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Into the Future: Manufactured Housing Opportunities

AN **ALL FOR HOME** EVENT

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Millennial Consumers and the Future of Manufactured Housing in Rural America

AN ALL FOR HOME EVENT

Lesli Gooch, Ph.D.
CEO Manufactured Housing Institute

The Housing Landscape

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- The U.S. is experiencing a housing crisis.
  - Home prices have become unaffordable for many Americans.
  - Inventory is low and there is a severe deficit in entry-level homes.
  - Inflation is at historic highs, mortgage rates are increasing, and there is growing concern of a recession.
- The Covid-19 pandemic exacerbated pre-existing inequities in access to affordable housing.
  - Increasing demand for WFH spaces.
  - Driving competition among homebuyers.
  - Rapid increase in home prices.
- Younger consumers in particular find themselves priced out of the housing market and are often delaying homebuying.

Millennials and Manufactured Housing

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- Millennials, and younger consumers more broadly, are increasingly open to manufactured homes as a housing option.
  - This openness is driven by a shift in attitudes about MH in general and a desire for affordable home ownership.
  - Similarly, younger consumers are increasingly attracted to rural areas where cost of living is lower than urban centers.

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Understanding the Housing Landscape for Younger Consumers

Housing Affordability and Accessibility

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Homeownership is becoming an increasingly expensive, and for many consumers unattainable, pursuit.

- The average cost of a new, site-built home was **$464,200** in 2021.
- Moody's home price index shows a 32% rise in prices nationally over the past two years. [1]
- As of the first week of September 2022, the 30-year fixed-rate mortgage averaged 5.66%. [2]
  - Compared to the 2.87% rate in September 2021, this increase is equivalent to **roughly $500 more per monthly payment** on a median priced home.
- Redfin reported that in May 2022, the median monthly asking rent in the U.S. was $2,002, **a 15% year-over-year increase**. In the most expensive markets, year-over-year rent increases ranged from 24.4% to 48.4%. [3]
- Current estimates suggest that the U.S. has a current **housing supply deficit of 3.8 million units**. [4]

1. Arnold, C. 2022. *Home prices could fall in some U.S. cities. Here's where and why*.
2. Bahney, A. 2022. *Mortgage rates rise again after Fed says it will take 'forceful' steps to curb inflation*.
3. Ellis, T. 2022. *Rental Market Tracker: Typical U.S. Asking Rent Surpassed $2,000 for First Time in May*.
4. Freddie Mac. 2021. *Housing Supply: A Growing Deficit*.

Millennial Consumers – Next Generation Homebuyers

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Millennial Americans aged 26-41, are the largest living demographic in the U.S. at 72.1 million individuals.

- Gen Z was born between 1997-2012, Millennials between 1981-1996, Gen X between 1965-1980.
- As housing prices have continued to increase, **nearly 20% year-over-year as of early 2022**, Millennials have increasingly been priced out of housing markets, particularly in urban areas.

- Millennials lag other generations in homeownership. **Just under half of Millennials (48.5%) are homeowners**; for Gen X-ers homeownership is closer to 70%, Boomers are near 80%. [1]
- Millennial consumers are experiencing the effects of inflation differently.
  - Millennial consumers who signed a new rental lease in July 2022 **experienced an 11.6% YoY increase** in the cost of goods and services compared to 8.5% for the overall population. [2]
- As a consumer group, Millennials express broadly positive attitudes toward manufactured housing, while two thirds of Millennials surveyed report that they are likely to consider purchasing a manufactured home in the future. [3]

1. Anderson, D., T. Velentzas, and S. Bokhari. 2022. *Millennial and Gen Z Renters Have Personal Inflation Rates Above 11%, Compared with 8.5% For the Typical American*. September 1, 2022.
2. ibid.
3. Freddie Mac. *Manufactured Housing 2022: An Untapped Affordable Housing Solution*.

Migration and Rural America

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Rural areas and smaller cities and towns have experienced growing levels of in-migration over the past few years.

- The Covid-19 pandemic spurred a dramatic increase in home prices, as well as constrained levels of inventory, in small towns and rural areas as a result of out-migration from larger cities and metropolitan areas. [1]
- Research from the Federal Reserve Bank of Cleveland found that **migration into smaller towns and rural areas doubled** from 2020 to 2021.
  - There were less than 10,000 monthly migrants leaving high-cost areas for more rural environments at the beginning of 2020; monthly in-migration **increased to more than 20,000 in 2021**. [2]
  - In 2019, 40% of non-metropolitan counties, represented by largely rural areas, experienced net in-migration; by 2021 the share of non-metropolitan counties experiencing in-migration had increased to 66%.[3]
- In a survey of older Millennial consumers living in large cities, 37% report that they want to relocate to a smaller town, primarily as a means of cutting down on costs. [4]
  - Similarly, 36% of parents and consumers saving for a down payment report that they are interested in moving to smaller towns.

1. Urban Institute. 2022. *The Role of Manufactured Housing in Increasing the Supply of Affordable Housing*.
2. Whitaker, Stephan D. 2021. *Migrants from High-Cost, Large Metro Areas during the COVID-19 Pandemic, Their Destinations, and How Many Could Follow*. Federal Reserve Bank of Cleveland.)
3. Frost, R. 2022. *Domestic Migration Drove State and Local Population Change in 2021*.
4. Carter, S. 2022. *Why nearly half of city-dwelling millennials want to buy a home in a small town*.

Younger Americans are the Most Likely to Move

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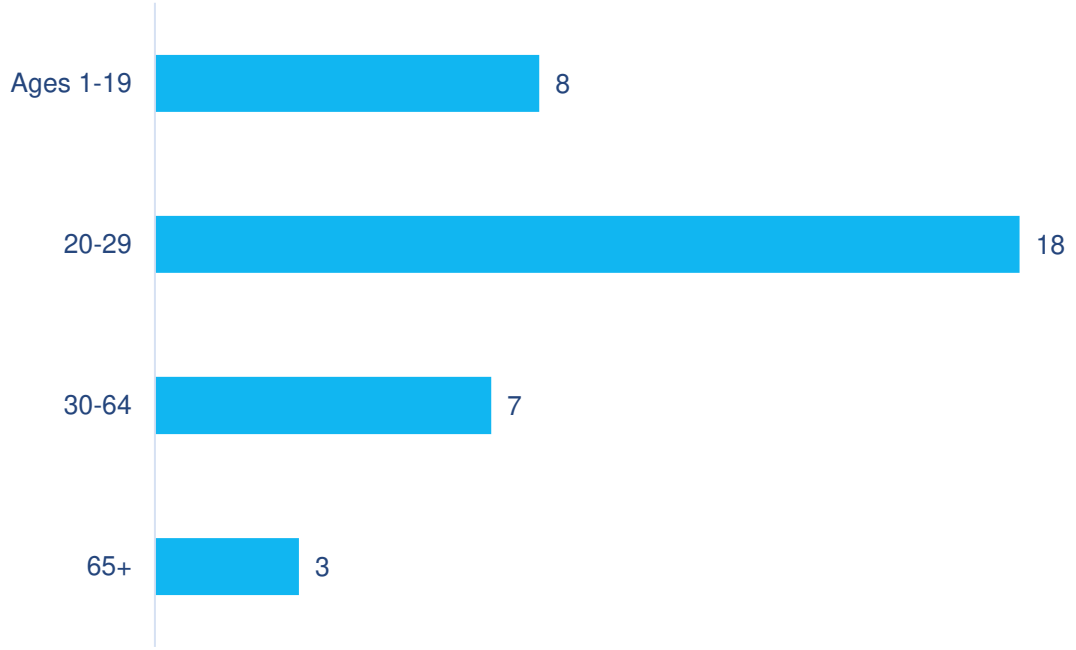
Young adults more likely than other age groups to move from one U.S. home to another

% of each age group who moved within the U.S. in 2020



Note: Movers are those who lived at a different U.S. address one year earlier. Includes movers who were at least 1 year old at the time of the survey.
Source: Pew Research Center analysis of 2021 Current Population Survey Annual Social and Economic Supplement (IPUMS).

Pew Research Center

Manufactured Homes Provide Affordable Homeownership

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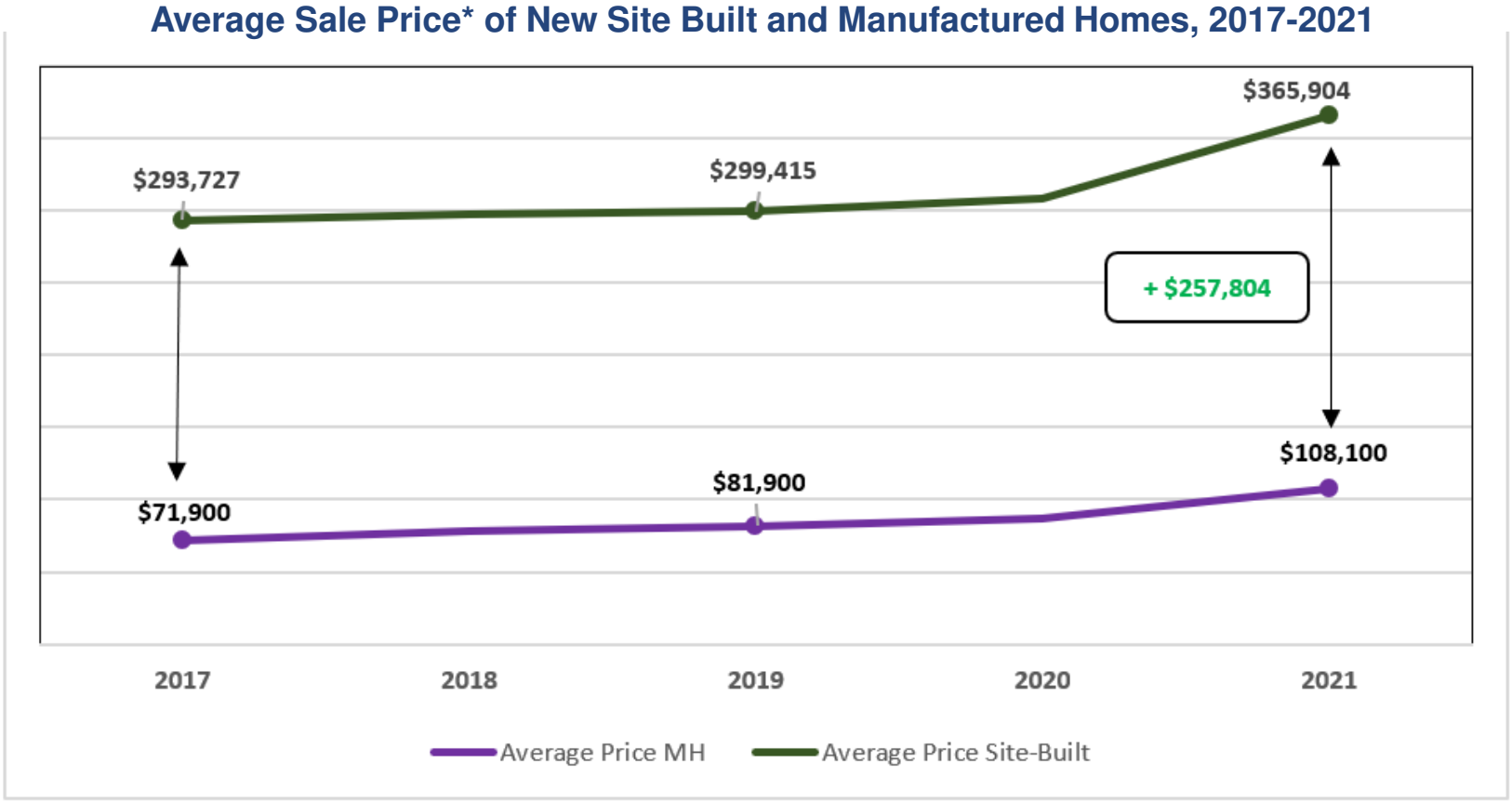
Manufactured homes offer a high-quality, affordable alternative to site-built homes.

- The manufactured housing industry produced 105,772 new homes in 2021, **approximately 9% of new, single-family home starts**. [1]
- In 2021, the average sale price for a site-built home without land in the U.S. was $365,904; the average sale price for a new manufactured home was $108,100. [2]
  - The average cost of a site-built home was **109% higher** than a manufactured home.
- On average, manufactured homes are half the price of site-built homes per square foot, as manufactured homes average $72 per square foot while site-built homes cost an average of $144 per square foot. [3]
  - As of 2021, manufactured homes **cost 66% less per square foot** than site-built homes.

1. MHI. 2022. *2022 Manufactured Housing Facts Industry Overview*.
2. US Census Bureau, Manufactured Housing Survey.
3. ibid.

Comparative Costs of Site-Built and Manufactured Homes

RURAL RESEARCH SYMPOSIUM



Source: US Census Bureau, Manufactured Housing Survey
*Excludes cost of land

Millennials Like Manufactured Housing

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Recent research by Freddie Mac has found shifting perceptions of manufactured housing, particularly among younger consumers. [1]

- A majority (72%) of surveyed consumers said that manufactured housing was a “great option” for first-time homebuyers. Two-thirds (66%) of consumers also believe that manufactured homes are “affordable without compromising on quality.” [2]
- The research found that among Millennials, positive sentiment was even higher, with 78% reporting a positive view of manufactured homes; Gen Z was close by at 76%. [3]
  - A fifth (20%) of Millennials report an “extremely positive” perception of manufactured housing.
  - A majority of Millennials (68%) and Gen Z (61%) indicated that they were likely to consider purchasing a manufactured home in the future.

1. Freddie Mac. 2022. *Manufactured Housing 2022:An Untapped Affordable Housing Solution*.
2. ibid.
3. ibid.

Research Question

- **How are the attitudes and actions of Millennials, and younger consumers more broadly, changing as they relate to manufactured housing.**
  - Are these consumers actually participating in the manufactured housing marketplace?
  - Similarly, how is this related to younger consumers favoring rural areas where cost of living is lower than urban centers?
    - Are homebuyers moving to rural environments?
    - Are these areas where manufactured housing is a viable and desired option?

Data and Methods

- MHI analyzed data from the Home Mortgage Disclosure Act database, the American Housing Survey, the Census Bureau's Manufactured Housing Survey, and MHI's Monthly Economic Reports to address the following questions:
  - Who is buying manufactured homes?
  - Where are consumers who purchase manufactured homes living?

Findings

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Who Is Buying Manufactured Homes?

Younger Consumers Hold a Higher Proportion of Manufactured Home Mortgages than Older Homebuyers

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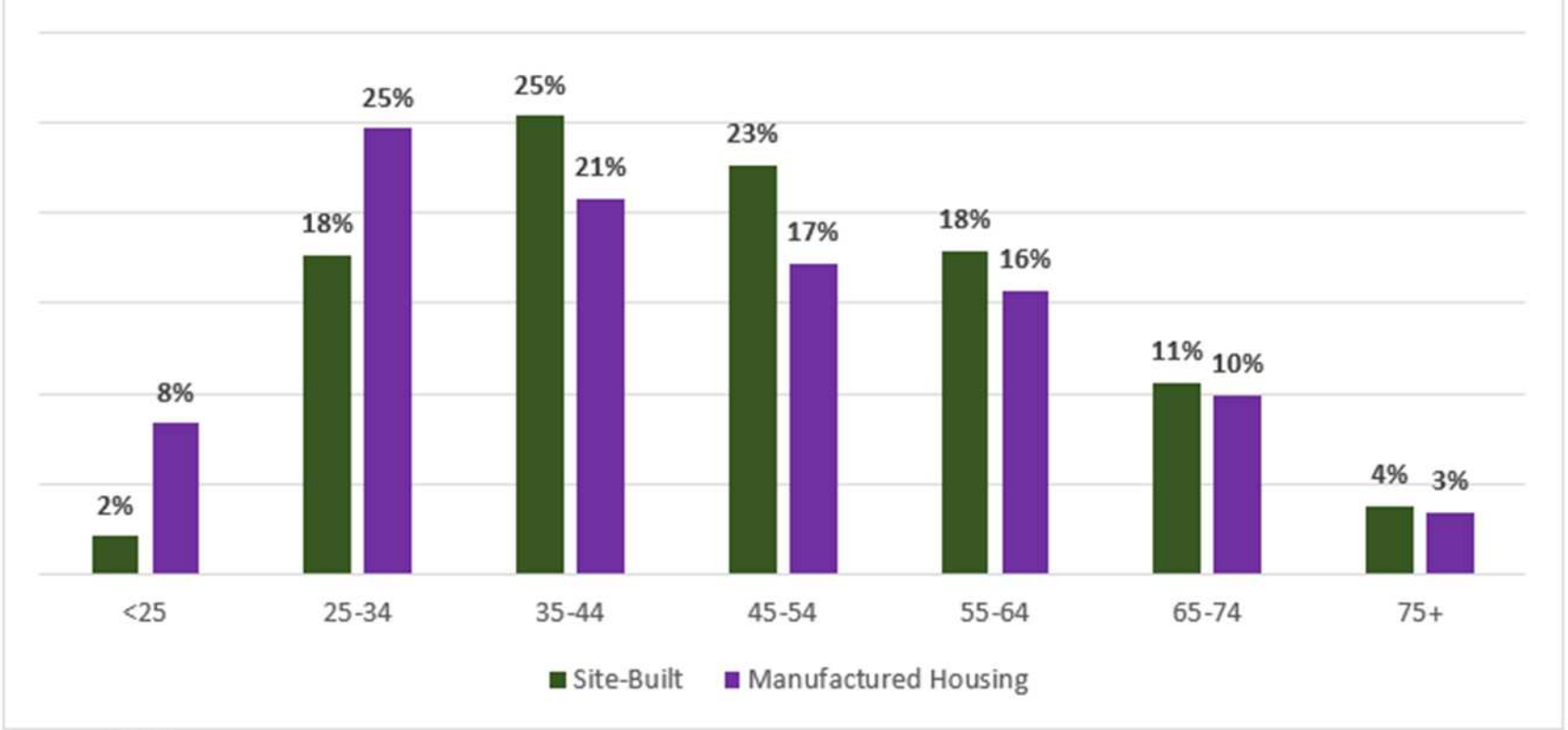
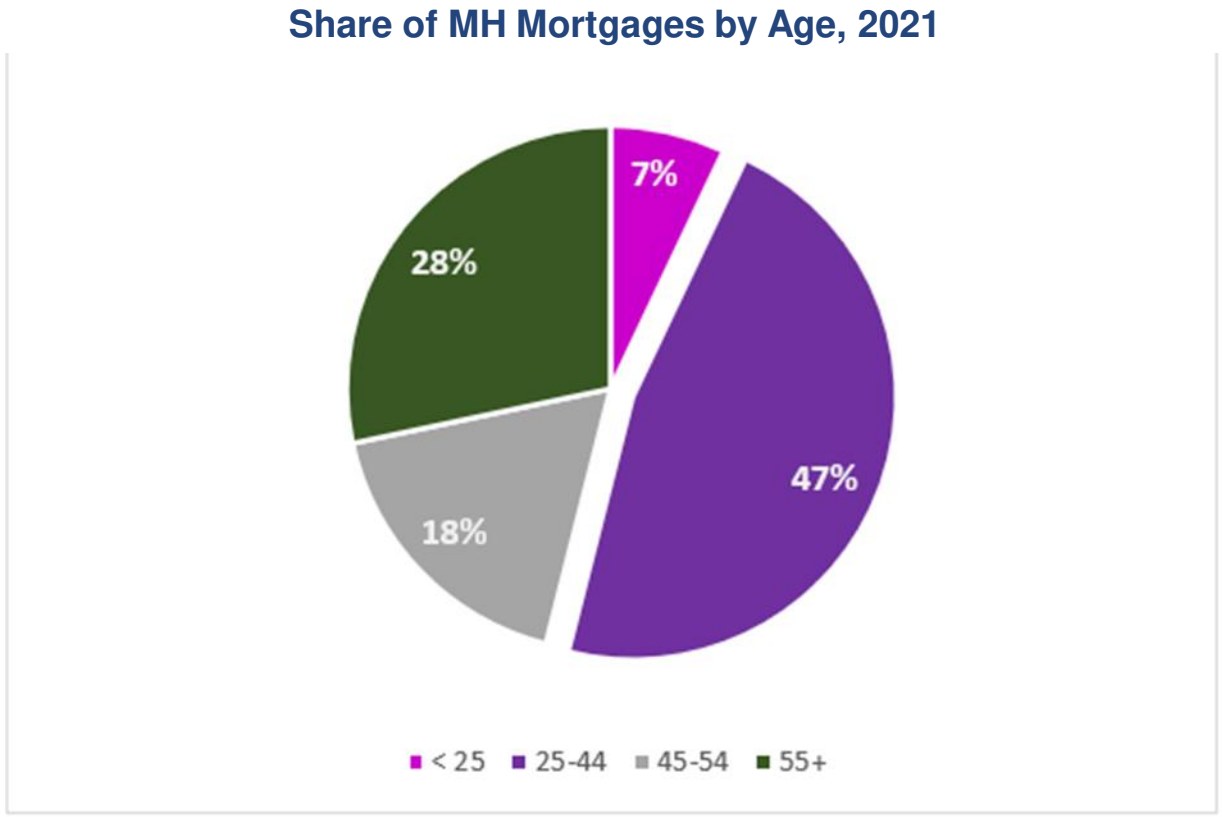
Percent of Total Mortgages by Housing Type and Age, 2021



Source: HMDA

Consumers Under the Age of 44 Account for 54% of all MH Mortgages in 2021

RURAL RESEARCH SYMPOSIUM



Source: HMDA

Consumers Between 25-44 are Part of a Continuing Trend Choosing to Live in Manufactured Housing

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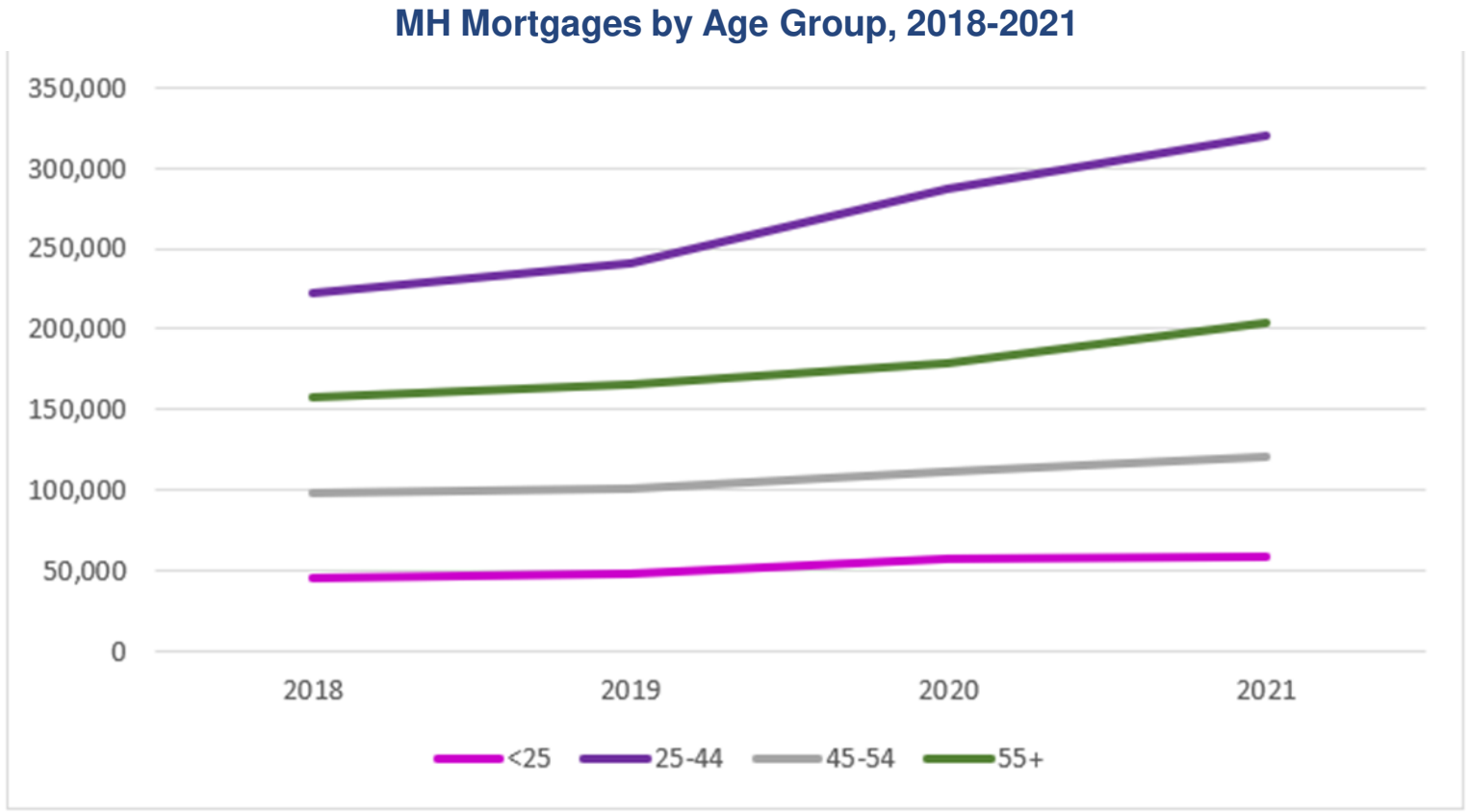

Source: HMDA

Millennial Consumers Outpace the National Average for % Increase in MH Mortgages

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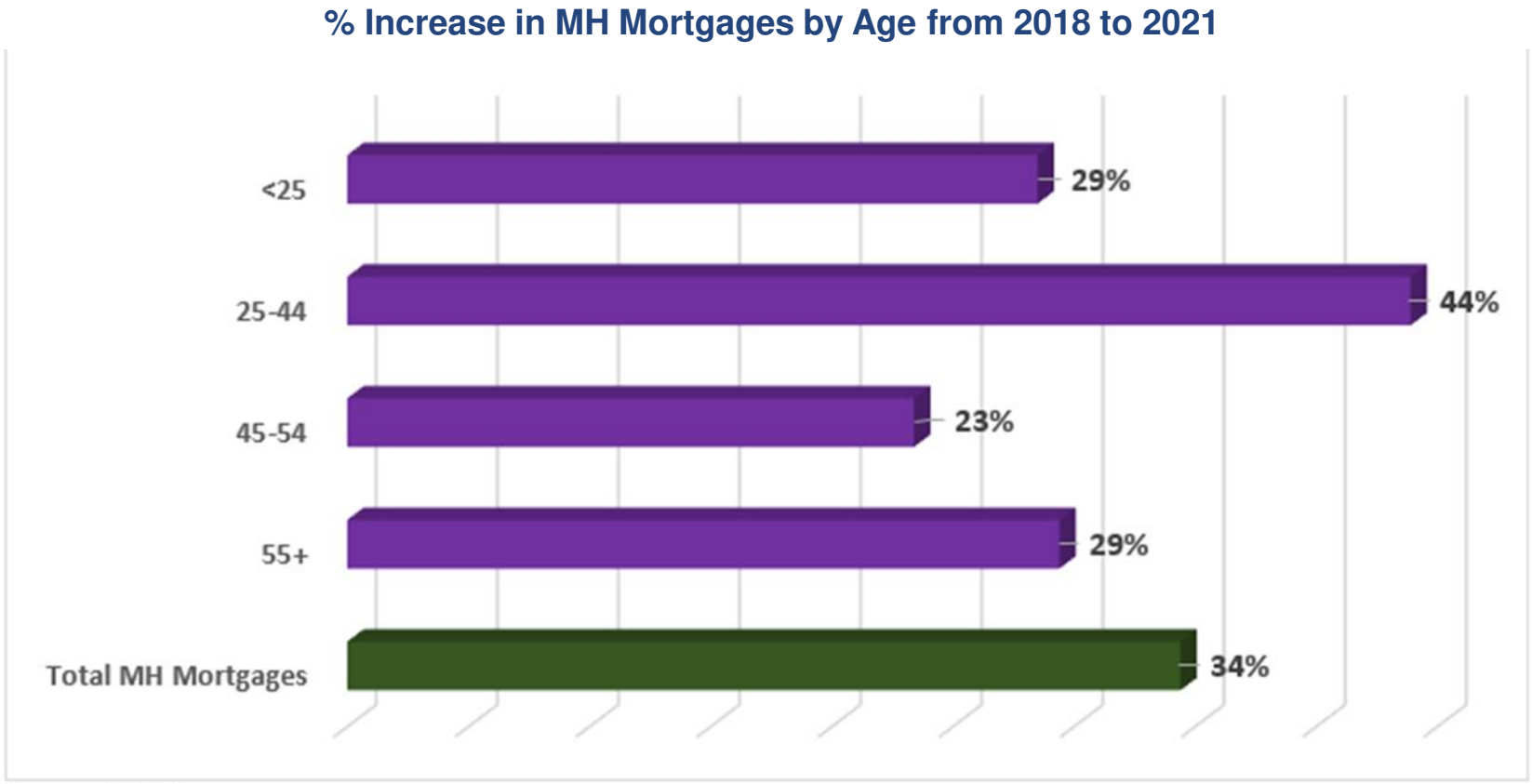

Source: HMDA

Findings

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Where are Manufactured Home Buyers Living?

The States Receiving the Largest Numbers of Manufactured Homes are Largely Rural

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Top 10 States for MH Shipments by Percent Rural, 2021

State	MH Shipments	% Rural
Texas	18,478	15.3%
Florida	7,601	8.8%
North Carolina	6,129	33.9%
Louisiana	5,623	26.8%
South Carolina	5,216	33.7%
Alabama	5,153	41.0%
Mississippi	4,415	50.6%
Georgia	4,211	24.9%
Michigan	4,037	25.4%
Kentucky	3,884	41.6%

Sources: US Census Bureau; MHI Monthly Economic Report

States with High Levels of Domestic Migration and Large Rural Populations also Lead in Percentage of Manufactured Housing

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Highest Population Growth States by MH Shipments and % of Occupied Housing

State	Net Domestic Migration 2021	% Rural	Rank for MH Shipments	MH as % of Total Occupied Housing Units
Florida*	220,890	8.8%	2	10.5%
Texas*	170,307	15.3%	1	7.7%
Arizona*	93,026	10.2%	14	11.9%
North Carolina*	88,673	33.9%	3	14.4%
South Carolina*	64,833	33.7%	5	18.7%
Tennessee*	61,390	33.6%	11	10.1%
Georgia*	50,632	24.9%	8	9.8%
Idaho*	48,876	29.4%	34	8.8%
Utah	32,200	9.4%	41	3.5%
Nevada*	25,327	5.8%	33	5.9%
Oklahoma*	24,687	33.8%	13	10.7%
Alabama*	22,136	41.0%	6	15.7%
Montana*	19,240	44.1%	37	12.0%
Arkansas*	16,016	43.8%	15	13.7%
Maine*	15,473	61.3%	30	10.9%

Sources: HJCS, US Census Bureau; MHI Monthly Economic Report
*Above the US average 7.5% of existing single-family homes being manufactured homes

States with High Domestic Migration Have Seen Consistent Growth in Manufactured Housing

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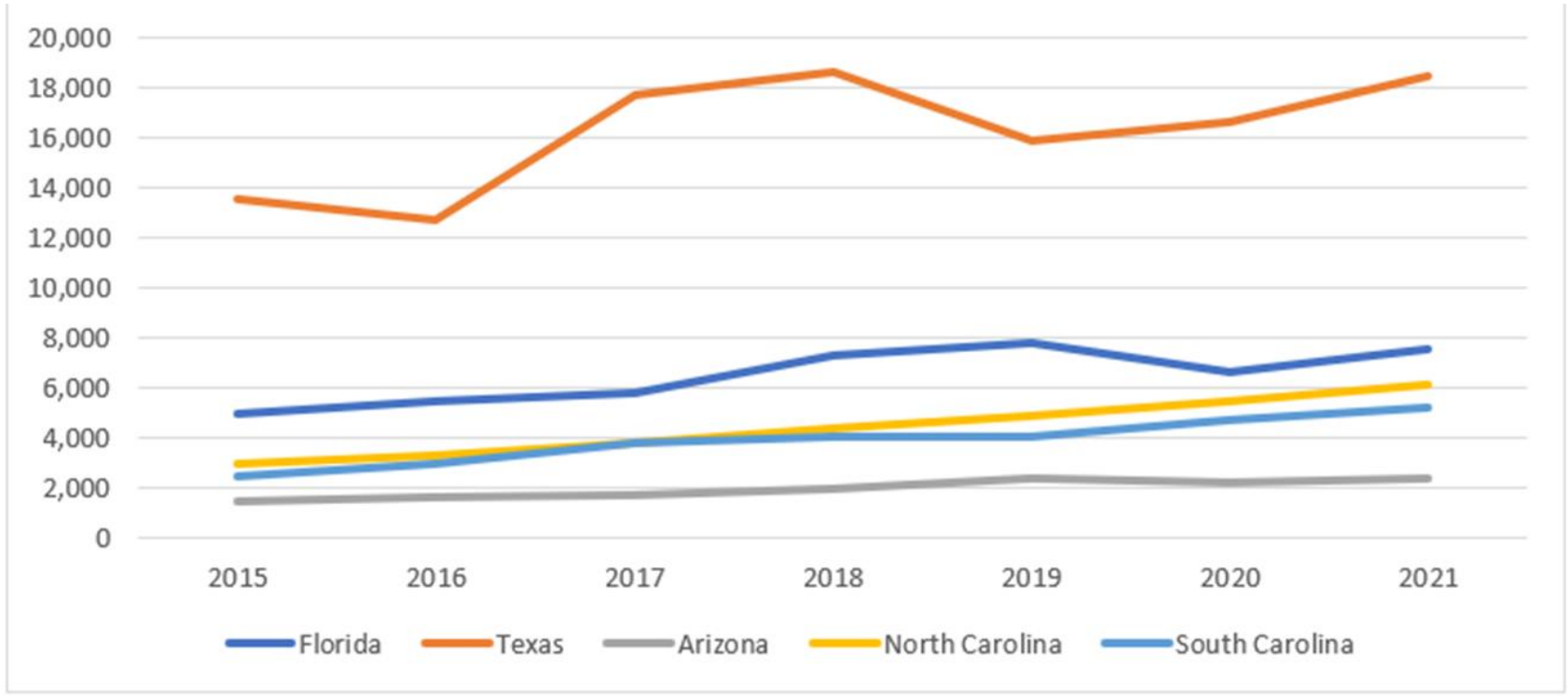
Total Manufactured Homes Shipped to Top 5 Population Growth States, 2015-2021



Sources: HJCS, US Census Bureau; MHI Monthly Economic Report

States with High Domestic Migration Have Seen Consistent Growth in Manufactured Housing

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% Increase in MH Shipped to High Growth States, 2015-2021

State	Increase in MH Shipments
Florida	53.4%
Texas	35.9%
Arizona	64.5%
North Carolina	105.9%
South Carolina	109.1%

Source: MHI Monthly Economic Report

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Conclusions and Takeaways

Conclusions and Takeaways

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Younger consumers indicate enthusiasm for manufactured housing in surveys, AND their attitudes appear to be translating into action.

- Millennials and Gen Z are engaged in the manufactured housing market as evidenced by the share of MH mortgages they hold relative to other generational cohorts.
- Data suggests that this participation is part of a broader trend of younger consumers purchasing manufactured homes.
- Given current economic headwinds, particularly for younger consumers, manufactured housing offers an affordable alternative to site-built homes.

Conclusions and Takeaways

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States with larger rural populations are leaders in both domestic migration and shipments of manufactured housing.

- Conditions in the homebuying market are pushing consumers to explore options outside of population-dense urban areas.
  - Rural areas and smaller towns typically offer more affordable options for housing, both in rental markets and homes for purchase.
  - These environments also provide other benefits such as less density, more green space, or private yards.
- These areas have experienced high levels of in-migration, particularly in the past year.
- Similarly, rural areas and smaller towns offer the space for placement of new manufactured homes and often have zoning ordinances that are amenable to manufactured homes.

Conclusions and Takeaways

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Younger consumers, particularly Gen Z consumers, are concerned with affordability while also seeking to achieve traditional milestones such as homeownership.

- Manufactured housing presents an opportunity for Millennials and Gen Z to enter the homebuying market, especially as they are increasingly priced out of the market for site-built homes.

The Covid-19 pandemic was an opportunity for many consumers to reevaluate their goals and expectations.

- With the proliferation of WFH, the high-costs of urban centers, and the limited housing options available in larger cities, many younger consumers are considering rural environments and smaller towns as the place to make their home.

Questions?

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Thank you

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Sources of Statistics for U.S. Production of Factory-Built Housing

Elena Falcettoni and James A. Schmitz, Jr.

Falcettoni: Federal Reserve Board of Governors; Schmitz: Federal Reserve Bank of Minneapolis. The views expressed are those of the authors' and do not represent the views of the Federal Reserve Board, the Federal Reserve Bank of Minneapolis, or the Federal Reserve System.

Speaker Bio

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Elena Falcettoni

Senior Economist, Payment System Studies
Federal Reserve Board

Elena is a Sr. Economist at the Federal Reserve Board. Her research interests are health economics, inequality, and affordable housing. At the Board, she works on debit cards and cross-border payments. She also serves as a Director and Secretary to the Board for the FRB Federal Credit Union and is an Affiliate Scholar with the Heller-Hurwicz Economics Institute.

Introduction

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- Data on mobile home shipments are readily available through the Census and are usually assumed to be equal to the total data on factory-built housing
- However, many other types of factory-built housing grew at the same time, but data sources have been limited
- → To solve this, we collect new data by going through documents published at the time (e.g., newspapers) to build a dataset of factory-built housing from 1947 onward
- With the new dataset, we show that:
  - Factory-built housing has been underreported substantially by focusing on mobile homes only
  - Factory-built housing was a massive share of single-family housing (60% in 1970) and dropped substantially over the years (separate paper on policies that affected this)

Some Definitions

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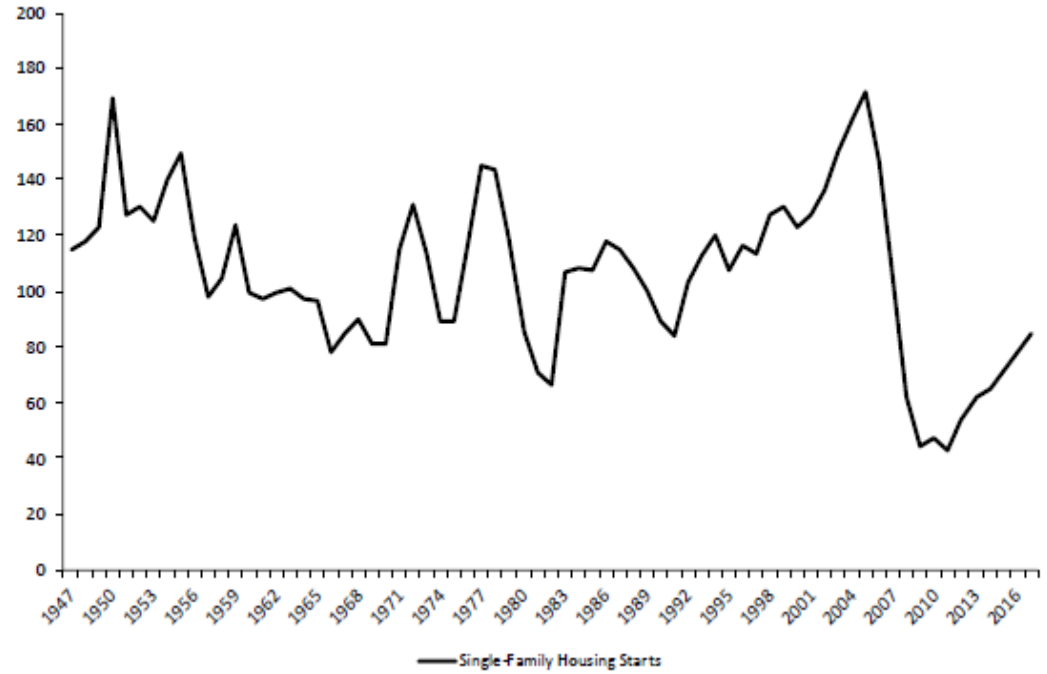
- **Manufactured (Mobile) Homes:** This group consists of all types and sizes of mobile homes, built in a factory (roughly 90% ready by the time they are transported). They have to abide by the HUD code
- **Modular homes:** A modular home is built in sections, transported to the home site (about 70% ready), and set on a foundation; they have to respect State and local housing codes
- **Prefabricated homes:** Either panelized or pre-cut homes. Housing parts are produced in a factory and assembled on site. These are more labor-intensive than the other two types
- **Single-family homes:** Single-family housing starts (stats from Census) include fully detached, semidetached (semi attached, side-by-side), row houses, and townhouses. These units must not share heating/air-conditioning systems or utilities
- **Stick-built housing:** Difference between single-family housing starts and the sum of prefabricated housing and modular housing. This is due to the fact that prefabricated and modular homes would be included in housing starts, while mobile homes would not
- **Factory-built housing:** Sum of mobile, modular, and prefabricated homes

Single-Family Housing

- Single-family housing starts following 1959 are available from the Census – New Residential Construction
- Data before 1959 come from David Saskind, “Housing Starts: Background and Derivation of Estimates 1945-1982”
- Before 1959, the BLS was responsible to track housing starts; Census revised them after and should be comparable following their revision

Single-Family Housing Starts (Units, 000s)

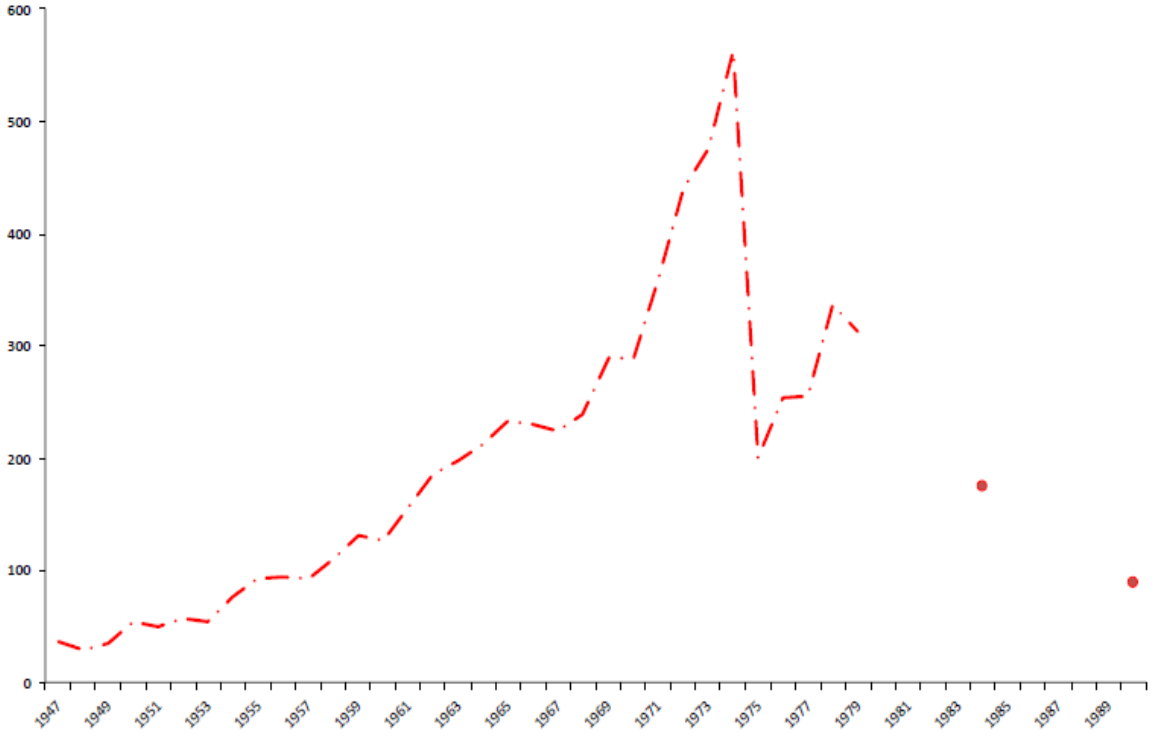


Source: Data following 1959 are available from the U.S. Census Bureau New Residential Construction. Not seasonally adjusted data are used. Data before 1959 come from David Saskind, Housing Starts: Background and Derivation of Estimates 1945-1982, Construction Review, 1982.

NAHM Data

- The National Association of Home Manufacturers (NAHM) ran their own surveys and professional surveys collecting data on modular and prefabricated housing
- Data up to 1969 are reported in Field and Rivkin (1975)
- Data from 1969 to 1972 are reported in Reidelbach (1972)
- Data from 1973 to 1979, 1984, and 1990 are collected through newspaper articles at the time
- Upshot: similar trend as mobile homes, with a boom and a sharp decline

NAHM – Sum of Modular and Prefabricated Housing (Units, 000s)

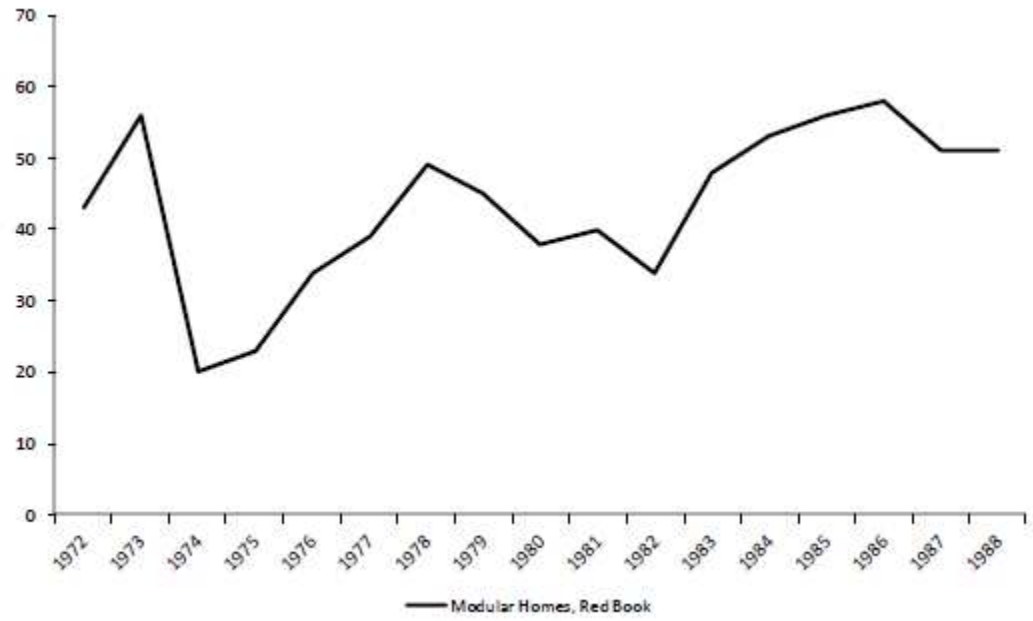


Source: NAHM from Field and Rivkin (1975), Reidelbach (1972), newspapers.

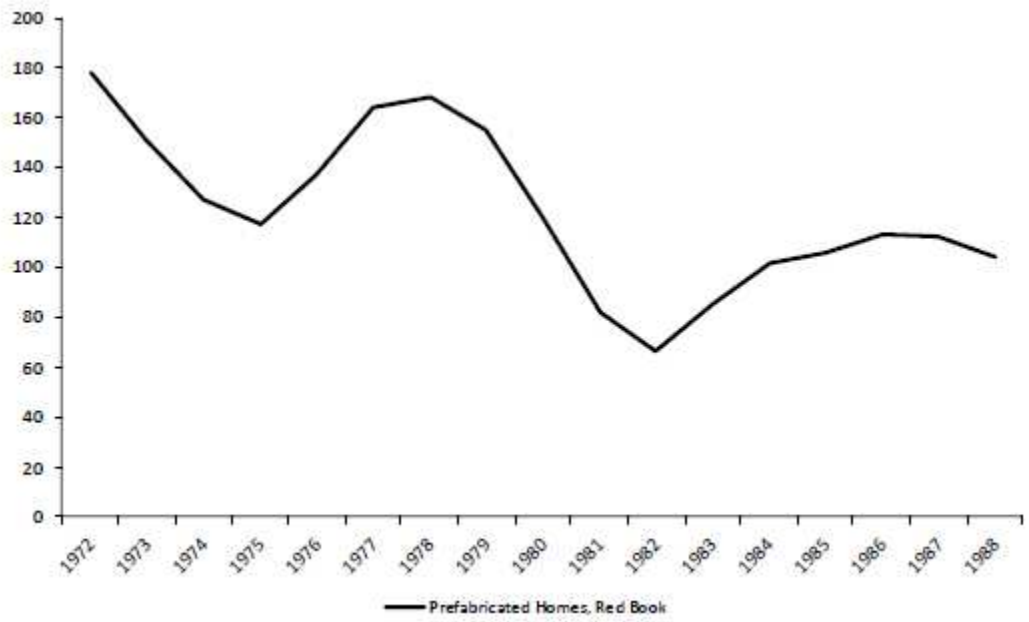
Secondary Data Sources: Red Book Data

- *The Red Book of Housing Manufacturers* collected data from a mailed questionnaire from 1972 to 1988
  - Differentiates between 1-4 unit and 5+unit – we focus on 1-4 for comparison

Red Book –Modular Housing (Units, 000s)



Red Book – Prefabricated Housing (Units, 000s)



Source: The Red Book of Housing Manufacturers

Secondary Data Sources: AIH Data

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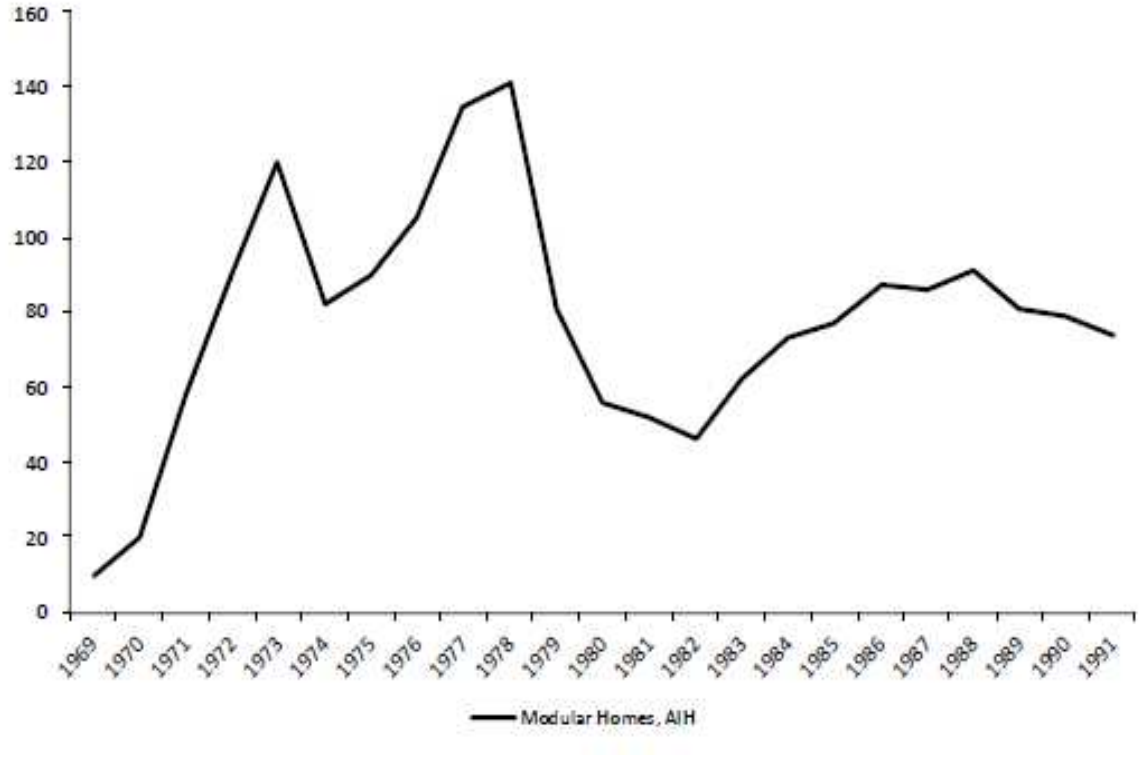
- Automation in Housing (AIH) data is based on a stratified sample of survey of subscribers to the *Automation in Housing & Manufactured Home Dealer* publication series
  - Subscribers = 90% of all housing starts
  - Does not include small custom builders and some producers of high-rise structures
- AIH differs in how they categorize production and housing types
  - While modular production is more similar in definition, AIH defines prefabricated housing to include units produced by major industrialized builders independently of the construction method used (i.e., even if it is only used for only parts of the home)

AIH –Modular Housing (Units, 000s)



Source: Automation in Housing.

Comparison: Mobile Homes in AIH & Red Book

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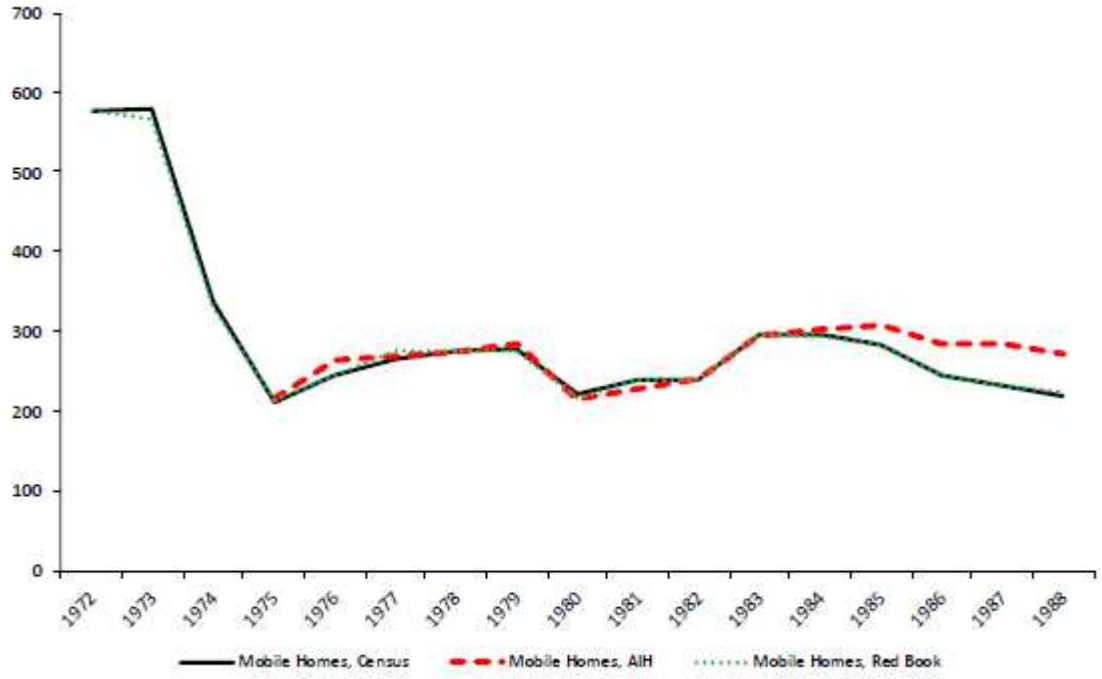
- From 1972 to 1988, the Census, AIH, and Red Book all report mobile homes
- We plot the estimated counts of mobile homes according to AIH and Red Book against the Census statistics
- All reported values are close to each other, giving us confidence in AIH's and Red Book's sampling techniques

Mobile Homes: Census, AIH, Red Book (Units, 000s)

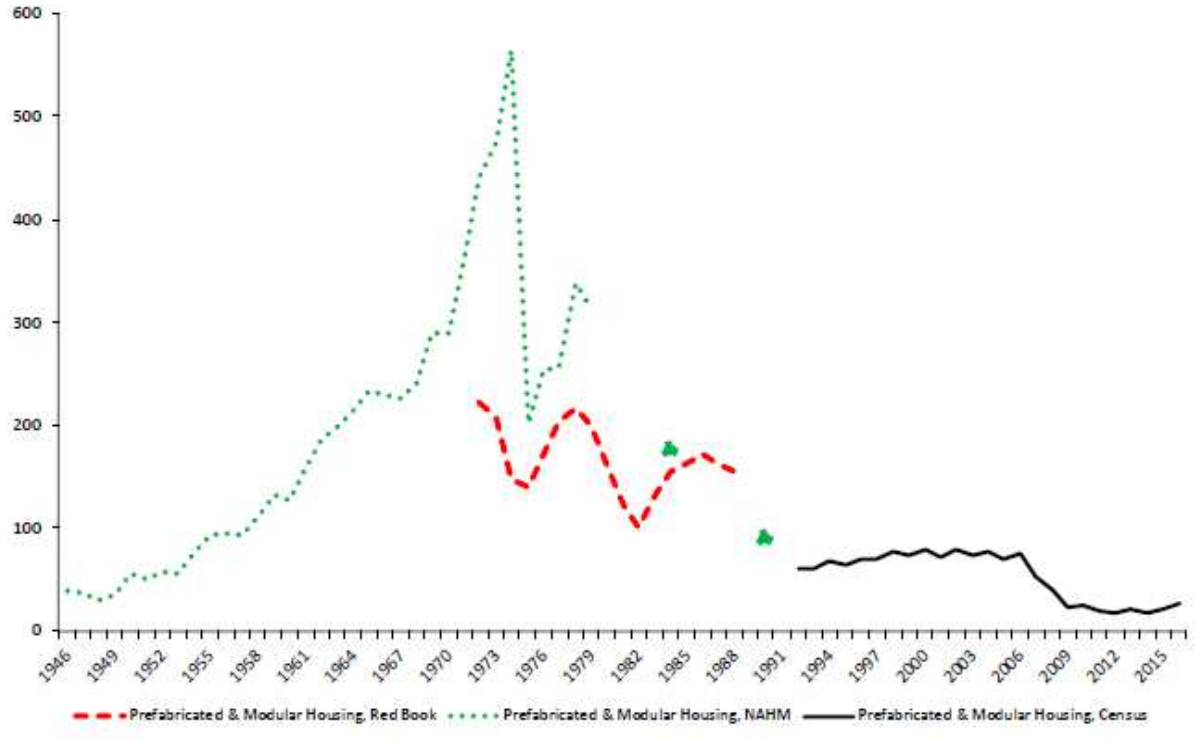


Source: Census, Automation in Housing, The Red Book of Housing Manufacturers

Total of Modular and Prefabricated Housing

- NAHM almost always reports the total of modular and prefabricated housing
  - In the paper, we also compare the series creation for modular and prefabricated housing separately
- We exclude AIH here because of the caveats on the way they define prefabricated housing
- The Census starts reporting data on modular and prefabricated housing in 1992
- The closest NAHM data point to the Census (1990) approaches the Census point closely, giving us confidence in our data collection

Sum of Modular and Prefabricated Housing (Units, 000s)



Source: NAHM, Census, The Red Book of Housing Manufacturers

Understatement of Factory-Built Housing

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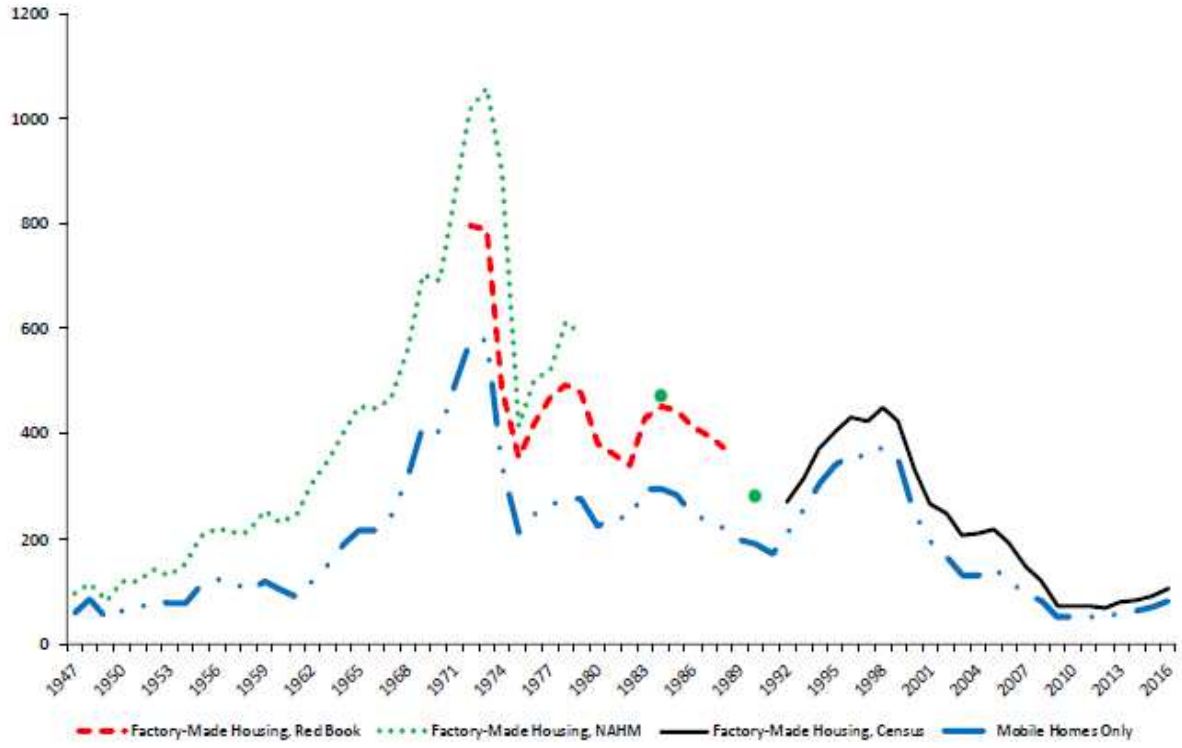
- Analyses in academia and policy use mobile homes as a synonym of factory-built housing
- However, factory-built housing equals the sum of modular, prefabricated, and manufactured (mobile) housing
- While, currently, the use of factory-built housing is negligible, the use of mobile home statistics in historical analyses would underestimate factory-built housing substantially
    - Total factory-built housing regularly equals double the number of mobile homes only across the decades considered

Factory-Built Housing vs. Mobile Homes Only (Units, 000s)



Source: NAHM, Census, The Red Book of Housing Manufacturers

Stick-Built vs. Factory-Built Housing

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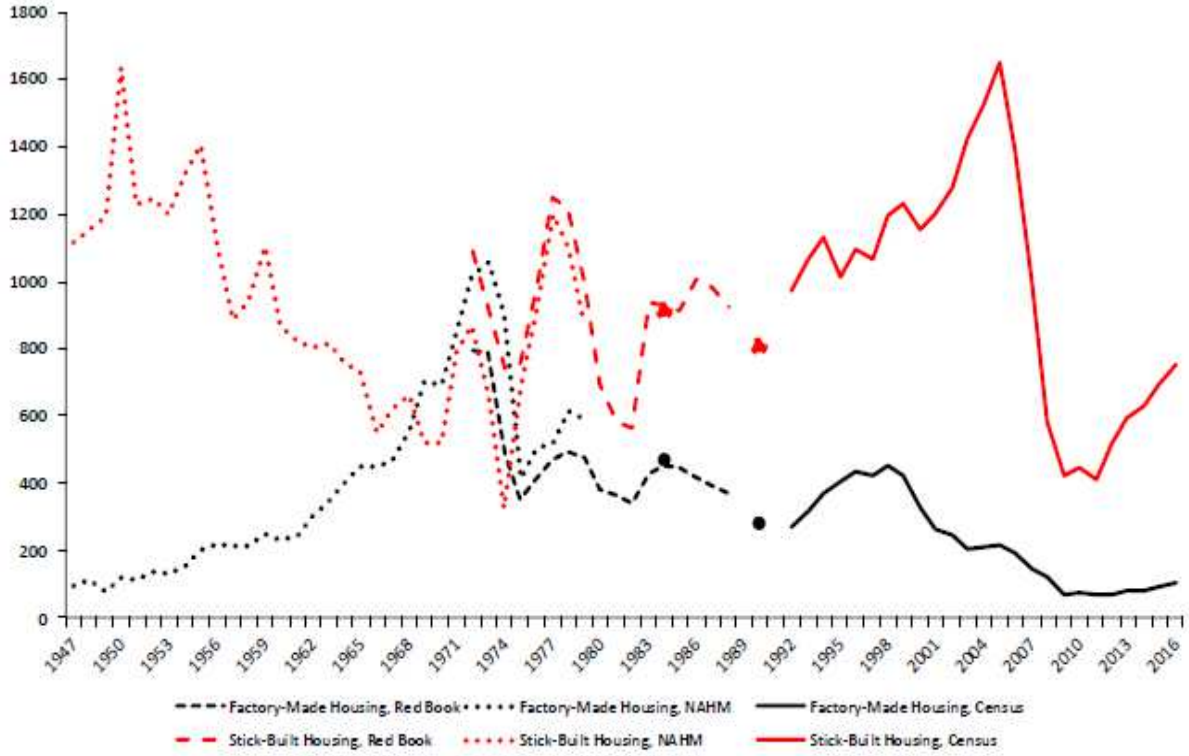
- Factory-built housing is once again the sum of manufactured (mobile) housing, modular housing, and prefabricated housing
- Modular and prefabricated homes are included in the counts of single-family housing starts
- Therefore, stick-built housing is the difference between total single-family housing starts and the sum of modular and prefabricated housing
- The series shows how during the boom of factory-built housing in the 60s and 70s, factory-built housing equalled and even surpassed stick-built housing

Stick-Built vs. Factory-Built Housing (Units, 000s)



Source: NAHM, Census, The Red Book of Housing Manufacturers

Share of Factory-Built Housing Over Time

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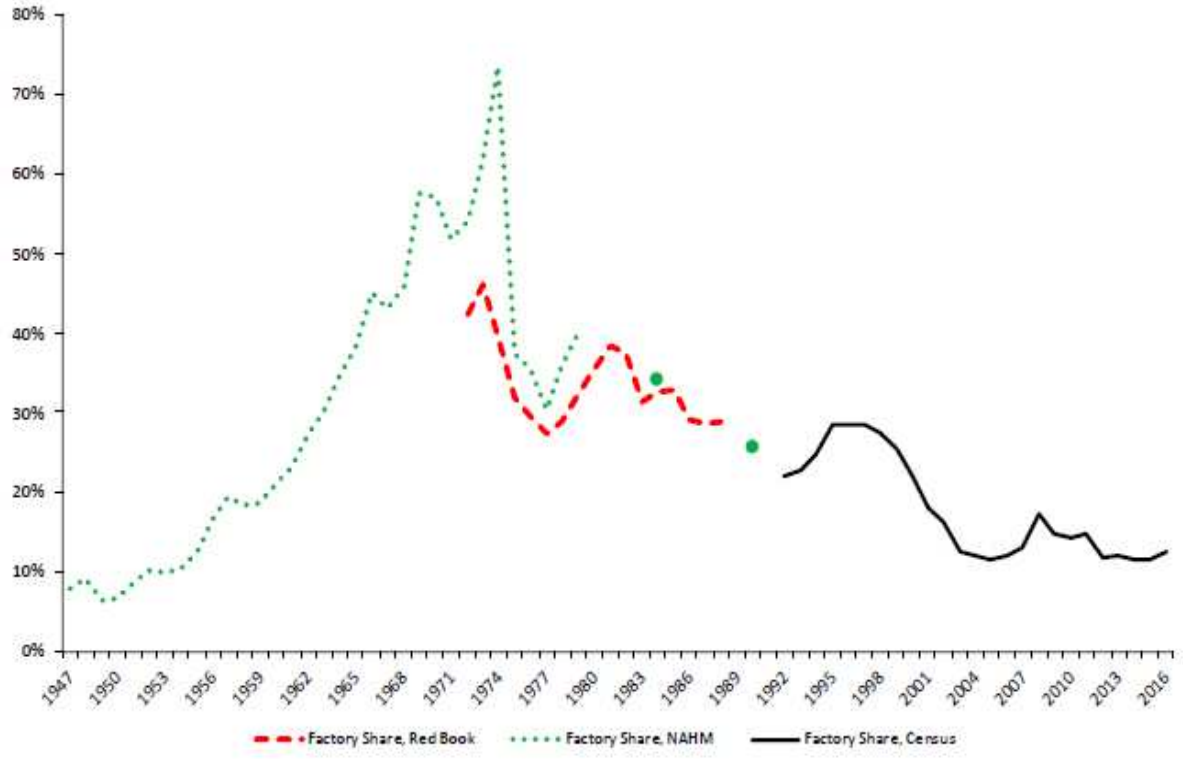
- To show the extent to which factory-built housing was important across these decades, we calculate the share of total single-family housing that was factory-built
- Total single-family housing = factory-built housing + stick-built housing = mobile homes + single-family housing starts
- Factory-built housing = mobile homes + modular homes + prefabricated homes
- Factory-built housing share = factory-built housing/total single-family housing
- While the share of single-family housing needs covered by factory-built housing is only roughly 10% currently, it was as high as 75% at its boom

Factory-Built Housing as a Share of Total Single-Family Housing (%)



Source: NAHM, Census, The Red Book of Housing Manufacturers

Conclusion

RURAL RESEARCH SYMPOSIUM

- We collect data from a number of sources, reports, magazines, and newspapers to build a more-comprehensive dataset of factory-built housing from 1947 onward
- With this new dataset, we show that using mobile homes only as a proxy for factory-built housing vastly underestimates the importance of factory-built housing over time (it is often as much as 2x or 3x the number of mobile homes)
- With this new dataset, we also show that factory-built housing covered a massive share of single-family housing needs historically, reaching its peak of 75% in the 70s
- We are in the process of analyzing policies that led to the reduction of factory-built housing (we have some work underway on policies that affected mobile home production)
- Hoping to use this dataset to understand how affordable housing provision was affected by changes in factory-built housing production

Questions?

Thank You

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Freddie Mac

RURAL RESEARCH SYMPOSIUM

Collaboration Through
Insights-Driven Solutions

Covid 19 and Loan Performance: A Focus on Manufactured Housing and High Needs Rural Regions

AN ALL FOR HOME EVENT

Astou Aw, PhD

Agenda

1. Motivation
2. Purpose
3. Data
4. Covid and Loan Forbearances
5. Covid and Loan Delinquencies
6. Conclusions

Motivation

Motivation

RURAL RESEARCH SYMPOSIUM

- Covid-19 had a big impact on the economy particularly in its early stages:
  - Financial Sector
  - Economic Hardships
  - Budget Trade-offs
- The impact of the pandemic is uneven:
  - Some demographics were relatively more impacted.
  - The effect of Covid in Rural America is exacerbated by economic disparities that have traditionally affected this region.

Manufactured Housing Owners were Excluded from Some Relief Programs

RURAL RESEARCH SYMPOSIUM

- Although few relief programs were available during the pandemic, manufactured housing owners were sometimes excluded from these programs or had to meet more stringent criteria, (especially in early stages of Covid).
  - CARES Act imposed restrictions related to the financing type of manufactured housing and loan type.
  - HEROES Act however offered more protection to manufactured housing owners.
- The Homeowners' Assistance Fund (HAF) included manufactured housing properties with and without structure but has yet to be implemented by many states.

Purpose

Purpose

RURAL RESEARCH SYMPOSIUM

- This research studies the performance (forbearance and delinquency) of manufactured home loans during the pandemic.
- This research also investigates loan performance in high needs rural regions during the pandemic.
- This work identifies relevant covariates associated with the likelihoods of forbearance and delinquency.

RURAL RESEARCH SYMPOSIUM

Data

Overview of the Dataset Used in the Analysis

RURAL RESEARCH SYMPOSIUM

- The Data come from the National Mortgage Database (NMDB, version 18).
- The NMDB is a nationally representative 1 in 20 random sample of residential mortgages in the United States.
- This analysis considers loans that are active from the first quarter of 2015 to the first quarter of 2022.

Main Variables of Interest (1 of 2)

- Two focal time periods:
  - Pre-Pandemic: time period before the first quarter of 2020.
  - Covid: From the first quarter of 2020 to the first quarter of 2022.

Main Variables of Interest (2 of 2)

- Four Focal variables
  - Forbearance
  - 90 + Day Delinquency
  - Property Type
    - Manufactured (MH)
    - Site Built (SB)
  - Geography
    - Metro
    - DTS high needs rural
    - Other Rural

Characteristics in the Analysis

RURAL RESEARCH SYMPOSIUM

Loan Characteristics

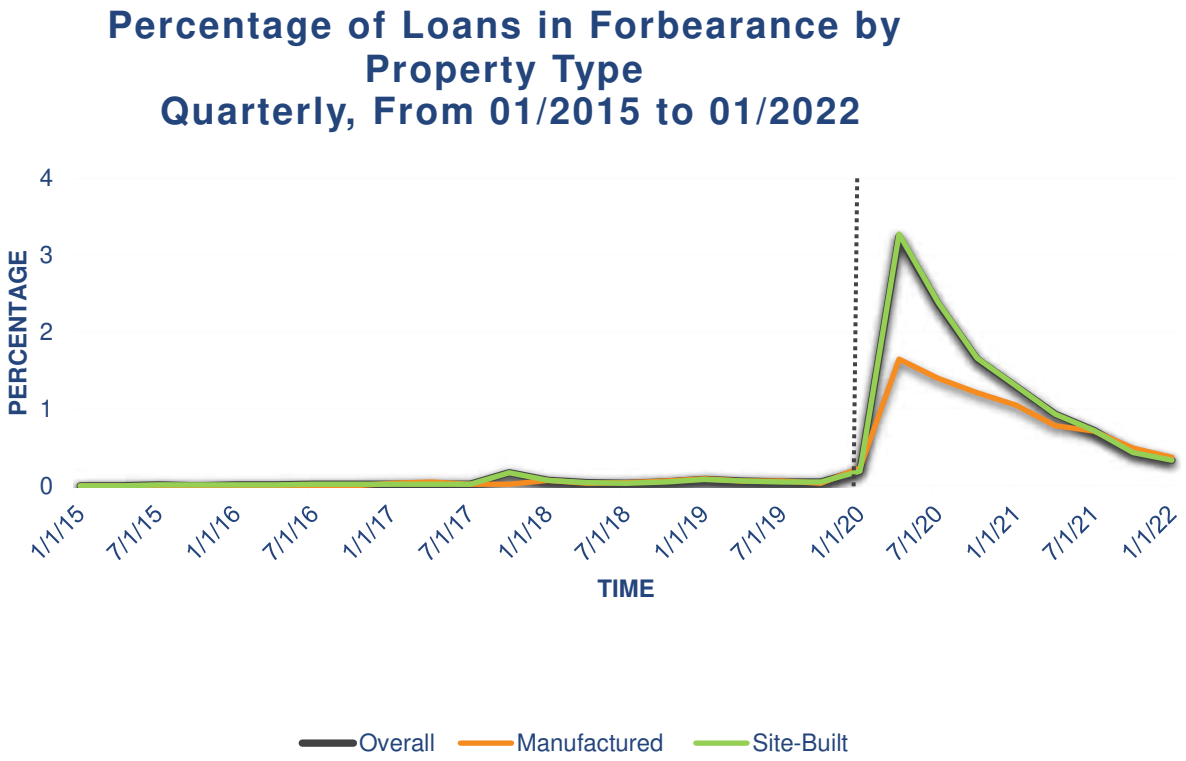
- Debt to Income Ratio (DTI)
- Interest Rate
- Loan amount
- Loan to value ratio (LTV)
- Loan purpose (purchase vs refinance)
- Loan type (conventional vs government backed)
- Term
- Government sponsored enterprises' loans

Borrower Characteristics

- Age
- Credit Score
- Income
- Race and ethnicity
- First-time homebuyer
- Owner-Occupancy status

Covid and Loan Forbearances

Manufactured Housing Owners have Lower Forbearances during Covid

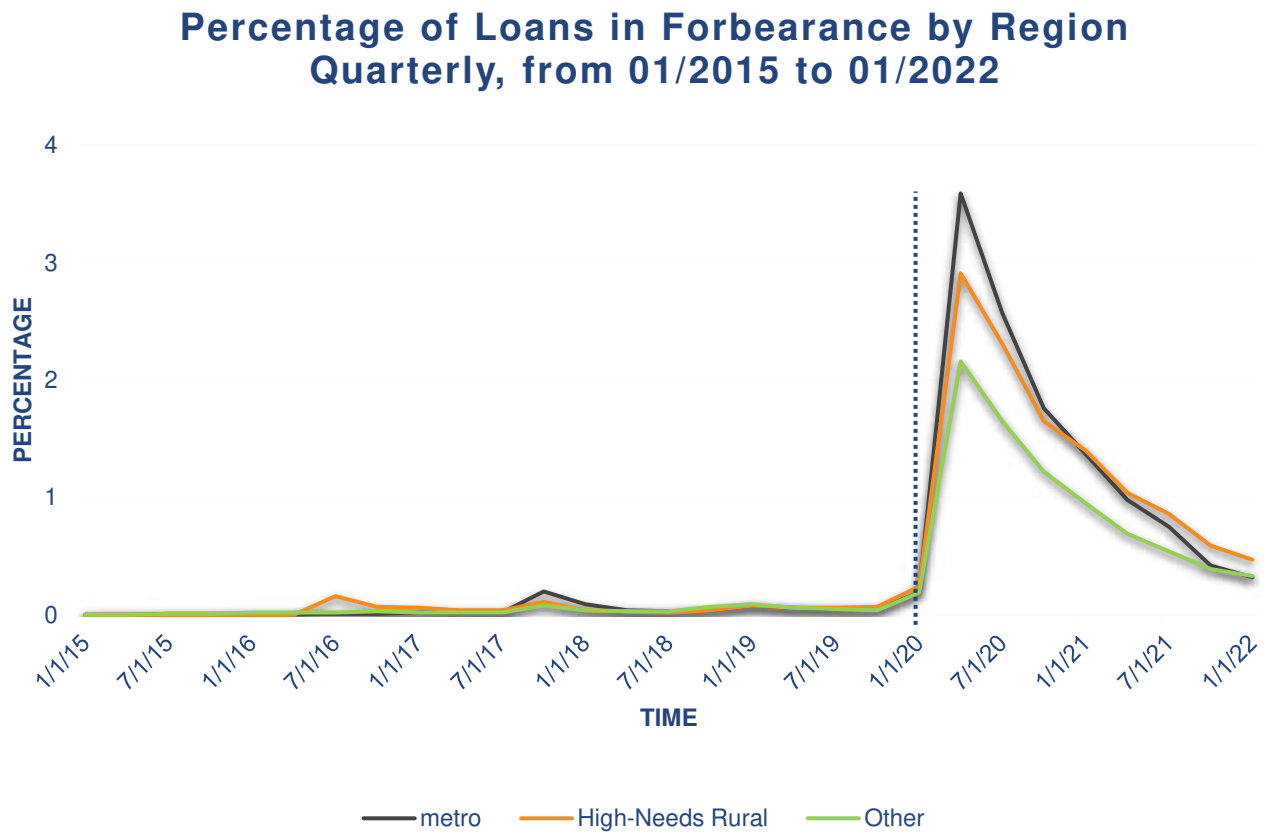


The percentage of loans in forbearance was relatively lower for manufactured housing owners during Covid.

Source: Freddie Mac Calculations using NMDB (Version 18).

Note: Dotted Line represents the start of Covid.

Forbearances were Lower in High Needs Rural Regions (Relative to Metros) During Covid



Source: Freddie Mac Calculations using NMDB (Version 18).

Note: Dotted Line represents the start of Covid.

Compared to metro areas, forbearances were lower in High needs rural regions in early stages of Covid.

Estimating the Probability of Forbearance (1 of 2)

RURAL RESEARCH SYMPOSIUM

- Aside from property type and geography, there are other factors that also simultaneously impact the likelihood of forbearance.
- We want to estimate the following equation:

$$(1) \qquad F_{it}^{*} = X_{it}'\beta + \varepsilon_{it} \quad i = 1, \ldots n \; and \; t = 1, \ldots T = 29$$

$$F_{it} = 1 \; if \; F_{it}^{*} > 0 \; and \; F_{it} = 0 \; otherwise$$

Estimating the Probability of Forbearance (2 of 2)

RURAL RESEARCH SYMPOSIUM

- Equation (1) is estimated using:
  - Pooled Probit
  - Panel Random Effects Probit
  - 2SLS and control function estimators (forthcoming)

MH Loans Have a Lower Likelihood of Forbearance

RURAL RESEARCH SYMPOSIUM

- Over the entire study period, manufactured home loans have a 0.6% lower likelihood of forbearance compared to loans linked to Site Built properties (SB).
- During Covid,
  - the marginal effect of MH on forbearance is even greater. We estimate that compared to SB properties, MH owners have a 1.1% lower probability of forbearance during the pandemic.
  - the probability of any loan being in forbearance is 1.4% higher relative to the pre-pandemic period.
- *These effects are statistically significant at least at the 5% level.*

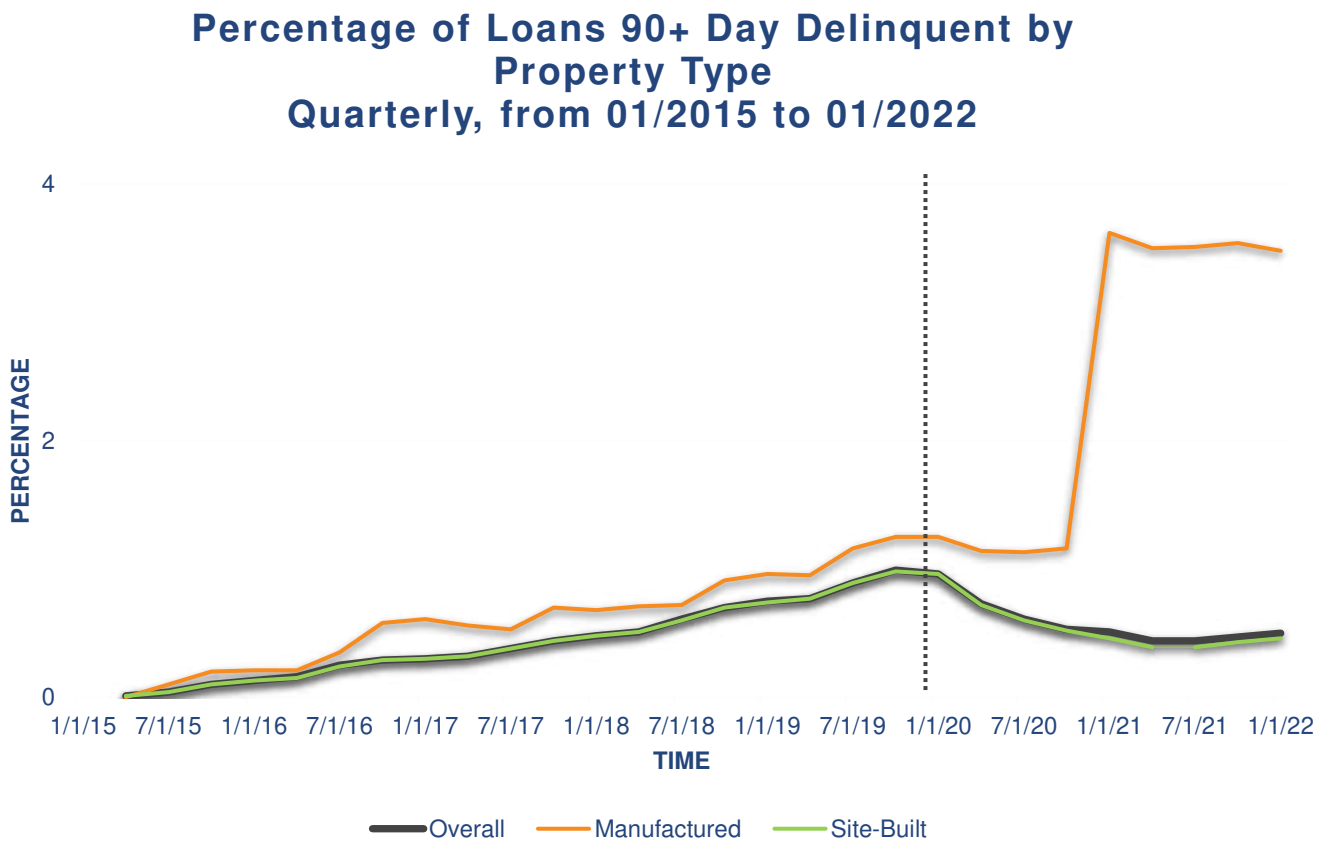
Manufactured Home Loans in HNR have a Lower Probability of Forbearance during Covid

- There exist no statistically significant differences in the overall likelihoods of forbearance in high needs rural regions and metropolitan areas during Covid.
- However, during the pandemic, loans linked to MH properties in high needs rural regions had a 0.22% lower probability of forbearance compared to those linked to Site Built homes within the same area. This effect is statistically significant at the 1% level.

Covid and Loan Delinquencies

The Average Delinquency Rate During Covid is Slightly Higher for Manufactured Home Loans

RURAL RESEARCH SYMPOSIUM

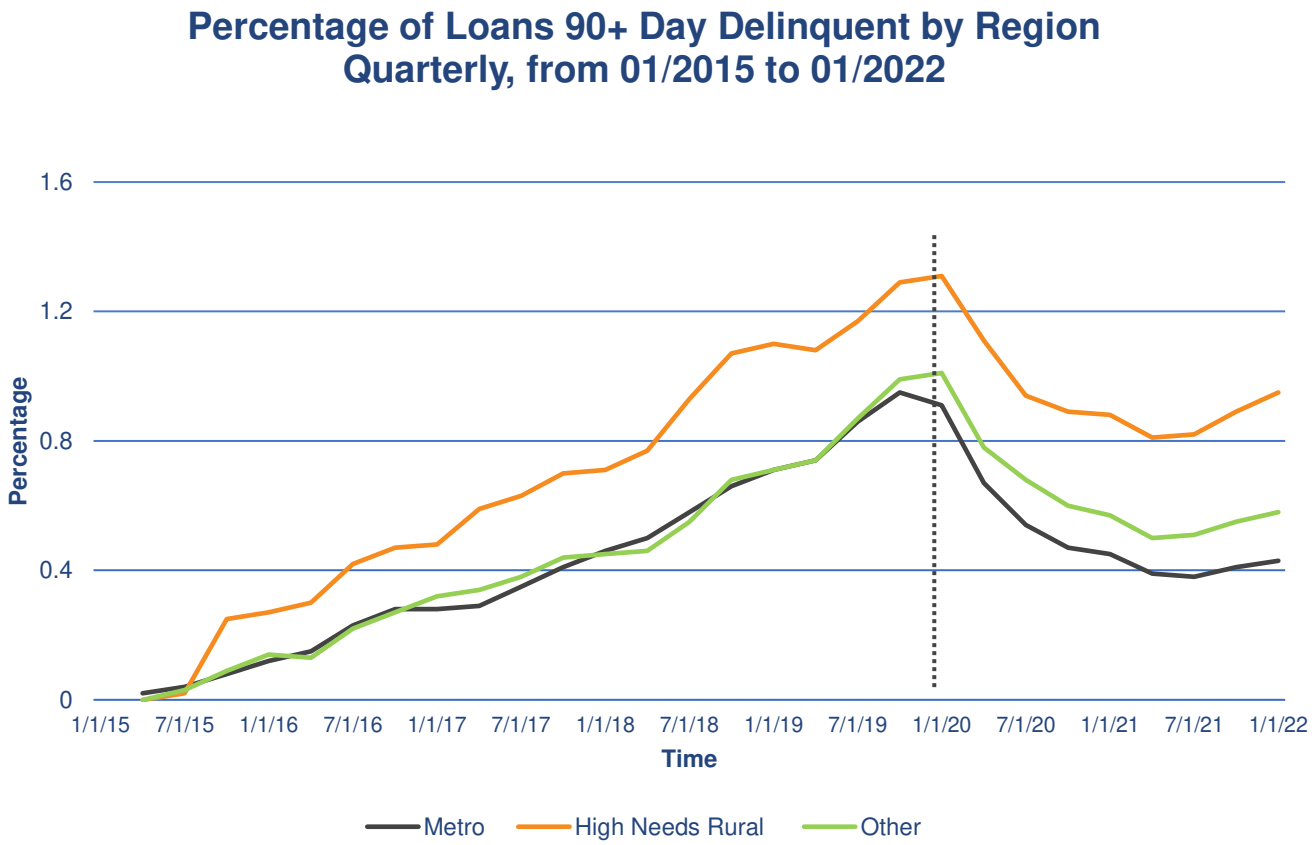


Source: Freddie Mac Calculations using NMDB (Version 18)

Note: Dotted Line represents the start of Covid

Quarterly summary statistics show a higher delinquency rate for MH owners relative to SB owners during the pandemic (the difference reached a maximum of 3% during the first quarter of 2021).

Delinquency Rates are Slightly Higher in High Needs Rural Regions



Source: Freddie Mac Calculations using NMDB (version 18).

Note: Dotted Line represents the start of Covid

Quarterly summary statistics show a traditionally higher delinquency for borrowers in High Needs Rural areas relative to metros and other rural areas, (both pre and during Covid).

Interestingly, quarterly delinquency during covid followed a downward trend in all regions until around the 2nd quarter of 2021, when rates started increasing.

Estimating the Probability of Delinquency (1 of 2)

RURAL RESEARCH SYMPOSIUM

- Similarly to forbearance, there exist other variables related to both loan and borrower characteristics that also impact the likelihood of delinquency.
- We want to estimate the following equation.

$$(2) \qquad D_{it}^{*} = C_{it}'\delta + \theta_{it} \quad i = 1, \dots n \; and \; t = 1, \dots T = 29$$

$$D_{it} = 1 \; if \; D_{it}^{*} > 0 \; and \; D_{it} = 0 \; otherwise$$

Estimating the Probability of Delinquency (2 of 2)

RURAL RESEARCH SYMPOSIUM

- Equation (2) is estimated using:
  - Pooled Probit
  - Panel Random Effects Probit
  - 2SLS and Control Function approaches (forthcoming)

Manufactured Home Loans Have a Lower Probability of Delinquency

RURAL RESEARCH SYMPOSIUM

- Overall, manufactured home loans have a lower probability of delinquency. In fact, loans linked to manufactured housing have about a 0.3% lower probability of being 90+ day delinquent.
- The overall marginal effects also reveal that loans located in high needs rural regions have a 0.03% lower likelihood of delinquency.
- During covid:
  - The likelihood of any loan being delinquent is about 0.07% higher compared to pre-covid.
  - Loans in high needs rural areas and other rural regions had a slightly higher probability of delinquency relative to those in metros.

Manufactured Home Loans in High Needs Rural Regions Have a Lower Probability of Delinquency

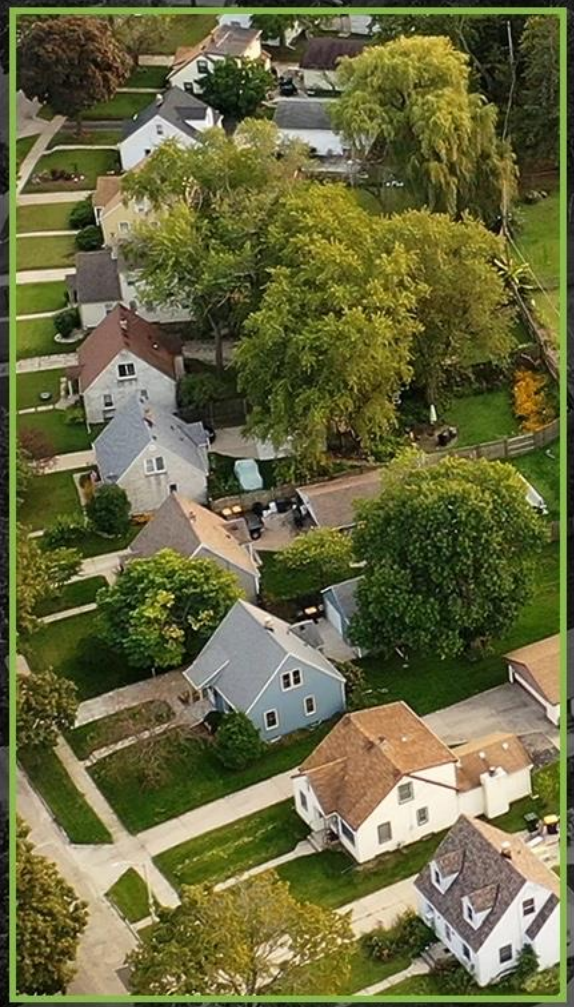
RURAL RESEARCH SYMPOSIUM

- There exists statistically significant differences in the likelihood of delinquency in high needs rural regions by property type during the pandemic:
  - For example, manufactured home loans located in high needs rural regions had a 0.1% lower probability of delinquency relative to site built ones within the same geography.

Conclusions

Conclusions (1 of 2)

- During the pandemic, the likelihoods of forbearance and delinquency were higher relative to the pre covid period.
- MH owners have lower probabilities of forbearance and delinquency.
- There exist no statistically significant differences in the overall likelihoods of forbearance in high needs rural regions and metropolitan areas during Covid.



Conclusions (2 of 2)

RURAL RESEARCH SYMPOSIUM

- Differences in loan performance during the pandemic:
  - Relative to SB loans, MH owners had a 1.1% lower probability of forbearance and 0.3% lower probability of delinquency during the pandemic.
  - Loans linked to MH properties in high needs rural regions had a 0.22% lower probability of forbearance and a 0.1 % lower probability of delinquency relative to SB loans.
  - Loans in high needs rural areas and other rural regions had a higher probability of delinquency relative to those in metros.

RURAL RESEARCH SYMPOSIUM

Thank you