South Palm Beach County Community Land Trust
	Housing Partnership Inc.
	South Florida Community Land Trust
Washington, DC	City First Homes

Overview of Shared Equity Program Model Components

Shared equity programs are designed to establish and maintain an affordable stock of homes for purchase by low- and moderate-income residents. Programs can manage shared equity units in their own portfolios, on behalf of third parties, or some combination of the two. Some programs complement these tasks by offering down payment assistance to homebuyers, providing technical assistance to other affordable housing organizations, or advocating on behalf of affordable housing locally.

Programs that steward the units in their portfolios first access them in a variety of ways. They may purchase and rehabilitate existing units. Or they may develop homes through new construction. Or, they may access homes that are set aside for the program, for example through inclusionary zoning or other efforts.

Any shared equity program operates within a specific local context and requires political and financial support from state and local policymakers. Local housing market conditions also influence program efficacy. For instance, shared equity homes may not appear to be an attractive alternative in markets where home prices are not appreciating or where market-rate homes are relatively affordable to low- and moderate-income buyers. And opportunities to acquire newly constructed units are especially limited in hot markets, unless developers have a regulatory motivation or financial incentive to construct homes for sale below market prices.

Establishing and Maintaining Affordability over Time

The primary goal of a shared equity program is to provide homeownership opportunities to low- and moderate-income households. They often limit participation to these intended beneficiaries by restricting eligibility to households earning less than a specified share of area median family income, for example, those earning below 80 percent of the area median. The program maintains a stock of homes that remain affordable to this population by subsidizing the initial sales price, and creating rules for how resale values are determined.

The initial sales price for a shared equity home requires a trade-off between making a unit affordable and using available subsidy dollars as efficiently as possible. This means establishing an initial sales price affordable to buyers with a particular income based on assumptions regarding down payments, interest rates, and loan terms. However, because of the restrictions placed on potential profit on resale of these homes, the difference between the price of a shared equity home and a market-rate home must be large enough to attract potential buyers.

Resale formulas establish the maximum proceeds that a shared equity owner can realize when selling his or her unit. Any shared equity program, in establishing the resale formula, must balance two competing objectives: allowing sellers to build equity (which facilitates wealth creation and encourages property maintenance) and maintaining the home's affordability to subsequent buyers. Five general types of resale formulas are introduced below, all of which are used by programs within this study.

Although there are important administrative differences among them, it is possible to arrive at similar rates of return and similar levels of affordability preservation using different resale formulas.

- **Fixed rate.** The maximum resale price is established by applying a fixed annual percentage growth rate to the initial purchase price. Under fixed-rate formulas, the maximum resale price for homes increases without regard to changes in area house prices or incomes.
- **Indexing to changes in the national price of household goods.** The maximum resale price is established by increasing the initial affordable price by a percentage equal to the percentage increase in the Consumer Price Index during the reseller's tenure. Like properties governed by fixed-rate formulas, the maximum resale price for homes with resale formulas indexed to the Consumer Price Index increases without regard to changes in area house prices or incomes.
- **Indexing to changes in area incomes.** The maximum resale price is established by increasing the initial affordable price by a percentage equal to the percentage increase in the area median family income during the reseller's tenure. The maximum resale price for homes with resale formulas indexed to the area median family income increases with regard to changes in incomes rather than to changes in area house prices.
- **Indexing to changes in area home values.** The maximum resale price is established by increasing the initial affordable price by a percentage equal to the percentage increase in area home value during the reseller's tenure. Changes in area home values may be measured by median sales prices or real estate price indices.
- **Appraisal based.** The change in a home's market value is determined by the difference in appraisals conducted at the time of purchase and resale. The reseller is allowed to retain a portion of the change in appraised market value. For example, the reseller might keep 25 percent of the appreciation. The home then resells at a price equal to the initial affordable price plus the reseller's share of the change in appraised value. Homes with appraisal-based resale formulas increase in price with regard to changes in home values and without regard to changes in area incomes.

It is important to bear in mind that the proceeds realized by owners at resale for each type of formula offer the potential (although not a guarantee) for substantial returns on investment, as most shared equity owners purchase their homes with a small down payment. For example, in programs with a flat percentage rate (the fixed-rate resale formula described above), this percentage (e.g., 2 percent) is applied to the purchase price of the home, which can be 20 times the down payment amount (assuming

a 5 percent down payment). Therefore, even a relatively modest allowable rate of 2 percent per year will result in allowable appreciation in excess of the buyer's down payment within 2.5 years (assuming no compounding).

One potential drawback of the shared equity approach is that owners, because they do not realize all of a unit's appreciation, may have fewer incentives to invest in capital improvements. Some programs address this by allowing owners to recover the some or all of the cost of capital improvements they've made. (And the program may depreciate the value of the expenses that can be credited over time.) Many programs require that owners receive approval before starting major capital improvements to ensure that units remain affordable at resale.

Participant Engagement

Because shared equity homes are priced below market, the concept is attractive to potential low- to moderate-income homebuyers; however potential homebuyers are often unfamiliar with shared equity. Organizations that operate shared equity programs work with local realtors and developers to improve awareness of shared equity buying opportunities and local knowledge of how the programs operate. In addition to referrals from these real estate professionals, some organizations also maintain websites or use social media to advertise their programs and homes.

Because many shared equity buyers are first-time homeowners, programs frequently require that prospective buyers complete a prepurchase homebuyer counseling program. Shared equity programs that provide their own counseling typically teach attendees about their program policies simultaneously. If the program does not provide buyer counseling, it can refer clients to counseling organizations, such as those approved by the US Department of Housing and Urban Development (HUD).

Many organizations that operate shared equity homeownership programs provide services to buyers after purchase. These stewardship services have the potential to improve the performance of shared equity mortgages and ease the transition from rental housing. Owners will have a point of contact if they have trouble paying the mortgage or have questions related to maintaining their home. Indeed, all the programs take steps to remain in contact with their buyers after purchase; thus, buyers are aware of resources if they require assistance. In some cases, the organizations operating shared equity programs will also assist owners in selling their homes.

Lender Engagement

Although shared equity housing has been in place for more than 30 years, many lenders are unfamiliar with such housing. Moreover, given the restrictions on homes purchased under these programs, whether shared appreciation, deed restrictions, or only a leasehold interest in the underlying land, standard Federal Housing Administration (FHA) are unavailable to shared equity homebuyers. During this period, conventional mortgages were difficult to access in some of the sites, though this has improved of late with Fannie Mae's changes in 2015 that allow lenders to use Desktop Underwriter for these loans.[13] Lenders often struggle to understand their own risks or what happens to a shared equity home in the event of default or foreclosure. As a result, shared equity program managers must typically work to educate local lenders about their particular shared equity program for these lenders to develop products that can be used for permanent mortgage financing.

However, only a limited number of lenders have been willing to work with shared equity buyers, mainly because the difficulty of accessing FHA or the secondary market meant that lenders generally had to hold the loans on their balance sheets, and hold capital against them. (As referenced, with changes in 2015, Fannie Mae began purchasing these loans.) In addition to these factors, many loans under these programs are relatively small, which reduces lender profit, and thus, interest in serving the market. Programs have overcome these impediments by providing loans themselves; partnering with local lenders and credit unions; or coordinating with other public organizations, such as state housing finance authorities.

Marketing to Potential Buyers

Shared equity as an approach for providing affordable housing is unfamiliar to many potential buyers and also some real estate market participants. To alleviate this problem, many programs work with local realtors and developers to foster familiarity with shared equity programs and create a valuable source of referrals. This can include holding periodic meetings with local real estate professionals to ensure that key market participants are aware of shared equity buying opportunities. In addition to working directly with local realtors and developers, shared equity programs often maintain websites and use social media to advertise their programs. Some also receive word-of-mouth referrals as community members spread news of their programs.

Shared Equity Program Profiles

HomeBase Texas (Austin, Texas)

Founded in 2008, HomeBase Texas (also known as HomeBase) manages a portfolio of 650 deed-restricted homes in the City of Austin and Travis County, including properties they manage as a subsidiary for the local Habitat for Humanity affiliate and on behalf of the Mueller Foundation. (However, after study enrollment, management of the Mueller Foundation portfolio was transferred to another organization.) Beyond a shared equity homeownership program, HomeBase can also provide down payment assistance throughout greater Texas.

Source of homes. HomeBase acquires new units by developing relationships with volume builders that may have lots for development and by building homes on acquired land.

Prepurchase services provided to homebuyers. All buyers must participate in a one-on-one session that covers shared equity homeownership, and take a class that uses the NeighborWorks prepurchase curriculum.

Sources for mortgage financing. HomeBase works with credit unions, some of which offer 100 percent financing. Loans are either portfolio products or sold to Fannie Mae. In some cases, developers offer permanent financing.

Resale proceeds. HomeBase allows 2 percent per annum appreciation on the sales price and offers no credits for capital improvements.

Hello Housing (San Francisco Bay Area, California)

Founded in 2005, Hello Housing operates in the greater Bay Area, which includes Alameda, Contra Costa, Marin, and San Mateo counties. Their portfolio of 540 deed-restricted homes includes units managed for the cities of Novato, Alameda, Concord, and Menlo Park. In addition to a shared equity program, Hello Housing provides down payment assistance.

Source of homes. Hello Housing develops homes, sells inclusionary units on behalf of private developers, and manages homes already constructed through inclusionary zoning or other "below market rate" programs in municipalities contracting with Hello Housing.

Prepurchase services provided to homebuyers. In most cases, homebuyers are required to take a four- to eight-hour class from a HUD-certified counseling agency before purchase.

Sources for mortgage financing. PNC Mortgage and Boston Private Capital are Hello Housing's preferred lenders.

Resale proceeds. Hello Housing operates in multiple jurisdictions in the Bay Area and applies different resale formulas based on the jurisdiction. One resale formula applies the change in area median family income to the original purchase price (not the appraised value) of the home, plus the depreciated value of capital improvements. In another, the resale formula takes the percentage change in Consumer Price Index (CPI) plus a quarter of a percent for every three months the owner has been in the home, plus capital improvements.

Champlain Housing Trust (Burlington, Vermont)

Founded in 1984, the Champlain Housing Trust operates in Chittenden, Franklin, and Grand Isle counties. It has a portfolio of roughly 570 homes, which it manages using a CLT model.

Source of homes. Champlain Housing Trust has acquired properties in various ways, including through the Neighborhood Stabilization Program (NSP) and the Vermont Housing and Conservation Board, and also manages units constructed through Burlington's inclusionary zoning program. In addition, the organization will, through its buyer-driven program, provide subsidies on a home already being purchased in exchange for resale restrictions.

Prepurchase services provided to homebuyers. Champlain Housing Trust provides homebuyer education and prepurchase counseling, and requires all buyers to participate.

Sources for mortgage financing. Champlain Housing Trust homebuyers access first mortgage financing through four local credit unions, three local banks, and USDA Rural Development. Mortgages are salable to Fannie Mae through the state housing finance agency or directly by local lenders.

Resale proceeds. Champlain Housing Trust allows sellers to retain 25 percent of appreciation as measured by the change in the appraised value of a home between initial purchase and resale. Owners receive 100 percent of the increased value resulting from capital improvements.

Long Island Housing Partnership (Long Island, New York)

Founded in 1989, Long Island Housing Partnership, Inc. operates in Nassau and Suffolk counties. Their portfolio consists of more than 1,250 deed-restricted homes, which include units managed on behalf of local municipalities on Long Island.

Source of homes. Long Island Housing Partnership's largest source of homes during this study was through NSP funding, but the program uses other sources as well. In addition to organization-developed homes retained in its portfolio, it also manages acquisitions of tax-default properties.

Prepurchase services provided to homebuyers. Long Island Housing Partnership's shared equity program is restricted to first-time homebuyers, all of whom are required to attend mortgage counseling. The program also offers a down payment assistance program and a matched savings program in partnership with local banks.

Sources for mortgage financing. Long Island Housing Partnership participates in a local coalition of mortgage lenders that includes Citibank, JP Morgan Chase, Capital One, Bank of America, HSBC, Astoria, M&T, and the State of New York Mortgage Agency. The following credit unions also originate shared equity loans: Suffolk Federal Credit Union, Teachers Credit Union, Bethpage Federal Credit Union, as does the Municipal Credit Union.

Resale proceeds. Long Island Housing Partnership uses the Consumer Price Index to limit the resale price, but caps resale prices so that homes are affordable to families whose incomes are the same percentage of area median family income as the original buyers. There are provisions for sellers to recover the cost of capital improvements.

The Housing Fund (Nashville, Tennessee)

Founded in 1996, The Housing Fund Inc. operates state-wide in Tennessee. The Housing Fund's portfolio currently consists of 20 deed-restricted homes, but the organization also assists in the development of new, affordable homes to be sold to low- or moderate- income families. In addition to their shared equity program, the Housing Fund provides owners with down payment assistance.

Source of homes. During of this study, the Housing Fund used NSP funds to acquire lots in a foreclosed suburban subdivision and build townhomes on the vacant land. In addition, it acquired a few existing homes, some at the request of buyers.

Prepurchase services provided to homebuyers. The Housing Fund works with buyers throughout the process, including helping the buyer work with the lender, title, and real estate agents. In addition, all buyers are required to receive homebuyer counseling from a third-party provider. If needed, the Housing Fund will refer some potential buyers to credit repair agencies.

Sources for mortgage financing. The Housing Fund works primarily with Pinnacle Bank for its mortgage financing products. The Tennessee Housing and Development Agency offers first mortgages, and it can modify the terms of its normal first mortgage product to mirror the Housing Fund's underwriting. The state housing agency holds these notes, and several banks originate these products, acting as broker for the housing agency.

Resale proceeds. Through year 3, resellers receive 25 percent of appreciation as measured by changes to appraised value. For years 3 to 30, appreciation is split 50-50. After year 30, resellers receive 100 percent of the appreciation. Major improvements that change a unit's footprint require the Housing Fund's approval. The value of capital improvements the owner makes is added to the resale formula–dictated sales price.

Mountainlands Community Housing Trust (Park City, Utah)

Founded in 1993, Mountainlands operates in Summit and Wasatch counties. Their portfolio of roughly 180 homes includes units developed by Mountainlands and under Summit County's inclusionary zoning requirements. A small share of units are managed using a CLT model.

Source of homes. Mountainlands manages deed-restricted homes on behalf of the county. In addition, Mountainlands sometimes requests lots from developers with inclusionary zoning requirements or purchases them to build homes.

Prepurchase services provided to homebuyers. Mountainlands provides prepurchase services to potential homeowners.

Sources for mortgage financing. Mortgage lenders at Mountainlands are Academy Mortgage Corporation, Intermountain Mortgage Company, Key Bank Mortgage, Mountain Valley Financial, and USDA Rural Development.

Resale proceeds. Mountainlands allows a maximum of 3 percent per annum appreciation on purchase price. With varying limits, resellers receive 100 percent of capital improvements approved by Mountainlands.

Homestead Community Land Trust (Seattle, Washington)

Founded in 1992, Homestead Community Land Trust provided its first shared equity subsidy in 2002 and manages a portfolio of 183 homes (at year end 2015) in the City of Seattle and King County.

Source of homes. Homestead's acquisition strategies from 2012 to 2015 included new construction infill homes, acquisition rehab of single-family detached homes, partnerships with other nonprofit developers and purchase and completion of a distressed condominium development.

Prepurchase services provided to homebuyers. Homestead's shared equity program is limited to first-time homebuyers, who are required to participate in a first-time homebuyer class. Homestead also provides one-on-one financial counseling tailored to each family's budget and purchasing power, as well as additional support throughout the purchase process as needed on an individual basis.

Sources for mortgage financing. Mortgage lenders at Homestead are Washington Federal, Guild Mortgage, and HomeStreet Bank.

Resale proceeds. Homestead allows resellers to realize 1.5 percent per annum appreciation on the restricted resale price. Owners can receive 100 percent of qualified capital improvements.

South Florida Consortium (South Florida)

CHIP awarded a single grant to a consortium of South Florida shared equity programs, all of which use a CLT model. We collectively refer to these groups as the "South Florida consortium."

TABLE 2.2

Shared Equity Programs in the South Florida Consortium

Program	Geographic footprint	Founding year	Portfolio size
Community Land Trust of Palm Beach County	Palm Beach County	2008	28
Delray Beach Community Land Trust	City of Delray Beach	2006	56
Heartfelt Florida Housing of South Palm Beach County Community Land Trust	Palm Beach County	2010	20
Housing Partnership Inc.	Palm Beach County	1986	32
South Florida Community Land Trust	Broward County	2006	8

Source of homes. Programs in the South Florida consortium acquire properties by purchasing never-occupied, real estate owned, or foreclosed homes; developing on land the local government donates; assuming ownership of NSP properties; and partnering with local Low-Income Housing Tax Credit developers.

Prepurchase services provided to homebuyers. CLT of Palm Beach County and Delray Beach CLT are both restricted to first-time homeowners. CLT of Palm Beach County and South Florida CLT both require buyers to attend HUD-approved prepurchase counseling, and a CLT orientation. Delray CLT only requires buyers to attend a CLT orientation, and Heartfelt Florida Housing of South Palm Beach County CLT requires buyers to attend at least one program-provided workshop. Housing Partnership offers prepurchase group classes, provides down payment assistance, and offers financial coaching.

Sources for mortgage financing. The South Florida consortium is served by six lenders. Additionally, Heartfelt Florida Housing of South Palm Beach County CLT originates loans for qualifying homebuyers earning under 80 percent of the area median family income.

Resale proceeds. CLT of Palm Beach County, Heartfelt Florida Housing of South Palm Beach County CLT, and South Florida CLT allow resellers to receive up to 25 percent of any appreciation. Delray Beach CLT's resale formula is based on purchase price plus change in area median family income, and owners receive credits for capital improvements and capital systems replacements.

City First Homes (Washington, District of Columbia)

Founded in 2010, City First Homes manages a portfolio of 242 deed-restricted homes in Washington, DC.

Source of homes. City First Homes uses several methods to create permanently affordable homes. One method of creation is by providing developers with flexible and subordinate capital in consideration for their agreement to record covenants that secure permanently affordable units. City First Homes also works with renters in multifamily buildings that are interested in purchasing their buildings and converting them to housing cooperatives. City First Homes provides these groups with lending capital and technical assistance to create shared equity units.

Prepurchase services provided to homebuyers. Before purchase, City First introduces buyers to the shared equity model in a two-hour course. Buyers are also referred to third parties for general housing and homeownership counseling with a requirement for 8 hours of pre-purchase training.

Sources for mortgage financing. City First Homes refers buyers to Industrial Bank, Citibank, and Monarch Bank.

Resale proceeds. City First allows the owner to retain 25 percent of allowable appreciation. The owner is allowed to recover 100 percent of the value of capital improvements made to the property as estimated by the appraiser at resale.

Chapter 3. Data and Methodology

This chapter describes the data and analysis techniques used in this paper. Four types of data support the analysis: baseline surveys provided at the point of application to the programs, program data about purchase transactions for shared equity buyers, baseline and follow-up financial information from a large credit bureau about all applicants and a nonapplicant comparison group, and secondary data about the neighborhoods where applicants and nonapplicants live. A complete data dictionary can be found in appendix A. Funding was not available to support a follow-up survey as included in the original study design, and as a result this report reflects outcome analysis relying only on credit bureau and program data.[14]

To analyze the data, we first estimate the characteristics that contributed to the likelihood that an applicant would purchase a home through a shared equity program. We then estimate the relationship between the shared equity program and financial outcomes of shared equity purchasers. To do so, we compare shared equity purchasers to other applicants who did not purchase a shared equity home. Next, we compare shared equity purchasers to other applicants who purchased a home outside of the program. Finally, we compare shared equity purchasers to similar purchasers who were not applicants to the shared equity program but who lived in the metro region of the purchaser. (We explain each group in further detail later in this chapter.)

Data

Application Data

Programs provided detailed information about applicants who agreed to participate in this research. Study enrollment ran from June 2012 through June 2014. To be considered an applicant, a potential homebuyer had to express an interest in purchasing a shared equity home, complete the program's required intake form, and comply with any eligibility criteria (e.g., relating to household income). Each organization had a limited number of homes available for sale in their portfolio at any given time, though the number of applicants was not restricted.

Program staff then informed potential buyers about the research study and asked them to sign an informed consent form indicating their willingness to participate in the evaluation. Buyers unwilling to

participate in the research study were still able to pursue a home through the program; this report does not contain information on those individuals, and we do not know how many people are in this category. The programs then collected baseline data on these individuals, either through their normal intake forms if they contained all questions we needed, or if they preferred, using a supplemental questionnaire in addition to their normal intake process. In either case, sites shared the same set of baseline data points with us.

The baseline data contain information about applicants' demographic and financial characteristics, their housing expenses, self-reported credit history, and living arrangements. Applicants also provided identifying information.

Homekeeper Administrative Data on Shared Equity Purchase Transactions

The shared equity programs then provided us data on study participants who applied to a program and purchased a shared equity home. The programs shared these data via HomeKeeper, a web-based Saleforce.com application.[15] By combining shared equity purchase and baseline application data (and credit data, as discussed in the next section), we are able to identify the characteristics of applicants who purchased homes through the programs. We present this analysis in chapter 4: Program Applicants. These data also include information about the shared equity purchases, such as information on the physical characteristics of the new home, its location, and buyer financing. These are described in chapter 5.

Baseline and Follow-up Credit Bureau Data

To understand the relationship between shared equity programs and participant finances, we use information from a large credit bureau about credit scores, overall debt, revolving debt, student loans, mortgage debt, home equity lines of credit (HELOCs), and delinquencies. We also purchased from the credit bureau age and estimated wage data, as well as information on which census tract each person lived in before and after the study period. For each individual, we purchased data for coinciding with baseline (June 2012 or June 2013[16]) and follow-up (June 2016) periods. The credit bureau was able to match 91 percent of applicants (623 of 683).

We purchased these credit data for individuals who applied to the shared equity programs—both those who purchased homes through the programs and those who did not. We also purchased credit

data for individuals who did not apply to the shared equity program but who lived in the same metro areas as shared equity applicants, so that we could have a second comparison group for the shared equity purchasers. We selected this outside comparison group based on their similarity to program applicants in terms of credit score and geographic location, and required that they be first time home buyers at baseline, and recent buyers by the follow-up period.

Secondary Data

Finally, we incorporate demographic data on neighborhoods from the American Community Survey (2010–2014) and area median family income data from HUD. We use these data to identify differences in neighborhood characteristics between where purchasers were living at the time of application and where their new home is located. We used home price and median family income data to evaluate purchased homes' affordability relative to the local market. These analyses are located in chapter 4: Program Applicants.

Empirical Methodology

Program Applicants

To analyze baseline data, we first explored descriptive characteristics of program applicants, including their demographics, finances and creditworthiness, and the neighborhoods in which they live (chapter 4).

Shared Equity Purchases

Next, we estimated the differences in these average characteristics between shared equity purchasers those applicants who did not purchase a shared equity home (chapter 5). We also segmented the latter group into applicants who purchased a home outside of the program and applicants who did not purchase a home at all, comparing both groups with shared equity purchasers. (We refer to those who purchased a home *not* through a shared equity home as "other" purchasers, not "market" or

"conventional" purchasers, as they may have used other public or philanthropic supports to purchase homes, and we do not observe these attributes of the transactions.)

To more closely examine what types of characteristics make an applicant more or less likely to purchase a shared equity home, we then estimated a linear probability of the likelihood of purchasing a shared equity home.[17] This allowed us to determine which characteristics were associated with a shared equity home purchase, holding other variables constant.

Shared Equity Buyer Outcomes

To estimate the relationship between shared equity programs and financial outcomes, we compared follow-up credit bureau data for shared equity purchasers with data for those applicants who did not purchase a shared equity home. (We provide these estimates in chapter 6 and minimum detectable effects in appendix C). We also compared shared equity purchasers with just those applicants who purchased a home outside of the program. Finally, as a check against these findings, we used credit bureau data to compare shared equity purchasers with a de-identified group of nonapplicants who purchased outside of the shared equity programs but within the same MSAs as program purchasers.

It is important to note that we do not make causal claims about any differences found between shared equity and nonapplicants' outcomes because we cannot fully control for unobservable characteristics that might be related to program participation such as motivation or expected future earnings.[18] Such differences, to the extent they exist, would lead to selection bias. With this research approach, we can detect meaningful differences on the average outcomes for individuals with similar pre-program observable characteristics. And it is worth noting that the baseline controls we include are consistent with existing literature assessing homeownership using matching approaches, for example, as in Aratani 2011; Grinstein-Weiss et al. 2011; Manturuk, Lindblad and Quercia 2012; and Roskruge at al. 2013.

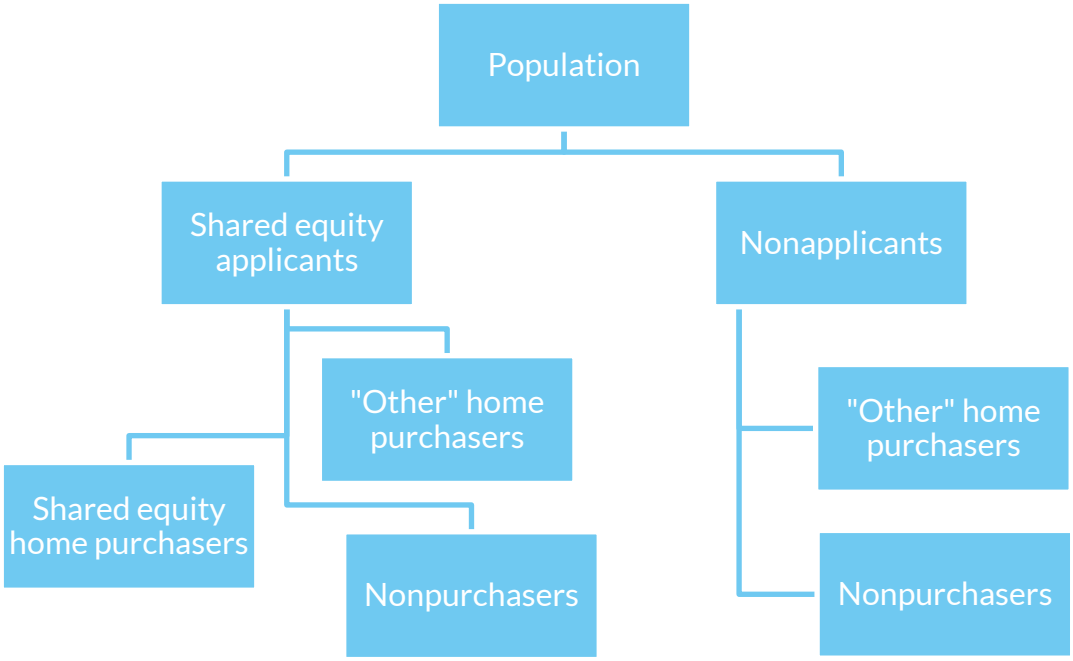
Selection for participation into shared equity programs may occur at two levels (figure 3.1). In the first level, individuals select to become applicants into the program. These are low and moderate-income individuals and households living in areas where the program is available who demonstrate some interest in buying house using a shared equity approach.

In the second level, shared equity applicants select into purchasing a house using a shared equity program or not. And shared equity programs elect to approve or reject applicants as home purchasers. Some shared equity applicants will be unable to qualify for conventional mortgages, and do not

purchase a home. Some applicants will purchase homes via other programs, for example, using down payment assistance. Some applicants will opt to purchase homes with conventional mortgages, though perhaps at a home value lower than they could access via a shared equity program. Some applicants who are mortgage-eligible have life circumstance changes, or otherwise have shifts in their priorities that mean they do not buy a home at all. Applicants may be rejected by a program if their incomes or asset levels are too high, or they do not complete the necessary counseling requirements. Given all these possibilities, it is possible that those applicants who purchase shared equity homes differ in non-observable ways from applicants who do not, but we do not have good insights into the magnitude and direction of a bias, if one exists.

FIGURE 3.1

Program Selection



We therefore estimated the differences in outcomes using three different comparison groups (applicants who did not purchase a shared equity home, applicants who purchased outside of the program, and non–shared equity applicants) to get as robust a picture as possible. None of these comparisons is ideal, but together they give us a picture of the relationship between shared equity and outcomes. Each comparison method is described in detail below.

SHARED EQUITY PURCHASERS VERSUS ALL OTHER APPLICANTS

To estimate the relationship between shared equity home purchase and a number of nonmortgage financial and neighborhood outcomes, we first compared shared equity purchasers to shared equity applicants who did not purchase a shared equity home. Some of the latter group of applicants purchased a home outside of the program and others did not purchase a home at all.

To make this comparison, we estimated the following model:

$$Y_{im2016} = \beta_0 + \beta_1 T_{im} + \beta_2 Y_{im2012} + \beta_2 X_{im2012} + \delta_m + \varepsilon_{im2016}$$

where Y_{im2016} was the outcome of interest for individual i in site m in year 2016, T_{im} was an indicator whether individual i is a shared equity purchaser, Y_{im2012} was the outcome measured before the program implementation (baseline), X_{im2012} was a set of covariates also measured at baseline, δ_m were site fixed effects, and ε_{im2016} was the idiosyncratic error. For the set of characteristics X_{im2012}, we included information from the application data, such as asset level, race, income and education; from the credit bureau data, such as past credit history; and characteristics about the neighborhood (census tract) where an applicant resided at baseline from the American Community Survey. We estimated the model using linear least squares with standard errors clustered at the site level.

The coefficient of interest is β_1, which compares the outcomes of program applicants who were shared equity purchasers and those who are not, controlling for a set of pre-program characteristics and the baseline variable of the outcome variable. While we cannot draw causality from these estimations since selection to purchase a shared equity home might be based on other unobservable characteristics, β_1 represents the average difference in outcomes for individuals *net* of difference in observed pre-program characteristics.

SHARED EQUITY PURCHASERS VERSUS OTHER APPLICANT PURCHASERS

Next, we compared shared equity purchasers to the other shared equity applicants who purchased a home outside of the program. In addition to nonmortgage financial and neighborhood outcomes, this allowed us to compare mortgage performance, since both groups opened a mortgage during the study period.

To do so, we used the same model above, but restricted the sample to applicants who purchased a home during the study period (both through the program and outside of it), and we examined mortgage and home purchase related outcome measures, such as total mortgage amount, and also nonmortgage and neighborhood characteristics.

SHARED EQUITY PURCHASERS VERSUS NONAPPLICANT PURCHASERS

Finally, we compared shared equity purchasers to purchasers who were not shared equity applicants but who lived in the same metro area at the time the study began. This group was selected to be within the credit score range of the shared equity applicants in the sample. The group was also limited to individuals who were first time homeowners at the baseline data pull, to ensure that length of tenure of ownership was comparable across the two groups.

To draw this sample, we used data from a major credit bureau. Since we could not observe, in advance, a desire to purchase a home in the general population, we have no way of comparing "interested buyers" to all shared equity applicants. We did, however, examine recent home purchasers. However, as before, this comparison group has limitations: some shared equity purchasers likely were unable to purchase outside of the programs, and may not have had an adequate match in the general pool of nonapplicants.

To draw a comparison group from these outside purchasers, we use a propensity score matching approach. This method relies on selecting a group of home purchasers from the pool of nonapplicants who have similar baseline characteristics to the shared equity purchasers. The decision to use propensity score matching approach for the comparison between the share equity purchasers versus nonapplicants and linear square for the other groups is based on the number of individuals in the comparison group with similar observable characteristics (there are only 139 applicants who purchased a home outside the program).

We implemented the model in two steps. First, we estimated the probability that each individual i will purchase a shared equity home based on his or her baseline characteristics – the "propensity" to enroll. To do so, we used a Probit model to predict each individual $i's$ probability of being a shared equity purchaser:

$$P_i = p(Y_{im2012}, X_{im2012}, \delta_m),$$

where Y_{im2012} was the outcome measured before the program implementation (baseline), X_{im2012} was a set of baseline characteristics from the credit bureau data including age and credit history characteristics, and average characteristics of the census tract where individual i lived at baseline (e.g. median income level, share African American, share Latino, share bachelor's degree, etc.) from the American Community Survey, and δ_m were site dummies.

Second, we used this estimated propensity score to match individuals in the treatment group to those in the comparison group with a similar likelihood of selecting to participate in the program. To do

so, we used a nearest neighbor matching with replacement approach, where an individual in the control group can be matched to more than one individual in the treatment group. The statistic of interest is then the difference in the average outcomes between the shared equity purchasers and the matched comparison group:

$$\hat{\tau}_Y = \bar{Y}_{T,2016} - \bar{Y}_{MC,2016},$$

where $\bar{Y}_{T,2016}$ is the average of outcome Y for shared equity purchasers at follow up and $\bar{Y}_{MC,2016}$ is the average of outcome Y for individuals in the comparison group who are matched to individuals in the treatment group based on their observable characteristics. To test whether $\hat{\tau}_Y$ is statistically different from zero, we estimated its standard errors using the expression derived by Abadie and Imbens (2006).

We also adjusted the results from the propensity score matching for multiple comparisons. For this purpose we group the outcome variables in five families: financial (credit score, credit utilization rate, and revolving debt); loan performance (any 90- to 180-day nonmortgage delinquencies and at least one account in collections); debt amounts (monthly payment on credit accounts and credit on open mortgage trades); mortgage type and performance (any open HELOCs reported in the last 6 months, any 90-180 day mortgage delinquencies and any foreclosure); and neighborhood (percent of neighborhood with a bachelor's degree or more and neighborhood median occupied home value). We used the Bonferroni adjustment.

Chapter 4. Program Applicants

In this chapter we provide baseline information about individuals who applied to a shared equity program. In total, 683 individuals applied through the shared equity organizations to purchase a home in the study period and consented to participate in the research study. The 683 applicants who consented to participate in this research were not screened for program eligibility, and therefore some applicants included may not have been qualified to purchase a home through the programs, for example if they were over-income. Table 4.1 summarizes the number of applicants by site. The number of applicants participating in the study ranged from a high of 136 in Burlington (Champlain Housing Trust) to a low of 25 in the Bay Area (Hello Housing).

TABLE 4.1

Shared Equity Program Applicants by Site

Organization headquarters	Organization	Applicants in study
Austin, TX	HomeBase	111
Bay Area (San Francisco, CA)	Hello Housing	25
Burlington, VT	Champlain Housing Trust	136
Long Island (Hauppauge, NY)	Long Island Housing Partnership	48
Nashville, TN	The Housing Fund	29
Park City, UT	Mountainlands Community Housing Trust	68
Seattle, WA	Homestead Community Land Trust	102
South Florida		114
South Florida (Lake Worth, FL)	Community Land Trust of Palm Beach County	
South Florida (Delray Beach, FL)	Delray Beach Community Land Trust	
South Florida (Delray Beach, FL)	Heartfelt Florida Housing of South Palm Beach County Community Land Trust	
South Florida (Riviera Beach, FL)	Housing Partnership Inc.	
South Florida (Fort Lauderdale, FL)	South Florida Community Land Trust	
Washington, DC	City First Homes	50
Total		**683**

Source: CHIP application data.

In the remainder of this chapter, we report on the combined set of all applicants. For a breakdown of program applicant characteristics by site, see our baseline study (Theodos, Temkin et al. 2015).

Demographics

Across all sites, the median applicant was 37 years old with more than a third in the 30-39 age category (table 4.2). This is somewhat older than the 31-year median age of all first-time homebuyers during this time, according to the National Association of Realtors (2014). The programs attracted greater interest from women than from men: 69 percent of all applicants were female. When a couple applies for housing, one is considered the applicant and the other a coapplicant. Across all sites, nearly two-thirds of applicants applied for a shared equity program on their own, not with a coapplicant. Marital status was married for half of all applicants. Understandably, unmarried applicants were more represented among sole applicants than coapplicants. But 30 percent of all sole applicants were married, while conversely 14 percent of coapplicants were single.

The programs attracted applicants from a mix of races/ethnicities. Forty-four percent of applicants were white non-Hispanic (white), 23 percent were black non-Hispanic (black), 19 percent were Hispanic, and 14 percent were from another or multiple races. While not shown, racial and ethnic composition of applicants varies widely across the sites. A majority of applicants to the programs in Burlington Vermont and Park City Utah were white, with black applicants the majority in Nashville and South Florida, and Hispanics the majority for the Austin site.

An overwhelming share of applicants (96 percent) were not homeowners at the time of application. This includes renters and those who have other living arrangements, such as living with friends or family. This finding is consistent with many shared equity organizations requiring applicants to be first-time homebuyers to qualify for a shared equity home. Nearly 85 percent of applicants were first-time buyers, classified following HUD's definition of those who have not owned a home in the previous three years.

At the time of application, applicants lived primarily in two-bedroom homes (43 percent) or those with three or more bedrooms (32 percent), with the remaining 26 percent in zero- or one-bedroom units.

TABLE 4.2

Demographic Characteristics of Shared Equity Program Applicants

Demographic characteristics	N	Percent
Less than 30 years old	683	21
30–39 years		38
40–49 years		19
50–59 years		13
60 years and older		10
Female	643	69
Married	659	50
Sole applicant	681	64
White non-Hispanic	661	44
Black non-Hispanic		23
Hispanic		19
Other non-Hispanic		14
Renter	624	80
Other/lives with family		16
Homeowner		4
Lives in studio or 1 bedroom home	595	26
Lives in 2 bedroom home		43
Lives in 3+ bedroom home		32

Source: CHIP application data.

Education and Employment

Half of applicants had a bachelor's degree and roughly one-fifth had an associate's or technical degree (table 4.3). This is more education than for the overall US population. For example, by comparison, 30 percent of the US population 25 and older have at least a bachelor's degree.[19] It is not clear from our study why these programs attracted a more educated applicant pool. Looking to the other applicants, we see that 30 percent of all applicants lacked an associate's or bachelor's degree, though only a small share did not graduate from high school.

About 82 percent of applicants reported working full time and another 14 percent were working part time or were self-employed. Applicants were employed in diverse occupations. About 30 percent were in office administration or health care. No other single occupation category accounted for more than 15 percent of applicants.

TABLE 4.3

Education, Employment, and Occupation Characteristics of Shared Equity Applicants

Education and employment characteristics	*N*	Percent
HS diploma or less	572	20
Technical certification		9
Some college		21
College graduate		50
Full time	453	82
Part time		9
Self employed		5
Other		4
Office administration	453	15
Health care		15
Maintenance/repair/building and grounds		8
Sales/retail		8
Education		6
Food services		6
Community/social services		5
Transportation/material moving		4
Production/manufacturing		4
Financial		3
IT/technology		3
Legal		2
Construction		1
Management		1
Hospitality		1
Research		1
Architecture/engineering		1
Other		14

Source: CHIP application data.

Finances and Creditworthiness

Across the sites, applicants' incomes were generally between 45 percent and 60 percent of the median family income for their surrounding area (table 4.4). These values were quite low compared with conventional homeownership targets of either 80 or even 120 percent of the area's median family income. However, they were consistent with targets set by the shared equity organizations and with the

buyers they wished to recruit. Of course, median incomes are different across metros. For example, in South Florida, the median family income is just 60 percent of that in Washington, DC.

Applicants' low incomes were somewhat surprising, given that the typical applicant was a college graduate, older, and with a full-time job. We hypothesize that this is the result, to a large degree, of the field that these individuals are working in. Many occupations require a college degree but are not necessarily high paying, which puts a particularly strain on buying a home in areas with a high cost of living. Given the demographic data, which show most shared equity applicants had college degrees, were in their late 30s at the median, and worked full time, their low incomes are not likely the result of life cycle patterns (being young and starting a career). Rather, many shared equity applicants worked in jobs like office administration and healthcare that, though stable, may not be sufficiently lucrative to support their purchasing a market rate home.

At intake, applicants who owned or rented had a median monthly housing expense of $835; in addition, some applicants paid separate utilities that had a median monthly cost of $150 (table 4.4). Across all sites, 49 percent of applicants were housing cost burdened, defined as spending more than 30 percent of their income on housing and utility expenses. This share was close to the national figure for renters: roughly half are cost burdened at this level.

In addition to having incomes roughly 45 to 60 percent of median family income across the sites, applicants had little net worth. Homeownership (even with resale restrictions) provided an opportunity for applicants to begin building wealth. The all-site median applicant net worth was $712. The mean was nearly $13,000. The median and mean statistics reported in table 4.4 show considerable differences for a select number of measures. Mean statistics can be inflated due to a small number of applicants with extremely high levels of assets or debts.

On the debt side of the balance sheet, total debts outstanding in the last 6 months as recorded on their credit record averaged $6,144 for all applicants. At baseline, roughly four in five applicants had revolving debt (for example, via a credit card), with a median of balance of $1,393 (for those with such debt). Roughly one-third had an auto loan, with a median balance of $11,276 and roughly one-fifth had student loan debt, with the median balance of $16,006. With respect to debt in collections, 35 percent of applicants had at least one collection outstanding on their credit record. This was the same as the share of all Americans with debt in collections (Ratcliffe et al. 2014).

The median asset level was $6,500 for all applicants. Most applicants had checking or savings accounts, and the median balance of those who did was $1,141 and $2,844 respectively. For the quarter of applicants with retirement accounts, the median amount was $10,000. Fewer applicants had

investment accounts; those who did had a median balance of $7,651 (table 4.4). Although applicants' net worth was low, the typical applicant saved some money to purchase a home. As of the program intake date, roughly two-thirds reported they had saved for a home purchase. When asked specifically how much of their assets were set aside to purchase a home, the median amount was $5,500.

One key constraint in obtaining a mortgage is meeting lenders' creditworthiness standards. The median borrower FICO score of all originated mortgages has hovered around 740 since June 2012 (Urban Institute 2016). The median baseline credit score for applicants as reported by a major credit bureau was 696. While this is close to the median credit score for FHA borrowers (at roughly 680), buyers through these programs cannot make use of FHA-insured mortgages, per FHA's implementation of its rules on shared equity loans.

Also of interest, programs asked applicants at baseline to report their credit score if they knew it. Just over sixty percent of applicants reported a credit score, with the remaining indicating they did not know it. (Knowing ones credit score may indicate, among other things, that the applicant is further along in the mortgage finance process, and has checked his or her credit report.)

TABLE 4.4

Financial and Creditworthiness Characteristics of Shared Equity Program Applicants

Financial characteristics	*N*	Mean	Median
Household income	624	$42,743	$41,415
Household income / median family income	624	51%	
Monthly housing costs	603	$837	$835
Monthly utilities	384	$175	$150
Housing cost burdened	468	49%	
Net worth	605	$12,856	$712
Total debt	605	$ 20,495	$6,144
Revolving debt	456	$2,950	$1,393
Auto loan debt	208	$12,519	$11,276
Student loan debt	128	$22,805	$16,006
Credit utilization rate	605	26%	
Any 90- to 180-day nonmortgage delinquencies	605	16%	
At least one account in collections	605	35%	
Total assets	683	$32,269	$6,500
Checking + savings balance	487	$12,264	$3,719
Retirement account balance	184	$30,139	$10,000
Investment account balance	66	$24,665	$7,651
Past foreclosure	683	2%	
Savings for home purchase	500	$15,699	$5,500
Credit score	599	682	696
Credit score self-reported	680	61%	

Sources: CHIP application data; credit bureau data.

Notes: Data are given only for applicants with the type of account or debt specified.

Neighborhood Characteristics

The neighborhoods in which applicants lived varied across the sites with respect to poverty rate and median income. Among applicants, the average poverty rate for their baseline census tracts was 13 percent (table 4.5). The median income of tracts in which applicants lived was $61,125.

On average, non-Hispanic whites accounted for about 55 percent of residents in applicant neighborhoods yet this proportion differed quite a bit by site. For example, Burlington stood out for its high share of white applicants. This was also the case for its surrounding MSA, as shown in appendix D. Washington DC; Nashville, and South Florida applicants lived in neighborhoods that had significantly higher shares of black residents than did their surrounding MSAs. Austin applicants lived in neighborhoods with greater shares of Hispanic residents than the overall MSA, but in South Florida applicants lived in neighborhoods with lower shares of Hispanics than the MSA.

Shared equity applicants lived in neighborhoods where more one-third (34 percent) had a bachelor's degree or higher (table 4.5). Applicants in Washington, DC, lived in neighborhoods with the highest percentage of college degree holders (51 percent) while the lowest was in South Florida (19 percent).

TABLE 4.5

Characteristics of Shared Equity Program Applicants' Neighborhoods

Neighborhood characteristics	*N*	Mean
Poverty rate	607	13%
Median household income	607	$61,125
Median occupied home value	602	$296,441
Homeownership rate	607	55%
White non-Hispanic	607	59%
Black non-Hispanic	607	15%
Hispanic	607	17%
Other non-Hispanic	607	3%
Bachelor's degree or higher	607	34%

Sources: CHIP application data; US Census Bureau, American Community Survey (2010–14).
Note: As a point of reference, these characteristics are displayed at the MSA-level, by site in appendix D.

Chapter 5. Shared Equity Home Purchases

In this chapter we describe "take-up" rates for the program and the baseline characteristics of applicants who purchased shared equity homes. We compared these shared equity buyers, at baseline, with those who did not purchase shared equity homes—a group comprised of nonpurchasers and people who bought homes, but not through the programs. Finally, we describe the financial characteristics of the shared equity transactions themselves.

This study's first research question is whether shared equity programs resulted in households being more likely to purchase homes than they would otherwise. Over one-third (36 percent) of shared equity applicants completed the process and purchased a home through the program. However, some applicants who did not purchase through a shared equity program ultimately purchased a home—about 20 percent of all applicants (and 32 percent of those not buying through shared equity programs). These "other" purchases may have involved other subsidy or homeownership supports, or buyers may have used conventional mortgages without any external assistance. About 44 percent of applicants did not purchase a home at all.

Not purchasing a home through the program is not necessarily a negative outcome. In some cases, an applicant being able to purchase a home through conventional means may be preferable because full appreciation accrues to the purchaser. Similarly, certain applicants may be better off not purchasing a home at all if they are not financially ready. Indeed, one benefit of a shared equity homeownership program may be helping applicants to determine when they should not purchase a home, thereby saving them from financial stress, delinquency, and foreclosure.

Rates of purchasing shared equity homes varied by site from 21 percent in Austin to 52 percent in Nashville (table 5.1). Although Nashville had the highest rate, it also had one of the fewest numbers of applicants (29). South Florida, alternatively, had one of the highest numbers of applicants (114) but one of the lower rates of purchasing shared equity homes (22 percent). Burlington had the highest number of applicants (136) and one of the highest shared equity purchase rates, at 50 percent. It is worth acknowledging that the rate at which applicants purchased shared equity homes could vary according to several factors, including those having to do with the potential pool of applicants, but also programmatic ones like whether sites ask people to officially apply early or late in the process, and whether sites allow buyers to bring homes into the program ("buyer-driven" approaches).

TABLE 5.1

Shared Equity Program Purchases by Site

Site	Applicants *N*	% Purchasers *N*	% Purchasers % of Applicants
Austin, TX	111	23	21
Bay Area (San Francisco), CA	25	12	48
Burlington, VT	136	68	50
Long Island (Hauppauge), NY	48	15	31
Nashville, TN	29	15	52
Park City, UT	68	20	29
Seattle, WA	102	49	48
South Florida	114	25	22
Washington, DC	50	17	34
Total	**683**	**244**	**36**

Source: CHIP HomeKeeper administrative data.

Home Purchasers

To understand which applicants chose to purchase a home through a shared equity program and which did not, we first look at the baseline mean characteristics of shared equity purchasers, "other" purchasers, and nonpurchasers (table 5.2). We test for statistical differences in baseline characteristics controlling for site fixed effects, as more applicants purchased homes in some sites than in others.

As shown below, shared equity purchasers were similar at baseline to the combined group of other purchasers and nonpurchasers. We observed no differences in age, gender, marital status, sole-applicant status, race, living arrangement, employment, income, housing costs, housing burden, net worth, debt levels, assets, credit scores, or neighborhood characteristics. Shared equity purchasers did pay less for utilities at baseline, were less likely to have at least one account in collections or a past foreclosure, were more likely to have completed a technical certification, and were more likely to self-report their credit score. (Net worth and assets appear higher on average for shared equity purchasers than for all other applicants, but the differences were not statistically significant. The differences are driven by a few high asset applicants who purchased homes. We present the median values in appendix B.)

Similarly, shared equity purchasers did not differ much from other purchasers on observable characteristics at baseline. There were no meaningful differences in most demographic or residential characteristics. So too with incomes, assets, debts, delinquencies, collections, foreclosures, credit scores, and several neighborhood attributes. The "other purchaser" group did have somewhat higher

monthly utility costs, were somewhat more likely to be housing cost burdened, and lived in neighborhoods with lower home values, but higher homeownership rates.

Shared equity purchasers and nonpurchasers who applied to shared equity programs also had similar demographic characteristics, incomes, debts, and neighborhood attributes at baseline. However, other measures showed that nonpurchasers were less ready to buy homes than those who bought shared equity homes (and those who bought homes apart from a shared equity program). For example 19 percent of nonpurchasers had a nonmortgage 90- to 180-day delinquency at baseline, compared with 11 percent of shared equity purchasers. Fifty percent of nonpurchasers had an account in collections versus 23 percent of shared equity purchasers. Nonpurchasers had roughly half the amount saved for a home as shared equity purchasers. Nonpurchasers were also more likely to have had a foreclosure (3 percent versus 0.4 percent).

TABLE 5.2

Baseline Characteristics of Shared Equity Program Applicants by Home Purchase Status (Averages)

		Other Purchasers and Nonpurchasers		
Statistic	**Shared equity purchaser**	**Combined**	**Other purchaser**	**Non purchaser**
Demographics (%)				
Age				
Less than 30	20	21	24*	20
30–39	41	36	42	33
40–49	16	21	18	22
50–59	12	13	14	12
60 years or older	12	9	1***	12
Female	55	61	51	66
Married	38	34	33	34
Sole applicant	60	67	65	67
Race				
White non-Hispanic	54	39	50	34
Black non-Hispanic	22	23	19	25
Hispanic	9	24	17	28
Other non-Hispanic	15	14	15	13
Renter	81	80	82	79
Other/lives with family	15	17	14	19
Homeowner	4	3	4	2
Lives in studio or 1-bedroom home	25	21	23	20
Lives in 2-bedroom home	35	38	37	39
Lives in 3-bedroom home or larger	40	41	40	41
Educational Attainment				
HS diploma or less	16	18	16	19
Technical certification	5	9***	4	12***
Some college	16	18	22	17

Statistic	Shared equity purchaser	Other Purchasers and Nonpurchasers		
		Combined	Other purchaser	Non purchaser
College graduate	48	38	52	32
Employment				
Full time	83%	81%	88%	77*
Part time	8%	9%	6%	11**
Self employed	4%	6%	4%	6
Other	5%	4%	2%	6
Finances				
Household income	$44,192	$41,089	$44,190	$39,435
Household income/median family income (%)	54	51	54	49
Monthly housing costs	$838	$838	$893	$809
Monthly utilities	$98	$139**	$142**	$137
Housing cost burdened (%)	37	49	48*	49
Net worth	$29,968	$2,725	$7,641	-$79
Total debt	$21,501	$19,900	$26,875	$15,923
Revolving debt	$2,444	$2,094	$2,759	$1,714**
Auto loan debt	$3,646	$4,694	$4,561	$4,769
Student loan debt	$4,386	$5,085	$4,856	$5,216
Credit utilization rate (%)	25	27	27	27
Any 90- to 180-day nonmortgage delinquencies (%)	11	18	17	19*
At least one account in collections (%)	23	43**	31	50***
Total assets	$49,101	$22,915	$35,491	$17,088
Checking + savings balance	$4,088	$2,685	$2999	$2,510
Retirement account balance	$14,815	$10,000	$12,830	$8,191
Investment account balance	$37,121	$12,941**	$11,448**	$13,756
Savings for home purchase	$20,406	$12,535	$15,752	$10,552*
Past foreclosure (%)	0.4	2*	1	3*
Credit score	704	669	698	653**
Credit score self-reported (%)	81	50**	71	41**
Census Tract Characteristics				
Poverty rate (%)	14	13	12	13
Median household income	$62,448	$60,346	$62,868	$58,920
Median occupied home value	$315,677	$285,204	$296,286*	$278,956
Homeownership rate (%)	54	56	58*	54
White non-Hispanic (%)	61	57	60	56
Black non-Hispanic (%)	14	16	14	17
Hispanic (%)	14	18	17	19
Bachelor's degree or higher (%)	38	33	38	30
Number of individuals	**244**	**439**	**139**	**300**

Sources: CHIP application data; CHIP HomeKeeper administrative data; US Census Bureau, American Community Survey (2010–14); credit bureau data.

Notes: Sample restricted to primary applicant only. T-stats are based on standard errors clustered at the site level. Sixty applicants were not matched to credit bureau data. Figures presented above are means.

*** = significantly different from shared equity purchasers at 1 percent, ** = significantly different from shared equity purchasers at 5 percent, * = significantly different from shared equity purchasers at 10 percent.

We next looked at a linear probability model to estimate which characteristics are associated with home purchase through a shared equity program rather than apart from the program or not at all (table 5.3). We find that when we hold other variables constant, participants age 60 and older were 14.6 percentage points more likely to purchase a home through a shared program than those younger than 30. Participants who reported their credit score at baseline (an indication that they had checked their score recently, which may also be a proxy for readiness to buy) were also more likely to purchase a home through the program, this time by 23.8 percentage points. Conversely, applicants with a past foreclosure were 24.3 percentage points less likely to purchase a shared equity home, and those with a student loan were 7.4 percentage points less likely to purchase a shared equity home. Similarly, a ten percent increase in income was associated with a 19 percentage point decrease in probability of purchasing a shared equity home indicating that higher income individuals were less likely to purchase. Participants who applied to the program in 2012 were 18.1 percentage points more likely to purchase a home than those who applied in 2013, though the reasons for this are not clear.

TABLE 5.3

Predictors of Shared Equity Home Purchase Using Baseline Characteristics

Characteristic	Shared equity purchase
Age	
Less than 30	[omitted]
30–39	0.0521
	(0.0390)
40–49	-0.037
	(0.055)
50–59	-0.010
	(0.052)
60 or older	0.146*
	(0.077)
Gender	
Female	-0.020
	(0.035)
Marital status	
Married	0.038
	(0.047)
Race	
White non-Hispanic	[omitted]
Black non-Hispanic	0.002
	(0.072)
Hispanic	-0.099
	(0.069)
Other	-0.069
	(0.050)
Educational Attainment	
HS diploma or less[b]	[omitted]

Characteristic	Shared equity purchase
Technical certification[b]	-0.080
	(0.049)
Some college[b]	0.010
	(0.037)
College graduate[b]	-0.006
	(0.047)
Financial characteristics	
Log of household income[b]	-0.019***
	(0.004)
Log of monthly housing costs[b]	0.001
	(0.010)
Student loan	-0.074*
	(0.034)
Log of total assets[a]	0.011
	(0.008)
Past foreclosure	-0.243***
	(0.065)
Credit score[b]	0.000
	(0.000)
Credit score self-reported	0.238***
	(0.053)
Neighborhood characteristics	
Log of median occupied home value[b]	0.019
	(0.059)
Percent with a bachelor's degree or more[b]	-0.078
	(0.097)
Applied in 2012	0.181***
	(0.045)
Observations	610
R-squared	0.239
Adjusted R-squared	0.191

Sources: CHIP application data; CHIP HomeKeeper administrative data; US Census Bureau, American Community Survey (2010–14); credit bureau data.
Notes: Robust standard errors clustered at the site level are reported in parentheses. Site fixed effects are included.
[a] dummy for zero included.
[b] dummy for missing included.
*** p<0.01, ** p<0.05, * p<0.1

Shared Equity Transactions

Shared equity home purchases are financed through a combination of subsidies, mortgage financing, and buyer cash investment (down payment), as illustrated in figure 5.1. The deployment of subsidies varies across organizations, but in all cases shared equity programs enable buyers to purchase homes

for below the market value ensuring the home sells at a discount to the market value. This is done by capping the resale price or providing cash grants to the buyer, or some combination of the two. In either case, a portion of the shared equity subsidies remain with the home due to the resale restrictions. In addition to the shared equity subsidies, programs may provide, or buyers may access, other cash subsidies like grants and forgivable loans to make their homes more affordable. Combined, these forms of assistance represent the total subsidy in each sale.

As a point of reference, we consider shared equity home purchases in the context of what the home would have sold for in the absence of a shared equity program. We refer to this hypothetical price as the "unrestricted market value." This value is an estimate derived using available information about the home and other homes in the immediate area. For example, the home may be assessed by municipal assessors and assigned a value for tax purposes. Or "comp sales" of nearby homes may be used by the program to estimate the market value of a shared equity home.

As a share of the unsubsidized market price of their home, those who bought a home through a shared equity program received the equivalent of 37 percent of the home's value in subsidies. The remaining 64 percent was paid for using a combination of cash investment and mortgage financing.

Buyer subsidies are transfers to the homebuyer to support the home purchase, and include the following:

1. Grants, which can reduce the price of the home, serve as down-payment assistance, or serve as closing cost assistance;
2. Deferred loans, which do not accrue interest for a specified period;
3. Forgivable loans, which homebuyers only need to repay if they sell their home within a specified period, after which the forgivable loan behaves as a grant; and
4. Equity held by the program, which allows the program to maintain the below-market price of the home for future qualified homebuyers.[20]

FIGURE 5.1

Shared Equity Purchase Financing

Note: "Cash subsidy" includes additional buyer grants, forgivable mortgages, and deferred mortgages.

Table 5.4 presents how shared equity purchasers in this study financed their purchases. The average unrestricted market value of homes purchased through shared equity programs was approximately $241,000. Buyer subsidies reduced the homebuyer's price by 39 percent, worth on average roughly $94,000. After investing an average of about $11,000 in a down payment, homebuyers used mortgage financing to pay the remaining amount, roughly $138,000, or 57 percent of the unrestricted market value of homes.

TABLE 5.4

CHIP Purchaser Funding Sources

	Average amount	Share of unrestricted market value (%)
Unrestricted market value	$240,676	100
Buyer subsidy	$94,292	39
Buyer cash investment	$10,792	5
Buyer financing	$137,864	57

Source: CHIP HomeKeeper administrative data.

There were some notable differences by site (table 5.5). Some sites provided subsidy by discounting homes relative to the market value, while others made up the difference by offering grants directly to buyers. We found that some programs like in the Bay Area and Washington DC sold homes at a discount to market value and offered subsidies of 37 percent and 51 percent respectively. They paid for their homes through a combination of down payments and financing. On Long Island, on the other hand, buyers purchased homes primarily with grants and paid at or close to the market value. This type of program still allowed buyers to purchase homes at about 68 percent of their unrestricted value.

The average first lien mortgage interest rate[21] for shared equity homebuyers was 4.13 percent. For context, since 2010 average 30-year fixed mortgage rates have ranged from a high of 5.21 in April 2010, to a low of 3.35 in May of 2013.[22]

TABLE 5.5

CHIP Purchaser Funding Sources, by Site

	All Sites	Austin, TX	Bay Area, CA	Burlington, VT	Long Island, NY	Nashville, TN	Park City, UT	Seattle, WA	South Florida	Washington, DC
Unrestricted market value	$240,676	$194,840	$496,163	$196,265	$282,080	$140,167	$256,583	$283,126	$207,011	$263,344
Buyer subsidy	$94,292	$78,153	$183,401	$59,918	$91,478	$27,509	$60,703	$147,379	$97,329	$134,479
% of unrestricted market value	39.2	40.1	37.0	30.5	32.4	19.6	23.7	52.1	47.0	51.1
Buyer cash investment	$10,792	$286	$62,539	$8,600	$12,377	$1,403	$34,120	$3,521	$1,461	$12,163
% of unrestricted market value	4.5	0.1	12.6	4.4	4.4	1.0	13.3	1.2	0.7	4.6
Buyer financing	$137,864	$116,401	$250,221	$135,433	$178,224	$111,254	$161,760	$132,226	$108220	$116,702
% of unrestricted market value	57.3	59.7	50.4	69.0	63.2	79.4	63.0	46.7	52.3	44,3

Source: CHIP HomeKeeper administrative data.

Note: Unrestricted market value was recorded in HomeKeeper. However for records in Austin, Bay Area, and South Florida where unrestricted values were not available, we estimated market the value using square footage of the home and price per square foot data for the metro area.

Chapter 6. Shared Equity Buyer Outcomes

Shared equity programs may produce near-term financial benefits for those who would otherwise be unable to buy a home. And these programs may lead to financial gains over time, especially if they result in more manageable monthly payments. Programs may also help individuals purchase homes in neighborhoods with higher home values and education levels than they would have been able to otherwise.

The approach typically considered most rigorous for understanding program effects is a randomized controlled trial (Theodos et al. 2014). In well-designed randomized control trials, those receiving an intervention are comparable in observable and unobservable ways to a control group of people not receiving the intervention. The shared equity programs could not randomize access to their homes, however. We thus needed to create comparison groups without the assurance that these individuals are comparable to shared equity buyers in the characteristics we cannot observe.

As described in chapter 3, to get as full a picture as possible, we estimated outcomes for shared equity purchasers in three ways. First, we compared financial outcomes for shared equity purchasers with all program applicants who did not purchase a shared equity home. We also compared shared equity purchasers to applicants who purchased outside the program, looking at mortgage outcomes in addition to nonmortgage and neighborhood outcomes. Last, we compared shared equity purchasers to an entirely different group of purchasers who were not shared equity applicants but had similar observable characteristics at baseline; we examined mortgage, nonmortgage, and neighborhood outcomes for these groups.

We found that shared purchasers had smaller mortgages than other applicant purchasers and that they had lower monthly payments on all credit accounts. There were no other differences in nonmortgage, mortgage, or neighborhood outcomes when comparing shared equity buyers to other applicants, or the subset of other applicants that purchased homes outside of the shared equity programs. When comparing shared equity purchasers to nonapplicant purchasers with similar observable characteristics, we again found that shared equity purchasers had smaller mortgages and had smaller monthly payments on all credit accounts. We also saw that they were less likely to have HELOCs, and had higher accounts in collections. All these results were robust to adjustments

accounting for tests of multiple outcomes. After making such adjustments, we did not see differences in other financial and neighborhood metrics.

Shared Equity Purchasers versus All Other Applicants

We first compared shared equity purchasers with all other applicants who did not purchase a shared equity home. This group consists of both applicants who purchased a home outside of a program, and applicants who did not purchase at all.

These findings are displayed in table 6.1. The first row "shared equity purchaser" displays the regression derived estimate of the association between shared equity purchasers (versus all other applicants) and the outcome in question, controlling for other factors. The second row displays the estimate of the association between the outcome variable measured at baseline and the outcome variable at follow-up. These estimates show that the model is working, at least in the sense that the baseline measures are strongly correlated with the outcome measure of interest. (Several other variables noted in the table, but not shown, were included as control variables in each model.)

We found that shared equity purchasers showed no detectable differences in post-purchase credit score, credit utilization rate, revolving debt, nonmortgage delinquencies, or collections compared with all other applicants. In other words, the shared equity purchasers did no worse and no better, that we could detect, than applicants who did not purchase shared equity homes. There were also no detectable differences in the share of adults with a bachelor's degree living in an applicant's census track or the median occupied home value in the census tract, indicating that shared equity applicants did not move to neighborhoods that differed greatly from those in which non–shared equity purchasers lived at the end of the study.

TABLE 6.1

Financial Characteristics of Purchasers versus All Other Applicants

	Credit score	Credit utilization rate	Revolving debt[a]	Any 90- to 180-day nonmortgage delinquencies	At least one account in collections	% of neighborhood with a bachelor's degree or more	Neighborhood median occupied home value
Shared equity purchaser	2.136	-0.038	$182.5	-0.006	0.009	-0.018	-$7,792
	(6.804)	(0.042)	($576.2)	(0.033)	(0.027)	(0.021)	($9,649)
Dependent variable measured at baseline	0.662***	0.219***	$0.55***	0.127*	0.384***	0.495***	$79,513**
	(0.034)	(0.058)	($0.15)	(0.065)	(0.061)	(0.044)	($32,780)
Observations	574	568	568	568	568	610	567
R-squared	0.591	0.251	0.219	0.214	0.540	0.570	0.605

Sources: CHIP HomeKeeper administrative data; US Census Bureau, American Community Survey (2010–14); credit bureau data.

Notes: Robust standard errors clustered by site in parentheses for most variables. However, due to concerns about the small number of clusters, we report unclustered standard errors for the few cases in which those standard errors were larger. The regression-adjusted models include the following control measures: gender, age, race, education attainment, marital status, site dummies, log of total assets at baseline, whether applicant reported credit score on application, whether applicant had a past foreclosure, log of total monthly rent and utilities, baseline credit score, whether applicant had a student loan at baseline, log of household income, percent of baseline neighborhood with a bachelor's degree or more, log of baseline neighborhood median occupied home value, whether the applicant appeared as a purchaser in HomeKeeper data but not in credit bureau data, and whether the applicant applied in 2012 (versus later).

a. Revolving debt does not include HELOCs.

*** p<0.01, ** p<0.05, * p<0.1.

Shared Equity Purchasers versus Other Applicant Purchasers

We next compared shared equity purchasers to shared equity applicants who purchased outside of a program, the "other purchasers" described in chapter 4.[23] These outside purchases could have included other forms of subsidy such as down payment assistance, or they could have been funded through traditional mortgages with no additional assistance.

As in the above analysis, we did not detect that shared equity purchasers had higher or lower credit scores, credit utilization rates, revolving debt, or nonmortgage delinquencies than other applicant purchasers. These results are shown in table 6.2, which can be interpreted in a manner similar to table 6.1.

Turning to mortgage outcomes, we found that purchasing a shared equity home was associated with, on average, $36,346 less credit on open mortgage trades compared with other purchasers, indicating that shared equity purchasers were taking out smaller mortgages than applicants who purchased outside a program (table 6.2). Additionally, on average, shared equity purchasers paid $235 less on all credit accounts each month (including mortgages). These results were robust to the Bonferroni correction for multiple comparisons (which is described further in the following section). We found no differences between shared equity purchasers and all other purchasers on 90- to 180-day delinquencies on mortgages or number of open HELOCs.

We also found no differences in neighborhood characteristics such as percentage with a bachelor's degree and median occupied home value (table 6.2). Thus, while shared equity purchasers were getting smaller mortgages, we found they moved into similar neighborhoods as outside purchasers.

TABLE 6.2

Nonmortgage, Mortgage, and Neighborhood Characteristics of Shared Equity Purchasers versus Other Applicant Purchasers

	Credit score	Credit utilization rate	Revolving debt[a]	Any 90-to 180-day nonmortgage delinquencies	At least one account in collections
Shared equity purchaser	2.121	-0.064	$-720.70	0.013	0.009
	(8.694)	(0.040)	($898.70)	(0.036)	(0.037)
Dependent variable measured at baseline	0.624***	0.263**	$0.53***	0.197*	0.390***
	(0.0637)	(0.102)	($0.14)	(0.0918)	(0.036)
Observations	345	342	342	342	342
R-squared	0.580	0.360	0.260	0.273	0.571

Sources: CHIP HomeKeeper administrative data; US Census Bureau, American Community Survey (2010–14); credit bureau data.

Notes: Robust standard errors clustered by site in parentheses for most variables. However, due to concerns about the small number of clusters, we report un-clustered standard errors for the few cases in which those standard errors were larger. The regression-adjusted models include the following control measures: gender, age, race, education attainment, marital status, site dummies, log of total assets at baseline, whether applicant reported credit score on application, whether applicant had a past foreclosure, log of total monthly rent and utilities, baseline credit score, whether applicant had a student loan at baseline, log of household income, percent of baseline neighborhood with a bachelor's degree or more, log of baseline neighborhood median occupied home value, whether the applicant appeared as a purchaser in HomeKeeper data but not in credit bureau data, and whether the applicant applied in 2012 (versus later).

a. Revolving debt does not include HELOCs.

*** p<0.01, ** p<0.05, * p<0.1

TABLE 6.2 CONTINUTED

Nonmortgage, Mortgage, and Neighborhood Characteristics of Shared Equity Purchasers versus Other Applicant Purchasers

	Monthly payment on credit accounts	Credit on open mortgage trades	Any open HELOCs reported in the last 6 months	Any 90-to 180-day mortgage delinquencies	% of neighborhood with a bachelor's degree or more	Neighborhood median occupied home value
Shared equity purchaser	-$235**	-$36,346**	-0.008	0.001	-0.001	$12,072
	($94)	($13,848)	(0.019)	(0.015)	(0.020)	($11,554)
Dependent variable measured at baseline	$0.35**	$0.21	0.312***	-0.179	0.390***	$53,914
	($0.11)	($0.17)	(0.0491)	(0.0966)	(0.0426)	($31,822)
Observations	342	342	342	342	350	343
R-squared	0.438	0.499	0.249	0.172	0.522	0.659

Sources: CHIP HomeKeeper administrative data; US Census Bureau, American Community Survey (2010–14); credit bureau data.

Notes: Robust standard errors clustered by site in parentheses for most variables. However, due to concerns about the small number of clusters, we report un-clustered standard errors for the few cases in which those standard errors were larger. The regression-adjusted models include the following control measures: gender, age, race, education attainment, marital status, site dummies, log of total assets at baseline, whether applicant reported credit score on application, whether applicant had a past foreclosure, log of total monthly rent and utilities, baseline credit score, whether applicant had a student loan at baseline, log of household income, percent of baseline neighborhood with a bachelor's degree or more, log of baseline neighborhood median occupied home value, whether the applicant appeared as a purchaser in HomeKeeper data but not in credit bureau data, and whether the applicant applied in 2012 (versus later). The indicator "any foreclosures" was not able to run in this model given the lack of observations with a foreclosure.

*** p<0.01, ** p<0.05, * p<0.1

Shared Equity Purchasers versus Nonapplicant Purchasers

Finally, we compared shared equity purchasers to nonapplicant home purchasers using a propensity score matching approach. Effective matching will balance observable baseline characteristics between the shared equity purchasers and the matched comparison group. In table 6.3, we explored how effectively this study matched shared equity home purchasers with the unmatched comparison group by comparing baseline characteristics. After restricting the analysis to individuals who were credit bureau home purchasers, the sample consisted of 186 shared equity purchasers, 301 individuals in the unmatched comparison group and 93 in the matched comparison group.[24]

In table 6.3, "Shared Equity Purchasers,", "Unmatched Comparison Group," shared equity purchasers," "unmatched comparison group," and "matched comparison group" show average characteristics of shared equity purchasers, unmatched nonapplicant home purchasers, and matched nonapplicant home purchasers, respectively, before the program intervention. For example, the share of individuals who had a credit score between 650 and 700 at baseline was 23.1 percent among the shared equity purchasers, 14.3 percent within the unmatched comparison group, and 21.5 percent within the matched comparison group.

"Statistical differences: shared equity purchasers vs. unmatched group" tests whether shared equity purchasers and the unmatched comparison group had different baseline characteristics. Shared equity purchasers had significantly lower credit scores, were younger on average, had lower incomes, and had lower revolving debt than the unmatched group of home purchasers. This difference most likely reflected that the programs targeted less well-off populations with limited access to mortgages. In addition, shared equity purchasers were more likely to live in areas that have higher shares of non-Hispanic blacks.

"Statistical differences: shared equity purchasers vs. matched group" tests whether shared equity purchasers and the matched comparison group had different baseline characteristics. We observed that the matched group was not statistically different from the shared equity group in all baseline characteristics.[25]

TABLE 6.3

Test of Balancing Covariates

Baseline

Baseline means	Shared equity purchasers	Unmatched comparison group	Statistical difference	Matched comparison group	Statistical difference
Individual characteristics					
Credit score distribution (%)					
<650	17.7	19.3		20.4	
650–699	23.1	14.3	**	21.5	
700–749	23.1	20.6		19.9	
750–799	26.3	27.2		24.7	
≥800	9.7	18.6	***	13.4	
Age	36.1	41.9	***	36.5	
Household income	$40.516	$49,192	***	$39,037	
Credit utilization rate (%)	24.4	27.2		20.0	
Revolving debt	$2,731	$4,651	***	$2,178	
Any 90-to 180-day nonmortgage delinquencies (%)	9.7	10.3		10.2	
Monthly payment on credit accounts	$332	$438		$330	
Student loan (Y/N)	21.5%	20.9%		26.3%	
At least one account in collections	19.4%	21.3%		19.9%	
Neighborhood characteristics (census tract level)					
% of neighborhood with a bachelor's degree or more	25.9	27.0		27.1	
Neighborhood median occupied home value	$326,576	$307,133		$314,737	
Neighborhood racial/ethnic composition (%)					
Black non-Hispanic	12.1	6.7	***	14.0	
Hispanic	12.6	11.1		9.2	
Observations	**186**	**301**		**93**	

Sources: CHIP HomeKeeper administrative data; US Census Bureau, American Community Survey (2010–14); credit bureau data.

Notes: Propensity score is estimated using a Probit model with the following control variables at baseline: credit score, age and income as reported by the credit bureau, credit utilization rate, revolving debt, nonmortgage delinquency debt, indicator of student loans, at least one account in collections, monthly payment on credit accounts, any open home equity line, credit amount on open mortgage, mortgage delinquency, share of adults at each education level, share of population that is black, share of population that is Hispanic, median occupied home value, and site dummies. We used a nearest neighbor matching with replacement matching approach.

*** p<0.01, ** p<0.05, * p<0.1

Table 6.4 compares the outcomes of shared equity purchasers and the matched comparison group. In terms of mortgage outcomes, shared equity purchasers have on average significantly less mortgage credit than their matched counterparts. Though participants have on average $143,988 in credit on

open mortgage type trades, home purchasers in the matched comparison group have on average $224,780. This result most likely reflects the design of CHIP programs, in which shared equity applicants have access to subsidized housing and therefore lower housing costs. We did not observe any statistically significant difference in delinquency or rates of foreclosures on mortgages between these two groups, meaning that shared equity purchasers paid their mortgage debts as regularly as the matched comparison group. We found that shared equity purchasers were appreciably less likely to have a HELOC than the matched comparison group. Only 1 percent of shared equity purchasers had an open HELOC reported in their credit files compared to 17 percent of individuals in the matched comparison group. Several shared equity programs do not allow participants to take out HELOCs or other additional financing on their purchased homes.

While shared equity purchasers had on average $1,304 in monthly payments on credit accounts, purchasers in the matched comparison group had $1,950 in monthly payments on credit accounts. The lower monthly payments by shared equity applicants can be explained by smaller mortgage amounts since mortgage payments are included in credit account payments.

Beyond these outcomes, we also compared measures of financial standing for shared equity purchasers and the matched group. We did not observe any statistical difference between these two groups in their revolving debt, and nonmortgage delinquencies. While the average credit score of shared equity purchasers increased from baseline to follow-up, it did so by less than did the matched comparison group, meaning that at follow-up, credit scores were lower for shared equity purchasers than other purchasers. However, credit utilization rates—an indicator of how much debt consumers use relative to the debt they have available—were lower at follow-up for shared equity buyers than the matched comparison group. Like with credit scores, the share of shared equity purchasers with at least one account in collections went down from baseline to follow-up, but less than the matched comparison group, meaning that at follow-up, shared equity purchasers were more likely to have an account in collections.

We also compared the average characteristics of neighborhoods (census tracts) of shared equity purchasers and the matched comparison group and did not find that neighborhood education levels or neighborhood home values were significantly different between the two groups. Shared equity applicants lived, on average, in neighborhoods where 23 percent of adults had a bachelor's degree or more and the median home value was about $293,000. The matched comparison group lived, on average, in areas where 25 percent of adults had at least a bachelor's degree and the median home value was about $270,000. These results were not statistically different. The results indicate that the

restriction on housing supply for program participants did not make them more likely to live in lower-income neighborhoods than their counterparts.

TABLE 6.4

Follow-up Outcomes for Shared Equity Purchasers versus a Matched Comparison Group

Means	Shared equity purchasers	Matched comparison group	Difference	Standardized Effect Size
Credit score	724	737	-13.48*	-0.13
			(7.85)	
Credit utilization rate (%)	22.5	27.0	-4.63**	-0.17
			(2.25)	
Revolving debt	$4,475	$5,444	-$969	-0.14
			($871)	
Any 90- to180-day nonmortgage delinquencies (%)	7.0	10.2	-3.23	-0.11
			(3.29)	
At least one account in collections (%)	13.44	4.30	9.14***	0.32
			(2.07)	
Monthly payment on credit accounts	$1,304	$1,950	-$646***	-0.71
			($117)	
Credit on open mortgage trades	$144,042	$224,780	-$80,738***	-0.74
			($13,019)	
Any open HELOCs reported in the last 6 months (%)	1.1	17.2	-16.13***	-0.56
			(4.37)	
Any 90- to180-day mortgage delinquencies (%)	2.2	2.2	0.0	0.00
			(2.02)	
Any foreclosure (%)	0.0	0.5	-0.54	-0.10
			(0.54)	
% of neighborhood with a bachelor's degree or more	23.3	24.6	-1.41	-0.15
			(1.33)	
Neighborhood median occupied home value	$292,639	$269,797	$22,780	-0.06
			($17,406)	
Observations	**186**	**93**		

Sources: CHIP HomeKeeper administrative data, US Census Bureau, American Community Survey (2010–14); credit bureau data.

Notes: Propensity score is estimated using a Probit model with the following control variables at baseline: credit score, age and income as reported by the credit bureau, credit utilization rate, revolving debt, nonmortgage delinquency debt, indicator of student loans, at least one account in collections , monthly payment on credit accounts, any open home equity line, credit amount on open mortgage, mortgage delinquency, share of adults at each education level, share of population is black, share of population that is Hispanic, median occupied home value, and site dummies. We used a nearest neighbor matching with replacement matching approach. Standard errors are estimated using the expression derived in Abadie and Imbens (2006).

*** p<0.01, ** p<0.05, * p<0.1

It is possible to detect statistical significance errantly by chance, all the more when conducting multiple statistical tests. As the number of outcomes increases, so too does the likelihood of a Type I error, or incorrectly finding significance when it does not exist. To account for this, we estimated significance levels of these same outcomes using the Bonferroni correction for multiple comparisons, which corrects for the number of variables within larger groups of outcomes (table 6.5).

Using this correction, we found that shared equity purchasers had lower credit on open mortgage trades, lower monthly payments on credit accounts and, and lower likelihood of having a home equity line of credit. However, the relationship between shared equity and credit score was no longer significant, nor was utilization rate. But, the likelihood of having at least one account in collections was still significant for shared equity purchasers. Of course, all these outcomes were measured in the relatively near-term, and a longer-term study will be needed to investigate whether the lower mortgage costs for shared equity buyers translate into more secure financial standing relative to other buyers.

TABLE 6.5

Multiple Comparisons Analysis for Shared Equity Purchasers versus a Matched Comparison Group

Outcomes	Unadjusted *P*-value	Bonferroni correction significance level
Financial		
Credit score	0.086	
Credit utilization rate (%)	0.040	
Revolving debt	0.266	
Loan Performance		
Any 90- to180-day nonmortgage delinquencies (%)	0.327	
At least one account in collections (%)	0.000	***
Mortgage Amount		
Monthly payment on credit accounts	0.000	***
Credit on open mortgage trades	0.000	***
Mortgage Performance		
Any open HELOCs reported in the last 6 months (%)	0.000	***
Any 90- to180-day mortgage delinquencies (%)	1.000	
Any foreclosure (%)	0.321	
Neighborhood		
% of neighborhood with a bachelor's degree or more	0.287	
Neighborhood median occupied home value	0.191	

Sources: CHIP HomeKeeper administrative data, US Census Bureau, American Community Survey (2010–14); credit bureau data.
Notes: P-values from estimated using a Probit (propensity score) model. Control variables described in table 6.4. We used a nearest neighbor matching with replacement matching approach.

Chapter 7. Implications for Practice and Policy

Shared equity homeownership has the potential to create affordable and sustainable ownership opportunities for low- and moderate-income families. Many applicants in this study's sample were able to buy shared equity homes (36 percent). The subsidies for the shared equity homes were sizeable—an average of $94,292, or 39 percent of the homes' value. Shared equity buyers had average incomes at baseline of 51 percent of the area median family income, lower than many homeownership supports. Together, these facts indicate that shared equity programs were serving their core mission of linking low- and moderate-income people with affordable owner-occupied housing.

The finding most notable across the different comparisons was that shared equity purchasers had lower mortgages and lower monthly payments than comparable buyers. At the point of follow-up, we found that shared equity purchasers performed largely the same as other applicants and the matched comparison group in terms of their other financial and neighborhood outcomes. Apart from accessing smaller mortgages, more time may be needed to understand whether and how shared equity purchasers are better or worse off financially compared with other buyers.

A fairly high proportion of those who did not buy a shared equity home purchased a home outside of the program (20 percent of all applicants). This may be appropriate sorting: people who do not need all the help shared equity gives should not accept it because they would be trading a sizable portion of the upside of their investment. The outside purchasers might suggest that the trade-offs between the subsidy and the long term equity are working. If no one had purchased outside of the programs, we might worry that the subsidy is actually too large, and that some of those households should have been purchasing on the conventional market. Some applicants did purchase outside of the programs and shared equity purchasers had low incomes as a percentage of median family income, suggesting that the programs are appropriately targeting those who need it.

The remaining applicants who did not buy any home were not able to buy, or their circumstances changed, and they were no longer interested. This may actually be a positive effect; discouraging people who are not ready to purchase a home from doing so, thus preventing future financial distress. Alternatively, it may well be the case some applicants would have benefited from greater help.

In particular, potential buyers might have benefitted from additional counseling. The credit market for mortgages is quite tight by historical standards. In 2015, lenders failed to make about 1.1 million

mortgages that they would have if conventional lending standards had been in place.[26] Shared equity helps lower monthly payments, but does not typically decrease credit standards for first mortgages. In this sample, about 29 percent of applicants at intake had a credit score below 680—a level below which conventional mortgages were not widely available during this time. This suggests that credit counseling or credit-repair services may broaden the pool of potential homebuyers. Recent research shows that financial coaching can help individuals increase savings, pay off debt, and raise their credit scores, suggesting that this approach could help shared equity applicants prepare for home purchase as well (Theodos, Simms et al. 2015).

Future Research

Assessing the impacts of homeownership can be a challenging endeavor because randomization is rarely possible and personal choice is involved in the decision to buy a home. For example, researchers have long been trying to determine what effect homeownership has on child outcomes, and they still disagree in many respects. Several studies found that homeownership was associated with positive youth outcomes such as increased years of schooling, reductions in teenage pregnancies, higher cognitive test scores, fewer behavioral problems, and higher income later in life (Boehm and Scholttmann 1999; Boyle 2002; Green and White 1997; Haurin, Parcel, and Haurin 2002). However, other studies have found that once other factors are controlled for, the benefits of homeownership disappear (Barker and Miller 2009; Holupka and Newman 2012; Mohanty and Raut 2009).

Here too determining the true causal effect of shared equity programs on buyer outcomes is difficult, as shared equity buyers may differ in unobservable ways from applicants who chose not to buy and those who bought apart from the programs. However, by combining all these comparisons into one study, we investigated the relationships between shared equity programs and buyer outcomes. We could control for a robust set of baseline conditions, including baseline measures of the outcome variables of interest, thus removing some of our concerns about bias. Our study also followed the Great Recession, and thus does not reflect that atypical period in the housing market. And the study included a wide range of programs and housing markets.

More research is needed, though, to explore the causal relationship between shared equity and buyer outcomes, such as via a randomized controlled trial. A promising approach would be to leverage the opening of a large development for which demand exceeds supply and for which a lottery represents the fairest means of distributing the scarce resource of shared equity housing subsidies. This

sort of approach would be especially helpful in establishing the extent to which these programs create more homeowners than would happen absent the existence of this form of subsidy.

Other questions remain as well. Most important in our minds is whether the benefits of reduced mortgage costs redound in meaningful ways to owners over time. It is possible that these buyers will subsequently differentiate themselves from other buyers in their levels of savings, debt, financial stress, and mortgage delinquency and foreclosure. This study was only able to observe buyers through June 2016; longer-term follow-ups would be useful.

Neighborhood outcomes also merit further investigation. For some programs, it is plausible that shared equity approaches allow for low- and moderate-income households to buy homes in more expensive neighborhoods than they could otherwise afford. However, some programs in this study brought homes online through funding sources that may not have prioritized more affluent neighborhoods, or even that actively targeted distressed neighborhoods, such as the Neighborhood Stabilization Program.

A Growing Field

Through this study, and as recorded in our baseline report (Theodos, Temkin, et al. 2015), we heard staff articulate that shared equity programs must become larger to be more financially sustainable. Across the country, many shared equity programs manage or own only a few units. Representatives of the shared equity programs in this sample estimated they require about 300 units in portfolio to generate sufficient revenue to cover annual operating expenses. But scaling up requires additional subsidy and subsidy remains a challenge. Bringing homes into a shared equity program while preserving affordability is expensive. Inclusionary zoning is growing, and remains a good tool for hot-market cities. But this approach is not likely to be sufficient in these rapidly appreciating markets, nor will it be the solution for mid- and cool-market cities. Thus, accessing sufficient subsidy will be critical, but it is hard to imagine such funding emerging at large levels in a constrained spending environment.

Moreover, although shared equity programs have been in place for more than 30 years, the concept is still unfamiliar to many real estate agents, lenders, and prospective buyers. As a result, real estate agents may be hesitant to list shared equity properties or show them to their clients. Buyers are largely unaware of these approaches. And historically, lenders could not use their standard mortgage products for shared equity transactions, and such loans were not salable to the secondary market. Most can now use Fannie Mae's Desktop Underwriter, however, and are purchased by Fannie Mae. Further, with the

recently proposed Duty to Serve regulatory language including shared equity mortgages as "affordable housing preservation" lending, borrowers may be even more able to access financing for these loans.

Given challenges of scale, are other approaches available? Wall Street has shown increasing interest in creating privately financed equity-sharing models.[27] Such developments could quickly enable far more people purchase homes than will be possible through community land trusts, inclusionary zoning, limited equity cooperatives, and the like. But, these market-driven approaches will not preserve affordability over successive borrowers and questions remain about whether and how they can be established and sustained in a manner that best serves consumers while generating a reasonable return for investors.

Homeownership has fallen to its lowest level since 1965. Although important questions remain, this study offers evidence that shared equity models provide homeownership opportunities to lower-income households with less debt than they could otherwise achieve.

Appendix A. Codebook

TABLE A.1

Codebook for the Cornerstone Homeownership Innovation Partnership Evaluation

Variable	Description	Source
Date	Date of application	CHIP application data
Applied in 2012	1 Applicant applied to a shared equity program in 2012	CHIP application data
Application street	Baseline address - street	CHIP application data
Application city	Baseline address - city	CHIP application data
Application state	Baseline address - state	CHIP application data
Application zip	Baseline address - zip code	CHIP application data
Sole applicant	Applicant did not apply with co-applicant	CHIP application data
Tenure status	1. Renter 2. Other/live with family 3. Homeowner	CHIP application data
Number of bedrooms in current home	1. Studio or 1 bedroom 2. 2 bedrooms home 3. 3 bedrooms or more	CHIP application data
Monthly housing costs	Self-reported monthly housing costs	CHIP application data
Housing cost burdened	Monthly housing cost greater than 30 percent of gross monthly income	CHIP application data
Monthly utilities	Self-reported monthly utilities cost	CHIP application data
Log of monthly costs	Log(monthly housing and utility costs	CHIP application data
Age	1. Less than 30 2. 30-39 3. 40-49 4. 50-59 5. 60 or older	CHIP application data
Female	Applicant is female	CHIP application data
Race	1. White non-Hispanic 2. Black non-Hispanic 3. Hispanic 4. Other non-Hispanic (American Indian, Alaska Native, Asian, Native Hawaiian, or Pacific Islander)	CHIP application data
Ethnicity	1. Hispanic 2. Not Hispanic	CHIP application data
Marital status	1 if applicant is married (not single, divorced, separated, or widowed)	CHIP application data
Site	1. HomeBase, Austin, TX 2. Champlain Housing Trust, Burlington, VT 3. City First Homes, Washington, DC 4. South Florida Consortium, FL 5. Hello Housing, Bay Area (San Francisco), CA 6. Long Island Housing Partnership, Long Island (Hauppauge), NY 7. Mountain Lands Community Housing Trust, Park City, UT 8. The Housing Fund, Nashville, TN 9. Homestead CLT, Seattle, WA	CHIP application data
Employment status	1. Full time	CHIP application data

Variable	Description	Source
	2. Part time 3. Self employed 4. Other	
Occupation	Self-reported occupation, manually matched to industry codes	CHIP application data
Household income	Self-reported gross annual household income	CHIP application data
Household income divided by median family income	Household income divided by median family income	CHIP application data
Total assets	Self-reported checking account balance plus savings account balance, plus retirement account balance, plus investment account balance, plus real estate assets, plus CDs, plus other assets	CHIP application data
Checking + savings balance	Self-reported checking account balance plus savings account balance	CHIP application data
Retirement account balance	Self-reported retirement account balance	CHIP application data
Investment account balance	Self-reported investment account balance	CHIP application data
Net worth	Total assets – total debts	CHIP application data; credit bureau data
Credit score self-reported	1 if applicant reported credit score on application	CHIP application data
Savings for home purchase	Self-reported amount saved specifically for buying a home (down payment, closing costs)	CHIP application data
Education attainment	1. High school diploma or less 2. Technical certification 3. Some college 4. College graduate	CHIP application data
Past foreclosure (self-reported)	1 if applicant has ever been involved in the foreclosure process (self-reported)	CHIP application data
Shared equity purchaser	1 if the individual purchased a home through a shared equity program during the study period	CHIP HomeKeeper administrative data
Unrestricted market value	Value of the home if it were available on the unrestricted open market; estimated using list price per square foot data in Austin, the Bay Area, and South Florida	CHIP HomeKeeper administrative data
Noncash subsidy	The amount of home equity held by the shared equity organization; the difference between the purchase price and the home's appraised unrestricted market value	CHIP HomeKeeper administrative data
Noncash subsidy percentage	Noncash subsidy as a percentage of unrestricted market value	CHIP HomeKeeper administrative data
Cash subsidy	Cash transfers to the homebuyer to support the home purchase, to include grants, deferred loans, and forgivable loans	CHIP HomeKeeper administrative data
Cash subsidy percentage	Cash subsidy as a percentage of unrestricted market value	CHIP HomeKeeper administrative data
Buyer cash investment	The amount that the homebuyer contributed to the home's down payment	CHIP HomeKeeper administrative data
Buyer cash investment percentage	Buyer's cash investment as a percentage of unrestricted market value	CHIP HomeKeeper administrative data
Buyer financing	The amount of mortgage and other financing used by the buyer to purchase the home (not including forgivable and deferred mortgages)	CHIP HomeKeeper administrative data
Buyer financing percentage	Buyer's financing as a percent of unrestricted market value	CHIP HomeKeeper administrative data
Median family income	Median family income of the metropolitan statistical	HUD

Variable	Description	Source
	area	
Percent white non-Hispanic	Share of tract population that is non-Hispanic, white	2010–2014 American Community Survey
Percent black non-Hispanic	Share of tract population that is non-Hispanic, black	2010–2014 American Community Survey
Percent Hispanic	Share of tract population that is Hispanic	2010–2014 American Community Survey
Median occupied home value	Median occupied home value in tract	2010–2014 American Community Survey
Homeownership rate	Share of occupied homes that are owner occupied	2010–2014 American Community Survey
Percentage with a bachelor's degree or more	Share of tract population over age 25 whose highest level of education is a bachelor's degree	2010–2014 American Community Survey
Poverty rate	Share of families in tract below the federal poverty level	2010–2014 American Community Survey
Median household income	Median household income in tract	2010–2014 American Community Survey
Credit score	Vantage V3 score. When individuals are scoreable using both models, Vantage and FICO scores are generally comparable.	Credit bureau data
Home purchaser	1 if observation's mortgage debt increased by more than $10,000 during the study period, if their months since an opened mortgage at the end of the study was less than the study period, or if their number of mortgage trades increased by at least 1 during the study period.	Credit bureau data
Total debt	Total balance on credit accounts reported in the last six months	Credit bureau data
Any 90- to180-day nonmortgage delinquencies	1 if the individual showed one or more occurrence of 90-to 180-day delinquencies on nonmortgage trades	Credit bureau data
Monthly payment on credit accounts	Total monthly payment on credit accounts reported in the last six months (including mortgages)	Credit bureau data
At least one account in collections	1 if one or more trades are in collections	Credit bureau data
Number of open home equity line of credit in last six months	Total number of open home equity line of credit trades reported in the last 6 months	Credit bureau data
Any 90- to 180-day mortgage delinquencies	1 if one or more occurrence of 90- to 180-day delinquency in the last 24 months on mortgage type trades (excluding unsatisfied derogatory)	Credit bureau data
Credit on open mortgage trades in last six months	Total credit amount on open mortgage type trades reported in the last six months	Credit bureau data
Any foreclosures	1 if foreclosed first mortgage trades	Credit bureau data
Revolving debt	Total balance on open revolving trades reported in the last six months minus total balance on open HELOC trades reported in the last six months	Credit bureau data
Credit on open revolving trade in last six months	Total credit amount on open revolving trades reported in the last six months	Credit bureau data
Credit utilization rate	Revolving debt/credit on open revolving trades	Credit bureau data
Student loan debt	Total balance on open nondeferred student trades reported in the last six months	Credit bureau data
Auto loan debt	Total balance on open auto loan or lease trades reported in the last six months	Credit bureau data

Appendix B. Baseline Medians by Purchase Status

TABLE B.1

Baseline Characteristics of Shared Equity Program Applicants by Home Purchase Status (Medians)

		Other Purchasers and Nonpurchasers		
Statistic	**Sh. Eq. purchaser**	**Combined**	**Other purchaser**	**Nonpurchaser**
Finances				
Household income	$42,449	$40,000	$43,690	$38,400
Household income / median family income (%)	52	50	52	48
Monthly housing costs	$825	$845	$878	$800
Monthly utilities	$75	$119	$120	$117
Net worth	$1,945	$0	$1,376	$0
Total debt	$5,440	$7,224	$10,713	$4,961
Revolving debt	$795	$681	$1,062	$480
Auto loan debt	$0	$0	$0	$0
Student loan debt	$0	$0	$0	$0
Credit utilization rate (%)	12	15	19	11
Total assets	$9,059	$5,200	$10,300	$2,450
Checking/savings	$1,361	$1,000	$1,247	$1,000
Retirement account	$3,788	$2,080	$4,248	$1,398
Investment account	$11,040	$5,928	$5,928	$6,463
Savings for home purchase	$7,000	$5,000	$8,000	$3,000
Credit score	713	683	707	655
Census tract characteristics				
Poverty rate (%)	10	9	8	10
Median household income	$60,000	$57,804	$58,666	$57,049
Median occupied home value	$279,700	$254,800	$266,600	$246,900
Homeownership rate (%)	54	57	60	57
White non-Hispanic (%)	70	66	67	64
Black non-Hispanic (%)	5	6	6	6
Hispanic (%)	7	11	11	11
Bachelor's degree or higher (%)	39	32	39	29
Number of individuals	**244**	**439**	**139**	**300**

Sources: CHIP application data; CHIP HomeKeeper administrative data; US Census Bureau, American Community Survey (2010–14); credit bureau data.

Notes: Sample restricted to primary applicant only. T-stats are based on standard errors clustered at the site level. Sixty applicants were not matched to credit bureau data. Figures presented above are means.

Appendix C. Minimum Detectable Effects

In this appendix, we present the minimum detectable effects we can obtain in our estimations given a power level, significance level, sample size, and mean and standard deviation of the comparison group. The minimum detectable effect tells us the smallest effect on the outcome detectable for a given level of power and statistical significance. The power of the test is the probability that we will be able to reject the hypothesis of zero effect for a given effect size and a given statistical significance level. Sample sizes, as well as other design choices, will affect the power of a statistical test.

We present this power analysis for a few example metrics as illustrations: credit utilization rate, revolving debt, and any 90- to 180-day nonmortgage delinquency. The same logic would apply to all outcomes we analyze; we expect these three will provide the reader with a general sense of our ability to detect effects in this study. We conduct power calculations for a 10 percent significance level and 80 percent power level.

We first calculate the minimum detectable effects for the sample used in table 6.1. The estimation compares the outcomes between shared equity purchasers and all other applicants. Given the sample size and characteristics of the comparison group, we would be able to detect statistical difference greater than 6.9 percent for credit utilization rate, $1,161 for revolving debt, and 7.5 percent for any 90- to 180-day nonmortgage delinquency at a 10 percent significance level (table C.1). All differences estimated in table 6.1 are lower in magnitude than these minimum detectable effects, and therefore are not statistically significant.

TABLE C.1

Minimum Detectable Effects, Shared Equity Purchasers versus All Other Applicants

	Number of Observations	Comparison Group		
	Comparison/ treatment	Mean	Std. deviation	Minimum detectable effect
Credit utilization rate	380/225	0.295	0.329	0.069
Revolving debt	380/225	$3,690	$5,544	$1,161
Any 90-to 180-day nonmortgage delinquency	380/225	0.153	0.360	0.075

Source: Credit bureau data.
Note: We use a 10 percent significance level and 80 percent power level in the minimum detectable effects calculations.

We now turn to the sample used in the estimations presented in tables 6.2 and 6.3, which compare the outcomes between shared equity purchasers and other applicant purchasers. From this power analysis, we would be able to detect statistical difference greater than 8.5 percent for credit utilization rate, $1,778 for revolving debt, and 7.0 percent for any 90- to 180-day nonmortgage delinquency at a 10 percent level between these two groups (table C.2). All differences estimated in table 6.2 are lower in magnitude than these minimum detectable effects, and therefore are not statistically significant at a 10 percent level.

TABLE C.2

Minimum Detectable Effects, Shared Equity Purchasers versus Other Applicant Purchasers

	Number of Observations	Comparison Group		
	Comparison/ treatment	Mean	Std. deviation	Minimum detectable effect
Credit utilization rate	138/225	0.322	0.317	0.085
Revolving debt	138/225	$5,455	$6,600	$1,778
Any 90- to 180-day nonmortgage delinquency	138/225	0.073	0.260	0.070

Source: Credit bureau data.
Note: We use a 10 percent significance level and 80 percent power level in the minimum detectable effects calculations.

Finally, we calculate minimum detectable effects for the sample used for the estimations in table 6.5. In this estimation we compare outcomes between shared equity purchasers and a matched comparison group of nonapplicant purchasers. Given the sample size and characteristics of the comparison group, we would be able to detect statistical difference greater than 8.5 percent for credit utilization rate, $2,199 for revolving debt, and 8.8 percent for any 90- to 180-day nonmortgage delinquency at a 10 percent level (table C.3). All differences estimated in table 6.5 are lower in magnitude than these minimum detectable effects and therefore are not significant.

TABLE C.3

Minimum Detectable Effects, Shared Equity Purchasers versus Matched Comparison Group

	Number of Observations	Comparison Group		
	Comparison/ treatment	Mean	Std. deviation	Minimum detectable effect
Credit utilization rate	186/186	0.270	0.290	0.085
Revolving debt	186/186	$5,444	$7,551	$2,199
Any 90-to 180-day nonmortgage delinquency	186/186	0.102	0.304	0.088

Source: Credit bureau data.

Note: We use a 10 percent significance level and 80 percent power level in the minimum detectable effects calculations. Individuals in the matched comparison group are weighted by the numbers of matched shared equity home purchasers. For example, an individual in the comparison group matched to three shared equity home purchasers receives a weight of three in the statistical calculations.

Appendix D. Regional Demographic Characteristics

TABLE D.1

Characteristics of Regional Demographic Characteristics, by Site

Neighborhood characteristics	Austin, TX (Austin-Round Rock, TX Metro Area)	Bay Area, CA (San Francisco-Oakland-Hayward, CA Metro Area)	Burlington, VT (Burlington-South Burlington, VT Metro Area)	Long Island, NY (New York-Newark-Jersey City, NY-NJ-PA Metro Area)	Nashville, TN (Nashville-Davidson-Murfreesboro-Franklin, TN Metro Area)	Park City, UT (Summit Park, UT Micro Area)	Seattle, WA (Seattle-Tacoma-Bellevue, WA Metro Area)	South Florida (Miami-Fort Lauderdale-West Palm Beach, FL Metro Area)	Washington, DC (Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area)
Poverty Rate (%)	15	11	11	14	14	8	12	17	8
Median Household Income	$61,900	$80,008	$62,175	$66,902	$52,805	$89,886	$68,969	$48,435	$91,756
Median occupied home value	$196,500	$592,000	$252,000	$400,000	$171,700	$496,800	$315,700	$188,700	$373,300
Homeownership rate (%)	58	54	68	52	66	76	60	62	64
White non-Hispanic (%)	54	42	91	48	74	85	67	34	48
Black non-Hispanic (%)	7	8	2	16	15	0	5	20	25
Hispanic (%)	32	22	2	23	7	12	9	42	14
Other non-Hispanic (%)	9	33	7	14	6	4	23	5	16
Bachelor's degree or higher (%)	41	45	42	37	31	50	38	29	48

Source: US Census Bureau, American Community Survey (2010–14).

Notes

1. See Brett Theodos, Ellen Seidman, and Laurie Goodman, "11 questions you should ask before sharing your home equity with Wall Street," *Urban Wire* (blog), Urban Institute, December 14, 2016, http://www.urban.org/urban-wire/11-questions-you-should-ask-sharing-your-home-equity-wall-street.
2. Authors' calculation of 2015 American Community Survey data.
3. Ralph McLaughlin, "House Arrest: How Low Inventory is Slowing Home Buying," *Trulia's Blog*, March 21, 2016, http://www.trulia.com/blog/trends/inventory-price-watch-q116/, and "Rich City, Poor City: How Housing Supply Drives Regional Economic Inequality," *Trulia's Blog*, August 31, 2016, http://www.trulia.com/blog/trends/rich-city-poor-city/.
4. See *Zillow Research* blog posts by Svenja Gudell: "The US Housing Affordability Crisis: How a Rent and Low-Income Problem is Becoming Everyone's Problem," April 11, 2016, http://www.zillow.com/research/housing-affordability-q4-2015-12111/; "Q1 2016 Market Report: Tight Inventory, Rapid Price Growth Represent Real Headwinds for the Market's Core," April 21, 2016, http://www.zillow.com/research/inventory-by-tier-march-12226/; "Housing Highs and Lows: How the Home Affordability Gap between the Rich and Poor Is Widening," July 10, 2016, http://www.zillow.com/research/affordability-2016q1-12763/; and "A Wealth of Problems: How the Housing Bust Widened the Rich-Poor Gap," July 12, 2016, http://www.zillow.com/research/foreclosures-and-wealth-inequality-12523/. Also see McLaughlin: "House Arrest" and "Rich City, Poor City."
5. Ibid.
6. Laurie Goodman, Jun Zhu. And Bai, Bing, "Overly tight credit killed 1.1 million mortgages in 2015," *Urban Wire* (blog), Urban Institute, November 21, 2016, http://www.urban.org/urban-wire/overly-tight-credit-killed-11-million-mortgages-2015.
7. Data from the US Census Bureau Housing Vacancies and Homeownership, https://www.census.gov/housing/hvs/data/histtabs.html.
8. Ibid.
9. Capital Impact developed a set of baseline eligibility criteria for CHIP that required applicants to (1) be classified as nonprofit organizations, (2) provide stewardship services to homeowners, (3) serve predominantly low-income homebuyers, (4) have a commitment to outcomes tracking and a willingness to participate in the evaluation component, and (5) meet a 1:1 matching funds requirement (Capital Impact Partners 2011).
10. The comprehensive assessment was a multistage process that allowed each finalist and CHIP staff to get to know one another better and assess whether the program would be a good fit for CHIP funding (Capital Impact Partners 2011).
11. See Grounded Solutions Network, "About," accessed December 27, 2016, http://groundedsolutions.org/about/.
12. Program profiles are current as of our interviews and later updates reflected in Theodos, Temkin et al. 2015; they may not reflect the status as of 2016.
13. Also, note that the Federal Housing Finance Authority included shared equity mortgages as "affordable housing preservation" lending in the Duty to Serve rule proposed December 2016.
14. Funding was discontinued one year earlier than anticipated. To accommodate this shorter timeline and decrease in funding, this report includes outcome analyses relying only on credit bureau and program data, not survey data as originally designed.
15. HomeKeeper is a data collection and workflow management tool. More information is available at www.myhomekeeper.org.

16. Since enrollment took place over two years, we purchased two separate baseline data points and assigned purchasers to 2012 if they purchased before or during June 2013, and 2013 if they purchased after June 2013. This allowed us to ensure that baseline data was as close to the point of application as possible.

17. Linear Probability models have the advantage that the parameter estimates can be directly interpreted as the "mean marginal effect" of covariates on the outcome and site dummies can be interpreted as unobservable fixed-effects (Angrist and Pischke, 2008). As a sensitive test, we also estimate average marginal effects using a Probit model and the results were very similar.

18. We tried and failed to use the distance of baseline residence to the centroid of the supply of shared equity homes in each site as an instrumental variable for shared equity purchase. However, the instrument proved to be weak making this estimation approach invalid.

19. Authors' calculation of 2013 American Community Survey data.

20. This equity may never be expressly included in the transaction (i.e., the home may be sold at the resale restricted price). Alternatively, the home could sell at the market price, with a program providing an equivalent amount of cash upon sale (with resale restrictions still applying).

21. For the 199 shared equity buyers for whom we had detailed funding source data.

22. Freddie Mac, "30-Year Fixed Rate Mortgage Average in the United States© [MORTGAGE30US]," FRED, Federal Reserve Bank of St. Louis, accessed December 29, 2016, https://fred.stlouisfed.org/series/MORTGAGE30US.

23. Credit bureau data captured 192 out of the 244 shared equity purchasers as home buyers. Reasons for the credit bureau not identifying shared equity purchasers as home buyers include purchasing the home with cash or purchasing through a program that does not report mortgage to credit bureau agencies. For example, the Habitat for Humanity programs in this study do not report about the mortgages they originate to credit bureaus.

24. Because of the matching procedure with repetition, individuals of the matched comparison group were weighted by the number of matches for statistical calculation purposes. For example, an individual in the comparison group matched to three shared equity home purchasers receives weight of three in the statistical calculations.

25. We also estimated the distribution of propensity scores in the treatment and comparison groups. Our visual analysis shows significant overlap between those distributions and therefore the common support assumption is likely to hold.

26. Laurie Goodman, Jun Zhu. And Bai, Bing, "Overly tight credit killed 1.1 million mortgages in 2015," *Urban Wire* (blog), Urban Institute, November 21, 2016, http://www.urban.org/urban-wire/overly-tight-credit-killed-11-million-mortgages-2015.

27. Theodos, Seidman, and Goodman, "11 questions you should ask before sharing your home equity with Wall Street."

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