Debt, Jobs, or Housing: What's Keeping Millennials at Home?

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Abstract

This paper uses the FRBNY Consumer Credit Panel (CCP), based on Equifax credit reports, to examine the residence choices of young Americans from 1999 to 2013. We document a persistent upward trend in the rates at which 25 and 30 year olds coreside with parents over the period, along with a decline in homeownership for the young. Coresidence with parents among both 25 and 30 year olds follows an unbroken, almost linear upward trajectory over the period, with no clear response to the business cycle. In this respect, it is similar to aggregate U.S. student debt. The rate of homeownership at 30 shows the most readily apparent business cycle sensitivity of the residence choices that we consider, beginning a steep decline around the start of the Great Recession. However, simple time trends provide no evidence of a response to the recent housing and job market recoveries in 25 and 30 year olds' residence choices. Instead, early homeownership continues to decline, and coresidence with parents continues to increase, through 2013. In an effort to decompose the contributions of housing market, labor market, and student debt changes to the observed changes in young Americans' living arrangements, we model flows into and out of coresidence with parents. Estimates suggest countervailing influences of local housing market and employment conditions on coresidence: youth labor markets at home and away appear to be the strongest determinants of location choice, with weak youth employment driving young workers to alternative locations. Strengthening local economies where parents live lead children to move out, and yet, fixing youth employment conditions, strengthening local economies where children live drive them home. Finally, we find that young people in areas with high student debt costs of schooling are substantially more likely to live at home at 25 and 30.

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The role of first time homebuyers in the ongoing recovery of the U.S. housing market is the focus of growing interest and speculation. The National Association of Realtors (NAR) points to a drop in first time homebuyers' share of existing home purchases to 30 percent from its long-standing level of roughly 40 percent as a headwind in the housing recovery. NAR President Steve Brown cites student loans as the primary factor holding back first-time buyers (NAR 2014). The Consumer Financial Protection Bureau has discussed the potential for student debt to slow household formation among the young, and to delay homeownership (CFPB 2013). Agarwal, Hu, and Huang (2013) describe a steep decline in homeownership among 25 to 34 year olds in the Federal Reserve Bank of New York's (FRBNY) Consumer Credit Panel (CCP). Our recent FRBNY blog post relays time series evidence consistent with a retreat among young consumers in general, and student borrowers in particular, from housing and auto markets (Brown and Caldwell 2013).

At the same time, available evidence points to an ongoing increase in young Americans' rate of living at home with their parents, rather than forming new households. Recent work on household formation has emphasized its relationship to employment and to poverty. Dyrda, Kaplan, and Rios-Rull (2012) demonstrate a substantial influence of household formation responses to the business cycle on the Frisch elasticity of labor supply, and show that accounting for household changes increases the responsiveness of labor supply to wages by as much as 45 percent. Duca (2013) finds a close relationship between 1979-2013 time series on U.S. 18-64 year olds' rate of coresidence with parents and U.S. poverty rates, which is not meaningfully weakened by accounting for the availability of mortgage credit. He infers that ongoing secular trends in poverty and inequality are producing a permanent shift in Americans' living patterns. The dual trends of decreasing early homeownership and extended coresidence with parents may portend slow recoveries of both consumption and the housing market, as young people living "at home" delay major purchases and general entry into economic life.

This paper investigates the residence choices of young people in the CCP, and their relationship to evolving local house prices, local employment conditions, and the student debt reliance of local college students. We document persistent upward trends in aggregate rates of coresidence with parents among 25 and 30 year olds. We discuss a range of coresidence measurement concerns, demonstrate a similar upward trend using CPS data, and cite other sources suggesting a similar trend. Homeownership in the CCP declines from 2005 forward for 25 year olds, and from 2008 forward for 30 year olds, following steady or modestly increasing youth homeownership rates during the housing boom. We note the rapid increase in student debt prevalence and balances over the period, which, like living with parents, shows little or no response in aggregate time series to the business cycle. Given the expansion of student debt over the period, we divide 30 year olds into student debtors and non-student debtors and look again at homeownership rates. We find steady homeownership rates in the two groups, higher for student

borrowers, from 2003-2008, and then a sudden retreat from housing markets following 2008 that is decidedly steeper for student borrowers than for non-student borrowers. This suggests a meaningful role for (increasingly prevalent) student debt in the housing decisions of Millennials.

Finally, we relate the approximately linear trend in coresidence with parents, and the homeownership trend, with its stable rates early in the period followed by persistent declines, to trends in the aggregate conditions faced by young consumers. While student debt follows an unwavering upward trajectory, total unemployment, youth unemployment, and house prices demonstrate the pronounced boom, bust, and recovery of 2002-2013. Hence the business cycle sensitivity of housing decisions would appear to provide an early picture of the relative importance of student debt and broader economic conditions to young consumers' housing choices. From this perspective, the decision to stay home with parents appears to be more closely tied to the student borrowing phenomenon, while housing choices (when not living with parents) appear to be more closely tied to economic conditions. The failure of young homeownership to track the housing market recovery, however, remains a puzzle.

These aggregate trends, while informative, mask evolving local relationships among housing cost, labor markets, and youth residence choices. The fine geographic data and long panel of the CCP allow us to exploit time variation in local economic conditions and student debt reliance to learn more about the contributions of jobs, housing costs, and student debt to the decisive aggregate trends toward parents, and away from economic independence, that we observe for recent cohorts of young adults. At the same time we will be able to account for general cultural shifts in attitudes or preferences among young adults and their parents for sharing housing. We model the flows of young consumers into and out of parents' households over time as a function of patterns in local unemployment, youth unemployment, house prices, and student debt per recent graduate.

Estimates indicate that local youth unemployment and local student debt reliance (per graduate) are the strongest determinants of coresidence with parents. When youth unemployment increases by one percentage point in her parent's region, our estimates imply that a youth is 0.6 to 1.5 percentage points more likely to move out. Where youth unemployment increases by one percentage point in a youth's location, she is 0.03 to 0.3 percentage points more likely to move home. Further, an increase of $1000 of average student debt per graduate among the current graduating cohort in the youth's state is associated with a 0.3 percentage point decrease in the probability that the student moves away from home, and a 0.05 to 0.08 percentage point increase in the probability that the student moves back home.

The effects of local economic conditions are substantial but complex. Effects of local total unemployment and house prices operate in opposing directions for youth living with parents and living on their own. Conditioning on state-level youth unemployment, both falling local unemployment and rising local house prices where parents live help youth to move away from parents. These effects are substantial

and precisely estimated, but sensitive to the inclusion of state student debt balances per graduate. The pattern is consistent with a circumstance in which more affluent parents, experiencing rising economic conditions, are better able to fund children's moves away from home. Parents facing worsening local labor and housing markets are forced to leave students with debt and cannot finance moves away from home.

On the other hand, improving local economic conditions for youth living away from home, on average, drive youth back to parents. A one percentage point decrease in unemployment away from home increases the probability of moving home by 0.1 percentage points. Similarly, a 1 percentage point increase in house prices away from home increases the probability of moving home by 0.02 percentage points.[1] The latter is robust to the inclusion of local student debt reliance among recent graduates and college graduation rates. This suggests that strong economic conditions where youth live independently tend to increase prices, particularly housing prices, and, as a result, tend to drive youth home to parents.

Net effects of employment and housing market swings on coresidence with parents, therefore, are mixed. This may explain some part of the failure of aggregate residence trends to track the recent pronounced boom, bust, and recovery as one might predict. If parents fund children's moves away from home out of labor and asset income, and yet children's ability to support living away relies on cheap housing and consumer goods markets, then the net effect of local economic changes on coresidence with parents is ambiguous. Instead of aggregate boom-bust patterns, coresidence with parents may track relative employment and housing price patterns in locations favored by older and younger residents. Nevertheless, the influence of student debt on coresidence patterns appears unambiguous: as student debt balances and prevalence trend ever upward, young consumers, on net, trend toward home.

The paper proceeds as follows. We describe the FRBNY Consumer Credit Panel in general, and as employed in this study, in Section I. Section II investigates broad trends in residence choices, debt, and economic conditions from 1999-2013, in both the CCP and other sources. In Section III, we lay out a simple empirical model of flows into and out of the parents' home. Section IV reports and interprets findings based on the model, and Section V offers concluding thoughts.

I. Data

a. The FRBNY Consumer Credit Panel

The FRBNY Consumer Credit Panel (CCP) is a longitudinal dataset on consumer liabilities and

[1] Note that the variation in house prices over the period is substantially greater in our sample than the variation in local unemployment rates. For example, while the standard deviation of county-level unemployment, at the individual level, over the period in our sample is 3.7, the standard deviation of zip code-level house price index over the period in our sample is 80.1. Hence the magnitude of the 0.02 percentage point response of moving home to a one percentage point change in the zip code house price index is also substantial.

repayment. It is built from quarterly consumer credit report data collected and provided by Equifax Inc. Data are collected quarterly since 1999Q1, and the panel is ongoing. Sample members have Social Security numbers ending in one of five arbitrarily selected pairs of digits (for example, 10, 30, 50, 70, or 90), which are assigned randomly within the set of Social Security number holders. Therefore the sample comprises 5 percent of U.S. individuals with credit reports (and Social Security numbers). The CCP sample design automatically refreshes the panel by including all new reports with Social Security numbers ending in the above-mentioned digit pairs. Therefore the panel remains representative for any given quarter, and includes both representative attrition, as the deceased and emigrants leave the sample, as well as representative entry of new consumers, as young borrowers and immigrants enter the sample.[2]

In sum, the CCP permits unique insight into the question at hand as a result of the size, representativeness, frequency, and recentness of the dataset. Its sampling scheme allows extrapolation to national aggregates and spares us most concerns regarding attrition and representativeness over the course of a long panel.

While the sample is representative only of those individuals with Equifax credit reports, the coverage of credit reports (that is, the share of individuals with at least one type of loan or account) is fairly complete for American adults. Aggregates extrapolated from the data match those based on the American Community Survey, Flow of Funds Accounts of the United States and SCF well.[3] However, because we focus on young people's coresidence decisions, we restrict our dataset to 25- and 30-year-olds, which have lower coverage than later ages; coverage ranges between 78 and 94% for 25-year-olds and between 91 and 100% for 30-year-olds, increasing from 1999 to 2007 and decreasing from 2007 to 2013 (compared to estimates from the US Census).[4] However, we do have some information about individuals not covered in the CCP; we know how many live in each state (based on Census figures), and we know that, in nearly all cases, they do not have consumer debt or credit (in which case they would be covered by Equifax). We use this information to analyze and bound our estimates below.[5]

We construct a cohort-level dataset from the CCP by extracting a panel of all individuals who turn 25 or 30 years old in each year between 1999 and 2013. The panel thus increases in length by cohort-

[2] See Lee and van der Klaauw (2010) for details on the sample design.
[3] See Lee and van der Klaauw (2010) and Brown et al. (2013) for details.
[4] We use the 2008 Census population projections as 'true' population data from 1999 to 2011 and the 2012 Census year-age population projects for 2012 and 2013. In each case, this is the most accurate available data on population size by age, year, and state.
[5] Lee and van der Klaauw (2010) extrapolate similar populations of U.S. residents aged 18 and over using the CCP and the American Community Survey (ACS), suggesting that the vast majority of US individuals at younger ages have credit reports. Jacob and Schneider (2006) find that 10 percent of U.S. adults had no credit reports in 2006, and Brown et al. (2013) estimate that 8.33 percent of the (representative) Survey of Consumer Finances (SCF) households in 2007 include no member with a credit report. They also find a proportion of household heads under age 35 of 21.7 percent in the 2007 SCF, 20.64 in the 2007Q3 CCP, and 20.70 from Census 2007 projections, suggesting good representation of younger households in the CCP.

year, as we are able to see further into individuals' past (back to the 1999 CCP start date). Because the time-series aspect of our study drastically increases the number of observations, we only pull a random 0.1% sample of the covered U.S. population, instead of the full CCP 5%. There are 55,656 25-year-olds and 58,819 30-year-olds in the dataset, of whom we have 1.19 million and 1.72 million observations, respectively. Finally, we balance our panel by including null observations in all quarters in which Equifax provides no credit report for an individual (starting at age 18), as well as including null observations for individuals who we do not observe as having a credit report at age 25 or 30 (imputing the number of such individuals at the state level from the U.S. Census). Our final dataset includes a total of 3.08 million observations.

Each observation in the CCP includes the (anonymized) information in an individual's credit report at the end of that quarter (e.g. zipcode, birth year, total balances of 10 types of consumer debt, etc.) as well as the information in the credit reports of all members of that individual's household, where households are defined by street address (down to an apartment number).[6] These data lead us to define coresidence (with parents) to be the circumstance in which a young person (here either a 25- or 30-year-old) resides at the same street address as at least one (Equifax-covered) individual who is between 15 and 45 years older than her, without regard to household head status or the relationship between the household members.[7] Data from the Center for Disease Control and Prevention's (CDC) National Vital Statistics System show that, for children born in 2012, 99.8% of mothers and 84.7% of documented fathers were within this age range (15-45). Moreover, we define individuals who live in households of more than 10 people (3.7% of 25-year-olds and 3.6% of 30-year-olds) as *not* coresiding, because most situations in which one would live in such a large household (prison, military, trailer park) are not such that the individual is in their parents' household.[8] Note that our definition might overestimate the aggregate rate of coresidence with parents due to a possible lag between a young person's switching their home address and updating their credit report address (as reported by financial institutions), which might bias the aggregate coresidence rate upwards.

We use a similar approach to categorize individuals who are not coresiding into three types. An individual is defined as living alone if she is the only (Equifax-covered) resident at her street address. We then divide the remaining individuals into those who live with only one other person and those who live with more than one other person, excluding households with more than 10 people and individuals whose

[6] See Avery et al. (2003) for a detailed discussion of the contents, sources, and quality of credit report data.
[7] We exclude all household members younger than age 18 because their credit histories are censored by Equifax. We also exclude household members with empty credit files, as those individuals' addresses may no longer be accurately recorded by their creditors, or thereby by Equifax itself.
[8] We also assume that individuals whose address is listed as a post office box do not coreside (4% of 25-year-olds, and 5% of 30-year-olds).

report lists a post office box address.

The CCP includes both loan-level 'custom attributes' for mortgages, HELOCs, HELoans, and student loans as well as aggregate 'credit trends' for each of these loan types. We use the former data to define an individual as a homeowner if she has originated or continued to hold a mortgage, HELOC, or HELoan within the past four years. We also use the custom attribute data to define an individual as a holder of student debt if they hold at least one positive-balance student loan, and calculate an individual's joint-account-corrected total student debt as the sum of the outstanding balances on their first 20 student loans.[9] We define an individual as having ever had a student loan if, at any time in the Equifax panel (even outside our sample period) she holds at least one student loan with an origination date that falls within our sample period.

The CCP also includes the Equifax risk score of covered individuals. This risk score is similar to the FICO score, in that both model 24 month default risk as a function of credit report measures.[10] It varies between 280 and 840 and represents an assessment of the individual's credit-worthiness, with a mean of 625 for 25-year-olds and 642 for 30-year-olds in our sample.

b. Other data sources

Annual county-level unemployment data are drawn from the Bureau of Labor Statistics's (BLS) Local Area Unemployment Statistics (LAUS) program. The unemployment data are reported on a monthly basis, and they cover a total of 3,145 counties. We calculate the youth unemployment rate at the state level using employment data from 18- to 30-year-old individuals in the CPS, aggregated from months to quarters.[11] The average youth unemployment rate across states over our sample is 9.9%, ranging from 1.8% in 2000 Connecticut to 22.1% in 2010 West Virginia.

House price appreciation values are calculated at the zip code level using data from the CoreLogic housing price index (HPI). The CoreLogic HPI uses repeat sales transactions to track changes in sale prices for homes over time, and it is the most comprehensive monthly house price index available. The CoreLogic data cover a total of 6739 zip codes (representing 58% of the total U.S. population, and to 61% of observed 25- and 30-year-olds in our sample) in all 50 states and the District of Columbia.

Using the CCP's loan-level joint-account-corrected student loan balance data, we calculate the average student debt burden per graduate as the gross third-quarter student debt held by 24-year-olds in that state-year over the total number of college graduates from universities in that state-year. We calculate the total number of graduates using the Integrated Postsecondary Education Data System (IPEDS),

[9] At no time in our sample period did more than 0.1% of holders of student debt have more than 20 student loans.
[10] The consumer credit score provided by Equifax is based on a different methodology than the FICO score, but it predicts the same probability of severe delinquency over the next 24 months. See Lee and van der Klaauw (2010).
[11] CPS youth unemployment data is only available from 1999-2012.

summing over the number of graduates of four-year and two-year institutions who receive Bachelor's degrees within 150% of the normal completion time in that state-year. We also calculate the average graduation rate as the ratio of the total number of graduates to the total number of 24-year-olds in that state, as estimated by the US Census. The average graduation rate across states over our sample is 28.4%, and the average state-level per-graduate student debt burden is $18,950.

II. Aggregate trends in the economic conditions facing young consumers and their residence choices

a. *Coresidence with parents: measurement and trends*

Figure 1 depicts the proportion of U.S. 25 and 30 year olds living with "parents" in the CCP from 1999-2012.[12] As above, we define living with parents as sharing an address, including an apartment number if one exists, with at least one household member who is 15-45 years older. Note that this includes a range of coresidence circumstances, including coresidence with a parent or parents in which the child is the economic dependent, coresidence with a parent or parents in which the parent is the economic dependent, coresidence with a spouse or partner's parents, coresidence with a grandparent, and even rooming with an older spouse or non-relative. Evidence from the CPS, available upon request from the authors, suggests that the overwhelming majority of households with this age profile consist of children living with parents or parents-in-law. Hence from this point we refer to this living arrangement simply as "coresidence with parents".

For 30 year old CCP sample members, we observe an increase in the rate of coresidence with parents from 19.4 percent in 1999 to 31.5 percent in 2012. Note that this pattern is free of life-cycle effects, as we measure coresidence with parents for the cross-section of CCP sample members who are 30 years old in each year. This substantial growth in living with parents is approximately monotonic over the period, and proceeds at a steady pace.

Among 25 year olds, the rate of growth is similar, though the levels, as expected, are higher. Coresidence with parents for 25 year olds grows from 29.0 percent to 48.9 percent between 1999 and 2012. As with 30 year olds, the trend for 25 year olds is approximately monotonic and the growth in coresidence is steady. Overall, the rate of coresidence with parents observed in the CCP grows by 62.3 percent for 30 year olds, and by 68.6 percent for 25 year olds, from 1999 to 2012. A striking change appears to have occurred since 1999 in the living arrangements of young consumers.

[12] The median individual born in a year turns 25 around July 1st 25 years later. In order to capture the average characteristics of 25-year-olds in a year, then, we use the observations of those born 25 years earlier from the first quarter of the following year, allowing for a six month lag in order to measure characteristics, on average, in the middle of the year in which the individual is 25, and aone-quarter lag from the median time at which those individuals would be 25.5 years old to account for delays in Equifax data updating.

There are several reasons why the coresidence rate measured using the CCP might differ from measures in other relevant sources. For example, a 2013 report from the Pew Research Center, based on their own analysis of the March Current Population Survey (CPS), reported that 32 percent of 18-31 year olds in 2007, 34 percent in 2009, and 36 percent in 2012 live with parents. However, the Pew analysis defines an individual as living with a parent only if she lives with a parent or step-parent, not a parent-in-law, and is not her- (or him-) self a head of household. Clearly, this narrows the definition of living with parents from the one used in our analysis.

Further, the CCP is unable to identify family relationships, though it does provide the age distribution of individuals living at the same address. Hence, our measure of coresidence with parents is an overestimate, as it contains the small minority of U.S. adults, described above, living with significantly older non-relatives. This should also increase our measure of coresidence relative to calculations like the Pew results. Another factor that might increase our measure of coresidence relative to survey-based measures is the possibility that mailing address correspondence, even with the requirement that apartment numbers match, may not perfectly measure residence in a shared housing unit.

In addition, credit report coverage of younger U.S. individuals is extensive but not complete, as described above. To the extent that the five to 14 percent of the youth population of the U.S. that is not represented in the trends in Figure 1 lives with parents, these trends will reflect understimates of the true underlying rate of coresidence with parents among young Americans. To the extent that the small unrepresented share of youth do not live with parents, the Figure 1 trends will be overestimates of the true rate of coresidence.

In order to address this concern, Figure 2 depicts the coresidence trends for 25 and 30 year olds when one assumes that all 25 and 30 year olds represented in the Census but not in the CCP (that is, individuals with no active credit history) live with parents, and then when one assumes that they live away from parents. This creates an upper and a lower bound on estimates of the coresidence rates of U.S. youth based on the CCP.

The more plausible assumption may be that Census youth not represented in the CCP live away from parents. Reasons behind this include institutional populations, such as military and prison populations, who generally live away from home and, we infer, have limited credit report coverage. Such populations tend to be young, and hence their credit report coverage and residence status are particularly relevant for this study of youth residence. According to the U.S. Bureau of Justice Statistics, 0.94 percent of U.S. resident adults were incarcerated at the end of 2011. Presumably the incarcerated shares of 25 and 30 year olds are greater. Similarly, as of 2010, 2.28 million U.S. adults were active duty or reserve

members of the armed forces.[13] This represents 1.2 percent of adults 18-64 years of age. Again, shares of the population in the military are likely much larger at ages 25 and 30. Though prison and military populations may have actively updating credit files, they are presumably more likely to be among the small share of 25 and 30 year olds without active credit files, and are of course substantially more likely than other young consumers to live away from parents.

The estimated trend in coresidence with parents in which we assume all youth represented in the Census but not in the CCP live away from parents is represented in Figure 2 by the series with long dashes, lying in each case below the CCP-only trend. These lower trends show an increase in coresidence with parents from 23.7 percent to 41.6 percent of 25 year olds, and from 17.2 to 29.4 percent of 30 year olds. Their slopes are quite similar to the CCP-only trends, while their levels are roughly 5 to 6 percentage points lower for the 25 year olds and two percentage points lower for the 30 year olds (for whom coverage in the CCP is fairly complete).

As a final check of our coresidence results using the CCP, we turn to the 1999-2012 waves of the CPS, and create coresidence measures designed to be similar to our CCP measures using the CPS. We construct U.S.-representative samples of 25 and 30 year olds in the CPS, using the CPS individual weights. From there, we create an indicator of coresidence with parents that equals one for any youth living in the same household with one or more individuals who are 15 to 45 years older.[14] The purple coresidence curves in Figure 2 panels (a) and (b) represent our coresidence calculations using these criteria in the CPS.

Coresidence rates measured in this manner in the CPS are similar to those based on the CCP and assuming Census youth not represented in the CCP live away from home, though the slope of the CPS coresidence curve is somewhat less steep. The inference that coresidence with parents rises markedly from 1999 to 2012 is accurate to both the CCP and the CPS series. For 25 year olds, the CPS coresidence curve lies quite close to the CCP curve that assumes youth without credit reports live away. Coresidence for 25 year olds in the CPS grows from 27 to 37 percent, for a 36 percent increase over the period. For 30 year olds, the CPS curve lies three to 10 percentage points below the CCP lower estimate, which in turn is quite close to the CCP-only estimate. The CPS curve depicts a steady growth in coresidence with parents from 1999 to 2010, followed by a very modest decline in coresidence with parents for 30 year olds in 2011 and 2012.

In sum, we observe a steady growth in coresidence with parents among U.S. youth. While the level of coresidence rates may be sensitive to measurement choices, the levels we obtain are similar enough across alternative methods and sources to suggest that our CCP measures are informative, and the

[13] See H.R. 4310, 112th Congress (2013).
[14] As on the CCP, we assume that any individual in a household of 10 or more persons is living away from parents.

marked upward trend in coresidence with parents is robust to all sources and methods discussed in this paper.

b. Trends in other living arrangements

Given general agreement that young Americans are staying home with parents at an increasing rate, what alternative living arrangements are they forsaking? Popular speculation suggests declining rates of first marriage among young people in the wake of the recession. After the release of the 2009 American Community Survey, Mather and Lavery (2010) noted a recession-era decline in the share of young people who had ever been married. Shortly after, Wolfers (2010) countered that this data artifact represented not a meaningful decline in stable relationships, but an ongoing increase in the age at first marriage in the U.S., coupled with an increase in cohabitation during the recession, which may have been motivated by a desire to cut living expenses. The relevant question for the current study, then, may be whether young Americans are choosing extended adolescence at home with parents in place of independent adulthood and marriage.

Our CCP measures do not allow us to measure the rates at which CCP sample members are marrying before and after the recession. They do not even allow us to measure cohabiting relationships, whether or not they involve marriage. What we can do, however, is look at trends in the rate at which young Americans coreside with one other adult of a similar age. The benefit of this approach is that it includes marriage with both opposite sex and same sex cohabitation, yielding a broader picture of trends in coresiding relationships over the period. The obvious drawback, however, is that it includes roommate pairs whose relationships are platonic. Our analysis of CPS household characteristics suggests that this later group is reasonably rare from at least the age of 30 onward.[15] Interpretation of trends in living with a single adult roommate of comparable age should, however, bear this inclusion in mind.

Figure 3 panels (a) and (b) show CCP trends from 1999 to 2012 in the rates at which 25 and 30 year olds, respectively, appear alone, with parents, with one adult of similar age to the file holder, and with two or more adults of similar age.[16] The latter category we interpret as roommates. We find a consistent pattern across the two age groups, though, of course, the level and growth of coresidence with parents is much great for 25 than for 30 year olds. At each age, the growth we observe in coresidence with parents appears to come at the cost of fewer young people living alone, and fewer young people living with young roommates. The rate of living alone, for example, falls from just above 30 percent for each age group in 1999 to 18 percent for 25 year olds, and 21 percent for 30 year olds, in 2012. The rates of living with roommates at the two ages follow a similarly steady decline. Cohabiting with one adult of

[15] Calculations available from the authors.
[16] By similar age, we mean 14 or fewer years older than the file holder. This cutoff is chosen to create mutually exclusive and exhaustive living arrangement categories.

similar age, however, follows a hump-shaped pattern for each group. For 25 year olds, the rate of such cohabiting relationships begins in 1999 at 16.3 percent, hovers for some years near 20 percent, and then gradually drops to 16.8 percent between 2008 and 2012, for a total gain over the period of 0.5 percentage points. Similarly, the rate for 30 year olds began at 23.7 percent in 1999, rose to a 2006 peak of 32.6, and dropped slightly between 2006 and 2012 to 29.7, for an overall growth in cohabiting relationships among 30 year olds over the period of 6 percentage points. In sum, the observed growth in coresidence with parents is balanced by steep declines in living alone and living with groups of roommates for 25 and 30 year olds; surprisingly, we see no clear evidence of a decline in cohabiting relationships in favor of living at home with parents in these data.

c. Youth homeownership and student debt trends in the CCP

The past decade has brought a widely recognized escalation of student debt. The most recent FRBNY Household Debt and Credit Report, based on CCP figures through 2013Q4, shows nominal aggregate student debt rising from $253 billion in 2003Q4 to $1.080 trillion in 2013Q4, for a total nominal growth of 327 percent over 10 years. The Office of Federal Student Aid (FSA), based on the National Student Loan Data System (NSLDS), reports an increase in nominal federal direct loan plus FFEL program and Perkins loan balances from $516 billion in 2007 to $1.040 trillion in the fourth quarter of 2013.[17] The private student loan market grew steadily during the boom of the mid-2000s, originations shrunk dramatically as a result of tightened underwriting standards in the wake of the Great Recession, and private student loan balances are only recently beginning to recover. MeasureOne reports a growth of total private student loan balances among the seven leading lenders currently in the market from $44 billion in 2008Q3 to $63 billion in 2013Q3 (Arvidson et al., 2013). In sum, student borrowing has changed substantially from 2003 to 2013.

All of the above, however, describes the student loan market as a whole, including parent and student borrowers of all ages. More relevant to the residence choices of young Americans may be the trends in student debt among recent graduates (and dropouts). Figure 4 depicts the proportion of CCP 25 year olds participating in the student debt market, along with the mean student loan balance of 25 year olds in each year, among those 25 year olds who have student debt. Once again, the only financial variables appearing in this paper pertain to student loans. They are reported in 2013 U.S. dollars. We observe an increase from 25 percent in 2003 to 45 percent in 2013 of 25 year olds with positive student debt, for an 80 percent growth in 25 year olds' rate of participation in student debt markets over the decade. Mean student loan balances at 25 among those with positive student debt balances between the

[17] NSLDS federal loan balances reached $1.051 trillion in early 2014, and the CCP aggregate balance, which includes the private student loan market, reached 1.11 trillion in 2014Q1.

ages of 22 and 25 nearly doubled over the period, from $10,649 in 2003 to $20,932 in 2013. In sum, the remarkable aggregate growth in student debt over the decade from 2003 to 2013 is more than reflected in the student debt growth we observe for 25 year olds in the CCP. More students are enrolling in college, and students in college are borrowing more to fund their educations. As speculated by the NAR, the CFPB, and various arms of government, we might expect the burden of increasing educational debt to delay standard life-cycle economic milestones, such as living independently and the purchase of first homes.

Next we turn to trends in early homeownership in the CCP. Figure 5 panel (a) depicts the trend in homeownership among all 25 and 30 year olds represented in the CCP.[18] We infer homeownership based on the presence of home-secured debt, whether mortgage or home equity-based loans, on the sample member's credit report. The presence of home-secured debt on the credit report is a particularly reliable proxy for homeownership at young ages, and its absence a reliable proxy for non-homeownership, as very few 30 year old homeowners in the U.S. own their homes outright. In the figures, we trace the proportions of 25 and 30 year olds who have owned homes over the past 4 years, inferred based on the preceding four years of linked data in the panel. The object of interest is whether the individual currently owns or has ever owned a home, and four years of history is a reasonably good proxy for ever owning at these very young ages. Similar results obtain where we track the rate of current homeownership and the rate of ever owning over the full course of the panel. The potential difficulty with the latter measure is that the look-back window available in the CCP lengthens as the panel progresses, creating time dependence in the quality of the measure of homeownership. However, homeownership measures based on all three approaches are very similar for these young age groups.

We find that homeownership among 30 year olds grew modestly from 33.7 in 2003 to 36.1 percent in 2007. After its peak at 36.1 percent, it dropped off dramatically following the housing market crisis, to 32.6 in 2008 and 25.6 percent by 2012. Hence we observe more than a 10 percentage point drop in the share of 30 year olds who have owned their own homes over the course of five short years. This hump-shape in homeownership corresponds to cohabitation pattern discussed earlier. However, the decline in homeownership for 30 year olds in recent years has been much larger than that for cohabitation.

Homeownership rates among 25 year olds are, as expected, substantially lower. Perhaps more surprising is the timing of their growth and decline relative to the housing market boom and bust. Speculation regarding the source of the boom and bust, and its relationship to sub-prime lending and easy

[18] Note that Figure 5 reflects all youth in the CCP as well as the small portion of youth represented in the Census but not in the CCP. We assume that 25 and 30 year olds not covered by the CCP (and who thus do not have Equifax credit reports) are not homeowners, as (we infer) they almost certainly cannot have mortgages. The qualitative findings all persist in the CCP-only sample.

credit for buyers with limited funds for down payments, suggests a housing market that grew to reach younger and younger consumers. The CCP time trends on early homeownership appear to tell a different story. Homeownership among 25 year olds grew from 14.6 percent in 2003 to a peak of 15.4 percent in 2005. This increase appears reasonably modest, in the face of softening sub-prime lending standards and historically low down payments. From its peak in 2005, homeownership among 25 year olds fell to 14.4 percent in 2006 and continuing to decline until it reached 8.1 percent in 2012. Thus the drop in homeownership among 25 year olds led the downturn in the housing market by roughly a year, and peak homeownership at 30, traditionally the median age of first home purchase in the U.S., peaked a full two years later.[19] Clearly the youngest homeowners had a different relationship to the housing boom and bust than traditional first time buyers.

In panel (b) of Figure 5, we examine the sensitivity of these patterns to the exclusion of those who coreside with parents. Here we see a steeper rise in homeownership among 30 year olds during the housing boom, from 40 percent in 2003 to 43 percent in 2008. This is followed by a similar 10 percentage point decline in homeownership among 30 year olds not living with parents from 208 to 2013. For 25 year olds, homeownership levels among those not living with parents, as expected, are substantially higher than those of 25 year olds living with parents, ranging from 23 to 15 percent over the panel. The pattern in the early period for this group becomes non-monotonic, but the steep drop from 2005 to 2013 in homeownership among 25 year olds is the same for those living without parents, and the magnitude is somewhat greater, with a fall of 8 percentage points.

Figure 6 relates the timing of the homeownership decline to that of the increase in the rate of living with parents for each age group. Declines in homeownership coincide with increases in living with parents for both age groups. At 25, homeownership drops steadily from 2005 through 2012, and the rate of living with parents shows a steady increase throughout the 2003 to 2012 window. At 30, living with parents increases throughout, but appears to accelerate after 2006. Shortly after, in 2007, homeownership reaches its peak and then declines steeply until 2012, at which point 30 year olds in the CCP are more likely to be living with a parent than to own a home.

Returning to the sharp drop in homeownership at 30 around the housing crisis and the start of the Great Recession, we investigate the nature of the relationship between increasing student borrowing and homeownership by the traditional median age at first home purchase in the U.S. Figure 7 shows the trends in the rates of (inferred) homeownership over the last decade for thirty-year-olds with and without histories of student debt.[20] Unsurprisingly, homeownership rates between 2003 and 2008

[19] See Lautz (2011) for recent median ages at first purchase.

[20] Note that the measure of student debt used to divide the two groups is whether any student debt appeared on the individual's credit record over the past three years, when she was roughly between the ages of 27 and 30. Ideally

were significantly higher for thirty-year-olds with a history of student debt than for those without. Student debt holders have higher levels of education on average and, hence, higher incomes. These more educated consumers have, historically, been more likely to buy homes. The homeownership difference between student debt holders and others expanded during the housing boom: by 2008 the homeownership gap between the two groups had reached 4 percentage points, or almost 14 percent of the nonstudent debtors' homeownership rate.

However, this relationship changed dramatically during the recession. Homeownership rates fell across the board: thirty-year-olds with no history of student debt saw their homeownership rates decline by 5 percentage points. At the same time, homeownership rates among thirty-year-olds with a history of student debt fell by more than 10 percentage points. By 2012, the homeownership rate for student debtors was almost 2 percentage points *lower* than that of nonstudent debtors. In 2012, for the first time in at least ten years, thirty-year-olds with no history of student loans were more likely to have home-secured debt than those with a history of student loans. This surprising change in the relationship between student debt and homeownership around the housing market crisis and recession raises questions regarding the role of escalating student borrowing in young consumers' housing decisions, and the possibility that unprecedented student debt may hamper the ongoing recovery of the housing market.

c. Prevailing macroeconomic conditions and youth residence choices

So far we have seen approximately unbroken upward trends in coresidence with parents among 25 and 30 years over the years from 2003 to 2012, and a substantial change in aggregate homeownership at 30 and relative homeownership rates between student borrowers and non-student borrowers at 30 around the Great Recession. All of this raises questions regarding the relationships among youth residence choices and the prevailing economic conditions under which these choices are made.

Figure 7 represents trends in broader economic conditions and youth residence choices in a common space. Aggregate U.S. student debt, as measured in the CCP, is represented by the yellow line, and follows a steep upward path, without wavering around the recession. Total

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one would distinguish consumers who have ever relied on student debt from those who have not, but this long a look-back period would be infeasible for earlier waves of the panel. In order to maintain a stable comparison, herefore, we consider student debt between the ages of 27 and 30. Given a standard 10 year repayment structure, and longer repayment periods under forbearance and income based repayment, we expect most student borrowers to hold debt at 27.

unemployment for the U.S. is drawn from the Bureau of Labor Statistics (BLS) monthly Labor Force Statistics for 1999-2014. Represented by the dark red line, it showed a modest decline during the economic boom of the mid-2000s, followed by a steep increase from 5.0 percent in 2008 to 10.0 percent in late 2009, and a subsequent recovery. The recent recovery in unemployment has been gradual but substantial: total unemployment among the adult population participating in the workforce, seasonally adjusted, fell from 10.0 percent in late 2009 to 6.7 percent in the most recent 2014 releases. Unemployment among youth aged 18-30, based on our own calculations in the CPS, followed a similar modest decline in the boom and then increased even more sharply, from 6.8 percent in late 2006 to a maximum of 14.8 percent in early 2010. Its recent recovery involves a decline from 14.8 percent at its 2010 maximum to 11.3 percent in the end of 2012. The monthly CoreLogic house price index, here represented by the purple line, increased from a normalized value of 100 in January 2000 to a peak of 200 in 2006, fell to a 2011 trough of 134, and since then has moved through an unsteady recovery to reach 165 by late 2013. In sum, while aggregate student debts have followed a steep, unbroken upward trajectory since 2003, both employment and house prices have experienced a pronounced boom, bust, and recovery.

One question, then, is to what degree the residence choices of the young track the recent, pronounced business cycle. To the extent that they move with the boom and bust, residence choices may appear to be driven by economic conditions, such as youth labor markets and the cost of housing. To the extent that their changes are gradual and persist throughout the boom, bust, and recovery, however, they may appear to be driven instead by young consumers' recent, unprecedented accumulation of student debt.

In Figure 7, as before, the upward trend in coresidence with parents appears steady, and suggests little direct relationship to broad economic indicators such as unemployment measures and the house price index. This would seem to suggest that the decision to stay home with parents, or moving back in, relates more closely to the recent changes in the debt burden of higher education than to swings in youth labor markets and the cost of housing.

However, the analysis presented in Figure 7 is unsophisticated, and, as such, poses more questions than it resolves. In terms of the aggregate trends, the steady increase in coresidence with parents may reflect not a failure to respond to aggregate conditions, but offsetting effects of, for example, job and housing markets on residence decision among the young. The failure of all

youth residence decisions to reflect the recent recovery in employment and house prices remains a mystery. The limited sensitivity of youth homeownership to housing market climbs, but pronounced drop during the housing market downturn, along with analysis in Figure 6, suggest contributions to homeownership from both recent student debt developments and broad economic conditions. The relative magnitudes of the contributions from these sources, and from the evolution over the period of preferences and cultural standards, remain far from clear.

Finally, these aggregate trends, while informative, may mask evolving local relationships among housing cost, labor markets, and youth residence choices. The fine geographic data and long panel of the CCP allow us to exploit time variation in local economic conditions and student debt reliance to learn more about the contributions of jobs, housing costs, and student debt at the local level to the decisive aggregate trends toward parents, and away from economic independence, that we observe for recent cohorts of young adults. Motivated by this potential in the CCP, and by the questions raised by the relationships among the national trends, in the following section we model the flows of young CCP consumers into and out of parents' households over time as a function of patterns in local unemployment, youth unemployment, house prices, and student debt per recent graduate.

III. Empirical model

a. Flow home to parents from independent living

In order to refine our understanding of the relationships among economic conditions and Millennials' lingering in parents' households, we estimate the dependence of the choice to move away from parents, and the choice to move home, on a variety of individual and local characteristics. A model of the overall stock of young people living with parents in a region poses several challenges to interpretation. First, persistent heterogeneity in the fundamental socioeconomic characteristics of U.S. localities is likely to drive the resulting estimates. Countervailing effects of persistent levels of child and parent need lead to unpredictable, and difficult to interpret, estimated relationships. Less affluent regions, for example, may be characterized by children more in need of parental support, but also parents less able to offer support.

Second, the location of residence of the child in a stock regression of coresidence on individual and local characteristics poses a fundamental problem. When a child lives with a parent, local characteristics are measured in the parent's neighborhood, and not in the child's best alternative location. When a child lives independently, the reverse is true. Assume, for example, that housing prices and unemployment are more favorable in parents' neighborhoods than in children's neighborhoods, in keeping with typical life-cycle patterns of consumption in the U.S. Then the problem with the location of measurement generates a

spurious positive relationship between local house prices and living with parents, and a spurious negative relationship between the local unemployment rate and living with parents. Of course several other concerns arise round the interpretation of stock regressions of coresidence with parents.

Therefore we turn to models of the flows of children into and out of parents' households. Two separate models are required, as the effect of local economic conditions on whether a child moves away from home may be very different from the effect of those same conditions on whether a child moves home. Consider first the decision to move home to parents. We begin with a sample of children who, at time *t*, live away from parents, and, therefore, are at risk of moving home. Define Y_{ilt} as an indicator for whether individual *i* living in location *l* at time *t* coresides with her parents. We estimate the model of moving home in a sample of CCP youth for whom $Y_{ilt} = 0$. The outcome of interest is $Y_{ilt+1} = Y_{ilt+1} - Y_{ilt}$, an indicator for whether a member of this group moves home between periods *t* and *t*+1. The estimates below pertain to the probability of a change in residence over a period of two years.

We estimate linear probability model

$$\Pr(Y_{ilt+1} = 1 \mid Y_{ilt} = 0, X^H_{ilt}, X^H_{ilt+1}, Z^H_{ilt}, i, l) = (X^H_{ilt+1} - X^H_{ilt})\beta^H + Z^H_{ilt}\gamma^H + \varepsilon^H_{ilt}, \qquad (0)$$

where X^H_{ilt} represents a vector of individual *i*, location *l*, period *t* characteristics whose growth may influence the residence choice of individual *i* between *t* and *t+1*. This vector includes county-level unemployment, state-level youth unemployment (based on our calculations in the CPS), the zip code-level CoreLogic house price index, and individual *i*'s Equifax risk score.[21] An additional vector of characteristics measured at the start of the estimation period, Z^H_{ilt}, is permitted to influence the transition probability through its level at *t* rather than its *t* to *t*+1 growth. These characteristics include a constant, the average student debt cost per degree at age 24 that we measure for state *s(l)* in year *t*, and the college degree completion rate among 24 year olds in year *t* in state *s(l)*. Idiosyncratic error ε^H_{ilt} is clustered at the individual level. Superscript *H* denotes factors influencing the probability of moving "home".

Importantly, location *l* is defined as the parent (and child)'s location at time *t*, and all local characteristics at *t* and *t*+1 are measured for location *l*. This avoids the problem of measuring location characteristics of the parent for children living at home and location characteristics of the child's preferred independent location for those moving away.

The estimation sample pools across observations on the 25 and 30 year old cohorts in each year described above, and includes observations in which members of the cohorts are 23 and 25, and 28 and

[21] The Equifax risk score is a credit score analogous to the FICO score, in the sense that both use credit report measures to predict the probability of severe delinquency in 24 months of a loan made at the time the score is drawn.

30. Separate estimates for the 25 and 30 year old cohorts are available from the authors.

b. Flow away from parents to independent living

We estimate a similar model for the probability that a youth living independently moves back in with parents between periods t and t+1. The (obvious) changes made in this case are the following: we estimate using a sample in which all youth initially live with parents, *i.e.*, $Y_{ilt} = 1$, and therefore each sample youth faces a risk of moving out. The expression for the linear probability model estimated in the sample of youth coresiding with parents, then, is

$$\Pr(Y_{ilt+1} = 0 \mid Y_{ilt} = 1, X^A_{ilt}, X^A_{ilt+1}, Z^A_{ilt}, i, l) = (X^A_{ilt+1} - X^A_{ilt})\beta^A + Z^A_{ilt}\gamma^A + \varepsilon^A_{ilt},$$

where all arguments are defined analogously to those in expression (1). In this case, all location characteristics are measured for location l, the youth's location away from home in period t. Superscript A denotes factors influencing the probability of moving "away".

Note that we will be able to estimate the dependence of the probability of moving in with parents on economic conditions in the youth's chosen independent location, and the dependence of the probability of moving away from parents on conditions in the parent's location. Owing to the unobservability of locations not chosen, what we will not be able to explore is the dependence of the youth's decision to move home on the characteristics of the parent's location, and the dependence of the youth's decision to move out on the characteristics of the youth's preferred independent location.

c. Endogeneity concerns

A first order concern regarding reverse causality arises from the individual youth's influence on labor and housing markets in the location she leaves, should she decide to move. A youth who moves away from one location to another, if unemployed, can be expected to decrease the total and youth unemployment rates in the original location. If employed, she increases the unemployment measures in the origin. Assuming movers are more likely to be unemployed than the population of young people overall, this mechanical source of endogeneity should bias coefficents on the unemployment measures downward. This source of reverse causality of youth residence choices is not a concern if moves to and from parents' households all occur within the relevant location. For example, to the extent that all moves home or away occur within the same county, no unemployment coefficient will be affected.

Assuming youth in our model influence the housing market as well, a similar type of reverse causality affects the coefficients on house prices. Assuming that a child living in a parent's basement does

not lead the parent to demand more housing, the departure of a youth who lives at home has no effect on house prices. Hence we are less concerned about the effect of reverse causality on the house price coefficient in the moving out regression. A youth who has been living independently and returns home, however, leaves the origin housing market and therefore decreases total housing demand in the origin. As each youth in the moving home regression exerts this influence, this source of mechanical reverse causality should bias the estimated coefficient on house prices in the moving-home regression downward. As in the case of unemployment, to the extent that moves between parent and independent youth locations fail to cross locations, this is not a concern. House prices in the estimation are measured at the zip code level, and so it is reasonably likely that youth moving back home will cross zip code lines and exert spurious downward pressure on house price effects in the moving-home regression.

Standard endogeneity concerns deriving from observable and unobservable individual and local characteristics that are fixed over the two year window are accounted for by the transition approach we take to estimation. Obvious examples include child ability, parent generosity, and persistent regional characteristics. Remaining major concerns regarding the endogeneity of changes in local characteristics to youths' transitions home and away seem most likely to arise from third factors determining both changes in local characteristics from t to t+1 and youths' interest in living with parents. An immediate example is changing local demand conditions. Their effect is likely to be picked up by some combination of total employment and house price measures. Given this, we interpret total employment and house price coefficients as though they contain both direct effects of employment and house prices, and indirect effects of local economic conditions. So far we have not found that this necessity changes our inferences based on the estimates substantially. Concerns regarding third factors influencing local levels of student debt among recent graduates are more relevant, and we discuss them along with the model results in the following section.

IV. Results

a. Flow home to parents from independent living

Table 1 reports the coefficient estimates for the moving home model in expression (1). The relevant scales of measurement are as follows: The dependent variable, the probability that a youth moves (away or home) runs from 0 to 100. Unemployment measures and the graduation rate among current 24 year olds in the state, similarly, range from 0 to 100. The CoreLogic house price index takes a value of 100 in January 2000 for each zip code, and hence measures growth in house prices relative to January 2000. The Equifax risk score ranges from 280 to 840. Student loan debt per graduate among current 24 year olds in the state is measured in $1000s of 2012 dollars.

Youth unemployment in the independent youth's location is estimated to increase the probability of

moving home to parents. In specification (1), the magnitude of the estimated effect is such that a one percentage point increase in youth unemployment leads to a 0.24 percentage point increase in the probability of moving in with parents. This effect is significant, its magnitude is fairly substantial, and it works in the direction we might expect, as worse labor markets for youth in the independent location drive young workers home. Note further that the mechanical reverse causality arising from unemployed youth moving home at higher rates (discussed above) biases the coefficient downward, working against this result. Further, as it operates at the state level, this reverse causality problem is likely to be small. Therefore the Table 1 estimates suggest that worsening youth labor markets, on average, drive young workers home to their parents.

The estimated effect of youth unemployment on moving home is, however, sensitive to the inclusion of the level of student debt per college graduate among current 24 year olds. Accounting for the difference between locations with more and less indebted college graduates absorbs much of the estimated effect of youth unemployment. The interpretation of this association is not clear, and it is not obvious that specifications (2) and (3) are preferable to (1); hence we infer that youth unemployment appears to have a meaningful positive effect on the rate at which young people move home to parents.

Total unemployment and the local house price index, taken together, provide a measure of the strength of local demand. As demand increases in the youth's independent location, the total unemployment there decreases and the house price increases. We observe a negative, in some cases significant coefficient on total unemployment, and a positive and consistently significant coefficient on house price index, in the moving home regression. Together, these results suggest that strengthening local demand conditions in the youth's independent location increase the likelihood that the youth moves back home. The house price coefficient is particularly robust to the inclusion of student debt and graduation measures. One interpretation of these results is that, conditional on the youth labor market, stronger demand in the youth's independent location increase prices, particularly house prices, and these increased prices drive the youth home to her parents.

The reverse causality generated mechanically by the shifting populations in this case works against our finding a positive effect of house prices on moving home, implying that this point estimate of a 0.03 percentage point increase in the rate of moving home for every one percent increase in local house prices over the January 2000 base prices is a lower bound estimate of the true effect. Further, the extent of this reverse causality problem may be large given that house prices are measured at the zip code level, and many young people may cross zip codes to return to parents. Note that the 0.03 percentage point increase is reasonably substantial, when one considers the magnitude of the swings in house prices over the period. As noted, the standard deviation of the zip code-level house price index over the period in our sample is 80.1. The average homeowner in the CCP experienced roughly a 50 percentage point increase

in house price over the boom, and roughly a 25 percentage point decrease over the housing market bust. Additional variation in these experiences at the regional level enhances the effect of house prices on coresidence with parents estimated for this sample. On the other hand, the reverse causality problem actually works toward finding a spurious negative effect of total unemployment on moving in with parents, as unemployed youth leaving the county at higher rates exert negative pressure on the unemployment coefficient. Hence we see strong evidence of a positive effect of housing costs in the independent location on the odds that a child moves home to parents, and a weak or possibly insignificant negative effect of total unemployment in the independent location on moves home.

The estimates in columns (2) and (3) demonstrate a significantly higher rate of moving home in states with higher debt cost of a college degree in the most recent graduating cohort.[22] An increase of $1000 in the debt cost of a degree is associated with a 0.08 percentage point increase in the probability of a young resident of the state moving home over two years. This effect is robust to controlling for the share of college graduates among current 24 year olds in the state, which, unsurprisingly, is associated with a lower propensity to move home. These estimates provide further, and perhaps more credible, evidence of a positive effect of growing student debt burdens on young people's propensity to live with parents.

One caveat is in order, however. This aggregated student debt measure employed here is an improvement over measures involving the level or change in individual student debt, which clearly carries with it a host of other information regarding the student's life stage and her parent's degree of supportiveness. The aggregated measure responds to state by time variation in the generosity of financial aid and the availability of student loans, providing extensive sources of variation in the reliance on student debt to support higher education. However, the student debt balance of the recent cohort of graduates in the state does enter as a level rather than a change. As such, it contains information about the state's propensity to support college students over the past few years, which may influence state residents' tendency to rely on parents apart from its effect on student debt.

b. Flow away from parents to independent living

Table 2 reports the coefficient estimates for the model of the decision to move away from home. We find that the effects of economic conditions in the parent's location operate more or less in the opposite direction of the effects of economic conditions in the youth's independent location on the propensity to live with parents. Higher youth unemployment in the current location again encourages moving, though this time the move is away from parents. A one percentage point increase in youth unemployment is

[22] Specifications (4) through (6) repeat the exercise while controlling for changes in the individual risk score of the youth over the period. In all cases, the risk score has a precisely estimated zero effect on the propensity to live with parents, and fails to move the other estimated coefficients.

estimated to lead to a 0.6 to 1.5 percentage point increase in the propensity to move away from home. This large effect is highly significant, and is robust to all specifications presented in Table 2. Once again, the mechanical reverse causality arising from the flow of young people away from home would seem to work against finding this result. Youth unemployment in the parent's location has a large, positive, precisely estimated, robust effect on the rate at which young people move away from home, and it appears to be the strongest determinant of moving away from home among the vector of individual and local characteristics we consider.

Again total unemployment and house prices can be taken as indicators of broader economic conditions, this time in the parent's location. Here we see that improving local economic conditions are associated with increases in the rate at which young people move away from parents. A one percentage point decrease in total unemployment in the parent's county is associated with a 0.7 to 0.9 percentage point increase in the probability that a youth moves away from home, and this estimate is highly significant and robust to all listed specifications. It is worth noting that, in this case, if the unemployed are more likely to move, then the reverse causation generated by the movement of the youth in the outcome measure reinforces the estimated negative coefficents. This is made less worrying by the size and precision of the estimated effects, and by the fact that it is not obvious that unemployed youth would be differentially likely to move away from home. In the specifications omitting student debt, the estimates imply that a one percentage point increase in house prices, on a January 2000 price base, is association with a 0.06 percentage point increase in the likelihood of moving away from home.

Hence strengthening economic conditions in the parent's location are estimated to increase the rate at which children move away from home, and the strength of this estimated effect appears to be stronger for the case of total unemployment. This may seem counterintuitive, as improving economic conditions, holding constant youth employment, might seem to make staying home more appealing. However, these estimates are consistent with circumstances in which parents are more able to fund children's moves away from home when economic conditions improve, and also in which young people are driven away from parents' location by increasing prices of goods and housing caused by improving local demand conditions.

The estimates for student debt imply that a $1000 increase in the student debt cost of a college degree for the current cohort of 24 year olds is associated with a 0.3 percentage point decrease in the probability that a youth living at home moves out. Again, this provides evidence that the escalating student debt we've observed over the period may be leading to extended coresidence with parents for the most recent youth cohorts. However, the caveats described for the moving home model apply here as well. Among the more important next steps we hope to take in the analysis of the housing decisions of young Americans is estimation of the student debt effect on housing choices that relies on other types of

credibly exogenous variation in reliance on student debt.

IV. Discussion and Conclusions

This paper investigates young people's parental coresidence rates in the CCP, and the correlation between coresidence decisions and local house prices, local employment conditions, and the student debt reliance of local college students. Evidence from the CCP shows that coresidence with parents has been persistently increasing for 25- and 30-year-olds since 1999, while the number of 25- and 30-year-olds living alone or with more than one non-parent has declined (defining parents as people 15-45 years older than the individual). This trend is corroborated by similar analysis in the CPS. Simultaneously, homeownership has decreased for both age groups, and has decreased at a greater pace among those who have ever held student debt. Both the fraction of individuals who have student debt and those individuals' average balances have steadily increased over the same period.

Using county- and state-level geographic variation, we use regression analysis to show that there are strong correlations between individuals' decisions to move back into and out of their parents' homes and local average measures of house prices, youth unemployment, and student debt per college graduate. For young people not living with their parents, increases in local house prices are shown to significantly increase the likelihood of transitioning to coresidence, while for young people living with their parents, increases in the young unemployment rate and decreases in the general unemployment rate significantly increase the likelihood of transitioning away from coresidence. We interpret this finding to imply that increasing parental wealth is associated with young peoples' transitioning away from coresidence, while increasing living costs (often faced by young people through rent) are associated with young people's transitioning into coresidence. Increasing local youth unemployment is associated with a higher transition rate both into and out of coresidence, suggesting an increase in young people's geographic 'churning' (repeatedly switching locations in order to find work). Finally, we find that a high state-level student loan balance per college graduate (among the most recent cohort of graduates) significantly increases the likelihood that young people either transition to living with their parents or fail to transition away from living with their parents, with a $5,000 increase in average student debt implying a 1.6 percentage point

decrease in the likelihood of moving out from one's parents' household, even controlling for the fraction of local young people who are college graduates. Since student debt has been increasing since 1999, this suggests that a substantial portion of the persistent increase in coresidence with parents among recent youth cohorts can be explained by increasing student debt balances.

Finally, we have argued above that much of the endogeneity inherent in our model due to local conditions reflecting past residential location choices would lead to bias against many of our results, suggesting that the true relationship between coresidence with parents and both house prices and unemployment might be of greater magnitude than those estimated above. Moreover, using aggregate state-level student debt data (which reflects state tuition and subsidy levels) avoids many of the endogeneity issues tied to individual-level student loan information, which is confounded by an individual's level of educational attainment. However, endogeneity in our student loan measurement might upwardly-bias our result, since states with a greater proportion of higher-income or more 'benevolent' households might have lower student debt (because childrens' education is paid for by their parents) and lower coresidence with parents (because the parents are more able and willing to finance their children's housing and living costs away from home), implying a spurious correlation between the two, independent of the causal effect of higher student debt on one's coresidence decision. For this reason, identifying and employing an effective source of exogeneity in student debt could improve the estimated causal impact of student debt presented above.

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Table 1: Linear probability model of moving in with parents, conditional on living away from parents

Independent variable	Dependent variable: I(moved in with parents)					
	(1)	(2)	(3)	(4)	(5)	(6)
Total unemployment, county	-0.120*	-0.086	-0.071	-0.120*	-0.086	-0.071
	(0.067)	(0.067)	(0.067)	(0.067)	(0.067)	(0.067)
Youth unemployment, state	0.237***	0.068	0.034	0.237***	0.068	0.034
	(0.054)	(0.062)	(0.062)	(0.054)	(0.062)	(0.062)
CoreLogic HPI	0.028***	0.025***	0.023***	0.028***	0.025***	0.023***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Equifax risk score				0.000	0.000	0.000
				(0.001)	(0.001)	(0.001)
Student loan debt per grad, current 24yos, state		0.079***	0.053**		0.079***	0.053**
		(0.026)	(0.026)		(0.026)	(0.026)
Graduation rate			-0.069***			-0.069***
			(0.017)			(0.017)
Constant	23.584***	19.861***	21.921***	23.584***	19.860***	21.920***
	(0.588)	(0.745)	(0.895)	(0.588)	(0.745)	(0.895)
F statistic	114***	96.2***	88.4***	99.5***	86.6***	80.3***
R-squared	0.013	0.015	0.015	0.013	0.015	0.015
N	61,821	61,821	61,821	61,821	61,821	61,821

* indicates significance at the 10%, ** the 5%, and *** the 1% level.

Source: FRBNY/Equifax

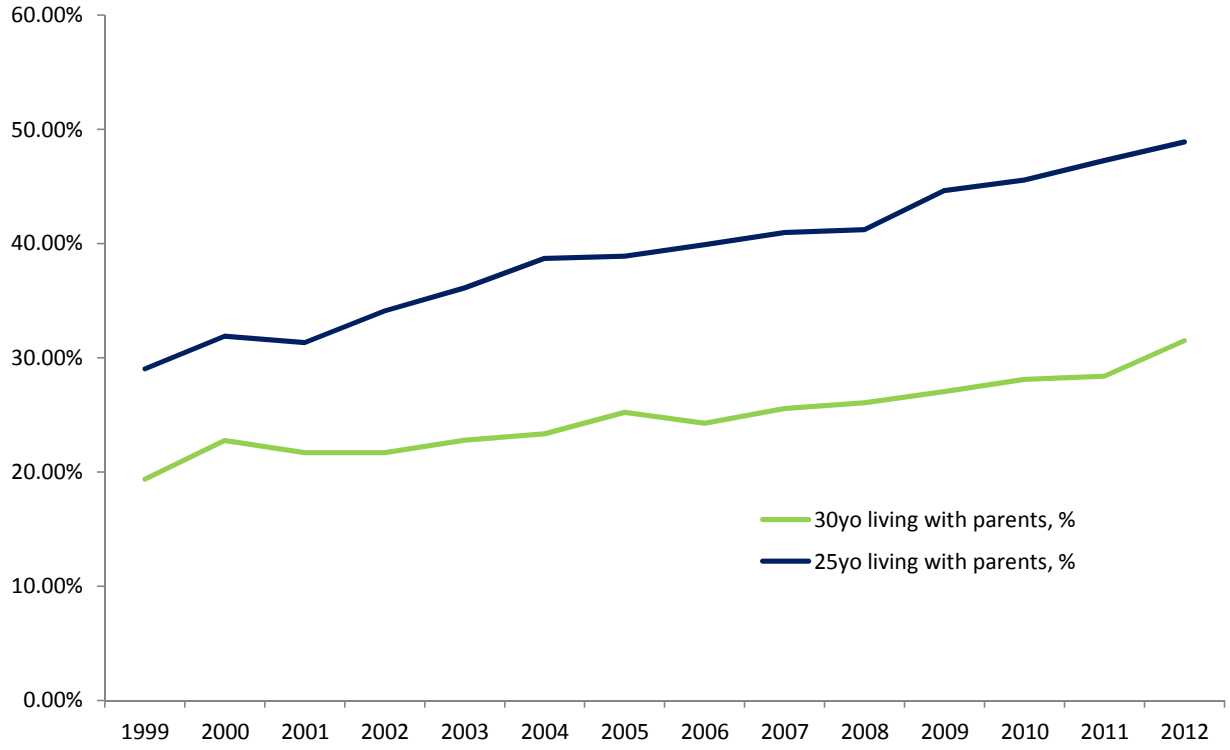
Table 2: Linear probability model of moving away from parents, conditional on living with parents

Independent variable	Dependent variable: I(moved away from parents)					
	(1)	(2)	(3)	(4)	(5)	(6)
Total unemployment, county	-0.884***	-0.670***	-0.683***	-0.885***	-0.671***	-0.684***
	(0.122)	(0.122)	(0.122)	(0.122)	(0.122)	(0.122)
Youth unemployment, state	1.461***	0.583***	0.616***	1.461***	0.584***	0.616***
	(0.094)	(0.106)	(0.107)	(0.094)	(0.106)	(0.107)
CoreLogic HPI	0.055***	0.007	0.008	0.055***	0.006	0.008
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Equifax risk score				0.003	0.003	0.003
				(0.002)	(0.002)	(0.002)
Student loan debt per grad, current 24yos, state		-0.317***	-0.293***		-0.317***	-0.292***
		(0.043)	(0.044)		(0.043)	(0.044)
Graduation rate			0.059**			0.059**
			(0.028)			(0.028)
Constant	50.401***	46.148***	44.380***	50.407***	46.151***	44.370***
	(1.013)	(1.266)	(1.517)	(1.013)	(1.266)	(1.517)
F statistic	88.8***	103***	93.7***	77.9***	93.3***	85.3***
R-squared	0.017	0.026	0.026	0.017	0.026	0.026
N	35,672	35,672	35,672	35,672	35,672	35,672

* indicates significance at the 10%, ** the 5%, and *** the 1% level.

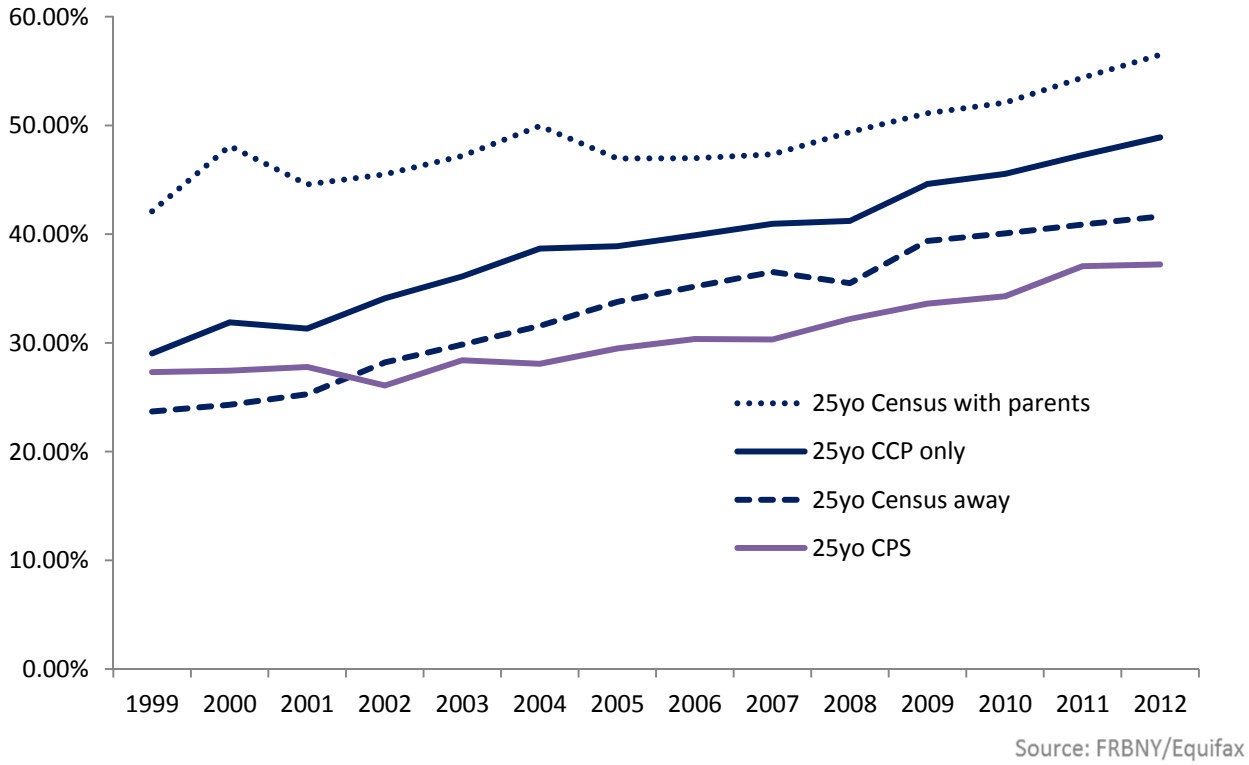
Source: FRBNY/Equifax

Figure 1: Coresidence with parents among 25 and 30 year olds in the CCP, 1999-2012



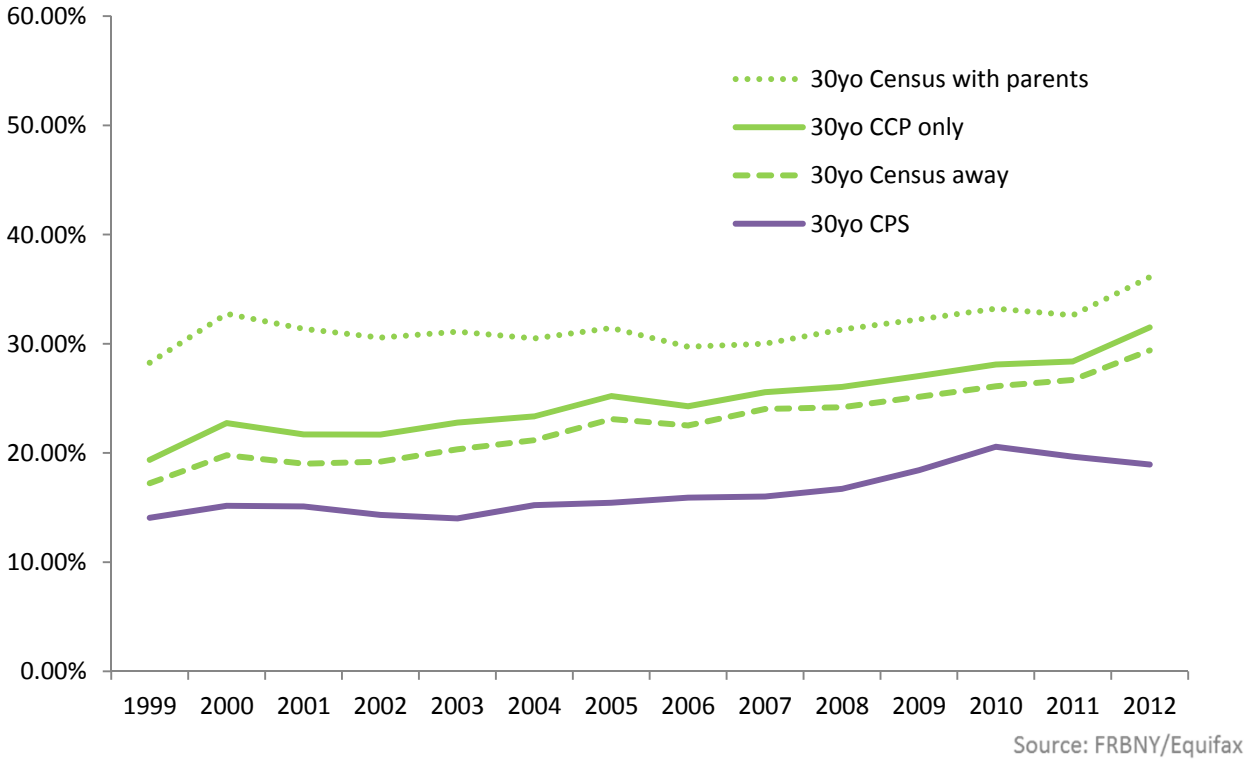
Source: FRBNY/Equifax

Figure 2a: Measurement of living with parents at 25, CCP with and without Census correction



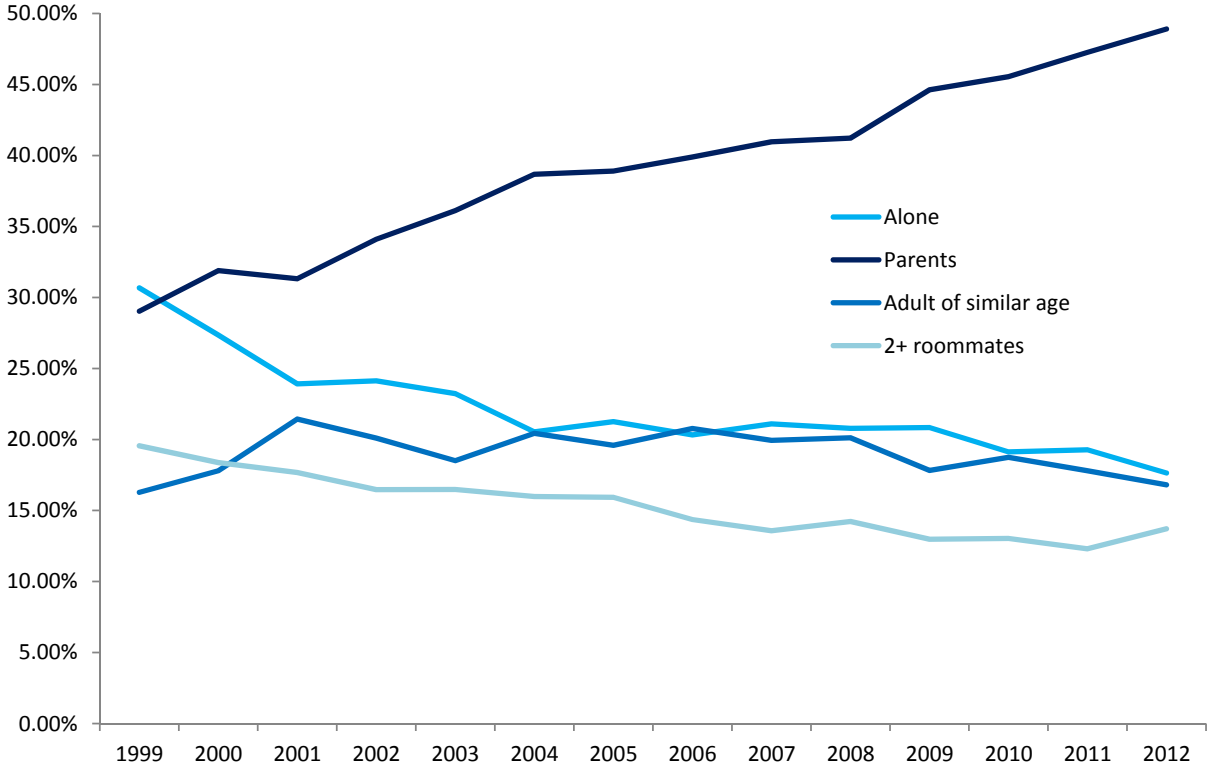
Source: FRBNY/Equifax

Figure 2b: Measurement of living with parents at 30, CCP with and without Census correction



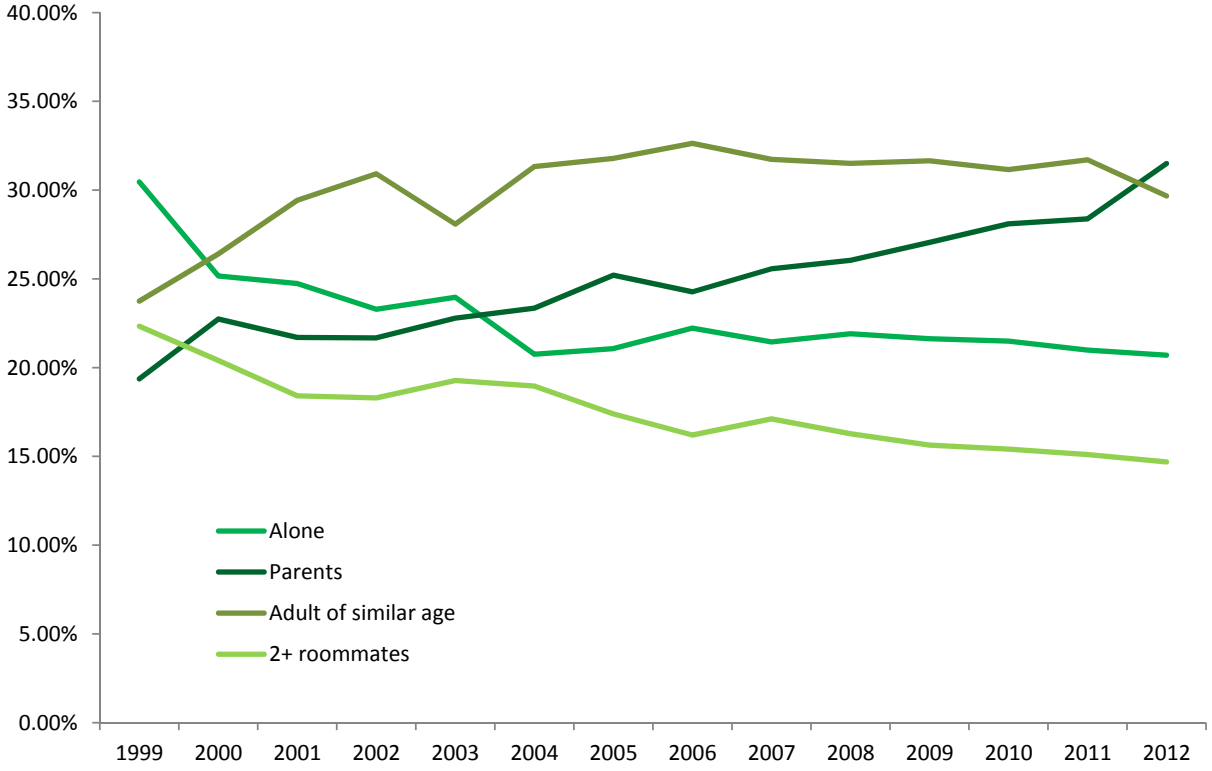
Source: FRBNY/Equifax

Figure 3a: Residence arrangements of 25 year olds in the CCP, 1999-2012



Source: FRBNY/Equifax

Figure 3b: Residence arrangements of 30 year olds in the CCP, 1999-2012



Source: FRBNY/Equifax

Figure 4: Student debt prevalence and mean among 25 year olds

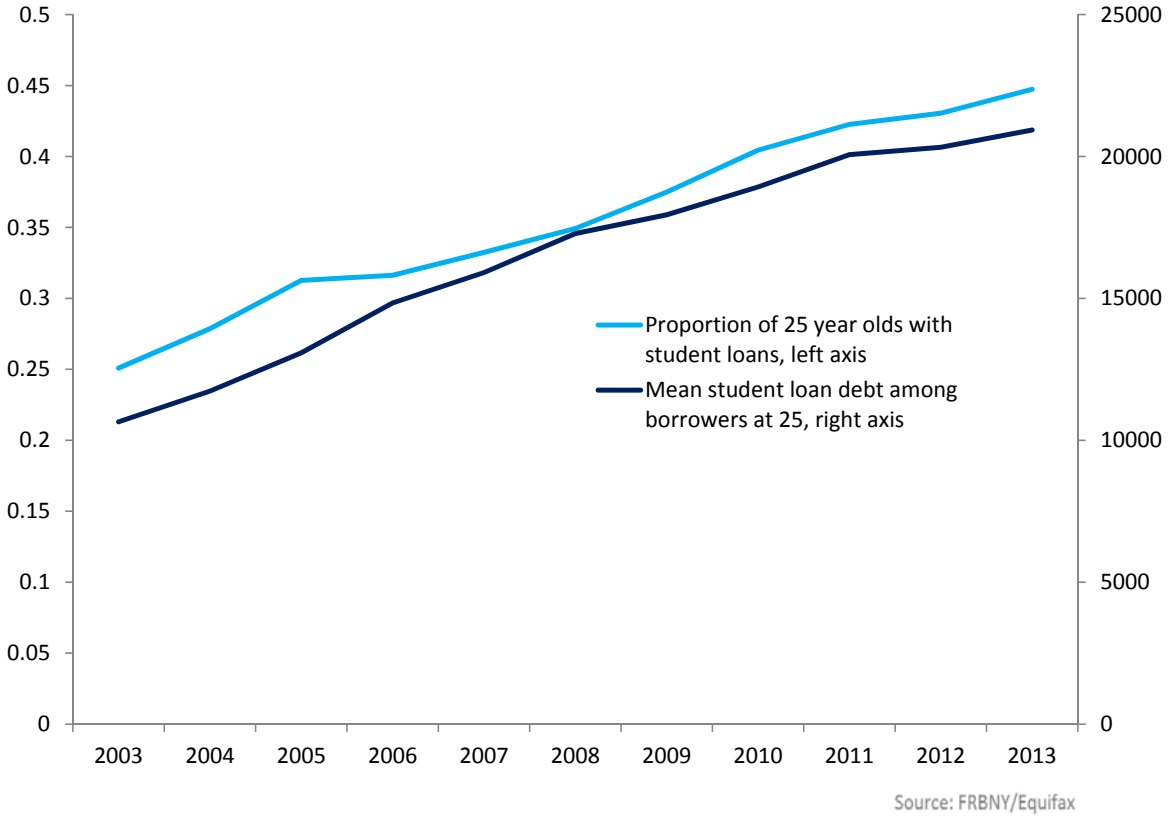
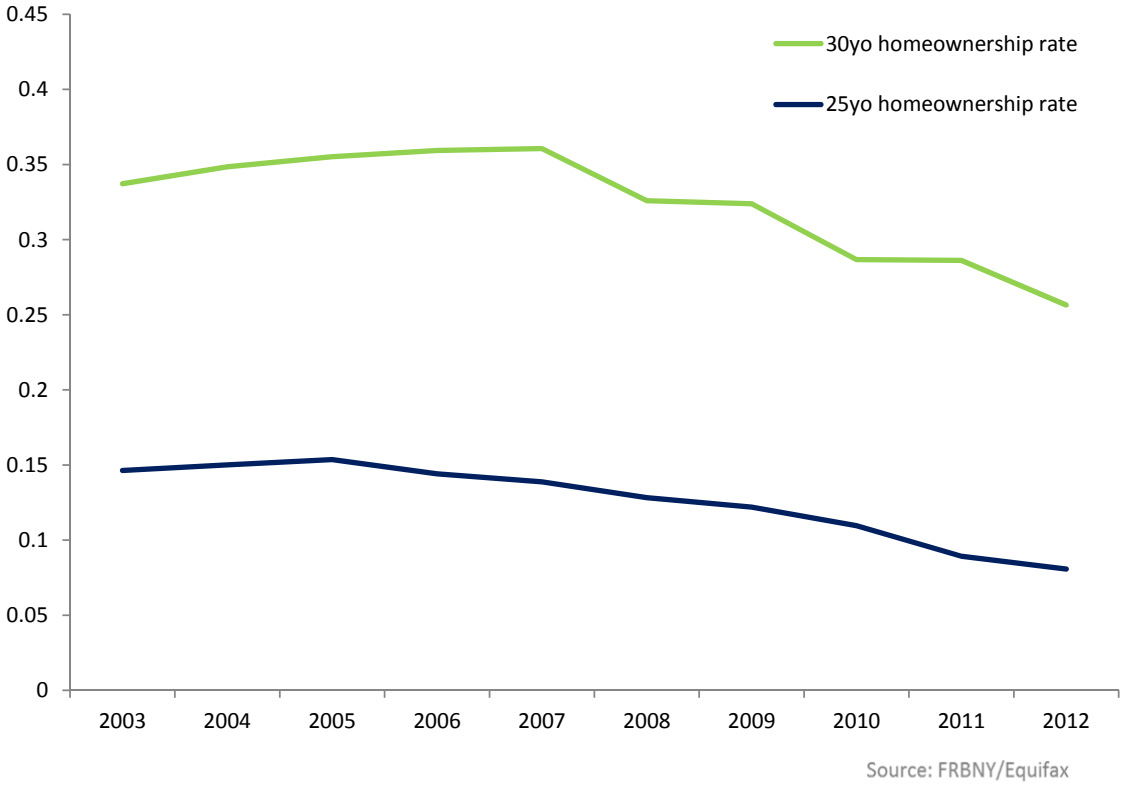
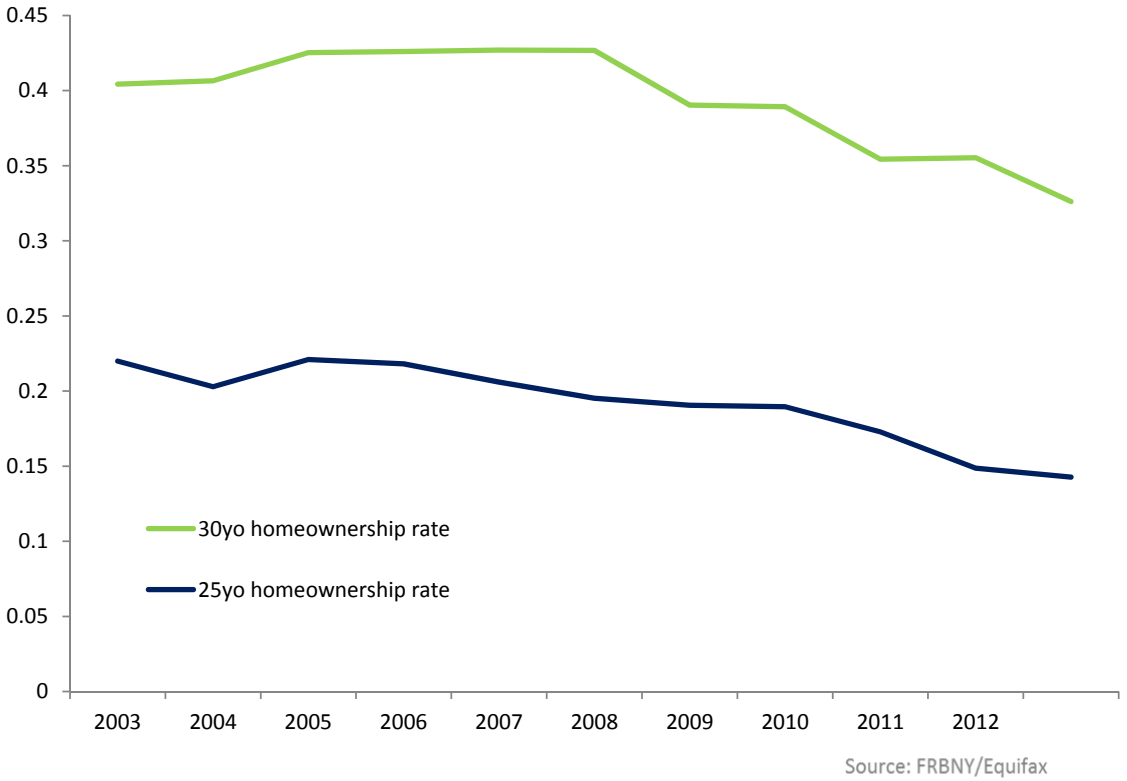


Figure 5a: Homeownership among 25 & 30yos in the CCP, 1999-2012
Inferred from debt over past 4 years



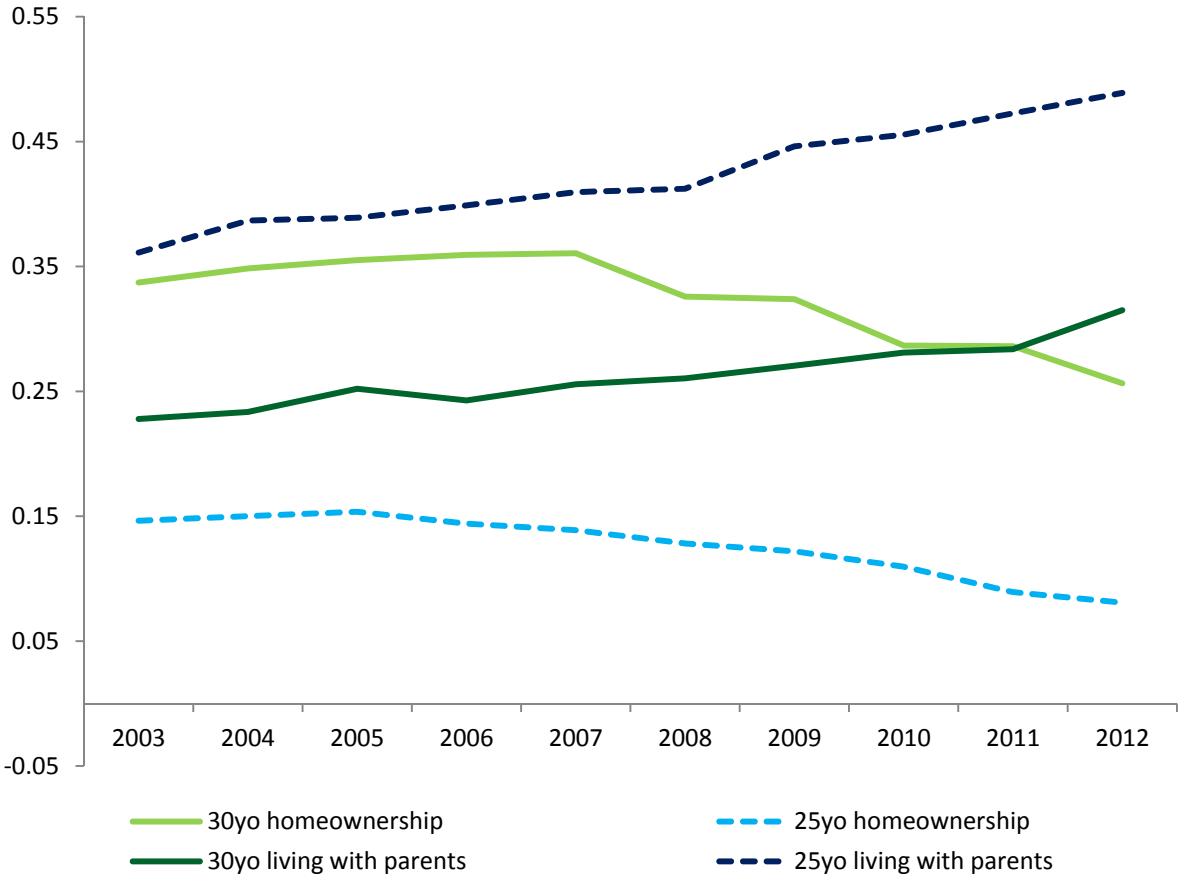
Source: FRBNY/Equifax

Figure 5b: Homeownership among 25 & 30yos in the CCP, 1999-2012
Inferred from debt over past 4 years, living without parents



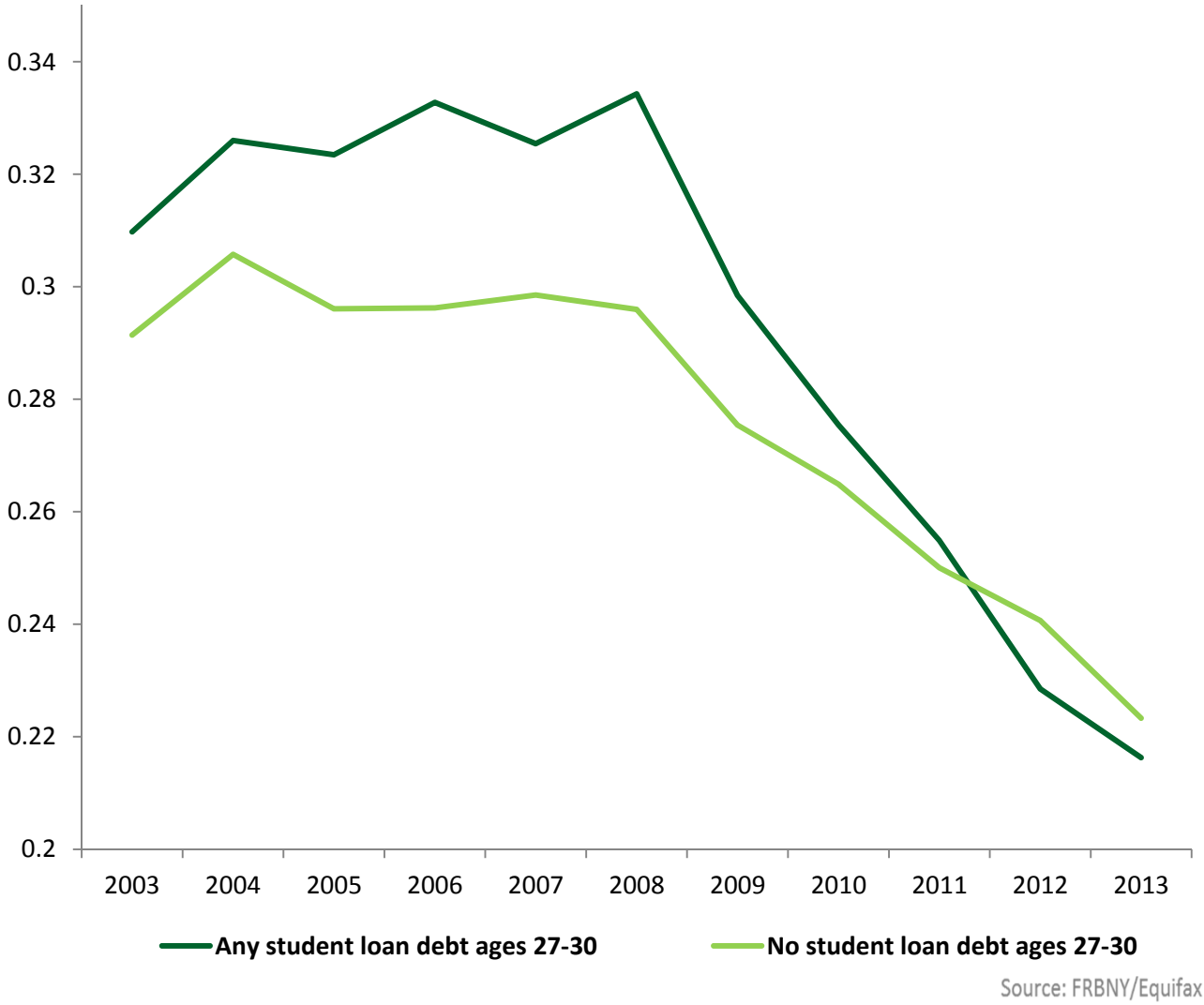
Source: FRBNY/Equifax

Figure 6: Homeownership and living with parents among 25 and 30 year olds in the CCP, 1999-2012



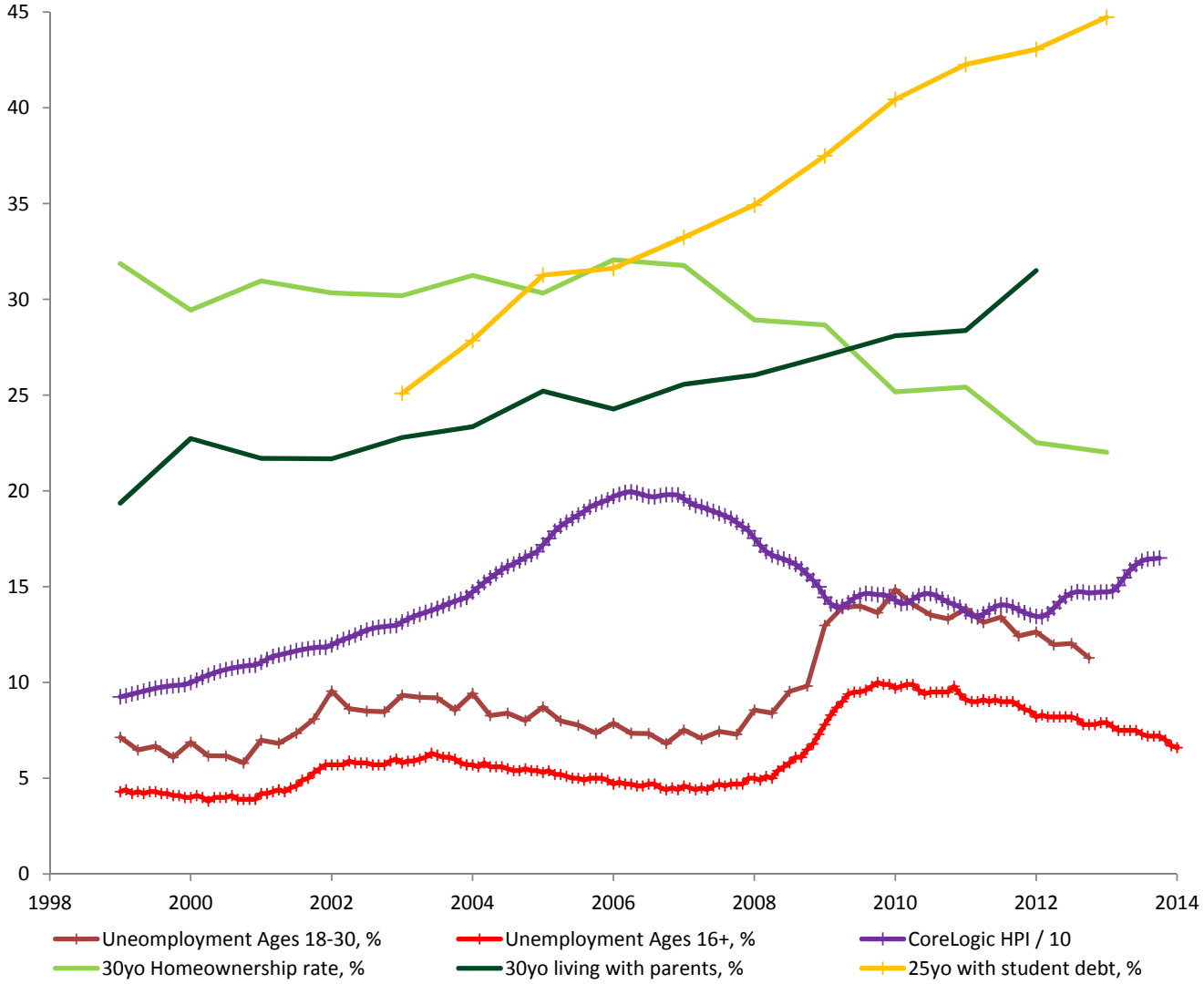
Source: FRBNY/Equifax

Figure 7: Current homeownership among 30 year olds in the CCP by student loan history, 2003-2013



Source: FRBNY/Equifax

Figure 8: Residence choices and economic conditions, 1999-2014



Source: FRBNY/Equifax