The Effect of Local Labor Markets on Household Wealth *

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Abstract

This paper investigates the effect of local labor markets on household level wealth in the United States from 1980-2019. I establish three facts about local labor markets and how they interact with local housing markets and household wealth: first, local labor demand drove house prices to increase much more between 1999 and 2019 than between 1980 and 1999. Second, between 1999 and 2019, areas with high labor demand tend to be areas in which it is difficult to build new housing. Third, between 1999 and 2019, households in high labor demand areas are able to accumulate $43,000 more in net worth, but only if they are homeowners. Most of the wealth gains are due to housing wealth ($25,000) as opposed to other assets ($11,000). Meanwhile, better labor markets are only associated with about a $15,000 increase in wealth between 1980 and 1999. These findings suggest that the spatial distribution of labor market growth matters for U.S. wealth inequality, particularly in the way it interacts with local housing markets.

JEL Codes: D31, E21, J62, P25, R13

Keywords: Household Finance, Urban/Regional Economics, Wealth Inequality

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1 Introduction

The recent increase in wealth inequality within the United States (documented by Saez and Zucman (2016), amongst others) has led to debates about its extent and causes both within economics and public policy. When considered together with the rise in income inequality in the last few decades (Bloome, 2015), wealth inequality could have serious implications for access to opportunities. However, most of the focus on wealth inequality has been on the top 1%, whose wealth comprises mostly of business and stock holdings. On the other hand, the wealth of the bottom 90% is help primarily in housing. In this way, home ownership is an important aspect of the wealth holdings of a household, and deserves focus on how it contributes to U.S. wealth inequality.

This focus is especially salient because housing wealth is particularly sensitive to movements in house prices. If an area is doing well in terms of its labor market, households in the area earn more, and also demand more housing. This puts upward pressure on house prices, which in turn benefits homeowners. In this way, homeowners get not only the income benefits of being in a strong labor market, but also benefit in terms of their housing wealth. While they can also save the extra income, the second, home equity channel of wealth accumulation occurs due to the general equilibrium effects of labor markets on housing markets.

In this paper, I quantify the extent to which growth in local labor markets has led to some households acquiring more wealth than others by using a household-level panel of household wealth from the Panel Study of Income Dynamics (PSID). Using a difference-in-difference framework, I find that homeowner households who lived in a one standard deviation better labor market between 1999 and 2019 accumulated $43,000 more in net worth.[2] Most of these gains are due to housing wealth (about $25,000) compared to non-housing forms of wealth like stock market investments or savings ($11,000). I also find gains in the consumption patterns of these households, which implies that the gains in wealth have real effects on household welfare. On the other hand renters in these labor markets were not able to accumulate any additional net worth, and did not increase their consumption levels. Further, the effects are even stronger in markets with a lower elasticity of housing supply (such as San Francisco) compared to ones with a higher elasticity of housing supply, implying that the nature of local housing markets can exacerbate the effects of local labor market growth.

Further, labor market growth between 1999 and 2019 was concentrated in areas with a low elasticity of housing supply like San Francisco. Consequently, in this time period, there were major increases in home equity of households, particularly at the peak of the housing

[2]the mean wealth of these households in 1999 was around $260,000, meaning that the size of the effect is about 15% from the average

boom. These increases did not completely go away in the wake of the Great Recession. In fact, house prices increased steadily through the 2010s, which resulted in major gains in housing wealth for households living in good labor market areas.

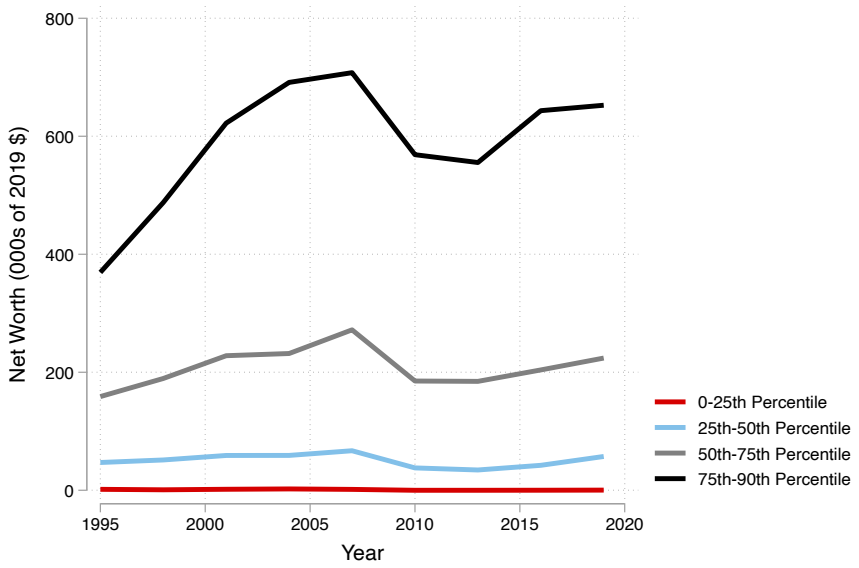
However, this pattern of labor demand growth and its tight correlation with wealth accumulation isn't something that was always true. The paper shows that the pattern of labor market growth was different between 1980 and 1999. In particular, there was no correlation between labor market growth and house supply elasticities. Consequently, I find that while households living in better labor markets did accumulate more wealth, but not by as much – homeowners accumulated about $17,000 more net worth, but most of this was through *non-housing* forms of housing ($12,000) compared to home equity ($5,000).

It is worth noting that while a lot of the literature has focused on the rise in the wealth shares of the top 1% (Saez and Zucman, 2016), there is also evidence of growing wealth inequality amongst the bottom 90% of households. Figure 1 gives a sense of this divergence in the last few decades. It plots the median net worth of households as measured by the Survey of Consumer Finances (SCF) for households in four percentile groups: the bottom 25%, the 25th-50th percentiles, the 50th-75th percentiles, and the 75th-90th percentiles. It shows that the total wealth holdings of these groups are diverging away from each other. The divergence is particularly salient for two highest groups, although even the 25th-50th percentile group has been pulling away from the bottom 25%.

Meanwhile, local markets across the U.S. have been diverging away from each other: between 1999 and 2019, Detroit has seen real wages decline by 2%, while real house prices have decreased by 12.5%; on the other hand, San Francisco has seen real wages increase by 50%, and real house prices increase by 99%. These trends, in turn, affect the wealth holdings of households experiencing them. For homeowners in these areas, they affect their housing wealth as well. Indeed, the wealth of homeowners has evolved in a dramatically different way over this period compared to that of renters. Figure 2 plots the evolution of median net worth for homeowners and renters between 1995 and 2019 as observed in the Survey of Consumer Finances. This figure shows how the wealth of owners has been growing over this period, while the wealth of renters has stagnated. At the beginning of the sample period, i.e., in 1995, the median net worth of homeowners is $173,800, while that of renters is only $8,000. At the end of the sample period in 2019, these numbers are $255,000 and $6,300 respectively.

In this way, areas with persistently positive labor demand shocks keep growing, and the wealth of homeowners in these areas keeps increasing. How important is the spatial distribution of increasing labor demand and house supply restrictions in determing the extent of wealth inequality in the US? How much of the increase in wealth inequality comes from

Figure 1: Median Net Worth in the United States by Percentile Groups

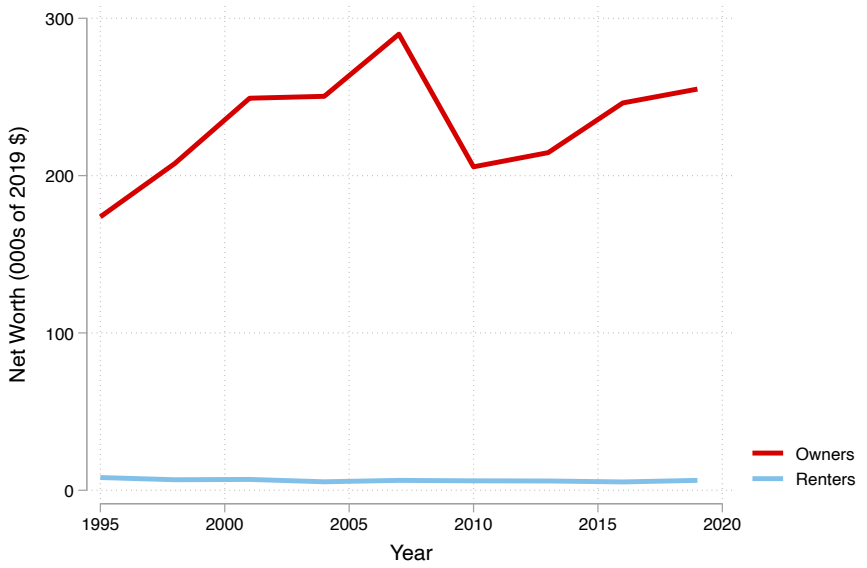


This figure plots the evolution of median net worth between 1995 and 2019. The numbers are calculated from the Survey of Consumer Finances (SCF). Median net worth is plotted according to four percentile groups: 0-25th percentile, 25th-50th percentile, 50th-75th percentile, and 75th-90th percentile. The trend suggests that the wealth of the top two percentile groups has been diverging away from the bottom two in this period.

an increase in housing wealth as opposed to an increase in the amount of savings?

In order to investigate these questions in greater detail, I use data from a variety of sources to provide some baseline empirical facts about local labor and housing markets. I define local areas as Core Based Statistical Areas (CBSAs) because CBSAs are areas which capture large urban centers, meaning that households can live and work in the same CBSA. I start by showing that in fact, house prices increase disproportionately more in CBSAs with greater labor demand shocks, especially between 1999 and 2019. For a market with a 1 s.d. better labor market in this period, house prices grow by 1.6 percentage points more. This effect is exacerbated in markets with a lower supply elasticity: within these markets, like San Francisco, a 1 s.d. better labor market leads to a 10 percentage point increase in house price growth rates. Finally, between 1999 and 2019, local labor market growth was negatively correlated with house supply elasticity, i.e., areas in which it was difficult to build housing were exactly the areas that grew in terms of their labor markets. This meant that in this period, the increase in house prices was particularly salient and could have driven household portfolios a lot more than before. In fact, I also find evidence that this negative correlation

Figure 2: Median Net Worth in the United States by Homeownership



This figure plots the evolution of median net worth between 1995 and 2019 for homeowners and renters. The numbers are calculated from the Survey of Consumer Finances (SCF). The trend suggests that the wealth of homeowners has grown, while the wealth of renters has stayed roughly constant over this period.

between labor market growth and house supply elasticities did not exist between 1980 and 1999. Consequently, the link between labor market growth and house prices was also weaker in this period.

These movements in house prices have real effects on the wealth and welfare of households. Using the PSID, I assign each household the labor market growth between 1999 and 2019 based on their area of residence in 1999, and study the evolution of a household's wealth between 1999 and 2019 based on the strength of their local labor market. This can be thought of as an "event study" type framework, but this framing is not precise. The "event" is labor market growth between 1999 and 2019, and the associations I find are between this growth and the evolution of wealth as measured in each interview wave of the PSID.[3] Identification is through difference-in-differences, and follows the literature on shift-share instruments (Goldsmith-Pinkham et al. (2017) and Bartik (1991)).

Since local labor markets have knock on effects on local housing markets, their effects might be heterogeneous with respect to homeownership. One might suspect that incum-

[3]The advantage is that I follow the same families over time and track their household level wealth. In a repeated cross-section, cities would evolve in their composition as households migrate, meaning that we would not be able to delineate the effects of a particular labor market on wealth accumulation versus population composition.

bent homeowners benefit further from rising house prices as their home equity rises, but renters suffer as rents increase. Further, transitioning into homeownership also becomes more challenging.

I find that between 1999 and 2019, homeowner households in 1 s.d. better labor markets were associated with a higher net worth of almost $43,000. Most of this association was due to an increase in their home equity of almost $25,000, and an increase in their non-housing wealth of about $11,000. On the other hand, renter households in 1 s.d. better labor markets hardly see any rise in their wealth. This large increase in home equity is perhaps what one would expect given the large increase in house prices that occurs in this period in response to growth in local labor markets.

This increase in wealth, even if mostly from home equity, has real effects on the welfare of households. Homeowner households are able to consume an average of $4,500 per year more than those in poorer labor markets. Meanwhile, renter households in better labor markets also see an increase in their consumption, but only of around $2,000 per year. It is also worth noting that homeowners see an increase in income of around $6,000 per year, while renters see an increase of around $2,000, almost all of which is spent on additional consumption.

Finally, I also find some suggestive evidence that between 1980 and 1999, the wealth accumulation of households in better labor markets was not as salient as in the later period. This is in line with the results on house prices, which were also not as responsive to labor markets in this period. The PSID collected data on the wealth of households in 1984, 1989, 1994, and regularly from 1999 onwards, which makes this analysis possible. Using these data, I find that homeowner households are able to accumulate more net worth of around $17,000 by 1999, although most of this is due to non-housing forms of wealth ($12,000) rather than home equity ($5,000).

Related Literature This research is broadly related to two strands in the economics literature.

First, it relates to the analysis of local labor and housing markets. The mechanism of labor market shocks leading to house price declines has been studied extensively in the literature in the context of spatial equilibrium. Rosen (1979) and Roback (1982) analyze the optimal choice of location when areas differ by amenities. Spatial equilibrium models have been the foundation of many subsequent papers that also look at differences in wages and amenities across areas to study inequality in real wages (Topel (1986), Moretti (2013), Diamond (2016), Notowidigdo (2011), Zabek (2017)). Meanwhile, other studies have shown the complex interplay between labor markets and housing availability. Glaeser and Gyourko (2005) note that housing supply constraints, resulting from both geographical limitations

and regulatory restrictions, can result in higher house prices in high-demand areas. This finding is particularly relevant to our study, where such constraints exacerbate the effects of local labor markets in favor of homeowners vs. renters.

I add to this literature by explicitly considering the role of homeownership within local markets. My findings indicate that the fact that some of the people living in an area own their residence is quantitatively relevant in determining how they react to labor market shocks and their wealth holdings over time.

Second, this paper relates to the literature on the documentation, determinants, and causes of wealth inequality. Important papers in this literature include Saez and Zucman (2016) (the importance of taxation in determining the wealth shares of the top 1%), and Moll et al. (2021) (automation and wealth inequality). Other studies, such as Fisher et al. (2022) and Killewald et al. (2017), document the increase in wealth inequality in the United States. Case et al. (2012) argue that fluctuations in house prices significantly affect the economic behavior of households, impacting consumption and savings and, by extension, overall wealth.

The closest analysis to this paper is Greaney (2020), who also looks at the role of local labor and housing markets in determining wealth inequality in the long run. However, there are three key differences between the two papers. First, and most importantly, this paper relies on direct measurements of household wealth to provide evidence that the wealth of households is impacted by local labor markets in the long run. Second, it shows the importance of splitting the time period between 1980 and 2019 into two parts: while the first twenty years in this period has a more even distribution of labor demand growth, the second twenty years saw growth in areas with a low elasticity of housing supply, particularly during the Housing Boom. Therefore, the dynamics of wealth inequality look different at different points in between 1980 and 2019. Third, this study is largely empirical, while Greaney (2020) focuses on a modeling-based approach to generate counterfactuals.

Despite this considerable body of research, few studies have explored the effect of local labor market conditions on household wealth via the housing market in the long run. This paper contributes to this literature by shedding light on the significant impact of local labor market conditions on household wealth, mediated by local housing markets. Our findings reinforce the interconnectedness of these markets and underscore the need to consider them collectively when crafting economic policies.

The paper proceeds as follows. Section 2 presents some descriptive work on U.S. wealth holdings and wealth inequality, including how it has changed over time. Section 3 describes the data that is used in this paper. Section 4 describes empirical results about local house prices and the distribution of labor market growth across the U.S, and Section 5 links these

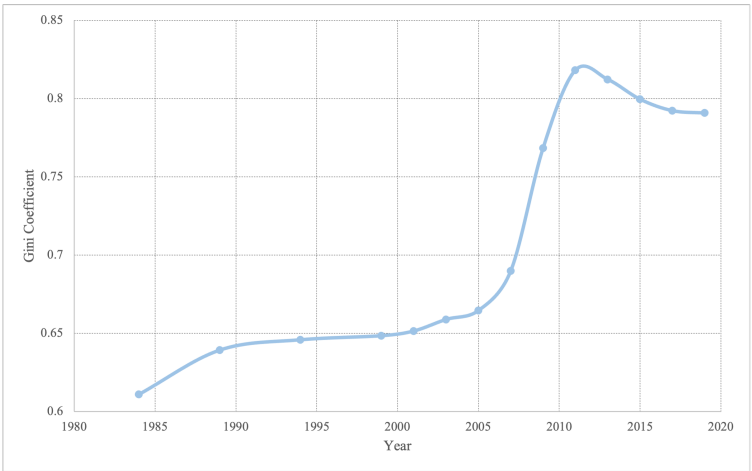


Figure 3

to the wealth and welfare of households. Section 6 discusses the results and provides implications for long run wealth inequality in the U.S., and Section 7 concludes.

2 Wealth Inequality amongst the Bottom 90%

Wealth inequality in the United States certainly increased due to a rise in top wealth shares (Saez and Zucman (2016)), but it also increased at other points in the wealth distribution. In particular, the wealth of the bottom 90% of households also shows an increase in the gini coefficient of wealth. For instance, Figure 3 plots the evolution of the wealth gini for the bottom 90% of households within the Panel Study of Income Dynamics.[4] One can see that between 1984 and 1999, the wealth gini increased from 0.61 to 0.65 – an increase of about 0.04 units, or 6.5%. However, between 1999 and 2019, the wealth gini shot up to almost 0.8, an increase of 0.15 units. It is also apparent that most of the increase in wealth happened in the lead up to the Great Recession, but has persisted in the ten years since then.

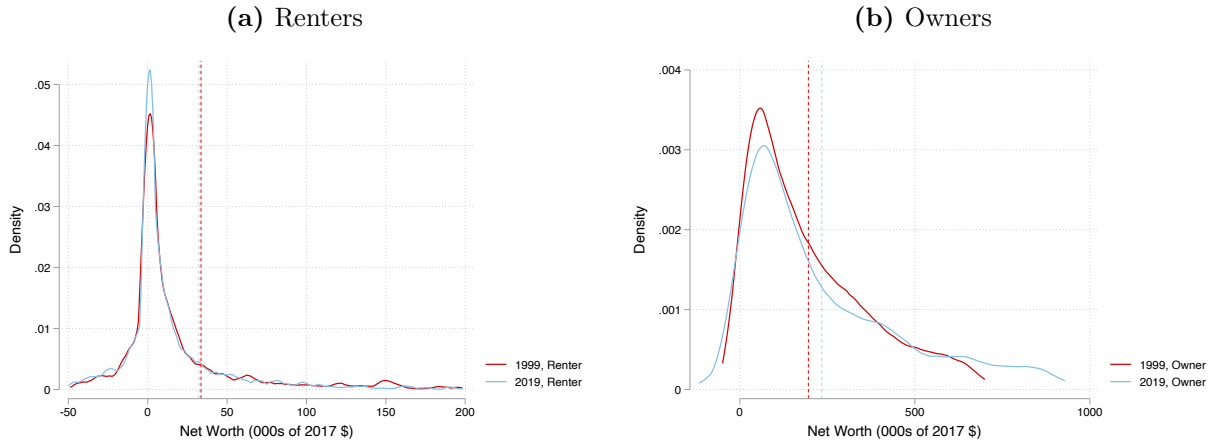
2.1 Decomposing Wealth Changes between 1999 and 2019

The mean level of wealth in the United States amongst the bottom 90% of households increased between 1999 and 2019. Using the Panel Study of Income Dynamics (PSID), I find that amongst this group, the average net worth (including home equity) was $142,299[5] in 1999. This went up to $168,022 by 2019, a real increase of almost $26,000.

[4]This measure includes negative values, but similar numbers can be calculated for non-negative wealth holdings only.

[5]All prices are in real 2019 dollars.

Figure 4: Distribution of Wealth of Renters and Homeowners in 1999 and 2019



This figure presents the wealth distribution of the bottom 90% of households in 1999 and 2019. The left panel shows the distribution of renters, and the right panel shows the distribution of homeowners. The wealth of owners, as expected, is much higher than the wealth of renters. However, while the wealth of renters has barely moved, and if anything slightly decreased between 1999 and 2019, the wealth of homeowners has gone up considerably.

Figure 4 presents the wealth distribution of the bottom 90% of households in 1999 and 2019. The left panel shows the distribution of renters, and the right panel shows the distribution of homeowners. The wealth of owners, as expected, is much higher than the wealth of renters. However, while the wealth of renters has barely moved, and if anything slightly decreased between 1999 and 2019, the wealth of homeowners has gone up considerably.

Given the importance of housing wealth in the wealth portfolio of these households, it is useful to decompose the change in mean wealth as coming from homeowners or renters. However, the homeownership rate has also changed in this time span, which makes it harder to see how much of the increase in mean wealth overall is due to each group. Therefore, I decompose the change in mean wealth between 1999 and 2019 as coming from three components: the change in the wealth of homeowners and renters respectively, keeping ownership rates constant, and the change in the ownership rate, keeping the wealth difference between owners and renters constant.

Specifically, we can write the change in mean wealth between 1999 and 2019, $\Delta\bar{W} = \bar{W_{2019}} - \bar{W_{1999}}$ as:

$$\begin{aligned}\bar{W}_0 &= \frac{1}{N}\sum_{i=0}^{N} W_{i,0} \\ &= \frac{N_{R,0}}{N}\frac{1}{N_{R,0}}\sum_{i=1}^{N_{R,0}} W_{i,R,0} + \frac{N_{O,0}}{N}\frac{1}{N_{O,0}}\sum_{i=1}^{N_{O,0}} W_{i,O,0}\end{aligned}$$

We can further define $Q_{R,1} = N_{R,1}/N$ as the proportion of renters in period 1, $Q_{O,1} = N_{O,1}/N$ as the proportion of owners, and ΔQ_O as the change in the fraction of owners over time. Assuming N is constant over time,

$$N_{R,0} + N_{O,0} = N = N_{R,1} + N_{O,1} \implies \Delta Q_R = -\Delta Q_O$$

We can now rewrite the difference in mean wealth between period 1 and period 2:

$$\Delta\bar{W} = \bar{W}_1 - \bar{W}_0 \tag{1}$$

$$= \left(Q_{R,1}\frac{1}{N_{R,1}}\sum_{i=1}^{N_{R,1}} W_{i,R,1} + Q_{O,1}\frac{1}{N_{O,1}}\sum_{i=1}^{N_{O,1}} W_{i,O,1}\right) - \left(Q_{R,0}\frac{1}{N_{R,0}}\sum_{i=1}^{N_{R,0}} W_{i,R,0} + Q_{O,0}\frac{1}{N_{O,0}}\sum_{i=1}^{N_{O,0}} W_{i,O,0}\right) \tag{2}$$

$$= Q_{R,0}\Delta\bar{W}_R + Q_{O,0}\Delta\bar{W}_O + \Delta Q_O(\bar{W_{O,1}} - \bar{W_{R,1}}) \tag{3}$$

where ΔW_R is the change in the average wealth of renters between periods 0 and 1, and ΔW_O is the same statistic for the wealth of owners. Notice that in the last equation, these changes are weighted by the proportion of renters and owners in the first period. In other words, it's the contribution of the mean changes in rental and owner wealth keeping constant the proportion of renters and owners. The final term of Equation 3 is the change in the proportion of owners multiplied by the difference between the mean wealth of owners and renters in the final period.

To aid interpretation, we can divide both sides of the last equation (Equation 3) by the left hand side to get:

$$1 = \frac{Q_{O,0}\Delta\bar{W_O}}{\Delta\bar{W}} + \frac{Q_{R,0}\Delta\bar{W}_R}{\Delta\bar{W}} + \Delta Q_{O,0}\frac{(\bar{W_{R,1}} - \bar{W_{O,1}})}{\Delta\bar{W}} \tag{4}$$

The first term on the right hand side captures the mean change in the wealth of owners over time, keeping constant the ownership rate. The second term captures a similar change in the mean wealth of renters, keeping constant the ownership rate. The third term is

Table 1: Mean Wealth for Bottom 90% Households in PSID (in 000s of 2019 dollars)

	1999	**2019**
Owners	\$192,648	\$246,161
Renters	\$43,618	\$42,606
All	\$142,299	\$168,022
Ownership	0.662	0.616

the change in the ownership rate, keeping constant the difference in the mean wealth of owners and renters. Table 1 provides the moments of the wealth distribution needed for the calculation using household level PSID data in 1999 and 2019.

Plugging in the numbers, I find that:

$$1 = \underbrace{(1.377)}_{\text{Due to change in wealth of owners}} + \underbrace{(-0.0133)}_{\text{Due to change in wealth of renters}} + \underbrace{(-0.364)}_{\text{Due to change in ownership rate}} \tag{5}$$

The calculations reveal that almost the entirety of the change in means between 1999 and 2019 has come from the wealth of homeowners and the fact that homeownership rates have declined. The wealth of renters, on the other hand, is barely responsible for the change in means.

This indicates that homeowners and renters had dramatically different dynamics of wealth over this time period, and while one group increased their wealth, the other group stagnated. Ownership rates decreased, which means that more people are excluded from future gains in housing wealth.

We can do a similar decomposition for the earlier period, i.e., between 1984 and 1999. Table 2 provides the summary statistics used in the calculations.

Table 2: Mean Wealth for Bottom 90% Households in PSID (in 000s of 2019 dollars)

	1984	**1999**
Owners	\$147,039	\$192,648
Renters	\$31,044	\$43,618
All	\$100,707	\$142,299
Ownership	0.62	0.662

Unsurprisingly, the numbers paint a different story in this time period:

$$1 = \underbrace{(0.671)}_{\text{Due to change in wealth of owners}} + \underbrace{(0.120)}_{\text{Due to change in wealth of renters}} + \underbrace{(0.209)}_{\text{Due to change in ownership rate}} \quad (6)$$

The numbers show that while the change in average wealth was still driven by the wealth of homeowners, the wealth of renters also increased in this time period. Moreover, the homeownership rate went up by 4 percentage points.

Given these different dynamics, it is evident that homeownership and housing wealth changes were more important to explain the dynamic of wealth inequality between 1999 and 2019 compared to the earlier time period. Further, the distribution of the growth was more equitable between 1984 and 1999: access to homeownership was higher, and renters gained in terms of their wealth holdings as well, even though homeowners still gained the most.

In the next sections, I explore the relationship between local labor markets and house prices, and then move on to investigating the links between local labor markets and household wealth, which provide further context to these decompositions.

3 Data and Measurement

I use two main data sources for the empirical analysis presented in this paper. The first is the County Business Patterns (CBP) dataset, which I use to construct measures of local labor market growth in areas. The second is the Panel Study of Income Dynamics, which is a panel of households followed over time and space, and linked across generations. Both these sources are describes in detail below.

3.1 County Business Patterns (CBP)

The County Business Patterns (CBP), released publicly by the United States Census Bureau is a dataset that reports industry level employment and annual payrolls in the United States at the county, Meteropolitan Statistical Area (MSA), and state levels. For the various analyses in this paper, I use the county level data and aggregate these up to the level of Core Based Statistical Areas (CBSAs), which are collection of counties meant to capture larger areas in which people live and work. I define local areas as Core Based Statistical Areas (CBSAs) because they capture urban centers where households live and work. They consist of groups of counties. I do this by using a county-to-CBSA crosswalk, with county specific weights used to capture the relative importance of each county to the CBSA in

terms of population. CBSAs are similar to Metropolitan Statistical Areas, but also include smaller urban areas (defined as Micropolitan Statistical Areas) which lets me capture more households in the data. On the other hand, Commuting Zones, the other most commonly used definition of local markets, include rural areas as well as urban areas. Since my focus is on aggregate markets in *urban* areas, CZs are not appropriate in my context.

I use employment changes from the CBP over time to define the shift-share labor demand growth that forms the main measure of local labor markets. In particular, I collect employment by industry (I use the 3-digit 2012 NAICS industry classifications) in each area between 1984 and 2019. These statistics, as mentioned previously, are aggregated up to the CBSA level. I provide more details about calculating the measure of labor demand growth by area in Section 3.6.

3.2 Panel Study of Income Dynamics (PSID)

The Panel Study of Income Dynamics (PSID) is a household survey that began in 1968, and in 2019 collected data for about 9,000 households. It was a yearly survey until 1999, at which point it became biennial. It asks interviewees detailed questions about housing, wealth, employment, and mobility, and follows families over time and even across generations.

This is the primary source of data for this paper. The richness of the PSID makes it particularly amenable to answering questions about wealth and the labor market, since it contains details not only about (self-reported) home values and income, but also about the wealth portfolio of households. The PSID first asked about wealth in 1984, and then once every five years until 1999, after which every interview wave has collects this information. This makes the PSID particularly useful in exploring wealth dynamics, since we are able to follow the same households over time as they interact with the labor market, save, purchase housing stock, and so on.

It should be noted that information about wealth portfolios is available at the household level, and is asked to the "household head", or "reference person" (RP). So, the unit of analysis in this paper will be the household, and not individuals. The specific wealth variables I consider are:

1. Wealth with home equity: total net worth, calculated as the sum of all assets minus all debt.

2. Wealth without home equity: the sum of all other forms of wealth, including cash, bonds, sums in checking and savings accounts, etc. minus all outstanding debt.

3. Home equity: calculated as self reported home value minus all outstanding mortgages on the house.

Note that these measures of wealth include retirement wealth in IRA accounts. However, they do not include other sources of wealth such as pensions or Social Security, because these are not "owned" by the household yet. In principle, it is possible to calculate future Social Security wealth based on current income, but this is not reflective of life cycle income patterns, which is what determines Social Security returns. This matters because a household might change its consumption and savings behavior in the present given future sources of wealth. In other words, all forms of wealth could potentially be fungible across the life cycle. However, given the difficulty in estimating retirement wealth more completely, I only use wealth in IRA accounts in my measures.

In addition to these, I use the vast array of household level characteristics that the PSID is known for, including measures of family income, employment, race, age profiles, number of children, marital status, etc.

3.3 FHFA House Price Index

The FHFA HPI is a broad measure of the movement of single-family house prices, and serves as an accurate indicator of house price trends at various geographic levels. The FHFA HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or refinancings on the same properties, and is available 1975 onwards.

This uniformity in measurement is useful because the FHFA takes care to measure the price of the same housing unit if it were in, say, San Francisco, or Indianapolis. This is important because the value of a house can be written as $p_h h$, where p_h is the price of housing, and h is the amount or stock of housing. Since the FHFA index keeps h constant across regions, the differences in the index reflect differences in p_h across areas.

3.4 Saiz (2010) House Supply Elasticity

A key parameter of interest is the house supply elasticity, which determines the responsiveness of prices to population changes. Data for this comes from Saiz (2010), who uses local land availability measures to construct a measure of house supply elasticity that is plausibly exogenous to local labor market conditions. Essentially, these elasticities are a measure of how difficult it is to build new housing in an area – areas where the land is steep (San Francisco, for example), or areas near water bodies (Miami, for example), are naturally areas with a low elasticity of housing supply, while areas located on plains (like Indianapolis) have a higher elasticity of housing supply.

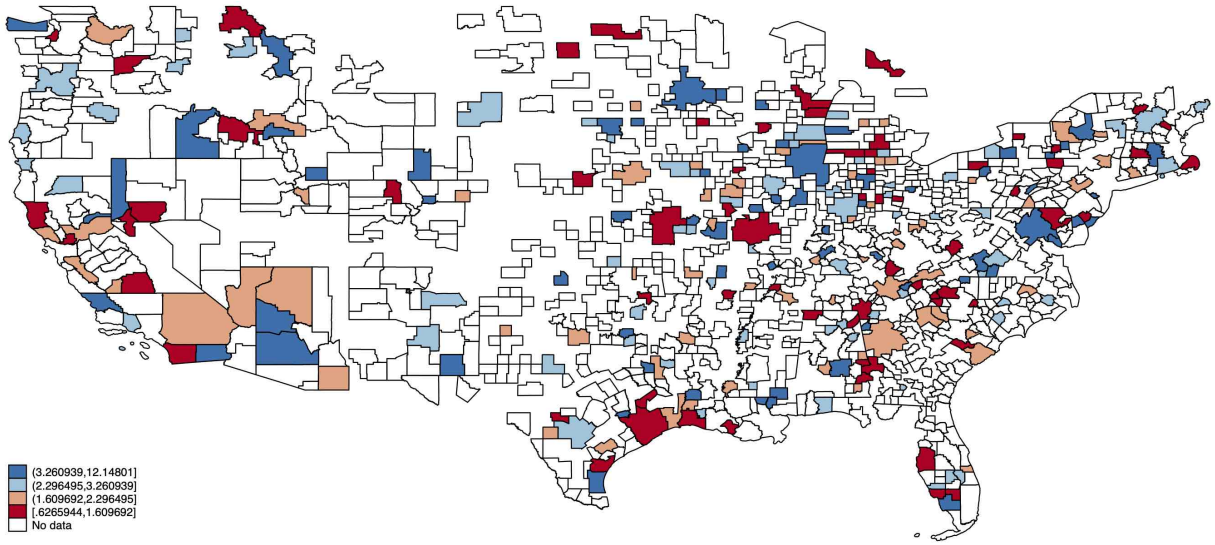


Figure 5: House Supply Elasticities Across the United States

Figure 5 presents a map of house supply elasticities across the U.S., where red areas have a lower supply elasticity and blue areas have a higher one.

3.5 Final Dataset

Finally, these datasets are merged to create the final dataset I use for the empirical analyses in the paper. Specifically, I rely on the fact that the PSID also collects information about the location of households, although this isn't made publicly available (except at the state level). However, the restricted version of the dataset does contain this information.

I further merge the labor demand growth constructed using the CBP data and Saiz (2010) house supply elasticities to the PSID based on the location of households in 1999 for the main time period (1999-2019) and 1984 for the secondary time period (1980-1999), respectively. This is done because the PSID only collects information on wealth beginning in 1984.

Table 3 provides some summary statistics for the main sample of households used for regressions between 1999 and 2019. In total, we have information on 12,950 households over 11 interview waves (biennially from 1999 to 2019). However, there is some attrition in the sample, which why the total number of observations (household x time) is not 12,950 x 11, but rather 65,834. The sample statistics are weighted using longitudinal weights provided by the PSID, which makes the data nationally representative every year.

	Mean	S.D	Min	Max
Age	43.5	12.1	18	65
Homeowner	0.584	0.493	0	1
Black	0.163	0.370	0	1
Married	0.517	0.500	0	1
Years of Education	13.6	2.65	0	17
Unemployed	0.056	0.230	0	1
Family Income	90.1	129	-130	7264
Labor Income	55.6	96.2	0	6785
Net Worth	307	1555	-2320	115536
Net Worth (without Equity)	220	1480	-3050	115335
Home Equity	87	190	-1292	6939
Observations	65834			
Families	12950			
Time Periods	1999, 2001, . . . , 2019			

Table 3: Descriptive Statistics for Main Panel of Families, 1999-2019

The idea is to measure the evolution of wealth as labor markets are growing in an area. What is the association of net worth with 1 s.d. better labor markets? Further, what part of the wealth portfolio is responsible for the changes – housing, or other forms of wealth? Do these relationships change with the time period under consideration, or the nature of the housing markets (as captured by the house supply elasticity)? These questions are answered in the next sections.

3.6 Measuring Local Labor Market Growth

Before presenting the regressions I estimate, it is important to define the measure of parental labor market growth that I use. Motivated by the literature (for instance Notowidigdo (2011) and Zabek (2017)), I construct local employment shift share shocks in the spirit of Bartik (1991) to measure changes in local labor demand. The shift-share shock, as illustrated in **?**, takes the changes in national industrial employment and projects them onto the CBSA-level employment shares. These capture local changes in labor demand because they capture national level trends in industries, which are then weighted by the share of that industry in the area. Finally, this term is aggregated over industries. Specifically, I use employment shares for 3-digit 2012 NAICS private industries, and then project them onto leave-one-out national industry growth rates for the relevant time period.

In the main regression specification, I calculate labor market growth between 1999 and 2019. This is done for several reasons. First, the PSID measures wealth consistently starting in 1999, and biennially from that interview wave onwards. The latest interview wave available is 2019. This means that we have a long enough period of labor demand growth for households to accumulate wealth. Second, the period from 1999 to 2019 is an economically significant one, encompassing the housing boom and bust, the Great Recession, and the recovery from it. As seen in Figure 3, there was a significant increase in the wealth gini in the first half of this period, and these did not recede in the recovery – in fact, the gini coefficient seems to have stabilized at a much higher level after the housing boom and bust and the Great Recession. However, I also present results for local markets using a decade-specific definition of the shift-share labor demand growth (as is common in the literature, e.g., Moretti (2013), Goldsmith-Pinkham et al. (2017), Zabek (2017)).The results from these regressions are discussed in Appendix A.

Further, Goldsmith-Pinkham et al. (2017) show that the exogeneity of the shift-share instrument comes from employment shares, and not from the national level growth rates. To partially alleviate this concern, I take employment shares in an area five years prior to the growth period. For instance, I take employment shares in an area from 1994 for the growth period between 1999 and 2019. Second, I also leave out real estate and construction industries from my calculations since many of the increases in fast growing labor markets might be due to tight housing markets, which muddles the relationship between the two.

Specifically, I define parent's labor market growth as $\Delta\theta^{2019}_{j,1999}$, for a household in CBSA j in 1999 as:

$$\Delta\theta^{2019}_{j,1999} = \underbrace{\sum_{k \in ind}}_{\text{summing over industries}} \underbrace{\left(\frac{L_{k,-j,2019} - L_{k,-j,1999}}{L_{k,-j,1999}} \right)}_{\text{national growth rate}} \underbrace{\frac{L_{k,j,1994}}{L_{j,1994}}}_{\text{share of industry in area}} \tag{7}$$

where k is industry, and L is employment. Further, I also "standardize" the shocks by demeaning them and dividing by the standard deviation – this aids interpretation, as now the shock can be measured in standard deviation units. in words, $\Delta\theta^{2019}_{j,1999}$ captures how labor markets grow due to local labor demand.

In practice, how are these Bartik measures spread across the United States? Figures 6 presents the spatial distribution of labor market growth between 1999 and 2019. Most areas experienced moderate growth in this period. This is mostly due to the Great Recession wiping out the gains before 2007, and the Recovery bringing them back a little.

Figure 6: Regional Heterogeneity in 1999-2019 Labor Demand Shock

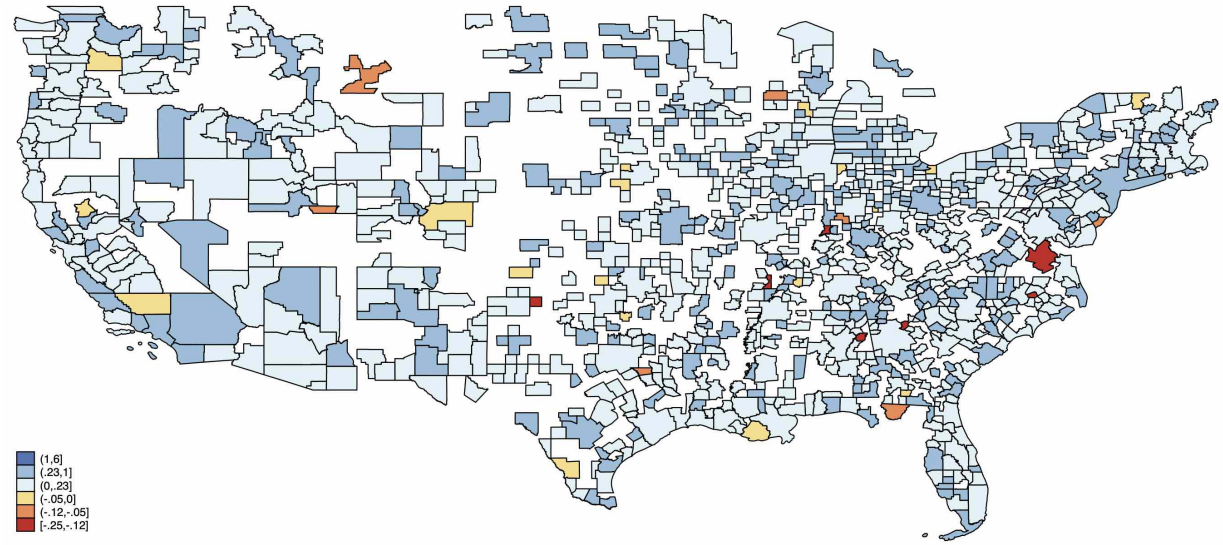


Figure 7 presents the same numbers in histogram form.

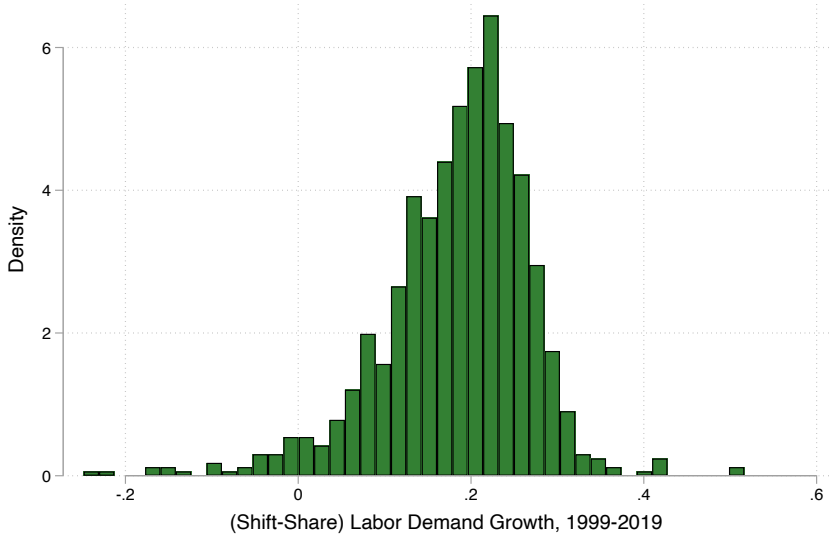


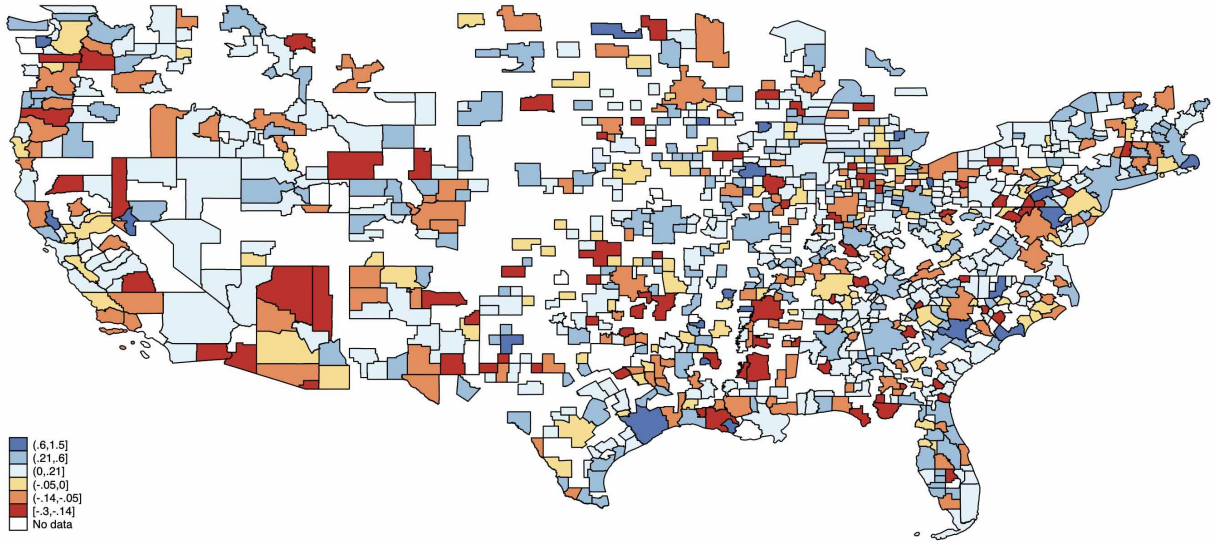
Figure 7

The main idea is to examine differences in regional house prices and household wealth 1999 onwards according to their CBSA's labor market growth between 1999 and 2019. In the next section, I formalize the notion of these regressions.

4 Empirics: Regional Labor Demand and Housing Markets

How have regional labor markets affected house prices? To answer this question, I regress the measure of labor demand growth between 1999 and 2019 on local house price growth. I use a non-housing CPI index to deflate the values of the house price index to 2019. Recall that the house price index is as measured by the FHFA. The regional heterogeneity in house price growth can be found in Figure 8. The map shows that there is substantial regional heterogeneity in house price growth, with areas in the rust belt and places like New Mexico not doing so well in this time period.

Figure 8: Regional Heterogeneity in 1999-2019 House Price Growth



I also include in this regression an interaction of the local labor market growth with the local house supply elasticity. Recall that this measures the extent to which new housing can be built in an area: a low supply elasticity implies that it is difficult to build more housing. This would imply that the effects of local labor market growth have a large pass through to house prices. The mechanism is that as labor demand increases, households get richer and more families move in. This raises housing demand and puts upward pressure on house prices. If housing supply was perfectly elastic (i.e., it was costless to build more housing), house prices would not move. On the other hand, in perfectly inelastic markets, house prices would increase a lot. So, it is interesting to see how the supply elasticity interacts with the labor demand growth to explain house price growth.

Specifically, the regression is of the form:

	(1)	(2)	(3)
Labor Demand Growth	0.016^{**}	0.089^{**}	0.148^{**}
	(0.003)	(0.014)	(0.032)
Elasticity		-0.049^{**}	-0.043^{**}
		(0.010)	(0.010)
Labor Demand Growth x Elasticity			-0.022^{*}
			(0.011)
N	273	273	273
R^2	0.0338	0.2393	0.2476

Table 4: The Effect of Local Labor Markets on House Price Growth, 1999-2019

$$\Delta HPI^{2019}_{j,1999} = \beta_0 + \beta_1 \Delta\theta^{2019}_{j,1999} + \beta_2 \text{Elasticity}_j + \beta_3(\Delta\theta^{2019}_{j,1999} \text{ x Elasticity}_j) + \beta_2 \text{Pop}_j + \epsilon_j \quad (8)$$

where j is the CBSA in question, $\Delta HPI^{2019}_{j,1999}$ is the percentage growth in the FHFA House Price Index between 1999 and 2019, $Elasticity_j$ is the house supply elasticity, and Pop_j is a vector of area specific characteristics including population.

Ex-ante, we would expect β_1 to be positive, but β_2 and β_3 to be negative, since higher supply elasticities should be associated with a lower growth in house prices. β_3 being negative would imply that as housing becomes easier to build, the pass through of labor markets onto house prices becomes lower. In fact, this is exactly what I find in the regressions, whose results are presented in Table 4. Of course, it must be noted that these relationships have been studied before: some papers include Rosen (1979), Roback (1982), Bartik (1991), Moretti (2013), and Diamond (2016). However, linking these outcomes to wealth has not been the subject of much prior research, mostly due to data availability (a notable exception is Greaney (2020), which is related to this paper).

The first specification (Column 1 of Table 4) shows that a 1 s.d. better labor market leads to a 1.6 percentage point increase in growth rates of house prices in this time period. The second specification controls for house supply elasticity, and finally the third one adds an interaction term between labor demand growth and elasticity. In other words, the third specification estimates Equation 4. We find that low elasticity areas are substantially more sensitive to an increase in labor demand in terms of the local house prices. These would be areas like San Francisco or Miami. On the other hand, since β_3 is negative (-0.022), it shows that areas like Indianapolis are not as sensitive to increases in labor demand.

We can also visualize how house prices have grown over time in this period. We can estimate regressions of the form:

$$HPI_{j,t} = \beta_0 + \beta_1 \Delta\theta^{2019}_{j,1999} + \mu_t + \sum_{t=1999}^{2019} \beta_{2,t} \Delta\theta^{2019}_{j,1999} \text{ x } \mu_t + \nu_{j,t} \tag{9}$$

where μ_t are year fixed effects and $HPI_{j,t}$ is the house price index in area j in year t. The estimates from this regression can be found in Figure 9. This figure shows the dynamics of the growth in house prices over this time period. It captures the housing boom and bust, the Great Recession, and the recovery as well. On average, a 1 s.d. better labor market is associated with an index that is higher by about 75 points. It is important to keep this in mind when interpreting the results on wealth in the next section.

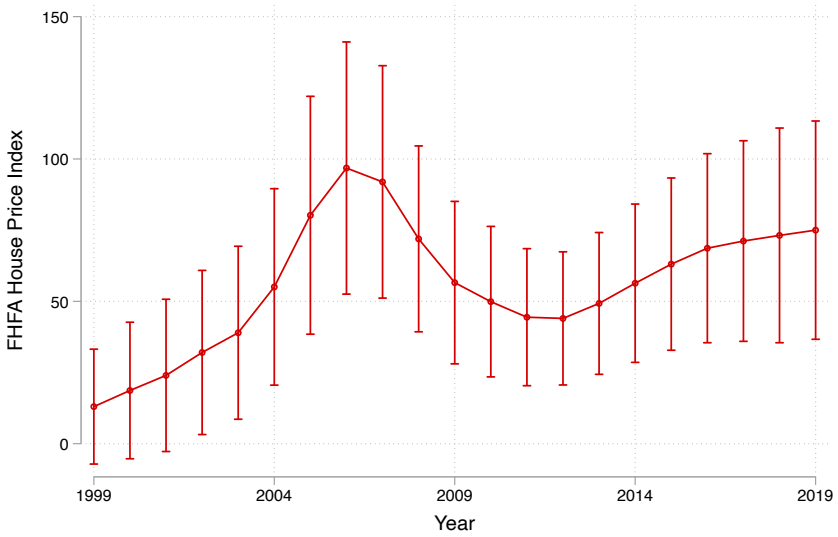


Figure 9: Association of 1 s.d. Better Labor Markets with House Prices, 1999-2019

4.1 Correlation of Labor Demand Growth with House Supply Elasticities

As per theory, a low house supply elasticity can exacerbate the effects of local labor market growth on house prices. The previous set of results provided evidence of this. Further, if labor demand growth is more likely to occur in areas that have a low house supply elasticity, then the dispersion in house prices is likely to grow over time. This seems anecdotally true between 1999 and 2019: for instance, places like San Francisco, which have a lower elasticity of house supply, had greater labor demand growth than places like Indianapolis, which have higher elasticities of housing supply. To see this, we can estimate a simple regression to get some measure on the correlation between the two:

$$\text{Elasticity}_j = \beta_0 + \beta_1 \Delta\theta^{2019}_{j,1999} + \psi \tag{10}$$

Results from this estimation are presented in Table 5. Indeed, there is a significant negative relationship between the two: increasing the elasticity by 1 unit (i.e., considering an area with a *higher* elasticity) is correlated with labor markets that perform worse by about 0.2 standard deviations. This can also be seen in Figure 10, which plots the data that is used to estimate Equation (10).

	Labor Demand Growth
Elasticity	-0.219^*
	(0.088)
N	273
R^2	0.0259

Table 5: Correlation Between Labor Demand Growth and House Supply Elasticities

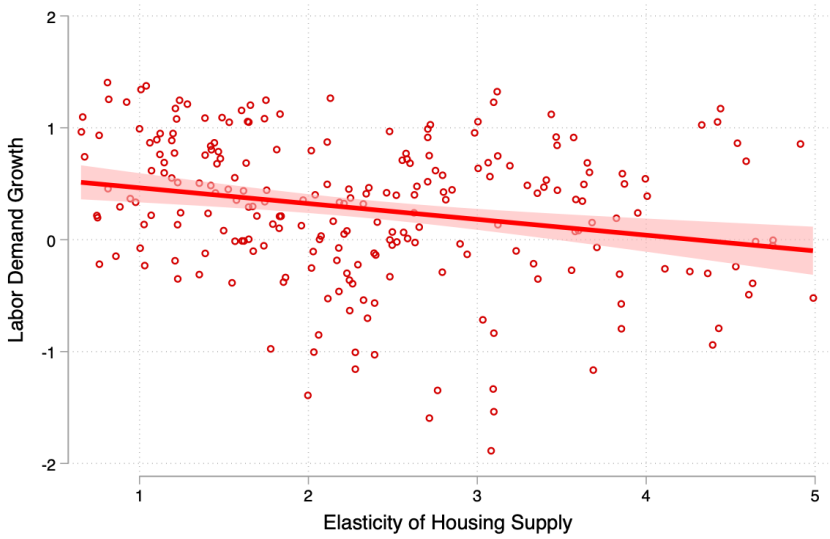


Figure 10: Growth in Labor Demand between 1999 and 2019 and House Supply Elasticity

This implies that in this period, part of the reason house prices were going rapidly was because labor market growth was concentrated in areas with a low elasticity of supply. Consequently, the housing wealth of households is likely to have been affected similarly as well. But was this spatial pattern of growth always true in the United States? In the next section, I repeat the exercises here but I consider labor market growth between 1980 and 1999 instead.

4.1.1 1980-1999: Suggestive Evidence

Growth in local labor markets looked different between 1980 and 1999 compared to the years after it. Figure 11 presents a map of the labor demand growth in this period, and Figure 12 presents a map of the growth in house prices.

Figure 11: Regional Heterogeneity in 1980-1999 Labor Demand Shock

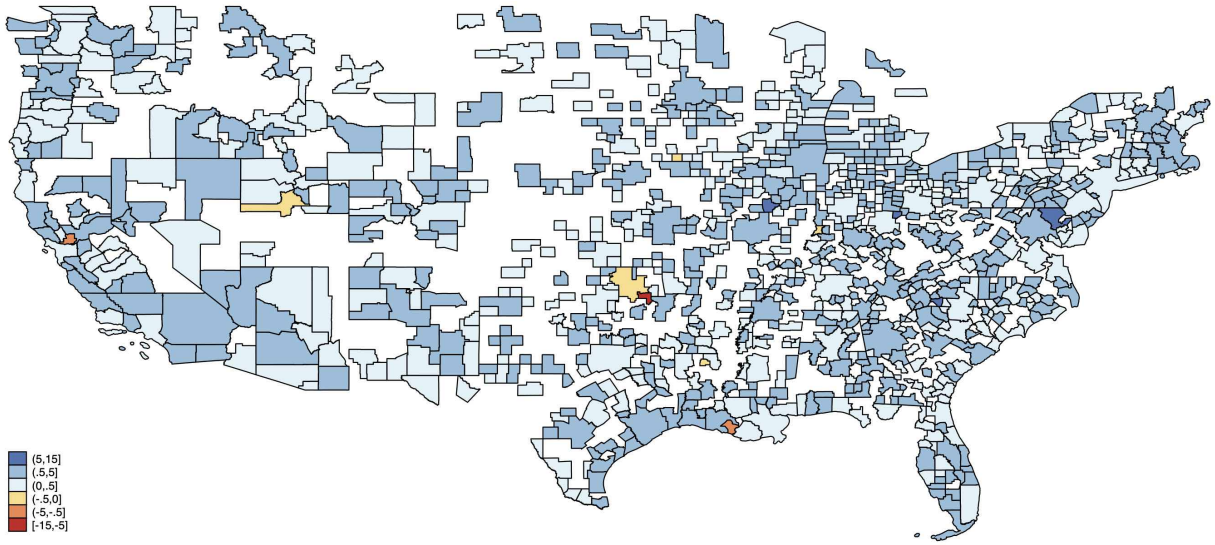
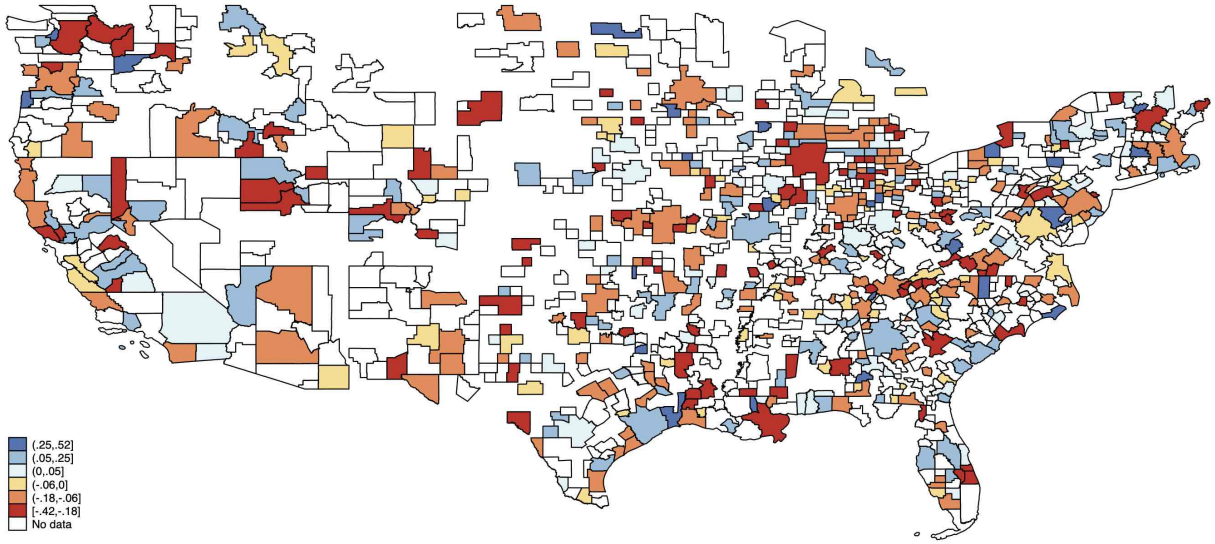


Figure 12: Regional Heterogeneity in 1980-1999 House Price Growth



Labor demand growth does have a positive relationship with house prices, but it isn't as strong as before. Table 6 provides the estimates from this regression. It implies that

a 1 s.d. better labor market is associated with only a 1 percentage point higher growth in house prices. However, low supply elasticity areas still show the most growth in house prices, which agrees with theory. The interaction term is still in the right direction, but is smaller in magnitude and not statistically significant.

	1999-2019	**1980-1999**
Labor Demand Growth	0.148^{**}	0.010^{*}
	(0.032)	(0.038)
Elasticity	-0.043^{**}	-0.066^{**}
	(0.010)	(0.010)
Labor Demand Growth	-0.022^{*}	-0.012
x Elasticity	(0.010)	(0.023)
N	273	257
R^2	0.2476	0.1763

Table 6: The Effects of Labor Demand Growth and House Supply Elasticity on House Price Growth

This could be because of *where* labor market growth was strongest in this time period. If there was no correlation between house supply elasticities and labor demand growth, i.e., high supply elasticities grew equally well compared to areas with lower ones. Table 7 provides the results of estimating Equation (10) for this time period, and Figure 13 plots the results. This pattern might mean that wealth gains in these period was more evenly spread compared to before.

	1999-2019	**1980-1999**
Elasticity	-0.219^{*}	-0.042
	(0.088)	(0.039)
N	273	257
R^2	0.0259	0.0047

Table 7: Relationship Between Local Labor Demand Growth and House Supply Elasticity

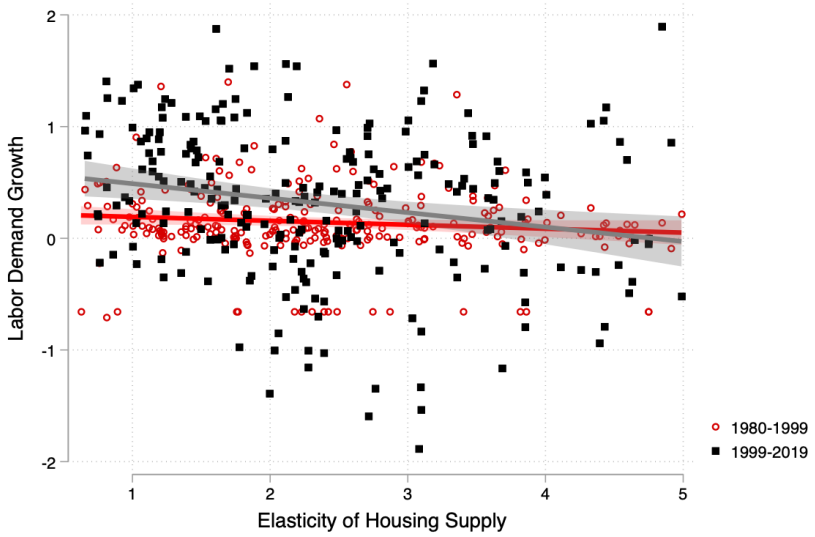


Figure 13: Relationship Between Labor Demand Growth and House Supply Elasticity

It might be claimed that the time periods considered here are somewhat ad-hoc. While that is true, we can still find similar patterns of labor demand growth even if we use decadal growth rates (i.e., 1980-1990, 1990-2000, and so on). The results from these are found in Appendix A.

This section presented evidence on the response of regional house prices to local labor demand, and how this varies by house supply elasticity. It also presented evidence that the distribution of labor market growth in the U.S. between 1999 and 2019 hasn't been random: areas that were hard to build in were also good labor markets to be in. However, this wasn't true between 1980 and 1999, where this relationship did not exist. Consequently, large increases in labor demand did not, on average, lead to large increases in house prices.

Next, I move on to investigating the wealth accumulation of households in response to the labor demand growth.

5 Empirics: The Effects of Local Labor Markets on Regional Wealth

What are the Once households are assigned the labor market growth of the parent, I regress this measure of parental labor market growth on the child's household wealth. It is useful to think about the regression as an event study regression of sorts. The event here is the child splitting off to form her own household, and the shock in question is the labor demand growth in the parent's area of residence in the ten years prior to splitoff. The identification of the

effect of the labor market growth, then, is through difference-in-differences. The regressions I run are of the form, where T is the time of splitoff and j is the area of residence of the parent:

$$Y_{ijt} = \beta_0 + \beta_1 \Delta\theta^{2019}_{j,1999} + \mu_t + \sum_{t=1999}^{2019} \beta_{2,t}(\Delta\theta^{2019}_{j,1999} \text{ x } \mu_t) + \beta_3 X_{ijt} + \epsilon_i + \epsilon_{ijt} \tag{11}$$

where:

- Y_{ijt}: household level outcome
- μ_{t-T}: indicator for year
- X_{ijt}: household characteristics
- $\Delta\theta^{2019}_{j,1999}$: labor demand growth

All regressions include year fixed effects. $\beta_{2,t}$ is the effect of a 1 standard deviation increase in the strength of the local labor market on the mean wealth of houeholds in year t. The outcomes I examine include several measures of wealth, income, and home values.

It is important to note that I do *not* include income or occupation as part of the control variables in this regression. This is because these are all plausible mechanisms through which local labor markets might impact a household's wealth, and thus should not be included in the regression. In other words, including them would mean we shut off some of the channels through which the local labor markets might have an effect.

All regressions are run using longitudinal weights provided by the PSID. These are meant to make the data nationally representative. I also cluster standard errors at the CBSA level.

Finally, I Winsorize the wealth data at the 5th and 95th percentile. This is done because the wealth data in particular contains outliers that ideally should not have a disproportionate effect on the estimate, and is particularly important in this case because wealth is also allowed to be negative (this is why I cannot simply take logs). Winsorizing the data essentially means top and bottom-coding the data. This means I do not lose these observations, but rather just top-code them to ensure that the effects I estimate are not unduly influenced by households who have millions of dollars in wealth. In practice, the 95th percentile of wealth in the data is about $1 million, and the bottom percentile is at $80,000 of debt, i.e., -$80,000 of wealth.

This can be thought of as an "event study" type specification, except that the shock occurs over a long time horizon (between 1999 and 2019). Essentially, we are looking at the evolution of the wealth holdings of an individual who resided in an area which, in 1999, received a long term labor demand shock. Instead of displaying the results in a table, I

plot these estimates to give a better visualization of the results. Since the measure of labor demand growth I am using is a shift-share instrument, identification is through difference-in-differences.

However, an increase in labor demand in an area has multiple effects. First, it directly increases wages; second, it attracts people to the area, increasing local population and therefore housing demand, which in turn increases house prices; third, there could be an increase in the wealth holdings of households in the region, which can occur due to two mechanisms: the increase in expendable income could mean households automatically save more, and the increase in house prices could increase the housing wealth of incumbent homeowners. In this way, we find that local labor market growth likely has different effects on homeowners and renters, and it would be useful to know which of these groups is driving the results.

I do this by adding an interaction term with homeownership to Equation (5), which makes it a triple difference estimator. For a household i in area j in year t, I estimate:

$$Y_{ijt} = \beta_0 + \beta_1 \Delta\theta^{2019}_{j,1999} + \mu_t + \sum_{t=1999}^{2019} \beta_{2,t}(\mu_t \text{ x } \Delta\theta^{2019}_{j,1999}) + \sum_{t=1999}^{2019} \beta_{3,t}(\Delta\theta^{2019}_{j,1999} \text{ x Homeowner}_t \text{ x } \mu_t) + \beta_4 \text{Homeowner} + \beta_5 X_{ijt} + \epsilon_{ijt} \quad (12)$$

where Y_{ijt} is the outcome we are considering Homeowner captures the ownership status of a household.

5.1 Income

Do increases in local labor demand translate into increases in income? That seems to be the case. I estimate Equation 5 and Equation 5 for the income for the labor income of households and find that in fact, households in 1 s.d. better labor markets are associated with a higher labor income of $4,000 per year. Figure 14 presents these results.

Figure 15 breaks down this association by homeownership, and finds that homeowners make about $6,000 more per year in booming markets, while renters make $2,000 more. This probably reflects the fact that homeowners tend to be of a different demographic (older, male, white) and might also work in different occupations within the same industry.

Figure 14: Association of 1 s.d. Better Labor Markets with Labor Income, 1999-2019

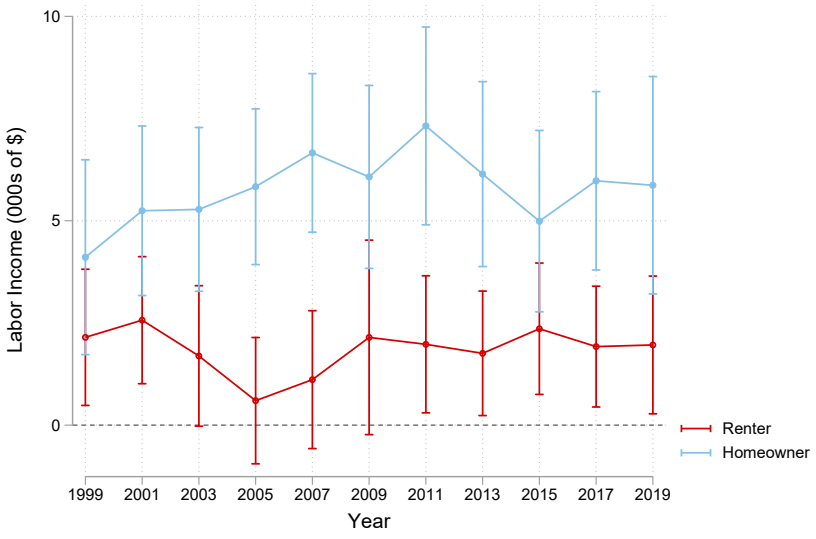


Figure 15: Association of 1 s.d. Better Labor Markets with Labor Income by Homeownership, 1999-2019

5.2 Net Worth

Figure 16 presents the results of estimating Equation (5). It shows that on average, households in 1 s.d. better labor markets accumulate $20,000 more in net worth by 2019. This association is the greatest in 2007 (at the height of the housing boom), which suggests that housing wealth is probably a crucial component of this relationship. It also indicates that

it would be informative to break this association into coming from homeowners and renters separately.

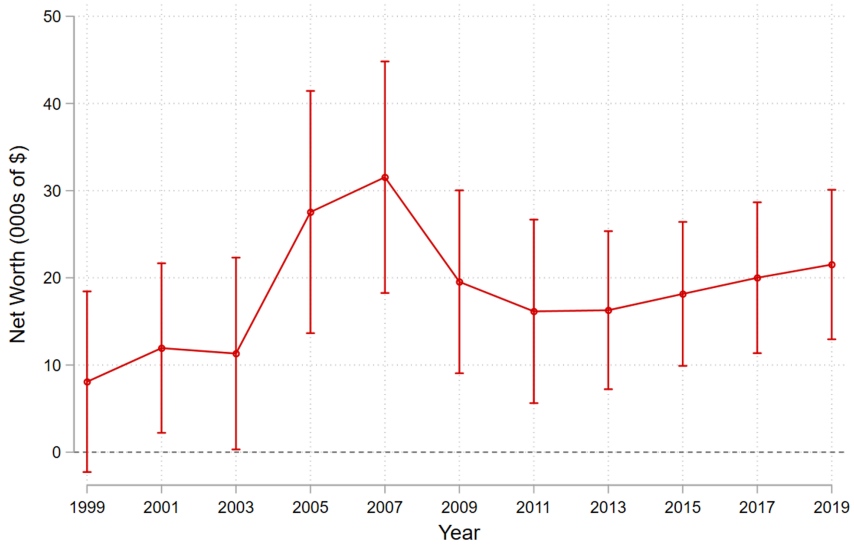


Figure 16: Association of 1 s.d. Better Labor Markets with Net Worth, 1999-2019

Figure 17 plots the results of estimating Equation (5). It should that by 2019, Homeowners living in one standard deviation better labor markets between 1999 and 2019 are able to accumulate roughly $43,000 more net worth. Meanwhile, the same number for renters is close to zero. This show the tremendous inequality in net worth that is produced within the same labor market, due in large part to housing. The point estimates in this figure can be backed out by summing across the relevant coefficients in Table A.2 in Appendix D. For instance, the association of a 1 s.d. increase in local labor markets with the net worth of homeowner households in 2019 is calculated as $-1.508 + 0.797 + 15.356 + 28.396 = 43.041$, or $43,041. The same point estimate for the renter households would be $-1.508 + 0.797 = -0.711$, or -$711.

It also shows why looking only at Figure 16 masks substantial heterogeneity in terms of homeownership. It should also be noted that renter households tend to be disproportionately younger and black, and a little more likely to have a female head of household.

Further, the trend suggests that the households started accumulating wealth early, and better labor markets were associated with a higher net worth of almost $50,000 in 2007, which was the height of the housing bubble. However, after the bust and the Great Recession, the increase in net worth drops to $30,000, but recovers to around $43,000 by 2019. This shows how important the housing boom and Great Recession were to the wealth of households. Perhaps even more crucially, it shows that the gains from the housing boom have persisted

even ten years after the Great Recession.

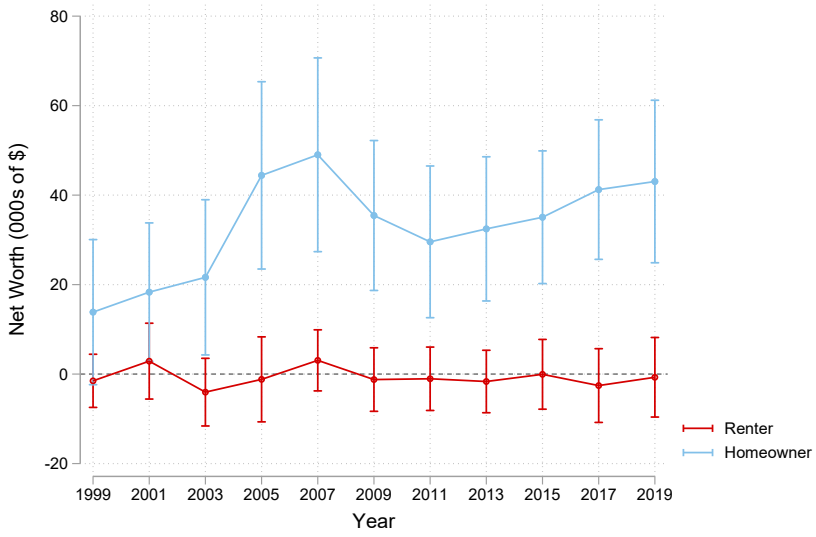


Figure 17: Association of 1 s.d. Better Labor Markets with Net Worth by Homeownership, 1999-2019

5.3 Home Equity and Home Values

Figures 19 and 18 present results of estimating equation (5) for homeowner households on their home equity and home values respectively. Both these graphs show a large and significant increase. Home equity increases by about $25,000 by 2019, and home values increase by about $40,000. This implies that most of the gains in net worth are due to an increase in home equity. Further, these households are able to afford more expensive homes as well.

Moreover, since these households are selected from the working age population, it means that they are likely still paying down their mortgage. This implies that once the mortgage is paid off, they will be even wealthier. In other words, the total benefits of being in a strong labor market have yet to be realized. Therefore, the estimates on net worth are likely to be lower bounds.

- Home equity increases by almost $25,000, and home values increase by almost $40,000.
- This implies there are long term benefits that will accrue to homeowners once their mortgage is paid down.

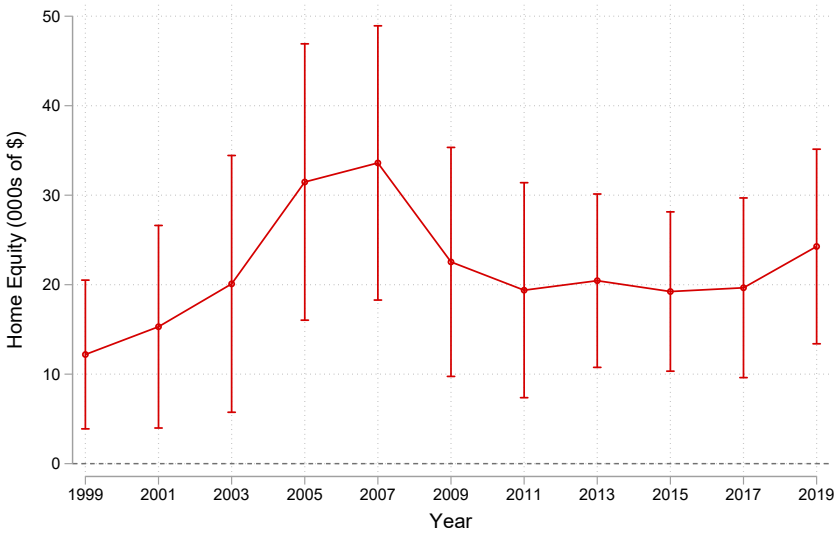


Figure 18: Association of 1 s.d. Better Labor Markets with Home Equity for Owners, 1999-2019

Figure 19: Association of 1 s.d. Better Labor Markets with Home Values for Owners, 1999-2019

5.4 Net Worth without Home Equity

Finally, Figure 20 presents the estimates from estimating Equation 5 for the net worth without home equity for the sample. I find that by 2019, homeowner households are able to accumulate about $12,000 additional non-housing wealth, which is still large, but smaller than the $25,000 that households accumulate through home equity.

The estimates also aren't statistically distinguishable from those of renters.

Figure 20: Association of 1 s.d. Better Labor Markets with Net Worth (without Home Equity) by Homeownership, 1999-2019

5.5 Interaction with House Supply Elasticity

The previous section established that house prices are most responsive to labor markets when the housing supply has a low elasticity. I examine this in a quadruple-difference framework by interacting a categorical measure of high vs. low elasticity with the triple difference estimation strategy in Equation (5). The results from this estimation are presented in Figure 21.

One can see that as expected, the association of a 1 s.d. better labor market with net worth is the highest in low supply elasticity housing markets – in 2019, homeowners in low supply elasticity areas are better off by more than $50,000 while the comparable number for homeowners in high supply elasticity areas is only $25,000. In other words, homeowners in housing markets with a lower supply elasticity see house prices go up much more in response to the same increase in labor demand. Consequently, their home equity increases and they are richer than their counterparts in high supply elasticity areas.

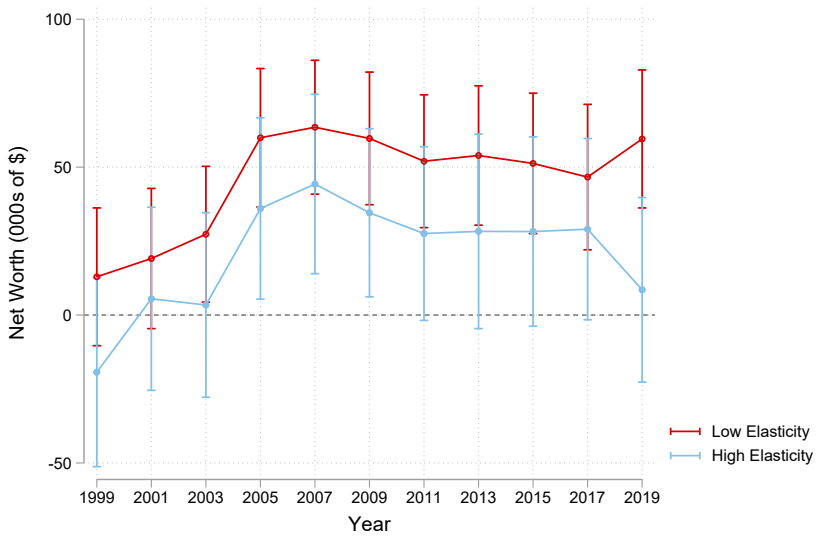


Figure 21: Association of 1 s.d. Better Labor Markets with Net Worth of Homeowners in Low and High Elasticity Housing Markets

5.6 1980-1999: Suggestive Evidence

The Panel Study of Income Dynamics (PSID) collects data on household wealth in 1984, 1989, 1994, and 1999 (after which it starts collecting wealth data in every interview wave). This allows for a deeper examination of wealth dynamics within these particular years. Using this, I run the regression in Equation (5) for this time period. Households are assigned the labor market growth in their area of residence in 1984 for this exercise. Results from this estimation are presented in Figure 23 (Net Worth), Figure 22 (Net Worth without Home Equity) and Figure 24 (Home Equity).

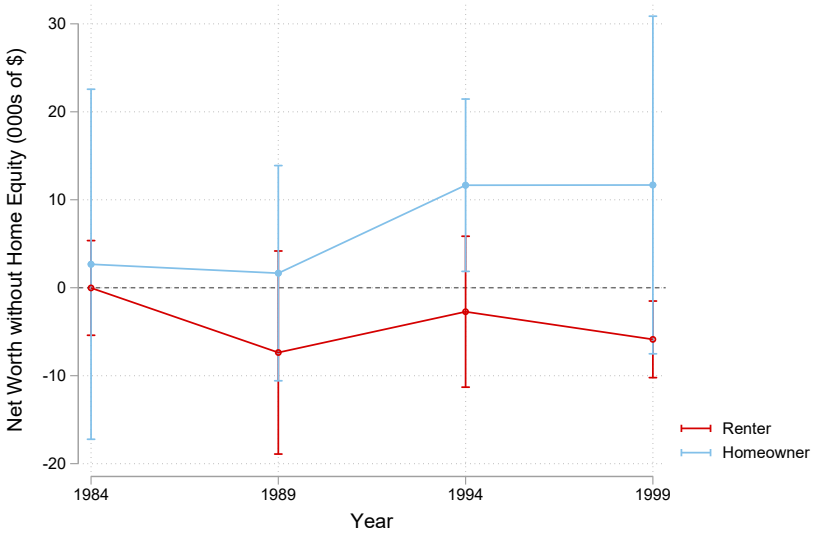


Figure 22: Association of 1 s.d. Better Labor Markets with Net Worth (Without Home Equity) by Parental Tenure, 1984-1999

Notably, homeowners in 1994 witnessed an increase in their net worth by approximately $20,000, a finding with statistical significance. However, this growth appears to diminish by 1999, with homeowners experiencing a less significant increase of about $12,000 in net worth, a result that lacks statistical significance. Even in this time period, no increase in net worth was observed among renters.

When we remove home equity from the equation, the net worth of homeowners continues to follow an upward trajectory. Specifically, homeowners in 1994 saw their net worth without home equity rise by about $17,000. This growth slightly regressed to $7,000 in 1999. In contrast, renters did not display any noticeable increase in their net worth during these years, maintaining a pattern consistent with the general net worth trends. Meanwhile, the data shows a moderate elevation in home equity, with an increase of roughly $5,000 in 1994 and $4,000 in 1999.

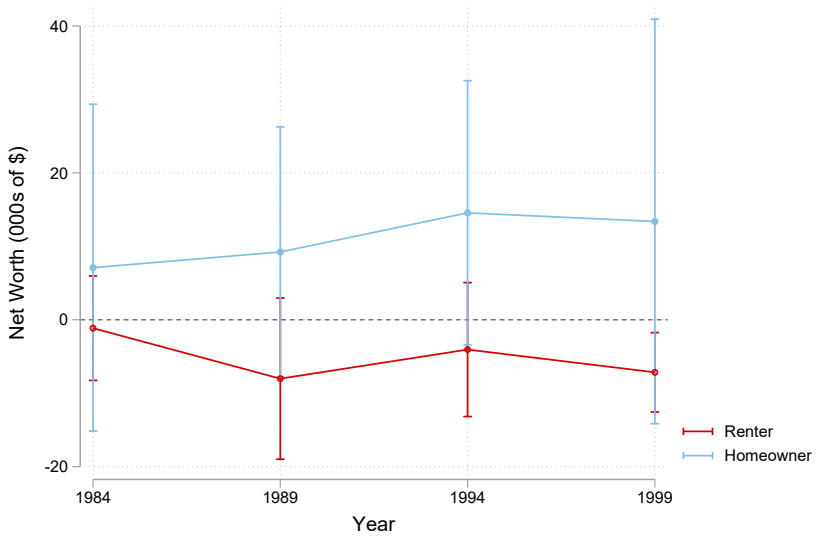


Figure 23: Association of 1 s.d. Better Labor Markets with Net Worth by Parental Tenure, 1984-1999

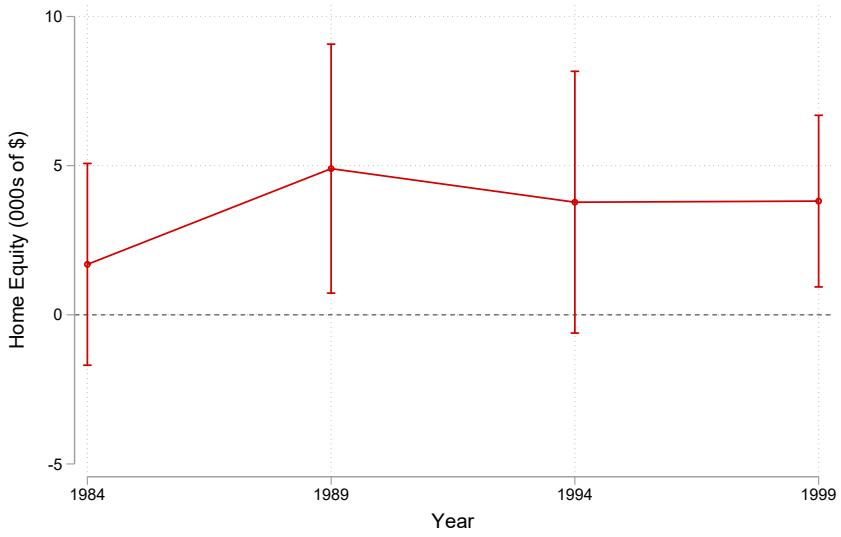


Figure 24: Association of 1 s.d. Better Labor Markets with Home Equity for Owners, 1984-1999

These findings collectively indicate that the wealth dynamics at play during this period were both lower in magnitude and qualitatively distinct. Specifically, there was no evidence of home values appreciating in response to changes in local labor markets. Thus, the wealth dynamics of this period stand in stark contrast to those of the later years, highlighting the evolving relationship between labor markets, housing markets, and wealth accumulation.

5.7 Summary

Between 1999 and 2019, a significant shift in the wealth distribution of U.S. homeowners was evident. Notably, for every one standard deviation improvement in the labor market during this period, homeowners saw an increase in their wealth by approximately $43,000. The majority of this wealth accumulation, about $25,000, was traced back to home equity, while non-housing wealth witnessed a more moderate increase, ranging between $10,000 to $15,000. An interesting pattern was observed concerning the regional dynamics of this wealth accumulation. The increase in net worth was also more prevalent for homeowners in markets with a low elasticity of housing supply (like San Francisco) compared to others.

This wealth accumulation trend, however, was not equally pronounced across all decades. For instance, the association between housing market wealth and labor markets was less robust between 1980 and 1999. Within this period, a one standard deviation improvement in the labor market correlated with a net worth increase of about $20,000. Contrary to the 1999-2019 period, a larger share of this wealth increase, approximately $12,000, was due to a rise in non-housing wealth.

The combined analysis of these temporal and regional patterns suggests a profound shift in the dynamics of wealth inequality, with housing wealth playing a dominant role in shaping wealth inequality between 1999 and 2019. This elevation in the significance of homeownership for wealth accumulation carries noteworthy policy implications, especially given the spatial distribution of labor market growth. Consequently, policy makers should consider these evolving dynamics when devising strategies to address wealth inequality or addressing inequities in the housing market.

6 Implications for Welfare and Wealth Inequality in the United States

In this section, I discuss what the increase in wealth means for welfare, and why the effects of local labor markets should matter for policy on inequitable access to housing and wealth inequality.

6.1 Consumption

The results of the paper show that the wealth of households increased significantly for homeowners living in better labor markets. However, what are the real benefits of this wealth? In Rao (2023), I explore how households can leave this wealth to their children. In this paper, I

focus on how the households themselves can spend this wealth by focusing on consumption.

The PSID collects information on certain key categories of expenditure over the entire time period of this paper: food, health, education, childcare, transport, and housing.[6] I aggregate these expenditures to create a measure of overall consumption, and use local CPI measures as a deflator. This is important because the expenditures collected by the PSID are highly local.

Figure 25 presents the results of estimating Equation (5), and Figure 26 breaks it down by whether the household owns or not. I find that consumption increases by about \$3,000 - \$4,000 per year for a one standard deviation increase in labor demand growth, and that this effect is even great amongst homeowners, who are able to consume \$4,500 more if they live in 1 s.d. better labor markets. Renters also see their consumption go up, but by less than \$2,000.

These results should be interpreted in the light of the results on income, which showed that there is, roughly, a \$6,000 increase in income for homeowners, and a \$2,000 increase in income for renters. This implies that renters consume all their extra earnings, while homeowners are able to save some. Note that the measure of consumption here includes rental expenditure, which might explain why renters need to consume so much of the increase in their income.

Figure 25: Association of 1 s.d. Better Labor Market with Consumption

[6]Other categories, such as trips or clothing are also collected, but only after 2005. For this reason, I do not include them in the calculations here.

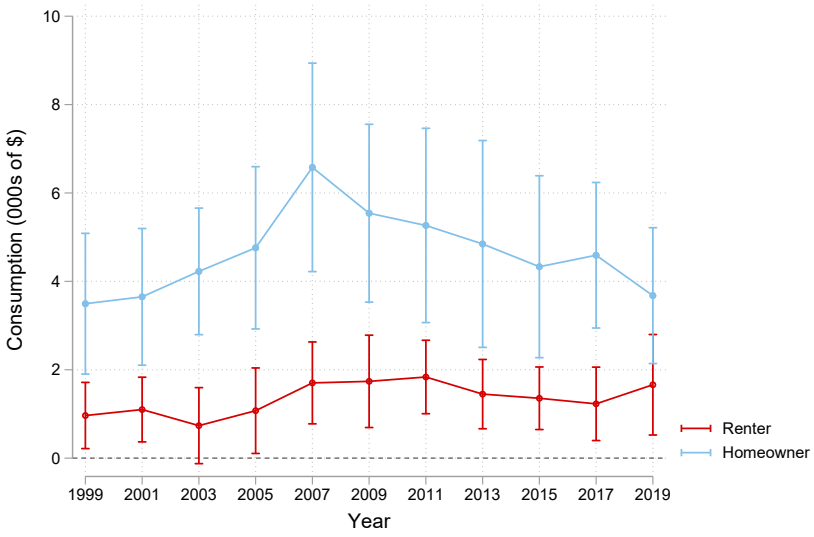


Figure 26: Association of 1 s.d. Better Labor Market with Consumption by Parental Tenure

6.2 Wealth Inequality

Building a model to quantify the effects of house supply elasticities on the level of wealth inequality is beyond the scope of this paper. However, I develop such a model in Rao (2023), which finds that between 1999 and 2019, the dispersion in labor market growth across areas, i.e., the fact that certain areas grow more than others, is responsible for about 0.02 points (40%) of the increase in the wealth Gini; however, heterogeneity in local house supply elasticities only accounts for a rise of 0.003 points (8%). Shutting off labor mobility would increase inequality by an additional 0.008 points (13%). Finally, an alternate version of the model which does not allow for homeownership would only increase wealth inequality by 0.02 points of the Gini, or about 40% as much as in the main model.

In particular, it finds that while house supply elasticities themselves only explain about 8% of the rise in inequality, they can still interact with the dispersion in local labor market growth to exacerbate their effects. This is particularly relevant because between 1980 and 1999, house prices were not very responsive to labor market conditions. Consequently, the effects of these labor markets on wealth inequality is likely to not have been large.

However, it is clear that the dynamics of wealth inequality were different across the two periods. The empirical results of the paper imply that equating labor market growth across regions is a useful strategy if the policymaker values a reduction in wealth inequality. Moreover, the spatial distribution of local labor market growth and whether it happens in areas with a low elasticity of housing supply is quantitatively relevant in determining household wealth accumulation and consumption.

7 Conclusion

This study presents a comprehensive examination of the interplay between local labor markets, housing markets, and wealth accumulation in the United States. Utilizing a rich dataset that encompasses the Panel Study of Income Dynamics (PSID) and Core Based Statistical Areas (CBSAs), the research underscores the importance of these relationships across two distinct periods: 1980-1999 and 1999-2019.

Between 1999 and 2019, housing markets in CBSAs with higher labor demand shocks exhibited a disproportionate increase in house prices, with a 1 standard deviation improvement in labor market conditions leading to an increase in house prices by 1.6 percentage points. In markets with a low elasticity of housing supply, such as San Francisco, the impact was even more pronounced, with a 10 percentage point escalation in house price growth rates. The confluence of these factors resulted in homeowners within these markets gaining significantly, with an average net worth increase of $43,000. Much of these gains stemmed from housing wealth, particularly pronounced in markets with a low housing supply elasticity. This increase in wealth and an additional $6,000 annual income enabled homeowners to elevate their yearly consumption by $4,500. Contrastingly, renters within these strong labor markets experienced no noteworthy wealth accumulation or consumption increases.

The dynamics were notably different in the earlier period of 1980-1999. There was no observable correlation between labor market growth and housing supply elasticity. While homeowners still managed to accumulate wealth in healthier labor markets, the amount was lesser, with a net worth increase of around $17,000, mostly originating from non-housing wealth sources ($12,000).

In essence, these findings indicate a significant shift in the mechanisms of wealth accumulation and inequality, with housing wealth playing an increasingly central role in recent decades. The resulting implications for policy are profound. Policymakers need to address the widening wealth disparity between homeowners and renters and devise strategies to facilitate access to homeownership. As the relationship between local labor market growth and house prices strengthens, efforts must also be made to manage the intensified effects in areas with lower housing supply elasticity. The insights provided by this research underscore the necessity for a continuous examination of evolving trends in housing and labor markets to inform more nuanced and effective economic policy and wealth inequality interventions.

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A Robustness to Period of Local Labor Market Growth

How has the relationship between house supply elasticities and local labor market growth evolved over time? The paper presents results for two time periods: 1980-1999 and 1999-2019. However, in this section, I also present results for local markets using a decade-specific definition of the shift-share labor demand growth (as is common in the literature, e.g., Moretti (2013), Goldsmith-Pinkham et al. (2017), Zabek (2017)). In particular, I consider labor market growth between 1980-1990, 1990-2000, 1999-2009, and 2009-2019.

The results from estimating a regression of the labor demand growth on for these alternate definitions are presented in Table A.1. One can see that there is little correlation between labor demand growth and house prices in the first two periods, but a positive and significant relationship between them in the following two periods. This lines up with the initial definitions of the periods in consideration, and shows that there is no heterogeneity within them.

	1980-1990	**1990-2000**	**1999-2009**	**2009-2019**
Labor Demand Growth	0.008	-0.005	0.110*	0.022*
	(0.026)	(0.017)	(0.039)	(0.010)
N	525	766	903	907
R^2	0.0004	0.027	0.033	0.015

Table A.1: Relationship Between House Price Growth and Labor Demand Growth Across Decades

B Robustness Checks within the PSID

B.1 Controlling for Labor Income

Labor income is not included as a control when estimating Equation (5), since growth in labor markets affects income, and income affects wealth. Therefore, controlling for income would "shut off" a channel of wealth accumulation. However, I also estimate the regression while including labor income and the results are unchanged. The results are presented in Figure A.1.

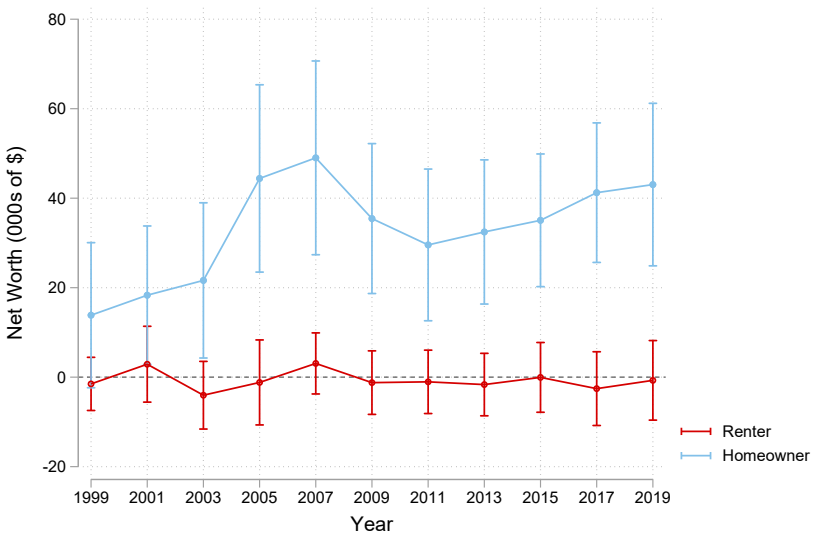

Figure A.1: Association of 1 s.d. Better Labor Markets with Net Worth after Controlling for Labor Income, 1999-2019

B.2 1999 Households Only

The sample of the PSID is slightly different every year as some households split off from others and add to the PSID sample size. In order to account for this, I run the regression in Equation (5) but only with the households that are present in the sample in 1999. The results can be seen in Figure A.2 (Net Worth) and Figure 20 (Net Worth without Home Equity). The numbers are similar to the ones in the main regression.

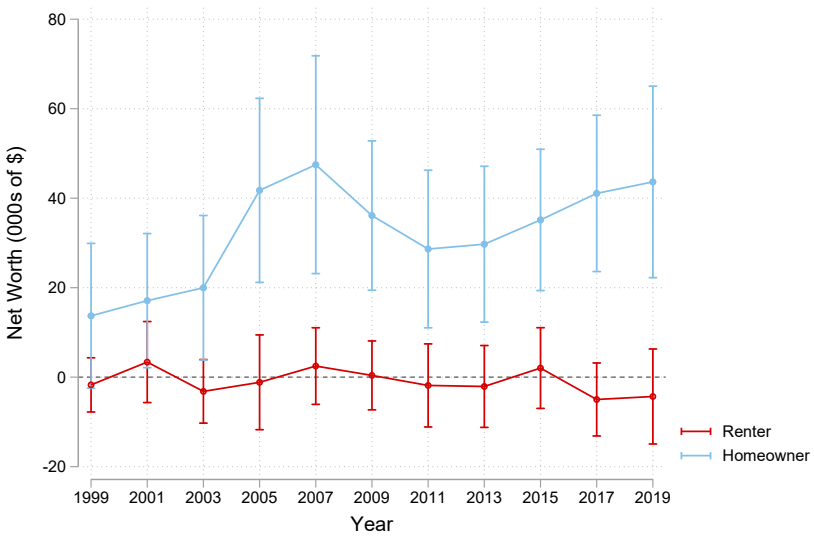

Figure A.2: Association of 1 s.d. Better Labor Markets with Net Worth for Households Present in 1999, 1999-2019

B.3 Incumbent Homeowners in 1999

In the main PSID sample, there are changes in homeownership over time as households buy and sell their houses. This might bias the estimates as people might sell or buy for a variety of reasons. In this section, I run the regression in Equation (5) for the subsample of households who are already homeowners in 1999. The results are somewhat higher for this subsample, as in 2019, homeowners in better labor market have $50,000 more in net worth, compared to $43,000 for the full sample.

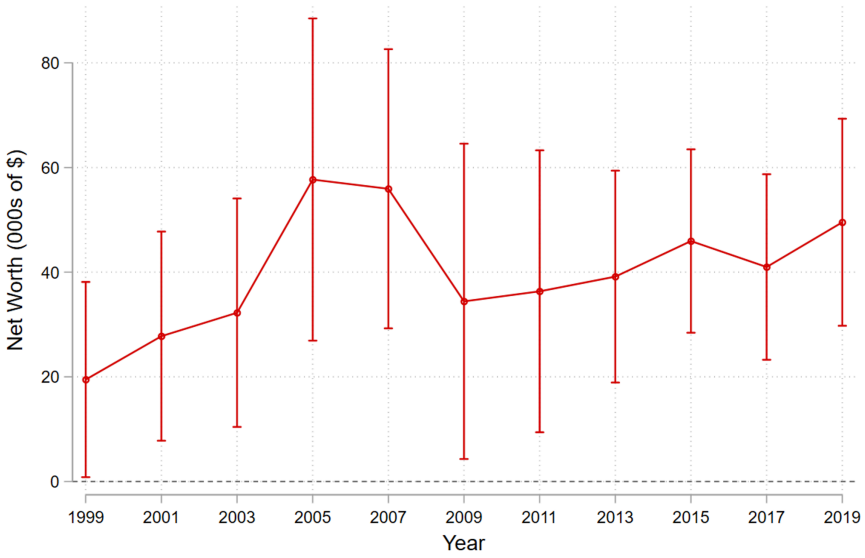

Figure A.3: Association of 1 s.d. Better Labor Markets with Net Worth of Incumbent Homeowners in 1999

C Effects of Local Labor Market Growth on Debt

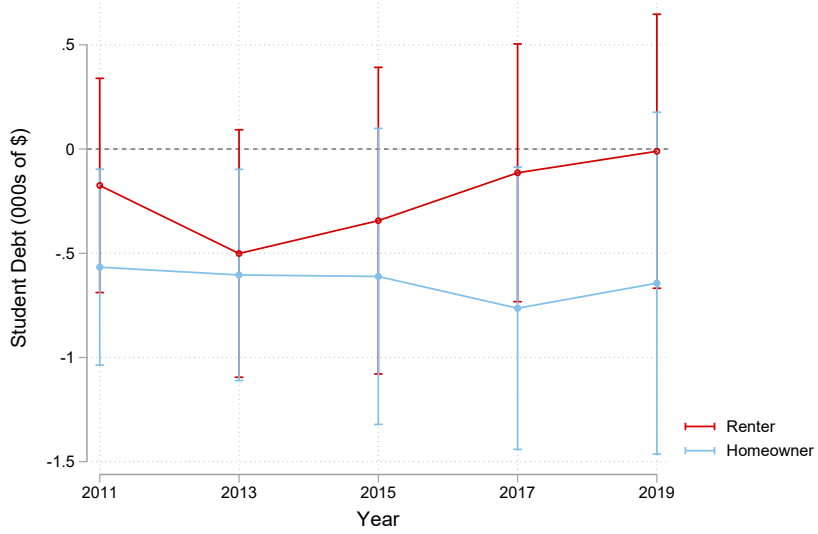

Figure A.4: Association of 1 s.d. Better Labor Markets with Debt by Parental Tenure, 1999-2019

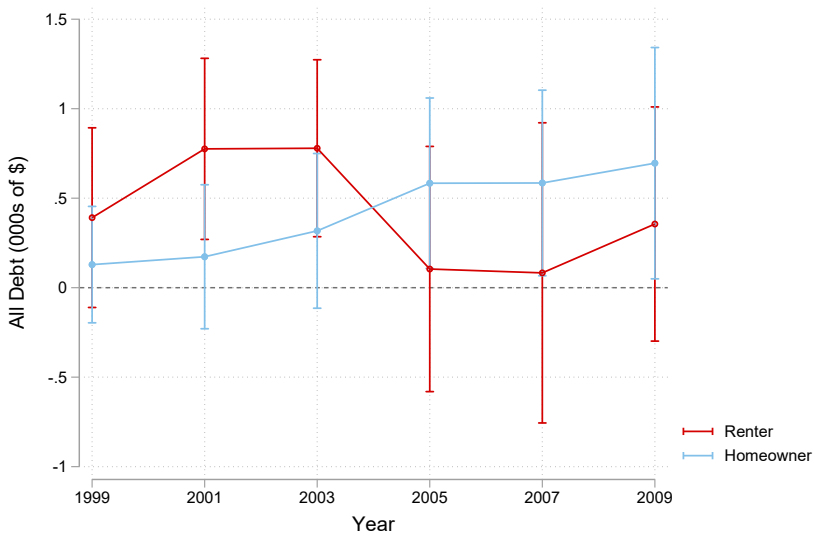

Figure A.5: Association of 1 s.d. Better Labor Markets with Student Debt by Parental Tenure, 1999-2019

No effect on debt.

D Results of Regression

This section presents results from estimating Equation (5) in Table A.2. Due to concerns of space, I only show results for the main coefficients of interest, which show the marginal effect of a 1 s.d. higher labor demand growth in the area of residence of the household.

The graphs presented in Section 5 with the results can be backed out by summing across the relevant coefficients. For instance, the association of a 1 s.d. increase in local labor markets with the net worth of homeowner households in 2019 is calculated as $-1.508 + 0.797 + 15.356 + 28.396 = 43.041$, or \$43,041. The same point estimate for the renter households would be $-1.508 + 0.797 = -0.711$, or \$711.

		Net Worth
Labor Demand Growth		-1.508
		(3.031)
Year x Labor Demand Growth	**2001**	4.403
		(3.981)
	2003	-2.529
		(4.324)
	2005	0.330
		(5.369)
	2007	4.578
		(4.381)
	2009	0.288
		(4.296)
	2011	0.462
		(4.573)
	2013	-0.148
		(4.668)
	2015	1.458
		(4.825)
	2017	-1.056
		(4.751)
	2019	0.797
		(4.817)
Homeowner		15.356
x Labor Demand Growth		(6.732)
Homeowner x Year	**2001**	0.067
x Labor Demand Growth		(5.484)
	2003	10.303
		(5.590)
	2005	30.235
		(7.645)
	2007	30.585
		(8.060)
	2009	21.306
		(7.221)
	2011	15.247
		(8.964)
	2013	18.756
		(8.624)
	2015	19.75
		(7.768)
	2017	28.443
		(8.591)
	2019	28.396
		(9.683)
N		65834
R^2		0.349

Table A.2: Regression Coefficients Used for Point Estimates