COMMERCIAL REAL ESTATE AND MIGRATION: WHAT CAN THE EMPLOYMENT COMPOSITION OF LOCAL JOB MARKETS TELL US ABOUT FUTURE DEMAND?

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Abstract. Demographics and population growth are among the most important factors affecting real estate markets. Differences in population growth between U.S. metros are driven largely by domestic migration patterns.

What explains migration patterns, and can this help anticipate future conditions in commercial real estate markets? We examine the structure of local job markets and find that metros with higher concentrations of certain professions like management, business and finance, have persistently higher in-migration, while metros with greater focus on production, transport (and "material moving") saw lower in-migration or net outmigration. Jobs in computer, science, and engineering were the largest driver for international migration.

These migration patterns have a statistically significant impact on apartment and office markets, including higher rent growth, larger price increases, stronger demand growth and new construction. Among metros like Seattle and Austin, high levels of construction may be warranted by future in-migration in response to the composition of professions in the local job market.

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Introduction

In any real estate cycle, there are cities that become hot spots for activity and show strong fundamentals, while others chug along and may even experience softening commercial real estate markets. The differences in performance across regions can be significant and persist over long periods of time. Recent research has analyzed differences in performance in commercial real estate across metro areas, but little attention has been paid to the drivers of these performance differentials. This paper examines the fundamental forces behind growth in cities like San Francisco and Austin to see what sets them apart, and their impact on commercial real estate markets.

Demographics and population growth are among of the most important factors affecting real estate markets, and the main driver of differences in population growth across regions is migration. Attracting more people to an area has many potential upsides. More consumer spending adds revenue to businesses and boosts the economy. Real estate benefits from the need for additional housing and office space as companies grow their footprint. Strong migration patterns this cycle have helped certain cities grow while boosting real estate in those areas.

Greater demand from higher rates of migration also helps explain why cities with heavy levels of construction, Seattle for example, enjoy robust real estate markets despite a large new supply. Migration patterns suggest rising future demand, especially given the persistence of migration flows, which in turn call for the added construction. The added demand in the face of this new supply tends to be more than sufficient in cities with heavy in-migration to keep vacancy rates low and rents and property prices rising.

The critical question for the performance of CRE markets across regions, therefore, is to what extent future trends in-migration can be anticipated. Previous research cites employment opportunities as a main driver of whether someone moves across cities or regions (Böheim and Taylor 2003). Using data from the American Community Survey (ACS), we examined employment data by occupation within a metro area and how it affected migration patterns from 2010 to 2017. We find that metros with higher concentrations in certain professions like management, business and finance, have persistently higher in-migration, while metros with a greater local employment in production, transport and "material moving" saw lower in-migration or net outmigration. Jobs in computer science and engineering were the largest driver for international in-migration.

Higher rates of in-migration were associated with stronger fundamentals for apartment and office markets, including higher rent growth, larger price increases, more demand, as well as more supply. These findings demonstrate that the mix of professions in a given metro job market are an important factor for understanding future migration patterns and how they in turn could influence commercial real estate fundamentals. The ACS data on intercity migration are only available from 2010; given the relatively short history and the persistence of migration trends within this period, we do not test the ability to forecast future migration patterns.

Literature Review

Previous research on this subject focused on the determinants of migration pattens, the relationship between employment and mobility, and migration's effect on house prices. There has been little attention to the intersection of employment, migration and commercial real estate.

Studies on employment and mobility show that job prospects do play an important role in an individual's choice to move. Böheim and Taylor (2003) conclude that employment has the largest impact on the probability of moving between regions. Clark and Huang (2004) drew a similar conclusion but draw a distinction between long distance and local moves. They state that long distance moves are largely driven by employment and local moves have to do with "residential satisfaction". Eliasson, Lindgren and Westerlund (2003) analyzed labor mobility in Sweden and found that individual unemployment increases the possibility of migration.

Studies have also examined the simultaneous relationship between migration and housing prices. Molloy (Saks) (2008) analyzed housing supply regulations and their effect on housing and the labor markets. She concluded that places confronted with increased demand and low barriers to construction have higher rates of construction, but smaller increases in prices. Zabel (2012), Potepan (1994), and Jeanty, Partridge and Irwin (2010) all analyzed U.S. housing markets during different time periods and concluded that prices responded to increases in population, but populations decreased within an area in response to higher housing prices.

Molloy, Smith and Wozniak (2017) examined migration patterns since 1980 and documented a steady decline of interstate migration. They find that declining migration is related to a decline in job changes, but are unsure of the sources of this trend.

Migration Patterns in the U.S. since 2010

Net migration is the primary determinant of differences in population growth across metro areas. Population growth can come from an "organic" increase, due to the birth rate and death rate, or from migration. Migration, however, explains over 75% of the variation in population growth between cities (see chart 1). Many metros saw significant growth from 2010 to 2017, while others saw little in-migration or net outmigration. Austin, Texas, had the highest in-migration (in percentage terms) of metros with a population over one million. The city's population grew 23.3% over this time period, and 68.5% of that growth was from in-migration. Seattle also saw a significant increase during this time period, and its population grew by 12.4%. Migration accounted for 62.3% of the metro area's overall growth. Other larger metros that saw high rates of in-migration were Orlando and Raleigh. Florida, Oregon, Washington, Colorado, and Texas were states that had more metros with in-migration than outmigration. Some of these states are known for having no income tax or for being more "business-friendly".

Other metros saw outmigration over this time period. Chicago saw the largest outmigration of metros with a population over one million, with a net outmigration of 296 thousand people from

2010 to 2017. Other large metros that saw higher rates of outmigration were Memphis, Milwaukee, and Cleveland. Outmigration was more prevalent in small metros, suggesting a broader trend towards medium to larger cities.

Migration patterns vary greatly according to domestic versus international migration. Several cities had higher international in-migration, but domestic outmigration. Six out of the seven gateway metros[1] (Boston, Chicago, Los Angeles, New York, San Francisco, and Washington DC) had domestic outmigration from 2010 to 2017. Other areas, such as Orlando and Houston, saw domestic and international migration both increase over this time period. The make-up of an area's migration patterns indicates a difference in opportunity for certain groups, possibly in relation to employment or affordability. The gateway cities mentioned are some of the most expensive places to live in the country, while Orlando and Houston are known for being more affordable cities.

Employment Composition

To understand the possible factors influencing migration patterns, we analyzed the relationship between the composition of different professions in a metro job market and migration. Certain professions, including tech, finance, management and business, require specific skills that may be in short supply among the resident population. Others may require lower skill levels, production and transportation for example, and are more easily filled without migration.

We estimated a weighted regression of net migration from 2010 to 2017 on the portion of the workforce in several occupations in 2010. Our sample included 375 metros, with employment and migration data from the ACS. Table 1 reports results. Areas with local job markets with higher concentrations of management, business and finance occupations also had higher rates of in-migration. Cities with higher concentrations of lower skilled jobs, including, production and transportation (prevalent in the manufacturing industry), in contrast, saw lower in-migration or outmigration during the same period (table 1, column 1; charts 2 and 3).

These findings were also consistent when examining domestic migration (column 2). International migration, however, was more closely linked to workforces with higher portions of computer, science and engineering roles (column 3 and chart 4).

It is noteworthy that international in-migration to a metro area responds more strongly to tech professions, including computer, science and engineering, than the estimated response of domestic migration to these professions. This may be due to demand for the tech professions growing more rapidly than the training of the domestic workforce in these specialized skills. It is well known that growth of the technology sector has boosted demand for tech jobs in the US over the past decade. The number of recent graduates in these fields, however, has not kept pace with the demand.

Employment data from ACS show an increase of around 1.5 million computer, science and engineering jobs in the U.S. between 2010 and 2016. The number of degrees awarded in these fields,

[1] Gateway metros include Atlanta, Boston, Chicago, Los Angeles, New York, San Francisco, and Washington DC.

based on data from the National Center for Education Statistics, totaled around 1.2 million during this period, suggesting a potential labor shortfall of almost 300 thousand, or 20%. Of course, some of the demand for tech workers may be filled by recent graduates with degrees in other fields, or mid-career workers who switch professions. Nevertheless, the size of the disparity between tech degrees granted and the growth of tech jobs suggests that US residents are not meeting the demand for technology jobs, leading companies to recruit workers from other countries. Cities with a large number of tech-related jobs, including San Francisco and San Jose, have had to attract international workers to meet the labor demands in their job markets. Our regression results support this interpretation.

A job market with high demand for workers with skills in technology can affect a metro area's affordability, which can in turn affect domestic migration patterns. Computer, science and engineering jobs are paid the highest, on average, compared to other occupations (see chart 5). An influx of highly paid workers to a city has the potential to drive up the prices for housing and other goods. This pattern could make an area less affordable for residents working in lower-paid professions. This impact on local cost of living may account for the cities with a high concentration of tech employment and significant international in-migration but domestic outmigration.

Table 1: Net migration 2010-2017 and professional composition of job market

	(1)	(2)	(3)
	Net Migration		
VARIABLES	(total)	Domestic Migration	International Migration
Management, Business, Finance (%)	0.584***	0.540***	0.0429
	(0.138)	(0.149)	(0.0451)
Computer, Science, Engineering (%)	-0.352**	-0.489***	0.144**
	(0.163)	(0.173)	(0.0665)
Production, Transportation (%)	-0.384***	-0.293***	-0.0857***
	(0.0805)	(0.0807)	(0.0188)
Constant	1.145	-0.402	1.458**
	(2.373)	(2.523)	(0.569)
Observations	375	375	375
R-squared	0.188	0.115	0.195

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The impact of migration on real estate

To what extent do the migration patterns, in response to employment needs, affect commercial real estate fundamentals? More migration means more people in a given area, who are going to need places to live, places to work and will spend their dollars at various local establishments. This has positive implications for nearly all types of real estate. While the level of construction and property

prices are endogenous, a higher level of demand can be expected to result in higher rents and property prices.

Using a weighted regression, we estimated the response of several indicators of commercial property market performance (rent growth, change in vacancy rates, price growth, net operating income (NOI) growth, demand (net absorption as a percent of 2010 stock) and supply (net completions as a percent of 2010 stock)) from 2010 to 2017 on net migration (as a percent of 2010 population on over the same time frame). The analysis was completed for both apartment and office property sectors. Our results overall showed that higher net migration was associated with stronger real estate fundamentals.

Apartments

Table 2 presents the results of weighted regressions of several measures of apartment market performance on net migration. Migration had the expected effect on nearly every measure of market performance. A one percentage point increase in-migration was associated with 0.7 percentage point increase in rent growth over the period. This is a modest but statistically significant effect. Regressions explained around 18% of the cross-sectional variation in rent growth. Migration was also correlated with price increases and NOI growth. A one percentage point increase in-migration was associated with 1.2 percentage point increase in price growth and a 0.5 percentage point increase in NOI growth.

Vacancy rates (column 2) did not respond to the level of migration. As discussed earlier, many of these variables are jointly determined, and migration trends may induce a higher level of construction and new supply, keeping vacancy rates little changed. It is noteworthy, however, that rents, prices and NOI (columns 1, 3 and 4) respond positively to migration.

A one percent increase in migration was associated with roughly a one percent higher level of both demand and supply (columns 5 and 6). This suggests a rather tight relationship between population and the number of households and rental apartment units. (Charts 6 through 9 plot the metro area data on apartment fundamentals and migration; the size of the bubble corresponds to the population of the metro area in 2010. Regression results are summarized in the blue box.)

Office

Table 3 shows the results of weighted regressions of the same measures of performance for office markets. Results are similar, although generally not as strong as for the apartment sector (there was a stronger impact on vacancy rates, however). Higher rates of migration were associated with larger rent increases for office space (column 1), larger decreases in vacancy rates (column 2), higher price increases for office buildings (column 3), higher growth of NOI (column 4), more demand for office space (column 5) and more office space coming to market (column 6). The coefficients in the regressions were lower than the estimated coefficients in apartment regressions, but all were statistically significant. These regressions also explained much less of the variance compared to apartments. This suggests that a given amount of office space may be more flexible in

accommodating a larger or smaller workforce than a given number of apartments can house a greater or smaller number of people.

Table 2: Apartment markets and migration

VARIABLES	(1) Rent Growth	(2) Vacancy Change	(3) Price Growth	(4) NOI Growth	(5) Demand	(6) Supply
Net Migration (total, %)	0.716***	0.00540	1.167***	0.463***	1.011***	1.069***
	(0.127)	(0.0369)	(0.155)	(0.0647)	(0.321)	(0.313)
Constant	15.15***	-0.965***	48.74***	32.59***	9.974***	9.304***
	(0.443)	(0.111)	(0.791)	(0.370)	(0.762)	(0.710)
Observations	385	385	385	385	385	385
R-squared	0.181	0.000	0.152	0.114	0.202	0.198

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Office markets and migration

VARIABLES	(1) Rent Growth	(2) Vacancy Change	(3) Price Growth	(4) NOI Growth	(5) Demand	(6) Supply
Net Migration (total, %)	0.266***	-0.176***	0.390**	0.135**	0.359***	0.181***
	(0.0813)	(0.0459)	(0.157)	(0.0633)	(0.0415)	(0.0423)
Constant	8.457***	-1.196***	45.24***	22.66***	4.008***	3.047***
	(0.295)	(0.226)	(0.732)	(0.325)	(0.299)	(0.225)
Observations	385	385	385	385	385	385
R-squared	0.041	0.056	0.019	0.013	0.138	0.055

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[Note: These are preliminary results, and further analysis is underway.]

Conclusion

High levels of apartment and office construction in many cities have raised concerns about overbuilding, which could have a negative impact on prices and rents in the near future. This paper demonstrates that migration patterns respond to the composition according to professions of the local job market, and that more rapid population growth due to migration tends to result in higher rent growth, higher property prices, and higher NOI growth, even as supply increases.

In particular, the relative proportions of different professions with high or low requirements for specialized skills in a local job market can explain a significant amount of migration patterns to that metro area. These migration patterns in turn can anticipate future conditions for commercial real estate markets. High-skill occupations in industries experiencing growth are associated with attracting more workers into the local job market. Growth in the local population fuels demand for

commercial real estate either through housing or office space. These effects could mean stronger rent and price growth, which increases returns for landlords. Examining migration patterns helps illuminate the different stories of metro areas and what is happening in their local economy.

Citations

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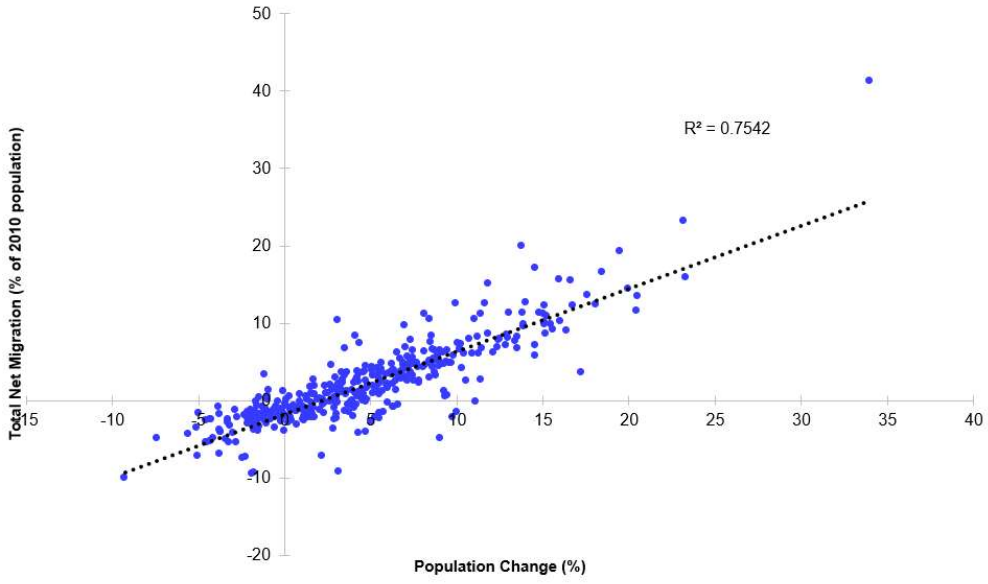
Chart 1: Population Change vs. Migration 2010-2017

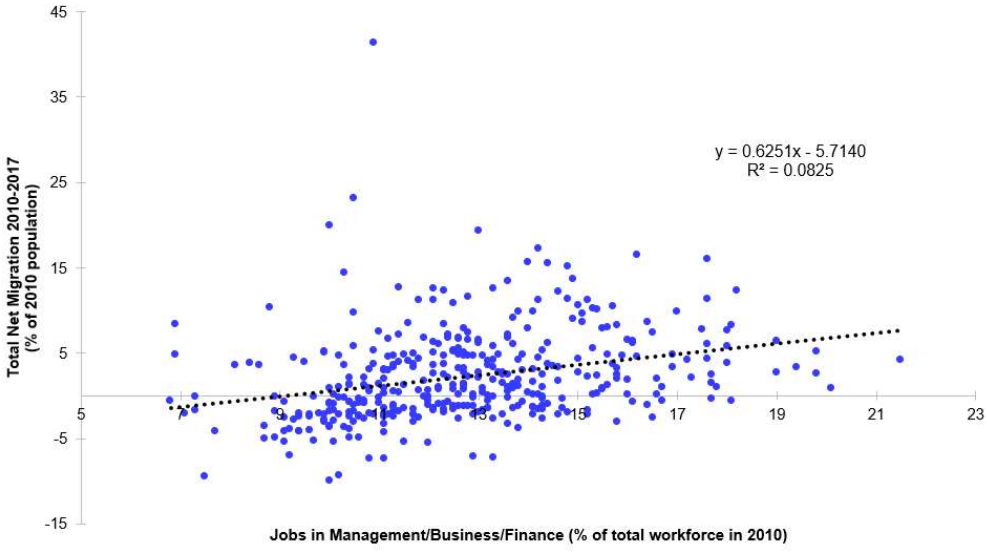
Population growth is highly correlated with migration patterns.



Nareit. Source: American Community Survey, Nareit

Chart 2: Management/Business/Finance Occupations

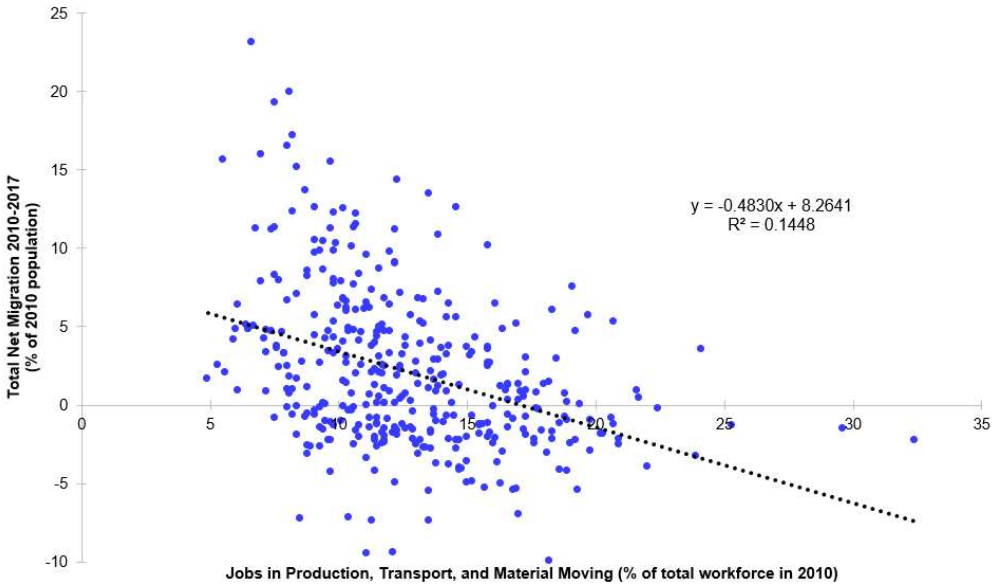
Metro areas with a higher percent of their workforce in management had higher net migration.



Nareit. Source: American Community Survey, Nareit

Chart 3: Production/Transport and Migration

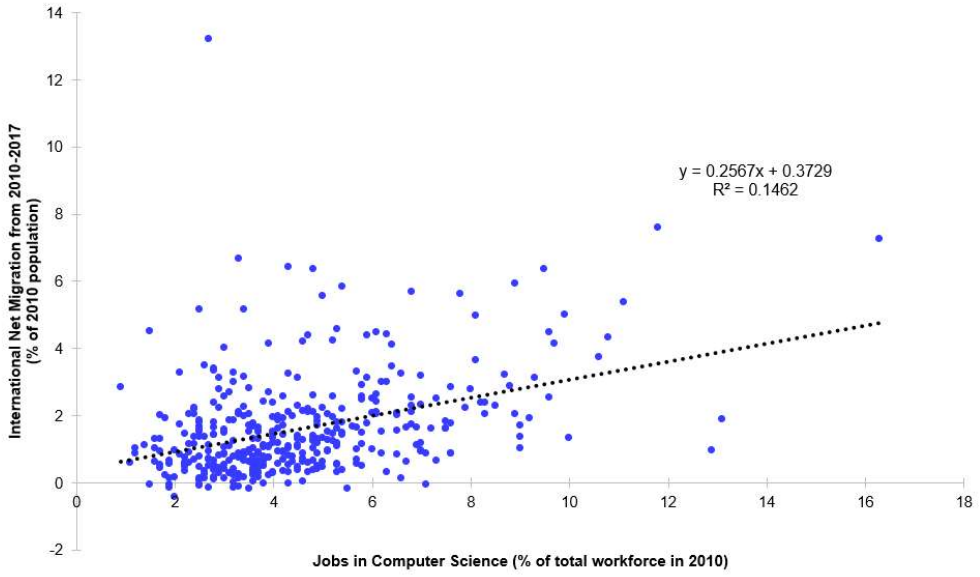
Metros with higher rates of production jobs have lower net migration.



Nareit. Source: American Community Survey, Nareit

Chart 4: International Migration & Computer Science

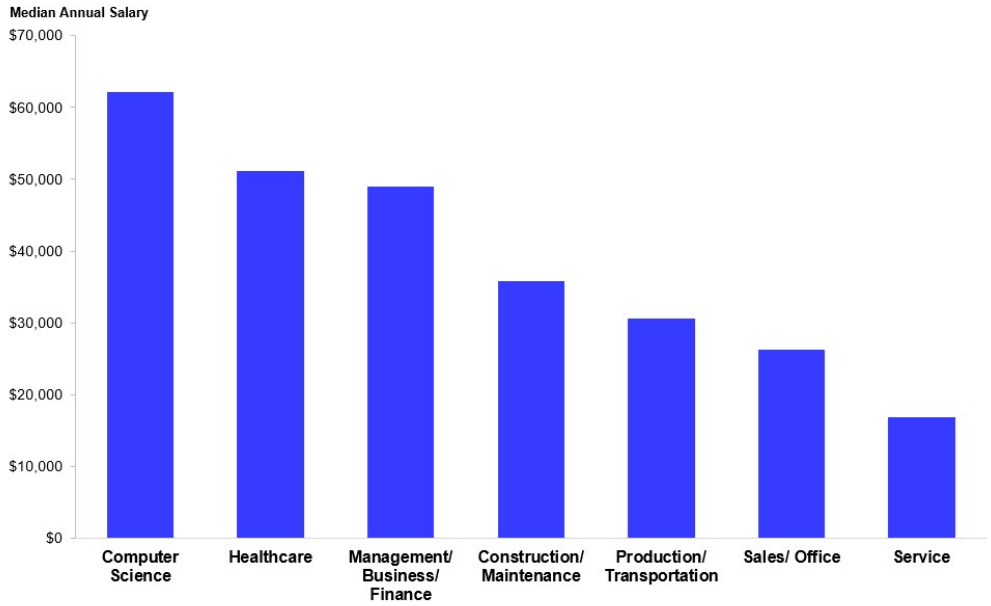
Metros with more jobs in computer science had more international migration.



Nareit. Source: American Community Survey, Nareit

Chart 5: Wages by Occupation

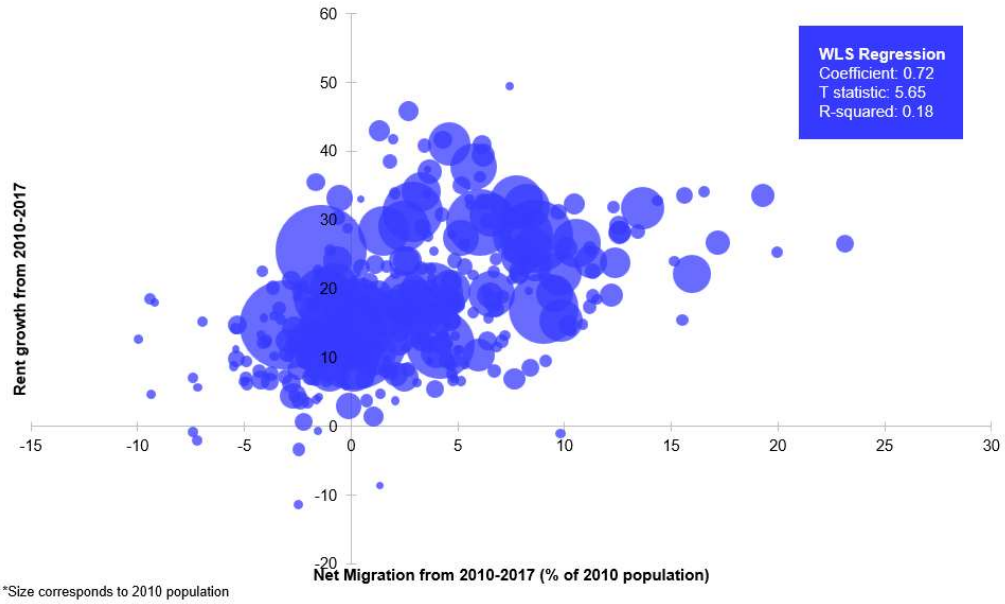
Computer science, healthcare, and business positions tend to have higher salaries.



Nareit. Source: American Community Survey, Nareit

Chart 6: Rent Growth and Migration by Metro Area*

Places with more migration experienced larger increases in rents.

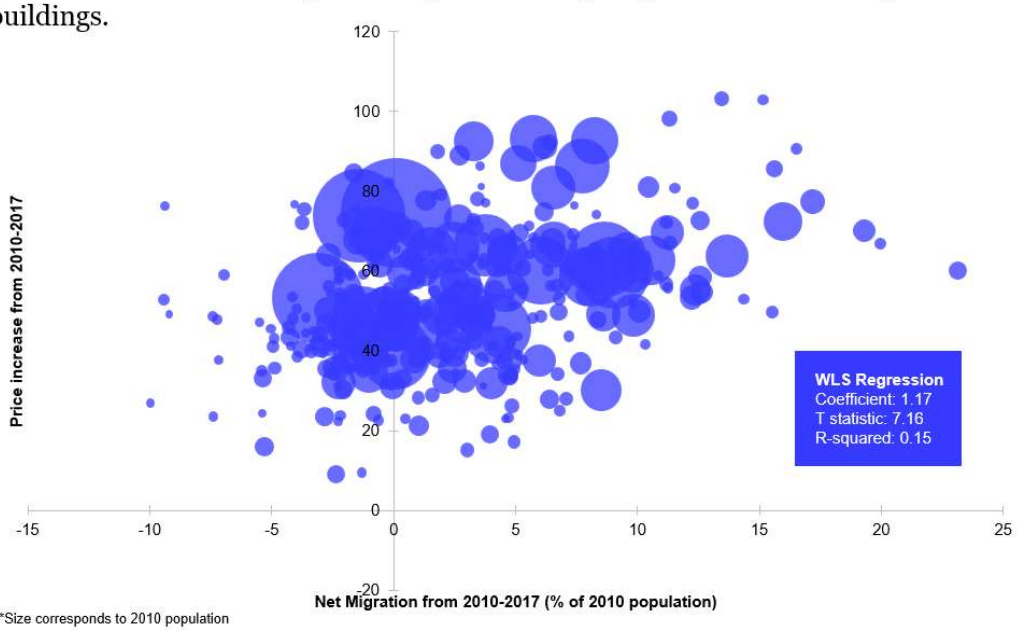


*Size corresponds to 2010 population

Nareit. Source: American Community Survey, CoStar, Nareit

Chart 7: Price Growth and Migration*

Metro areas with more migration experienced higher price increases for apartment buildings.

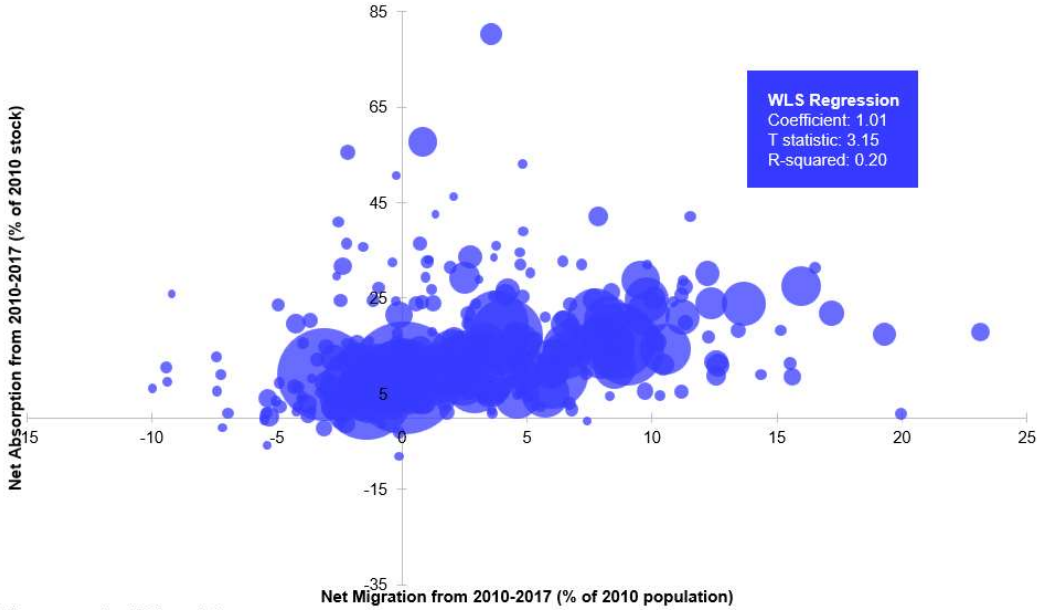


*Size corresponds to 2010 population

Nareit. Source: American Community Survey, CoStar, Nareit

Chart 8: Net Absorption and Migration*

Metros with more migration had more demand for apartments.

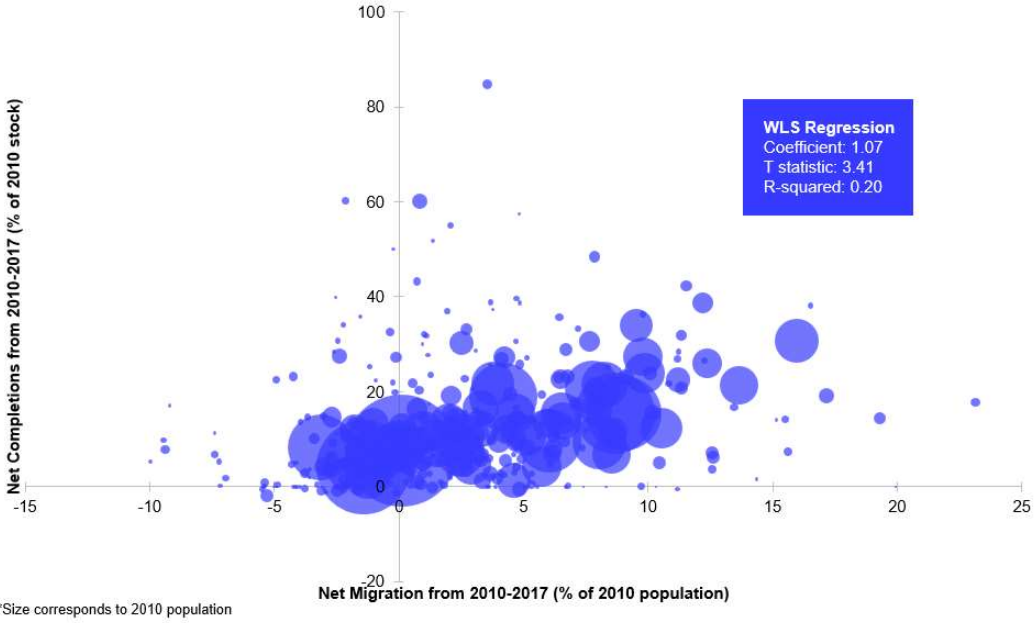


*Size corresponds to 2010 population

Nareit. Source: American Community Survey, CoStar, Nareit

Chart 9: Completions and Migration*

Metro areas with higher net migration also had higher rates of apartment supply.



*Size corresponds to 2010 population

Nareit. Source: American Community Survey, CoStar, Nareit