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ABSTRACT

U.S. government concerns about great disparities in housing conditions are at least 100 years old. For the first 50 years of this period, U.S. housing crises were widely considered to stem from the failure of the construction industry to adopt new technology -- in particular, factory production methods. The introduction of these methods in many industries had already greatly narrowed the quality of goods consumed by low- and high-income Americans. It was widely known why the industry failed to adopt these methods: Monopolies in traditional construction blocked and sabotaged them. Very little has changed in the last 50 years. The industry still fails to adopt factory methods, with monopolies, like HUD and NAHB, blocking attempts to adopt them. As a result, the productivity record of the construction industry has been horrendous. One thing has changed. Today there is very little discussion of factory-built housing; of the very few that recognize the industry's failure to adopt factory methods, there is no realization that monopolies are blocking the methods. That these monopolies, in particular, HUD and NAHB, can cause so much hardship in our country, and through misinformation and deceit cover it up, seems almost beyond belief. But, unfortunately, it's a history that is not uncommon. There are many other industries where monopolies have inflicted great harm on Americans, like the tobacco industry, yet through misinformation and deceit cover up the great harm.

*This brief essay is based, in part, on research in Schmitz (2020), "[Monopolies Inflict Great Harm on Low- and Middle-Income Americans](#)," Federal Reserve Bank of Minneapolis, Staff Report 601, May 2020. Its purpose is to discuss some of the policy lessons from that research, in a more accessible form.

SOLVING THE HOUSING CRISIS WILL REQUIRE FIGHTING MONOPOLIES IN CONSTRUCTION¹

Government concerns about great disparities in housing conditions, what are often called housing crises, date to at least the 1920s. These great disparities are, of course, still with us 100 years later. In this essay, we argue there will be no progress ending these great disparities until the residential construction industry adopts technology that other industries began adopting more than 100 years ago — factory production methods. There have been attempts to introduce these methods in residential construction for the last century, but they are always blocked and sabotaged by monopolies in the traditional construction sector, that is, the sector producing homes outside, on-site, using “stick-built” methods.²

Monopolies in traditional construction sabotage many types of factory-built homes. In this essay, we focus on the sabotage of particular types of such homes, what we call *small-modular homes*. These homes can be produced and sold at very-low prices, so that the sabotage of these homes has disproportionately hurt the low-income. The sabotage is the primary reason for the existence of, and perpetuation of, U.S. housing crises.³

Figures 1 and 2 present pictures of small-modular homes. Houses of this type are blocked from most areas of the country — it’s simply illegal for a household to purchase such a home,

¹This essay is based on material from a number of sources, including Schmitz (2020, especially pp. 172-239); Schmitz, Teixeira and Wright (2020a, 2020b); and slides from a talk Schmitz gave at a conference honoring Edward C. Prescott, at the University of Minnesota, on September 21, 2018. The slides for “How HUD and NAHB Created the U.S. Housing Crisis,” by Arilton Teixeira, James Schmitz, and Mark Wright, are available at: <https://drive.google.com/file/d/1sKqn3q6RgOOEBHB2qJeWJmL2-4atRURR/view>. References for most of the material cited in this essay can be found in Schmitz (2020). A few additional references are at the end of the essay.

²The term “stick-built” method emerges from the image of two-by-fours sticking up from the ground on construction sites employing traditional methods.

³This phenomena of traditional construction industries sabotaging the emergence of factory-built housing occurs in many countries throughout the world. See brief discussion below.

and place it on land owned by the household. In areas where they are “allowed,” they are often zoned for areas like manufacturing districts and dumps. Even then, regulations mean higher production costs for these homes in factories. They also mean the homes are financed as automobiles (with personal loans, or chattell loans) and not real estate loans.

It’s clear why these homes are a threat to those constructing stick-built homes, especially in the lower-priced home market, and why monopolies in traditional construction have invested so heavily in blocking these small-modular homes. The homes are of high-quality, built to a strict national building code. They are manufactured at a cost per square foot that is *one-third to one-half* less than the cost per square foot to construct homes with traditional methods.⁴ Not only can factory production methods produce houses at a fraction of the cost per square foot of traditional methods, factory methods are also able to “go small.” That is, factory methods are able to economically produce homes of small sizes.⁵ The average size of these homes (in square feet) is less than *one-half* that of homes constructed with traditional methods.

This combination of very small costs per square foot, and the ability to economically produce small-sized homes, means factory methods deliver very low-priced homes. In 2007, the

⁴For evidence, see e.g., U.S. Census Bureau, “Cost & Size Comparisons: New Manufactured Homes and New Single-Family Site-Built Homes (2007 - 2014),” available at <https://www2.census.gov/programs-surveys/mhs/tables/time-series/sitebuiltvsmh.pdf> The evidence we discuss in this paragraph, and the next few paragraphs, is for small modular homes of one-piece, one module. In addition to the significant evidence on differences in costs by method, there is the compelling logic for why a house, of a given size and quality of materials, can be produced in a factory at a small fraction of the cost to construct it on-site. Imagine, then, that Honda had constructed my Honda on-site, delivering the thousands of pieces to my front yard, and then assembling them over 6 to 8 months, with a highly skilled and highly paid work crew. What would it have cost Honda to build the car in my front yard as opposed to the cost of producing it in a factory? My guess is it would cost more than double or triple the factory cost.

⁵What matters for the “profitability” of a factory in producing homes is the extent of capacity utilization, not the size of house. In contrast, with traditional methods, making houses one-at-a-time, the “profitability” of the method requires that houses be above some size.

average price of a small modular home of one-piece was \$37,300. The average size of the home was 1,100 square feet, manufactured at an average square footage cost of \$33.91, for the total average price of \$37,300. The contrast with the price of new single family homes produced on-site is striking. In 2007, the U.S. Census Bureau estimates the average *price of the structure* for single family homes made on-site was \$229,332.⁶ The average size of the structure was 2,479 square feet, constructed on-site at an average square footage cost of \$92.51, for the total average price of \$229,332.⁷

Consider the consequences, then, for low-income households of the sabotage of small-modular homes. First, imagine there was no sabotage. A household, then, would have had the opportunity to purchase in, say, 2013, a small-modular home for \$42,200. They could have financed the home as real estate. They could have placed it in residential districts.

But there is sabotage of these homes, and in most areas of country, as mentioned, it's simply illegal for a household to purchase such a home, and place it on land owned by the household. The next "option" for the household is to purchase a stick-built house, the average price being \$249,429. The differences in costs are dramatic. The low-income household could purchase a smaller stick-built home than the average size, but it's going to be significantly bigger than the factory-built house, as stick-built homes cannot be economically made to a small-size.

And the square footage cost would be more than double. Obviously, for the vast majority

⁶The Census Bureau arrives at the "structure price" by deducting an estimated land price from the total selling price of the house.

⁷In 2013, the average price of a small modular home of one-piece was \$42,200. The average size of the home was 1,100 square feet, manufactured at an average square footage cost of \$38.36, for the total average price of \$42,200. In 2013, the U.S. Census Bureau estimates the average price of the structure for single family homes made on-site was \$249,429. The average size of the home was 2,662 square feet, constructed on-site at an average square footage cost of \$93.70, for the total average price of \$249,429.

of low-income households, this is really no option at all.⁸

It's hard to imagine that such a situation could persist. In fact, in a little known piece of U.S. history, in the 1960s U.S. producers of factory-built homes were able to “breakthrough” this sabotage. From 1960 to 1972, the shipments of small-modular homes increased from 103.7 thousand units to 575.9 thousand units. Over the period, factory production of single family homes rose from 10% to 60% percent of total production (total production being the sum of factory-built homes and stick-built homes).

The surge in the share of factory production of homes was overwhelmingly a surge in production of smaller homes. These were homes that low-income Americans were buying. It was a significant start to narrowing the housing disparities among Americans.⁹

The tremendous growth in small-modular homes in the 1960s was expected to continue throughout the 1970s. In 1973, the Department of Commerce forecast that shipments of small-modular homes would increase from 575.9 thousand units, its 1972 level, to the range of 750 – 850 thousand units by 1980. But actual shipments in 1980 were 221.6 thousand units. The breakthrough proved temporary. The monopolies in traditional construction were able to introduce new and more powerful weapons to sabotage the factory-built housing industry. These weapons, and more introduced since, continue to insure that the small-modular home industry is a shell of its former self.

⁸We are not considering land prices in these comparisons, as they would add the same cost to both houses, the factory-built and the stick-built. Moreover, in most parts of the country, those outside major cities and suburbs, the land costs are a very small part of total house costs (the cost of the structure plus the cost of land).

⁹One way to see this is by examining the loss in market share of stick-built houses with selling prices below \$20,000. Of the stick-built homes constructed in 1966, 50% sold for under \$20,000. Of those constructed in 1970, only 19% sold for under \$20,000.

In this essay, we focus on the sabotage of small modular homes because here sabotage has its greatest cost, as it's inflicted on the low-income.

We also discuss the history of sabotage of factory-built homes more generally. To understand the current state of sabotage, it's important to understand methods that were developed 75 years ago, as many are still bearing "fruit" today. Many different monopoly groups in traditional construction engage in sabotaging factory-built homes. The resistance to factory-built housing was, and continues to be, a perfect storm. Many groups were, and still are, opposed to factory production, including building contractors, building craft unions, building code inspectors, architects, materials producers and politicians (who are supported by the traditional industry). While these groups are sometimes at odds with each other, they all join together to fight factory production of homes. They form a mega-monopoly, composed of their individual monopolies.

But the key monopolies involved in blocking *small modular* homes are the Department of Housing and Urban Development (HUD) and the National Association of Home Builders (NAHB). They have successfully squashed the emergence of these factory houses.

In a word, then, competition is the answer to U.S. housing crises. If competition were introduced, if monopoly sabotage were rolled back, we know that, given the experience of the 1960s briefly described above, that factory producers would overwhelm stick-built producers, particularly in the market for "small" houses, a market where factory producers have their greatest advantage, and the market where progress in solving housing crises will be made.¹⁰

¹⁰Introducing competition between factory-built home producers and those in traditional construction will

Note well that this proposed policy doesn't involve a "trade-off" between equity and efficiency. Reducing the power of monopolies that sabotage factory production both increases efficiency in the economy, as well as provides its greatest benefit to low-income households.

—Introduction and Summary

From the 1920s through the 1970s, the central hypothesis for the source of U.S. housing crises was that the construction industry was a technology laggard – in particular, that the industry was not adopting factory production methods. During the first part of the 20th century, the introduction of factory production methods in many industries significantly narrowed the quality of goods consumed by low-income and high-income Americans. The methods also made it possible for low-income households to consume goods, like automobiles, that had previously only been available to high-income households. So, it was understood that adoption of factory methods in construction would narrow the great disparities in housing conditions between low- and high-income households.

It was widely recognized why the industry failed to adopt factory methods: Monopolies. Producers in the traditional construction sector, those that construct homes on-site, and are often called "stick-builders," formed monopolies to sabotage the introduction of factory methods. This sabotage was not only discussed in academic journals, but throughout the popular press, such as major city newspapers and major national magazines.

The construction industry's lack of adoption of factory methods meant its productivity

reduce the harm caused by other monopolies in the "housing industry." In particular, there are groups, like housing associations, that *limit all types of new housing in local areas*. This well known phenomenon goes by the name Nimbyism (Not in My Backyard - ism). As we describe below, the increased competition will allow households to "escape" those blocking their way to new housing. Fewer households will be "victims" of Nimbyism.

suffered. Its productivity record is best summarized by contrasting it with that of industries that are a reasonable “comparison” group, in particular, industries producing goods, like manufacturing, and not services. As shown in Gordon and Sayed (2019), over the period 1950-72, labor productivity growth in construction significantly lagged that in manufacturing. Over the period, average annual labor productivity growth in construction and manufacturing were 1.9% and 3.4%, respectively, a difference of 1.5 percentage points.

This lagging productivity meant, of course, that the price of homes increased relative to the price of other goods.

The experience of the construction industry over the last 50 years, since the 1970s, has been very similar to that from the 1930s-1970s.

First, the industry has continued to be a technology laggard, failing to adopt factory production methods. Today, only about 10% of single-family homes are made in factories. This is roughly the share of factory production of homes in the late 1940s, so that there has been zero-progress along this dimension.

Second, monopolies in the traditional construction sector continue to sabotage the introduction of factory methods. There have been, and continue to be, a large number of monopoly groups formed by producers in traditional construction. Today, two of the most powerful are the NAHB and groups in HUD.

The industry’s failure to adopt factory methods has meant its productivity growth continues to lag that in manufacturing. In fact, the differences in productivity growth between construction and manufacturing have widened since the period 1950-72. As Gordon and Sayed

show, between 1972–1995, the construction industry’s average annual labor productivity growth was -1.4%, versus 2.4% for manufacturing, a difference of 3.8 percentage points. From 1995-2005, it was -1.0%, versus 5.5%, a difference of 6.5 percentage points; and from 2005-2015, it was -0.9%, versus 1.9%, a difference of 2.8 percentage points.

The productivity estimates of Gordon and Sayed are for major sectors of the economy, like construction and manufacturing. Recently, statistics have been developed which allow us to look at labor productivity of sub-sectors of construction, like construction of single family housing. In Figure 3, we plot labor productivity in the single family home construction sector from 1987 through 2016, along with labor productivity of durable goods manufacturing, a subsector of manufacturing producing goods like automobiles. Both productivities are normalized to 100 in 1987.

There is no evident trend in labor productivity in single family home construction over the period. It rises above its 1987-level at some points, then moves below the 1987-level at others. The most accurate summary, it seems, is to say there was no labor productivity growth. If we compare the 1987-level to the 2016-level, there is roughly 15% growth, an average annual rate of growth of less than 0.5%. Labor productivity in durable goods manufacturing, in contrast, has a strong upward trend. Productivity increased roughly 250 percent over the period, an average annual rate of growth of 3.2%.

This lagging productivity means, as before, that the price of houses continues to increase relative to the price of other goods.

While the experience of the construction industry over the last 50 years is very similar to

that from 1920-1970, there is one significant difference: Today, while the industry's dismal productivity record receives some attention, but far too little, there is almost no discussion of factory built housing. There is almost no recognition, then, that the industry's slow productivity growth is due to its failure to adopt factory production methods. And of the few observers that discuss factory production, there is no realization that monopolies are blocking the adoption of factory methods.

How is this possible? How was it once widely known among the *general public* that factory methods were crucial to solving housing crises, and that factory production methods were being blocked by monopolies in traditional construction, but now it's all forgotten?

As we argue below, the monopolies that have sabotaged the adoption of factory methods over the last 50 years have been extremely successful in producing misinformation and deceit to cover up their sabotage.

Below we'll discuss many types of deceit and misinformation employed by the monopolies, but a very important one is the development of a narrative as to why housing prices have been increasing so strongly over the last several decades. Some scapegoat must be found for the rapid rise in real housing prices. So, the monopolies have created one.

Today, a central hypothesis about the source of housing crises is that zoning regulations and land use restrictions placed on traditional home builders dramatically raise the cost of constructing homes. As the story goes, the regulations and restrictions make it impossible for stick-builders to construct decent housing for low-income Americans at prices that don't consume large shares of household budgets. But this is misinformation and deceit — new

housing prices are very high in rural areas and small towns where these regulations are not cumbersome and often don't exist at all.

That these monopolies, in particular, HUD and NAHB, can cause so much hardship in our country, and cover it up, seems almost beyond belief. But, unfortunately, it's a history that is not uncommon. There are many other industries where monopolies have inflicted great harm on Americans, yet have produced misinformation and deceit to cover it up.

The tobacco industry is one such instance. As dangers of cancer from smoking became clear in 1950, the industry undertook a campaign to sow doubt about the scientific findings. Helen Epstein (2007) summarizes her review of Brandt (2010), a medical historian at Harvard, by writing: "For most of the twentieth century, few people were aware of how dangerous smoking really was; they were lulled into a false sense of security by a deliberate industry campaign to promote the falsehood that scientists had failed to prove that there was a strong, consistent link between smoking and cancer. For decades, the companies managed to fool not only the public but also the medical community, Congress, the courts, and the press."¹¹

Kaiser and Wasserman (2016) describe a similar dynamic in the fossil fuel industry. In their article explaining how the Rockefeller Family Fund was divesting its fossil fuel holdings, they began "For over a quarter-century the company [Exxon] tried to deceive policymakers and the public about the realities of climate change, protecting its profits at the cost of immense

¹¹Here is Epstein (2007) in a similar vein: "Why don't people listen to health warnings? Volumes of research on how to promote health and change behavior have been devoted to this issue and the answers are much debated; but in the case of smoking, it seems that the cigarette manufacturers colluded in a highly successful campaign of half-truths and outright falsehoods intended to cast doubt on the lung cancer studies and other research findings. This gave many people the impression that the habit could not be all that dangerous if there was so much "controversy" about it. But the risks associated with smoking were not small. They were huge, and there should have been no controversy."

damage to life on this planet.” They relate how a Columbia School of Journalism report “learned that Exxon had understood and accepted the validity of climate science long before embarking on its denial campaign”

Considering these histories in tobacco and fossil fuels suggests that what HUD and NAHB “pulled off” is not unbelievable but, in fact, it’s naive to think such misinformation and deceit is not currently being foisted on Americans by other monopolies, ones that are creating great harm, but have yet to be exposed.¹²

Returning to residential construction, the *general public*, then, has been fooled by monopolies; they don’t “see” the sabotage. But how is it that we *economists*, whose business is to understand monopolies and the harm they inflict, once knew monopolies were sabotaging factory built methods, but now we don’t know?

Economists, too, have been fooled by the deceit and misinformation of HUD and NAHB. But there is another very important reason. Seventy-five years ago, economists employed a model of monopoly that enabled them to see through deceit and to “see” the sabotage. The model we use today is not equipped to see such sabotage by monopolies.

Before the 1950s, the consensus model of economists was the Arnold-Simons model of monopoly, named for Thurman Arnold, who served as Assistant Attorney General for Antitrust for FDR, and Henry Simons, who was a professor at the University of Chicago in the 1930s

¹²In a recent essay, “Doubt is Their Product”:, Tommaso Valletti (2020), Chief Competition Economist of the European Commission between 2016 and 2019, discusses how large corporations and organizations hired economists to produce “doubt” about recent academic findings suggesting a rise in the power of monopolies. Relatedly, Schmitz (2020) discusses the troubling state of U.S. antitrust institutions. He discusses an industry that developed after 1980 that offers consulting services to corporations that are facing antitrust challenges from the FTC and/or DOJ-AD. The industry consists of economists at private consulting firms. He calls it the “Antitrust Consulting (from) Economists” industry, and denotes it by “ACE.”

through the mid 1940s.¹³ Today, the consensus model is the Cournot-monopoly model. Many readers will have seen this model in introductory economics courses.

In the Arnold-Simons model, monopolies decide what price to charge for their good. But this is only a small part of what they do. They engage in many activities designed to sabotage and destroy rivals. Here are two descriptions, given by Thurman Arnold, of the activities that monopolies engage in:

Monopolies “consolidate their power by destroying existing independent enterprise.”

Monopolies “enter into politics using money and economic coercion to maintain themselves in power, making alliances with other powerful groups against the interests of consumers and independent producers. In short, they will become a sort of independent state within a state, making treaties and alliances, expanding their power by waging industrial war, dealing on equal terms with the executive and legislative branches of the government and defying governmental authority if necessary with the self-righteousness of an independent sovereign.”

With the Arnold-Simons model of monopoly as their “tool,” economists before the 1950s were well equipped to “see” the sabotage that traditional builders were inflicting on factory producers of homes.

During the 1950s, the economics profession “switched” their consensus model of monopoly. The Cournot monopoly model replaced the Arnold-Simons model. In the Cournot-monopoly model, the monopolist has only a single decision: What price to choose for its good. No

¹³See Schmitz (2020) for an extended discussion of the Arnold-Simons model, and its power in studying monopoly harm.

longer does the monopoly have a choice on whether to sabotage substitutes, or to employ any of the other weapons at the disposal of monopolies in the Arnold-Simons model.¹⁴

Employing the Cournot model since the 1950s, economists have been ill-equipped to study the harm inflicted by monopolies. In particular, when monopolies in the traditional construction industry sabotage and destroy substitutes for their products, economists don't "see" it, as this flies under the radar of the Cournot model.

Using the Cournot model not only means economists miss the sabotage of the traditional builders. It's *worse* than this. Using the Cournot model, the economics profession concludes that the residential construction industry is *competitive*.

How is this conclusion reached? What roughly happened in the residential construction industry is that new technologies emerged that, if adopted, would render the existing capital stock, both physical and human, of little value. In this industry, the greatest capital loss would be human capital in stick-built methods. The existing producers, whose livelihoods were threatened, were willing to contribute to build or strengthen monopolies, such as their *trade associations*, to block the new technology. They were willing to do this even though there would be competition among themselves after the substitute product was sabotaged.¹⁵

With the competition among stick-builders, the residential construction industry is one with small firms, low concentration, great ease of entry, low profits, small price-cost margins and

¹⁴When we say "Cournot-monopoly model" in this essay, we use it as a shorthand for the entire class of models where the monopoly does not have the choice to devote resources to destroy substitutes, whether through deceit and misinformation, or downright sabotage. Others in this class are the model of monopolistic competition, the Bertrand model, the Stackelberg model, the Cournot-oligopoly model and so on. The weapons available for monopolies in these models are extremely limited.

¹⁵For exciting recent research on trade associations, see, in the references below, work by David Levine, Andrea Mattozzi and Salvatore Modica, as well as Jorge Ale-Chilet and Juan Pablo Atal.

the like. The logic of the Cournot model suggests that such industries are competitive, so that the 100s of economists studying the housing industry, economists steeped in the Cournot model, assume the industry is competitive.

That's how the conclusion is reached that the residential construction industry is competitive, though it's overrun with monopolies. That's why "matters are worse" than economists missing the sabotage.

Let me make a general point to close this introduction/summary. The construction industry is by no means unique in that the logic of the Cournot monopoly model tells us it's competitive, though it's overrun with monopolies. The giants in economics and law that studied monopolies in the 1930s and 1940s (and earlier) understood that in the Arnold-Simons model of monopoly there was no close connection between monopoly power and summary statistics of industries, like concentration, price-cost margins and profits.

These giants not only didn't employ such simple industry statistics to assess whether an industry was competitive or not, or how powerful a monopoly was. They strongly argued against using them. When the idea of using a price-cost margin as a measure of monopoly was first introduced by, it seems, Lerner (1934), it was widely criticized. A list of critics looks like a who's who of economists. Some of the economists included: Edward Chamberlin, Milton Friedman, Frank Knight, Fritz Machlup, Tibor Scitovsky, and Henry Simons. The idea was criticized both on the grounds of evidence and theory.

But in the economics literature today, such industry statistics play a central role in discussions of monopoly. In fact, definitions of monopoly, when they are given, are typically cast

in terms of such statistics.¹⁶

In the rest of this essay, we retrace our discussion above, providing more details in order to further drive home our arguments. We finish with recommendations for alleviating housing crises. Introducing competition into the residential construction industry is a key recommendation.

— A Long Held View: Housing Crises Resulted From Failure to Adopt Factory Methods

Here we present a few commentators discussing the construction industry’s failure to adopt factory production methods, and how these methods were crucial for achieving low cost housing.

In 1937, A.C. Shire, the chief engineer of the Federal Housing Administration, stated: “in an age of large-scale financing, power, and mass production, we have the anachronism that the oldest and one of the largest of our industries, concerned with the production of one of the three essentials of life follows practices developed in the days of handwork is bogged down by waste and inefficiency, [and] is unable to benefit by advancing productive techniques in other fields.” He continued “Unlike other widely used commodities, *shelter is not made in a factory or plant organized for its production.....*”

Thurman Arnold long recognized the failure to adopt factory methods in construction. In

“Why We Have a Housing Mess,” in *Look*, Arnold (1947) discusses how new methods of

¹⁶There are many reasons why there is no close connection between monopoly power and summary statistics of industries, like concentration, price-cost margins and profits. In addition to those discussed by these giants in the 1930s and 1940s, colleagues and myself have provided more evidence and theory for the failure of these statistics to correctly “signal” market power of monopolies. There is discussion of these findings in Schmitz (2020; see, e.g., pp. 329-344).

factory production were long promised but never came to fruition.¹⁷

Also in 1947, Edward Levi, who was a Professor of Law at the University of Chicago, organized a group at the Law School to study housing crises. William Speck, an Assistant Professor at the Law School, wrote a key report where he stated “there is general agreement that the high costs of houses result from the failure of the building industry to abandon handicraft, custom building and to adopt large-scale, machine production.”

In American Legion Magazine, L.A. Knight (1970) discussed how returning Vietnam Veterans were having great difficulty finding housing. Knight wrote: “It almost seems silly to explain that mass production to standard specifications in a factory is the key to producing any goods including houses at prices far below what hand labor at the customer’s site can meet. Housing is about the only common product that has escaped the industrial revolution and still hews to basic procedures that are 400 years old.”

Even those pioneers in mass producing homes outside, Levitt and Sons, came to understand that factory methods were the only way to provide affordable housing on a large scale. The Levitts created an “assembly-line-like” system on-site. Skilled workers would move along an assembly line, that is, from house to house. Electricians would wire one house, then move next door. While these methods significantly brought down the cost of producing homes, the Levitts came to understand that their mass production method had major drawbacks. The method still required very large amounts of skilled labor to make a house.

In Congressional testimony in 1969, the Levitts stated: “The labor time in a factory-built

¹⁷ *Look* was an American general-interest magazine (large format), whose circulation was second only to *Life*. For those of a certain age, these magazines are well known.

dwelling unit is only a fraction of what is required to construct a similar unit on-site. That's why we must look at factory-built housing. That's why factory-built housing must succeed, or we will never be able to produce the homes and apartments needed to house our expanding population and our underprivileged citizens in a comfortable, dignified, decent way.”

— A Long Held View: Monopolies Blocked Factory Methods

Not only was it widely known that factory methods were not being adopted by the construction industry, it was also widely recognized that monopolies had blocked such methods.

As early as 1920, it was widely recognized that factory-built homes were being blocked in Chicago by an alliance of monopolies in stick-built construction, including union contractors and trade unions. These monopolies were often in conflict with each other, but were unified in sabotaging factory production. In September, 1921, Judge Kenesaw Mountain Landis wrote an arbitration decision (dealing with warring monopolies in the stick-built construction sector) that was seen as providing an opportunity for factory-built homes in Chicago.

Figure 4 is an advertisement in the Chicago Tribune, from an Iowa firm that manufactured factory-built homes, placed the day after Landis' arbitration decision, offering to deliver factory-built homes to Chicago.

A.C. Shire, introduced above, argued that the construction industry was a technology laggard because the traditional industry was “highly resistant to progress,” to new methods of production.

Thurman Arnold, of course, knew why the long promised factory methods never materialized: Monopolies blocked them. He gathered staff at the DOJ who were also well aware of

these monopolies in construction, including Henry Simons and other prominent economists, like Corwin Edwards, a professor at Northwestern University, and Edward Levi, who we introduced above. Arnold and his staff brought indictments against monopolies sabotaging factory made homes, including “an indictment which [charged] a conspiracy to prevent the sale of prefabricated houses in Belleville, Illinois. Local building materials dealers, contractors, locals of the carpenters’ and building laborers’ union, and the chief of police [were] charged with a series of efforts to prevent the erection of a prefabricated house.”

As is clear from this description of sabotage in this indictment, the resistance to factory-built housing was, and continues to be, a perfect storm. Many groups were, and still are, opposed to factory production, including building contractors, building craft unions, building code inspectors, architects, materials producers and politicians (who are supported by the traditional industry). While these groups are sometimes at odds with each other, they all join together to fight factory production of homes. It’s as if they form a mega-monopoly, composed of their individual monopolies.

Figure 5 is the cover from Arnold’s (1947) previously mentioned *Look* article, “Why We Have a Housing Mess.” The cover is a picture of a homeless Pacific War veteran, with his wife and five children, sitting on the street with their belongings. The caption says: “This Pacific War veteran and his family are homeless because we have let rackets, chiseling and labor feather-bedding block the production of low-cost houses.”

Arnold began his text this way: “Why can’t we have houses like Fords? For a long time, we have been hearing about mass production of marvelously efficient postwar dream houses, all manufactured in one place and distributed like Fords. Yet nothing is happening. The low-

cost mass production house has bogged down. Why? The answer is this: When Henry Ford went into the automobile business, he had only one organization to fight [an organization with a patent] . . . But when a Henry Ford of housing tries to get into the market with a dream house for the future, he doesn't find just one organization blocking him. Lined up against him are a staggering series of restraints and private protective tariffs."

The group organized by Edward Levi to study housing crises recognized sabotage as a leading reason for lack of adoption of factory methods of production. In William Speck's report, he states: "The combination in house building of perhaps the most complete and widespread local government regulation, restraint-of-trade minded builders and material dealers, and some of the strongest, most conservative labor unions in the country has proved in many localities an insurmountable obstacle to the use of new methods. Prefabricated builders have simply confined themselves to those areas where restraints are not serious."

The Levitts, too, knew how monopolies in traditional construction blocked new methods. They had, not surprisingly, encountered fierce resistance from monopolies in the traditional construction sector when they introduced their new methods of on-site assembly line construction. They knew that factory methods were being blocked — they discussed this in their testimony above.

This list of commentators shows that blocking of factory homes was well known not only among government officials (such as A.C. Shire), academics (like Arnold, Edwards, Levi, Simons and Speck) and stick-builders willing to admit it (like the Levitts), but also by the general public, such as those that read major newspapers (like the Chicago Tribune) and major national magazines (like *Look*).

— Factory Producers of Houses Overcome Sabotage in 1960s – Temporarily

In the 1960s, in a little known piece of U.S. history, U.S. producers of factory-built homes were able to overcome this sabotage — though their victory proved temporary. Over the decade, factory production of single family homes rose from 10% to 60% percent of total production (total production being the sum of factory-built homes and stick-built homes).

Figure 6 shows the annual shipments of small-modular homes, also called *manufactured homes* by HUD, in the United States from 1947-2019. These homes represent a major part of the production of factory-built homes in the United States each year. The surge in production during the 1960s, as shipments increased from roughly 100K to 600K units, is evident.

It's important at some point, and now is a good time, to discuss the language used in the industry to describe different types of factory-built homes. Monopolies in traditional construction have employed language from the beginning as a weapon against factory-built homes.

There are two broad categories of factory-built homes, modular homes and panelized homes. *Modular homes* are those delivered from the factory to the home's permanent location in a small number of completely formed, three-dimensional (3D) pieces. *Panelized homes* are those primarily delivered in two-dimensional (2D) pieces.

We can further distinguish modular homes according to the method by which they are transported to their housing site. Modular homes of one or two pieces, which we call *small-modular* homes, are typically transported to their site on a chassis, as this is the most cost

effective means of transport. After delivery, the chassis is typically removed. By the 1960s, most would be put on a foundation.¹⁸ *Large-modular homes* are those of many 3D pieces. These homes are typically transported to housing sites on the flatbeds of trucks.

As mentioned, monopolies have used language against factory-built homes, in particular, small-modular homes, like those in Figures 1 and 2. In particular, monopolies like HUD and NAHB *never* call these homes modular homes.

When small-modular homes were initially introduced in the late 1940s, they were a large threat to stick-builders, especially those making homes in the lower price ranges. They were immediately attacked by stick-built producers. One very successful method of attack was the use of language to spread deceit and misinformation about the homes. Stick-builders called the homes *trailers*. Trailers were used extensively during the Great Depression by individuals and families that were constantly on the move searching for work. House trailers were primitive forms of shelter that were towed behind vehicles. The shelter was placed on a chassis and fitted with wheels so that it could be moved on a daily basis. The chassis and wheels were never removed. Because most were not equipped with sanitation facilities, local zoning ordinances were often adjusted to ban trailers and other vehicles (with primitive shelters) from local jurisdictions.

By calling small-modular homes trailers, the monopolies were able to (1) link the prejudices

¹⁸Bair (1967, 287) provides one description of how doublewides, small-modular homes of two pieces, were placed on foundations: “The doublewide unit is a stranger to wheels except during its journey from factory to site. Two 12-foot wide sections are ‘slid’ onto an already prepared foundation, with or without basement, and permanently joined. The result is a house 24 feet wide, up to 56 or more feet in length, and in most respects indistinguishable from the conventionally built or prefab one-story dwelling.” In testimony before Congress, Levitt and Sons stated that “Mobile homes, 90 percent of them, end up on a foundation and are not mobile at all” (United States 1969, 388). The term “mobile home” is sometimes used for small-modular home, as we discuss shortly.

associated with trailers to the small-modular homes, both prejudices about the people living in trailers, and those about the low quality of trailers; and (2) link the local zoning regulations against trailers to the small-modular homes. The new modular homes were not trailers. In contrast to trailers, they were rarely moved after delivery. As for quality, some obviously were of low quality, just as were stick-built homes in the lowest price ranges.

But quality was improving quickly, as future President Ford argued in a speech to a group of producers in 1973. Ford said: “You are to be congratulated for turning out a steadily improving product.” ... “There is no question that the mobile home industry took a big step forward with the adoption of the American national Standards Institute A-119.1 standard and the National Fire Protection Associations standard 501.B.”

The producers of small-modular homes obviously wanted to distance themselves from the word “trailer.” But the word that they chose to promote their homes — *mobile home* — was a poor choice. In this choice, they hoped to say “our homes are just like stick-built homes except that they are mobile in their delivery.” But stick built producers were able to “link” the name “mobile home” with trailers — which were also mobile.

In 1976, HUD introduced another name for these small-modular homes, namely, *manufactured home*. But this only applies to small-modular homes produced after 1976. Those built before 1976 are now officially called mobile homes by HUD.

So, these small-modular homes are called trailers, mobile homes and manufactured homes. Nowhere will you see them called what they are: modular homes.

Monopolies, like HUD and NAHB, reserve the term “modular home” for large-modular

homes. This is no accident. To describe small-modular homes as “modular” would lend them credibility. In this essay we’ll sometimes call them manufactured homes, though we realize this usage must change, that monopoly language that confuses must be fought against.

Turning back to Figure 6, the collapse of shipments of manufactured homes in the 1970s is evident. After collapsing to 200K units, shipments bounced around in the 200-300K range for a decade, before starting a more gradual decline to less than 100K units today, roughly the production level in 1947, that of nearly 75 years earlier. There was an exception to the downward trend — the late 1990s. During this period, the market for manufactured home loans, that were chattel loans, went through a no-doc lending boom, just as the traditional mortgage market would roughly a decade later.

Stick-built home construction was, obviously, significantly falling throughout the 1960s. But the loss of production was not uniform across “small” and “large” houses. Recall that while factory production methods reduce the costs of production of houses relative to stick-built construction, their greatest cost advantage over stick builders is in producing small homes. And market share losses for stick builders were concentrated in smaller homes. To see the dramatic losses in the small house market, consider the distribution of selling prices of stick built homes constructed in 1966 and 1970. Of the stick-built homes constructed in 1966, 21% sold for under \$15,000. Of those constructed in 1970, only 2.0% sold for under \$15,000. Stick builders had nearly completely lost the market for homes selling under \$15,000. The loss in market share was even large for stick-built houses with selling prices that accounted for 50% of sales in 1966. Of the stick-built homes constructed in 1966, 50% sold for under \$20,000. Of those constructed in 1970, only 19% sold for under \$20,000.

The surge in factory production of manufactured homes in Figure 6, then, was overwhelmingly a surge of production in smaller homes. These were homes that low-income Americans were buying. It was a significant start to narrowing the housing disparities among Americans.

In one sense, it's not surprising that producers of factory-built homes could "break-through" the sabotage of stick-builders. The productivity of factory producers increases faster than stick builders. As productivity differences grow, differences in costs of production grow. By 1968, the U.S. Department of Commerce (1968, pp. 6-7) estimated that the costs per square foot of making homes in a factory were about one-half the costs (in fact, 47%) of constructing homes on-site.

With such cost differences, the Department of Commerce expected shipments of manufactured homes to strongly grow through the 1970s. In 1973, with the previous year's shipments of 575,900 units, the Department of Commerce (1973, p. 31) forecast that shipments of manufactured homes by 1980 would be in the range of 750,000 – 850,000 units. Actual shipments in 1980 were 221,600 units.

While the "break-through" in the 1960s might, in some sense, not be surprising, that monopolies in stick-built construction reasserted control in the 1970s, and found new ways to block a competitor with such lower relative costs, and relative costs that were growing smaller every year, seems almost unbelievable. But that's what happened.

— Monopolies in Traditional Sector Double-Down on Sabotage in 1970s/1980s

How did the stick-built monopolies regain the ability to squash the factory-built housing industry? The monopolies, like NAHB and HUD, "accomplished" this by developing a

whole new set of methods to sabotage factory production. Their existing strategies were failing, and a new “generation” of weapons were needed to complement the old weapons.

The old methods of sabotage were primarily constructed at the local level, the town, county and state levels. The major “innovation” of the monopolies in the 1970s was to construct weapons at the national level. What the monopolies needed was a method to crush the factory-built home industry at all locations with “one fell swoop.”

Of course, it’s one thing to imagine such weapons, but quite another to create them. But the development of HUD, in 1965, provided the monopolies with their vehicle to achieve these goals. We briefly discuss three types of weapons: subsidies, regulations against factory producers of homes, and misinformation/deceit.

Weapon-Type One. As for *subsidies*, in 1968 HUD introduced a series of programs which subsidized the construction of stick-built housing (but not factory-built housing). One famous program, the so called “Section 235,” provided mortgages at interest rates as low as one percent for buyers purchasing a home built on-site. Buyers of factory-built homes, in particular, manufactured-homes, were not eligible. These subsidies shifted demand to the inefficient technology, the stick-built technology, and away from factory homes. Similar programs have flourished since. In particular, programs to build low-income housing typically exclude factory housing.

Note the string of events these subsidies set off. Subsidies are used to purchase housing produced with an inefficient technology, whose productivity growth lags that in other industries. Hence, the prices paid for subsidized housing construction increases relative to other

prices; the real cost of a given level of subsidized construction increases over time. This means government must increase taxes in order to pay the higher prices for the given level of subsidized production.

This logic was known more than 75 years ago. Both Thurman Arnold and Henry Simons pointed out this logic. Thurman Arnold argued: “[Y]ou can’t spend money in a relief market [housing] like that without subsidizing inefficiency and thus raising both prices and taxes.” Henry Simons stated “Urban housing conditions become worse and worse, largely because labor costs prohibit new construction; and the widespread demand for governmental housing projects is mainly a demand for government subsidies to offset excessive building costs.”

It’s somewhat depressing that it was once known that these type of housing subsidies were doomed to fail, yet they are still a major part of policies to alleviate housing crises. We, as a society, can’t expect such great and clear thinkers as Arnold and Simons very often, but we can “stand on their shoulders,” on “the shoulders of giants.” But not if we ignore them.

Weapon-Type Two. As for *regulations*, U.S. regulation of housing, both stick-built and factory-built, was historically the jurisdiction of local governments. Both zoning regulations and building codes in a local area, if there were any, were set by local government.

One major “innovation” of the monopolies was to “transfer” some of these regulations from the local to the national level. In particular, HUD was able to introduce a national building code (Nat-BC) for factory-built homes, in particular, manufactured homes. This Nat-BC was sold as a benefit to the manufactured housing industry, though it was a mechanism to destroy it. The Nat-BC was a devious and artful weapon to sabotage the producers of

manufactured homes. The sabotage was inflicted with one fell swoop. The regulations, and others that have followed, still inflict severe damage on the industry.

A HUD-sponsored law, the National Manufactured Housing Construction and Safety Standards Act of 1974 (NMHCSSA), led to the Nat-BC for manufactured homes. This Nat-BC is sometimes called the HUD-code.

Here is how the Nat-BC was “sold,” to Congress, to the press, and even to the industry, as a great benefit to the industry.

There is great diversity in local building codes (Loc-BC). They vary from town to town. This diversity of building codes imposes greater costs on factory producers of homes than stick-built producers. A stick-built producer, constructing one-house-at-a-time, follows the building code in the local town (if there is one). But a factory producer, manufacturing 100s of homes, and selling them in many towns, has to frequently change its production line to satisfy the various local codes.

So, a uniform building code across the country would be a great benefit to factory producers. But the Nat-BC in NMHCSSA was not uniform. It only applied to manufactured homes. The HUD-code did not apply to stick-built producers.

HUD and NAHB claimed that local-BCs were stricter than the HUD-code, so they portrayed the Nat-BC as a great victory for the industry. Their claim was false – and they produced misinformation and deceit to widely promote it.

First, some areas, as suggested above, had no Loc-BC. If an area had no Loc-BC, then the Nat-BC was, obviously, stricter. Statistics collected at the time showed an important

percentage of local areas had no building code. In particular, as part of Paul Douglas' (of Cobb-Douglas fame) massive report on housing, Manvel (1968) collected much information on local building codes. He showed that 25% of local areas had no building code. Second, many areas had Loc-BCs with constraints that were not significant.

It was in these local areas, of course, where the fiercest competition between stick-builders and factory builders took place. Factory producers would locate to such areas, as Loc-BCs were not working against them as they were in other areas.

Recall William Speck emphasized this: "The combination in house building of perhaps the most complete and widespread local government regulation, restraint-of-trade minded builders and material dealers, and some of the strongest, most conservative labor unions in the country has proved in many localities an insurmountable obstacle to the use of new methods. *Prefabricated builders have simply confined themselves to those areas where restraints are not serious.*"

James Price, the CEO of National Homes, the largest producer of factory-built homes in the United States, tells the same story in Congressional testimony in 1970.¹⁹ "I want to deal with mobile homes. I think it has to be mentioned at this time because insofar as the consumer is concerned, 65 percent of the people have to either look to a mobile home or low rent apartment for shelter. The spectacular rise in the mobile home industry is because mobile homes are placed primarily in an area beyond where code and zoning requirements are exercised. Their construction techniques allow far less space than the accepted housing

¹⁹National Homes had a capacity of 100,000 factory-built housing units in 1970. National Homes had almost exclusively produced large-modular homes and panelized homes before the 1960s, but quickly added capacity for small-modular homes in the middle 1960s.

standards for the Federal Government. ... ”

Note well that when Price mentions “their construction techniques allow far less space,” he is referring to the fact that in a factory, homes can economically be made much smaller than stick-built homes constructed on-site.

The first reason the Nat-BC was devastating, then, is because in the areas where producers of manufactured homes actually competed with stick builders, typically small towns and rural areas, there were often no local building codes, or not severe ones. With the Nat-BC, factory builders had to meet a strict code; stick builders faced no code. This feature of the regulations by itself meant great sabotage.

Another feature of the code is the requirement that the homes have a permanent chassis. Before this requirement, these homes would be transported to their site on a chassis, as this is the most cost effective means of transport. The chassis would then be removed, and most would be put on a foundation. The regulations require that the chassis not be removed, even if the house is put on a foundation, and even if the house has a basement.

Figures 7 and 8 show the basements of two manufactured homes with the permanent chassis “in the basement.” Again, regulations forbid the chassis to be removed. The absurdity is evident. The regulation’s intent — to sabotage the house — is clear.

Monopolies, obviously, like to keep sabotage under wraps.²⁰ But this permanent chassis requirement is like a smoking gun. The monopolies in the stick-built industry in the 1970s

²⁰Speck makes this point: “At the outset it should be made clear that the straightforward exclusion of prefabricated houses and new building materials has never been attempted in any code. Such a practice by any of the interest groups would be poor public relations and afford a clear ground for attacks by opponentsThe exclusion is accomplished by devious means cloaked under a beneficent purpose of protecting the public health and welfare.”

were, it seems, desperate, so they resorted to measures they otherwise would not have. The permanent chassis requirement led to poor public relations, and gave opponents an opening to challenge the HUD-code.

Here is Congressional testimony of two advocates of manufactured housing, appearing before a committee that was proposing legislation to remove the permanent chassis requirement and make other reforms (United States Senate 1990).²¹

Gub Mix, the Executive Director of the Nevada Manufactured Housing Association, stated: “The Hiler amendments contain a provision to remove the antiquated requirement that all manufactured homes be built on permanent chassis. In our view, Mr. Chairman, this provision has perhaps the most important impact on the availability of affordable housing to Americans today. By requiring a permanent chassis for homes that are permanently sited adds unnecessarily to the construction and installation costs of a manufactured home. And the consumer pays.”

Maureen Wagner, the Chairman of the National Manufactured Housing Federation, stated: “I can assure you that when a homebuyer buys a home from me and wants to finance it for 30 years and have it installed on a permanent foundation, the homebuyer prefers to have the chassis removed. In many cases homebuyers prefer to have their manufactured homes placed over basements. Because of the presence of a chassis, we must dig the basements deeper and erect more costly and unsightly piers. I could save my homebuyer significant costs, both in factory costs and installation costs, if I could order a home designed to have the chassis

²¹Mention of John Hiler (born April 24, 1953) is made in these testimonies. Hiler was a United States Representative from Indiana from 1981 to 1991. He fought many battles to reform the manufactured housing industry.

removed. When I advise a homebuyer that the chassis cannot be removed because of Federal law, they find it illogical (United States Senate 1990, 468-9).”

But this legislative attempt, as well as others, failed to remove the permanent chassis requirement and introduce other reforms. Misinformation and deceit by HUD and NAHB won the day. The victory has been so thorough that today people in the industry don’t even question the chassis.

The permanent chassis requirement has a significant negative impact on the industry. First, by requiring a chassis, the regulation endeavors to make the small modular home resemble a trailer, linking the prejudices of trailers with small-modular homes. Second, since the house has a chassis, local zoning laws can often be applied to block it from the local area. Third, since it has a chassis, it’s argued that it can be moved (though they aren’t moved), so that the houses are financed as cars (with personal loans) and not real estate. Fourth, the regulation increases the cost of manufacturing the house.

Weapon-Type Three. Misinformation and deceit have played a very large role in the sabotage of factory homes. There have been at least four types of such misinformation.

i). During the late 1960s and 1970s, when HUD was devising programs to drive factory builders out of the small home market, NAHB argued that government programs had always benefited factory producers over stick-built producers. They argued that the new programs being introduced were simply “a way to level the playing field.” This was, of course, the opposite of the truth.

This first type of deceit was extremely important at the time the new national weapons were

being introduced. NAHB and HUD needed to confuse legislators, the press, and even the factory built industry, as to the purposes of HUD's interventions. This way the opposition to the weapons could be minimized and overcome.

With success on this front, the monopolies of stick-builders also wanted, of course, to bury the idea of factory-built homes altogether. The next three types of deceit played this role.

ii). Language, as discussed above, has long been used by monopolies in traditional construction to thwart and sabotage production of small-modular homes.

iii). As mentioned above, NAHB created a scapegoat for ever increasing home prices. NAHB argues that these price increases result from zoning regulations and land use restrictions placed on traditional home builders that dramatically raise the cost of constructing homes.

iv). Another tactic employed by NAHB is to simply ignore manufactured homes. NAHB simply acts as if manufactured homes are not part of new houses constructed each year. When NAHB mentions factory-built homes, they include panelized homes and "large" modular homes, but not manufactured homes.

Hence, NAHB states that factory built homes account for roughly 3% of new houses constructed each year. But, in fact, the share is roughly 10%. The 10%-share includes the share of panelized homes and large-modular homes, about 3%, the share acknowledged by NAHB, plus the share of manufactured homes, about 7%, the share NAHB refuses to acknowledge.²²

These types of misinformation and deceit have been extremely effective. Today, U.S. factory production of homes is seldom discussed. In a recent paper for the Annual Review in

²²See, for example, <http://nahbnow.com/2019/12/mit-report-spotlights-need-to-reform-policies-on-factory-built-housing/>

Economics, titled “Housing Supply,” there is one mention of factory homes (in a footnote).²³

In the few instances where U.S. factory production of homes is discussed, the analysis makes no mention of sabotage by producers of stick-built homes. The consulting firm McKinsey (2019) has written about factory production of homes in the United States and United Kingdom. They argue that to alleviate housing crises, more homes should be produced using manufacturing methods. They should be applauded for this.

However, McKinsey makes fundamental errors in their analysis of U.S. factory production of homes. First, McKinsey doesn’t have a handle on U.S. housing statistics. The time-series of factory production of homes they present (in Exhibit 6) looks nothing like the actual series. There is no major increase in factory production in the 1960s, nor a crash in the 1970s. Second, when McKinsey considers why there is so little factory production of homes in the United States, they make no mention of monopolies. They are unaware that the central reason for lack of factory-production is the 100 year sabotage of this production.

We’ve studied the history of factory-built homes in the United Kingdom as well. Today, there is very little factory production of homes in the United Kingdom, though it had significant levels in the 1960s and 1970s. The reason for the drop-off appears to be the same as in the United States: Monopolies in traditional construction sabotaged the methods. In discussing why the U.K. has low levels of factory production, McKinsey make no mention of monopolies. They are unaware of the key role of sabotage by monopolies in traditional construction.²⁴

²³Here is the mention: “This figure is a market-value estimate for all types of owner-occupied housing, including farm houses, mobile homes, second homes that are not rented, vacant homes for sale, and vacant land.”

²⁴For a brief discussion of the U.K. history of factory-built homes, see Schmitz (2020, e.g., pp. 231-237). As we mentioned above, sabotage of factory production of homes occurs in many countries throughout the world. Schmitz (2020) also briefly discusses the Canadian experience.

If we are going to make headway solving housing crises, if we hope to stop them from growing worse, we need to produce a very large fraction of U.S. homes in factories. As Levitt and Sons, and many others, knew, there is no other way: “factory-built housing must succeed, or we will never be able to produce the homes and apartments needed to house our expanding population and our underprivileged citizens in a comfortable, dignified, decent way.”

How to accomplish this? We need competition in the residential construction industry. We need to stop monopolies in the stick-built construction sector from sabotaging factory-built housing. In a word, competition is the answer to housing crises. With competition, we know that, given the experience of the 1960s, factory producers will overwhelm stick-built producers in the market for “small” houses, a market where factory producers have their greatest advantage, and the market where progress in solving housing crises will be made.

Introducing competition between factory-built home producers and those in traditional construction will reduce the harm caused by other monopolies in the “housing industry.” In particular, there are groups, like housing associations, that *limit all types of new housing in local areas*. This well known phenomenon goes by the name Nimbyism (Not in My Backyard - ism). As we briefly describe, the increased competition will allow households to “escape” those blocking their way to new housing. Fewer households will be “victims” of Nimbyism.

To begin the explanation, let us emphasize that there are really *two types of stick-built technologies*. The first technology is the one used for hundreds of years: Building houses one-at-a-time. The second technology is that pioneered by Levitt and Sons in the 1940s.

They developed a method to simultaneously construct a large number of homes on-site, in the same location. This method is widely used in the United States but, of course, is limited to areas where a “100 houses” are to be simultaneously built (e.g., large suburbs surrounding large cities). The method is not employed in small towns or rural areas.

Factory production methods dominate, in terms of costs per square foot, and ability to “go small,” Levitt methods. And Levitt methods dominate, in terms of costs per square foot, and ability to “go small,” the method of constructing one-house-at-a-time. Imagine, then, the dramatic fall in the costs of producing houses in small towns and rural areas if competition between factory producers and stick producers were introduced.

The opportunities for households, and businesses, to migrate to these areas would dramatically increase. Large numbers of low-income, city residents would move to these areas, especially those areas in the vicinity of these large cities.²⁵ Households in urban and suburban areas would no longer be victims of Nimbyism.

There is a literature that asks why the poor live in cities. One answer provided is that transportation options are much better in cities than rural areas and small towns. Public transportation is certainly an important consideration for low-income households. But what stops public transportation from expanding upon the arrival of new residents?

A more important reason for why the poor live in cities, it seems, is that many low-income households are “trapped” in cities by the high cost of constructing housing in rural areas and small towns. Housing is a much bigger cost for low-income households than transportation is. And we know why local housing cannot expand as new households arrive — monopolies.

²⁵This was households could stay “close” to family.

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Figure 1
A Small- Modular Home
(Sometimes Called a Manufactured Home)



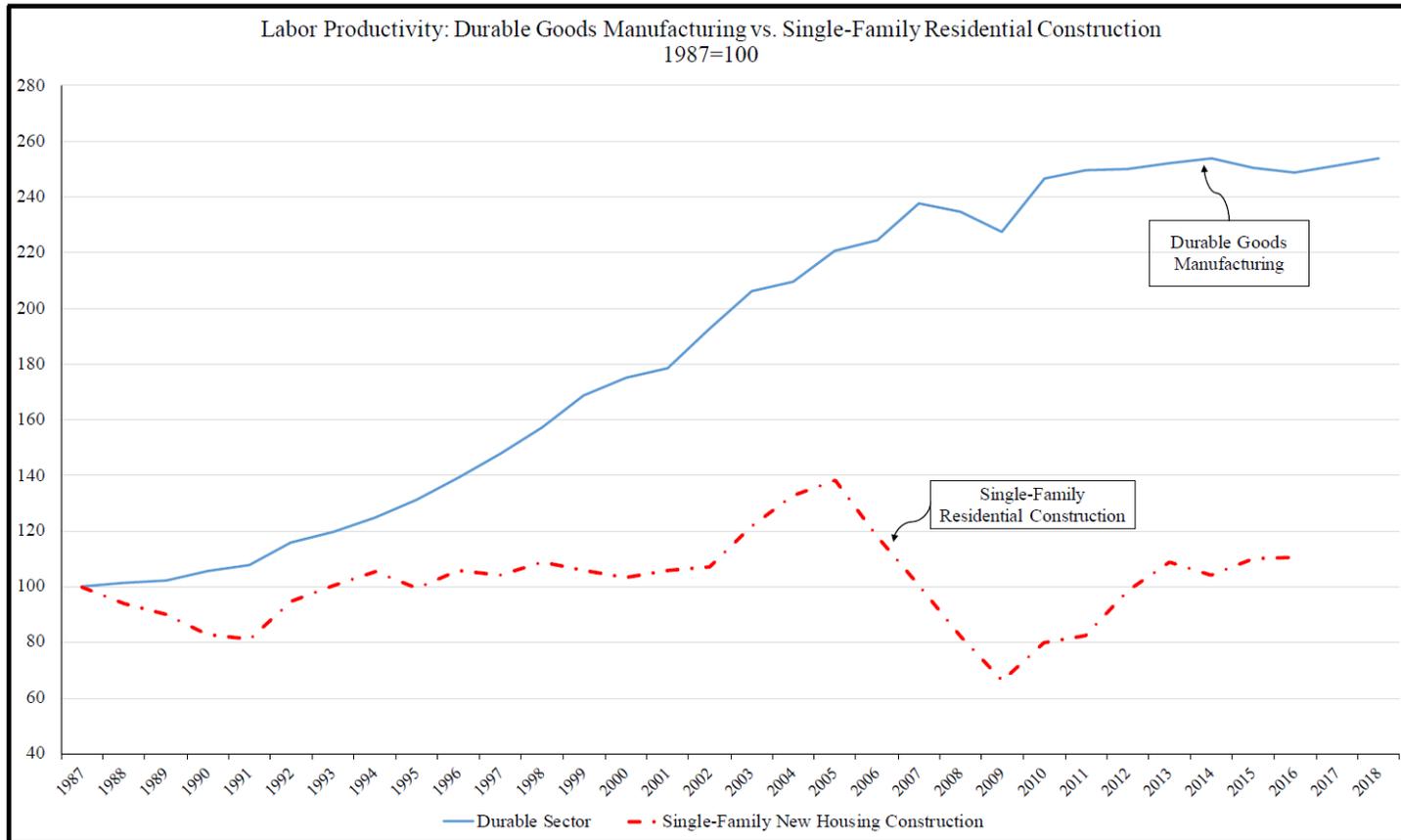
*Next Step: Affordable Housing Done Right, available at: <https://ncxistepus.org/smartmh/>

Figure 2
A Group of Small-Modular Homes



*Nevada Housing Division-Manufactured Housing, available at: www.mhd.nv.org

Figure 3



*Data on productivity of the durable sector comes from the Bureau of Labor Statistics. Data on the durable sector refers to NAICS 321, 327, 331-337, and 339. Series ID: MPU9920062. Data on productivity of single-family new housing construction is taken from Sveikauskas, Rowe, and Mildemberger (2018) based on Bureau of Labor Statistics data. Data on single-family new housing construction refers to NAICS 236115.

Figure 4



Judge Landis'

Decision Gives You Wholesale Prices on Building Material!

In the agreement between the Unions and Building Contractors before Judge Landis last Saturday, Rule No. 3 says: "There shall be no restriction in the use of any raw material or manufactured material except prison made."

People of Chicago—Here is the opportunity for which you have long waited. Do you know that you can now build a new home or repair your old one at a positive saving of 25% to 50% on materials? Judge Landis has made this possible. By this agreement, for the first time in years, millwork manufactured outside of Chicago may now be shipped into and used in Chicago. This means that you get the benefit of outside low prices—that you can enjoy, as do 200,000 other of our customers, the benefits of the famous Gordon-Van Tine system of selling from mill direct to you.

Because of our tremendous resources and method of selling, we can offer you building materials—either complete homes or lumber, millwork and other requirements called for by your building contractor—at prices actually at or lower than wholesale. You can build or repair at pre-war costs and get finest quality if you buy of Gordon-Van Tine. Shipments delivered to your nearest freight depot.

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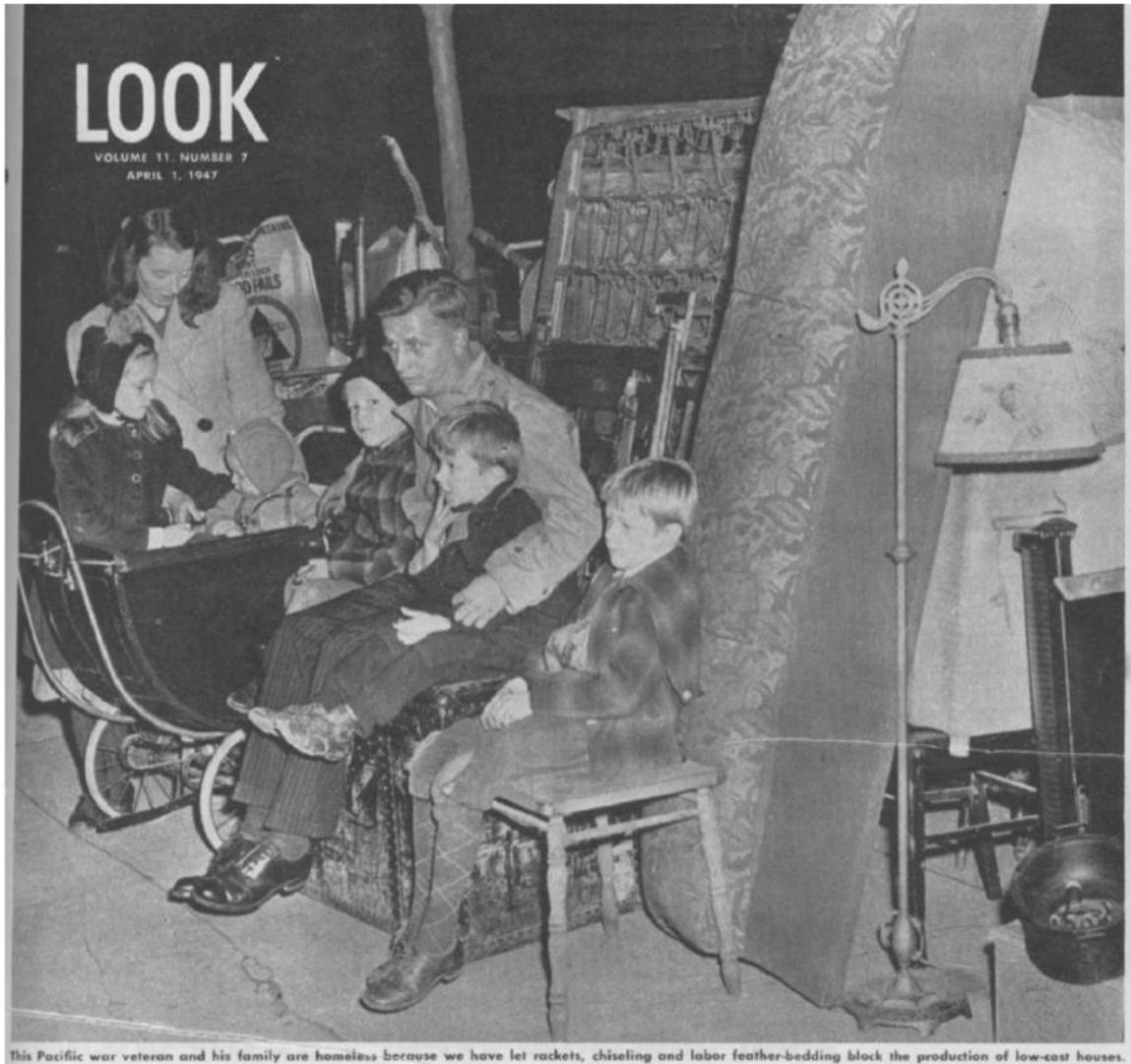
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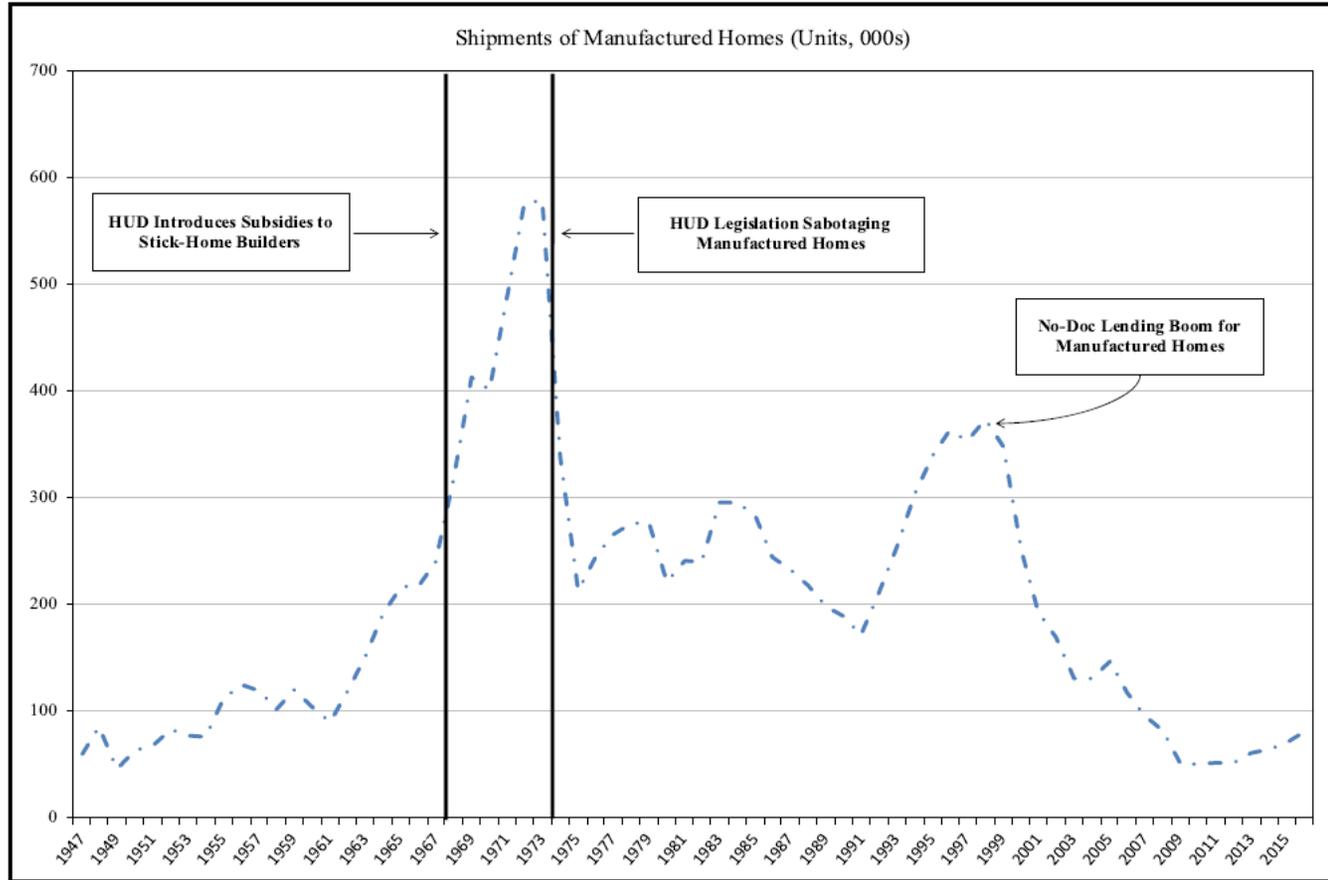
*The Chicago Tribune (Sep. 6, 1921): p. 6.

Figure 5



**Look* (April 1, 1947): p. 21.

Figure 6



NB: (1) These homes are not in the statistics on housing starts or building permits. (2) Notice lending boom roughly a decade before the real estate lending boom.

*Data from the U.S. Census Bureau – Shipments of New Manufactured Homes, retrievable at <https://www.census.gov/data/tables/time-series/econ/mhs/shipments.html>. Data prior to 1959 for manufactured homes are available from the Historical Statistics of the United States, Millennial Edition, Part Dc, Series Dc637-652.

Figure 7

Metal Chassis in the Basement of Modular Home



**Manufactured Housing Research Alliance, 2000.*

Figure 8

Metal Chassis in the Basement of Modular Home



**Mobile Home Living*, available at: <https://mobilehomeliving.org/basements-under-mobile-homes>.