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Housing Affordability and Migration Choice Among US Urban Areas*

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Abstract: Our study examines several factors affecting migration choice among US urban areas, with emphasis on a factor currently at the center of policy discussions: housing affordability. Aggregating county-to-county IRS migration data for core-based statistical areas in each of the 48 continental US states from 2014 through 2020, we implement a zero-inflated negative binomial model to estimate the effect of house price and rent differentials on migration choice. Our findings confirm that housing affordability is a relocation barrier that results in a loss of productivity and economic growth for the US economy. We also show that using an average measure of housing affordability masks important effects and reveal that differences in house prices greater than $50,000 and rents greater than $250 are thresholds for negatively impacting migration choice.
Keywords: Migration, Relative Economic Conditions, Housing Affordability
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1. INTRODUCTION

Migration between US urban areas is important to policymakers at both the state and local levels, as well as business leaders. From a policy perspective, population flows across regions are an important mechanism of adjustment to local economic shocks, reducing unemployment rates and increasing productivity as workers expand their economic choices and opportunities by moving to their most productive jobs (Daveri and Faini, 1999; Chen et al., 2003; Arzaghi and Rupasingha, 2013). Relocating populations lessens business concerns about a sufficient pipeline of skilled workers to fill high-growth, high-demand jobs and can create a more diverse and productive workforce. Knowledge flows between areas, transmitted by new populations, generating new ideas among workers and firms. Areas that do not attract new citizens will have slow population growth with fewer workers, less tax revenue, fewer electoral votes, and slower economic growth in the long run.

Research examining US migration is extensive and examines a myriad of subjects, which can be narrowed to three primary categories: 1) determinants of the propensity to migrate, 2) migration rates and patterns over time, and 3) migration choice, or the factors that influence how migrants choose their destination. Although we briefly examine all three in

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the next section, the focus in this paper is on migration choice. In particular, we examine the factors that determine location selection for those who move from one US urban area to another using a spatial interaction model. Our analysis covers the years 2014 through 2020 using area-to-area migration flow data made available by the IRS. This time period updates previous research investigating migration choice using IRS data (Davies et al., 2001), adds the early-stage effects of the COVID-19 pandemic, and provides us with some sense of the temporal patterns and stability of our parameter estimates during a sustained period of economic growth.

Beyond providing an updated analysis, we extend the literature on migration choice in the US in a number of ways. First, we focus on *urban* migration to mitigate aggregation bias, analyzing migration choice among origin-destination pairs that are more homogeneous than previously examined. Previous studies use entire Metropolitan Statistical Areas (MSAs), State Economic Areas (SEAs), or States (Modestino and Dennett, 2013; Cebula, 2016; Arif et al., 2020), with data aggregation that could mask or bias the impact of important migration choice factors. There is a great deal of variation in economic potential, access, and outcomes across large geographies, and attributing a single measure used for large areas reduces the potential importance of a particular effect. For example, a simple measure for large areas will include migration to rural areas from urban areas, where a different set of circumstances or preferences generate the decision to move (Arzaghi and Rupasingha, 2013). We focus on the *urban core* of the core-based statistical areas (CBSAs), rather than the entire makeup of CBSAs, because some CBSAs (or even MSAs) include counties that are far from the urban core and rural in nature. For example, Clarke County, Virginia, and Rappahannock County, Virginia, are both included in the Washington-Arlington-Alexandria, DC-VA-MD-WV statistical area. These are rural in characteristics, with 2020 populations of 14,783 and 7,348, respectively (compared to Fairfax County, Virginia, with a 2020 population of 1.15 million). By eliminating these from our geographic definition, we have a more precise measure of the migration choice between urban areas while maintaining the benefits of aggregation. We capture relocation to the urban core of a CBSA for employment opportunities or job market changes. Disaggregating to the county-level would not replicate job market migration responses as well.

We also differ from previous studies in our treatment of a distance variable. Most studies utilize a linear distance, either in the logarithmic form or linear with distance squared, to capture how distance deterrence may decline with greater distances. To gain a deeper understanding of distance and its dissipating effect, we use a set of indicator variables. This approach is similar to university patent citation research(Belenzon and Schankerman, 2013).

Finally, we pay special attention to the affordability of housing, both housing prices and rents, since market conditions have changed since they were the predominant focus in the literature on migration choice (Plantinga et al., 2013; Bloze and Skak, 2016). At the beginning of the 2010s, research focused on the impact of prolonged weakness in the housing market due to the Great Recession and whether people were unable to relocate to regions with better labor market opportunities because they were locked into their existing residence (Modestino and Dennett, 2013; Foote, 2016). During the economic recovery, public policy discussion and concern shifted to a wide dispersion in housing affordability between regions (Peng and Tsai, 2019). The chairman of Biden's Council of Economic Advisers,

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Jared Bernstein, recently expressed concern about housing prices and the choice of interstate migration in a New York Times interview:

> One of the pretty bereft assumptions of traditional economics is that you don't need to worry about place because, as long as there are good jobs somewhere, people will go there and get them. It doesn't really work that way. One reason why it does not work that way is housing costs. The idea that you can relocate from rural America, where housing is cheap, to expensive housing America, even with pay differentials, is a bit of a fantasy.
> —New York Times (2 July 2023)

We consider multiple measures of housing and rental affordability that extend beyond a simple estimate of average impacts. Like our distance measure, we include the use of indicator variables rather than solely relying on a continuous measurement; it is important to understand the effect of housing prices that are higher by less than $10,000 compared to those that are greater than $100,000. In addition, we include a variable that captures the option for cheaper housing anywhere within a CBSA. This has not been examined in previous research but is of increasing importance with the already highlighted changes in housing markets and the potential for our own CBSA-aggregated measures to mask the importance of the range of housing options in migration choice.

As a prelude to our results, our main findings include: the majority of factors influencing migration choice are stable over the seven years of sustained economic growth, including the first year of the pandemic; cheaper housing options are one of the exceptions of being a consistent influence on migration choice during the study period, having a greater influence in later years and mirroring the rise in conversation centered on housing affordability; and housing affordability is a limiting factor for house price differentials greater than $50,000 (rent greater than $250), with negative effects increasing as these differences increase. In addition to our main results, our findings match expectations: migrants choose destinations that are closer to their origin, have better economic prospects, lower taxes, shorter commute times, and greater amenities, while noncompete agreements limit the choice of migration.

The remainder of the paper is organized as follows. Section 2 provides an overview of the literature on migration, once again segmenting the research into three broad categories and focusing on migration choice. Section 3 discusses our model, followed by a description of our data in Section 4. Our econometric approach and results are presented in Section 5. Finally, the last section provides our concluding remarks.

2. LITERATURE

One of the largest areas of investigation focuses on migration decisions and the determinants of the propensity to migrate or remain at the same location; individuals and families weigh the costs and benefits of their location options and migrate when the benefits of relocation outweigh the costs (Weinberg et al., 1981; Greenwood, 1985; Treyz et al., 1993; Greenwood, 1997). Using aggregate cross-sectional data on the percentage of the population moving or microdata observing the movement (or non-movement) decision for an individual, recent

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factors determining migration propensities include mover demographics (Otieno and Otieno, 2022) while controlling for other factors such as income, unemployment rate, home price index, distance, climate, educational quality, population, and fixed effects of location. These extend a long history of factors that affect the migration decision of individuals, dating back to (Schwartz, 1973; Pack, 1973; Greenwood and Hunt, 1989; Knapp and Graves, 1989; Fox et al., 1989; McGranahan, 1999; Sasser, 2010; Rickman and Rickman, 2011)

Understanding the migration rate and the pattern of urban/rural migration over time is another issue of interest (Molloy et al., 2011, 2017; Basso and Peri, 2020). It has become a point of concern that the process of regional economic convergence in the US economy has slowed since the 1980s, and the economic fortunes of US cities are diverging from each other in wages, employment growth, and productivity (Moretti, 2012; Ganong and Shoag, 2017). Studies investigating migration rates over time focus on the impact of changing demographics, labor market conditions, and urban/rural patterns.

Migration choice, or how migrants choose their destination, is a third research topic. This research examines the decision leading to the selection of a particular destination, conditional on moving, using a benefit-cost framework. For example, Hunt and Mueller (2004) find that people tend to migrate to areas where returns to work skills are higher, while crossing the border has a negative influence on migration choice. Our research question relates to migration choice.

The literature on migration choice in the US is varied, using aggregate data, covering a wide range of time periods, and typically focusing on a few factors influencing the decision. A quick glance at the literature provides a useful understanding of the considerations influential for undertaking our analysis, such as date, data, and model selection. For example, Li et al. (2020) develop a measure of the migration costs for US states that includes all potential states and estimate the effects of their measure on state migration annually between 2005 and 2015. Similarly, Davies et al. (2001) analyze the migration choice decision using state-to-state migration-flow data from the IRS for 11 consecutive years (1986-1987 through 1996-1997) using repeated cross sections. Recently, researchers recognize the benefits of disaggregating data; aggregation can obscure or distort the influence of critical factors driving migration choice. Significant variation exists in economic potential, accessibility, and outcomes across vast geographic regions, and relying on a single measure for large areas risks undervaluing the importance of specific effects. Song (2017) examines bilateral migration flow among State Economic Areas (SEAs) from the Decennial Census between 1960 and 2000,[1] and Arif et al. (2020) uses a panel of MSA-to-MSA migration produced by aggregating the county-to-county data from the Internal Revenue Service (IRS) for four five-year averages for the period 1993-2014. In addition to data structure, there are many commonalities among the control variables used in migration choice research. For example, nearly all of the studies include some measure of distance between locations, income, unemployment, population, and fixed effects at the level of migration analysis.

Considering the aforementioned factors and data sources, we extend the literature in three primary ways. First, we update the previous literature by focusing on migration after

[1]SEAs are defined by the Census Bureau as single counties or groups of contiguous counties within the same state that have similar characteristics.

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the Great Recession, analyzing data from 2014 through 2020 and adding the effects from the early stages of the COVID-19 pandemic. Second, we use less aggregate data to examine migration choice, focusing on migration between the urban core of CBSAs. Third, we focus primarily on affordability of housing and rent as policy discussion and concern have shifted to this topic. Related to the last point, our analysis extends beyond a simple and single measure of housing affordability effects. Instead, we include measures that capture different levels of affordability, as well as cheaper options evident anywhere within the potential migration area.

3. EMPIRICAL MODEL

We investigate migration choice, the decision leading to the selection of a particular destination conditional on moving, using a spatial interaction model (SIM). A SIM is an established approach for understanding flows between locations that include migration (Yano et al., 2003; Cheng et al., 2014), knowledge (Mukherji and Silberman, 2013), trade (Neumayer, 2011), and commuting (McArthur et al., 2011).

A SIM allows analysis of the flow of migration from an origin location, such as a city, county, or state, to a similar destination location. The migration flow between the origin and destination locations depends on the stock of migrants at the origin and the separation factors between the two locations. The SIM distributes the number of migrants departing an origin to destinations based on the comparative attraction strength of each destination.

The basic framework for a migration SIM is represented by Equation 1:

$$\mathrm{M}_{ij} = \Phi(\mathit{Geography}, \mathit{Economy}, \mathit{Policy})\, O_{it}^{\delta} N_{ijt}^{\theta} \tag{1}$$

where M_{ij} is the number of migrants from origin i to destination j, O_{it} is the potential stock of migrants available to have a migration choice, and N_{ijt} is the number of migrants from origin i to destination j in previous periods (t). Including the number of migrants in previous periods controls for potential network effects between locations. Knowledge of an area is enhanced when individuals know previous migrants, increasing the probability of choice of migration to that area. To capture the unique characteristics of the origin-destination locations that affect the migration flow, fixed effects are included for both the origin and destination. These control for time-invariant unobserved characteristics that can be correlated with the observed independent variables.

Finally, of particular interest for our study is the separation function $\Phi(.)$, which captures the differences in factors important in determining the migration choice from origin i to destination j. We include a number of factors that have been shown to influence migration choice in previous research, classified as economic, policy, and geographic variables, and we discuss each of these in detail in our next section.

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4. DATA

4.1. Dependent Variable

Migration data at the state and county levels are made available each year by the Internal Revenue Service (IRS), and we follow other migration studies in their use of this data to construct the dependent variable (Davies et al., 2001; Molloy et al., 2011; Modestino and Dennett, 2013; Arif et al., 2020). In particular, we use annual county-to-county migration data from 2014 to 2020, where the IRS includes the positive flow of migrants between counties. We add a migrant flow equal to zero for all counties not included in the out-migration dataset to ensure that a data record is present for every county-to-county combination. We then aggregate this data to the urban core of CBSAs, generating 378 CBSAs to examine the factors affecting migration choice between areas.[2]

Our focus is on core urban-to-urban migration within the coterminous United States. We identify these counties with the CBSA-to-FIPS county crosswalk provided by the National Bureau of Economic Research (NBER), using "central" counties within each CBSA as our classification of a core urban area.[3] We focus on this group of counties for two reasons. First, migration to and from non-central locations (i.e., rural and exurban), as well as to and from non-continental regions (i.e., Alaska, Hawaii, and Puerto Rico), may be generated by a different set of circumstances or preferences. Arzaghi and Rupasingha (2013) highlight that rural households may have an additional factor that affects their migration decision that is not necessarily present between large urban areas: rural migrants will be greatly influenced by the diversification gains in employment opportunities that are present when moving from rural to urban areas. Although there may still be some diversification in opportunities between urban areas, this is likely to be less important than the economic, social, and policy factors that will direct migrants from one urban core to the next.

Second, flows between the core urban areas represent the majority of moves between urban counties. Figure 1 highlights the share of migration between county types as a percentage of total migration for the last year of data availability, 2020.[4] Migration between core urban counties in different CBSAs ("Core-to-Core Different CBSA") accounts for nearly 60 percent of total migration each year. Figure 1 also highlights that the share of core urban migration within an urban area (i.e., "Same CBSA") is 36 percent. An example of migration within an urban area includes migration between Orange County and Los Angeles County, both within the Los Angeles-Long Beach-Anaheim, CA, CBSA. We narrow our focus to movement between core urban areas, as the economic, demographic, and personal circum-

[2]We aggregate our data to measure and control for migration choices related to important factors that are not county-specific. For example, an individual may move to an area for employment opportunities, but their choice of county residence may differ due to housing costs. Both are important for the area and disaggregating the data by county could obfuscate our findings.

[3]Central counties are defined as having at least 50% of their population living in urban areas of at least 10,000 in population. Additional surrounding counties, known as outlying counties, can be included in the CBSA if these counties have strong social and economic ties to the central county or counties, as measured by commuting and employment. Outlying counties are included in the CBSA if 25% of those living in the county work in the central county or counties, or if 25% of the employment in the county is held by workers who live in the central county or counties.

[4]Data for previous years are similar and percentages are available upon request.

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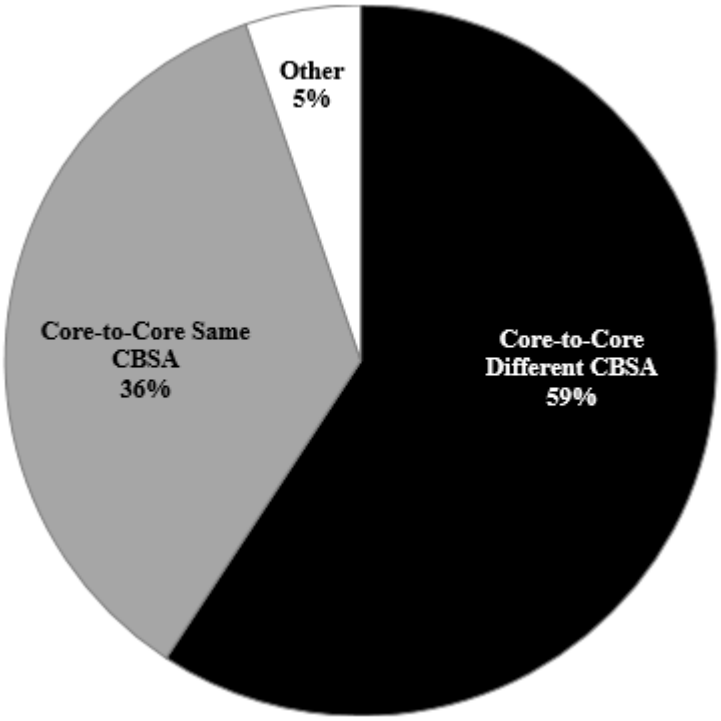
Figure 1: Migration Percentage by County Type (2020)



Note: Authors' calculations from the Internal Revenue Service county migration data, based on the number of returns. These only represent the number of migrants for which we are able to identify the types of counties to which migrants are relocating, excluding within county moves.

stances or preferences that dictate an individual's decision to move between core urban areas are likely different from the decision to move within an urban area. The remaining three types of migration—urban to rural, rural to urban, and rural to rural—are included in the "other" category and represent only 5 percent of total migration.

The IRS data has two primary limitations. The first is the timing of the data. IRS migration data include the movement of individuals between April of year one through March of the following year. That is, it identifies the location of an individual at these two points in time and does not allow us to measure multiple moves within the year. Although our data are not panel data in the sense of following specific migrants over time, they still provide a view of the temporal patterns and stability of our estimates (Davies et al., 2001).

The second limitation concerns filers. Those who are not required to file United States Federal income tax returns are not included in the county-to-county migration data (e.g., poor and elderly individuals). In addition, tax returns for those using an extension are also excluded in the current year; IRS migration data can under represent the very wealthy since they are more likely to file using an extension. Finally, the matching process causes some returns to be missed when a husband and wife change their filing status from year to year, and when marriage or divorce changes an individual from being the primary taxpayer. Despite these limitations, approximately 94 percent of the population is covered with IRS data and has been shown to follow well with other migration measures, such as the American Com-

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munity Survey and the Annual Social and Economic Supplement of the Current Population Survey (Davies et al., 2001; Molloy et al., 2011).[5]

4.2. Independent Variables

As noted in the literature review, previous research has shown that several factors are important in an individual's decision about migration choice (Greenwood, 1997; Hunt and Mueller, 2004; Sasser, 2010). We group these factors into three distinct categories: economic, policy, and geographic. The variables, definitions, and data sources for each variable are reported in Table 1. Continuous variables represent the average separation between destination and origin as percentage changes, and indicator variables represent origin-destination pairs within each category. Measurement of the separation of variables between locations recognizes previous migration research that suggests that migrants are attracted to areas with relative improvements to their current location (Arzaghi and Rupasingha, 2013).

4.2.1. Economic Variables

Our primary relationship of interest is the effect of differences in housing values between origin and destination on migration choice decisions. It is reasonable to expect that migrants respond to housing market conditions, with more expensive housing at a destination prohibiting migration to that location. Rather than rely on a single measure of housing, we examine multiple measures to identify different views that may be important to migrants and determine if there are varying effects. At a minimum, examining variations in housing costs provides a simple robustness check on the importance of these costs, regardless of how they are measured.

Our first housing cost measure uses median housing values at the county level. We average the median housing values of the urban core CBSA counties, weighted by population, and construct the percentage change between the urban core CBSAs of origin and destination.[6] We also stratify differences in housing values into indicator variables to examine the effects of house value ranges between destination and origin on migration choice. Relying solely on a single measure for housing values may result in aggregation bias and mask important relationships based on the level of housing value differences between origin and destination pairs. The use of indicator variables provides a deeper understanding of the effect housing values can have on migration choice. For example, it is important to understand the impact of housing value differences that are less than $10,000 compared to those greater than $150,000.

In separate analyses, we replace our housing value measures with rental prices to examine the role of differences in aggregate rental prices on migration patterns. It is reasonable to expect rental affordability to have a greater effect on migration choice decisions since renters are generally more mobile, as confirmed by comparisons of the trend of state-to-state migration rates highlighted by Modestino and Dennett (2013): the migration rate of homeowners is approximately one-fifth of renters.

[5]See Gross (2005) for a thorough discussion of the IRS data.

[6]We also explored using Census MSA data, rather than weighted averages for counties. The correlation between our weighted estimates and the Census MSA housing value data is 0.9972.

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Table 1: Variable Definitions and Sources

Variable	Definition	Source
Migration	Number of migrants from each origin-CBSA, in year one, to each destination-CBSA, in year two, measured by the number of IRS returns. County-level data are aggregated to the CBSA level using the CBSA-to-FIPS county crosswalk provided by the NBER, excluding noncentral counties.	IRS county-to-county outflows
Economic		
House Value	Percent difference between origin-CBSA and destination-CBSA housing values. Housing values for each CBSA are calculated as the average population-weighted median housing values from central counties making up each CBSA.	ACS 5-year estimates
Cheaper Housing	=1 if any county in the destination-CBSA has a median housing value less than the average population-weighted median housing value of the origin-CBSA, =0 otherwise.	ACS 5-year estimates
Rent Value	Percent difference between origin-CBSA and destination-CBSA rents. Rents for each CBSA are calculated as the average population-weighted median rents from central counties making up each CBSA.	ACS 5-year estimates
Cheaper Rent	=1 if any county in the destination-CBSA has a median rent less than the average population-weighted median rent of the origin-CBSA, =0 otherwise.	ACS 5-year estimates
UE Rate	Difference between origin-CBSA and destination-CBSA unemployment rates. Unemployment rates for each CBSA are calculated as the average population-weighted rate from central counties making up each CBSA.	BLS
Real Income	Percent difference between origin-CBSA and destination-CBSA incomes, normalized by regional price parities collected from the BEA. Incomes for each CBSA are calculated as the average population-weighted median incomes from central counties making up each CBSA.	ACS 5-year estimates, BEA
Policy		
Income Tax	=1 if the origin-CBSA is in a state that collects income tax and the destination-CBSA is in a state that does not collect income tax, =0 otherwise.	Tax Foundation
Non-Compete	=1 if the origin-CBSA is in a state that has non-compete laws and the destination-CBSA is in a state that does not have non-compete laws, =0 otherwise.	Economic Innovation Group
Geographic		
Same State	=1 if the origin-CBSA is in the same state as the destination-CBSA, =0 otherwise.	
Dist 0–100	=1 if the origin-CBSA is within 100 miles of the destination-CBSA, =0 otherwise.	NBER (2010)
Dist 101–250	=1 if the origin-CBSA is between 101 and 250 miles of the destination-CBSA, =0 otherwise.	NBER (2010)
Dist 251–500	=1 if the origin-CBSA is between 251 and 500 miles of the destination-CBSA, =0 otherwise.	NBER (2010)
Dist 501–1,000	=1 if the origin-CBSA is between 501 and 1,000 miles of the destination-CBSA, =0 otherwise.	NBER (2010)
Dist 1,001–1,500	=1 if the origin-CBSA is between 1,001 and 1,500 miles of the destination-CBSA, =0 otherwise.	NBER (2010)
Dist > 1,500	=1 if the origin-CBSA is greater than 1,500 miles from the destination-CBSA, =0 otherwise.	NBER (2010)
Commute	Percent difference between origin-CBSA and destination-CBSA commute times. Commute times for each CBSA are calculated as the average population-weighted median commute times from central counties making up each CBSA.	ACS 5-year estimates
Amenity Rank	Percent difference between origin-CBSA and destination-CBSA amenity ranks. Amenity ranks for each CBSA are calculated as the average population-weighted median amenity ranks from central counties making up each CBSA.	USDA ERS
Stock	The total number of migrants leaving an origin-CBSA during the year, measured by the number of IRS returns.	IRS county-to-county outflows
Previous Migration	The total number of migrants between each origin-CBSA and destination-CBSA pair for the previous three years, measured by the number of IRS returns in those years.	IRS county-to-county outflows

Finally, we examine the variability of affordable options within a region. Not only is it reasonable to expect more affordable locations to attract more migrants (everything else constant), but it is also reasonable to expect that areas with a wider range of affordable options provide more opportunities for migrants of all income levels, education levels, and family status, and to generate more migration, greater growth, and potential future economic growth for an area. Although the range of affordable options at any particular time is

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important, the lower end of the value spectrum within a CBSA may be the most important. We include the simplest measure to capture the importance of the low end of the housing variability spectrum in migration decisions: an indicator variable equal to one for destination CBSAs that have at least one of the counties that make up the destination CBSA with a median housing value less than the average median housing value of the counties that make up the origin CBSA. This consideration has not been included in previous research.

Previous research examining migration patterns from a theoretical utility maximization framework identifies two additional economic variables as important for capturing migration decisions: unemployment rate and income (Davies et al., 2001; Kennan and Walker, 2003). It is reasonable to expect that migrants are attracted to areas with lower levels of unemployment and higher expected incomes, and both measures represent economic opportunities when examining relative differences.

4.2.2. Policy Variables

We include two state policy variables. The first is the origin-destination difference in the existence of income tax laws. Prehus (1999) and Gius (2011) show that income taxes have an effect on migration, with individuals moving from states with high income taxes to states with low income taxes.

Our second state policy variable is the origin-destination difference in the existence of non-compete laws. Non-compete agreements are a restrictive employment agreement in which the former employee cannot work for a competitor after separation. Typically, this applies for a specified period of time, covering a certain geographic area, and within a specific industry. Non-compete agreements are important to include since they have been shown to have a negative impact on interstate migration. Marx et al. (2015) found that non-compete agreements lead to a "brain drain" of knowledge workers out of states that enforce such contracts to states where they are not enforceable. Workers are less likely to make interstate job-to-job moves to states that enforce non-compete agreements.

4.2.3. Geographic Variables

Distance plays a significant role in interstate migration. Migration is costly, and it is reasonable to expect costs to increase with distance. Moving expenses and transport costs between the origin and destination are not readily available. The standard approach to handling these important costs is to use physical distances between the origin and destination locations. We used distances between all counties provided by the NBER. Similar to our other data measured at the county level, we use the average distance between counties that make up the origin-CBSA and counties making up the destination-CBSA. We then create indicator variables for varying distances to highlight the diminishing effects of migration as distances increase. Our use of indicator variables also explicitly recognizes that physical and psychological moving costs for additional units of distance are likely to decrease for longer distances. For example, the mode of transportation may change with longer distances. In addition, a marginal increase in the distance from established networks (i.e., family, friends, etc.) is less important as distance increases. We also include a same-state migration dummy

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variable in our specification to further identify geographical familiarity (as well as political familiarity) and closeness to established social networks in our model.

Amenities have also been shown to be important factors in migration decisions (Knapp and Graves, 1989; Mueser and Graves, 1995; Rickman and Rickman, 2011; Chen et al., 2003). We use the natural amenity index developed by McGranahan (1999), which includes average temperatures, average days of sunshine, average humidity levels, water area as a percent of the total area of the county, and a topography rating. This follows an approach by Arzaghi and Rupasingha (2013) and Koch (2015) who find evidence that simple amenities rankings capture useful geographic information that explains migration behavior. Similarly, commute times are important and we include a measure of the difference in commuting times between CBSA origin and destination.

5. RESULTS

5.1. Estimation

Due to the count nature of the dependent variable, the econometric analysis is based on the assumptions that the underlying probability follows either the Poisson or negative binomial (NB) distribution. The dependent variable, M_{ij}, is a count variable with values ranging from a minimum of 0 for all years to a maximum of 52,154 in 2020, a mean inclusive of all locations (zero and positive flows) equal to 17.9 in 2017, and a mean inclusive of positive flows equal to 203.2 in 2017.[7] More than 90 percent of origin-destination pairs have zero migration when we include all CBSAs. The reported results are based on the zero-inflated negative binomial (ZINB) distribution, the preferred NB regression for count data that exhibit overdispersion and excess zeros.[8] The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values are used for model selection to test if our results are an improvement over the NB model. The model with the lower AIC and BIC values is preferred. The bottom rows of Table 2 show the comparison of the NB and ZINB models and demonstrate that the ZINB fits the data better.

5.2. Main Findings

The interpretation of coefficients in ZINB models requires an exponential transformation due to the nonlinear nature of the distributions. To offer a more direct interpretation of the coefficients from the results, all tables report incidence rate ratios. Our primary results for all 378 urban core CBSAs over the seven years (2014 through 2020) are reported in Table 2. Negative relationships between explanatory variables and the dependent variable result in incident ratios less than 1. The estimated incidence rate ratios are stable for the seven

[7] 2017 was highlighted because it is the middle year of our data and represents the approximate middle value of means across years, where the positive flow mean increased from 181.7 in 2014 to 215.8 in 2020.

[8] Further disaggregation may not be estimable or may decrease model stability due to an increased number of zeros introduced into the dataset: county-level analyses double the number of non-zero observations but introduce nearly four times as many zero observations. Increasing the number of zeros by this amount leads to issues of convergence and imprecise or unstable parameter estimates. See Weinberg et al. (1981) for more information on using negative binomial models and data with zero observations.

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Table 2: House Value Migration Results by Year

	2014	2015	2016	2017	2018	2019	2020
Economic							
House Value	0.998***	0.998***	0.998***	0.998***	0.998***	0.999***	0.999***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cheaper Housing	0.982	1.007	1.051***	1.040**	1.047**	1.074***	1.082***
	(0.021)	(0.019)	(0.019)	(0.020)	(0.027)	(0.020)	(0.020)
UE Rate	0.960	0.960	0.991	1.030	1.003	1.014	1.058
	(0.027)	(0.023)	(0.024)	(0.030)	(0.027)	(0.024)	(0.040)
Real Income	1.006	1.000	0.994*	0.994*	0.995*	0.993**	0.994**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Policy							
Income Tax	1.238***	1.425***	1.477***	1.377***	1.395***	1.392***	1.402***
	(0.047)	(0.048)	(0.047)	(0.046)	(0.047)	(0.046)	(0.044)
Non-Compete	1.376***	1.442***	1.531***	1.420***	1.459***	1.503***	1.407***
	(0.078)	(0.073)	(0.073)	(0.071)	(0.074)	(0.073)	(0.068)
Geographic							
Same State	2.196***	2.502***	2.634***	2.389***	2.326***	2.407***	2.514***
	(0.063)	(0.065)	(0.065)	(0.061)	(0.060)	(0.061)	(0.062)
Dist 0-100	6.924***	7.151***	8.425***	7.312***	7.359***	7.544***	7.808***
	(0.301)	(0.277)	(0.309)	(0.275)	(0.277)	(0.279)	(0.283)
Dist 101-250	2.911***	2.848***	3.050***	2.831***	2.856***	2.888***	2.946***
	(0.100)	(0.085)	(0.083)	(0.081)	(0.082)	(0.081)	(0.081)
Dist 251-500	1.770***	1.724***	1.810***	1.716***	1.708***	1.751***	1.767***
	(0.052)	(0.044)	(0.042)	(0.042)	(0.042)	(0.042)	(0.041)
Dist 501-1,000	1.353***	1.306***	1.329***	1.311***	1.302***	1.312***	1.341***
	(0.034)	(0.028)	(0.026)	(0.027)	(0.027)	(0.027)	(0.027)
Dist 1,001-1,500	1.310***	1.253***	1.262***	1.247***	1.248***	1.270***	1.302***
	(0.035)	(0.030)	(0.027)	(0.028)	(0.028)	(0.028)	(0.028)
Commute	0.968***	0.966***	0.967***	0.972***	0.973***	0.974***	0.974***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Amenity Rank	1.000	1.000	1.001**	1.001***	1.001***	1.002***	1.001***
	(0.001)	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)
Stock	1.002***	1.002***	1.004***	1.007***	1.005***	1.008***	1.004***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Previous Migration	1.001***	1.000***	1.000***	1.000***	1.000***	1.000***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CBSA Origin & Dest. FE				Yes			
Observations	142,506	142,506	142,506	142,506	142,506	142,506	142,506
Zero Observations	132,534	130,438	127,291	129,932	130,184	129,511	128,978
AIC							
NB	147,463	192,739	280,581	201,220	230,834	208,326	216,936
ZINB	109,932	144,391	251,196	149,671	206,146	153,767	163,150
BIC							
NB	155,037	200,336	280,749	208,818	231,002	215,923	224,534
ZINB	117,674	152,157	251,522	157,436	206,471	161,532	170,915

Note: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.10

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years, including the first year of the pandemic (2020). This is consistent with the findings of Davies et al. (2001). The pandemic influenced the amount of interregional migration, but not the choices of interregional migration of those migrating.

Differences in housing value between the origin-destination pairs have a statistically significant negative effect on the choice of migration in all years. This is consistent with the policy concern that housing affordability is a barrier to migration choice. Although the effect for housing does not appear as large as other economic, policy, and geographic factors when looking at the estimation results, the average difference of variables, as well as the range of differences, should be considered before making such comparisons. For example, while the 2017 estimate for *House Value* in Table 2 suggests a smaller negative effect on migration than *Real Income*, the effect of housing affordability is larger when actual differences between locations are considered.[9] The average increase in housing prices for those migrating to higher-cost places of living is nearly 65 percent (with a maximum difference in housing cost increases greater than 100 percent), while the average increase in income for those migrating to areas with higher incomes is only 15 percent (never exceeding 100 percent). Likewise, the average decrease in house prices and income levels for those migrating to areas with lower levels are 31 and 12 percent, respectively. Considering these differences, it is reasonable to expect the negative effect from an increase in housing values to be larger than other estimates. Beyond a consistent, statistically significant negative effect of housing affordability on migration, the coefficient size, sign, and significance is consistent across all years.[10]

Our measure of *Cheaper Housing* has mixed results in the choice of migration location. Cheaper housing is positive and statistically significant in all years since 2016, and the importance of this increases in the latter years. This is not surprising given the conversations around affordability being the "crisis" of our day.

The impact of housing affordability on migration choice is best evaluated using the indicator variables stratifying different levels of housing affordability, presented in Table 3 for house price differences and Table 4 for rent. These show that housing affordability does not have a statistically significant difference in migration choice up to a $50,000 difference between the origin and destination pair (or up to a 25 percent difference using percentage ranges). The categories above a $50,000 difference in house value have substantial and statistically significant impacts on migration choice, with negative effects increasing, although at a decreasing rate, for greater dollar differences. Now we clearly see the estimated effects of housing have a larger effect than some of the other economic variables and highlight how a single measure masks the importance of housing on migration choice.

[9]We recognize the negative effect from increasing incomes is unusual, and we discuss this in detail later. We merely use this as an example here to show the importance of considering observed differences between locations that are not captured in the estimates.

[10]Thanks to the suggestion of an anonymous reviewer, we examined the robustness of our results further controlling for differences in incomes and job market conditions across space. Specifically, we 1) analyzed the effect of housing costs (same measure) on migration decisions controlling for employment opportunities and the growth in employment (i.e., we added a variable measuring the indexed employment growth change between areas) and 2) we measured housing affordability relative to ones' income level in each area (new measure of house value/affordability). Each approach yields nearly identical results to what we present in Table 2 (available upon request).

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Table 3: House Value Migration Results by Year and Measure

	2014	2015	2016	2017	2018	2019	2020
Value							
House Value	0.998***	0.998***	0.998***	0.998***	0.998***	0.999***	0.999***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$ Range							
Diff = $0–$10,000	1.013	1.023	1.040	1.009	1.024	1.003	0.997
	(0.03)	(0.027)	(0.026)	(0.028)	(0.029)	(0.03)	(0.032)
Diff = $10,001–$25,000	1.018	1.027	1.013	1.044	1.031	0.984	1.014
	(0.028)	(0.025)	(0.023)	(0.025)	(0.026)	(0.026)	(0.026)
Diff = $25,001–$50,000	0.986	1.01	0.981	0.967	0.991	0.978	0.961
	(0.029)	(0.025)	(0.024)	(0.025)	(0.025)	(0.025)	(0.025)
Diff = $50,001–$100,000	0.944*	0.942**	0.911***	0.909***	0.926***	0.879***	0.899***
	(0.033)	(0.029)	(0.027)	(0.027)	(0.027)	(0.026)	(0.025)
Diff = $100,001–$150,000	0.890**	0.883***	0.829***	0.832***	0.822***	0.779***	0.799***
	(0.048)	(0.042)	(0.038)	(0.039)	(0.036)	(0.034)	(0.032)
Diff > $150,000	0.879**	0.828***	0.825***	0.830***	0.820***	0.763***	0.783***
	(0.058)	(0.054)	(0.049)	(0.047)	(0.046)	(0.043)	(0.04)
% Range							
Diff = 0%-25%	0.999	1.009	0.999	0.995	1.003	0.971	0.965*
	(0.022)	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)	(0.019)
Diff = 25%-50%	0.956	0.957	0.933***	0.939**	0.937**	0.901***	0.906***
	(0.031)	(0.027)	(0.025)	(0.026)	(0.026)	(0.026)	(0.025)
Diff = 50%-75%	0.956	0.902***	0.886***	0.877***	0.869***	0.823***	0.825***
	(0.039)	(0.035)	(0.032)	(0.033)	(0.032)	(0.032)	(0.031)
Diff > 75%	0.875***	0.820***	0.800***	0.826***	0.810***	0.770***	0.765***
	(0.047)	(0.042)	(0.039)	(0.040)	(0.039)	(0.038)	(0.037)
Other Controls				Yes			
CBSA Origin & Dest. FE				Yes			
Observations	142,506	142,506	142,506	142,506	142,506	142,506	142,506
Zero Observations	132,534	130,438	127,291	129,932	130,184	129,511	128,978

Note: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.10

Our results for rent affordability are larger than our housing affordability results for both the single measure and stratified measures, with the latter effects once again increasing at a decreasing rate for greater dollar and percentage differences. To highlight one of the differences between housing and rent, the coefficient for our 2017 effect of rental differences greater than 75 percent is 0.669 (statistically significant at the 1 percent level) and a much larger negative effect than the coefficient of 0.826 for housing differences greater than 75 percent. Overall, our findings for rent match expectation: rental affordability has a greater effect on migration choice.

Differences in the unemployment rate between the origin and destination are negative and not statistically significant in the years 2014-2016 and positive and not significant in the years 2017-2020. Real income is negative with some statistical significance in the years 2016-2020. Both the unemployment rate and the real income results are not consistent with expectations. To further investigate these results, we created indicator variables similar to the approach for housing affordability and distance. The results are reported in Table 5. The indicator unemployment rate variables show, as expected, a negative statistically significant

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impact above a 2 percent origin-destination differential. Although the real income variable is positive as expected, it is not statistically significant except at the 5 percent level in 2015 and 2016 for real income gains greater than 50%. Those years are before the rapid increase in housing prices. An explanation for why real income does not influence migration choice is that, although housing prices have always been higher in higher-income areas, housing prices now capitalize on a much greater proportion of income differences between regions (Ganong and Shoag, 2017). As housing affordability declines, returns to living in high-income areas with rising housing prices fall, especially for low-skill households offsetting the real income differential for migration choice.

Table 4: Rent Value Migration Results by Year and Measure

	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Value							
Rent	0.978***	0.981***	0.983***	0.986***	0.986***	0.989***	0.987***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
$ Range							
Diff = $0–$250	0.954**	0.991	0.980	0.981	0.983	0.991	0.978
	(0.023)	(0.021)	(0.294)	(0.020)	(0.020)	(0.024)	(0.019)
Diff = $250–$500	0.787***	0.845***	0.845***	0.879***	0.875***	0.881***	0.869***
	(0.033)	(0.032)	(0.029)	(0.030)	(0.029)	(0.028)	(0.026)
Diff > $500	0.652***	0.748***	0.724***	0.776***	0.789***	0.813***	0.765***
	(0.046)	(0.047)	(0.042)	(0.064)	(0.043)	(0.042)	(0.037)
% Range							
Diff = 0%-25%	0.930***	0.972	0.959**	0.964*	0.959*	0.972	0.957**
	(0.023)	(0.021)	(0.019)	(0.020)	(0.020)	(0.020)	(0.019)
Diff = 25%-50%	0.779***	0.863***	0.853***	0.856***	0.837***	0.839***	0.841***
	(0.031)	(0.031)	(0.028)	(0.029)	(0.028)	(0.027)	(0.026)
Diff = 50%-75%	0.642***	0.745***	0.703***	0.753***	0.737***	0.765***	0.736***
	(0.039)	(0.041)	(0.035)	(0.038)	(0.037)	(0.036)	(0.033)
Diff > 75%	0.526***	0.619***	0.609***	0.669***	0.625***	0.691***	0.662***
	(0.046)	(0.047)	(0.043)	(0.047)	(0.044)	(0.047)	(0.042)
Other Controls				Yes			
CBSA Origin & Dest. FE				Yes			
Observations	142,506	142,506	142,506	142,506	142,506	142,506	142,506
Zero Observations	132,534	130,438	127,291	129,932	130,184	129,511	128,978

Note: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.10

All remaining variables are consistent with expectations. Not having a state income tax and not enforcing non-compete agreements have positive impacts on migration choice. Consistent with the findings of Song (2017), the crossing of a state border remains a barrier to the choice of migration location. The impact of distance is positive and statistically significant, and decreases as the distance indicator variable increases its range compared to the excluded category of distance greater than 1,500 miles. A distance of up to 100 miles increases migration choice by a factor of 7.312 in 2017, compared to a distance of 1,001-1,500 miles, which increases migration choice by a factor of 1.247. Finally, amenities and commute times positively and negatively affect migration choice, respectively.

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Table 5: Income and Unemployment Migration Results by Year and Measure

	2014	2015	2016	2017	2018	2019	2020
Continuous Variables							
UE Rate	0.960	0.960	0.991	1.030	1.003	1.014	1.058
	(0.027)	(0.023)	(0.024)	(0.030)	(0.027)	(0.024)	(0.040)
Real Income	1.006	1.000	0.994*	0.994*	0.995*	0.993**	0.994**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Indicator Variables							
Diff UE Rate = 0-2%	0.968	0.941***	0.957**	0.962**	0.968*	0.983	0.982
	(0.022)	(0.019)	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)
Diff UE Rate = 2-5%	0.885***	0.812***	0.801***	0.752***	0.719***	0.805***	0.932**
	(0.036)	(0.032)	(0.031)	(0.033)	(0.038)	(0.040)	(0.029)
Diff UE Rate > 5%	0.598***	0.643***	0.648***	0.559***	0.436***	0.522***	0.853**
	(0.058)	(0.064)	(0.066)	(0.067)	(0.063)	(0.074)	(0.056)
Diff Income = 0-50%	1.006	1.025	1.013	1.019	0.996	0.996	1.010
	(0.022)	(0.020)	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)
Diff Income > 50%	1.072	1.189**	1.151**	1.095	1.016	1.069	1.063
	(0.097)	(0.094)	(0.81)	(0.077)	(0.058)	(0.063)	(0.064)
Other Controls				Yes			
CBSA Origin & Dest. FE				Yes			
Observations	142,506	142,506	142,506	142,506	142,506	142,506	142,506
Zero Observations	132,534	130,438	127,291	129,932	130,184	129,511	128,978

Note: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.10

5.3. Additional Considerations

To evaluate the sensitivity of our results to the size of CBSAs and the number of (zero) observations included, we report ZINB findings for five different CBSA groupings by population size: top-100, top-150, top-200, top-250, and top-300. The results in Table A1 and Table A2 of Appendix A show relative stability for most of the variables in our analysis, as well as similarity with our estimates across years. Unemployment rate and real income are the two exceptions. Unemployment is negative and statistically significant for migration between the top-200 core CBSAs, suggesting that migration choice is affected by unemployment when moving between large urban areas; however, this appears to be less important when considering movement to/from large urban areas from/to smaller areas. For example, movement to Los Angeles-Long Beach-Anaheim, CA, from New York-Newark-Jersey City, NY-NJ-PA, is affected by employment opportunities, but this is not as important for movement to Los Angeles-Long Beach-Anaheim, CA, from Cheyenne, WY. One potential reason for this follows Arzaghi and Rupasingha (2013) discussion on different influences on migration between urban and rural locations: migration, including smaller urban areas, is influenced by a wider range of factors. Evidence supporting these results may also be seen through the other factors that are less important when including all areas in the analysis, such as the policy and geographic factor variables. There is no pattern in looking at real income, and we defer to our earlier discussion of Table 5 concerning this variable.

It is also worth noting that we use the 5-year estimates for independent variables generated from Census Bureau data. Although 1-year measures may provide greater variation

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between years, they do not include all counties and potentially limit the sample of migration pairs. In total, 371 CBSAs are in the 1-year measures based on core urban-to-urban migration, compared to 378 for the 5-year analysis. We provide results using the 1-year data in Table A3 of Appendix 6. Despite the reduced number of CBSAs, the results are robust across each measurement.

6. CONCLUDING REMARKS

Our results support the conclusion that differences in housing affordability and rent between origin-destination pairs have a negative influence on migration choice for those who move. The literature on migration choice uses continuous variables that measure the average impact of housing affordability on migration location choice. Using average measures masks important impacts that are revealed using indicator variables that capture the size of the difference in housing affordability between origin-destination pairs. We also show that the use of indicator variables for distance, unemployment rate, and real personal income yields useful information compared to average measures of these variables. Differences in housing affordability greater than $50,000 have a large and statistically significant negative impact on the choice of interstate migration. These large housing affordability differences between CBSA pairs from origin to destination are likely to occur, with the destination being a highly productive coastal region.

Public policy is becoming aware of the consequences of housing affordability in the US. The recommended policies include modifying the residential zoning and density so that more homes can be built on a piece of land and increasing public transportation options from lower-income areas to areas with higher-paying job opportunities to increase access to these jobs. Our results support public policies to improve housing affordability in the US, especially in high-productivity growth regions. The impact of housing affordability on interstate migration will induce companies to substitute remote work arrangements for moving employees to home offices, where housing affordability is an issue. We expect that remote work arrangements will be more prevalent in areas with housing affordability issues, and that the new work-from-home era has made it possible for housing cost to be one of the most significant factors driving people's migration decisions. Remote work management to ensure productivity, innovation, and leadership development will be a new challenge for businesses, and affordability issues will be more relevant for policymakers in the work-from-home age.

Another public policy that adversely impacts interstate migration choice is non-compete agreements that are enforced in a state. We show that migration choice is substantially increased when the origin state enforces non-compete agreements, while the destination state does not enforce these agreements. People are more likely to move to locations that do not enforce non-compete agreements. Removing non-compete agreements or not enforcing them will enhance migration choice, facilitating the movement of people to more productive regions. The difficulty of changing non-compete legislation recently played out in New York State, when the governor vetoed legislation to ban non-compete agreements. The Federal Trade Commission and the National Labor Relations Board have proposals and enforcement actions under consideration that will restrict non-compete agreements, which our findings

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support. A federal judge in Texas recently barred a US Federal Trade Commission rule from taking effect that would ban employers from requiring their workers to sign non-compete agreements.

As expected, people move from states with an income tax to locations that do not have an income tax. More precise measurement of tax differences between origin-destination pairs would enhance understanding of the tax impacts on migration choice. Some states with an income tax have reduced the tax rates in recent years, and the total tax burden, including sales and property taxes, may be important. Property taxes are especially difficult to measure, since they are locally implemented and depend on assessed values and the tax rate. We recommend this as an area for further study.

The pandemic caused lifestyle changes that allowed people to move to any desired location and accelerated the remote work option for many employees. Our results show that the pandemic and remote work movement had no material impact on the choice of interstate migration. More people moved (Frost, 2023), but the factors that influence where they moved have not changed. The main variables influencing migration choice are stable over time and not affected by the pandemic, remote work, or recovery from financial panic.

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APPENDIX

Table A1: House Value Migration Results by Top CBSAs (2017)

	Top 100	Top 150	Top 200	Top 250	Top 300	All
Economic						
House Value	0.998***	0.998***	0.998***	0.998***	0.998***	0.998***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cheaper Housing	1.040	1.032	1.031	1.051**	1.047**	1.040**
	(0.028)	(0.023)	(0.022)	(0.021)	(0.021)	(0.020)
UE Rate	0.498***	0.663***	0.693***	0.980	1.022	1.030
	(0.056)	(0.077)	(0.078)	(0.024)	(0.030)	(0.030)
Real Income	0.990*	0.993	0.993*	0.995	0.994	0.994*
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Policy						
Income Tax	1.663***	1.625***	1.522***	1.478***	1.446***	1.377***
	(0.074)	(0.062)	(0.054)	(0.051)	(0.049)	(0.046)
Non-Compete	1.484***	1.656***	1.557***	1.527***	1.471***	1.420***
	(0.110)	(0.099)	(0.087)	(0.082)	(0.078)	(0.071)
Geographic						
Same State	3.066***	3.032***	2.811***	2.618***	2.500***	2.389***
	(0.155)	(0.113)	(0.091)	(0.076)	(0.069)	(0.061)
Dist 0-100	19.25***	14.34***	10.53***	9.720***	8.708***	7.312***
	(1.289)	(0.727)	(0.467)	(0.405)	(0.350)	(0.275)
Dist 101-250	6.006***	5.033***	3.970***	3.534***	3.238***	2.831***
	(0.249)	(0.176)	(0.126)	(0.107)	(0.097)	(0.081)
Dist 251-500	2.946***	2.585***	2.163***	2.031***	1.875***	1.716***
	(0.093)	(0.072)	(0.056)	(0.052)	(0.047)	(0.042)
Dist 501-1,000	1.858***	1.752***	1.532***	1.460***	1.393***	1.311***
	(0.048)	(0.040)	(0.033)	(0.031)	(0.030)	(0.027)
Dist 1,001-1,500	1.540***	1.514***	1.399***	1.346***	1.293***	1.247***
	(0.042)	(0.037)	(0.033)	(0.031)	(0.030)	(0.028)
Commute	0.943***	0.951***	0.958***	0.967***	0.971***	0.972***
	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)
Amenity Rank	1.007***	1.005***	1.003***	1.002***	1.002***	1.001***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Stock	1.000	1.000**	1.000*	1.000	1.007***	1.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Previous Migration	1.000***	1.000***	1.000***	1.000***	1.000***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CBSA Origin & Dest. FE			Yes			
Observations	9,900	22,350	39,800	62,250	89,700	142,506
Zero Observations	4,679	14,771	30,479	51,796	78,316	129,932

Note: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.10

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Table A2: Rent Value Migration Results by Top CBSAs (2017)

	Top 100	Top 150	Top 200	Top 250	Top 300	All
Economic						
Rent	0.990***	0.991***	0.990***	0.988***	0.987***	0.986***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Cheaper Rent	1.027	1.005	0.999	1.002	1.007	1.003
	(0.028)	(0.023)	(0.021)	(0.021)	(0.020)	(0.020)
UE Rate	0.477***	0.621***	0.642***	1.004	1.035	1.041
	(0.053)	(0.072)	(0.072)	(0.026)	(0.030)	(0.030)
Real Income	0.989**	0.992*	0.991**	0.995	0.996	0.996
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Policy						
Income Tax	1.660***	1.619***	1.515***	1.469***	1.434***	1.363***
	(0.074)	(0.061)	(0.053)	(0.051)	(0.049)	(0.045)
Non-Compete	1.470***	1.643***	1.543***	1.517***	1.470***	1.419***
	(0.110)	(0.099)	(0.086)	(0.081)	(0.078)	(0.071)
Geographic						
Same State	3.056***	3.028***	2.804***	2.605***	2.482***	2.370***
	(0.154)	(0.113)	(0.090)	(0.076)	(0.069)	(0.061)
Dist 0-100	19.22***	14.34***	10.55***	9.784***	8.768***	7.382***
	(1.282)	(0.726)	(0.468)	(0.407)	(0.351)	(0.277)
Dist 101-250	6.024***	5.063***	3.995***	3.564***	3.268***	2.861***
	(0.249)	(0.176)	(0.126)	(0.108)	(0.097)	(0.082)
Dist 251-500	2.970***	2.613***	2.187***	2.057***	1.899***	1.740***
	(0.094)	(0.072)	(0.056)	(0.052)	(0.048)	(0.042)
Dist 501-1,000	1.875***	1.773***	1.550***	1.478***	1.410***	1.329***
	(0.048)	(0.041)	(0.033)	(0.032)	(0.030)	(0.028)
Dist 1,001-1,500	1.542***	1.516***	1.403***	1.351***	1.299***	1.254***
	(0.042)	(0.037)	(0.033)	(0.031)	(0.030)	(0.029)
Commute	0.948***	0.955***	0.962***	0.971***	0.976***	0.977***
	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)
Amenity Rank	1.007***	1.005***	1.003***	1.002***	1.002***	1.002***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Stock	1.000	1.000**	1.000*	1.000	1.007***	1.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Previous Migration	1.000***	1.000***	1.000***	1.000***	1.000***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CBSA Origin & Dest. FE			Yes			
Observations	9,900	22,350	39,800	62,250	89,700	142,506
Zero Observations	4,679	14,771	30,479	51,796	78,316	129,932

Note: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.10

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Table A3: 1-Year House Value Migration Results by Top CBSAs (2017)

	Top 100	Top 150	Top 200	Top 250	Top 300	All
Economic						
House Value	0.999***	0.999***	0.998***	0.998***	0.999***	0.999***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cheaper Housing	1.030	1.035	1.040*	1.058***	1.057***	1.043**
	(0.027)	(0.023)	(0.022)	(0.021)	(0.021)	(0.020)
UE Rate	0.466***	0.618***	0.672***	0.986	1.018	1.030
	(0.051)	(0.071)	(0.075)	(0.024)	(0.030)	(0.030)
Real Income	0.981***	0.985***	0.989***	0.992**	0.993**	0.993**
	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Policy						
Income Tax	1.667***	1.629***	1.520***	1.476***	1.443***	1.391***
	(0.074)	(0.062)	(0.053)	(0.051)	(0.049)	(0.046)
Non-Compete	1.472***	1.644***	1.554***	1.524***	1.471***	1.433***
	(0.110)	(0.099)	(0.087)	(0.082)	(0.078)	(0.072)
Geographic						
Same State	3.061***	3.034***	2.811***	2.614***	2.497***	2.385***
	(0.154)	(0.113)	(0.091)	(0.076)	(0.069)	(0.061)
Dist 0-100	19.22***	14.26***	10.42***	9.643***	8.642***	7.403***
	(1.284)	(0.721)	(0.461)	(0.401)	(0.347)	(0.279)
Dist 101-250	6.005***	5.021***	3.936***	3.512***	3.218***	2.850***
	(0.249)	(0.175)	(0.124)	(0.106)	(0.096)	(0.082)
Dist 251-500	2.952***	2.584***	2.150***	2.021***	1.866***	1.721***
	(0.093)	(0.072)	(0.055)	(0.051)	(0.047)	(0.042)
Dist 501-1,000	1.859***	1.751***	1.524***	1.452***	1.386***	1.307***
	(0.048)	(0.040)	(0.033)	(0.031)	(0.030)	(0.027)
Dist 1,001-1,500	1.540***	1.512***	1.393***	1.342***	1.289***	1.241***
	(0.042)	(0.037)	(0.033)	(0.031)	(0.030)	(0.028)
Commute	0.944***	0.952***	0.959***	0.967***	0.971***	0.973***
	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)
Amenity Rank	1.007***	1.005***	1.002***	1.002***	1.001***	1.001***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Stock	1.000	1.000**	1.000*	1.000	1.007***	1.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Previous Migration	1.000***	1.000***	1.000***	1.000***	1.000***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CBSA Origin & Dest. FE			Yes			
Observations	9,900	22,350	39,800	62,250	89,700	137,270
Zero Observations	4,679	14,771	30,479	51,796	78,316	124,796

Note: Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.10

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