CENTER FOR CONTINUING STUDY OF THE CALIFORNIA ECONOMY

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November 2019

Report

High and Low Projections of Jobs and Population for the Bay Area to 2070- Projection Framework, Specific Assumptions and Results

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Introduction

SPUR asked the Center for Continuing Study of the California Economy (CCSCE) to prepare a set of high and low projections of jobs and population for the Bay Area to 2070. The results are an input to SPUR's analysis of alternative futures for the region and related policy implications. The work was conducted by Stephen Levy.

This report explains the framework for projecting regional growth, discusses the specific assumptions that underlie the report's projections and presents the projection results. The high and low projections are illustrative of what could be expected under different plausible assumptions and are not predictions of what will actually happen or advocating for specific policies.

Framework for Projecting Regional Growth

All regional projections methodologies project a region's growth by beginning with a projection of national growth. Regional projection analysis focuses on projecting the region's share of that national growth.

The key national variables are total population, total jobs and jobs by industry. National projections begin with a projection of population and translate that into total jobs. The key variables for projecting U.S. population are birth and death rates and, most significantly, the level of future immigration.

National job levels are projected based on population, labor force participation rates (the percentage of residents in specific age and ethnic groups that will be in the workforce) and the level of unemployment.

The next step is to project the types of jobs that will exist by industry. Detailed U.S. industry projections become the critical input to developing regional job projections. All regional projection methodologies begin by projecting regional job growth and then determining the population needed to support the projected job levels.

Regional job projections are determined by national industry growth patterns (for example, recently the Bay Area has recorded a very high share of jobs in some of the nation's fastest growing industries) and by projections of Bay Area/U.S. industry shares. The Bay Area population projections in this report were based on the regional job projections and a simplified methodology that compares population/job trends in the Bay Area and U.S.

Specific Assumptions

U.S. Population

National projections begin with total population and all models begin with the Census Bureau base case projections though some models make small changes to the Census projections. The key variables are assumptions about birth and death rates and the level of immigration, which is the most important determinant of population growth and also the one with the most uncertainty. All of the national models reviewed by CCSCE use the Census Bureau assumptions of slowing declining birth rates.

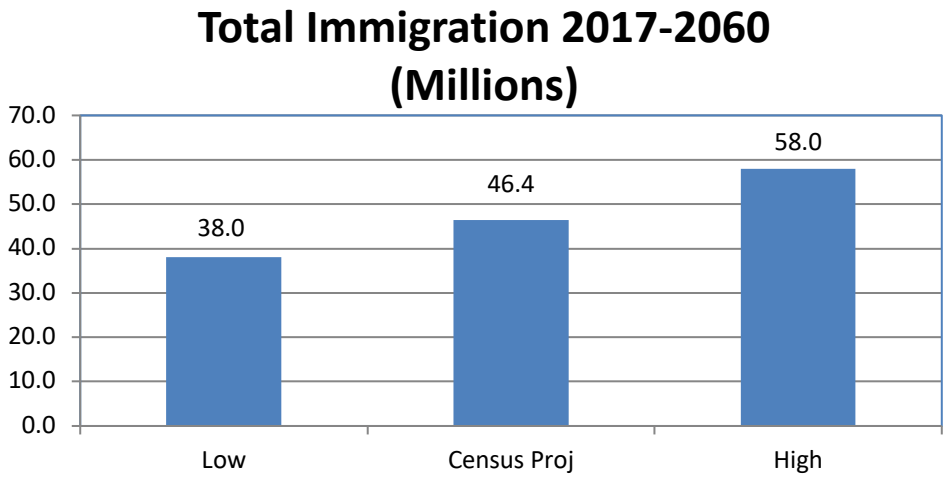
As a result CCSCE developed low and high U.S. population projections by varying the level of immigration. The Census Bureau projections assume an annual average 1.08 million level of immigration. The average for the 2011-18 years was 962,000.

In past projection cycles the Census Bureau produced a high and low projection along with the base case. To date they have not produced high and low projections in the 2018 projection set as of yet. However, the Center for Immigration Studies (https://cis.org/Report/Projecting-Impact-Immigration-US-Population) did produce alternative projections to 2060 by varying the immigration assumptions in the Census Bureau base case. These were "what if" scenarios designed to show the impact of varying immigration levels on population and demographic characteristics. CCSCE adapted two of these scenarios and extended them to 2070.

CIS developed immigration and population projections using a wide range of assumptions about annual immigration (including legal and unauthorized immigration) into the nation. CCSCE selected a set assuming that immigration in the low alternative would be 20% below the Census Bureau level and in the high alternative would be 25% above the Census Bureau projection. The results to 2060 are shown below.

The low projection assumes a continuation of recent trends and policies for immigration to be slightly reduced. The high projection assumes a near term continuation of recent policies followed by new immigration policies that respond to labor force needs and match the CIS 25% above the Census level projection.

The Census Bureau 2018 projections assume 46.4 million immigrants between 2017 and 2060 while the low alternative assumes 38.0 million and the high alternative assumes 58.0 million.



CIS then developed projections of total population using these immigration assumptions and including assumptions about the children born here to the new immigrants over time. CCSCE took the 2060 projections and extended them to 2070 by assuming that the 2060-2070 growth rate would be the same as for 2050-2060. The results are shown below. These immigration alternatives produce a range for the U.S. population in 2070. The difference between the high and low alternatives in 2070 is 37.5 million. This is a difference of 720,000 a year or 7.2 million per decade.

U.S. Population (Millions)

	2018	2040	2050	2060	2070
Low	327.2	367.5	382.1	395.1	408.5
High	327.2	381.3	401.8	423.3	446.0

In terms of growth the low alternative adds 81.3 million residents between 2018 and 2070 for a 24.9% (0.4% annually) growth rate. The high alternative adds 118.8 million residents for a 36.3% (0.6% annually) growth rate. Population growth slows after 2050. This is a result of rising levels of deaths while birthrates remain low. As a result most national population growth after 2050 comes from immigrants and their children. In the low projection population grows by 6.9% while in the high alternative population growth is 11.0% between 2050 and 2070.

U.S. Population 2018-2070

	Change		Average Annual
	Millions	%	Growth Rate
Low	81.3	24.9%	0.4%
High	118.8	36.3%	0.6%

U.S. Jobs

Projections of total jobs were based on the population projections and a simplified method building on detailed analyses conducted by CCSCE for several regional planning agencies. The detailed analyses, which included labor force participation and unemployment rends, resulted in a ratio between U.S. population and jobs. That ratio for each time period to 2050 was used and the 2050 ratio was extended to 2070.

The primary trend in these projections that affects the population/jobs ratio is the assumption that older workers will continue and extend recent trends of working longer. That means that a given population will produce more workers than if retirement patterns remain at current levels. The same assumptions were used for both the high and low alternatives.

U.S. job projections are shown in the table below. They range in 2070 from 198.0 million in the low alternative to 217.0 million in the high alternative.

U.S. Jobs (Millions)

Jobs	2018	2040	2050	2060	2070
Low	161.9	174.7	186.1	192.3	198.8
High	161.9	181.3	195.7	206.1	217.0

In terms of growth the low alternative adds 36.9 million jobs between 2018 and 2070 for a 22.8% (0.4% annually) growth rate. The high alternative adds 55.1 million jobs for a 34.0% (0.6% annually) growth rate.

U.S. Jobs 2018-2070

	Change Millions	%	Average Annual Growth Rate
Low	36.9	22.8%	0.4%
High	55.1	34.0%	0.6%

The next step was to develop a set of detailed industry projections. SPUR thanks Cynthia Kroll, the MTC chief economist, for sharing a preliminary test national industry model run for CCSCE to adapt. The national model run had previously been adjusted by MTC and CCSCE and will be further adjusted by MTC. It is not actively being used by MTC and was shared with the understanding that the CCSCE projections here are not in any way related to the final projections developed by MTC for Plan Bay Area 2021.

A list of the 85 industries analyzed is in Appendix A. The same industries have the fastest projected growth in both the high and low alternatives though in each case growth was much faster in the high alternative.

A list of comparative growth rates for 2018-2070 is shown below. They are included to give a sense of relative growth rates among the largest sectors. These projections do not include detailed analysis of the long-term trends with regard to automation and use of the Internet for shopping.

The U.S. projections were developed by CCSCE based on the initial run provided by MTC and adjustments to some major sectors—construction, retail trade, data processing and administrative services based on analysis of several national projections.

High growth sectors were focused in health care, data processing/Internet and professional services. **The strong growth in data processing/Internet and professional services is a primary reason the Bay Area could grow faster than the nation in both alternatives.** Manufacturing industries, wholesale and retail trade were lagging sectors in both alternatives. Other sectors have projected growth rates somewhat above or below the overall job growth rates.

Selected U.S. Growth Rates 2018-2070

	Low	High
Construction	25.2%	36.7%
Manufacturing	-14.2%	-6.3%
Wholesale trade	2.4%	11.8%
Retail trade	5.0%	14.6%
Transportation and warehousing	21.6%	32.7%
Data processing, hosting and related Information services	86.4%	103.5%
Finance and insurance	26.2%	37.8%
Real estate and rental and leasing	21.2%	32.3%
Professional, scientific, and technical services	38.8%	51.5%
Administrative and support services	24.1%	35.5%
Health care and social assistance	60.2%	74.9%
Food services and drinking places	30.5%	42.5%
State and Local Government	13.5%	23.9%
All Jobs	22.8%	34.0%

Summary of National Projection Alternatives

High and low growth alternatives for the nation were developed based on differences in the level of annual immigration into the nation. The high alternative assumes a near term continuation of recent trends followed by policies that result in immigration levels 25% above the current Census Bureau projections. Many analysts argue that higher levels of immigration are needed to replace retiring workers and address the trend of falling birth rates in the country.

The lower immigration alternative could occur if the country adopts the programs to reduce both legal and unauthorized immigration being proposed by the current administration.

In both alternatives growth rates are below recent levels with annual growth rates to 2070 ranging from 0.4% per year to 0.6%. Also in both alternatives population growth rates fall over time. Job growth rates are slightly higher than population growth rates in the later years as more residents remain in the workforce.

The fastest major industry sector growth rates are projected for health care, professional, scientific and technical services and data processing/Internet related services.

Bay Area Projections

High and low Bay Area projections were developed by 1) projecting Bay Area shares of national industry jobs by sector and 2) translating the job projections into population based on the population needed to fill the jobs. The job projections are for the Bay Area but the population projections do not require that the workers live in the region. That is a policy decision for SPUR to make.\

Background

The Bay Area economy has some enduring strengths as well as challenges. Strengths include:

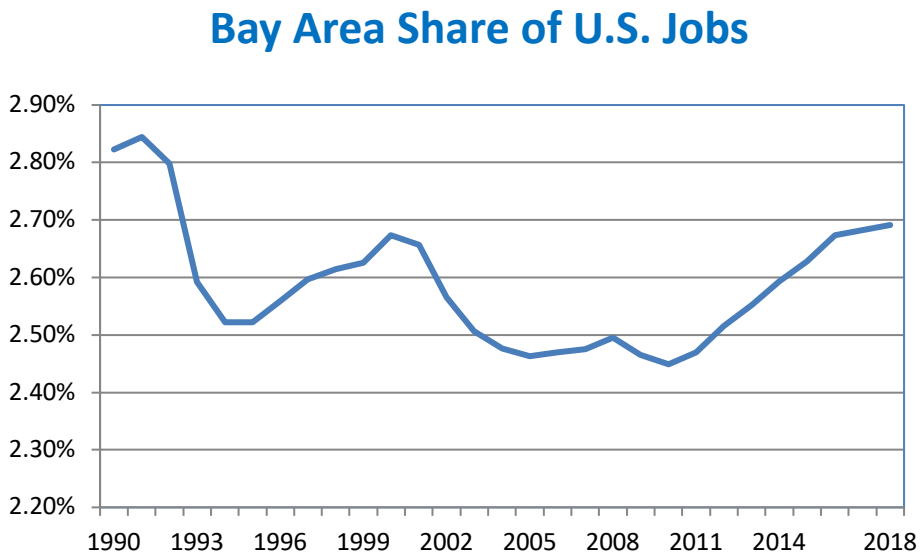
--a high share of the nation’s fastest growing industries
--record levels of venture capital investments
--a high share of well-educated residents
--major companies continuing to plan for expansion
--all of these strengths despite very high housing costs relative to competing regions

Challenges include:

--Very high housing costs and increasing congestion

--companies expanding elsewhere in regions with lower housing costs and a growing workforce
--increasing numbers of residents leaving the region in search of lower housing costs and less congestion
--increasing threats from climate change as well as earthquake danger

The Bay Area share of U.S jobs from 1990 through 2018 is shown below. Despite the recent surge in Bay Area/U.S. shares, the 2018 share is still below the record share in 1990. The Bay Area/U.S. share has increased further in 2019.



Projections of Bay Area/U.S. Job Shares

The low alternative shares were developed by assuming that the 2018 industry shares would continue into the future. In some cases the resulting industry shares were lower than the current 2019 shares. The low alternative job projection is based on the regional economic strengths listed above and some progress on addressing housing and transportation challenges given recent state and regional advances in these areas.

The Bay Area starts with above average shares of two fast-growing national sectors—data processing, hosting and related Internet services (19% of U.S. jobs in 2018) and professional, scientific and technical services (5% of U.S. jobs in 2018) compared to the region's share of total U.S. jobs (2.69%).

The high alternative shares were developed by CCSCE based on continuing the recent share increases in the data processing and professional, scientific and technical services sectors plus raising the projected share of construction jobs.

These assumptions resulted in increased population growth, which had the result of increasing Bay Area shares in population serving sectors.

The high alternative job projections will require substantial progress on addressing housing and transportation challenges, which is a high bar but certai8nly possible given the strong ongoing regional efforts to make substantial progress on housing and transportation planning and funding,.

Projection of Bay Area Total Jobs

Total jobs were projected by applying the projected Bay Area/U.S. industry shares to the projected U.S. industry jobs for both the high and low alternatives and then summing the industry job projections. The resulting projections of Bay Area total jobs are shown below. Projected jobs in 2070 range from 5.5 million in the low alternative to 6.4 million in the high growth alternative.

Bay Area Jobs (Millions)

Jobs	2018	2040	2050	2060	2070
Low	4.3	4.8	5.1	5.3	5.5
High	4.3	5.1	5.8	6.1	6.4

In terms of growth the low alternative adds 1.1 million jobs between 2018 and 2070 for a 26.3% (0.5% annually) growth rate. The high alternative grows roughly twice as much—2.1 million jobs for a 58.5% (0.8% annually) growth rate.

Bay Area Jobs 2018-2070

	Change		Average Annual
	Millions	%	Growth Rate
Low	1.1	26.3%	0.5%
High	2.1	48.5%	0.8%

The Bay Area grows faster than the nation in both alternatives as a result of the very favorable regional industry composition. The relative growth is much higher in the high alternative as a result of assuming some continued increase in Bay Area/U.S. industry shares.

Bay Area Share of U.S. Jobs

2018	2040	2050	2060	2070

Low	2.69%	2.74%	2.75%	2.75%	2.75%
High	2.69%	2.83%	2.96%	2.97%	2.97%

Comparison of Bay Area and U.S. Job Growth

In all alternatives the Bay Area is projected to have faster job growth compared to the nation. This is the result primarily the beginning high share of jobs in the data processing and professional, scientific and technical services sectors as well as assumed strong growth in construction. The high alternative assumes continued share growth as described above.

Bay Area Jobs 2018-2070

	Change Millions	%	Average Annual Growth Rate
Low	1.1	26.3%	0.5%
High	2.1	48.5%	0.8%

U.S. Jobs 2018-2070

	Change Millions	%	Average Annual Growth Rate
Low	36.9	22.8%	0.4%
High	55.1	34.0%	0.6%

Bay Area Population Growth

The Bay Area population projections in this report were based on the regional job projections and a simplified methodology that compares population/job trends in the Bay Area and the nation. The Bay Area currently has lower unemployment rates and higher labor force participation rates compared to the nation, which results in the Bay Area needing fewer additional residents (compared to the nation) to fill any given job level as a higher share of residents are working.

These projections use the 2018 ratio of population to jobs in the region compared to the nation.

These assumptions determine the number of people required to fill the projected jobs. The projected population may or may not all live in the region depending on the success of local housing and transportation policies and the preferences of workers.

Bay Area projections are shown below. Population in the region is projected to increase from 7.8 million in 2018 to between 10.0 and 11.7 million in 2070.

Bay Area Population (Millions)

Pop	2018	2040	2050	2060	2070
Low	7.77	8.94	9.34	9.65	9.98
High	7.77	9.57	10.55	11.14	11.74

In terms of growth the low alternative adds 2.2 million residents between 2018 and 2070 for a 28.5% (0.5% annually) growth rate. The high alternative adds nearly twice as much—4.0 million residents, for a 51.1% (0.8% annually) growth rate.

Bay Area Population 2018-2070

	Change Millions	%	Average Annual Growth Rate
Low	2.2	28.5%	0.5%
High	4.0	51.1%	0.8%

Comparison of Bay Area and U.S. Population Growth

In all alternatives the Bay Area population growth is faster than the national growth rate driven by the higher relative job growth rates. The Bay Area population growth rates are similar to but slightly higher than the job growth rates. This is the result of the retirement of baby boomers in the early years and the rapid growth of older non-working population throughout the period.

Bay Area Population 2018-2070

	Change Millions	%	Average Annual Growth Rate
Low	2.2	28.5%	0.5%
High	4.0	51.1%	0.8%

U.S. Population 2018-2070

	Change Millions	%	Average Annual Growth Rate
Low	81.3	24.9%	0.4%
High	118.8	36.3%	0.6%

Appendix A

List of Industry Sectors

- Forestry, fishing, and hunting
  - Forestry and Logging; Fishing, hunting and trapping
  - Support activities for agriculture and forestry
- Mining
  - Oil and gas extraction
  - Mining (except oil and gas)
  - Support activities for mining
- Utilities
- Construction
- Manufacturing
  - Wood product manufacturing
  - Nonmetallic mineral product manufacturing
  - Primary metal manufacturing
  - Fabricated metal product manufacturing
  - Machinery manufacturing
  - Computer and electronic product manufacturing
  - Electrical equipment, appliance, and component manufacturing
  - Motor vehicles, bodies and trailers, and parts manufacturing
  - Other transportation equipment manufacturing
  - Furniture and related product manufacturing
  - Miscellaneous manufacturing
  - Food manufacturing
  - Beverage and tobacco product manufacturing
  - Textile mills; Textile product mills
  - Apparel manufacturing; Leather and allied product manufacturing
  - Paper manufacturing
  - Printing and related support activities
  - Petroleum and coal products manufacturing
  - Chemical manufacturing
  - Plastics and rubber products manufacturing
- Wholesale trade
- Retail trade
- Transportation and warehousing
  - Air transportation
  - Rail transportation
  - Water transportation
  - Truck transportation
  - Couriers and messengers
  - Transit and ground passenger transportation
  - Pipeline transportation
  - Scenic and sightseeing transportation; Support activities for transportation
  - Warehousing and storage
- Information

- Publishing industries, except Internet
- Motion picture and sound recording industries
- Data processing, hosting, and related services; Other information services
- Broadcasting, except Internet
- Telecommunications

Finance and insurance
- Monetary authorities - central bank; Credit intermediation and related activities
- Securities, commodity contracts, other investments; Funds, trusts, other financial vehicles
- Insurance carriers and related activities

Real estate and rental and leasing
- Real estate
- Rental and leasing services; Lessors of nonfinancial intangible assets

Professional, scientific, and technical services

Management of companies and enterprises

Administrative, support, waste management, and remediation services
- Administrative and support services
- Waste management and remediation services

Educational services; private

Health care and social assistance
- Ambulatory health care services
- Hospitals; private
- Nursing and residential care facilities
- Social assistance

Arts, entertainment, and recreation
- Performing arts, spectator sports, and related industries
- Museums, historical sites, and similar institutions
- Amusement, gambling, and recreation industries

Accommodation and food services
- Accommodation
- Food services and drinking places

Other services (except public administration)
- Repair and maintenance
- Personal and laundry services
- Religious, grantmaking, civic, professional, and similar organizations
- Private households

State and Local Government
- State Government
- Local Government

Federal Civilian

Federal Military

Farm