CITY OF ORANGE

REGIONAL INTELLIGENCE REPORT

April 2022

ABOUT BEACON ECONOMICS

Founded in 2007, Beacon Economics, an LLC and certified Small Business Enterprise with the state of California, is an independent research and consulting firm dedicated to delivering accurate, insightful, and objectively based economic analysis. Employing unique proprietary models, vast databases, and sophisticated data processing, the company's specialized practice areas include sustainable growth and development, real estate market analysis, economic forecasting, industry analysis, economic policy analysis, and economic impact studies. Beacon Economics equips its clients with the data and analysis they need to understand the significance of on-the-ground realities and to make informed business and policy decisions.

PRACTICE AREAS

Economic, Fiscal, and Social Impact Analysis

Economic and Revenue Forecasting

Sustainable Growth and Development

Regional and Sub-Regional Analysis

Housing, Land Use, and Real Estate Advisory

Litigation Support and Expert Testimony

EXPERTISE IN ECONOMIC IMPACT ANALYSIS

Since 2011, Beacon Economics has conducted multiple comprehensive analyses that have provided reliable and quantifiable data on the economic impact of various industries and organizations, including universities and higher education institutions such as USC, UCLA, Cal State Pomona, and Loyola Marymount. Analyses evaluate major economic impacts associated with these entities and their fiscal impact on national, state, and local governments. They also incorporate a comprehensive assessment of the social and qualitative impacts associated with these institutions. By combining sampling methods, financial data, surveys, and other available economic resources with current frameworks for studying economic impacts, Beacon Economics estimates the amount of economic activity generated in the local and broader economy by calculating the spending of entities and other participants in the affected region.

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SCOPE

This report is divided into two sections. The first will compare economic trends in the City of Orange and Orange County before and after the Great Recession. It will focus on the changes in employment, labor force, and housing markets from before the recession up until the most recent data became available. Additionally, it will compare city-specific data to broader trends in the State of California. The second section will analyze and compare the impact of the Great Recession on the City of Orange with impacts on similar cities without a university. This will comprise two segments, the first compares employment growth and unemployment rate fluctuations, the second examines housing valuations.

OVERVIEW

Located in the heart of California's Orange County, the City of Orange is characterized by its historic architecture, diverse population, and acclaimed institutions. Chapman University represents all three aspects of what makes the City of Orange unique: SoCal style buildings dating back as far as 1905, a highly diverse student body, and a successful institute of learning that has produced leading research since it was established in 1861. Understanding City of Orange economic trends is important. Historic responses to events like the Great Recession can inform the city and its university's response to current and future upheavals, such as the volatile post-COVID economy.

Part One: Regional Economic Trends analyzes 20-year trends in Orange County employment, labor force, and City of Orange employment and housing relative to changes in California over the same period.

Part Two: Peer City Comparison focuses on how the Great Recession impacted the City of Orange, home to Chapman University, relative to similar 'peer cities' without a notable secondary education institution, and what this means for the City of Orange in the event of a future recession.

Part one recognizes that, over the last 20 years, Orange County has had tighter labor markets and slightly slower economic growth than the state of California. The Education and Health Care sector has seen the largest employment growth in Orange County both absolutely and relative to the state. The City of Orange has seen higher job growth than the county and experienced larger housing price growth and lower relative housing sales than the state.

Part two identifies peer cities using standard annual economic and demographic indicators, including median home prices, populations, median household incomes, unemployment rates, and income inequality (as measured by the Gini Coefficient). City of Orange peer cities without a significant community college, four-year college, or university include Anaheim, Burbank, Corona, Downey, and Sunnyvale. During the Great Recession, the City of Orange, home to Chapman University, outperformed all peer cities without a notable higher education establishment in various economic respects. This suggests that the City of Orange may be comparatively well-prepared to withstand future economic downturns.

PART ONE: REGIONAL ECONOMIC TRENDS

REGIONAL EMPLOYMENT AND LABOR FORCE

The City of Orange has seen consistent employment growth over the last 20 years and has outperformed Orange County for job growth over the same period. In 2002, it had 88,389 jobs within city boundaries. According to the most recent Census Bureau data from 2019, that figure rose 34.4% to 118,774 jobs. Orange County saw just 19.3% job growth over the same period. The city also outperformed Orange County in its recovery from the Great Recession. In 2011, for example, the City of Orange saw a 6.9% increase in local jobs compared to a 1.0% increase in Orange County. The most striking disparity between job growth in the City of Orange and in Orange County occurred between 2011 and 2015. Over those four years, the city saw jobs increase by 25.4% compared to just 9.0% in the county.
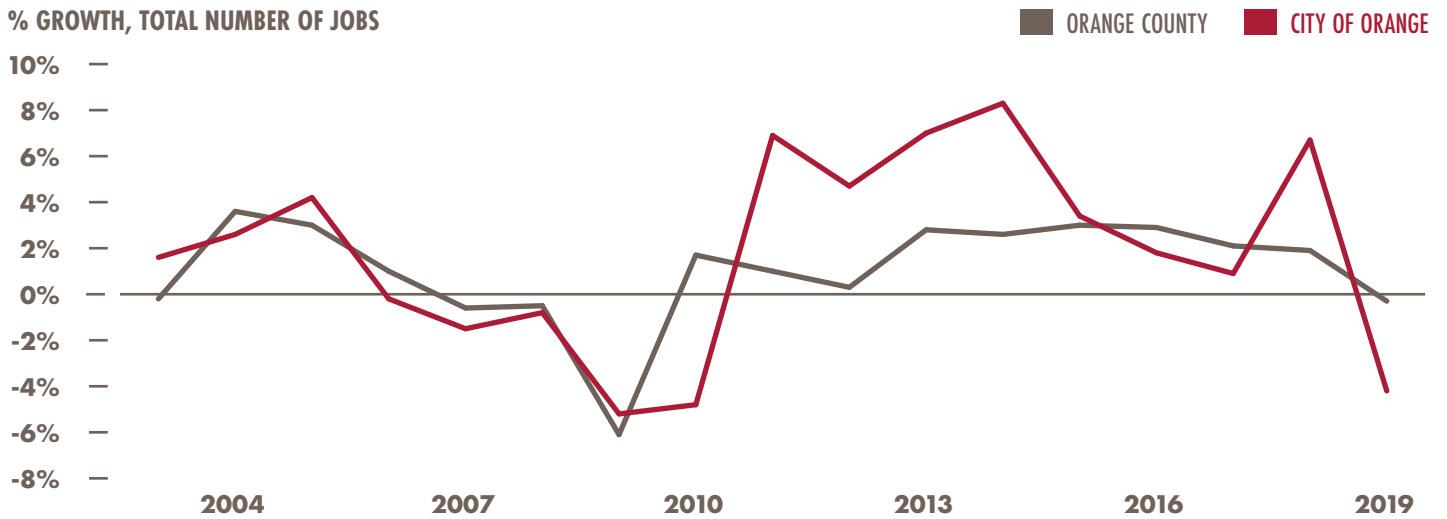
Total Number of Jobs: City of Orange

TOTAL NUMBER OF JOBS
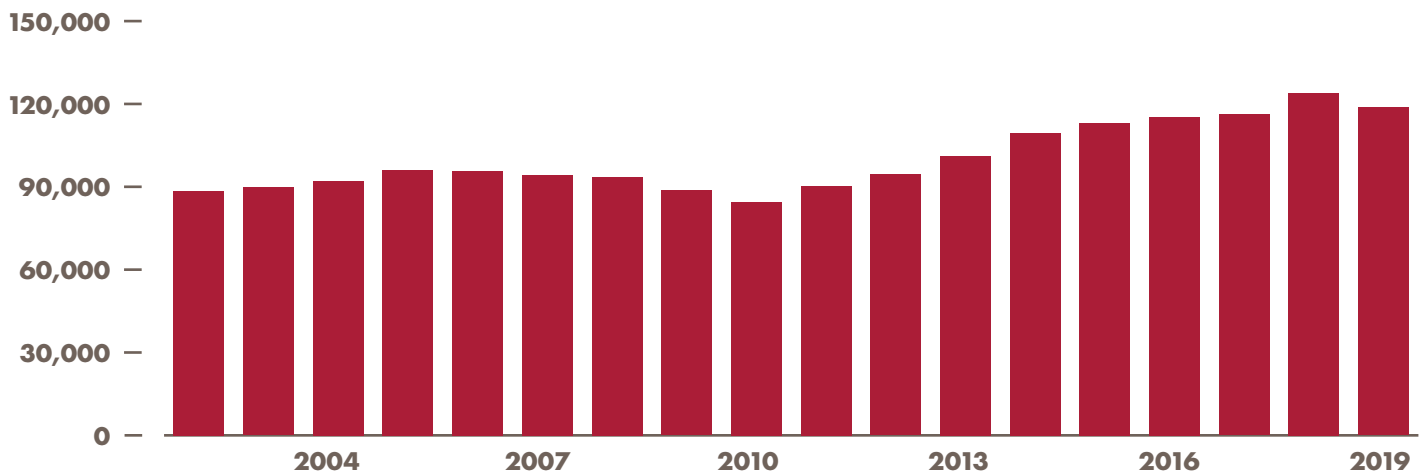
Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics (LEHD). Analysis by Beacon Economics.
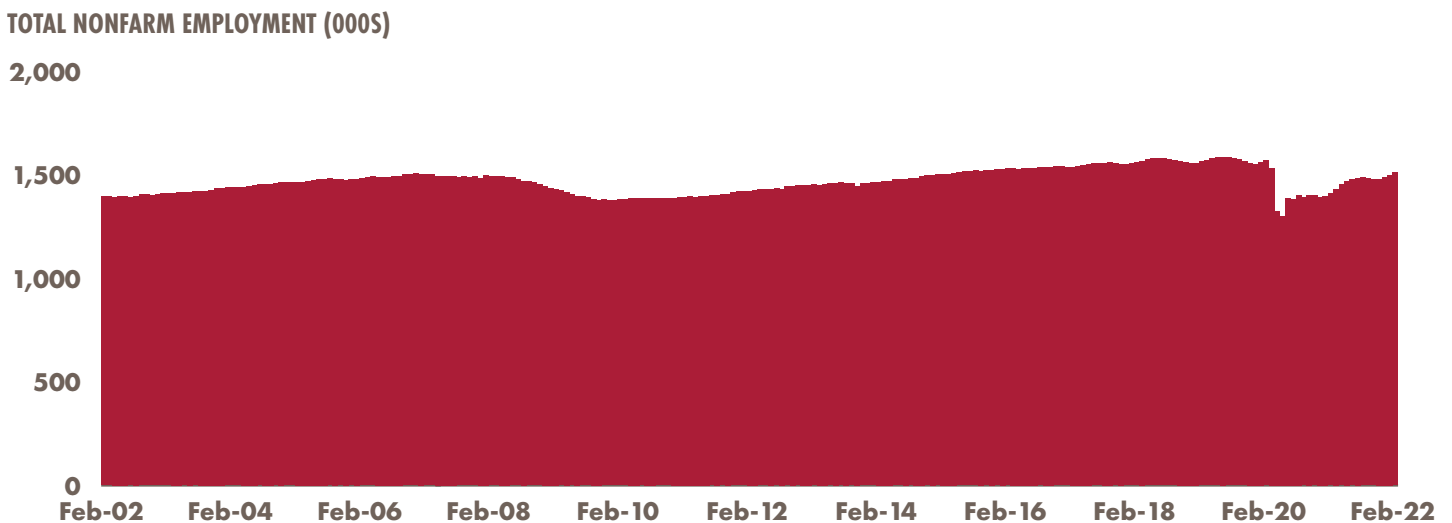
Growth in Total Number of Jobs

% GROWTH, TOTAL NUMBER OF JOBS

Compared to figures for California overall, labor markets in both the City of Orange and in Orange County have underperformed slightly over the last 20 years. From February 2002 to February 2022, Orange County saw an 8.4% increase in total nonfarm employment compared to a 12.4% increase in California. Orange County employment has also been more vulnerable to macroeconomic forces over the last 20 years. Both the Great Recession and the COVID-19 pandemic had more serious effects in Orange County than in California. During the Great Recession, which lasted from December 2007 to June 2009, Orange County saw nonfarm employment fall by 85,700 jobs, a -5.8% change, while the state saw -4.6% employment growth over the same period.

## Orange County Total Nonfarm Employment

TOTAL NONFARM EMPLOYMENT (000S)

Much of the discrepancy between local and state employment increases in Orange County is due to differing labor force growth rates. Over the last 20 years of data, Orange County saw a 6.9% increase in civilian labor forces, compared to a 10.8% increase for the state. In general, Orange County has a tighter labor market than California overall. Because of this, Orange County has had a lower unemployment rate than the state for all but a handful of months over the last 20 years of data. As of February 2022, Orange County has a 4.0% unemployment rate compared to a 5.4% rate for California.

Unemployment Rate

UNEMPLOYMENT RATE (%)

CALIFORNIA   CITY OF ORANGE

Indexed Labor Force

LABOR FORCE, INDEXED AT 100
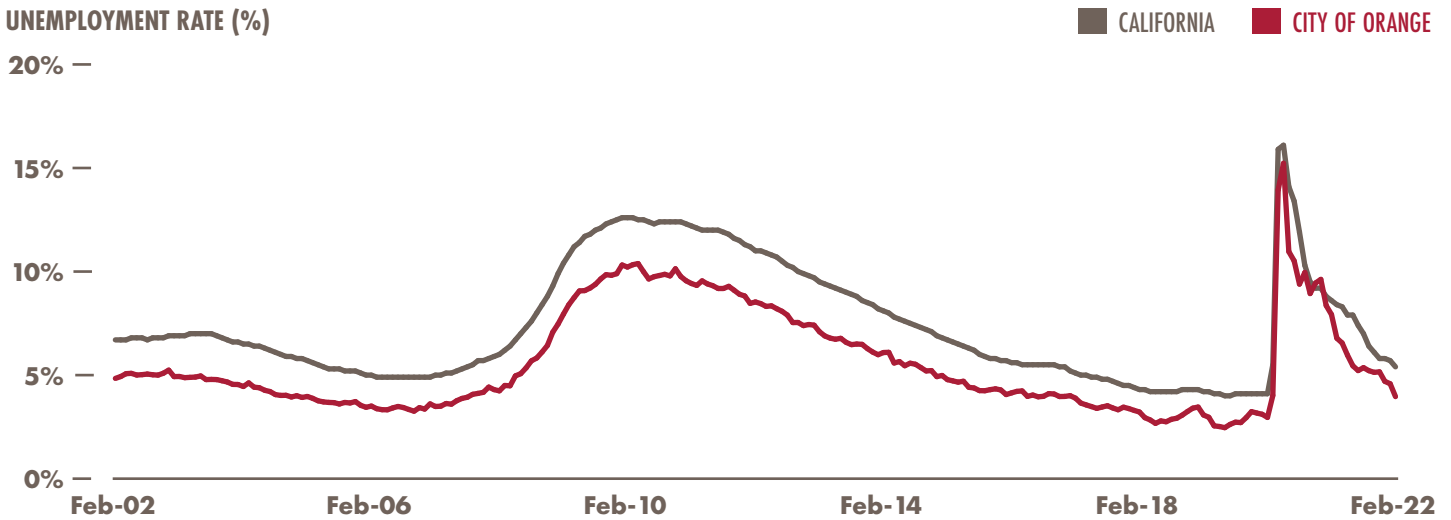
CALIFORNIA   CITY OF ORANGE
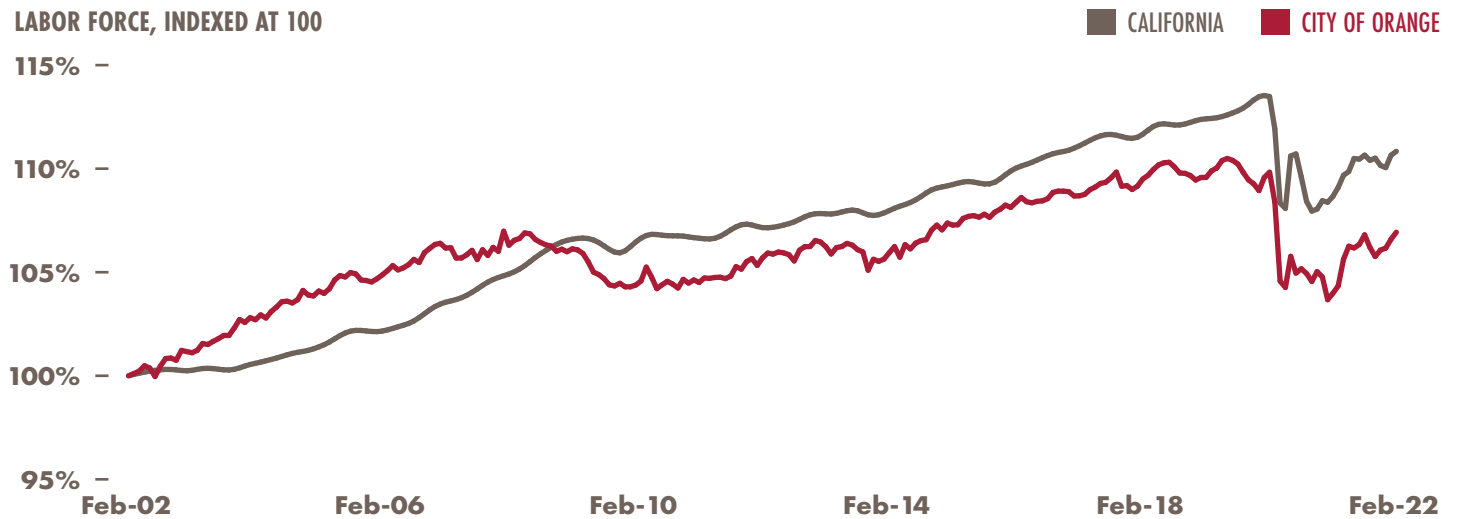
Source: California Employment Development Department (EDD). Analysis by Beacon Economics.

Orange County outperformed the California unemployment rate during the Great Recession but took a huge hit to its labor force over the same period. While Orange County rose by just 4.7 percentage points relative to 5.9 for California between December 2007 and June 2009, its labor force fell by -0.9% against a 1.7% increase for California. County unemployment rates remained low because many residents left the labor force during that six-month period.

Over the last 20 years, Orange County has seen a 16.1% increase in total nonfarm employment, raising payrolls to over 1.6 million workers. This growth is slightly slower than the state, which saw a 19.0% payroll increase over the same period.

Orange County has significantly outperformed the state in several industries. From February 2002 to February 2022, the county gained 122,800 Education and Health Care jobs (+102.5%), 24,100 Construction jobs (+30.3%), 34,400 Admin Support jobs (+29.5), and 5,200 Financial Activities jobs (+4.8%), while losing just 2,700 jobs in Management (-6.9%). In terms of payroll growth, these sectors all outperformed the state by at least five percent points. Chapman University contributed significantly to the massive increase in Education and Health Care employment with a full-time faculty of 216 in the fall of 2000 expanding to 544 by fall 2020 (+151.9%).

Conversely, over the last 20 years California has outpaced Orange County in many industries, including Professional, Science, and Technology; Retail Trade; and Wholesale Trade. Most notably, the Bay Area tech boom has led to a 16.2% statewide increase in Information jobs compared to a staggering 29.9% decrease in Orange County.

Industry Employment: Orange County (OC)

| Industry	Feb 2022 OC Employment (000s)	OC 20-Yr Absolute Gr. (000s)	OC 20-Yr % Growth (%)	CA 20-Yr % Growth (%)
Education/Health	242.7	122.8	102.5	77.4
Prof Sci and Tech	136.3	41.4	43.7	50.7
Leisure and Hospitality	208.1	53.8	34.9	35.3
Construction	103.7	24.1	30.3	17.3
Admin Support	151.2	34.4	29.5	24.1
Financial Activities	114.0	5.2	4.8	-0.9
Government	159.0	4.6	3.0	3.2
Retail Trade	144.9	-5.2	-3.5	4.3
Wholesale Trade	75.9	-4.1	-5.2	2.0
Management	36.1	-2.7	-6.9	-15.6
Manufacturing	149.3	-46.2	-23.6	-22.1
Information	24.7	-10.5	-29.9	16.2
Total Nonfarm	**1,628.2**	**225.2**	**16.1**	**19.0**

Source: California Employment Development Department. Analysis by Beacon Economics.

RESIDENTIAL REAL ESTATE

The housing market has been a pillar of the City of Orange economy over the last 20 years. Median existing single-family house prices have nearly tripled in two decades from around $325,000 in the fourth quarter of 2001 to $944,000 in the fourth quarter of 2021. Compared to California, the City of Orange has had both a larger absolute median price increase

($618,000 vs. $428,000) and a larger percent increase (+190.0% vs +186.8%) in the last 20 years. The city has also seen slower sales than California, selling 18.1% fewer homes in the fourth quarter of 2021 than in the fourth quarter of 2001 compared to a 3.7% decrease for California.

Prices

CALIFORNIA   CITY OF ORANGE
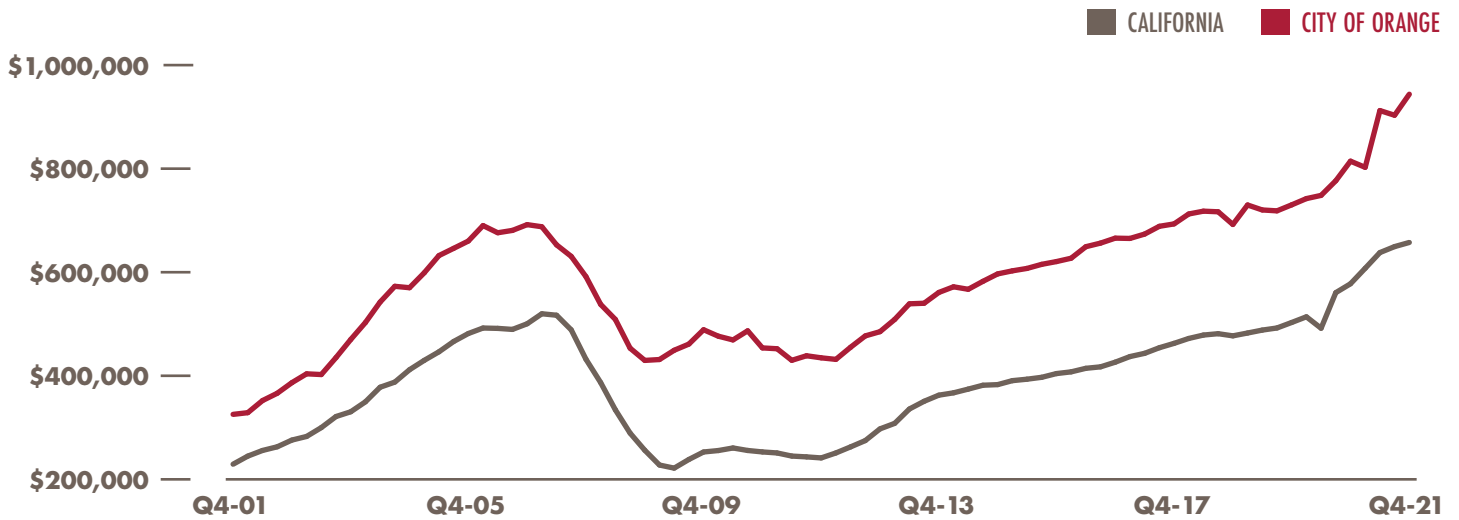
Indexed Home Sales

SA HOME SALES, INDEXED AT 100

CALIFORNIA   CITY OF ORANGE
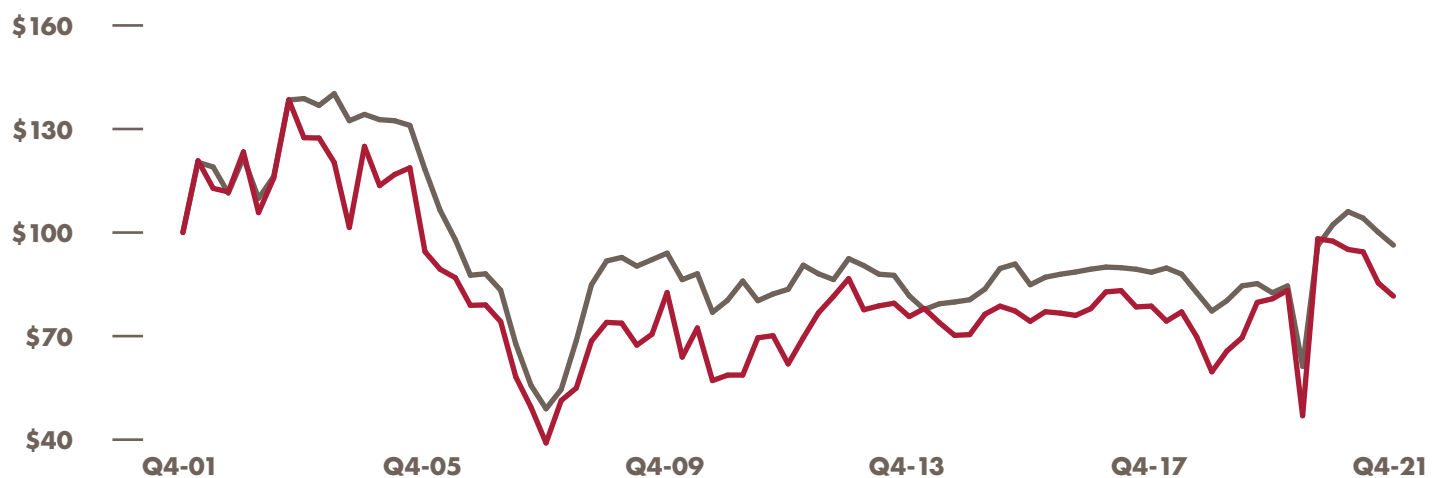
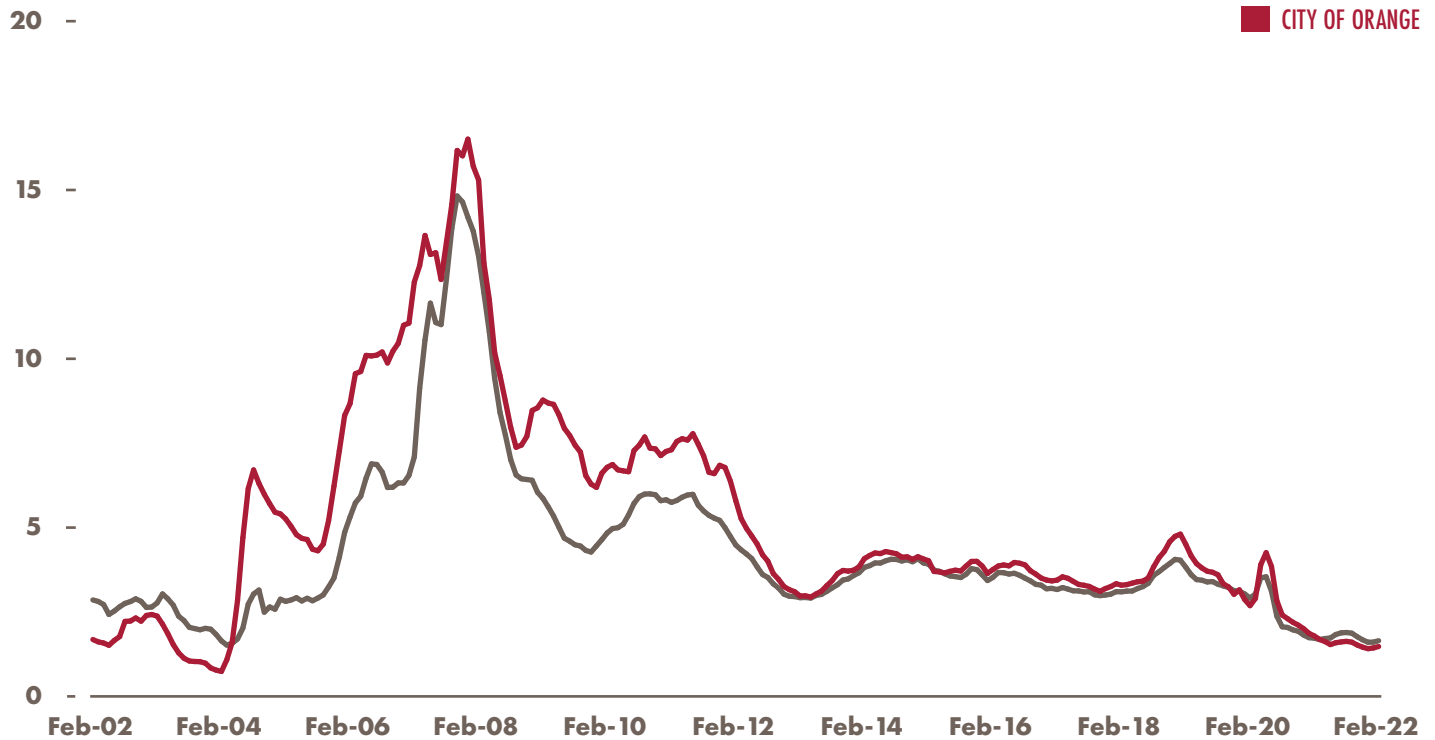Source: CoreLogic. Analysis by Beacon Economics.

Recent events have exacerbated high housing prices. The COVID-19 pandemic led to a series of price pressures, including record government stimulus, minuscule mortgage rates, increased work-from-home opportunities, massive labor force hits, and global supply issues. These factors contributed to both increased housing demand and decreased housing supply. With demand skyrocketing, existing single-family home sales in the City of Orange are at levels not seen since before the Great Recession.

While economic stimulus and low interest rates have increased the demand for housing in Orange County, supply has not risen to meet that demand. In February 2022, the county had a measly 1.5 months of housing inventory. For context, a healthy U.S. housing market typically has four to five months of housing inventory[1]. By this metric, Orange County has seldom had a healthy housing market since early 2012. With supply so low, it will take years for builders – if they build at all – to catch up to continuing high demands.

Housing Inventories

**HOUSING INVENTORY (MONTHS OF SUPPLY)**

Source: California Association of Realtors (CAR). Analysis by Beacon Economics.

1   There are many tools available that define "healthy" inventory levels at approximately four to five months of supply; here is just one: https://www.redfin.com/definition/monthsof-supply

Focusing solely on the City of Orange, it becomes apparent that construction activity has fallen since the onset of the pandemic and has yet to regain the residential permit values and absolute totals seen before the Great Recession. In 2020, the city issued just 26 multifamily and 54 single-family unit construction permits. The total number of units built in 2020 is lower than in every year of the last two decades except 2012 and 2013. Permits must increase significantly to alleviate exploding housing costs and record low inventories.

City of Orange Residential Permits

NUMBER OF UNITS

TOTAL VALUE OF RESIDENTIAL PERMITS ($MILLIONS)

■ SINGLE-FAMILY UNITS
■ MULTIFAMILY UNITS
— VALUE OF RESIDENTIAL PERMITS
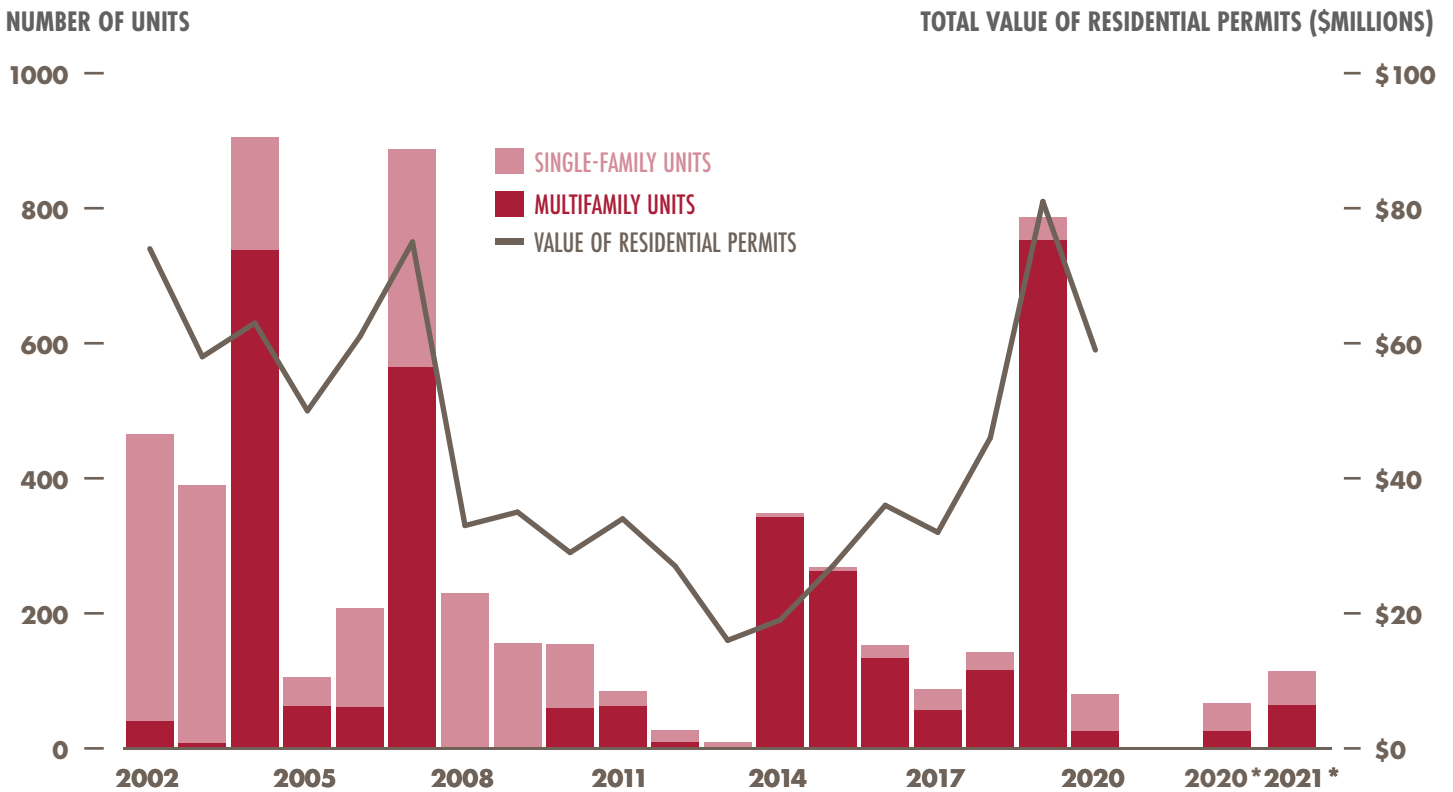
Source: Construction Industry Research Board (CIRB). Analysis by Beacon Economics.

Prices also increased in the City of Orange apartment market during the pandemic. Apartment vacancy rates rose to 4.1% from the second quarter of 2020 to the fourth quarter of 2021, a 2.0 percentage-point increase from before the pandemic. The last time City of Orange vacancy rates were this high was during and immediately after the Great Recession. Vacancy rates are lower than rates in the state overall and have been for most of the past 20 years. This is likely due to relatively limited supply and the presence of Chapman University students.

Average rents in the City of Orange have been stable over the last 20 year but have spiked since the pandemic. While the city did see a slightly larger than normal rent decrease during the Great Recession (-2.5%; the state saw rents fall -0.8% in the same period), City of Orange rents have absolutely exploded, with a 20.9% increase from the fourth quarter of 2019 to the fourth quarter of 2021. State rents increased just 4.1% over the same period. As of the most recent data, from the fourth quarter of 2021, average asking rents in the City of Orange are $2,403 compared to $2,225 for the state.

City of Orange Apartments
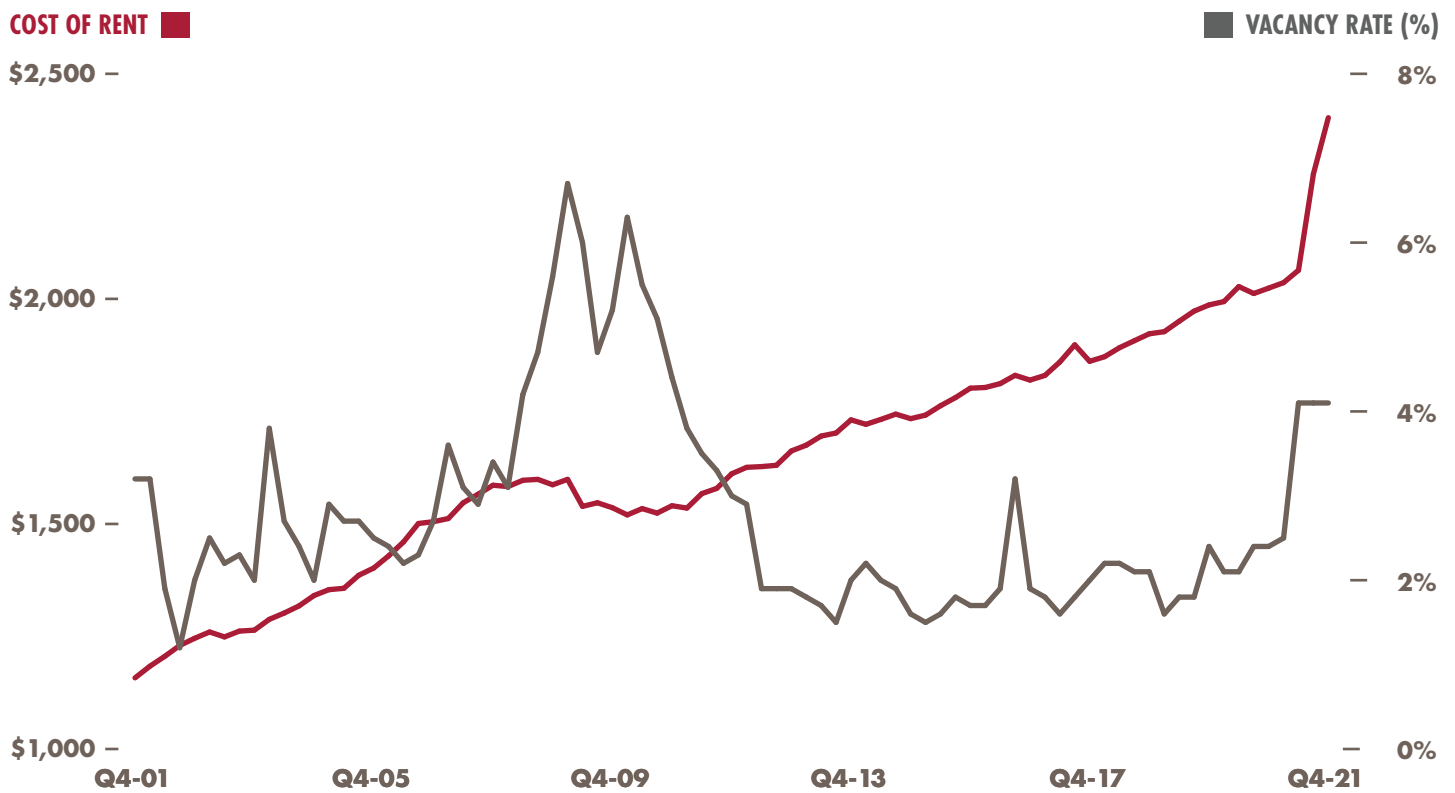
Source: REIS (Moody's Analytics). Analysis by Beacon Economics.

PART TWO: PEER CITY COMPARISON

The Great Recession, which lasted from December 2007 to June 2009, had a profound effect on the American people and the nation's economy. This recession is often referred to as a housing crash. Mass defaults by millions of people on sub-prime mortgages caused many to lose their homes and jobs as properties became worth less than the underlying loans they were bought with. Housing prices plummeted as millions defaulted on mortgages and foreclosed single-family homes saturated the market. But while housing prices nosedived across the country, local economic factors ensured that certain areas were more insulated from housing market turmoil and more general economic turmoil. Large institutions could provide some stability for housing prices, employment, and other economic indicators during unstable macroeconomic periods; this stability is of particular interest as an increasing number of economic institutions forecast a US recession within the next two years as the Federal Reserve fights alarmingly high inflation by raising interest rates. Because a recession is broadly expected, it is important to consider how the City of Orange fared during the The Great Recession, and Chapman University's role in the City's economic experience.

Chapman University has been an integral part of the City of Orange since it relocated from downtown Los Angeles to Orange in 1954. The University boasts a diverse student body, including undergraduates, graduate, and law students, across the eleven schools and colleges under the Chapman umbrella. University employment and enrollment growth is consistent over the last 25 years and across student types. Total fall 2019 enrollment of 9,850 students represented the highest enrollment in Chapman University history.[2]
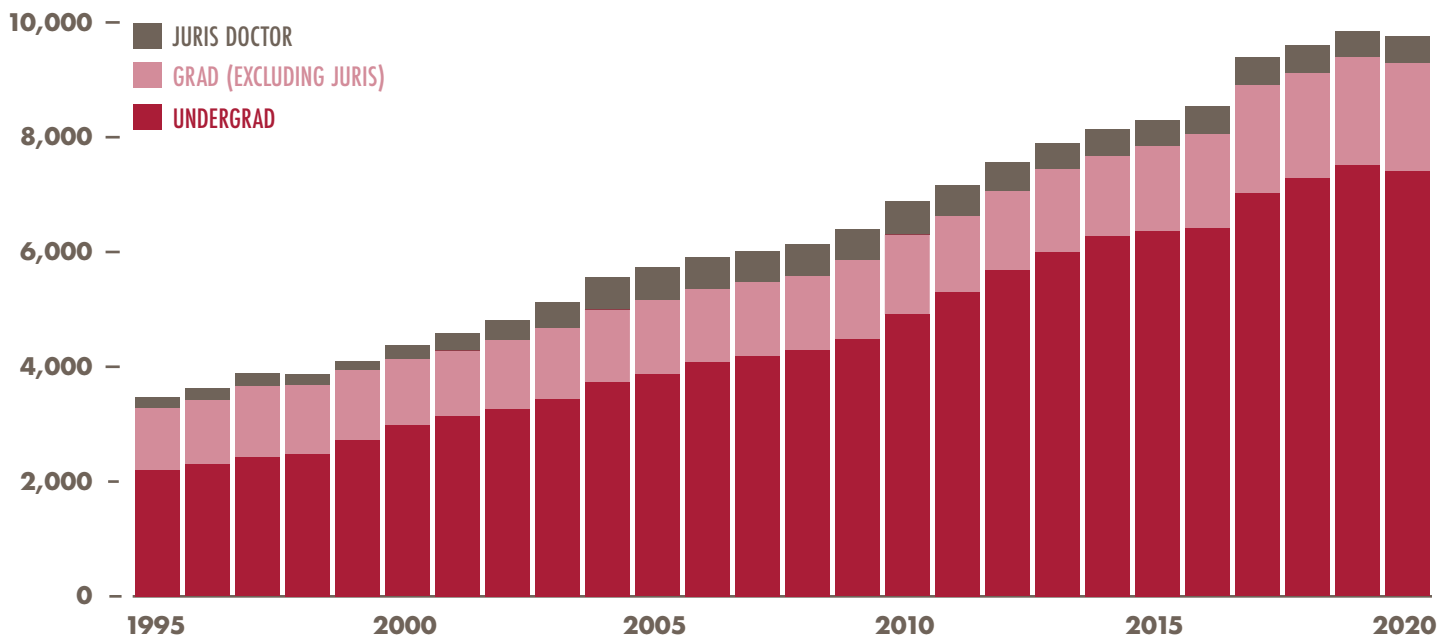
In 2006, a year prior to the recession, the City of Orange occupant population was 128,429. In the same year, Chapman University enrollment was 5,908 students, 69.1% of whom were pursuing an undergraduate degree. That number rose significantly during the recession, from 5,908 in 2006 to 6,881 in 2010, a 16.5% enrollment increase.

At private degree-seeking institutions, undergraduate students, graduate students, and law students often live in the immediate vicinity of the school they attend thanks to on-campus housing or nearby rentals. This is not the case for students at community colleges or junior colleges. Community colleges typically do not offer on-campus housing, and upwards of 99% of community colleges students commute from home[3].

2   Source: Chapman University 2020 – 2021 Fact Book
3   AACC analysis of Integrated Postsecondary Education Data System (IPEDS) 2015 Institutional Characteristics data file, U.S. Department of Education, National Center for Educational Statistics.

STUDENTS ENROLLED (FALL)

10,000 —
■ JURIS DOCTOR
■ GRAD (EXCLUDING JURIS)
■ UNDERGRAD
8,000 —

6,000 —

4,000 —

2,000 —

0 —

1995   2000   2005   2010   2015   2020

Source: Annual Chapman University Fact Books. Analysis by Beacon Economics.

Because private, four-year education institutions house a consistent number of students in a community each year, a city with a four-year college or university may have a more stable housing market. Existing literature supports this theory. A 2019 study on the impact of universities as 'opportunity hubs' found higher home prices and rents in zip codes with universities[4]. Home prices and rents have a positive correlation with the student body population of a given university, which means that larger universities correlate to higher nearby home prices and rents. Additionally, there is some evidence to support the notion that proximity to a university correlates with home price and rent appreciation.

Taxable sales data from the City of Orange, Orange County, and the State of California also supports the idea that proximity to a four-year school stabilizes (and potentially appreciates) the local economy; for the first five years after the Great Recession, from 2010 to 2014, the City of Orange saw an average annual 7.2% increase in taxable sales compared to 5.6% for Orange County and 6.2% for the state. In this same period, Chapman University enrollment expanded by a total of 18.2%.

This report evaluates how the City of Orange housing market and general economy fared during the Great Recession relative to comparable cities that do not have a four-year undergraduate college or a university. To do this, we identify median home prices, occupant populations, median household incomes, unemployment rates, and wealth inequality rates (measured by the Gini Coefficient) for all California cities in 2006. These 2006 metrics were available and statistically significant for 66 cities in the state of California, including the City of Orange. These were then standardized for each variable across all city observations. Using a Euclidian Distance Estimate for those five standardized housing and economic variables, we identified the cities most like the City of Orange prior to the 2007 recession. More information about this process is available in the **Methodology** section. Within inflation at its highest point in the last 40 years and the Federal Reserve considering additional interest rate hikes, past recession responses are useful in preparing for an increasingly probable future economic recession.

4   Rivas, Ryan, et al. "The Impact of Colleges and Hospitals to Local Real Estate Markets." Journal of Big Data, vol. 6, no. 1, 2019, https://doi.org/10.1186/s40537-019-0174-7. Accessed Apr. 2022.

20 Most Similar Cities (Peer Cities) to the City of Orange in 2006:

City (Annual Data, 2006)	Median Home Prices	Total Pop., Occupied	Median Household Income	Unemp. Rate	Wealth Inequality (Gini Index)	Standardized Euclidian Distance Similarity Score	Largest Notable Secondary Education Institution(s)
Orange	$685,234	128,429	$67,915	6.2%	0.43	-	Chapman University
Ventura	$617,150	99,969	$61,925	6.3%	0.43	0.52	Ventura College (CC)
Costa Mesa	$746,059	102,107	$61,535	5.2%	0.42	0.74	Orange Coast College (CC)
Burbank	$665,535	106,266	$55,763	5.7%	0.43	0.81	N/A
Huntington Beach	$771,365	186,795	$75,896	5.0%	0.43	0.88	Golden West College (CC)
Fullerton	$642,885	132,721	$62,124	4.5%	0.44	0.90	CS Fullerton, Fullerton (CC)
Oxnard	$594,797	169,649	$57,907	5.6%	0.41	0.94	Oxnard College (CC)
Anaheim	$607,694	340,327	$55,720	5.8%	0.44	0.99	N/A
Hayward	$579,805	127,598	$54,258	5.9%	0.43	1.01	CS EB, Chabot College (CC)
Santa Rosa	$537,594	146,850	$56,556	6.5%	0.44	1.03	Santa Rosa Junior College
Concord	$568,870	119,953	$60,221	6.2%	0.40	1.03	CS EB Concord Campus
Downey	$624,143	112,420	$60,648	7.3%	0.40	1.04	N/A
Garden Grove	$595,627	163,477	$59,149	4.6%	0.42	1.05	Coastline College (CC)
Sunnyvale	$797,175	138,570	$79,926	5.9%	0.41	1.07	N/A
Alameda	$677,514	68,609	$67,551	8.6%	0.44	1.13	College of Alameda (CC)
Chula Vista	$579,273	210,872	$56,303	5.9%	0.40	1.26	Southwestern College (CC)
Santa Clara	$702,674	107,488	$80,048	6.9%	0.39	1.27	Santa Clara University
Escondido	$512,995	135,897	$51,595	5.8%	0.42	1.35	Palomar College
Corona	$556,033	161,930	$72,162	6.6%	0.38	1.37	N/A
Santa Clarita	$599,464	156,277	$75,917	4.3%	0.39	1.49	College of the Canyons (CC)

Sources: CoreLogic, American Community Survey, Various Online Sources. Analysis by Beacon Economics.

From the list of peer cities identified through a standardized Euclidian Distance Estimate, the five most similar cities without a notable accredited degree-seeking community college, college, or university were Burbank, Anaheim, Downey, Sunnyvale, and Corona. As "peer cities" to the City of Orange, these cities are useful when analyzing the economic impact of Chapman University on economic stability during the Great Recession.

To evaluate how each city handled the Great Recession, we look at the same five variables used to identify City of Orange peer cities. Cities were evaluated for 2006 to 2010 percent growth in median home prices, total occupant populations, and median household income. Cities were also evaluated by 2006 to 2010 absolute change for unemployment rate and wealth inequality.

City of Orange vs Peer Cities Without Notable Secondary Institution, Before and After Great Recession

| City | 2006 TO 2010 % GROWTH | | | 2006 TO 2010 ABSOLUTE DIFFERENCE | | Average Rank (1 = Best, 6 = Worst) |
	Median Home Price	Total Population, Occupants	Median Household Income	Unemployment Rate	Gini Coefficient	
Orange	-31.1	3.5	13.1	2.4%	-0.015	2.0
Sunnyvale	-5.0	-3.7	10.6	4.5%	0.006	3.9
Burbank	-20.6	-4.5	20.0	4.9%	-0.002	3.2
Anaheim	-39.9	-1.5	-1.0	6.2%	-0.024	3.6
Corona	-41.1	-7.3	3.0	8.4%	-0.024	4.6
Downey	-39.2	-5.7	-1.1	2.7%	0.009	4.6

Sources: CoreLogic, American Community Survey. Analysis by Beacon Economics.

According to these standard economic indicators, the City of Orange had stronger economic growth and stability during the Great Recession than peer cities without a notable secondary education institution. However, this isn't to say that the City of Orange thrived during the Great Recession. From 2006 to 2010, median prices for existing single-family homes fell 31.1% from around $658,000 to $472,000, and unemployment rates rose from 6.2% to 8.6%. Still, relative to comparable cities, this was a stable response to the worst economic downturn of the century. The City of Orange also saw comparably strong population growth (+3.5%), household income growth (+13.1%), and wealth inequality shrinkage between 2006 and 2010. Overall, Orange fared well against qualifying peer cities during the 2007 housing crash, which bodes well for city in the event of future economic downturns.

CONCLUSION:

The City of Orange is a unique location that has excelled in some economic areas while falling short in others. Institutions like Chapman University may have provided stability to various aspects of the economy during upheavals like the Great Recession. Over the last 20 years, Orange County has underperformed relative to the state of California with regards to employment and labor force, but has had consistently lower unemployment rates. In the housing market, the City of Orange has seen massive housing price growth as inventories have recently fallen to 20-year lows. Residential housing construction was diminished by the COVID-19 pandemic, and apartment costs have exploded over the same period. The City of Orange, home to Chapman University, outperformed all peer cities without a comparable institution across various economic indicators during the Great Recession.

On the tail end of the Covid-19 pandemic, record gas prices, increasing interest rates, and the highest inflation of the millennium have brought consumer sentiment to its lowest levels since the Great Recession recovery. An increasing number of large banks, financial institutions, and central banks anticipate a recession at some point in the next handful of years as interest rates increase and economic stimulus returns to normal levels. With this in mind, it is reassuring to know that the City of Orange, home to Chapman University, fared comparatively well in the most recent period of significant national economic turmoil.

METHODOLOGY:

Peer cities are identified and evaluated using 2006 data from the U.S. Census Bureau's American Community Survey and CoreLogic. Select variables are kept for California city observations, standardized, and then plugged into the Euclidian Distance formula to establish cities most comparable to the City of Orange. Then, using standard searches for the top 20 cities (x) on the list, we ran standard internet searches including but not limited to, x college, x university, x community college, x university 2006, and x education Wiki to manually identify the top schools and universities in specific cities. Online schools and schools with less than 1,000 students, as of the most recent available data, were deemed insignificant.

The American Community Survey dataset that we primarily use is taken from an internal Beacon Economics compilation of annual California releases from the U.S. Census Bureau American Community Survey. This dataset provides city-level insights into a range of personal and household characteristics, broken down into various geographies. Generally, cities and towns of less than around 50,000 people are excluded from our internal dataset due to high error margins and are omitted from the similarity analysis. From this dataset we used four variables at the city level: Total Occupant Populations, Median Household Income, Unemployment Rates, and the Gini Coefficient. Total Occupant Populations are used rather than Total Populations since many cities had missing/incomplete Total Population in 2006 due to a lack of standardized methods for estimating unhoused populations and high error margins.

An internal Beacon Economics CoreLogic dataset, tracking city-level housing variables, is used for Median Home Prices in the peer city analysis. Specifically, this data is median home sale prices for existing single-family homes in a given geography. CoreLogic provides this data on a quarterly basis. We annualized the data for 2006 (and 2010 in the subsequent analysis) by determining the mean of the four quarterly median home prices available for each year, weighted by the number of home sales in each quarter for each unique geography.

There is a large literature that is focused exclusively on determining how two distinct observations are similar to one another. This is referred to as multidimensional scaling, and the intuition of its basic applications for our use is very simple. In fact, it's based on the Pythagorean Theorem and is frequently used in other algorithms where distance is a defining metric, like K-Nearest Neighbors. This frequently used method for determining the similarity between two observations (in this case, the City of Orange to another California city) is often referred to as a Euclidian Distance Estimate.

In a two-dimensional plane, we calculate the distance as $D1,2 = ((y2-y1)\wedge2+(x2-x1)\wedge2)\wedge(0.5)$, where y corresponds to some variable, x corresponds to some other variable, and 1 and 2 correspond to different entities. This is the equation we would have used if all we had was two cities, and two variables for each of those cities.

However, the city data we are working with is not two-dimensional. At the onset of this analysis there were hundreds of cities across the CoreLogic and ACS datasets encompassing five variables. This means we have to extend the equation above so that we're summing the squared distance between two cities for every variable in the dataset, and finally taking the square root of this distance.