SOUTH BAY
ECONOMIC FORECAST
&
INDUSTRY OUTLOOK

2020-2021

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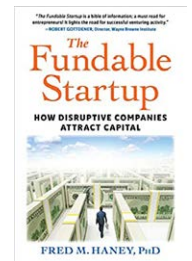

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Jose N. Martinez

Fynnwin Prager

Jennifer Brodmann

About California State University, Dominguez Hills

California State University, Dominguez Hills 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, CSU Dominguez Hills has served a diverse community of learners and educators collaborating to change lives and communities for the better. CSU Dominguez Hills 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.

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.

Jose N. Martinez
Co-Director

South Bay Economics Institute
California State University, Dominguez Hills

Fynnwin Prager
Co-Director

South Bay Economics Institute
California State University, Dominguez Hills

Jennifer Brodmann
Assistant Professor of Finance
California State University, Dominguez Hills

OVERVIEW

2020 has been a year few anticipated. We are living through a global pandemic for the first time in over a century. As we write, COVID-19 has contributed to the deaths of over 936,000 people worldwide, 196,000 of whom are U.S. citizens. This is more U.S. deaths than in any single pandemic except the 1918-19 flu, and more than those caused by World War I. Over 14,000 people have died in California, nearly 6,000 of whom lived in Los Angeles County. Words and phrases like "unprecedented," "new normal," "difficult times," "stimulus," "front line," and "in this together" have come to the fore to describe this period. The COVID-19 outbreak, lockdown, and recession frame our South Bay Economic Forecast 2020-21 Report. A caveat is important here: Given that this is an ever-evolving situation, we are aware that by the time you read this some of the information may be out of date.

We have also witnessed the re-emergence of a national movement for racial equality. The death of George Floyd in Minneapolis sparked nationwide and worldwide protests by people of all backgrounds. This incident highlighted deep racial inequalities in U.S. policing and the criminal justice system. It also sparked a broader debate about racial inequalities and systemic racism across society, including in our workplaces, schools and colleges, financial institutions, and beyond. At the South Bay Economics Institute, we are committed to anti-racism, and to upholding the CSUDH core values of social justice and providing economic opportunities for our diverse student body and South Bay community. We hope to uphold these values through our teaching, mentorship, and our research efforts, which this year have focused on access to capital for women and minority entrepreneurs and the equity-related economic impacts of COVID-19. We would particularly like to thank Dr. Nestor Garza for his contribution to the Real Estate section, as well as to our recent Student Fellows Matthew Taylor, Michael Aguilera, Khalil Awad, and Malak Elokour for their outstanding research support. We are also indebted to Marilyn McPoland for her excellent leadership of the South Bay Economic Forecast event. We would also like to thank Dean Joseph Wen, Provost Michael Spagna, and President Thomas A. Parham for their continous support of our work.

KEY QUESTIONS ADDRESSED IN THE REPORT:

1. *What are the largest changes to the economy?*
2. *Which economic trends have been accelerated?*
3. *How does the COVID-19 recession compare to previous ones?*
4. *How quickly will we recover?*
5. *Who has been the most impacted?*

GEOGRAPHICAL SCOPE

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

- Avalon
- Carson
- El Segundo
- Gardena
- Hawthorne
- Hermosa Beach
- Inglewood
- Lawndale

- Lennox
- Lomita
- Manhattan Beach
- Palos Verdes Estates
- Rancho Palos Verdes
- Redondo Beach
- Rolling Hills
- Rolling Hills Estates

- Torrance
- Harbor City/Harbor Gateway
- San Pedro
- Wilmington
- Rancho Dominguez
- View Park/Windsor Hills

SECTION 1 WHAT ARE THE LARGEST CHANGES TO THE ECONOMY?

Disruptions, closures, and innovations

Available economic data about the economic disruption from the COVID-19 outbreak and lockdown is sobering. At the national level, Real GDP declined by 5% in the first quarter of 2020, followed by a further 32.9% decline in the second quarter. This is substantially larger than prior major shocks, such as the 2008 financial crash, for which Real GDP declined by 8.4% in the fourth quarter of 2008.

U.S. unemployment has skyrocketed as a result of the pandemic, from 4.4% in March to 14.7% in April. This rate is significantly higher than the largest previous spikes of 10% in October 2008 and 10.8% in November 1982. Since April, the unemployment rate has declined, with businesses beginning to hire back laid-off workers as the lockdown eases. This is good news; however, an increasing number of lay offs are now permanent rather than temporary.

As with previous recessions, women and minorities have borne the brunt of the economic impacts. Nationwide in April 2020, the female unemployment rate was 16.2% compared to 13.5% for males. In that same month, Latinx unemployment was nearly 19% and African-American unemployment was over 16%, compared to a little over 14% for Whites. Particularly concerning is that in the months since April, the African-American unemployment has declined at a much slower rate than that for other ethnicities: in July, it was nearly 15%, compared to 13% for Latinx and 9% for Whites.

Los Angeles County has also been hit badly in terms of unemployment, increasing from 4% before the outbreak to 20.3% after, according to California EDD data (Table 1). Neighboring counties such as San Diego (15%), Orange (13.8%), and Riverside (15.3%) have fared better.

TABLE 1:
UNEMPLOYMENT BY CALIFORNIA COUNTIES

COUNTY	TOTAL	CHANGE	RATE	CHANGE
Los Angeles	968,000	+762,500	20.3%	+16.3
San Diego	231,300	+185,600	15.0%	+12.1
Orange	211,800	+171,200	13.8%	+11.3
Riverside	168,800	+128,000	15.3%	+11.6
Santa Clara	118,800	+95,300	11.7%	+9.5
San Bernardino	126,700	+93,500	13.4%	+9.9
Alameda	112,500	+90,300	14.1%	+11.4
Sacramento	99,300	+75,200	14.7%	+11.2
Contra Costa	77,600	+61,900	14.5%	+11.7
San Francisco	69,400	+57,700	12.6%	+10.6
Ventura	57,400	+44,100	14.0%	+10.9

Source: https://www.latimes.com/projects/california-coronavirus-cases-tracking-outbreak/unemployment/

Being part of Los Angeles County, the South Bay economy has followed closely the pace of the Los Angeles economy. From 2011 to 2018, its payroll employment grew steadily at 2.2% annually on average. The most important driver of South Bay's economy is the Manufacturing sector followed by the Health Care and Social Services sector (see Figure 1). The Health Care and Social Services sector had significant job growth from 2011 to 2018, averaging 7% per year. However, 2018 saw a decrease in employment in Manufacturing and Education Services, but a large increase in Arts, Entertainment and Recreation, Administrative and Support, and Waste Management.

FIGURE 1: SOUTH BAY PAYROLL BY INDUSTRY, 2018
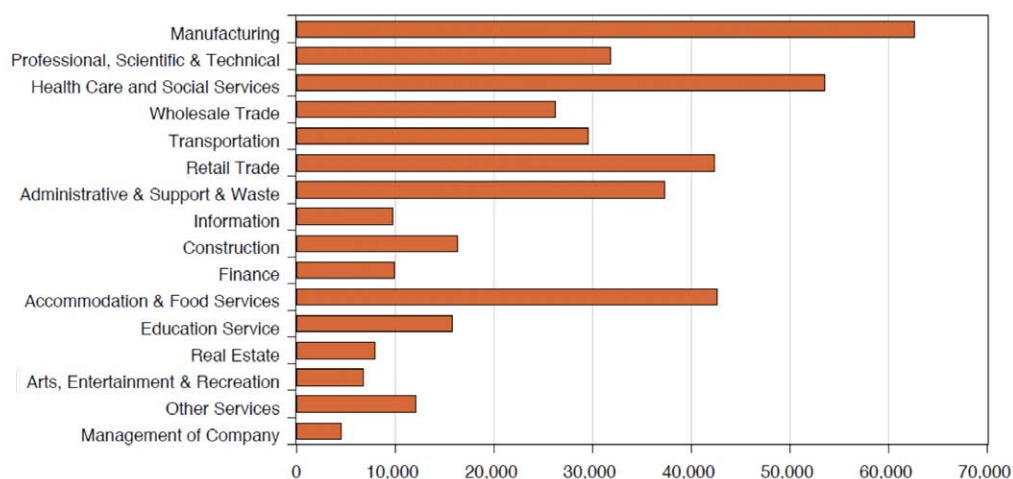
Source: California Employment Development Department; data is the third quarter of 2018 from Quarterly Census for Employment and Wages calculated by zip code.

To put the current employment conditions in context, we analyzed the data for the Los Angeles County and the South Bay during the 2008 recession and during the last few of months of 2020 since the stay-at-home orders were issued (Table 2). Between 2009 and 2008, Los Angeles County employment decreased by 5.3%, affecting most sectors of the economy, and taking several years to return to 2008 levels. However, Administrative and Support and Waste Services (-13.2%), Manufacturing (-10.3%), and Construction (-19.2%) were particularly affected. In contrast State and Local Government sectors were minimally affected (-0.4% and -1.1%, respectively), while Health Care and Social Assistance

(+3.6%) and Educational Services (+4.7%) even saw an increase in employment during this period.

In contrast, to 2008-09, the 2020 recession has seen more variation across sectors. Strict social distancing guidelines have hit Arts, Entertainment, and Recreation (-38.6%), Leisure and Hospitality (-37.6%), and Other Services (-37.3%). Decreases in government employment have been concentrated at the State (-8.9%) and Local (-3.0%) levels, while Federal Government employment increased (+1.6%), due in part to recent hiring of Census workers. Similarly, Finance and Insurance increased employment for the second quarter of 2020 hardest.

TABLE 2: LOS ANGELES COUNTY EMPLOYMENT CHANGE BY INDUSTRY DURING THE PAST TWO RECESSIONS

2009 VERSUS 2008		APRIL–JULY 2020 VERSUS APRIL–JULY 2019	
TOTAL	-5.3%	TOTAL	-14.4%
Construction	-19.2%	Arts, Entertainment, and Recreation	-38.6%
Administrative and Support and Waste	-13.2%	Leisure and Hospitality	-37.6%
Manufacturing	-10.3%	Accommodation and Food Service	-37.3%
Information	-9.1%	Other Services	-24.6%
Wholesale Trade	-8.5%	Information	-13.1%
Professional, Scientific and Technical	-7.4%	Retail Trade	-12.7%
Transportation, Warehousing and Utilities	-7.3%	Administrative and Support and Waste	-12.0%
Real Estate and Rental and Leasing	-7.1%	Real Estate and Rental and Leasing	-11.6%
Retail Trade	-7.1%	Manufacturing	-10.0%
Finance and Insurance	-6.6%	State Government	-8.9%
Other Services	-5.6%	Wholesale Trade	-8.3%
Federal Government	-4.7%	Management of Companies	-7.4%
Arts, Entertainment, and Recreation	-4.1%	Professional, Scientific and Technical	-6.7%
Management of Companies	-4.0%	Health Care and Social Assistance	-6.2%
Leisure and Hospitality	-3.9%	Transportation, Warehousing and Utilities	-6.1%
Accommodation and Food Service	-3.9%	Construction	-5.7%
Local Government	-1.1%	Local Government	-3.0%
State Government	-0.4%	Educational Services	-1.2%
Health Care and Social Assistance	3.6%	Federal Government	1.6%
Educational Services	4.7%	Finance and Insurance	3.9%

For the South Bay, we considered the employment distribution as of December 2019 (Table 3). As before, the largest employment sectors are Manufacturing, Health Care and Social Assistance, and Retail Trade. Considering the impacts of the 2008 crisis, we observe that the impact was slightly stronger for the South Bay (-5.6%) than for the L.A. County as a whole (-5.3%).

Based on preliminary and forecasted data, we expect South Bay employment to decrease 15.6% when compared to the second quarter of 2019. This decrease is slightly higher than for L.A. County (14.4%), but this might be due to the higher exposure for the South Bay on the Manufacturing, Retail Trade, and Administrative and Support and Waste Management sectors.

TABLE 3: SOUTH BAY EMPLOYMENT CHANGE BY INDUSTRY DURING THE 2008-09 RECESSION

INDUSTRY	DEC-19	2009 VERSUS 2008
TOTAL	100%	-5.6%
Manufacturing	15.6%	-7.5%
Health Care and Social Assistance	12.8%	3.9%
Retail Trade	11.8%	-6.3%
Accommodation and Food Services	10.8%	-5.2%
Administrative and Support and Waste	7.9%	-11.4%
Professional, Scientific, and Tech Servs	7.8%	-4.2%
Public Administration	7.0%	-1.0%
Transportation and Warehousing	5.8%	-7.5%
Wholesale Trade	5.3%	-8.3%
Construction	3.5%	-24.2%
Finance and Insurance	2.6%	-2.3%
Information	2.4%	-1.0%
Real Estate and Rental and Leasing	2.1%	-11.1%
Arts, Entertainment, and Recreation	1.9%	-5.9%
Other Services	1.2%	0.4%
Educational Services	1.0%	7.4%
Management of Firms and Enterprises	0.4%	0.8%

Source: CA EDD city level data and authors' calculations. Some data was suppressed due to confidentiality.

Businesses and laid-off workers are currently being supported by federal stimulus money to help them survive the economic crisis brought on by COVID-19. Firms across the South Bay have received Paycheck Protection Program (PPP) loans up to $150,000, which are eligible for forgiveness if the money covers operating expenses and retains jobs (Table 4). This has contributed to 19,964 jobs retained in Torrance, 9,718 jobs retained in Gardena, 6,562 in Redondo Beach, 6,257 in Inglewood, and 4,248 jobs retained in Carson.

TABLE 4: TOP 15 SOUTH BAY CITIES WITH NUMBER OF PPP LOANS GRANTED

SOUTH BAY CITY	NUMBER OF LOANS ISSUED	% OF LOANS	JOB RETENTION
Torrance	3,695	23.9%	19,964
Redondo Beach	1,677	10.9%	6,562
Gardena	1,546	10.0%	9,718
Manhattan Beach	1,225	7.9%	3,803
Inglewood	1,164	7.5%	6,257
El Segundo	879	5.7%	3,550
Carson	769	5.0%	4,248
Hawthorne	713	4.6%	3,999
Hermosa Beach	694	4.5%	2,480
Rancho Palos Verdes	561	3.6%	1,725
Compton	499	3.2%	2,511
Lawndale	337	2.2%	1,244
Lomita	322	2.1%	1,423
Rolling Hills Estates	314	2.0%	1,188
Palos Verdes Estates	271	1.8%	911

Source: U.S. Small Business Administration PPP Loan data for loans up to $150,000

There has been a push for innovation across industries to address the challenges of COVID-19. This includes rapid disease testing, production of Personal Protective Equipment (PPE), robotics in deliveries to accommodate contactless delivery, vaccine development, telehealth, telemedicine, remote patient monitoring, and contactless communication and entertainment, such as drive-in entertainment.[iii] South Bay businesses have also found ways to adapt to the changing business climate:

- Markers to indicate social distancing
- Facial covering requirements in workplaces
- Plexiglass to reduce droplet exposure

- Temperature checks prior to entering businesses
- Frequent cleaning to reduce COVID-19 surface transmission
- Closures of in-store purchases and shift to only delivery and/or pick-up orders
- Shifts in products/services offering to satisfy shift in demand, such as increase in production of PPE and sanitizers[iii]
- Virtual services (telehealth, virtual instruction), and providing emergency relief [iv]

Several trends are also bringing opportunities for entrepreneurs, including a shift to remote work, shift in products/services offered to meet shift in demands from COVID-19, rises in online orders and deliveries, rises in demand for cloud-based technology, and a greater need for an online presence and online functionality. Wireless Intellectual Property (IP) Companies are set to expand and 5G mobile technology will drastically grow the mobile technology market beyond smartphones to smart vehicles, virtual reality, cloud gaming, and other applications.

Notable sectors are emerging in the South Bay Los Angeles and surrounding area measured by capital invested, which include Space Tourism at $4.55 billion, Commercial Space Launch at $3.59 billion, Electric Vehicle Platforms at $1.33 billion, eDiscovery Platforms at $1.13 billion, Auto Commerce at $713.20 million, Ghost Kitchens at $700 million, Cloud Workload Protection at $612.00 million, Sleep Tech at $224.33 million, and Electric Vehicle Charging Infrastructure at $204.19 million. Table 5 and Figure 2 highlight these rising industries in the South Bay Los Angeles and surrounding area.

TABLE 5: INDUSTRIES ON THE RISE SINCE 2019 BY CAPITAL INVESTED IN SOUTH BAY LOS ANGELES AND SURROUNDING AREA

INDUSTRY	Capital Invested	FIRMS	Deals	Industry Description
Space Tourism	$4.55B	2	11	Firms that offer recreational space travel.
Commercial Space Launch	$3.59B	4	13	Firms associated with launching satellite payloads, coordinating satellite launches, and developing infrastructure for space launches.
Electric Vehicle Platforms	$1.33B	3	4	Development and manufacture of electric vehicles, powertrains, and platforms
eDiscovery Platforms	$1.13B	2	3	Firms involved in addressing the challenges of collecting, reviewing, and producing digital evidence for the legal process of discovery.
Robotic Process Automation	$793.00M	1	2	Algorithm and computer software platforms used to complete tasks typically done by humans.
Auto Commerce	$713.20M	3	9	Firms that are aiming to simplify the process of car ownership through the digitization of processes including automotive purchasing, leasing, sales, maintenance and repair.
Ghost Kitchens	$700M	3	3	Stripped down kitchens with no dine-in option and used for creating food for online delivery and catering.
Cloud Workload Protection	$612.00M	1	1	Firms that offer platforms that provide services such as threat detection for cloud-based environments.
Sleep Tech	$224.33M	2	5	Firms that develop and provide technologies to help people sleep, such as sleep monitoring headbands, track sensors, and smart mattresses.
Electric Vehicle Charging Infrastructure	$204.19M	15	23	Companies that provide EV charging infrastructure to enable the electrification of the mobility industry.
Fusion Energy	$237.00M	1	4	Companies that develop and provide energy through heat generated from nuclear fusion reactions.
Sustainable Fashion	$119.61M	5	9	Companies that are developing and producing clothing that uses less materials and contributes less waste to the environment.
Digital Freight Brokerage	$107.88M	2	3	Firms that provide marketplaces to connect truckers and shippers through an online application.
IoT Security	$102.29M	5	8	Companies that provide platforms to protect internet connected devices and networks.
Next-Generation Battery Technology	$92.58M	1	3	Companies that are developing improvements and alternatives to the lithium-ion battery.

As of 9/17/20, filtered by area codes 213 and 323 (Large portion of City of Los Angeles and surrounding cities) 310 and 424 (Westside and South Bay regions of Los Angeles County) referenced from https://www.cpuc.ca.gov/AreaCodes/
Source: Pitchbook

FIGURE 2: SOUTH BAY INDUSTRIES ON THE RISE SINCE 2019 BY CAPITAL INVESTED

Space Tourism $4.55B	**Electric Vehicle Platforms $1.33B**	**Auto Commerce $713.20M**	**Robotic Process Automation $793.00M**	**Cloud Workload Protection $612.00M**
			IoT Security $102.29 / **Digital Avatars $53.29M**	
	Sustainable Fashion $119.61M			
Commercial Space Launch $3.59	**eDiscovery Platforms $1.13B**	**Digital Freight Brokerage $107.88M**	**Fusion Energy $237.00M**	**Electric Vehicle Charging Infrastructure $204.19M** / **Sleep Tech $224.33M**
			Next-Generation Battery Technology $92.58M	**AI-powered Drug Discovery $75.22M** / **Neuro-technology $58.43M**
	Ghost Kitchens $700.00M		**Batteryless IoT Sensors $70.00M**	**Fertility Tech $54.47M**

As of 9/17/20, filtered by area codes 213 and 323 (Large portion of City of Los Angeles and surrounding cities) 310 and 424 (Westside and South Bay regions of Los Angeles County) referenced from https://www.cpuc.ca.gov/AreaCodes/
Source: Pitchbook

FIGURE 3: TOP INVESTORS IN THE SOUTH BAY

TECH COAST ANGELS
Deal Count: 20
Last Deal Date: 8/13/2020

WAVEMAKER PARTNERS
Deal Count: 15
Last Deal Date: 8/19/2020

NATIONAL AERONAUTICS AND
Deal Count: 14
Last Deal Date: 7/27/2020

NATIONAL SCIENCE FOUNDATION
Deal Count: 11
Last Deal Date: 8/28/2020

UNITED STATES DEPARTMENT OF DEFENSE
Deal Count: 10
Last Deal Date: 8/20/2020

NEW ENTERPRISE ASSOCIATES
Deal Count: 10
Last Deal Date: 9/1/2020

South Bay investors sorted by the highest Deal Count, Data as of: 9/4/20
Source: Pitchbook

FIGURE 4: TOP PUBLICLY TRADED COMPANIES IN THE SOUTH BAY BY HIGHEST MARKET CAP

BEYOND MEAT (NAS:BYND)
Stock Price: $129.80
Market Cap: $8.11B
Enterprise Value: $8.14B

SKECHERS USA (NYS: SKX)
Stock Price: $89.13
Market Cap: $4.69B
Enterprise Value: $5.77B

STAMPS.COM (NAS: STMP)
Stock Price: $116.43
Market Cap: $4.09B
Enterprise Value: $2.99B

MATTEL (NAS: MAT)
Stock Price: $13.71
Market Cap: $3.81B
Enterprise Value: $6.19B

AEROJET ROCKETDYNE HOLDINGS (NYS: AJRD)
Stock Price: $125.97
Market Cap: $3.30B
Enterprise Value: $2.89B

OSI SYSTEMS (NAS: OSIS)
Stock Price: $78.77
Market Cap: $1.42B
Enterprise Value: $1.60B

South Bay public companies sorted by the highest market cap. Data as of: 9/4/20
Source: Pitchbook

FIGURE 5: TOP PRIVATE COMPANIES BY HIGHEST POST-MONEY VALUATION

DIRECTV
Last Post Valuation: $67.10B
Last Deal Type: M&A

SPACEX
Last Post Valuation: $46.00B
Last Deal Type: Later Stage VC

RADIOLOGY PARTNERS
Last Post Valuation: $4.29B
Last Deal Type: Debt

CETERA FINANCIAL GROUP
Last Post Valuation: $1.75B
Last Deal Type: Debt

TECHSTYLE (FABLETICS BUSINESS)
Last Post Valuation: $1.50B
Last Deal Type: M&A

INTERNET BRANDS
Last Post Valuation: $1.10B
Last Deal Type: Debt

South Bay Public companies sorted by the highest Post-Money Valuation. Data as of: 9/4/20
Source: Pitchbook

Active start-up firms are located throughout the South Bay with heavy concentration in Torrance, El Segundo, Gardena, Redondo Beach, Manhattan Beach, and Inglewood, which is reflected in Table 6. The largest start-up employers for Top South Bay cities are Aerospace, Health and Social Care, and IT Services. Looking over a time span of 3 years, Top Firms by Capital Raised by Sector includes Industrial Equipment Supply at $5.91 billion, Healthcare at $4.27 billion, Mobile Engagement Marketing Software at $4.05 billion, Electronics at $742.63 million, Business Services at $686.69 million, and Business Review Platform at $395.38 million.

TABLE 6: NUMBER OF STARTUP FIRMS IN SOUTH BAY BY CITY

CITY	START-UP FIRMS
Carson	375
El Segundo	874
Gardena	851
Hawthorne	249
Hermosa Beach	220
Inglewood	339
Lawndale	79
Lomita	81
Manhattan Beach	497
Palos Verdes Estates	18
Rancho Palos Verdes	89
Redondo Beach	517
Rolling Hills Estates	16
Rolling Hills	1
Torrance	1,772
TOTAL	**5,978**

Source: Pitchbook

Minority and Women Entrepreneurship and Access to Capital

Access to capital has long been a challenge for minority and women entrepreneurs in creating and growing their businesses. Exclusion from funding through loans reduces their options in raising capital. This has been especially difficult during a health and economic crisis, with several minority businesses shutting their doors. Minority small businesses owners also struggled to gain access to funding from the Paycheck Protection Program. Conditions such as banks favoring large businesses or existing customers has shut out minority small business owners.

Impacts of the pandemic and the recession that has sparked from it have had a drastic impact on small businesses. In April 2020, due to COVID-19, there was a 22% drop in business ownership, disproportionately affecting minority business owners with a 41% drop in African-American business owners, 32% drop for Latinx business owners, and 26% drop for Asian business owners. In addition, female business ownership was heavily affected with a 25% drop in business owners.[vi] In Los Angeles,

gentrification may accelerate in Black, Asian, and Latino communities, due to the shuttering of minority businesses affected by the coronavirus recession.[vii] In September 2020, a new round of federal relief funding is available for businesses impacted by COVID-19, with $60 million allocated for Los Angeles County and $40 million for the City of Los Angeles. Los Angeles City Councilwoman Nury Martinez states that both the city and county of Los Angeles will prioritize underserved businesses and nonprofits, such as low-income minority and women entrepreneurs.[viii]

FACTORS INFLUENCING CITY-LEVEL ENTREPRENEURSHIP

There are several factors that are influencing entrepreneurship in the South Bay. City and state ordinances and orders affect business establishments in those jurisdictions and state and local governments have developed policies to help businesses in this new COVID-19 world of conducting businesses. Examples of factors that have affected businesses include ordinances that affect customers being inside business establishment, social distancing requirements, facial covering requirements, frequent cleaning to reduce COVID-19 surface transmission, impacts to firm supply chain from suppliers that have limited employees due to layoffs or social distancing requirements, and the shift in demand from customers purchasing goods and services in-person to purchasing online.

A South Bay Economics Institute study of entrepreneurship across Southern California cities finds that startups are attracted to cities with higher crime rates, more diversity, and older populations, yet not those with higher levels of economic development programming. There is evidence that some types of economic development programming may influence entrepreneurship, and especially with respect to the level of minority-owned businesses.

Local governments have enacted policies to help businesses transition into these requirements, such as moritoriums on commercial rents; parklets to expand dining for restaurants and other services, such as hair salons and nail salons; and emergency grants to help businesses stay afloat.

SECTION 2 WHICH ECONOMIC TRENDS HAVE ACCELERATED?

Telework, ecommerce, and supply chains

Through the COVID-19 outbreak and lockdown a new home-based economy has emerged. Telework has increased dramatically, with estimates ranging from 45-56% now working from home.[ix] This is up from 5-15% working from home prior to the lockdown, depending on the definition.[x] Within Los Angeles County, time spent at residences is up 15% since the lockdown, while trips to other locations are all down substantially.[xi] Unsurprisingly, traffic and congestion in Los Angeles both declined immediately following the lockdown, reached their low-point in early April, grew steadily until mid-June, and yet remain below baseline levels.[xii]

TABLE 7: LOS ANGELES MOBILITY BY DESTINATION COMPARED TO PRE-COVID-19 BASELINE

TRIPS TO...	MARCH–MAY	JUNE–JULY
Retail	-51%	-32%
Grocery/pharmacy	-11%	-10%
Transit stations	-43%	-39%
Workplaces	-35%	-41%
Residences	+14%	+15%

Source: https://www.gstatic.com/covid19/mobility/2020-06-19_US_California_Mobility_Report_en.pdf

FIGURE 7: MOBILITY TRENDS FOR WALKING, DRIVING, AND TRANSIT, JANUARY-AUGUST 2020

Source: https://www.apple.com/covid19/mobility
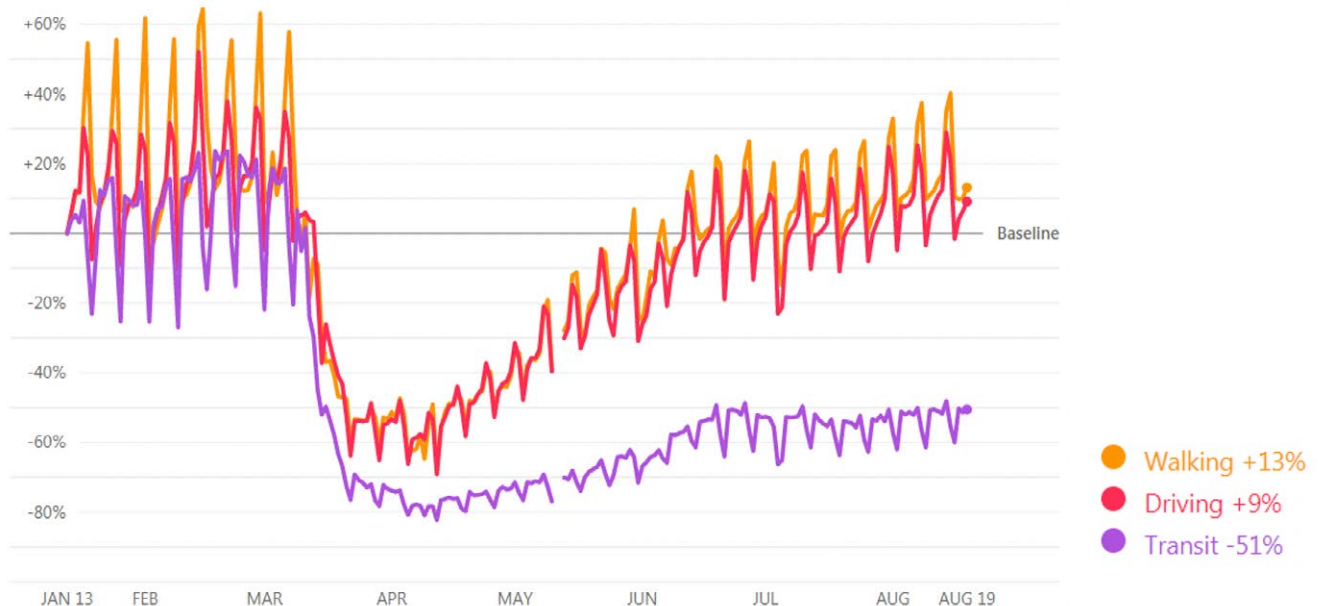
E-commerce was already growing steadily prior to 2020, increasing from 4% of total retail sales in 2010 to 10.5% in 2019.[xiii] However, the lockdown saw a surge in demand, with $77 billion more spent than projected in the U.S. during March-June. Home-based consumption is also evident in overall household spending, which increased only for groceries, household supplies, and home entertainment.[xv]

In contrast, supply chains have been disrupted significantly.

A "supply chain contagion" appears to have occurred, caused as shutdowns have rippled across the industrialized world.[xvi] These lockdowns have created supply-side shocks as factories have closed, and demand-side shocks through reduced consumer spending. It is anticipated that companies will have to innovate and adapt, using Artificial Intelligence and other Smart Manufacturing applications to improve the resilience of their supply chains and manufacturing processes.

"Through the COVID-19 outbreak and lockdown a new home-based economy has emerged."

ECONOMICS PRIMER: BEHAVIORAL ECONOMICS AND COVID-19

Just as the Great Depression became a standard study subject in Economics textbooks, soon we are going to see the impacts and responses to the crisis brought by the COVID-19 pandemic as a classical example in every Economics textbook. From panic purchases to stimulus bills, Behavioral Economics—the intersection of psychology and economics—can help us make sense of a very uncertain situation.

Economists often assume we are all "rational" decision makers and use all available information to maximize utility and self-interest; however Behavioral Economics highlights that we often make "irrational" decisions that contradict these assumptions. Factors such as Social Norms, Overconfidence Bias, Loss Aversion, and Culture offer insights into COVID-19 phenomena.

As social animals, **social norms** are powerful behavioral guidelines and social control measures can promote conformity, such as giving someone the stink eye or calling the police. Despite significant uncertainty at first, most people followed public health recommendations to stay-at-home, practice social distancing, and wash hands. However, the current political climate has complicated the adherence to social norms.

Many of us hold biased assessment of our skills, intellect, and performance; **overconfidence bias** can lead to poor planning after failure. Often (self-reported) expected performance exceeds (observed) actual performance in a systematic way. Students in the U.S. and some European countries that promote self-expression and self-esteem tend to show relatively higher levels of academic confidence (compared to countries like Hong Kong and Singapore) though this does not necessarily translate into better international-standard test scores. Such overconfidence appeared among younger and healthier groups once we learned there were serious consequences for the elderly and those with certain underlying medical conditions.

Loss aversion—the psychological pain of losing something is more powerful than the pleasure of gaining something of equal magnitude—highlights that we are often more motivated by our fears than by our aspirations, and that

penalties are more effective than rewards. While stay-at-home orders, face covering mandates, and social distancing guidelines are followed by many, some feel this is serious loss of their individual liberties. Not being able to be in public without a facemask, dine in at a restaurant, or go to the movies feels like a bigger loss than the actual value of being able to do those things in the first place.

A recent 14-country survey by Pew highlights the importance of **culture** in perceptions of COVID-19 responses and impacts to national unity. There is a strong negative correlation between believing the country has done a good job and both cases per capita (-0.57) and deaths per capita (-0.62). This implies that people's perception about a job well done depends greatly on their country's actual success to contain the outbreak. There is also a strong negative correlation between the sense of unity and both cases per capita (-0.74) and deaths per capita (-0.59). The pandemic appears to have divisively affected people's sense of national unity. A country's lack of national unity also appears to have made it more difficult for government to contain the outbreak. Using the same survey data, we also observe a strong correlation between cases per capita and both the country's Individualism score (0.38) and the Long Term Orientation score (-0.41), such that promoting individualism and a short-term orientation might contribute to struggling to contain the pandemic.

SECTION 3 HOW DOES THIS RECESSION COMPARE TO PREVIOUS ONES?

The depth and length of prior recessions

We are currently experiencing the largest recession since World War II. According to JP Morgan analysis,[xvii] the current recession experienced a peak to trough decline in real GDP of 12.8%. The does not yet match the 26.7% decline in real GDP following the 1929 financial crash, which ran into the late 1930s. Yet it is a similar size to the post-World War II demobilization decline of 12.7%, which took less than one year to recover from. It is significantly larger than the 4.0% decline in real GDP following the 2008 financial crash, which took approximately 18 months to recovery from.[xviii]

In contrast to those events, we have seen notable resilience in the financial markets. Following early declines, stock markets have responded well. Most of the losses experienced during the March and April 2020 have been regained. The Dow Jones Industrial Average was at a high at 29,551.42 and then was decreasing over February and March to a drastic low of 18,591.53 on March 23, 2020. It has been rising since that low since then now at 27,443.48 on August 7, 2020 seen in (Figure 8). However, market volatility has increased. Volatility reached its peak on March 16, 2020, at 82.69 shown in the Chicago Board Options Exchange Volatility Index (VIX). It was decreasing until a drastic rise on June 11, 2020 at 40.79 and has been decreasing from that peak since then and has been at 22.65 on August 6, 2020 (Figure 9).

This is in stark contrast to the "real" economy, which continues to struggle with an uncertain outlook. Stock market optimism is likely buoyed by hope of a vaccine being approved by the FDA in late 2020 or early 2021. Moreover, federal financial assistance to businesses and the unemployed has helped to calm investors.

FIGURE 8: DOW JONES INDUSTRIAL AVERAGE FROM 2016 UNTIL 2020

Source: S&P Dow Jones Indices LLC, S&P 500 [SP500], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/SP500, August 9, 2020.

Responding to COVID-19's impact on the market, investors are looking at the long-term, having in-depth conversations of firms' Environmental, Social and Corporate Governance policies, and are looking to operational managers to learn more about what is going on in a firm's day-to-day operations.[xix] Since investors are looking more towards the long-term, they are looking at shifts in technology and fuel-powered vehicles, which as driven gains in Shopify, Amazon, and Tesla.[xx]

FIGURE 9: CHICAGO BOARD OPTIONS EXCHANGE VOLATILITY INDEX (VIX) FROM 2016 UNTIL 2020

Source: Chicago Board Options Exchange

SECTION 4 HOW QUICKLY WILL WE RECOVER?

V-shape, W-shape, or saw tooth? The new 90% economy?

There is significant uncertainty about the future of our economy. It is important to acknowledge that economic forecasters are often more positive than the economic outcomes end up being.[xxi] The South Bay Economic Forecast was guilty of this last year when we anticipated a possible recession, but with a soft landing. To be fair, few predicted a global pandemic on this scale, which is the first of its size since the 1918-19 influenza pandemic. Uncertainty over vaccine availability and usage, treatment developments, testing systems, school closures, federal government stimulus packages and other important factors, all make this year harder to project than ever.

We looked at forecasts produced by UCLA Anderson, U.S. Congressional Budget Office, U.S. Federal Reserve Board, Wells Fargo, JP Morgan, and Deloitte.[xxii] Most forecasters anticipate a "V-shaped" or "Nike swoop" recovery to commence in the third quarter of 2020, and reach the prior peak in 2022 at the earliest. However, there could be bumps along the way, creating a "W-shape" or "Saw tooth" shape to the recovery. All forecasters agree that the unemployment recovery will lag behind GDP, and remain above 6% until 2022.

TABLE 8: PROMINENT MACROECONOMIC FORECASTS

UCLA Anderson	• GDP TO RECOVERY STEADILY OVER 3 YEARS AND REACH 2019 Q4 PEAK BY 2023 Q1 • EMPLOYMENT TO LAG BEHIND, AND REMAIN ABOVE 6% INTO 2022 • ASSUMES VACCINES AVAILABLE EARLY 2021 AND MOST SCHOOLS REOPEN IN FALL 2020
U.S. Congressional Budget Office	• REAL GDP CHANGE: 2020 -6%; 2021 +5%
U.S. Federal Reserve Board	• REAL GDP CHANGE: 2020 -6.5%; 2021 +5% • UNEMPLOYMENT RATE: 2020 9.3%; 2021 6.5%
Wells Fargo	• REAL GDP (QUARTER-ON-QUARTER CHANGE) 2020: Q3 +18.4%, Q4 +9.7% • REAL GDP (Q-ON-Q CHANGE) 2021: Q1 +5.1%, Q2 +3.2%, Q3 +3.1%, Q4 +2.5% • UNEMPLOYMENT DECLINING TO 6% IN 2022
JP Morgan	• GDP: -3% IN 2021 • UNEMPLOYMENT: 8% IN 2021
Deloitte	• GDP RECOVERY IN 2020 Q3, BUT DECLINE IN 2020 Q4. • RECOVERY TO BEGIN MID-21

Until vaccines and treatments are FDA-approved and widely used, many businesses will be unable to function as before. Tourism and hospitality, gyms, health care, education, and sales all have traditionally used indoor spaces and relied upon physically close interactions. Many such local businesses have taken advantage of the South Bay's accommodating weather and local governments to move their operations outdoors, including into parking lots and onto sidewalks. Even with such adaptations, it is estimated that up to 10% of economic activity could be put on hold until safe non-distanced interactions can continue.

SECTION 5 WHO HAS BEEN THE MOST IMPACTED?

The communities, sectors, and regions most changed by the lockdown

As with the rest of the country, Los Angeles County has been particularly impacted in terms of jobs losses in sales, hospitality, healthcare, community and social service, and personal care and service. At the time of writing, numerous sectors remain locked down for indoor activity, including hair and nail salons, fitness gyms, movie theatres, restaurants, music and theatre venues, sports entertainment, events, and weddings.[xxiv]

Evidence suggests that the lockdown was particularly harmful to businesses in wealthy neighborhoods, who experienced reduced revenues of 70%, compared to 30% reductions in low-income neighborhoods.[xxv] Yet staff at these businesses are often lower-income and live outside the wealthy neighborhoods. Alongside the disparities in unemployment rates discussed above, this highlights the increased interconnections within our regions.

Nonetheless, we see the South Bay as resilient in the face of this pandemic. In terms of health impacts, California's case rate is lower than the U.S. national average, while the death rate per capita is half that of the U.S. Within the South Bay, Carson, El Segundo, Hawthorne, Hermosa Beach, Lawndale, Lomita, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Rolling Hills, Rolling Hills Estates, Torrance are all below the national death rate.

According to the OECD, the U.S. economy as a whole has fared better than all but Japan of the G7 nations.[xxvi] California had been outperforming the U.S. economically in 21 of the 33 quarters since 2012, with an average quarterly real GDP growth rate of 3.5% for California compared to 2.1% for the U.S. The State of California will also benefit from its so-called rainy day fund of around $20 billion, which will soften the blow to State coffers.

The South Bay in particular has great strength in its diversity. We have a diversity of industry sectors, which increases our flexibility to respond to and recover more quickly from major shocks. Local high-tech companies in Silicon Beach and Biotech companies in the region will have possibly benefitted from the pandemic, especially the shift towards home entertainment, telework, and health care innovations. Moreover, our workforce is diverse in terms of demographics and education levels, which can help to drive the future recovery.

Real Estate Markets

According to seasonally adjusted data from California Association of Realtors, the first two months of 2020 saw very a healthy increase in sales (13% and 8%) and prices (9% and 8%) in year-over-year basis for Los Angeles Metropolitan Area and for California as a whole, respectively. Regions in the South Bay saw significant increases in sales (28% and 10%) and prices (4.8% and 4.9%) in year-over-year basis for coastal and inland communities, respectively. Stepping back and taking a long-run perspective, Figure 10 shows that the effect of the pandemic on prices has been relatively small: prices lowered a little during the months of March, April and May, but then recovered quickly. This price drop was driven by the reduction in sales (Figure 11). However, sellers appeared to perceive this situation as temporary. The uptick in prices in recent months is highlighted by the time on market having decreased across Southern California in July 2020 compared to July 2019 (Figure 12).

FIGURE 10. YEAR-TO-YEAR PERCENT CHANGE IN SALES IN SOUTHERN CALIFORNIA COUNTIES
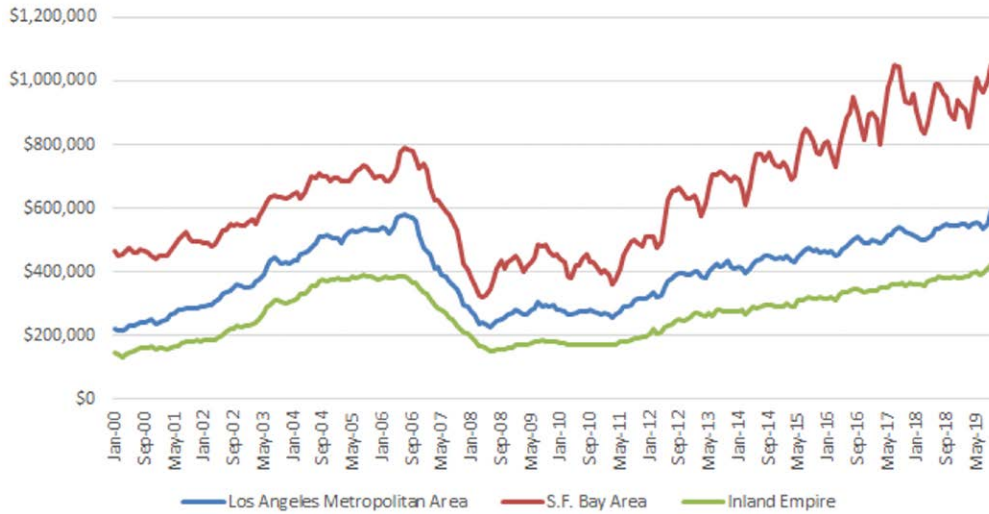

FIGURE 11. YEAR-TO-YEAR PERCENT CHANGE IN SALES IN SOUTHERN CALIFORNIA COUNTIES
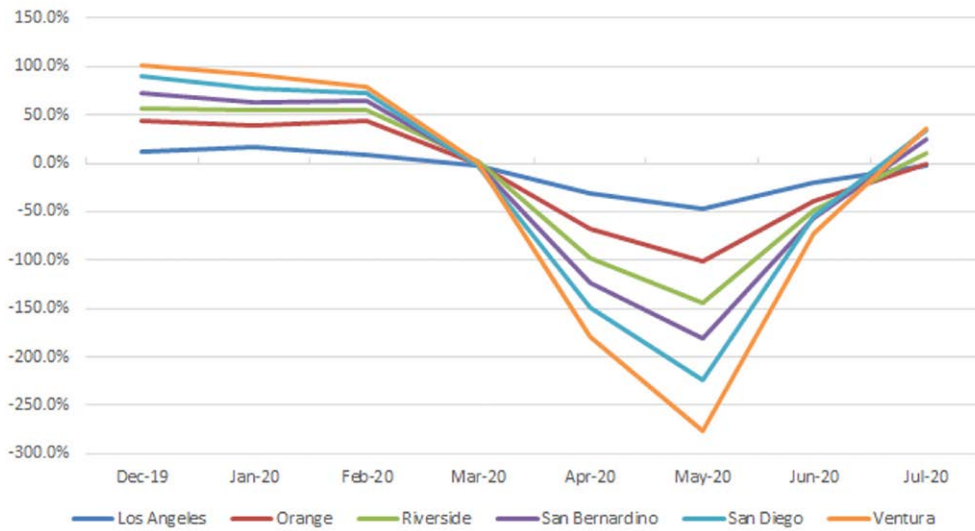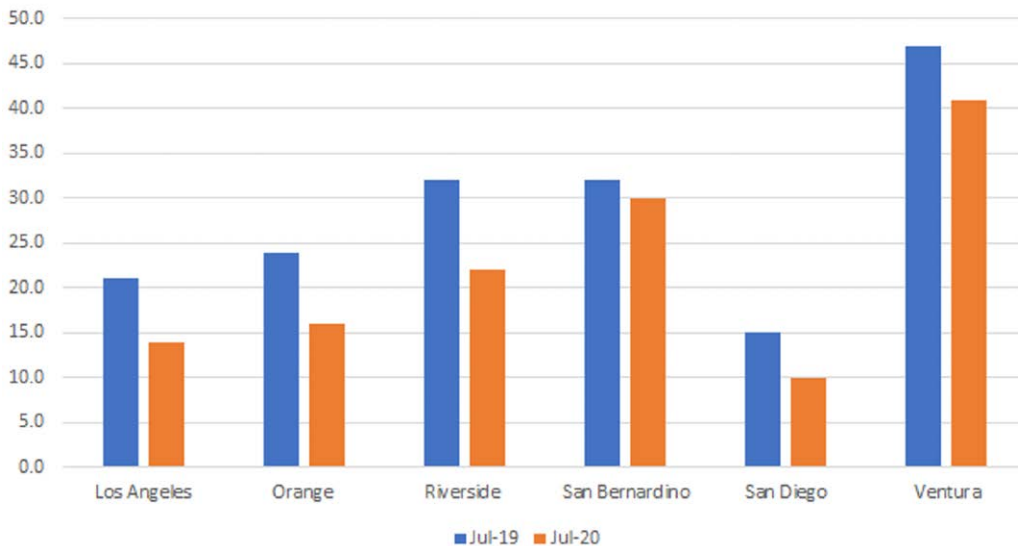

FIGURE 12. MEDIAN DAYS ON MARKET IN SOUTHERN CALIFORNIA COUNTIES

South Bay Housing Market

Monthly sales data for the South Bay coastal (SB1) and inland communities (SB2) areas have been averaging about 270 and 290 units for the last two years (Aug-Jul) respectively (Figure 13).[xxvii] This is a significant reduction from the year before (Aug 2017 – Jul 2018), when these areas were averaging 305 and 330 units per month. Starting in April 2020 sales started decreasing significantly in a year-over-year basis for both SB1 and SB2; however, there has been a recent uptick in sales for SB1 in the July 2020 data.

FIGURE 13. SOUTH BAY HOME SALES
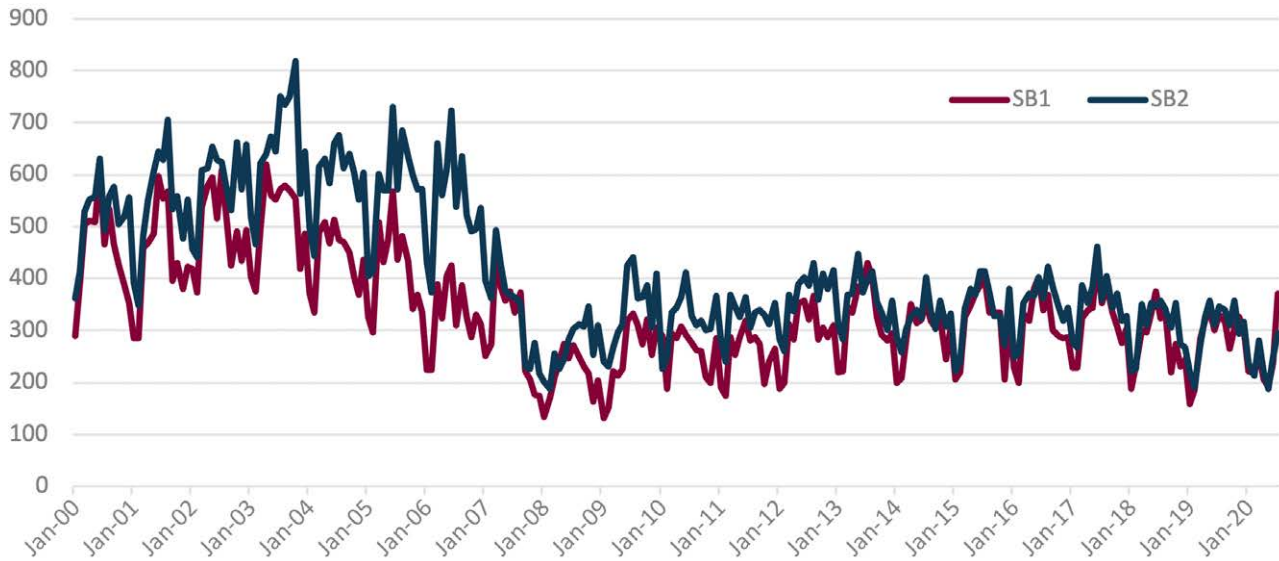
In terms of home price data, we saw a healthy increase in prices from Aug 2018 – July 2019 of 3.9% and 6.3% for SB1 and SB2, respectively (Figure 14). There was also a very impressive increase in July 2020 year-over-year price increase for SB1 and SB2 for almost 15 and 12 percent, respectively. Some experts cite low mortgage rates and a tight supply as the main drivers, but others are also considering the more permanent impacts the pandemic is having on location choices made by people working from home, now that the prospects of telecommuting on a permanent basis seem more feasible.

**FIGURE 14. SOUTH BAY HOME SALE PRICES**

Homelessness

Before the pandemic, the state government was finally trying to address the issue in a meaningful and comprehensive way. The appropriateness of those measures and the level of initial success is definitely up for debate, but most people would agree that a meaningful intervention was well overdue and that things would be even worse without any intervention. Unfortunately, the negative impacts from the economic uncertainty from COVID-19, its direct health implications, and the lingering structural problems in the housing market will likely lead to greater issues of homelessness and lack of affordable housing for the entire region. Furthermore, as those negative impacts tend to be amplified for the lower ends of the income spectrum, the homelessness issue in the Los Angeles region is likely to become a more serious public health concern.

Commercial Real Estate

Given the continuing economic uncertainty from the pandemic, there is a lot of uncertainty and pessimism for the entire commercial real estate sector, including the office, retail, and industrial market. Nobody knows what the future of work will look like, so the need for office space has been curtailed significantly. One of the gloomiest subsectors is the retail space sector, which was already dealing with some structural issues of oversupply before the pandemic. However, one of the bright spots in this sector is the increase in online spending and the subsequent need for industrial and warehouse space.

Rental Market

The economic uncertainty derived from the pandemic has led to a significant decrease in demand for rental units in the area. Part of this comes from an increase in the perceived need to save by households. At the same time, many people dealing with economic uncertainty from the pandemic are now forced to downsize or move in with family and friends. This decrease in demand has led to a sizable decrease in average rents, and the impact seems to concentrate more in the high-end market, which tend to offer amenities such as gyms and clubhouses, that are now mostly unavailable due to the pandemic. Once the eviction moratoriums expire, we should see a large decrease in demand and consequently prices. Landlords might wish to become more stringent with people applying to become tenants, but the reduced demand will limit how strict they can become.
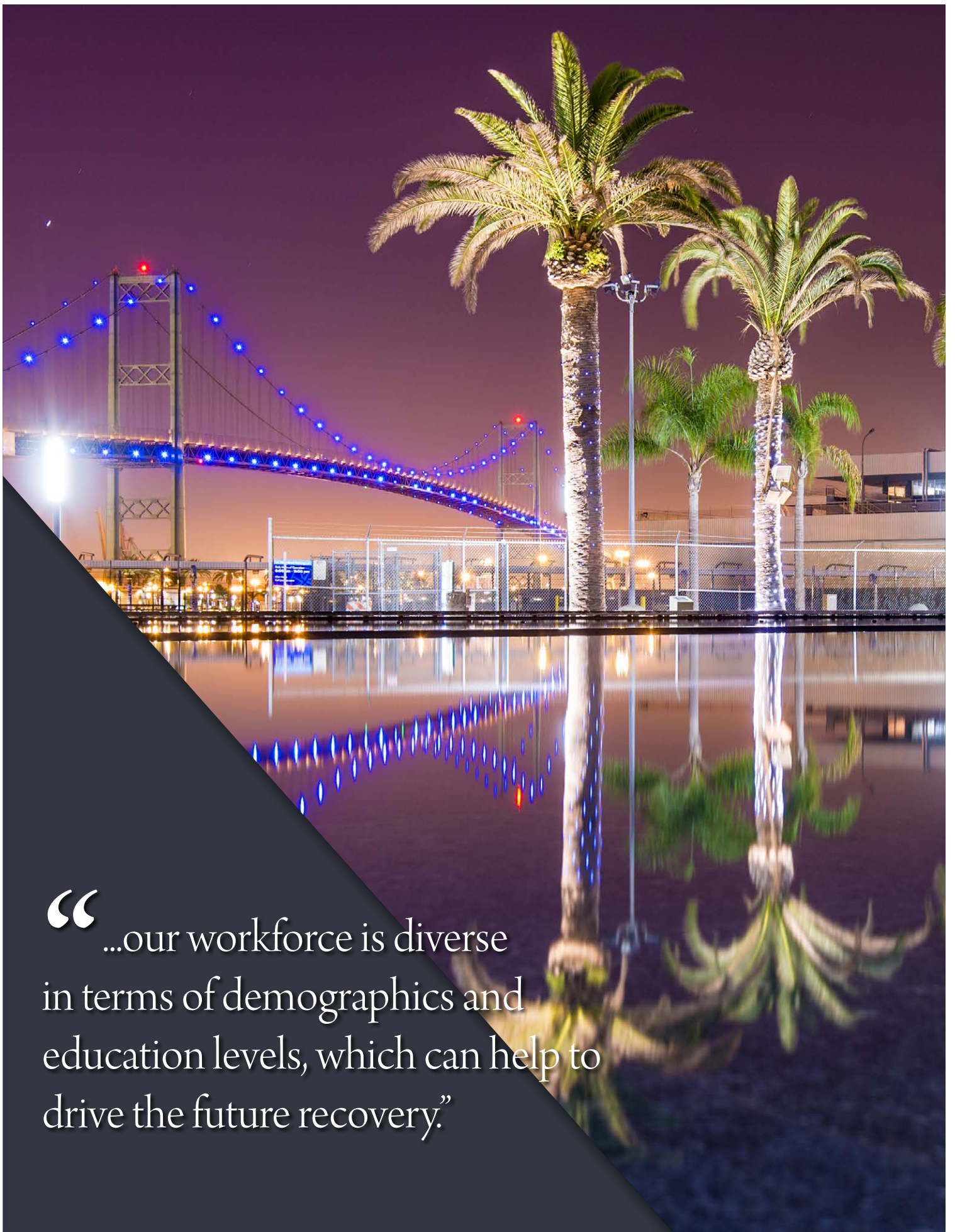
"...our workforce is diverse in terms of demographics and education levels, which can help to drive the future recovery."

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