

CALIFORNIA STATE UNIVERSITY,
DOMINGUEZ HILLS

SOUTH BAY ECONOMIC FORECAST & INDUSTRY OUTLOOK



2022-2023

PREPARED BY

**SOUTH BAY
ECONOMICS
INSTITUTE**

CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS

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Welcome

About California State University, Dominguez Hills

California State University, Dominguez Hills (CSUDH) was founded in 1960 and permanently relocated to Carson in 1965 in response to the Watts Rebellion and the need to increase access to higher education for Southern California residents.

For over 50 years, CSUDH has served a diverse community of learners and educators collaborating to change lives and communities for the better. CSUDH is committed to connecting its students to a higher-quality, transformative education while providing the L.A. region with a vital resource for the talent, knowledge, skills, and leadership needed to thrive today and tomorrow. Of the university's over 100,000 alumni, 65% live and work within 25 miles of campus.



Jose N. Martinez



Fynnwin Prager



Jennifer Brodmann



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Nestor Garza



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About the South Bay Economics Institute

The South Bay Economics Institute at CSUDH aims to lead the South Bay region with innovative and forward-thinking economics education and research. The Economics Institute serves the College of Business Administration and Public Policy faculty and students, as well as community stakeholders, by:

- Developing CSUDH economics curriculum and teaching while incorporating proven high-impact practices;
- Engaging our diverse student body in economic analysis projects through mentoring programs, guest speakers, and community outreach opportunities;
- Facilitating faculty development through economics research resources, grant writing deliverables, and local business and government community engagement.

A handwritten signature in black ink, appearing to read 'Jennifer Brodmann'.

Jennifer Brodmann, PhD
Faculty Researcher

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A handwritten signature in black ink, appearing to read 'Jose N. Martinez'.

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Co-Director

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Co-Director

South Bay Economics Institute
California State University, Dominguez Hills

SOUTH BAY ECONOMIC FORECAST & INDUSTRY OUTLOOK



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section 01 THE NEW NORMAL

- Is high inflation here to stay?
- What is happening in the job market?
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- Which innovations and industries will shape our region's future?
- What are the South Bay's strengths?

GEOGRAPHICAL SCOPE

In this report, the South Bay region of Los Angeles County includes the following incorporated cities and communities:

- | | | |
|-----------------|-------------------------|------------------------------|
| • Avalon | • Lennox | • Torrance |
| • Carson | • Lomita | • Harbor City/Harbor Gateway |
| • El Segundo | • Manhattan Beach | • San Pedro |
| • Gardena | • Palos Verdes Estates | • Wilmington |
| • Hawthorne | • Rancho Palos Verdes | • Rancho Dominguez |
| • Hermosa Beach | • Redondo Beach | • View Park/Windsor Hills |
| • Inglewood | • Rolling Hills | |
| • Lawndale | • Rolling Hills Estates | |



overview

The Future is Green!

Green means many things, and not least money. Much-needed major stimulus packages during the COVID-19 pandemic increased the money supply, creating inflationary pressures. Prices were already starting to increase significantly in 2021, as pent-up consumer demand was met with labor shortages and businesses keen to recoup lost revenue. At last year's forecast, we predicted that prices would calm, and how wrong we were! The invasion of Ukraine and subsequent economic sanctions against Russia placed supply constraints on oil and wheat, pushing up prices for these goods and creating substantial repercussions across the economy. In the Los Angeles Metro area year-on-year prices in summer 2021 had increased by 50% for gasoline, 20% for transportation, 18% for fuel and utilities, and 9% for food. These increases—which do not fully account for “skimpflation” or “shrinkflation,” where businesses reduce the quality of their service—have created a cost-of-living crisis, especially among already vulnerable populations that CSU Dominguez Hills serves. Softening oil prices and flat month-to-month price changes provide some hope that the tide has turned, but the short-run picture remains highly uncertain.

High prices are worrying because they often influence consumer confidence and spending, a major engine of our economy. There are already indications that the economy is entering a recession. GDP (Gross Domestic Product) has not grown for two quarters. And yet, the picture is more complicated. Consumer spending does not appear to be driving lagging growth. While consumer confidence has been declining for some time, consumer spending continued to grow in the first two quarters of 2022. Instead, the big drops are in domestic business investments (-13.5%) and non-defense government spending (-1.9%). Moreover, while businesses may be buying less stuff, they are still hiring more workers at substantial levels. Unemployment rates are back down to pre-pandemic levels. This is a remarkably quick recovery compared to the '01 and '08 recessions and helps to explain continued consumer spending.

So, while the South Bay economy is facing numerous challenges and uncertainties, we see many reasons for optimism. First, our regional economy is resilient, and demonstrated this in many ways during the pandemic. Many companies hit hard by the pandemic pivoted to providing other services. For example, restaurants offered more take-out and delivery as well as outdoor seating, meal kits and even groceries, enabling many to stay afloat. A broad diversity of regional economic sectors means that tough times for one industry are often offset by gains in others. We also have an enviable entrepreneurial culture. In normal times, L.A. County accounts for 33% of new business formations across California (far larger than its 25% population); during the pandemic, this increased to 36%!

Second, the South Bay economy remains highly competitive. As a state, our labor productivity levels have increased quicker over the past decade than all but Washington. This points to high levels of human capital—L.A. graduates more PhDs than any other region—and advanced technology in the manufacturing sector. Moreover, our freight infrastructure remains excellent in terms of ports and airports (despite having some room for improvement around rail, roads, and warehousing). We are excited to welcome Joel Perler, economic development manager of the Port of Long Beach, and David Reich, deputy executive director of Los Angeles World Airports to the South Bay Economic Forecast conference. They will both highlight the ways in which our seaports and airports are greening infrastructure and supporting shipping and logistics companies to meet environmental regulations. The Ports of Long Beach and Los Angeles are major engines for our regional economy and experienced many challenges during the COVID-19 pandemic, including supply chain uncertainties from COVID lockdowns worldwide, demand surges, historically low warehouse vacancy rates, and problems with the railroads. Thankfully, congestion has recently reduced significantly, helping to stabilize trade flows.



overview

Third, the regional economy is highly innovative. California is the number one state for venture capital investments, and L.A. County outshines other regions such as Austin, Texas, the North Carolina research triangle, and the Atlanta area in this regard. One recent success story is the growth of the cannabis industry in L.A. County. While South Bay cities have yet to issue licenses for this industry, retail stores are opening on their borders in neighboring cities and offering delivery to South Bay residents. Retail sales alone in L.A. County are now north of \$1 billion, and we estimate the cultivation market adds close to another \$1 billion in output. There is a significant opportunity for South Bay cities to increase tax revenues and undermine the still-prominent illegal cannabis market by issuing licenses and providing opportunities to local entrepreneurs.

Speaking of innovation, the South Bay region is uniquely placed to take advantage of opportunities in the green economy. California has long been a leader within the U.S. for environmental policy and green tech, and our South Bay region can benefit from President Biden's climate bill that provides infrastructure investments and subsidies for electric vehicles. Innovative South Bay companies such as Canoo—who joined us on stage three years ago—are the future of road transportation, and we are excited to welcome Coco this year, who are providing clean energy robot delivery services, as well as Odys Aviation, who offer sustainable solutions to cut air travel times in half. Climate change is a major challenge of our times, and South Bay companies are finding innovative solutions to reducing transportation emissions, a major source of greenhouse gases. All this highlights that our “green” forecast is about more than money.

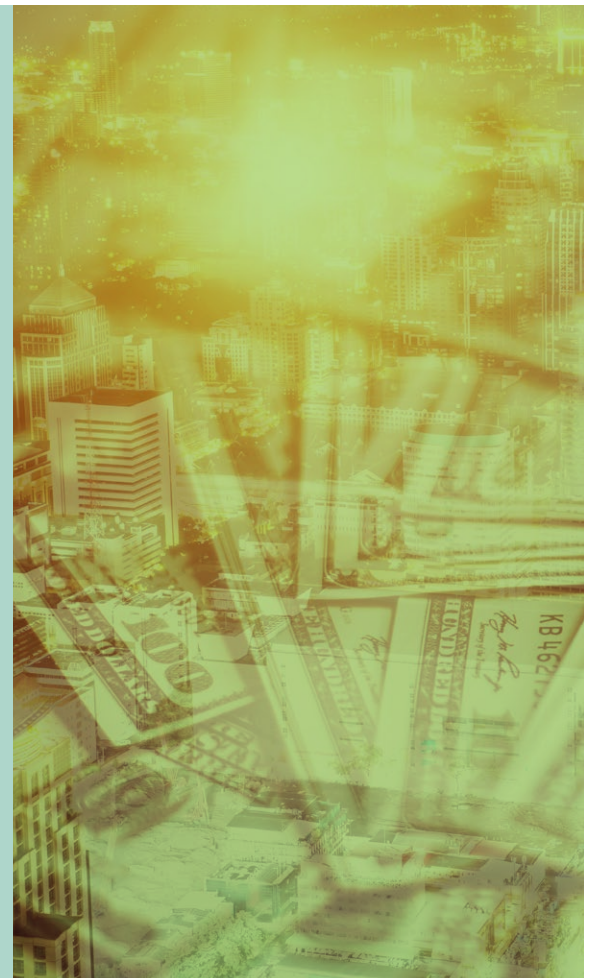
South Bay Economic Forecast Model for GDP and Unemployment

The South Bay Economic Forecast Model estimates that the GDP of our regional economy will grow by 1.4% in 2022, and slow down to a small 0.5% growth in 2023, before picking up again in 2024 to 1.7%. Similarly, unemployment will increase a little during 2023, up to 5.6% from 5.0% in 2022, before reverting to 5.1% in 2024.

GDP estimates are based on a combination of national-level forecaster averages (from the eight organizations in Table 1), national-level economic sector forecasts from U.S. Bureau of Economic Analysis, and South Bay economic sector share data from IMPLAN. These estimates account for the unique mix of economic sectors in the South Bay.

Unemployment estimates compare national and L.A. County (LAC) unemployment data. As shown in Figure 1, L.A. County unemployment is consistently higher than national unemployment, by an average of 1.8% over the period covered. We use regression analysis to account for recessionary periods and L.A. County GDP trends in the model, such that:

$$Y (\text{diff between U.S. \& LAC unemployment}) = 1.61 - 0.187*B1 (\text{LAC GDP}) + 0.792*B2 (\text{Recession Dummy})$$





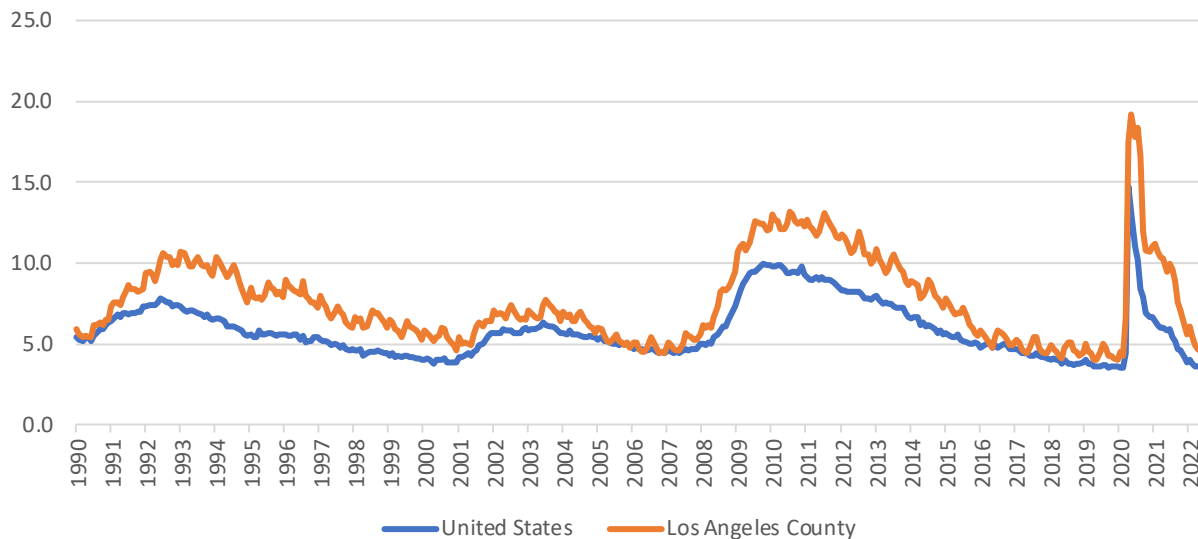
overview

TABLE 1. SOUTH BAY FORECAST AND MAJOR FORECASTER GDP AND UNEMPLOYMENT ESTIMATES, 2022-24

FORECASTER	GDP			UNEMPLOYMENT		
	2022	2023	2024	2022	2023	2024
UCLA Anderson Forecast	2.8%	2.0%	1.9%	4.0%	-	-
U.S. Congressional Budget Office	3.8%	2.8%	1.6%	3.8%	3.5%	3.7%
U.S. Federal Reserve	1.7%	1.7%	1.9%	3.7%	5.0%	4.1%
Wells Fargo	1.7%	-0.4%	-	3.6%	4.4%	-
Deloitte	-	-	-	3.7%	3.6%	3.6%
OECD	2.5%	1.2%	-	-	-	-
Fannie Mae	0.1%	-0.4%	-	3.7%	4.8%	-
SwissRe	2.0%	1.1%	-	-	-	-
Bloomberg Consensus	2.4%	1.7%	-	-	-	-
Average	2.1%	1.2%	1.8%	3.8%	4.3%	3.8%
South Bay Economic Forecast	1.4%	0.5%	1.7%	5.0%	5.6%	5.1%

Source: Most Recent Available Forecaster Reporters; Authors' Calculations

FIGURE 1. MONTHLY UNEMPLOYMENT RATE (%) FOR THE UNITED STATES AND LOS ANGELES COUNTY



Source: St. Louis Federal Reserve

section 01 THE NEW NORMAL

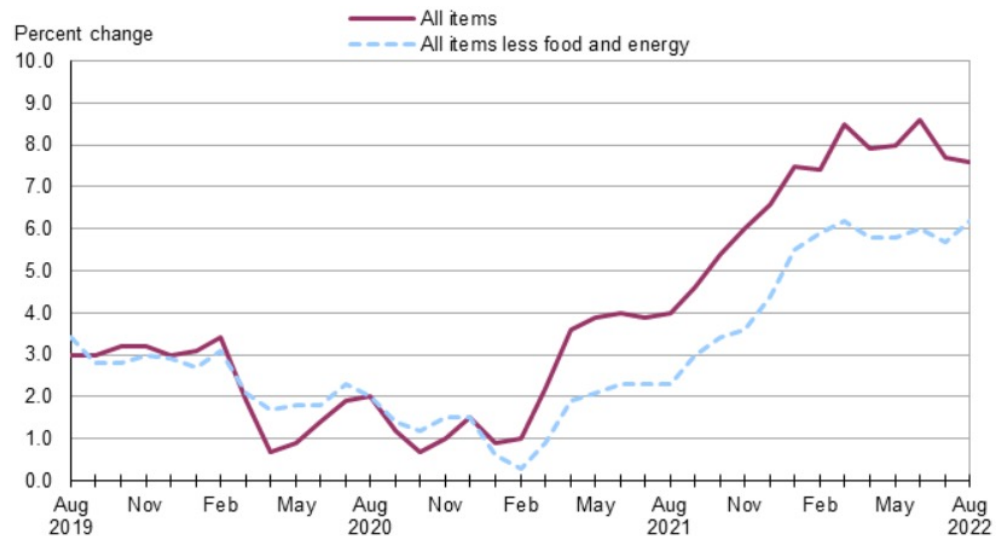
Is high inflation here to stay?

HIGHLIGHTS

- Historically high levels of inflation have put pressure on businesses and household finances.
- Year-on-year inflation remains high, but month-to-month prices have stabilized since July.
- Falling oil and gas prices have also helped to stabilize manufacturing prices.

The current high levels of uncertainty make this difficult to answer. Two major drivers – the war in Ukraine and China’s zero-COVID policy – appear likely to continue. These factors have contributed to the national Consumer Price Index (CPI) increasing by 8.3% over the past year (to August), including food prices (11.4%) and energy prices (23.8%). Figure 2 shows the percentage changes in CPI in Los Angeles, Long Beach, and Anaheim, CA from July 2019 to July 2022.

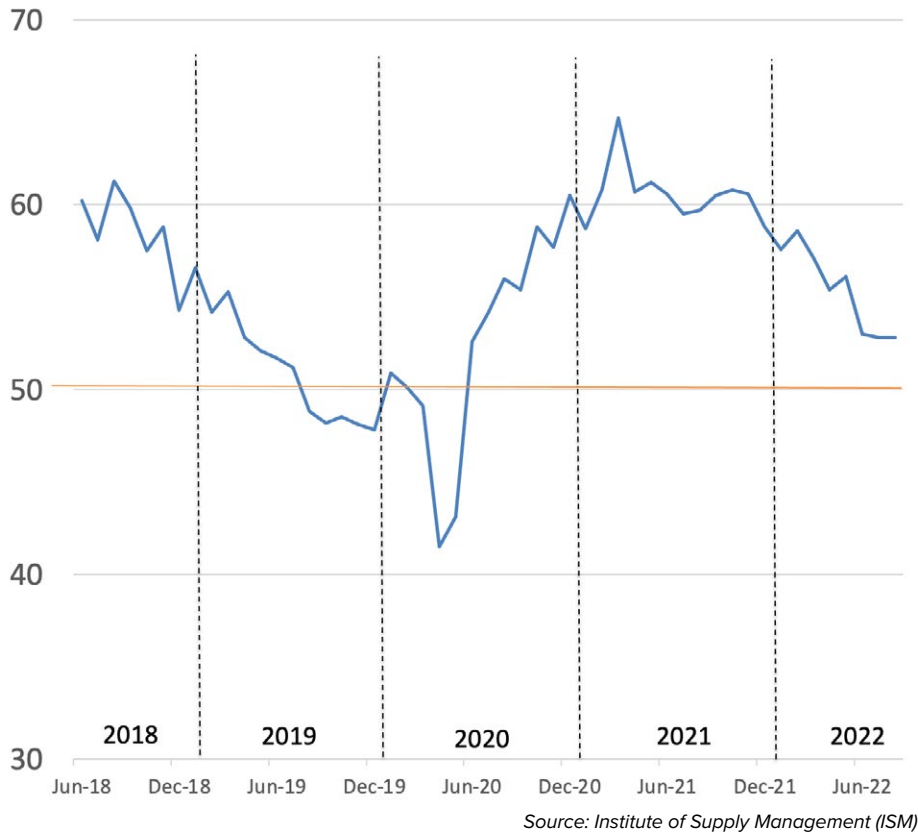
FIGURE 2. THE PERCENTAGE CHANGE IN CPI, SOUTHERN CALIFORNIA, JULY 2019-JULY 2022



Source: U.S. Bureau of Labor Statistics

More positively, however, the gap between demand and supply is narrowing. As discussed above, firms have reduced expenses and investments in anticipation of recession, leading to lower demand. As shown in Figure 3, the U.S. Manufacturing Purchasing Managers’ Index (PMI) for August 2022 was 52.8, implying that the expansion of the manufacturing sector was slowing down (50 or lower indicates contraction). Suppliers’ delivery time (one factor in the PMI) is improving, which suggests that supply shortages are softening.

FIGURE 3. U.S. MANUFACTURING PMI



Raw material prices have also declined significantly in recent months. As shown in Figure 4, purchasing managers had been reporting increased prices for the past two years, yet this figure dropped to 52.5% in August 2022, with 26.7% reported paying lower prices. The slowing price increases are due to volatility in the energy markets, softening in the copper, steel, aluminum, and corrugated metal markets, and a significant decrease in chemical demand.

FIGURE 4. THE ISM PRICE INDEX



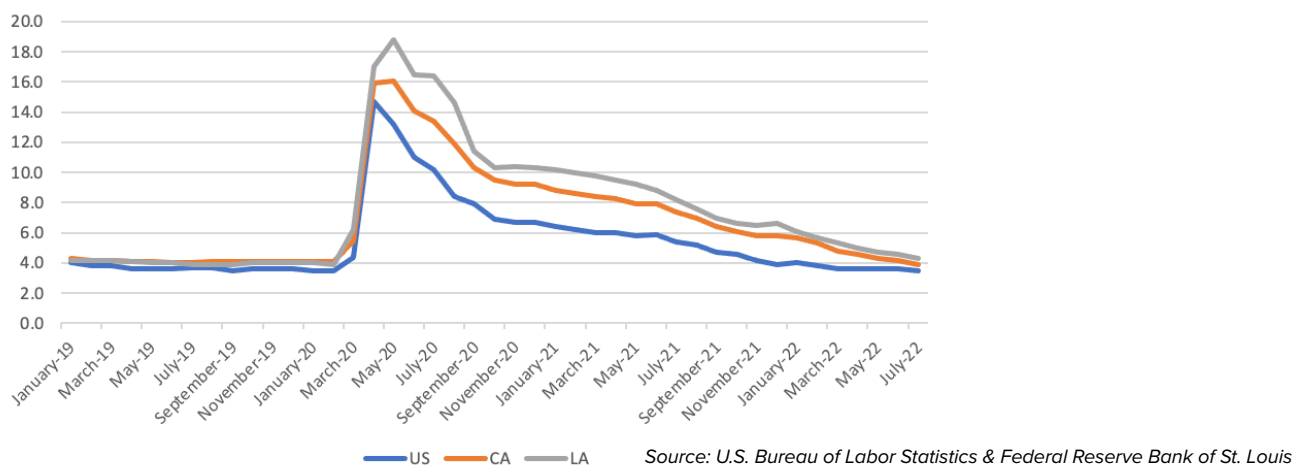
What is happening in the job market?

HIGHLIGHTS

- The regional labor market region is in good shape despite challenges.
- South Bay and LA County unemployment rates are closely related and higher than pre-pandemic levels, but Angelinos are largely back to work.
- Employment statistics point to an almost complete recovery, yet a climate of economic uncertainty prevails.

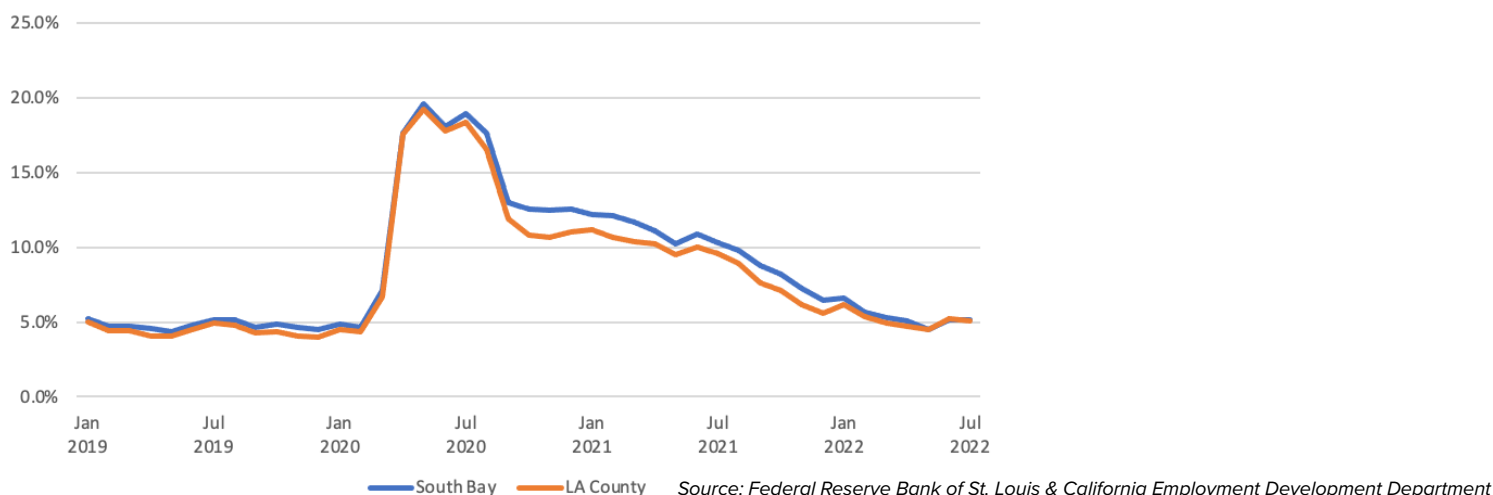
Despite severe challenges, the overall labor market in our region is in good shape. For the U.S., unemployment rates are back to pre-pandemic level, which is far ahead of where many economists forecasted in recent years. As shown in Figure 5, California and Los Angeles County unemployment rates are still slightly above their respective pre-pandemic levels, but the trends show that California is, for the most part, fully back at work.

FIGURE 5. UNEMPLOYMENT RATES, 2019-2022 (% , SEASONALLY ADJUSTED)



Overall, California's unemployment rate tends to be slightly larger than for the U.S., and this difference tends to grow larger during recessions. Given the nature of the unemployment figures, frictional versus structural unemployment, and the relatively larger exposure of California to certain industries (e.g. Leisure and Hospitality), this condition is not necessarily a surprise. A similar dynamic is observed between Los Angeles County and California. Altogether, this phenomenon explains, in part, the larger declines in employment for California and Los Angeles County due to the COVID-19 pandemic but also the relatively stronger recoveries for both.

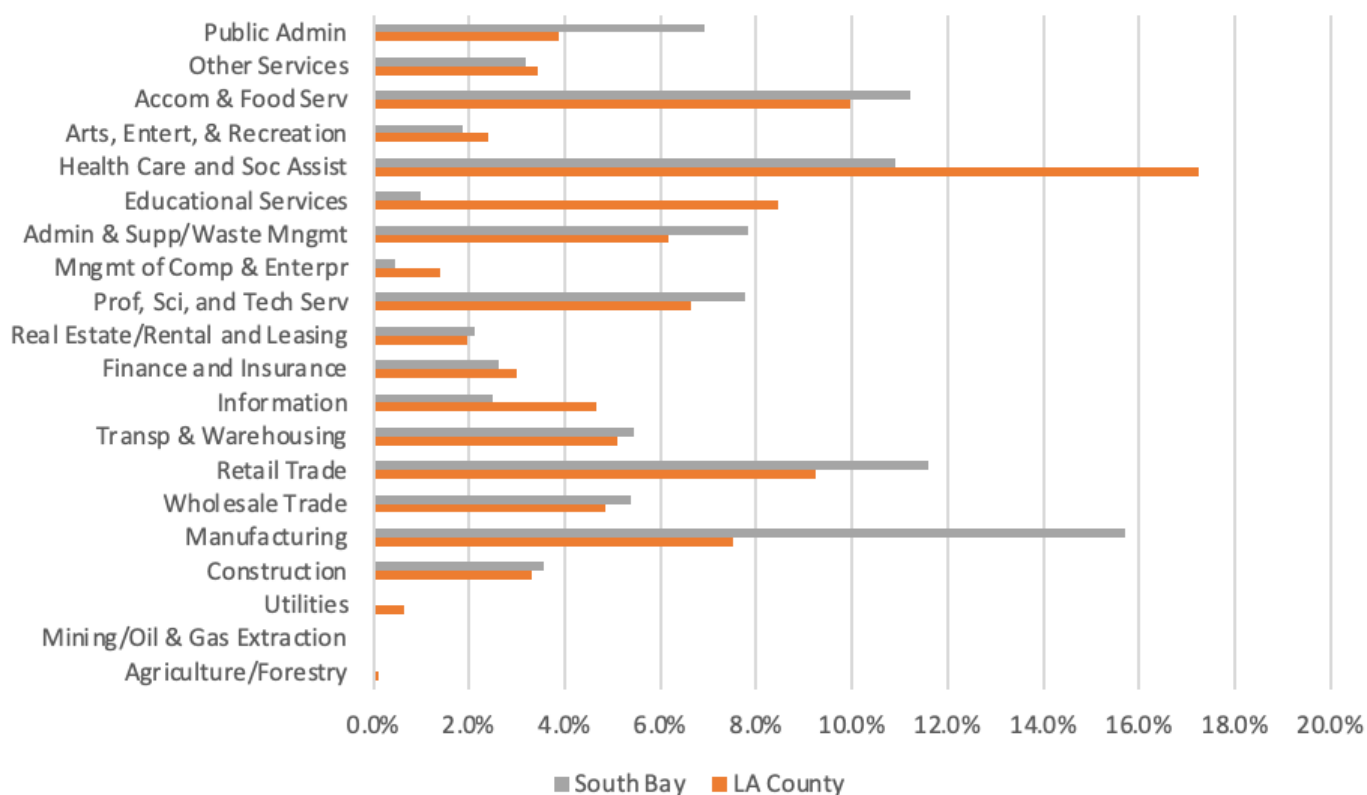
FIGURE 6. UNEMPLOYMENT RATES, L.A. COUNTY AND SOUTH BAY 2019-2022 (% , UNADJUSTED)



Zooming in to the sub-region level, as shown in Figure 6, unemployment rates in the South Bay are still slightly above the pre-pandemic levels, but it also reveals an almost full recovery. Furthermore, the South Bay continues to follow closely the unemployment conditions for Los Angeles County.

Figure 7 shows that Los Angeles County has particularly large shares of jobs in the Health Care and Social Assistance, Accommodation and Food Service, Retail Trade, and Educational Services industries. The South Bay region has large shares of jobs in the Manufacturing, Retail Trade, Accommodation and Food Service, and the Health Care and Social Assistance industries. Comparing 2021 and 2019, data shows that the most significant declines in employment were, not surprisingly, in the Arts, Entertainment, and Recreation, Accommodation and Food Services, and Other Services industries. Considering the relative exposures in these industries, the South Bay was in place to perform slightly better than Los Angeles County during the COVID-19 pandemic. However, the South Bay has a significantly higher exposure to the Manufacturing and the Administrative and Waste Services industries, which suffered also significantly large declines in employment during the COVID-19 pandemic.

FIGURE 7. INDUSTRY EMPLOYMENT AS A SHARE OF TOTAL FOR SOUTH BAY AND LA COUNTY



Source: California Employment Development Department and authors' calculations. Some data are suppressed due to confidentiality.

Even when recent employment data points to an almost complete recovery at all levels, a climate of economic uncertainty seems to prevail. Stubbornly high inflation levels, aggressive Federal Reserve responses, lingering employment uncertainties, especially for high-contact industries, supply chain disruptions (domestic and abroad), and continuing uncertainty overseas (China, Ukraine, European Union) make it hard to predict future economic conditions for our region, even in the short-term.

Are we seeing a housing market bubble?

HIGHLIGHTS

- Housing prices in South Bay cities increased 9.9% between July 2021 – July 2022, lower than 14.6% during July 2020 – July 2021
- These price increases have been fueled by the same sources than in the rest of Los Angeles metropolitan area: growing demand with a scarce supply, evidenced in lower time on market during 2020-2022 than 2018-2020.
- Higher interest rates will decrease housing demand and decelerate price growth.

House prices grew significantly during the pandemic for several reasons. Demand stayed high as historically low interest rates encouraged more borrowing to upgrade or buy new property. Supply remained low as lumber and construction material shortages during the pandemic increased prices and slowed down construction projects. Moreover, easing of regulations on mortgage payments allowed homeowners to postpone payments without the fear of foreclosure.

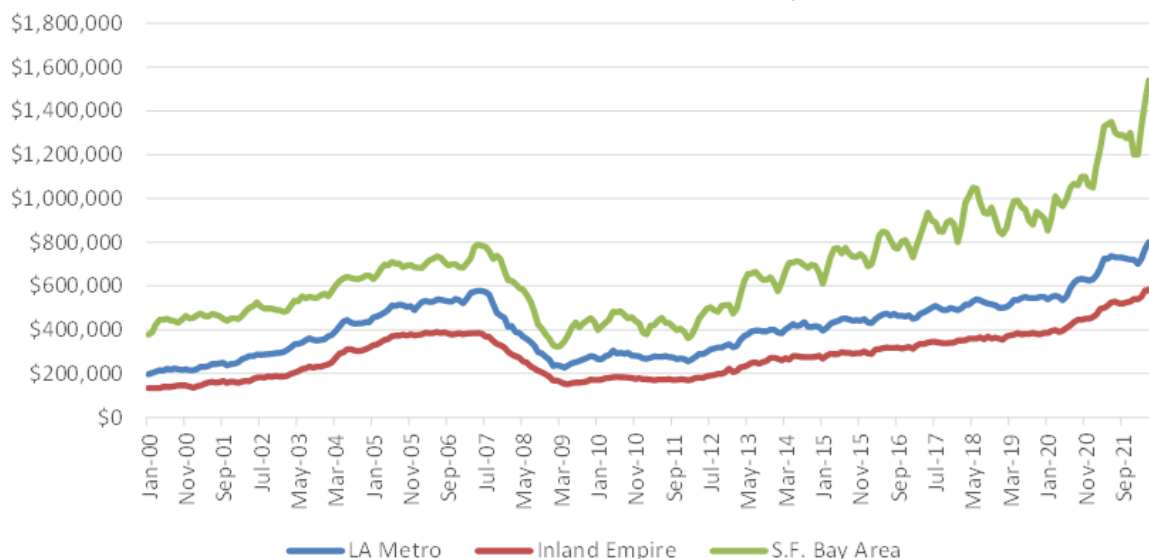
Recent reversals to each of these factors suggest the market will return to more “normal” conditions. The 2022 Federal Reserve decision to gradually increase interest rates means the real estate market is now cooling down. Development projects have increased as building materials prices have eased, and city government re-openings have issued construction permits more quickly than before. Housing inventories have increased, giving buyers more choice and bargaining power compared to the pandemic. These indicators suggest house prices will drop in the next 12 months.

Real Estate Market Analysis

CALIFORNIA METRO AREAS

House prices in Los Angeles, the Bay Area, and the Inland Empire increased above prior trends in recent years (Figure 8). Housing prices decreased during March-May 2020, recovering strongly since June 2020 and particularly during January-June 2021. Prices slightly decreased once again during July-December 2021 in Los Angeles and Bay Area, but strongly recovered since February 2022. This behavior contrasts to the visible downturn during the 2008-09 recession.

FIGURE 8. MEDIAN PRICE FOR SINGLE FAMILY HOMES (DETACHED ONLY), 2000-22



Source: Author's depiction of data from California Association of Realtors

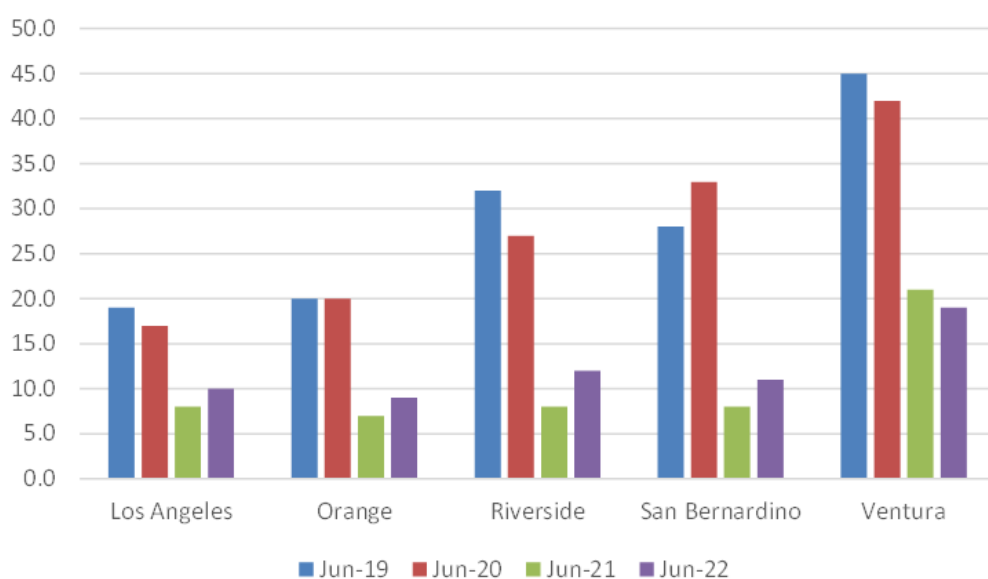
In contrast to these price increases, we have seen zero or negative sales growth. As shown in Figure 9, during April-May 2020 sales drastically reduced, but returned to pre-pandemic levels by August. The highest comparative increase in sales occurred during April-May 2021. The same trends occurred at both the metropolitan regions level and the L.A. metro region counties level. We can infer that abnormally high prices during this period were due to supply scarcity.

Such supply scarcity is further confirmed with data on median time on market, which has been drastically lower during 2021-2022 than during 2019-2020 (Figure 10). Fewer properties have been listed, and their price has grown as overheated demand competes for a smaller pool of supply. Data on unsold inventory (not shown here) largely follows these trends, pointing to the stubbornly negative sales year-to-year portrayed above. In short, homeowners in the region are not selling. This unwillingness to sell and the strong demand recovery has pushed up prices, although price decreases in May-June 2022 are reminders to exercise caution in this unstable market.

FIGURE 9. YEAR-ON-YEAR PERCENT CHANGE IN SALES BY METRO AREA



FIGURE 10. MEDIAN TIME ON MARKET (DAYS)



Figures 9 and 10

Source: Author's depiction of data from California Association of Realtors

SOUTH BAY

South Bay cities' housing markets have varied in terms of price recovery, housing units' sizes and sales. In July 2022 the highest prices were reported in Manhattan Beach, Rolling Hills, and Palos Verdes Estates (Figure 11), the latter of which also had the highest price growth. Other high price growth cities were Hermosa Beach and Lawndale (Figure 12), which had some of the lower South Bay growth rates in the period July 2020 to July 2021. El Segundo, Inglewood and Lomita had negative price growth during July 2021 to July 2022, contrasting with their strong price growth during July 2020 to July 2021. As an average, price growth was lower during 2021-22 than during 2020-21, replicating what was observed at the L.A. metro region level.

Large cities like Torrance and Carson have the most sales during the first half of 2022 (Figure 13); other large sellers were Redondo Beach and Gardena. Coinciding with the observations for the L.A. region above, the number of sales decreased during 2021-2022 in almost all the South Bay cities compared to 2020-2021. The strongest decrease occurred in Rolling Hills, which correlates with the high prices and price growth discussed above. Other cities with negative sales growth were Lomita, Hermosa Beach, Manhattan Beach and Redondo Beach. The only city with a positive change in sales was Gardena. No clear spatial pattern or correlation emerges between prices and their growth, and sales and their decreases. For example, fast price growth in Palos Verdes Estates, Hermosa Beach and Lawndale coincide with negative sales growth.

FIGURE 11. MEDIAN PRICES IN JULY 2022

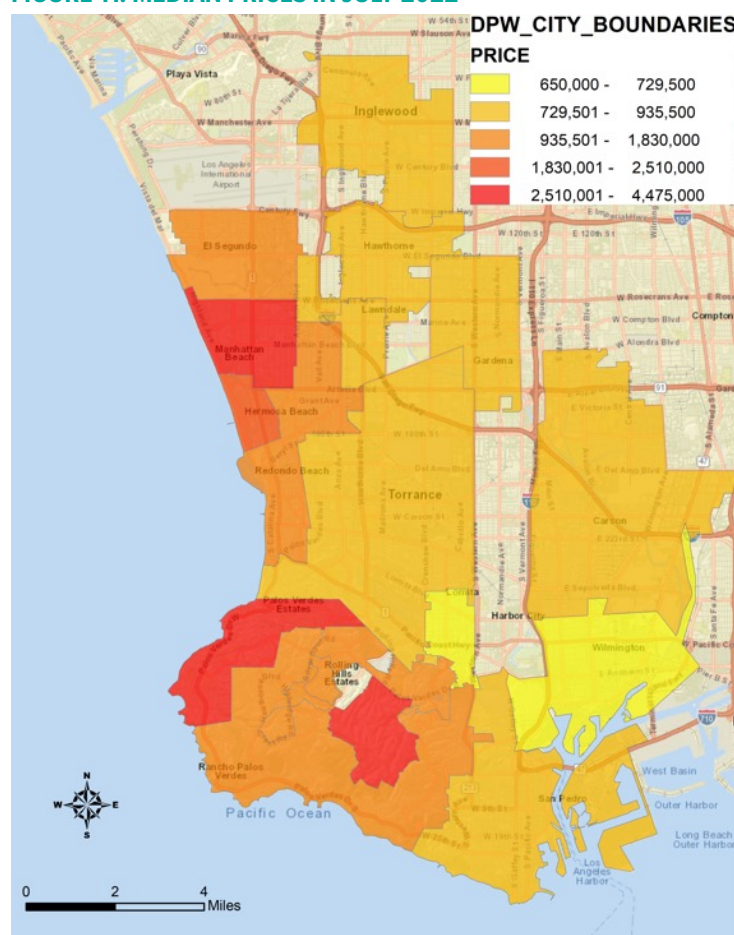


FIGURE 12. YEAR-ON-YEAR PERCENT CHANGE IN PRICES (JULY 2021-2022)

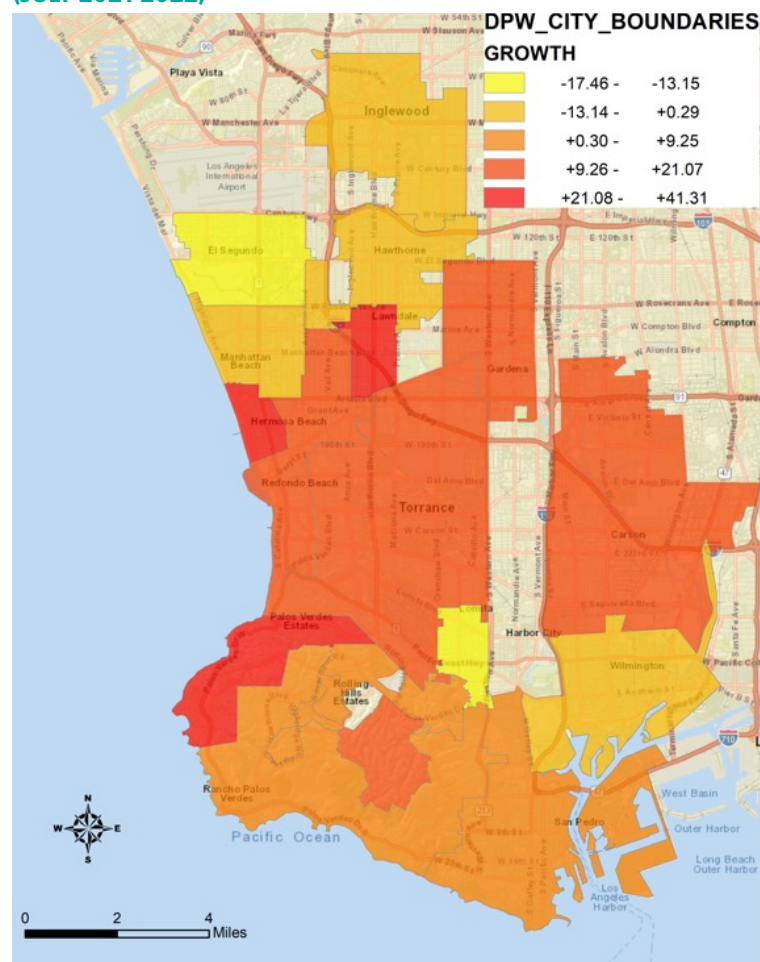
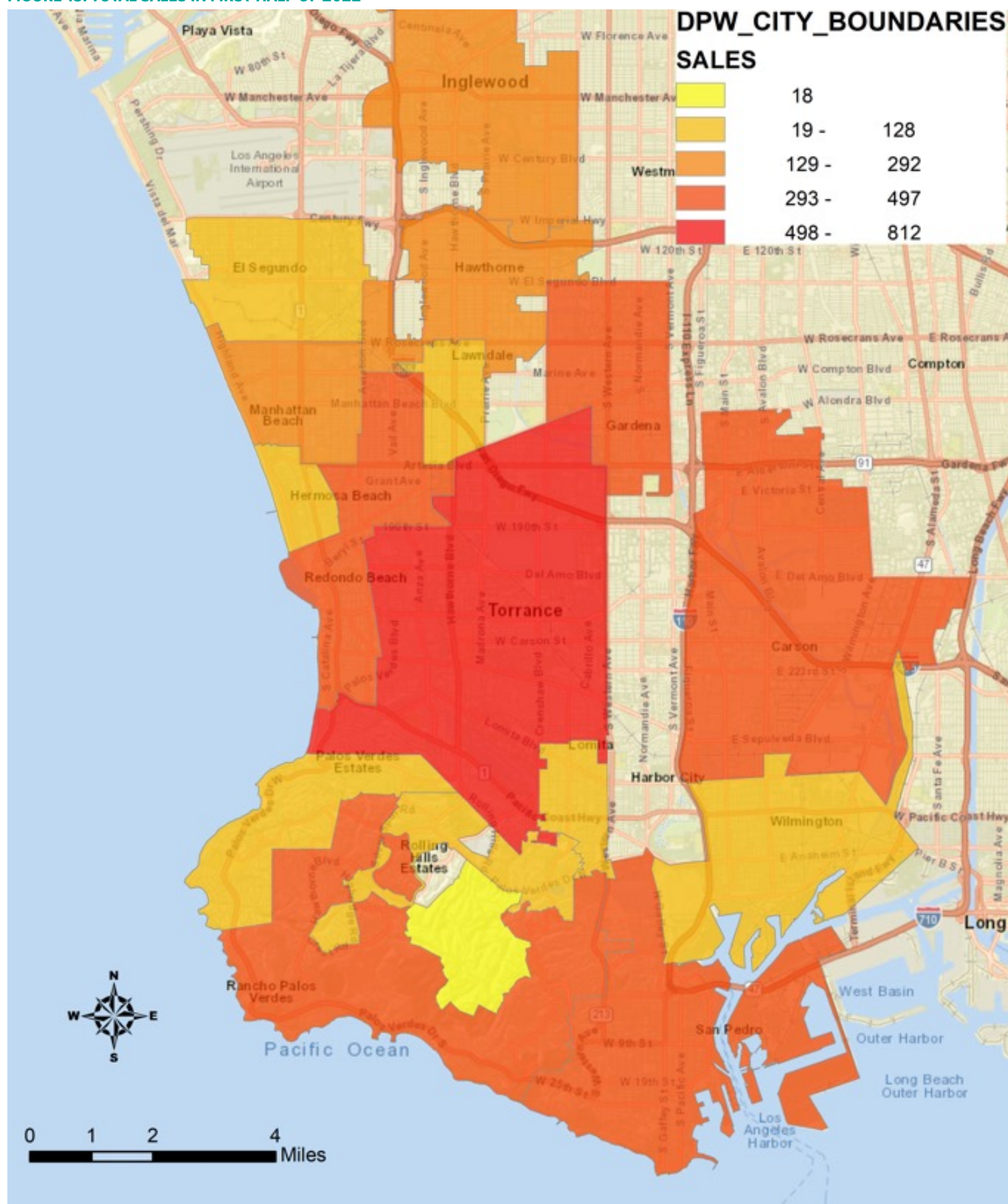


FIGURE 13. TOTAL SALES IN FIRST HALF OF 2022



section 02 THE POSSIBILITY OF A RECESSION

How probable is a recession?

HIGHLIGHTS

- Two consecutive quarters of negative GDP growth highlight a slowdown in the economy.
- There is hope for a mild and short recession like that in 2001.
- However, price inflation from buoyant consumer and government spending, and Fed interest rate responses, point to a possibly longer recessionary period.

The question is not whether we are in a recession. After all, we have had already two consecutive quarters of negative GDP growth (Q1=-1.6%; Q2=-0.6%). In that sense, the U.S. is already in the middle of a recession, even when some economists disagree on what an “actual” or “technical” recession is.

Maybe we should ask, what kind of recession is this one? Relatively short and shallow, like the one in 2001? Relatively long and deep, like the 2008 recession? Or even short and deep, like the most recent one in 2020?

- The 2001 recession was mainly caused by structural problems (the “dot.com” bubble) and an exogenous shock (terrorists attacks of September 11th). It was relatively mild and short (GDP declined 0.3% and lasted only 8 months) as strong fiscal and monetary responses proved to be effective to pull the country out of the recession relatively quickly.
- The 2008 recession was mainly caused by structural problems (the subprime mortgage crisis) and was widely felt in most industries. The largest employment declines were in Construction, Administrative, Support & Waste, Manufacturing, Information, Wholesale Trade, and Transportation, Warehousing & Utilities, in that order (GDP declined about 5%). The 2008 recession lasted 18 months, but the subsequent recovery was impressive, leading to more than 10 years of consecutive monthly job gains, the longest economic recovery since the 19th century. However, it took 10 years for the unemployment rate to get back to pre-recession levels.
- The 2020 recession (February – April 2020) was caused by an exogenous shock from the COVID-19 pandemic. Despite the work and travel restrictions, it was sharp but short. Substantial quantitative easing, Federal Funds rates close to zero, and trillions of dollars in pandemic relief pulled the country of recession quickly. Those same measures are playing a role in current economic conditions and prospects for a quick recovery.

So, where are we today? Representing about 2/3 of the U.S. economy, consumers continue to spend at impressive levels, despite high inflation rates. Supported by pent-up demand, rising wages and income, recent declining gasoline prices, consumer spending is strong. Consumer confidence indicators—Conference Board’s Consumer Confidence Index, Present Situation Index, and the Expectations Index— remain below pre-pandemic levels, yet are all showing recent improvements.

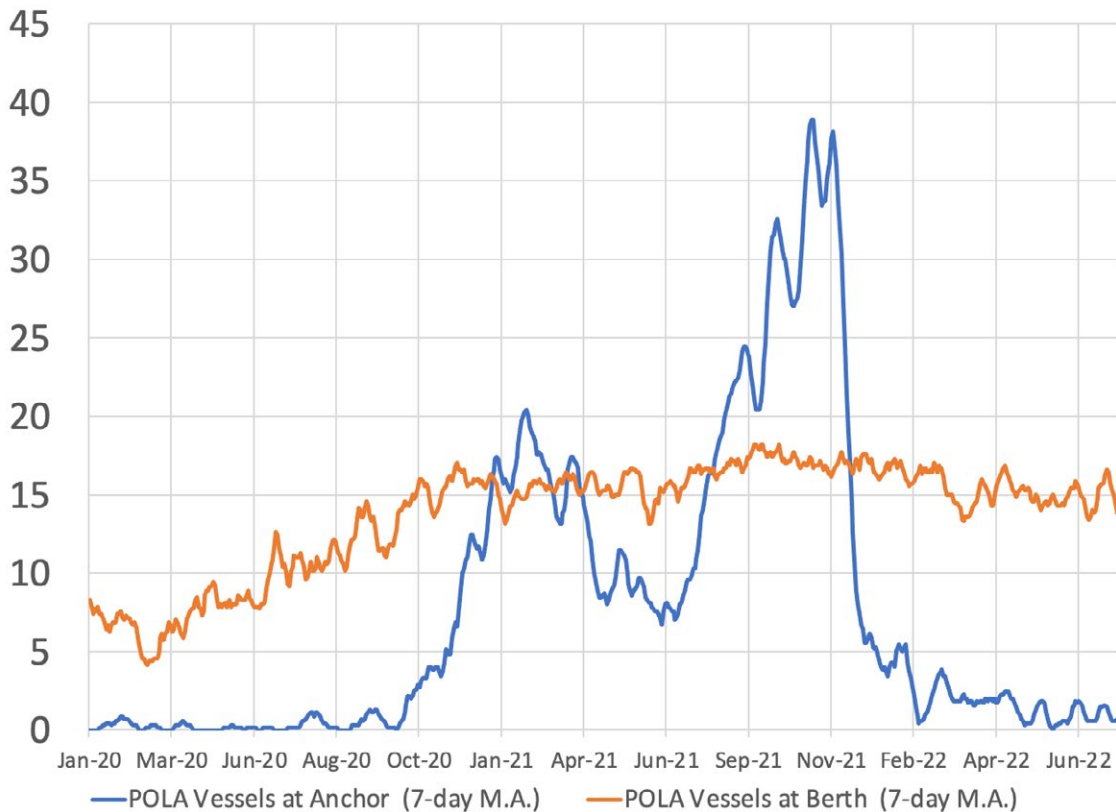
The latest rate hikes by the Federal Reserve—the third 75 basis point hike in a row—should lead to a decline in investment spending. Federal Reserve Chair Jerome Powell recently warned that their moves to bring down inflation would be painful for the U.S. economy, but there is no alternative. President Biden’s administration agenda is poised to keep the government spending in an expansionary mode. On the global arena, the continuing war in Ukraine and supply disruptions in China might pose an impediment to a quick recovery.

Inflation remains stubbornly high and continues to eat up most of the consumers’ wage gains and savings. Despite aggressive Fed interest rate hikes inflation might not be contained fast enough if consumers continue to spend at current levels. If the Federal Reserve responds by continuing to raise rates, this might increase the chances of having a longer-than-expected recession.

Global Supply Chain Disruptions

Global supply chains were severely disrupted in 2020 and 2021; even as production ramped up again in 2021, disruptions continued due to shipping delays. The good news is that the shipping delays have improved in 2022, with fewer boats anchoring on the ocean and relieved port congestion. Figure 14 shows that supply (vessels at berth; orange line) is once again outweighing demand (vessels at anchor; blue line) and berth (supply; orange line) at the Port of L.A.

FIGURE 14. DAILY VESSEL ACTIVITY AT THE PORT OF LOS ANGELES

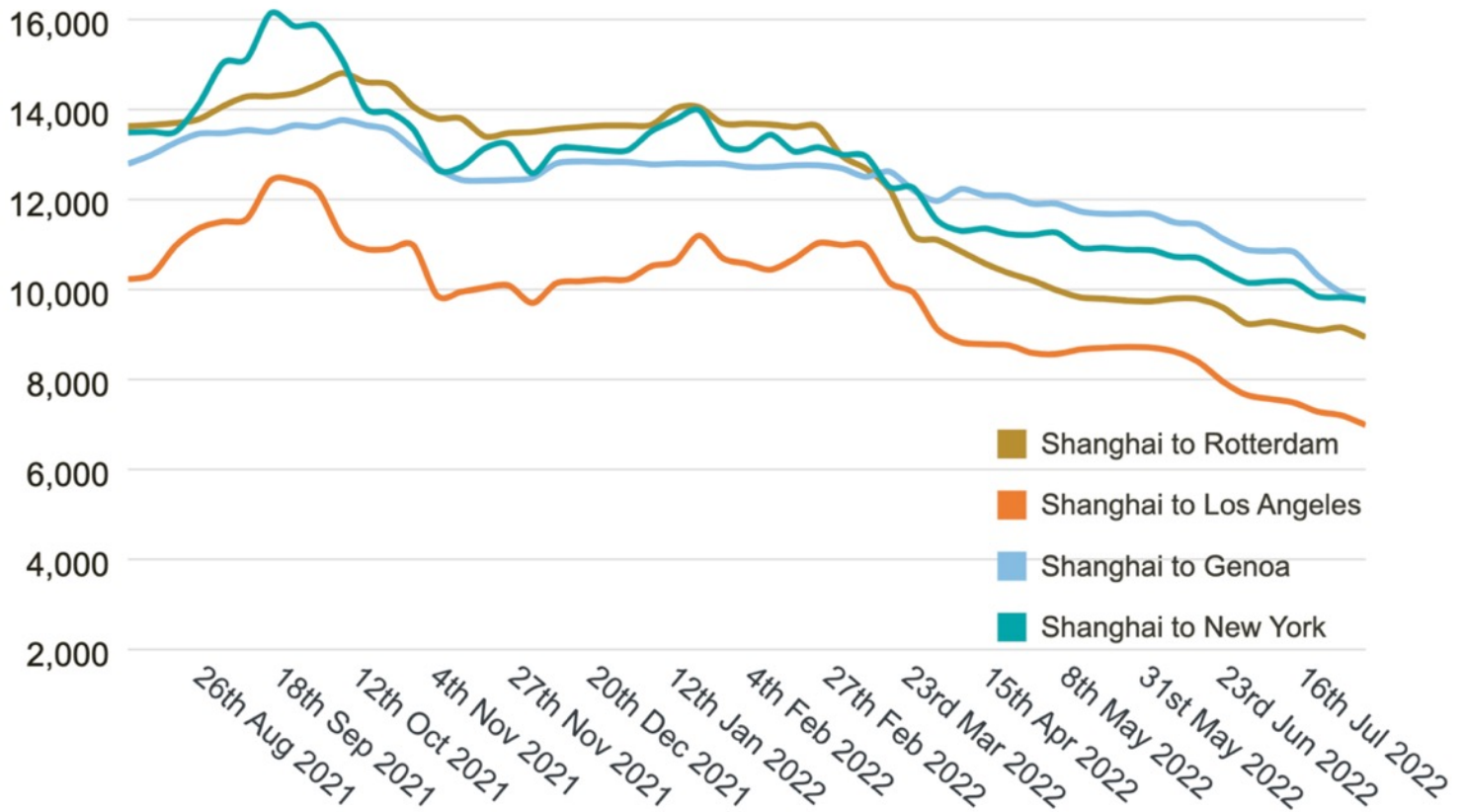


Source: Author's depiction using Corelogic data

After President Joe Biden announced federal efforts to improve port operations in October 2021, the “nominal” waiting line shrank noticeably in December 2021. The ports at San Pedro addressed some capacity constraints at the terminals and improved their efficiency, and instituted fines to discourage container storage on the docks. Shipping trade groups also contributed by encouraging incoming ships to wait in the open ocean rather than close to shore. (As such, a caveat here is that the number of anchored vessels may not reflect the whole picture of waiting vessels.) Another important change was that Shanghai started a four-month COVID lockdown in April-July 2022, which decreased China’s import and export cargos, and further relieved congestion at the L.A. and Long Beach ports.

As a result, the shipping delays significantly improved in early 2022. It took a boat almost 25 days to secure a berth in November 2021 while in June 2022 the waiting time was significantly reduced to 5 days, implying a 20-day shorter lead time in supply chains. In turn, ocean shipping rates dropped significantly in early 2022. Figure 15 reports historical freight rates by trade routes from Shanghai. Prices dropped from over \$10,000 per 40-foot container from Shanghai to Los Angeles in November 2021 to less than \$7,000 in August 2022, a 30-percent decrease.

FIGURE 15. FREIGHT RATE BY TRADE ROUTES FROM SHANGHAI (US\$/40 FT)



Source: World Container Index, Drewry Supply Chain Advisors

However, shortages of chassis and truck drivers, low warehouse vacancy rates, and clogged rail networks are still providing supply chain disruptions on land.

CLOGGED RAILROADS.

A shortage of rail workers, insufficient rail cars, and importers failing to pick up their goods are causing cargo to pile up at the Port of L.A.

TRUCK DRIVER SHORTAGES.

It is challenging to attract, recruit and retain drivers in the port because of low pay and poor working conditions.

FULL WAREHOUSES.

Unprecedented demand from overseas third-party logistics (3PL), logistics, and e-commerce tenants during the pandemic has taken most warehouse spaces in Southern California.

CHASSIS SHORTAGE.

There was a chassis shortage problem years before the pandemic. During COVID-19, the issue has worsened. Unprecedented demand and the above factors have meant chassis are being held longer and used to store goods in a container in parking lots.

How would the South Bay economy be affected by a recession?

RETAIL, E-COMMERCE, AND SUPPLY CHAIN IMPACTS

Over the next year, the South Bay economy will reflect the rebalancing of demand and supply. On the one hand, household spending on retail and e-commerce will slow as high inflation bites and a recession is anticipated. On the other hand, supply shortages will be relieved because of fewer shipping delays and higher vacancy rates in warehouses.

After peaking at 16.4% in Q2-2020, the e-commerce share of U.S. retail has slipped to 14.3% in Q1-2022 as brick-and-mortar retail shopping bounced back (Figure 16). Both retail markets cooled in early 2022 due to high inflation, Fed action on interest rates, and the end of pandemic-related government assistance. Retailers have absorbed some cost increases and big retailers like Target, Walmart, and Amazon are facing overstocking problems and using promotions to reduce inventories. As a result, major retailers have raised concerns about further margin contraction into the second half of 2022.

Over the next four years, the low vacancy rates are expected to improve gradually due to the demand slowdown (Table 2). These figures are drawn from the CoStar forecast of vacancy rates based on the Oxford Economics Baseline scenario published on March 22, 2022.

FIGURE 16. QUARTERLY U.S. RETAIL SALES: TOTAL AND E-COMMERCE

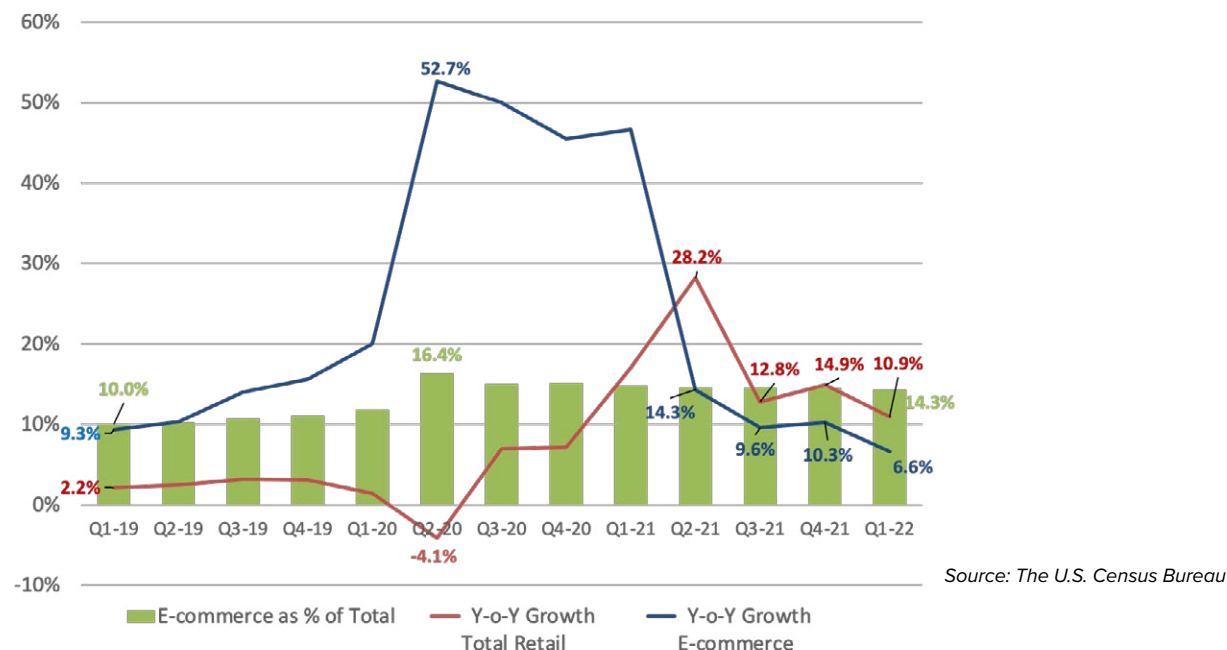


TABLE 2. VACANCY RATES IN SOUTHERN CALIFORNIA

	Actual					FORECAST			
	2018 Q1	2019 Q1	2020 Q1	2021 Q1	2022 Q1	2023 Q1	2024 Q1	2025 Q1	2026 Q1
Inland Empire	5.0%	4.4%	4.3%	3.2%	1.3%	2.3%	2.2%	2.5%	2.7%
Los Angeles	2.3%	2.1%	2.8%	2.8%	1.6%	1.5%	1.6%	1.7%	1.8%
Orange County	2.5%	3.5%	3.1%	3.1%	2.0%	1.9%	2.0%	2.1%	2.4%
Ventura	2.4%	3.3%	4.5%	3.9%	1.6%	1.9%	1.9%	2.3%	2.9%

Source: CoStar Database

STARTUPS AND INVESTMENTS

HIGHLIGHTS

- Startup funding is starting to pick up again.
- Major private investment in the South Bay is from accelerator firms, angel investors group, and venture capital firms.
- The top private companies in the region are in aerospace, tech, banking, real estate, and ecommerce with combined valuations of over \$200 billion.
- Venture capitalists are setting up offices in Los Angeles.
- L.A. County venture capital investment is larger than other innovative areas, such as Austin, North Carolina Research Triangle, Atlanta, Denver, and Seattle.

Startup funding is starting to pick up again. Major private investment in the South Bay is from accelerator firms Y Combinator, Techstars, and Plug and Play Tech Center; angel investor group NuFund, as well as venture capital firms 500 Global and Upfront Ventures (Table 3). The top private companies in the region are in aerospace (Space X), tech (Miro and Discord), banking (Bank of the West), real estate (CloudKitchens), and ecommerce (Faire) with combined valuations of over \$200 billion. Accelerators Y Combinator, TechStars, and Plug and Play Tech Center have unspent cash reserves (dry powder) of over \$1.2 billion.

TABLE 3. TOP INVESTORS IN THE SOUTH BAY REGION

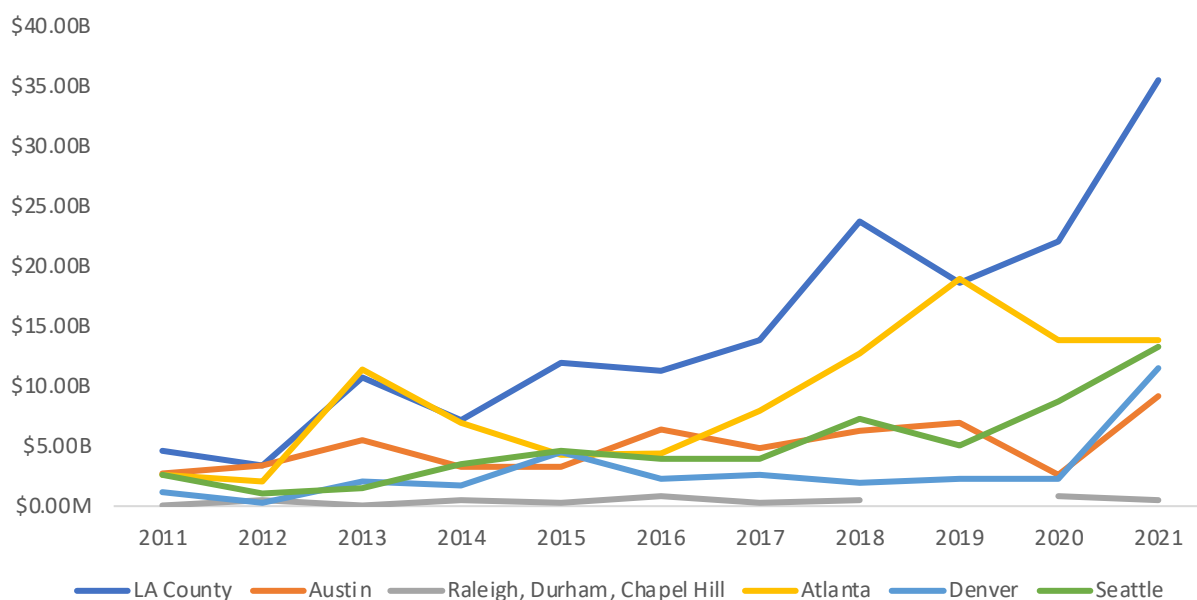
Investor Name	South Bay Deal Count
Y Combinator	428
Techstars	294
NuFund (TechCoast Angels)	276
500 Global	271
Plug and Play Tech Center	237
Upfront Ventures	270

TABLE 4. TOP PRIVATE COMPANIES IN THE SOUTH BAY REGION

Company Name	Last Post Valuation	Last Deal Type
SpaceX	\$125.00 billion	Secondary-Private
Miro	\$17.50 billion	Series C (fourth stage funding)
Bank of the West	\$16.30 billion	Mergers & Acquisitions
CloudKitchens	\$15.00 billion	Later Stage Venture Capital
Discord	\$14.70 billion	Later Stage Venture Capital
Faire	\$12.59 billion	Series G (eighth stage funding)

Venture capitalists are setting up offices in Los Angeles, because of its emerging tech and startup scene. This has brought a rise in private investment activity in the area. We have seen an upward trajectory of venture capital investment in L.A. County with an increase of venture capital investment by over \$13 billion since 2020 and an increase of 30 funds. (Figure 17). L.A. County venture capital investment is larger than other innovative areas, such as Austin, North Carolina Research Triangle, Atlanta, Denver, and Seattle (L.A. Area Chamber counties are Los Angeles, Orange County, San Bernardino, Riverside, and Ventura). In 2021, L.A. County venture capital investment was \$35.45 billion compared to \$13.85 billion in Atlanta, \$13.26 billion in Seattle, \$11.52 billion in Denver, \$9.15 billion in Austin, and \$485.21 million in the North Carolina Research Triangle. This reflects the growth in L.A. County private investment capital that contributes to startup creation and expansion.

FIGURE 17. TOTAL CAPITAL RAISED BY VENTURE CAPITAL, BY REGION



Source: Pitchbook Data, Inc.

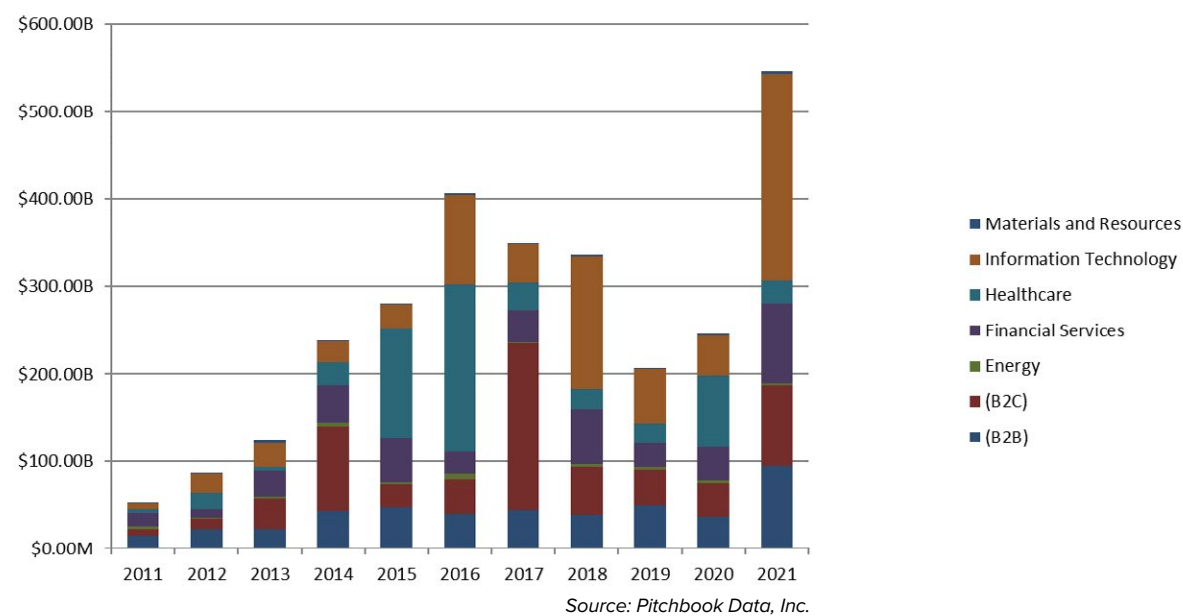
When looking at the composition of private investment in the South Bay over the past decade, the majority is from private equity and venture capital. This still holds with the current breakdown of private investment in 2022. Private equity comprises 49%, followed by real assets at 18%, venture capital at 15%, and private debt at 10%. We have also seen rises in company valuations and deal sizes over the past two years. Median Post-valuation of South Bay Companies is over two times the median post-valuation in 2020 from \$24 million to \$50.7 million, and median deal size has increased from \$1.9 million in 2020 to \$5.38 million in 2022 thus far.

Another major facet of resilience is innovation, the ability to create new business opportunities in challenging times. The South Bay has several strengths that make it a hub for innovation

- **Investment Capital:** Private investment capital in LA Chamber counties is still active with over \$159.53 billion in capital raised in 2022.
- **Ports of Los Angeles and Long Beach:** The Ports of Los Angeles and Long Beach are a major distribution hub, with over 5.4 million shipping containers going through the ports since last year.
- **Major Market Access:** LA Chamber counties are a major market with an estimated population of over 18.4 million.
- **Access to Cutting Edge Ideas:** The area has access to innovative ideas from higher education through the UC and CSU campuses and private universities as well as through Small Business Development Centers, incubators, and accelerators. Examples include the Innovation Incubator on the CSUDH campus.
- **Entrepreneurship Resources:** Investment in entrepreneurship resources has been implemented by cities, universities, as well as accelerators and incubators.

The capital invested in South Bay companies by primary industry sector is shown over the past 10 years in Figure 18. Investment in information technology, business to business, financial services, and business to consumer has increased from 2020 to 2021 by 419%, 160%, 139% and 135% respectively. In 2021, most of the capital raised is in the Information Technology sector at 43.5%, Business to Business at 17.2%, Business to Consumer at 16.8%, Financial Services at 16.5%, followed by Healthcare at 4.8%. When broken down by industry code, aerospace and defense comprises most of the capital invested in the South Bay with \$6.28 billion last year, followed by Broadcasting, Radio, and Television at \$1.8 billion, Logistics at \$1.5 billion, and IT Consulting and Outsourcing at \$466.94 million.

FIGURE 18. CAPITAL INVESTED BY PRIMARY INDUSTRY SECTOR



WHAT ARE THE EMERGING INDUSTRIES IN THE SOUTH BAY?

HIGHLIGHTS

- The top 10 emerging South Bay industries have total capital invested of over \$56 billion USD.
- Industries include aerospace infrastructure, aerial transportation, trucking technology, digital evidence technology, natural disaster preparedness and response, and sustainable packaging.

These top 10 emerging industries have total capital invested of over \$56 billion USD. Industries include aerospace infrastructure (small satellites, commercial space launch), aerial transportation (electric and autonomous flight), trucking technology (autonomous trucking, digital freight brokerage), digital evidence technology (eDiscovery platforms); natural disaster preparedness and response; and sustainable packaging.

TABLE 5. TOP 10 EMERGING INDUSTRIES IN THE SOUTH BAY REGION

Rank	Name	Companies	Deals	Capital Invested
1	Small Satellites	24	138	\$15.25B
2	Commercial Space Launch	11	84	\$13.05B
3	Electric Flight	3	26	\$12.72B
4	eDiscovery Platforms	8	56	\$4.61B
5	Digital Freight Brokerage	6	41	\$4.22B
6	Ghost Kitchens	16	42	\$2.42B
7	Autonomous Trucking	2	14	\$2.04B
8	Natural Disaster Preparedness & Response	3	14	\$973.24M
9	Autonomous Flight	5	16	\$497.68M
10	Sustainable Packaging	13	30	\$483.68M

section 03 WHAT DOES THE FUTURE HOLD?

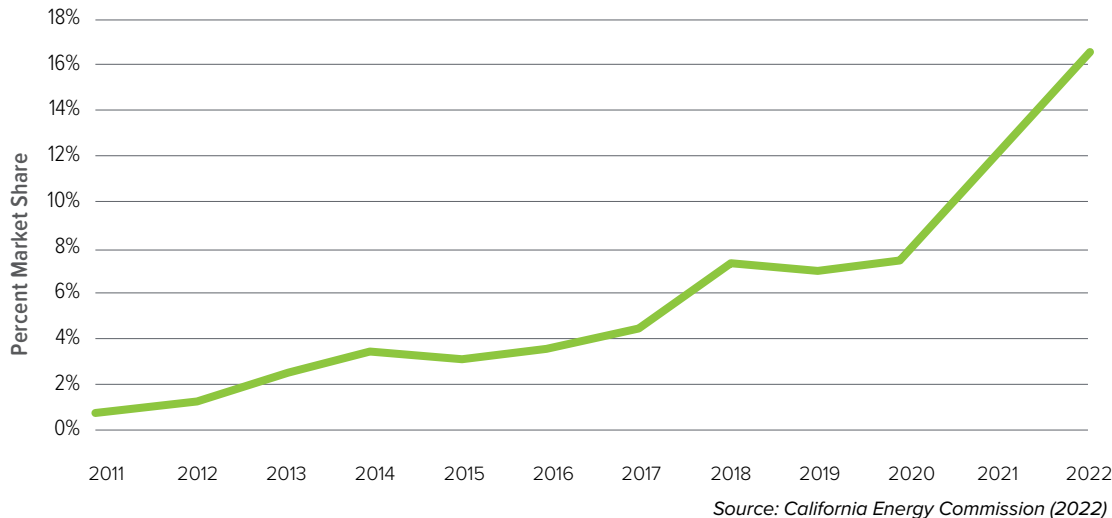
Which innovations and industries will shape our region's future?

GREEN TECH

2022 has witnessed record-breaking temperatures and extreme weather events, heightening concerns about the potential future impact of climate change. Yet the recent federal climate bill also provides substantial investment in green tech over the coming decade. California is poised to benefit from these investments, in terms of subsidies for household spending on electric vehicles (EV), solar panels, and related technologies, as critical infrastructure investments, such as EV charging facilities. Moreover, California companies have been at the cutting edge of the green tech field, which will benefit from industry growth.

California is already ahead of other states in EV adoption, accounting for 16% of total market share (Figure 19). In the first quarter of 2022, California reached 18.4% of sale shares of EV, almost three times the national average. In addition to federal and state policy changes, high gas prices and increased EV production by auto companies point to continued market growth. Even as we have experienced supply chain delays EV market growth has continued in California. EV sales are projected to reach 20% by the end of 2022 and 30% by 2023 if charging infrastructure is rolled out.

FIGURE 19. CALIFORNIA EV MARKET SHARE, 2011-22



AEROSPACE

The South Bay is a major hub for aerospace with over a thousand companies in the area. There is substantial investment activity, with over 2000 deals and investors. There is over \$215 billion in capital invested in the region, with top investors including NASA, US Department of Defense, Techstars, Starburst Accelerator, Founders Fund, and Y Combinator. Top Private Companies include SpaceX, Relativity, Quest Global Systems, ABL Space Systems, and Epirus.

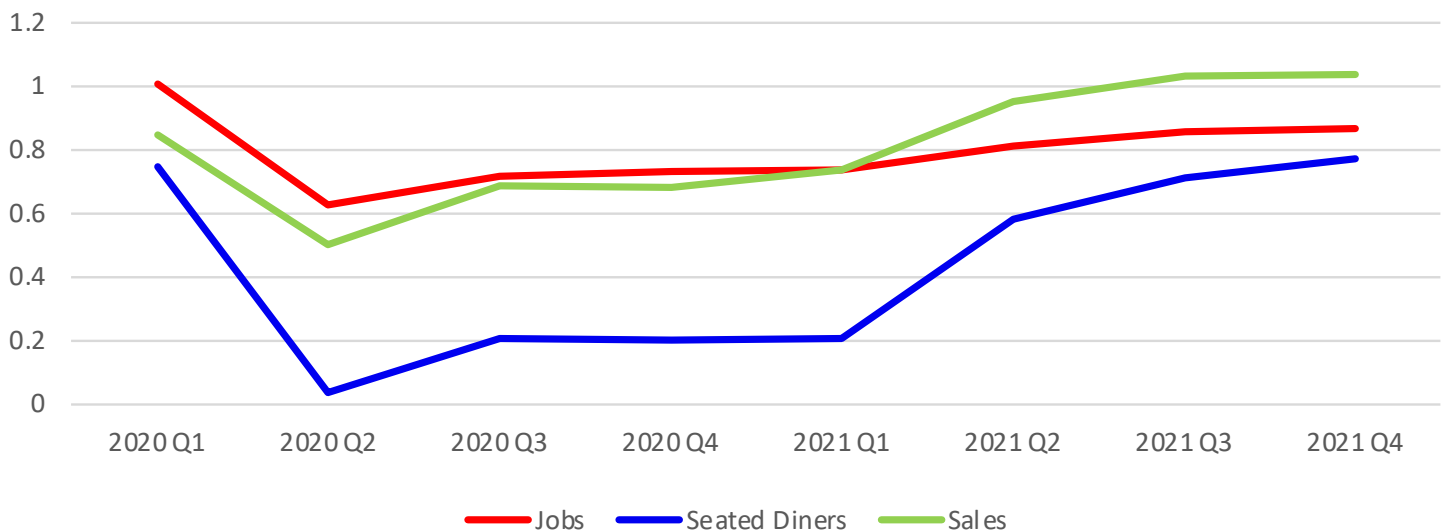
TABLE 6. THE SOUTH BAY AEROSPACE INDUSTRY

Companies	1,476
Deals	2,045
Investors	2,020
Exits	676
Largest Deal	\$67.10 Billion
Capital Invested	\$215.22 Billion
Median Post Valuation	\$40.00 Million
Top Investors	<ul style="list-style-type: none"> • NASA • US Dep. Of Defense • Techstars • Starburst Accelerator • Founders Fund • Y Combinator
Top Private Companies	<ul style="list-style-type: none"> • SpaceX • Relativity • Quest Global Services • ABL Space Systems • Epirus

What are the South Bay's strengths?

Our regional economy is clearly resilient, competitive, and innovative, and these qualities will allow us to navigate challenging times. Resilience was demonstrated in numerous ways through the COVID-19 pandemic, which forced many companies to pivot towards other operations. As shown in Figure 20, restaurants offered more take-out and delivery as well as outdoor seating, meal kits and even groceries, enabling many to stay afloat. Restaurants were supported in part by federal PPP (Paycheck Protection Program) loans and local cities offering flexibility in the use of parking spaces for outdoor seating. Another key element of the region's resilience is the broad diversity of economic sectors. Our new South Bay Economic Forecast model (further details available upon request) incorporates this diversity, such that when some sectors are facing choppy waters, others are plain sailing.

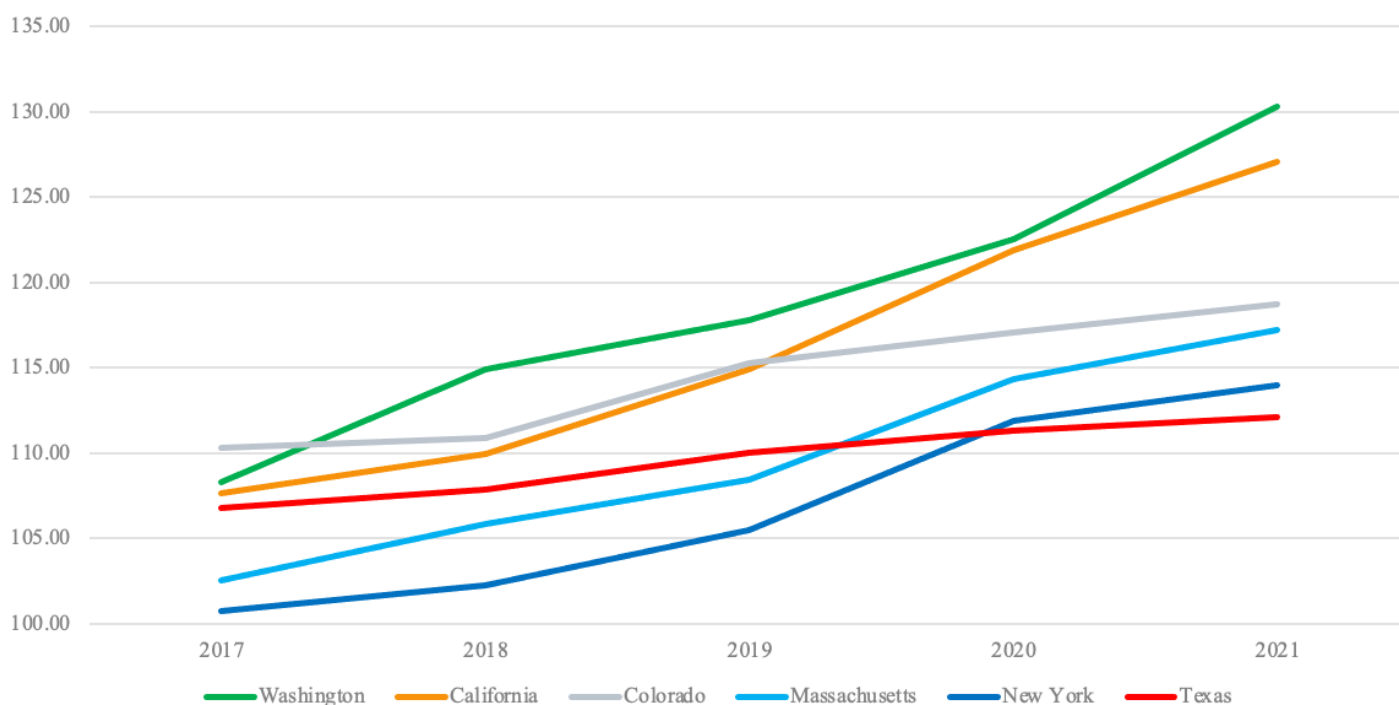
FIGURE 20. LA COUNTY RESTAURANT DINERS, SALES, AND JOBS (% OF PRE-COVID LEVELS BY QUARTER)



Source: Authors' calculations based on data from California Employment Development Division, California Department of Tax and Finance Administration, and OpenTable.

Another sign of resilience is that our regional economy remains highly competitive. As shown in Figure 21, California labor productivity levels have increased quicker over the past decade than all but the state of Washington. These improvements highlight the state's high and growing levels of human capital. For example, the L.A. region continues to graduate more PhDs than any other thanks to world-class educational institutions. These labor productivity improvements also highlight investments in advanced technology manufacturing across numerous sectors, which allow workers to add more value per hour worked. CSUDH is excited to facilitate the development of regional human capital and contribute to the economic growth of the region through innovative educational and applied programs. In other words, we learn and grow with our students, who use their knowledge and skills to benefit regional organizations and their communities.

FIGURE 21. INDEX OF LABOR PRODUCTIVITY FOR TOP-PERFORMING STATES



Source: Author's depiction of U.S. Bureau of Labor Statistics

SOUTH BAY ECONOMIC FORECAST

