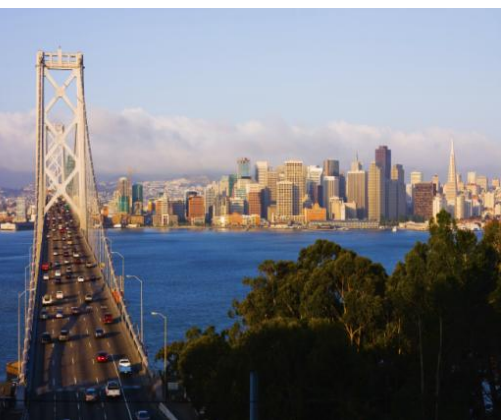


A Population Forecast

THE SAN FRANCISCO BAY AREA, MAY 2013



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Introduction

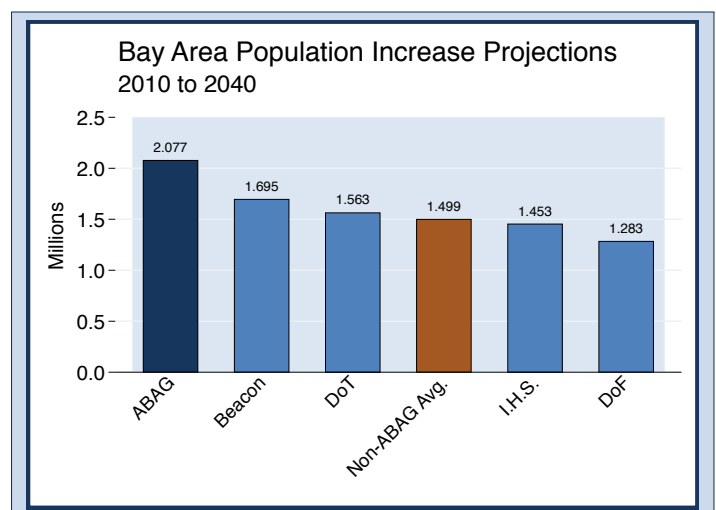
In March 2013, the Association of Bay Area Governments (ABAG), in association with the Metropolitan Transportation Commission, released the Draft Plan Bay Area Report to outline development throughout the Nine-County San Francisco Bay Region (Bay Area). In ABAG's report, the projected population growth for the Bay Area from 2010 to 2040 was approximately 30% and estimated to reach 9.299 million residents by 2040. The group Bay Area Citizens asked Beacon Economics to independently review the methodology and results of the ABAG forecast, and create an alternative forecast that would take into account any issues.

While we at Beacon Economics acknowledge the difficulty of long term forecasting and recognize that there can be a wide variety of potential outcomes, nevertheless we feel that the ABAG forecast likely overstates the rate of population growth the Bay Area might expect over the next few decades. We base this opinion on a number of issues we find with the ABAG methodology, including the failure to acknowledge a general slowing in the natural increase being experienced in the entire nation, misinterpreting the data on job growth in the region and not sufficiently accounting for the negative impact of high housing costs. These issues inflate ABAG's population projection, making it higher than we feel is likely.

Therefore, Beacon Economics has conducted an in-house forecast of the Bay Area's population through 2040, which considers historic growth rates and makes the appropriate adjustments. Our work has been performed independently and our results are completely our own. While our findings actually surpass ABAG's projections for 2020 due to the strong local economy, they also show that the following two decades will have much slower population growth and ultimately the projected population will only reach 8.862 million by 2040. Our projections are based on,

- Revised employment figures for the Bay Area that show employment was 300,000 jobs less than previously reported for 2010 by the California Employment Development Department.
- Shifts in demographic fundamentals that show natural population increases will slow.
- Lower levels of net migration due to home affordability and the previously mentioned slower job growth.

To put both the ABAG and Beacon Economics forecasts in context, we should note that various other entities have also forecasted population growth for the Bay Area and, for the ones we found, their projections for 2040 are even lower. One notable difference between these forecasts, including the California Department of Finance's January 2013 projections (DOF), and ABAG's forecast is in the projected populations for the most densely populated counties – Alameda, San Francisco, San Mateo, and Santa Clara; ABAG's population projections for these counties in 2040 is cumulatively 900,000 persons greater than the DOF.



Critique of the ABAG Forecasting Model

The following explains some of the differences between Beacon Economics' long-term demographic forecast for the nine-county San Francisco Bay Area and that of the Association of Bay Area Governments (ABAG). The first thing that needs to be acknowledged is, as Yogi Berra famously said, "prediction is very hard, especially about the future." Even a basic five-year forecast model has a relatively large error band around it by the end of the forecast period—the world simply has too much randomness and complexity in it for even the most complex long-term economic projection models to be able to predict outcomes that far into the future with a high degree of certainty. Thirty- or forty-year forecasts verge on speculation—particularly when we consider the possibility of "black swan" events. Nevertheless, when it comes to long-run planning, sometimes we have to just do it, acknowledging that there are a few definitely wrong answers and no completely right ones.

Be that as it may, we do feel there are a number of elements in the ABAG forecast in its current form that tend to bias the results upward, making the long-run population projections too high. In some cases, we have a difference of opinion regarding the methodology used. In other cases, we think that there are long-term drivers of demographic growth that have not been accounted for properly. As such, Beacon Economics' forecast for population growth is lower than the ABAG forecast, although ultimately the difference works out to be slightly over 3% less per decade.

The basic flow of logic in the ABAG forecast starts with the strong tech base in the Bay Area, a base that will allow the region's economy to outperform the U.S. economy in terms of job growth by a good margin. To fill these jobs, the Bay Area will, more or less, have to import people. This will in turn cause an acceleration of population from the current levels. Evidence of this comes from the rebound in employment in the area relative to the U.S. overall, as well as from the growing share of jobs in the region compared to the nation overall. We agree that empirical evidence supports the idea that places with lower unemployment rates enjoy more significant inflows of population than other areas, holding all else equal. We feel, however, that there are other forces that can slow things down.

The ABAG approach of jobs driving population growth is problematic for a number of reasons all by itself, not the least of which that it seems to mischaracterizes the relative success of the Bay Area in recent years. Indeed, better accounting suggests that overall employment growth in the Bay Area has been slower than in other places despite the tech industry that plays such an important role in the local economy.

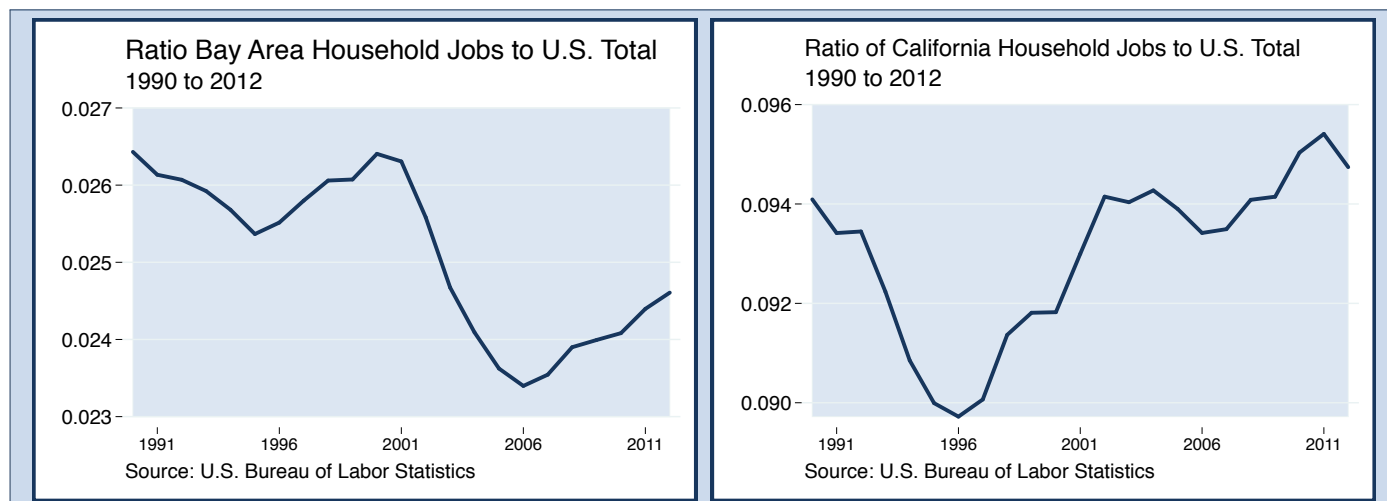
The ABAG report uses payroll employment as a share of the national total to discuss the relative advantage. Recent high pace of job growth combined with what happened in the late nineties during the tech boom seem to be the predominant evidence of the importance of this driver. But using payroll employment from the Current Employment Statistics (CES) survey makes employment gains in the Bay Area look more robust than they actually were over the past two decades. Payroll employment is based on where people work, not where they live. And payroll figures will double count people with more than one job.

Indeed while it is true that payroll employment in the late nineties was very rapid, growth was significantly faster than population growth, household employment growth or other measures of changes in the local demographic base. It seems as if one impact of the frenzied economy at the time was that many workers had multiple jobs, or equivalently that many were commuting in from other regions for work.

The household employment survey is a better way to measure true job growth in the area—particularly as it relates to population, since it is based on where a worker lives rather than where the worker works. When these are taken

into account, the Bay Area has actually seen a declining share of overall U.S. household jobs, despite the tech-heavy drivers of the Bay Area economy and despite its position as one of the most successful economies in the nation.

Even with the bounce in local employment in recent years, the overall ratio of jobs in the Bay Area to jobs in the U.S. is still well below 2003 levels, and even farther below where it was in 1990. This is especially notable when we look at the rest of California, where the share of household jobs in recent years is above where it was in 2002 or 1990, despite having a less tech-heavy employment base. In short there is little evidence to show that the booming tech industry has caused an overall acceleration in population growth in the region, and as such shows that it is logically incorrect to assume a high pace of long term demographic growth on this basis.



As for the recent trends, the current acceleration is simply a bounce-back effect driven by the fact that the skilled workforce in the U.S. saw its fortunes improve from the setbacks of the last deep recession faster than the low-skilled workforce. We should not assume that this is anything more than a cyclical effect, and is certainly not evidence that the historic decline in jobs in the Bay area compared to the rest of the U.S. or even California will soon be reversed.

Why has the booming tech industry not been matched by overall higher than average employment growth in the region? From our analysis it is because of the lack of affordable housing in the region. While low unemployment attracts people to a region, high home prices can drive them away. Because of the lack of construction relative to population growth in the Bay Area, the region already has one of the most expensive housing markets in the nation. To put this in perspective, in 1997 the median price of a house in San Francisco County was 2.17 times that of the median price in the nation overall. In March of 2013 that ratio reached 4.24. Even relatively affordable Alameda County has seen its ratio climb from 1.59 to 2.23 over the same time period. It is expensive to live in the Bay Area, particularly for mid-skilled workers.

Ratio of Bay Area to U.S. Median Home Price

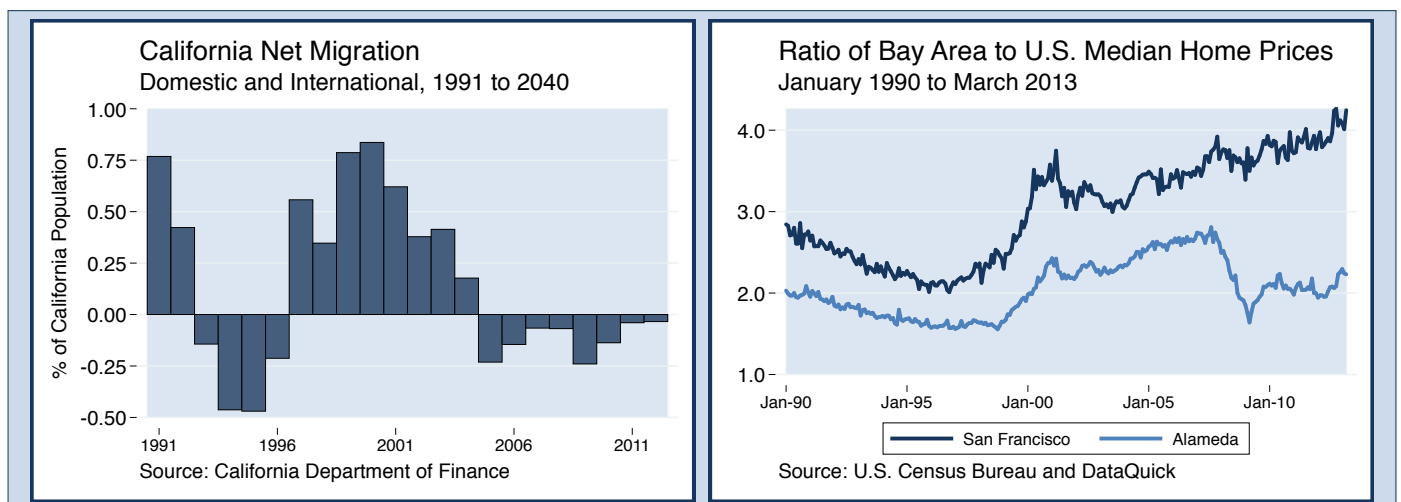
Date	San Francisco	Alameda
March 1997	2.17	1.59
March 2013	4.24	2.23

Source: National Association of Realtors and DataQuick

High housing costs can restrict population growth in a few different ways. Most obviously, people will choose to commute to expensive regions rather than move into them. By our calculations at least 20% of workers in the Inland Empire commute to work in the economies to the west of the region on a daily basis. In large part, people are choosing to commute to Los Angeles and Orange County because of the same lack of affordability that we are seeing in the Bay Area. Given the Bay Area's high median home price, even if the region does experience strong job growth, many workers will decide to live outside the area and commute in. Job growth by itself cannot be used as a sole driver of population growth.

We understand that a primary focus of the Plan and DEIR is to significantly expand the supply of housing in the Bay Area. As such the issue of high housing costs being a negative driver of population growth would seem to be irrelevant. But we are more referring to the fact that now home prices are relatively very high to other areas—and this will serve to restrict growth in the short run. In other words any housing plan would need to first catch up with past deficiencies before future growth can be accommodated for. We have not reviewed these aspects of the Plan and DEIR in detail, and we express no opinion on the likelihood of the success of these proposals, but we will observe that there is no record of any such program being successfully implemented anywhere in the U.S. to the extent projected in the Plan and DEIR.

The impact of high housing costs can be seen clearly in what happened in the state overall through the last housing cycle. As noted, low unemployment rates tend to attract people to the state, as seen clearly in data on negative net migration during the weak economy of the early 1990s and high positive net migration into the state during the hot tech-boom era of the late 1990s. Indeed, this is an important factor in the ABAG forecast, since they state that the hot tech core of the local economy will keep unemployment at 5% and thus draw in a high pace of migration into the area. However, the drop in affordability during the last housing bubble dampened this effect completely. Net migration was negative for California in 2005, despite the hot economy and the low unemployment rate. Because more people were moving out than moving in, the population shrank by .23%.



Then when the economy stumbled hard and home prices fell, despite higher unemployment in the state than the U.S. overall net migration actually stayed steady—higher affordability brought some folks back to the state. To put this in perspective, in 2009 at the height of the recession that hit California so much worse than other states, net migration

for California was negative, with .24% of the population moving out of the state, roughly the same as in 2005. It is worth noting again that prices in the Bay region have fallen less than in other places

Lastly there is basic demographic changes being seen in the U.S. overall. There will be fewer people to move into the Bay region if there is a slowing in overall population growth in the U.S. This is exactly what is being seen in forecasts for the national overall largely due to falling rates of natural increase (births less deaths). The lower rates of natural increase stem from declines in fertility rates among U.S. women, as well as from the aging of the baby boomers beyond childbearing years. The Census Bureau currently forecasts that population growth in the U.S. will slow from .77% per year in 2015 to .5% per year in 2046. As such, even if the Bay Area does grow more quickly than the nation as a whole, the overall slowing will mean slower growth over the years.

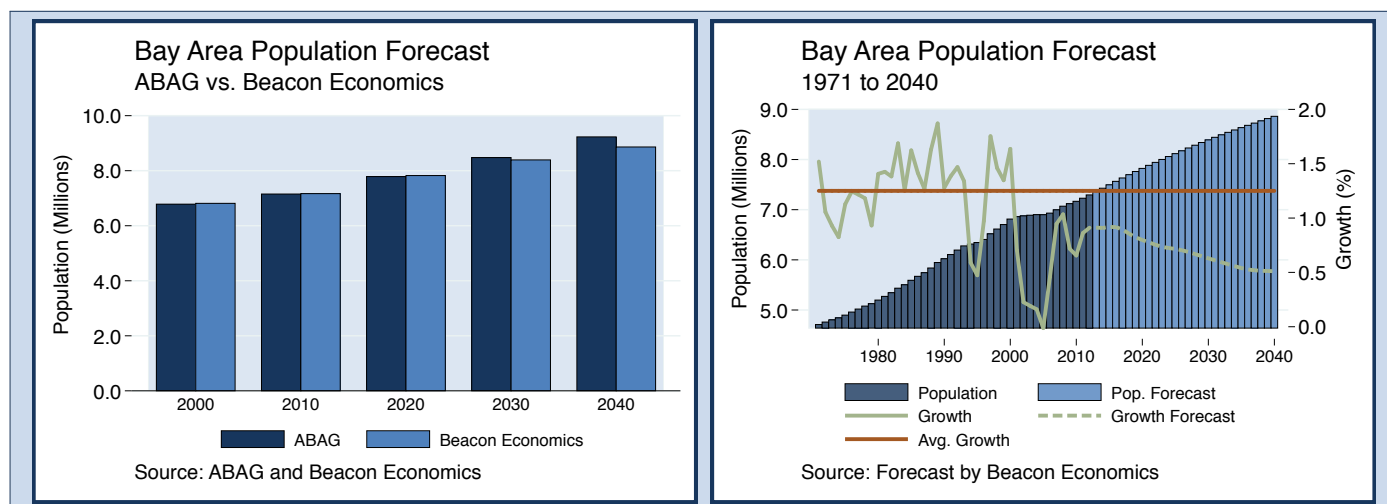
What could change our forecast? If the Bay Area saw a stunning reversal of relative home price trends, then the net migration number would likely increase. But we don't see a reasonable chance of major reforms in CEQA requirements or building permits that would be necessary to spark that pace of construction. Likewise, there have been attempts to broaden the housing market by issuing affordable housing mandates or creating redevelopment agencies with missions—at least on paper—to build more affordable housing. These efforts have failed to make even a dent in housing costs in the Bay Area. As such, we would have to see hard evidence of falling relative prices before we changed our opinion.

To reiterate, however, there is a wide range of potential outcomes for the Bay Area. The region could be struck by a potentially catastrophic disaster, or it could experience a reversal of fortune in the IT industry, as happened with the one-time seemingly unstoppable aerospace industry in Southern California. On the other hand, the region could experience a new burst of growth, driven by some new discovery in technology or a major housing reform. But, for the reasons cited above, we feel that there is a high probability that our projections will prove to be more accurate than ABAG's higher projections.

Bay Area Population Forecast

In addition to reviewing the forecast work performed by Stephen Levy, the director of the Center for the Continuing Study of the California Economy, in the ABAG report, Beacon Economics has constructed its own population forecast for the San Francisco Bay Area, extending out to 2040. Overall, Beacon Economics has found that the ABAG report is too optimistic in its projections for population growth in the Bay Area over the next 30 years. Our forecast, which has the benefit of incorporating the latest data from the California Department of Finance (DOF) on population and the components of population change, calls for the Bay Area population to grow to 8.86 million by 2040. This is roughly 367,000 fewer residents than projected by ABAG over the same period, or roughly 4% fewer residents in 2040.

Overall, we are projecting slightly faster growth over the short term, with growth averaging roughly 0.9% per year on a compound annualized basis. Over the longer term, Beacon Economics forecasts that population growth in the San Francisco Bay Area will decline to roughly 0.55% per year.



Beacon Economics' long-term population forecast is smaller than that of ABAG for three reasons. First, we use up-to-date data on employment growth—one of the primary determinants of population growth. The recent data indicate that employment fell further than previously determined. Specifically, Beacon Economics is showing roughly 3.1 million jobs in the Bay Area as of 2010, rather than the nearly 3.4 million jobs used in the ABAG forecast. Thus, although Beacon Economics is forecasting roughly 0.5% growth in nonfarm jobs over the long term, which is only slightly lower than ABAG's 0.6% annual growth in jobs through 2040, the lower starting point means that ABAG's forecast is overstated by nearly 460,000 jobs by the end of the forecast. Because the Bay Area will gain fewer jobs over the next three decades, Beacon Economics is forecasting that there will be slightly less net migration into the Bay Area. Importantly, the 0.5% job growth projected by Beacon Economics is below the long-run average growth rate of nearly 0.8% per year in the Bay Area. Still, Beacon Economics does envision employment in the Bay Area rising to 4.16 million by 2040. This represents a 1.06 million increase in the number of jobs located within the Bay Area by 2040. In comparison, the ABAG forecast shows employment growing from 3.39 million jobs in 2010 to 4.62 million by 2040. Indeed, even after adjusting for an overstated base year, it is likely that the ABAG forecast would still be too optimistic and overstate future job growth by more than 175,000 positions.

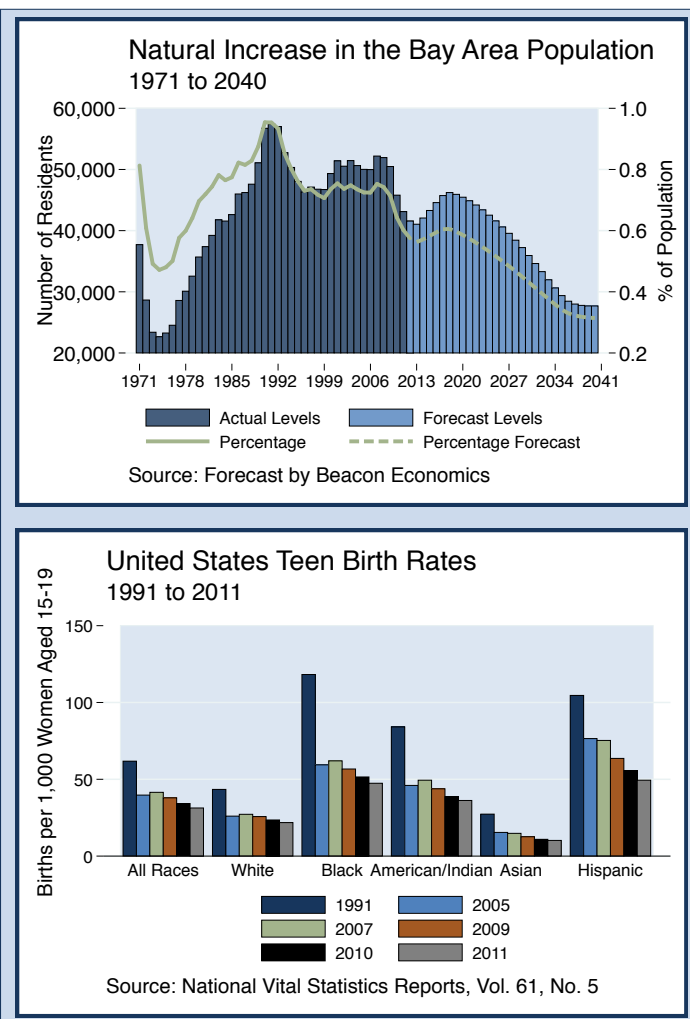
The second (and perhaps more important) reason for the discrepancy between Beacon Economics' forecast and that of ABAG is that our forecast pays closer attention to the fundamental demographic shifts that are currently underway in the Bay Area and the nation overall. Specifically, there has been a significant slowing in the pace of natural increase—the number of births in a region less the number of deaths. As recently as the early 1990s, natural increase was responsible for generating more than 57,000 new Bay Area residents each year. In the most recent data available (2012), natural increase had fallen to just 41,561 new residents per year.

It's not surprising that we are seeing a trend toward fewer births and greater deaths, given that birth rates are declining while the population is aging. The population in the Bay Area, the state, and the nation overall is becoming older. At almost 25% of the population, the 55 and older age group represents a large share of U.S. residents. As such, deaths are naturally expected to increase as the average age of the population rises. This will tend to put downward pressure on natural increase holding everything else constant. At the same time, birth rates are declining. Indeed, according to data from the World Bank, birth rates in the U.S. have fallen from nearly 24 births per 1,000 people in the early 1960s to just 14 births per 1,000 people in 2010.

According to the National Vital Statistics Reports¹, teen birth rates, a common measure of fertility, are down across all ethnicities. Since 1991, birth rates have fallen from 61.8 births per 1,000 women aged 15-19 in the U.S. to just 31.3 by 2011. Typically, U.S. residents of Hispanic or Latino origin have had relatively high birth rates. Given that California has a larger share of Hispanic residents relative to the rest of the nation, the state has seen more natural increase on a proportional basis. However, this data also shows that birth rates among Hispanic women have dropped dramatically, which will mitigate future natural increase in California and the Bay Area. In fact, birth rates for Hispanic women have fallen from 104.6 per 1,000 women in 1991 to just 49.4 in 2011. That marks a 52.8% reduction in birth rates among Hispanics over the 20-year period—a faster decline than the 49.4% reduction in birth rates across all racial and ethnic groups.

With an aging population in California and the Bay Area, and with trends in birth rates showing fewer babies being born to mothers of both Hispanic and non-Hispanic descent alike, Beacon Economics forecasts that natural increase will continue to decline in the coming years. A larger number of deaths will be expected as the mean age of Bay Area residents rises, and these deaths will be offset by a smaller number of births as birth rates continue to slide. As a result, Beacon Economics forecasts that the rate of natural increase in the Bay Area will have fallen to less than 30,000 per year by 2040, or 0.3% of the population base. This will help to drive below-average growth in the Bay Area's population over the long-run relative to the historical performance of the region since 1970, when natural population increase was roughly 0.6% of the population base each year.

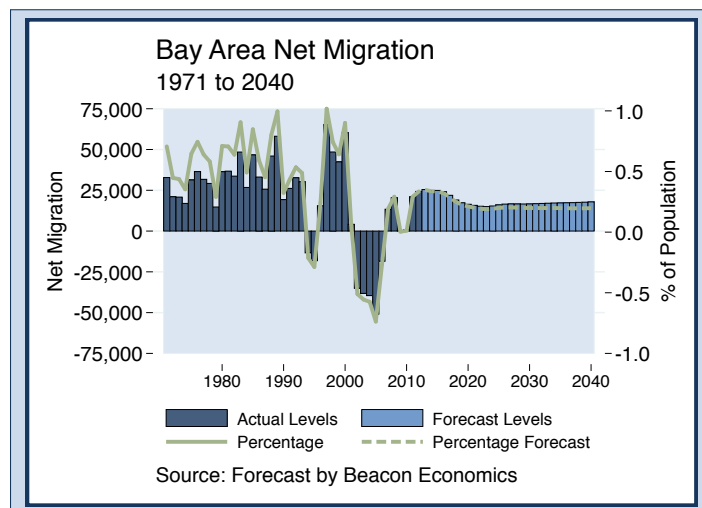
The third reason that Beacon Economics' long-term population forecast is smaller than that of ABAG is that we expect fewer people to move to the Bay Area. In addition to experiencing growth from natural increase, the Bay Area's population also grows or shrinks in response to net migration—the net number of people moving into or out of the region. Net migration takes into account the net movement of domestic residents as well as net foreign immigration. Unlike natural increase, net migration into or out of a region is largely a function of economic forces rather than demographic trends. As noted earlier, Beacon Economics is forecasting that fewer jobs will be added to the Bay Area economy from 2010 to 2040 relative to ABAG's forecast. As a consequence, the smaller number of jobs is expected to draw in a smaller number of migrants into the San Francisco Bay Area over the next 30 years. Back in the 1980s, net



¹National Vital Statistics Report, http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_05.pdf, Vol. 61, No. 5.

migration contributed 1% to the population base each year. However, from 2002 to 2006 (after the dot-com crash), a larger number of residents moved out of the Bay Area relative to the number of new residents that moved in.

As the economy heals, Beacon Economics expects that net migration into the Bay Area will remain positive through 2040. However, the pace of that migration will be below historical averages. Specifically, Beacon Economics is forecasting that net migration will add an average of just under 20,000 new residents each year (both foreign and domestic on net). This is much lower than the net number of 60,000+ new residents that migrated to the Bay Area each year during the height of the tech bubble, though it is markedly stronger than the out-migration the region faced in the wake of the dot-com bust. On a proportional basis, net migration is only expected to contribute 0.2% to the annual population base over the long run.



Bay Area Employment and Population Projections

Year	Employment Level			Compound Annual Growth (%)	
	ABAG	Beacon Economics	Difference	ABAG	Beacon Economics
2010	3,385,300	3,104,452	-280,848		
2020	4,068,500	3,763,009	-305,491	1.86	1.94
2040	4,617,500	4,160,373	-457,127	0.63	0.50
Cumulative (%)	36.40	34.01			

Year	Population Level			Compound Annual Growth (%)	
	ABAG	Beacon Economics	Difference	ABAG	Beacon Economics
2000	6,783,762	6,813,183	29,421		
2010	7,152,000	7,166,923	14,923	0.53	0.51
2020	7,786,382	7,823,100	36,718	0.85	0.88
2030	8,477,035	8,391,889	-85,146	0.85	0.70
2040	9,229,000	8,861,569	-367,431	0.85	0.55
Cumulative (%)	29.04	23.65			

Source: ABAG & Beacon Economics

This slower net migration has two causes. First, the Bay Area remains an expensive place to live relative to the rest of California. The affordability gap becomes even more dramatic when the region is compared to the nation overall. With job growth picking up across the nation, and with relatively cheaper housing in many other parts of the U.S., the incentives to migrate to the Bay Area will be reduced. And given that job growth is expected to be much slower over the next 30 years than it was during either the tech or housing bubbles, net migration into the Bay Area is expected to remain tepid at best.

Because natural increase is slowing and net migration into the region is staying relatively flat, Beacon Economics expects that long-run population growth in the San Francisco Bay Area will decline to 0.5%. As a result, our forecast for the total population in the Bay Area in 2040 shows roughly 367,000 fewer residents than the population forecast in the ABAG report.

Summary of Other Forecasts

In addition to reviewing the ABAG forecast and providing our own forecast of population growth in the Bay Area, Beacon Economics has also performed a review of other population forecasts. A summary of these additional forecasts is presented here. By looking at additional forecasts for the pace of population growth in the San Francisco Bay Area, we can situate the ABAG and Beacon Economics forecasts in a spectrum of possible trajectories, and thus provide a context for our analysis.

Other Bay Area Population Forecasts Show Population, Employment, and Multi-family Housing Demand will Come up Short of ABAG Expectations

Prior to the 2012 revisions, it was well known that the California Department of Finance (DOF) forecast for population growth was overly optimistic. The ABAG forecast, which resembles the DOF July-2007 projections, predicts that the Bay Area population will increase from 7.15 million in 2010 to 9.30 million in 2040, a 30.0% increase. In comparison, the new DOF forecast, released in January 2013, projects the population will increase to 8.45 million by 2040. This marks a reduction of 850,000 persons from the ABAG forecast—a decidedly more tepid projection.

Other reports also show lower projections. One written by the California Department of Transportation (DOT) in October 2012 projects that the Bay Area's population will increase to 8.73 million residents by 2040, while IHS Global Insight projects that the Bay Area's population in 2040 will be 8.62 million. ABAG's projections are between 570,000 and 680,000 persons higher than the projections in these two reports.

Overestimating population growth can significantly alter the ABAG forecast for employment and total housing units. For example, based on ABAG's estimate of a 50% labor force participation rate and a 5% unemployment rate, the new DOF population projections would call for a reduced forecast to ABAG's employment projection by 703,750 jobs throughout the Bay Area. Likewise, the DOT projections would reduce the employment forecast by 270,750 jobs, and the IHS projections would reduce the employment forecast by 323,000 positions. Furthermore, overestimating population growth in counties (urban), age groups, and ethnic groups can alter the labor force participation rates and the type of housing units that will be in demand.

Projected Population in 2040, Bay Area and Nine Counties

County	2040 Population Level (in millions)				Diff. from ABAG (in millions)		
	ABAG	Dept. of Finance	Dept. of Transportation	IHS Global Insight	Dept. of Finance	Dept. of Transportation	IHS Global Insight
Bay Area	9.30	8.45	8.73	8.62	−0.85	−0.57	−0.68
Alameda	1.99	1.68	1.82	1.78	−0.31	−0.17	−0.21
Contra Costa	1.33	1.39	1.36	1.44	0.06	0.03	0.11
Marin	0.29	0.26	0.29	0.24	−0.03	0.00	−0.05
Napa	0.16	0.17	0.17	0.17	0.01	0.01	0.01
San Francisco	1.09	0.89	0.91	0.88	−0.20	−0.18	−0.21
San Mateo	0.91	0.85	0.77	0.74	−0.06	−0.14	−0.17
Santa Clara	2.43	2.08	2.31	2.22	−0.35	−0.12	−0.21
Solano	0.51	0.55	0.53	0.54	0.04	0.02	0.03
Sonoma	0.60	0.57	0.56	0.61	−0.03	−0.04	0.01

Source: ABAG, DOF, DOT, IHS Global Insight

Bay Area Population Forecasts by County

ABAG's population projections for four Bay Area counties are significantly higher than the county projections from DOF, the Department of Transportation, and IHS Global Insight. ABAG forecasts significant population increases in the counties of Alameda (31.6%), San Francisco (34.8%), San Mateo (26.1%), and Santa Clara (36.1%). The new projections from the Department of Finance are lower for all four counties (10.9%, 10.6%, 18.1%, and 16.6%). The DOT projections perhaps most closely resemble the ABAG forecast (20.2%, 12.9%, 7.4%, and 29.2%), though the DOT projections remain significantly lower than those of ABAG by 2040. Finally, the IHS projections further suggest slower population growth in the four counties (17.3%, 8.9%, 2.8%, and 24.3%). ABAG's projections for the four combined urban counties are between 590,000 and 900,000 persons higher than the projections in the three other forecasts.

Reducing the forecasts for these four counties would mean reducing the expected demand for multifamily units. The current (2011) shares of multifamily structures in the four counties are 38.8% in Alameda, 68.0% in San Francisco, 34.5% in San Mateo, and 36.9% in Santa Clara. These are significantly higher than in Contra Costa (26.4%), Marin (30.2%), Napa (27.5%), Solano (24.0%), and Sonoma (24.9%) counties, where ABAG's population forecasts more closely resemble DOF, DOT, and IHS.

Projected Percentage Growth Populations from 2010 to 2040, Bay Area and Nine Counties

County	Change in Population from 2010 to 2040 (%)				Diff. from ABAG (Change in Percentage Points)		
	ABAG	Dept. of Finance	Dept. of Transportation	IHS Global Insight	Dept. of Finance	Dept. of Transportation	IHS Global Insight
Bay Area	30.0	18.0	21.8	20.1	−12.0	−8.2	−9.9
Alameda	31.6	10.9	20.2	17.3	−20.7	−11.4	−14.3
Contra Costa	27.3	32.3	29.1	36.4	5.0	1.8	9.1
Marin	13.1	2.7	14.8	−6.4	−10.4	1.7	−19.5
Napa	19.9	26.4	26.2	23.7	6.5	6.3	3.8
San Francisco	34.8	10.6	12.9	8.9	−24.2	−21.9	−25.9
San Mateo	26.1	18.1	7.4	2.8	−8.0	−18.7	−23.3
Santa Clara	36.1	16.6	29.2	24.3	−19.5	−6.9	−11.8
Solano	23.7	33.5	28.5	31.4	9.8	4.8	7.7
Sonoma	23.7	18.3	16.5	25.6	−5.4	−7.2	1.9

Source: ABAG, DOF, DOT, IHS Global Insight

Bay Area Population Forecasts by Age Group

ABAG projects that the senior aged population (65 years and over) in the Bay Area will increase from 900,000 to 2.1 million. The Department of Finance projects that the same group will increase to only 1.9 million. For the population under 25 years of age, both ABAG and DOF project a 25% increase (to 2.8 million, although a typo in the Draft Bay Area Plan 2013 misstates the population estimate for this age group). Since the ABAG projects the population to increase by 850,000 more residents than the DOF, then the ABAG forecast for persons of prime working age (from 25 to 64 years old) is approximately 650,000 persons higher than the DOF forecast.

ABAG assumes that the labor force participation rate will decline from the current 52% to 50% in 2040 because the share of the population in the prime working ages will decline from 56% to 47%. DOF projects this share to decline to 44%, which means that the labor force participation rate would be less than 50%. Although the difference between the two projected shares of residents of prime working age is small (47% vs. 44%), it nonetheless leans toward a lower employment count in 2040.

Projected Population Growth from 2010 to 2040 by Age Group

Age Group	2010	2040 Population (in millions)			Cumulative Growth 2010-2040 (%)			Share of Total in 2040 (%)		
	DOF	ABAG	DOF	IHS Global Insight	ABAG	DOF	IHS Global Insight	ABAG	DOF	IHS Global Insight
Bay Area	7.16	9.30	8.45	8.62						
24 and Under	2.24	2.80	2.79	2.34	25.0	24.9	4.6	30.1	33.0	27.1
25 to 64	4.05	4.40	3.75	4.78	8.9	-7.3	18.2	47.4	44.4	55.4
65 and Over	0.88	2.10	1.91	1.50	137.9	116.4	70.1	22.6	22.6	17.4

Source: ABAG, DOF, IHS Global Insight

IHS also breaks down their projections by age. IHS projects the senior aged population in the Bay Area will increase to only 1.5 million, and the population under 25 years of age will increase to only 2.3 million. On the other end of the equation, IHS does project that the population in the prime working ages will increase by 730,000 persons, more than the number in the ABAG and DOF reports. By their calculations, the share of the population in the prime working ages will remain the same from 2010 to 2040 (56%). By the same methodology, an unchanged portion of the prime working age population implies that the labor force participation rate will not decline.

Bay Area Population Forecasts by Race/Ethnicity

Both ABAG and DOF project that the white population will decline from 3.05 million in 2010 to between 2.87 million and 2.88 million in 2040. However, their projections for the Hispanic and Asian populations vary. ABAG projects that the Hispanic population will grow from 1.69 million to 3.25 million, while DOF projects that it will grow to only 2.50 million. As for the Asian population, ABAG projects that it will grow from 1.67 million to 2.23 million, while DOF projects that it will grow to only 2.11 million.

Projected Population Growth from 2010 to 2040 by Race/Ethnicity

Race/Ethnicity	2010	2040 Population (in millions)			Cumulative Growth 2010-2040 (%)		
	DOF	ABAG*	DOF	Census**	ABAG*	DOF	Census**
Bay Area	7.16	9.30	8.45	N/A			
White (non-Hispanic)	3.05	2.88	2.87	3.00	-5.3	-5.8	-1.5
Hispanic	1.69	3.25	2.50	3.05	92.4	47.9	80.5
Asian	1.67	2.23	2.11	2.98	33.9	26.6	78.9
Other	0.76	0.93	0.97	N/A	22.1	27.7	

Source: ABAG, DOF, U.S. Census Bureau

*ABAG projections are roughly based on the population percentages provided.

**Census Bureau projections are based on national growth projections by race and ethnicity.

The U.S. Census Bureau does not have a forecast by state or county through 2040; however, their forecast for the U.S. as a whole for race and ethnicity projects that the white population will decline by 1.5% from 2010 to 2040, while

the Hispanic population will increase by 79%, and the Asian population will increase by 81%. Applied to the Bay Area populations, this would imply that the white population will decline to 3.00 million, the Hispanic population will grow to 3.05 million, and the Asian population will grow to 2.98 million. These figures more closely resemble the ABAG forecast, but bear in mind that these are national projections and the migration, birth, and death patterns observed across the country in aggregate may not apply to the Bay Area specifically.

ABAG assumes that the fast-growing Hispanic and Asian populations will increase the demand for multifamily housing units due to their "historic preference" for this type of housing. Ignoring the notion that this so-called preference may just be the need of new residents to find the most affordable available living space in the Bay Area, a smaller population increase in these ethnic groups, as projected by the DOF, will decrease the demand for multifamily housing.

Summary & Conclusions

After careful consideration, Beacon Economics finds that the ABAG population forecast for the Bay Area in 2040 requires a significant downward revision of between 367,000 and 850,000 residents, based on our in-house forecast (low-end revision) and the California Department of Finance's forecast (high-end revision). The main reason lies in the various assumptions made in the ABAG report that inflate population projections, which will lead to an unattainable demand for housing units, particularly in those of multifamily type.

In addition, the various assumptions made in regards to future birth rates, migration patterns, job and economic growth inflate projections. Part of the problem with the ABAG forecast is that it seems to have been completed in mid-2011, prior to revised data in both job and population growth. The significant downward revision to job counts during the recession also demonstrates that a greater portion of the recent job growth is part of the recovery rather than an expansion. In other words, more of the recent job growth is the return of jobs rather than the formation of new ones.

With all else considered, since these growth projections will have a profound mandate-like impact for new housing that will be quite burdensome on individual cities, a more conservative and responsible forecast is preferred than the more aggressive ones.

About Beacon Economics

Beacon Economics, LLC is a leading provider of economic research, forecasting, industry analysis, and data services. By delivering independent, rigorous analysis we give our clients the knowledge they need to make the right strategic decisions about investment, growth, revenue, and policy. Learn more at www.BeaconEcon.com.

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