ESRI Demographic Update Methodology: 2008/2013

ESRI 380 New York St., Redlands, CA 92373-8100 USA
TEL 909-793-2853 • FAX 909-793-5953 • E-MAIL info@esri.com • WEB www.esri.com

ESRI Demographic Update Methodology: 2008/2013

An ESRI White Paper

Contents **Page**

J-9735

Contents **Page**

ESRI Demographic Update Methodology: 2008/2013

Current Trends

The predominant development in 2008 is not growth, but decline—the fallout from the downturn in the housing market. There are still areas of growth and pockets of prosperity to report; however, there are few areas untouched by the decline of the housing market and the ensuing credit crunch.

The fastest-growing metropolitan areas in 2008, measured by rate of growth since 2000, were also at the top of the 2007 list; however, each has experienced a slower rate of growth in the past year. Median home value in these markets has shifted from an average annual appreciation of 12 percent from 2000 through 2007 to -12 percent from 2007 to 2008. The only exception is St. George, Utah.

Metropolitan Statistical Area	Annual Rate of Population Growth				Annual Change: Home Value	
	2000–2007 %	2000–2007 Rank	2007–2008 %	2000–2008 Rank	2000–2007 %	2007–2008 %
Palm Coast, FL	10.1	1	-1.1	1	14.5	-22.2
St. George, UT	5.5	2	4.3	2	9.1	8.7
Cape Coral-Fort Myers, FL	5.1	3	4.0	3	15.0	-20.3
Las Vegas-Paradise, NV	4.5	5	3.5	4	5.4	-2.9
Greeley, CO	4.5	4	2.7	5	12.1	-15.2
Bend, OR	4.3	6	4.0	6	13.0	-3.0
Port St. Lucie, FL	3.9	8	2.1	7	14.6	-25.7
Prescott, AZ	3.7	10	3.5	8	11.2	-12.8
Average	**5.2%**		**2.9%**		**11.9%**	**-11.7%**

The depreciation in home value hit the hottest housing markets first and hardest. From 2000 through 2007, the top 20 housing markets experienced double-digit appreciation in home value, an average of 15 percent annually. From 2007 to 2008, the change in home value for these markets dropped by an average of 23 percent. Average annual population change in these markets also fell, from an annual average of 2.9 percent in 2000 to 2007 to 1.4 percent in 2007 to 2008.

This slowdown has seeped through most of the 940 U.S. metropolitan and micropolitan areas. In the past year, home value has shifted from appreciation to loss in 73 percent of the markets; population change has decreased in 62 percent. Even nonmetropolitan

counties are showing the effects of the decline in the housing market. Comparing the average annual rate of change in home value through 2007 to the rate in 2007–2008, almost half the counties experienced a drop of 10 percentage points or more, from an average increase of 7.6 percent to an average decrease of 9.3 percent.

Counties with the Largest Decrease in Home Value*	Number	Annual Population Change		Annual Change: Median Home Value		
		2000–2007 %	2007–2008 %	2000–2007 %	2007–2008 %	Difference (% points)
Metropolitan	427	1.5	0.8	9.3	-9.8	-19.0
Micropolitan	349	0.6	0.2	7.1	-9.0	-16.1
Nonmetropolitan	677	0.2	-0.4	6.8	-9.2	-16.0
Total Counties	**1,453**	**0.6**	**0.1**	**7.6**	**-9.3**	**-16.9**

** The drop in home value rates of change comparing 2000–2007 to 2007–2008 ≥ 10 percentage points*

Home value is declining; population growth is contracting. Vacancy rates are increasing from foreclosures on owner-occupied homes, and the rate of homeownership has declined. These changes are pervasive, not limited to the hottest markets or the most rapidly growing areas. What other effects are evident from the downturn in the housing market?

The U.S. economy has fallen flat. The past two downturns were brief enough to create a sense of near economic infallibility. The current outlook is less sanguine. Today, the ubiquitous footnote accompanying every financial prospectus or retirement statement has never been more apropos: "Past performance is no guarantee of future results."

Real gross domestic product (GDP), or the inflation-adjusted dollar value of all goods and services produced in the economy, slowed to an annualized rate of 0.6 percent in the fourth quarter of 2007 and continued at 0.6 percent in the first quarter of 2008. Although 2007 began at the same slow rate, economic activity increased in the second and third quarters of 2007, at 3.8 and 4.9 percent, respectively. What is causing anxiety now and a belief that the worst is yet to come?

First, the bad news continues in the slumping housing sector and credit markets. Foreclosures increased by 112 percent in the first quarter of 2008 compared to the first quarter of 2007. As the volume of defaults, delinquencies, and foreclosures increases, banks are responding by slowing the extension of credit—not only for mortgages, but also for small businesses in industries unrelated to the housing sector. Business loans, if granted, are being offered under less favorable lending terms.

On the consumer side, home equity lines of credit have dried up as a reliable source of funds with the decrease in home value. Many cash-strapped households are turning to credit cards for everyday expenses, not just big-ticket purchases. But card issuers have begun to raise rates, reduce credit availability, or both. As the banking sector is rediscovering the virtues of credit quality instead of quantity, the federal government has

taken a number of measures, some unprecedented, to shore up the stability of financial markets.

After keeping short-term rates at 5.25 percent for a year, the Federal Reserve Board decided to lower rates toward the end of 2007. Its goal was to infuse additional liquidity into the system as well as ease the pain many homeowners were feeling as their monthly payments climbed from their adjustable rate mortgages. Next, the Federal Reserve decided to cut its discount rates on short-term loans to banks and, for the first time in history, extended this credit to Wall Street investment firms.

However, the most extraordinary move came when the Federal Reserve and the Treasury Department orchestrated a bailout plan for J.P. Morgan Chase to buy out Bear Stearns. Bear Stearns was the smallest of the nation's five largest investment firms and the one most leveraged with subprime debt obligations. The government believed this action was necessary to prevent additional hemorrhaging that could have placed the whole financial system at risk.

Adding to consumer uneasiness are record-setting increases in gasoline prices from the continuing rise in the price of crude oil. With the aggressive steps taken by the Federal Reserve to drop interest rates, a renewed fear of inflation has emerged. Consumers are experiencing higher prices at the pump, in home heating costs, and at the grocery store. Although the data does not show inflation rising yet, higher prices are surfacing globally. The value of the dollar is dropping, and commodities such as gold, which is considered an insurance policy against future inflation, are trading at record prices.

As inflation and tightening credit erode the buying power of consumers, the slowdown in economic activity is beginning to filter to the labor market. ESRI projects total employment to reach only 142.2 million by July 2008. This represents a gain of only 582,000 jobs compared to employment growth of 2.4 million last year. Although the sluggish pace of job creation affects all regions of the country, states in the South and Midwest are disturbed the most. The unemployment rate is also increasing, to 6.9 percent, and the labor force participation rate, which measures the proportion of the working age population who are employed or actively seeking work, is shrinking, to 62.8 percent.

The effects of the economy on the job market are recent. In 2008, expect the fallout to cause downward pressure on wages and salaries. ESRI's 2008 updates represent income received in calendar year 2007. Median household income has maintained a 3.2 percent rate of annual growth since 2000, but growth in average household income is slowing from 3.4 to 3.1 percent a year. Median household income is $54,800 in 2008, and average household income is $73,800. Per capita income rose by $235, to $28,151.

Driven by job opportunities and income potential, U.S. population growth in metropolitan areas is three times the rate of growth in nonmetropolitan areas. Today, median household income in metropolitan areas and micropolitan areas is approximately $18,000 higher than the median income of $38,500 in nonmetropolitan areas. As metropolitan areas expand and new micropolitan areas are defined, annual income growth in metropolitan areas outpaces nonmetropolitan areas by more than 0.5 percent a year. More than 95 percent of U.S aggregate personal income is earned in metropolitan areas.

Douglas County, Colorado, continues to grow in population and prosperity, with median household income now reaching $115,000. Households in this county have accrued a median net worth of $390,000. Loudoun County, Fairfax County, and Falls Church City in Virginia; Hunterdon, Somerset, and Morris counties in New Jersey; and Los Alamos County in New Mexico continue to have median household incomes of more than $100,000. Households in Nassau and Putnam counties, New York; Howard County, Maryland; and Santa Clara County, California, now have median household incomes of more than $100,000.

In the current economic environment, media attention is focused on consumer spending and foreclosure activity. A household's disposable income is the bottom line to making ends meet. Median disposable income is $43,000 in 2008; average disposable income stands at $58,000.

Effects of the housing market downturn and tightening of credit are pervasive and growing—just now beginning to show in the labor market. Coupled with rising food and fuel costs, the economic fallout is likely to continue through 2008. What are the long-range prospects for the U.S. household? Is this the beginning of a long-term slowdown or a market correction?

Most analysts expect the housing market to begin recovery in 2009. However, that expectation is predicated on the actions of Congress and the Federal Reserve Board to stabilize the financial sector and the reactions of consumers to changes like rising fuel costs. The forecast must be tempered with demographic and generational changes.

Future Trends and the Retirement of the Baby Boomers

The first of the baby boomers reach age 62 in 2008 and qualify for Social Security. The question is whether the baby boom cohort will head for retirement quickly or ease into it. What are the likely effects on the economy, the labor market, the housing market—and future growth prospects? For years, the baby boom has been likened to a pig in a python as it moves through its life cycle. From its impact on schools in the 1950s and 1960s to its stimulus to housing growth in the 1970s, it's difficult to discount the effect of this generation. Today, however, it has become the 800-pound gorilla that few analysts or politicians are inclined to acknowledge. Let's begin with what we know about this generation:

- Born 1946–1964, the baby boom included more than 76 million births.
- In 2008, baby boomers comprise more than 25 percent of the U.S. population. Their median age is 52.6 years.
- Approximately 38 percent of the working age population in 2008 are baby boomers. The ratio of seniors to the working age population will increase by more than 10 percent in the next five years.
- Baby boomers owned more than 45 percent of all owner-occupied housing in 2000.
- In 2008, baby boomers' household income is more than 45 percent of U.S. aggregate household income.

- In 2008, baby boomers' collective net worth represents approximately 60 percent of U.S. net worth.

Clearly, the baby boom cohort is still a force in the U.S. economy. What happens if they choose to retire on schedule? Without intervention, Social Security will go into the red in 2013 and totally broke in 2041—an estimated shortfall of $15 trillion. Medicare will be in trouble in 2013 and broke in 2019.[1] The effect of withdrawals from the baby boomers' 401(k)s and IRAs on the financial market will be equally staggering.

The retirement of the baby boomers will also impact the labor force. A contraction in labor supply will strain labor markets. Not only will this increase the rate of job vacancies, but it can also reduce overall economic output. The baby boom was the most educated generation ever when it hit the labor market in the 1970s. Add almost 40 years of experience, and the loss of knowledge alone can slow productivity and contribute toward a drop in economic activity.

Finally, the possible effects of retirement on baby boomers' lifestyles and choice of housing are other subjects for speculation by housing analysts. The demographic force that fueled the housing demand for the past three decades could provoke another downturn in the housing market if they decide to sell their current homes in favor of retirement communities or apartments.

However, some of these changes remain speculative. Based on historical trends compiled by the Current Population Survey, labor force participation rates for older workers have been on the rise. The workforce aged 55 years and older has proportionally increased its participation in the labor market since the early 1990s. From a low of 29.4 percent in 1993, the labor force participation rate for these workers has climbed to 38.6 percent in 2007. The first wave of baby boomers turned 55 years old in 2001. Since then, the growth in participation rates within this age group has been much higher, suggesting that baby boomers are deciding to work beyond the customary retirement milestone.

Although baby boomers are critical in the changing demographic landscape, their children, the Echo Boomers, or Generation Y, rival them closely. This cohort is 77 million strong in 2008. By 2013, Echo Boomers will outnumber baby boomers by nearly two million and range from college age to their mid-30s. They are more ethnically diverse than their parents, and their housing preferences and needs are also likely to diverge from those of their parents. Although the focus in housing research and the media has been centered on the baby boomers, it is equally important to account for the Echo Boomers and their choices. Their ability to purchase a home may greatly affect the viability of the future housing market.

Hispanics will also play a key role in this demographic landscape. The Hispanic population now stands at 47.6 million, more than 15 percent of the total U.S. population. It is a younger population—two-thirds of Hispanics are younger than 35 years of age—and growing. With growth rates of 3.7 percent a year since 2000 and a projected total of 56.6 million by 2013, Hispanics' influence on American culture is increasing. Asian and non-Hispanic multiracial populations are following Hispanic trends closely, with growth rates of 3.5 percent and 3.1 percent, respectively, although they are smaller population

[1] Dana Milbank, "Smile—You're on Social Security!" *The Washington Post*, October 16, 2007, page A2.

groups. The non-Hispanic white population in the country is declining proportionately by 0.5 percentage points a year.

What's New in 2008

The 2008/2013 updates contain new data variables plus enhanced site analysis for users of ESRI's ArcGIS® Business Analyst products. New data includes current year updates of educational attainment for the population aged 25 years and older and marital status for the population aged 15 years and older. For time series fans, new data also includes quarterly updates of population and households. Finally, for data users who prefer to define their own trade areas, ESRI has developed a *current* database of the block weights used to retrieve information for user-defined polygons. Polygons are preferred over standard geography by data users focusing on select areas. To date, the options available to estimate site profiles have been limited to the latest census data for the blocks that comprise the site. Since that data is now eight years old, it can limit estimates for areas that are changing rapidly. ESRI has enhanced site analysis by updating the data that is critical to capturing current information for sites experiencing change.

Geography Changes

Change is inevitable with any geographic area—political or statistical. Identifying the changes in the areas for which data is tabulated and reported is critical to the analysis of trends. In the past year, there have been minor changes to metropolitan areas by the Office of Management and Budget, boundary revisions for designated market areas (DMAs) by Nielsen Media Research, and the usual adjustment of ZIP Codes by the U.S. Postal Service.

Metropolitan changes include the latest revisions to core-based statistical areas (CBSAs), released in November 2007. Changes include one new micropolitan statistical area: Show Low, Arizona (Navajo County); three name and code revisions: Bradenton-Sarasota-Venice, Florida, metropolitan statistical area (CBSA Code 14600, formerly 42260); and Helena-West Helena, Arkansas, micropolitan statistical area (CBSA Code 25760, formerly 48340); and Washington Court House, Ohio, micropolitan statistical area (CBSA Code 47920, formerly 47860); and five other name changes. There are now 940 core-based statistical areas, 363 metropolitan areas, and 577 micropolitan areas.

DMAs represent the 2007–2008 markets as defined by Nielsen Media Research. Most DMAs correspond to whole counties; however, there are a few exceptions where counties are split into different DMAs. There are few name changes to DMAs, but nine counties were assigned to different DMAs. Finally, ZIP Codes, which are defined solely to expedite mail delivery, are updated to reflect the U.S. Postal Service's November 2007 inventory.

ESRI 2008 Demographic Updates

ESRI presents the 2008/2013 demographic forecasts including population, age by sex, race by Hispanic origin, age by sex by race and by Hispanic origin, households and families, housing by occupancy, tenure and home value, labor force and employment by industry and occupation, marital status, educational attainment, and income—including household and family income distributions, household income by age of householder, and per capita income.[2] Updates of household income are also extended to provide after-tax (disposable) income and a measure of household wealth, net worth. Changes in the update base from the Census Bureau's Count Question Resolution (CQR) revisions,

[2] Forecasts represent the midyear population on July 1, unless otherwise specified.

updated boundaries, and improvements to forecasting techniques may obfuscate comparison to earlier updates.

Forecasts are prepared initially for counties and block groups (BGs). From the county database, forecasts are aggregated to CBSAs, states, or higher geography levels. From the block group database, forecasts can be retrieved for census tracts: places; county subdivisions; ZIP Codes, congressional districts for the 110th Congress; DMAs; or any user-defined site, circle, or polygon.

County Totals

The change in total population is a function of changes in household population and the population in group quarters (GQ), which are subject to different trends. For example, the addition of a prison in an area produces a sudden increase in the group quarters population that is unlikely to yield an attendant change in the household population or the projected population growth in a county. A military base closing creates an immediate decrease in the household population with the reduction not only of military personnel but also their families and civilian personnel; however, this drop is unlikely to continue. The disparity of trends in household versus the group quarters population is accommodated by separate projections. The group quarters population is the Census 2000 count of group quarters, with CQR revisions and updates culled from a variety of federal, state, and local sources.

Forecasting change in the size and distribution of the household population begins at the county level with several sources of data. ESRI begins with a time series from the U.S. Census Bureau that includes county estimates through 2006.[3] Because testing has revealed improvement in accuracy by using a variety of different sources to track county population trends, ESRI also employs a time series of building permits and housing starts, plus residential postal delivery counts. Finally, local data sources that tested well against Census 2000 are reviewed.

Block Group Totals

Measuring the change in population or households at the county level is facilitated by the array of data reported for counties. Unfortunately, there is no current data reported specifically for block groups. Past trends can be calculated from previous census counts, but nothing from any current information. To measure current population change by block group, ESRI models the change in households from three primary sources—the InfoBase database from Acxiom Corporation, residential delivery statistics from the U.S. Postal Service, and residential construction data from Hanley Wood Market Intelligence—in addition to several ancillary sources.

The U.S. Postal Service (USPS) publishes monthly counts of residential deliveries for every U.S. postal carrier route. This represents the most comprehensive and current information available for small, subcounty geographic areas. USPS establishes carrier routes to enable efficient mail delivery. Carrier routes are fluid geographic constructs that are redefined continually to incorporate real changes in the housing inventory and occupancy plus administrative changes in staffing and budgets of local post offices. These frequent changes in the carrier routes are not the only difficulty.

Converting delivery statistics from postal carrier routes to census block groups is a complex challenge. Carrier routes are defined to deliver the mail, while block groups are

[3] U.S. Bureau of the Census, Population Division, Table CO-EST2006-ALLDATA.

constructed to collect and report census data. Comparing two different areas that are defined for wholly different purposes provides one significant conversion issue. Carrier routes commonly overlap multiple block groups. In many cases, a carrier route encompasses disjointed areas that can be distant from each other, but block groups are rarely divided into multiple polygons. These overlaps require an effective method of allocating the postal delivery counts across multiple block groups.

One way to distribute delivery statistics among component block groups is to create a correspondence using boundary files. Changes in postal carrier routes can be tracked through quarterly updates of carrier route boundaries, then delivery statistics can be assigned to block groups with 2000 census block data. Another way also employs boundary files but assumes there is a uniform distribution of households within the area. Using standard geodemographic tools, it is possible to estimate the change in households from carrier route delivery statistics and to apply that change to any block groups in the area. But the estimated change is simply being redistributed from one summary area to another.

ESRI has developed another way to link a carrier route to the correct block groups—using the *actual* locations of mail deliveries. Its proprietary Address Based Allocation (ABA)[4] solves the complex challenge of converting delivery counts from carrier routes to block groups. This allocation method uses the addresses from the Acxiom Corporation InfoBase household database. Addresses in the database are geocoded with carrier route and block group codes, using an enhanced geocoding technique and locator database, and serve as the foundation for the conversion. This approach is unbounded by geographic borders or arbitrary assumptions about the distribution of households or postal deliveries.

ABA results have been tested extensively. The tests include benchmarking against Census 2000 data. Manual reviews confirm the capability of the method to identify areas with high growth. The ABA method reveals sprawls and new developments across the country since Census 2000. Assessments based on other data sources verify the efficacy and precision of ABA. For the small portion of block groups where addresses are not available from the InfoBase database, delivery statistics are allocated from a correspondence file. The correspondence between census block groups and postal carrier routes is developed using quarterly updated data from Tele Atlas®.

The effectiveness of ABA relies on the precision of block group assignment to InfoBase addresses. ESRI improved the geocoding accuracy of the InfoBase file by applying ArcGIS 9.2 with the Dynamap®/Address Points database from Tele Atlas, which provides coordinates that are accurate *to the building.* It offers a new development in large-scale geographic databases where addresses are represented as points rather than approximations estimated from address ranges or street segments. The database currently covers the most densely populated areas in the United States, with continuously increasing geographic coverage. Addresses that fall outside the coverage were geocoded with the conventional approach based on address ranges.

Post office delivery counts or address counts provide less coverage in rural areas. Sparsely populated areas tend to have post office box ZIP Codes because there are few rural addressing systems and little comparability to urban, street delivery. The same

[4] Patent pending.

problems characterize rural addresses in the InfoBase database. To track new housing developments, especially in previously unpopulated areas, ESRI licensed a new data source from Hanley Wood Market Intelligence of new and planned residential construction in the top 75 U.S. housing markets including 7 markets added in 2007.

The new residential construction database from Hanley Wood Market Intelligence adds a unique component to ESRI's strategy for producing accurate demographic forecasts. This database identifies individual construction projects, for instance, the exact location by latitude and longitude of a complex of single-family homes or townhomes or a condominium building. It also pinpoints the conversion of apartments into condominiums. The construction information includes

- Total number of units planned
- Inventory of units under construction, sold, and/or closed
- Type of housing such as detached homes, townhomes, and condominiums
- Target markets such as families, seniors, and empty nesters

The use of this type of information in demographic forecasts has traditionally been confined to small-scale implementation such as producing forecasts for a specific county. ESRI partners with Hanley Wood Market Intelligence to introduce this information in a large-scale forecasting effort. The new construction database complements and corroborates the postal delivery statistics. More importantly, it tabulates planned construction that will be completed in upcoming years. This information is incorporated in ESRI's five-year forecasts. Tracking residential development since 2000 with enhanced demographic and spatial analysis tools provides better information for the five-year forecasts than past trends.

A revised housing unit methodology applies the change in households estimated from address counts, delivery counts, and new housing construction to update household population by block group. The best techniques are derived from a combination of models and data sources. Discrepant trends are checked extensively against independent sources. Finally, totals for block groups are controlled to the county totals. Despite the appeal of microforecasting, there is simply more information available to track population change by county than by household. Ignoring the advantage of county-level data is throwing away information.

Blocks

The integration of demographic and spatial analysis has not only enabled the development of more accurate block group totals, it has also provided the opportunity to assess block totals. Blocks have attracted virtually no interest among data users. As the lowest common denominator in the geographic hierarchy that progresses to block groups, tracts, counties, and states, blocks are too small for the tabulation of most census variables. Only complete-count totals are reported for blocks from the decennial census.

However, blocks are useful in the estimation of data for polygons, which can be any area outside the geographic hierarchy, from places to ZIP Codes to user-defined polygons. All these areas attract the interest of data users. The most common technique overlays blocks within the polygon and apportions data from the ratio of the aggregated blocks to the component block groups. To date, this technique has applied the relationship between the blocks and the block groups from the most recent census. For most areas, the application provides a good estimate for the polygon. If the relationship between the blocks and the

block group has changed significantly since 2000, the estimate cannot incorporate that change unless both blocks and block groups are updated.

ESRI has developed a current database of the block weights used to retrieve information for polygons by extending the application of its Address Based Allocation technique to the block level. Updating the relationship between blocks and block groups for areas that are experiencing change is critical to capturing current trends in polygons. Enhanced site analysis does preclude comparisons to previous updates.

Quarterly Updates

To enable comparison to the previous update, ESRI introduces quarterly updates of population and households. Totals are provided for eight quarters (January, April, July, October) for the current year (2008) and the preceding year (2007). Quarterly updates for July 1 (Q3) of each year equal ESRI's annual update totals. Data for intervening quarters represents an application of ABA to postal delivery statistics for the point in time. Because the annual updates incorporate more than a time series analysis of postal delivery counts and several annual data series, the change that is shown by quarter is not a seamless trend line. Quarterly updates are designed to show periodic fluctuations in the data, especially in areas that are subject to seasonal population shifts, instead of the smooth trend lines commonly provided by interpolation.

Population and Household Characteristics

ESRI's population and household characteristics include population by age and sex, race and Hispanic origin, sex by age by race and Hispanic origin, and household type. Population by age and sex include estimates by five-year age groups and by single years from less than 1 year to 84 years.

The population by age and sex is projected via a cohort survival model that calculates the components of population change separately, by age and sex. Applying survival rates specific to the cohort carries the 2000 population forward. Changes in the population by age and sex diverge at the household level. For example, an area that is losing population can age more rapidly with the loss of population in prime migrant ages, 20–34 years—unless there is a college nearby. An influx of college students can offset the loss of youthful outmigrants.

To capture these variations, ESRI's model first separated the group quarters population from the household population and, second, keyed the calculations to the size and characteristics of the population. This stratification identified several different patterns of change by age and sex that were applied in the cohort survival model. Births were projected from area-specific, child-woman ratios. Migration was computed as a residual, the difference between the survived population and independent projections of the total population.

Accurate allocation of funds to minority groups and the tracking of immigration to the United States are two important reasons to accurately measure the growth of population by race and Hispanic origin. ESRI's database is supplemented with the diversity index, a measure that summarizes racial and ethnic diversity. The index shows the likelihood that two persons, chosen at random from the same area, belong to different races or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity).

The U.S. diversity index currently stands at 60, an increase of 1 percent annually since 2000. Led primarily by Hispanic diversity, California, New Mexico, and Texas are the

most diverse mainland states with diversity indexes higher than 70. The process of diversification in these states is advanced; therefore, these areas are among the states with slow rates of change in diversification. Although immigration is still rising in these states, it has a smaller impact on the diversity level. Traditionally nondiverse states, such as Maine, Vermont, and Connecticut, are experiencing some of the highest rates of diversification. Pockets of diversity are common in less diverse states. For example, the Liberal and Garden City micropolitan areas in Kansas have diversity indexes of more than 75.

The Hispanic population now stands at 47.6 million, more than 15 percent of the total U.S. population. The influence of this ethnic group on American culture is on the rise, due to growth rates of 3.7 percent a year since 2000 and a projected total of 56.6 million by 2013 (more than 17 percent of the U.S population). Asian and non-Hispanic multiracial populations are following Hispanic trends closely, with growth rates of 3.5 percent and 3.1 percent, respectively, although they are smaller population groups. The proportion of non-Hispanic white population in the country is declining annually by 0.5 percentage points.

Historical trends in race and Hispanic origin play an important role in the analysis and forecasting process. Tracking intercensal population change by race was encumbered by the new reporting method in Census 2000. Race was reported as a multiple-choice item, not "one person—one race," as reported in past censuses or estimates. Therefore, Census 2000 data is not directly comparable to 1990 Census data or to any earlier estimates or projections.

Comparisons made between single-race reporters in 2000 and 1990 underestimate the change by race. Excluding the rapid growth of the multiracial population minimizes the change by race from 1990 to 2000. Alternatively, combining single-race reporters with races reported in any combination can cut down the 63 racial groups reported in Census 2000. For example, a person who reports "white and Asian" is counted as both white and Asian. This combination of single-race and multiracial reporters overcounts multiracial reporters and overestimates the change by race from 1990 to 2000. To achieve a true picture of population change by race, it is important to account for the change in multiracial reporting.

ESRI takes an innovative approach in analyzing this data to make effective use of the additional information from Census 2000.[5] The Census Bureau released most race-related data by six single-race groups and one multiple-race group. ESRI's data preserves this format and enables a comparison of 1990 and 2000 data for six single races and one multiracial group. Assuming that the probability of reporting more than one race varies by race group and geographic area as shown in Census 2000, ESRI estimates the number of likely multiple race reporters from 1990 Census data. The same approach is adopted for the population of Hispanic origin by race.

The most current data sources by race and Hispanic origin are 2006 data that is available by county and state from the Census Bureau's estimates or its American Community

[5] A more detailed discussion of ESRI's 1990–2000 race analysis is available from Sangita Vashi's paper, "Trends in the U.S. Multiracial Population 1990–2000," presented at the 2001 Southern Demographic Association's Annual Meeting.

Survey (ACS). Survey data is analyzed in conjunction with ESRI's estimate of change from 1990 to 2000 by race and Hispanic origin to establish county population by race and Hispanic origin. Forecasts by block group combine local changes in the distributions by race and projected change for counties. The last step controls block group distributions to county projections.

The composition of the American household continues its slow evolution from married-couple families to nontraditional families and single-person households. Between 1990 and 2000, the dominant share of households remained married-couple families in most states but decreased from 55 percent of all households to 52 percent in 2000. Increased shares of single-parent and single-person units comprise the difference. The attendant change in average household size is the decline from 2.63 in 1990 to 2.59 in 2000. Through 2008, these changes continue, but even more gradually than in the 1990s.

The gradual change in household size makes it uniquely suitable to forecasting the change in households from the change in household population. Average household size is one of the most stable and predictable components of the forecasts. Household forecasts are predicated on local patterns of change, which are controlled to the more constant trends for states and counties. Nationally, household change stabilized in the 1990s and remains at 2.59 in 2008.

Local change, however, is affected more by the singular composition of the population, and trends often vary from the national norm. Nationally, average household size decreased by less than 0.4 percent annually from 1990 to 2000. By county, the change varied from a low of -2.1 percent to a high of 1.3 percent. An increase in household size can result from locally higher rates of fertility or from an increase in multigenerational households. Census 2000 has documented the increase in multigenerational households in areas where there is high immigration or areas with housing shortages and higher costs. From 2000 through 2008, the annual change in household size by county ranges from -1.2 to a high of 0.6 percent.

Few block groups represent a cross section of U.S. households. In areas that gained population from immigration in the 1990s, the trend in average household size actually reversed and increased. To distinguish local variation, ESRI's model is keyed to the characteristics of households at the block group level. This stratification identifies several different patterns of change by household type that are applied to forecast trends in the characteristics of households in terms of both family composition and tenure. Local change is emphasized in the 2008/2013 forecasts of households and families for counties and block groups. National and state trends are monitored with sources such as the Current Population Survey (CPS) and the American Community Survey from the Census Bureau and then applied as controls.

In 2008, ESRI is adding two new characteristics, marital status and educational attainment. Four marital status categories are updated for the population 15 years and older: never married, married (includes separated population), divorced, and widowed. Seven categories of educational attainment are reported for the population 25 years and older. For the population that attended college, educational attainment is categorized into some college, associate degree, bachelor degree, or graduate degree. The remainder of the population is classified as high school graduate, with some high school, or with less than a ninth grade level of education.

Data from the 2000–2006 American Community Survey is evaluated against long-term trends in census data. Intercensal trends identify the progress of important social factors such as the labor force participation among women, later age at first marriage, and delayed childbearing. Generational changes in the U.S. population from the baby boomers to their children, Generation Y, are key factors in ESRI's analysis of change in marital status and educational attainment. When regional profiles for marital status and education are established, local area estimates link expected regional change to local changes in the distributions.

Housing

ESRI's housing updates include total housing units, occupancy, tenure, and home value. With the mortgage crisis extending beyond the subprime market and the tightening of credit, the housing market represents a major concern for not only homeowners and Wall Street but for all levels of government. Many local governments have stepped up their efforts to deal with the rising incidence of foreclosures.

Home prices have dropped from the historical high in recent years, with a median of $183,000 for the United States in 2008 compared to $192,300 in 2007. The last time the United States faced a widespread decline in home prices occurred in the early 1990s. That recovery started around the mid-1990s, with homeownership surging at the same time.

In 2008, the U.S. homeownership rate fell below 68 percent. Historically, the rate hovered around 64 percent throughout the first half of the 1990s. From the mid-1990s, the rate climbed rapidly until 2004, then leveled off for the next few years before declining. Although the housing market crisis contributes to the recent decline in homeownership rate, demographics also play a key role. Due to the changing composition of the age cohorts in the United States, the homeownership rate is unlikely to return to its historical high over the next few years. The Echo Boomers, or Generation Y, represent a sizable share of the population that is more likely to rent than own as they begin to form households. In contrast, the baby boomers are primarily homeowners because of their financial position or desire to own a home, or both.

Current data on change in the housing inventory encumbers the application of past trends. From 1990 to 2000, the housing stock increased by less than 1.4 million annually. From 2000 to 2008, the annual increment has grown to more than 1.7 million units. Total housing units are updated from the Census 2000 base by recorded changes in the housing inventory and estimated changes in occupancy rates since April 2000. Recorded change in the housing inventory is culled from several data sources including our latest addition, construction data from Hanley Wood Market Intelligence; building permits for permit-issuing places and counties; data for new and demolished public housing from the Department of Housing and Urban Development; and data for new manufactured homes placed by state from the Census Bureau. Dozens of independent sources were consulted to retrieve detailed information on housing development data where no building permits existed. Fewer than half of the counties have complete coverage with building permits. Independent estimates of change in occupancy were calculated from U.S. Postal Service residential lists, the Current Population Survey, and the Housing Vacancy Survey from the Census Bureau.

The data for tenure represents owner- and renter-occupied housing units. Together, the two components sum to total households, or total occupied housing units. A time series

model based on data from the Housing Vacancy Survey, combined with changes in the Current Population Survey and the latest census data, guide tenure forecasts. With a blend of "top down" and "bottom up" techniques, the forecasts take advantage of the latest information from survey data at higher levels of geography while employing local characteristics at the lower levels. The data from the lower levels of geography are controlled to the higher levels to produce the tenure updates. Changes in owner-versus-renter occupancy are forecasted independently, then controlled to the total households.

ESRI tracks the change in home value using the House Price Index (HPI) from the Office of Federal Housing Enterprise Oversight (OFHEO). The HPI is designed to monitor changes in average home prices based on repeat sales or refinancing of the same properties. The index is derived from mortgage loans purchased or secured by Fannie Mae or Freddie Mac. OFHEO affirms the "significant advantages" of the HPI over Commerce Department surveys or other data collections based on snapshots of sales figures. Employing the repeat-sales methodology renders the index less susceptible to compositional effects, especially with data for smaller geographic areas. If a higher proportion of lower-end homes is sold in the current period than in an earlier period, the survey data will give the misleading impression over time that home prices have fallen.

The OFHEO index series is released quarterly for states and metropolitan areas, with county or county group data for larger metropolitan areas, and for nonmetropolitan areas within states. In 2008, the ESRI home value incorporates the newly released purchase-only HPI series for states and the United States. Traditionally, OFHEO has combined loan data from purchases and refinancing to compute the index. For refinanced loans, the appraised value of a home is used in lieu of the sales value to estimate the change in home prices.

ESRI has applied time series analysis to extrapolate both short-term (2008) and long-range (2013) trends in home value from states and metropolitan areas to block groups. The 2008 update introduces sophisticated new techniques to capture the local relationship between the House Price Index and home value. Local estimates of home value incorporate supply-demand characteristics, the socioeconomic traits of householders in the area, and HPI trends assessed for larger markets.

Labor Force

ESRI forecasts the civilian labor force and employed population by industry and occupation for 2008 and 2013. The forecast for July 2008 looks austere for workers or those searching for work. Compared to the brisk pace of job creation last year, the economy is poised to add only 582,000 new entrants to payrolls by midyear, reaching a level of 142.2 million employed. The impact of the housing market and credit collapse is filtering to the U.S. labor market. More than 30 percent of the 50 states (including the District of Columbia) are experiencing job loss. States in the South, Midwest, and Northeast are experiencing the slowest job growth or decline. Unemployment is growing. By July 2008, the U.S. rate of the unemployed is expected to rise 0.3 percentage points to 6.9 percent. Although the employment situation will not fare well in the near term, ESRI's five-year forecast shows an improved outlook, with employment growing at an annualized rate of 1.4 percent and unemployment shrinking to 6.4 percent.

Unsurprisingly, industries directly related to housing are contracting. Employment in construction and real estate is declining in response to the housing downturn. As the effects of the housing market spill over to the broader economy, employment in retail and

wholesale trade, manufacturing, and some service industries is experiencing labor cutbacks too. However, there are still sectors in the economy that are adding to payrolls—and offsetting some of the loss. These include industries such as health care; professional, scientific, and technical services; and education.

Data Sources

Estimates of the civilian labor force integrate recent change in the supply and demand for labor from the Local Area Unemployment Statistics (LAUS) and Employment Projections programs from the Bureau of Labor Statistics (BLS) as well as the American Community Survey and Current Population Survey from the U.S. Census Bureau. Federal statistical surveys are the principal sources of labor force trends. The LAUS program is the premier resource for current and local economic conditions utilized by state and local governments, media outlets, the private sector, and academic researchers.

Methods

Employment and unemployment forecasts are developed from the Census 2000 base.[6] Trends are adapted from an LAUS monthly time series, projected to July 2008. LAUS state estimates are based on the concepts and definitions from the program's main input source, the monthly Current Population Survey, as well as the Current Employment Statistics program from the BLS and state unemployment insurance systems. Additionally, LAUS substate models incorporate data from the decennial census. ESRI's labor force methodology retains the strategic improvement introduced in 2004 to enhance the accuracy of the July 1 estimate of employment status. Change between Census 2000 and ESRI's labor force estimates is more closely tied to historical and seasonal patterns in the LAUS state and county monthly series.

ESRI's industry and occupation updates capture temporal change from three federal statistical sources: the ACS and CPS from the Census Bureau and the Employment Projections program from the BLS. From the Census 2000 base, national industry and occupation distributions are updated with trends from all three sources, and state trends from ACS are applied. These targets, with total employment, are used to model substate areas.

Concepts

The civilian labor force includes the population aged 16 years and older who are classified as either employed or unemployed and excludes active duty Armed Forces personnel. The *employed* population includes persons who fit in either of the following two categories:

- Working during the reference week as a paid employee, self-employed, working on a farm, or as unpaid workers for 15 hours or more on a family farm or business

[6] In July 2002, the Census Bureau reported a processing error affecting its 2000 labor force estimates for areas surrounding college towns. The error apparently overstated the number of unemployed persons and the unemployment rate while underestimating the employed population and persons classified as not in the labor force. Further research by the Census Bureau uncovered a response pattern to the employment questions that extends beyond the population living in college towns. The Census Bureau estimates employment responses for roughly 15 percent (or 500,000 people) of the working-age, civilian noninstitutional GQ population were affected. Furthermore, they surmise the positive bias in the number of unemployed appeared to artificially increase the 2000 U.S. unemployment rate of 5.8 percent by 0.4 percentage points. ESRI addressed the apparent bias at the block group level and realigned the affected Census 2000 labor force estimates before any forecasts were calculated. For more information, refer to appendix 3 in U.S. Census Bureau, Housing and Household Economic Statistics Division, *Comparing Employment, Income, and Poverty: Census 2000 and the Current Population Survey.* September 2003. http://www.census.gov/hhes/www/laborfor/final2_b8_nov6.pdf.

- Temporarily absent from their job due to vacation, illness, bad weather, labor disputes, or other personal reasons, excluding layoffs

Total employment excludes volunteer workers and caretakers of home or family. The *unemployed* population includes persons who were one of the following:

- Neither at work nor temporarily absent from a job
- Seeking employment during the last four weeks
- Available to accept employment
- Waiting to return from a layoff

Dissimilarities in Sources of Labor Force Information

It is important for data users to recognize differences that exist across surveys of labor markets. To illustrate, the U.S. unemployment rate reported in the 2000 decennial census is 5.8 percent, while the CPS estimate for the same time period is 3.7 percent (seasonally unadjusted). This gap stems from differences in survey methodology. Census 2000 labor force data is sample estimates produced from responses reported in the long-form questionnaire mailed to roughly 17 percent of all U.S. households. The CPS produces more timely monthly data but from a much smaller sample size. Definitions of employment status are similar, but methods of data collection are not. The decennial census is self-reported, while the CPS employs experienced interviewers who ask more probing questions to minimize survey nonresponse or data misclassification. Due to the differences between the decennial census and the CPS, ESRI focuses on rates of change to capture current trends and seasonal patterns to produce accurate civilian labor force forecasts.

Income

The recent slowdown in economic activity did not affect the job market until early 2008. This year, the labor force surplus is expected to cause downward pressure on wages and salaries. ESRI's 2008 estimates represent income received in calendar year 2007. Median household income maintained an annual growth rate of 3.2 percent since 2000, but growth in average household income slowed from 3.4 to 3.1 percent a year. In 2008, median household income is $54,800 and average household income is $73,800. Per capita income rose by $235 to $28,151.

Driven by job opportunities and income potential, population growth in metropolitan areas is three times the rate of growth in nonmetropolitan areas. Today, median household income in metropolitan areas and micropolitan areas is approximately $18,000 higher than the median income of $38,500 in nonmetropolitan areas. As metropolitan areas expand and new micropolitan areas are defined, annual income growth in metropolitan areas outpaces nonmetropolitan areas by more than 0.5 percentage points a year. More than 95 percent of U.S aggregate personal income is earned in metropolitan areas.

Douglas County, Colorado, continues to grow in population and prosperity, with median household income reaching $115,000 in 2008. Households in this county have accrued a median net worth of $390,000. Loudoun County, Fairfax County, and Falls Church City in Virginia; Hunterdon, Somerset, and Morris counties in New Jersey; and Los Alamos County in New Mexico still have median household incomes above $100,000. Households in Nassau and Putnam counties, New York; Howard County, Maryland; and Santa Clara County, California, now have median household incomes higher than $100,000.

In the current economic environment, media attention is focused on consumer spending and foreclosure activity. A household's disposable income is the bottom line to making ends meet. Median disposable income is $43,000 in 2008; average disposable income stands at $58,000. On average, a household's disposable income is more than 75 percent of its pretax income. The youngest and oldest householders, younger than 25 and older than 65 years, have median disposable incomes that are more than 80 percent of their household incomes. The 45-to-54-year-olds, the tail end of the baby boomers, earn the highest average disposable income, approximately $10,000 more than all U.S. householders. This age cohort has acquired an average net worth of $630,000, lagging behind the 55-to-64-year-old baby boomers by more than $300,000.

Baby boomers are in their prime earning years. Despite the recent stock market and housing declines, baby boomers are accruing net worth. During calendar year 2007, 45-to 64-year-olds earned almost $4 trillion in household income. They have an aggregate net worth of $35 trillion that represents almost 60 percent of U.S. aggregate net worth. As the baby boomers retire, the distribution of wealth in the nation both geographically and demographically is expected to change.

Although the aging of the baby boom generation will be a strong influence on the U.S. economy, the potential income power of the larger Generation Y will be a growing countertrend. Generation Y members are predominantly younger than 25 years of age and diverse, racially and ethnically. They have accrued a median net worth of only $11,000, but they are young and unlikely to own a home yet. Improved educational attainment among this population can be expected to shift wealth to the younger age cohort.

Data Sources

ESRI's projection base is the income that was reported in Census 2000. Technically, 2000 income data represents income from 1999 because the Census Bureau tabulated income received in the "last year" before the decennial census. Similarly, ESRI's 2008 income updates represent income received in 2007, expressed in 2007 dollars. Projections for 2013 are shown in 2012 dollars, assuming there will be a continuation of the current rate of inflation of 2.7 percent.

ESRI uses the definition of *money income* used by the Census Bureau, which enables the direct comparison of income updates and decennial census data. For each person 15 years old or older, money income received in the preceding calendar year is tallied from each of the following sources: earnings, unemployment compensation, Social Security, Supplemental Security Income, public assistance, veterans' payments, survivor benefits, disability benefits, pension or retirement income, interest, dividends, rent, royalties, estates and trusts, educational assistance, alimony, child support, financial assistance from outside the household, and other income.

Data for consumer income collected by the Census Bureau covers money income received (exclusive of certain money receipts such as capital gains) before payments for personal income taxes, Social Security, union dues, Medicare deductions, and so forth. Therefore, money income does not reflect the fact that some families receive part of their income in the form of noncash benefits such as food stamps, health benefits, rent-free housing, or goods produced and consumed on a farm. In addition, money income does not include noncash benefits such as the use of business transportation and facilities and full or partial payments by business for retirement, medical, and educational expenses.

Income Methods

To estimate income for all households and family households, ESRI evaluated several federal data sources including the Current Population Survey and American Community Survey, personal and per capita income data, and the Census of Employment and Wages from the Bureau of Labor Statistics.

After Census 2000, ESRI conducted a detailed evaluation of data sources employed in past income forecasts and analysis of more recent data from the Supplementary and American Community surveys. Data for 2000 from each source varied from the income that was reported in Census 2000. It was concluded that one point in time is just not a good measure of a data series. For any given year, any estimate of income is likely to vary from the true population value. However, the sources that ESRI employed throughout the 1990s proved to be effective measures of change in income. Testing revealed the power of time series data in tracking income. ESRI's postcensal updates emphasize the use of time series data from household surveys to establish a base trend line. Annual updates evaluate current trends in wage inflation and other economic shocks that impact income growth.

After forecasting the state income distributions, household income is estimated for counties, tracts, and block groups. ESRI's income forecasts are uniquely designed to distinguish local variation, changes in income inequality, and urbanicity as differentiators of income growth. The model correlates the characteristics of households at the block group geography level with changes in income. This stratification identifies several different patterns of change by household type that are applied to forecast trends in income. The annual change in income is derived from national surveys. Modeling links the current income change to all households with similar socioeconomic characteristics. Separate forecasts of the change in income by strata are aggregated to compose the income distributions.

After the base 2000 income tabulations are updated, the distributions are extended to provide additional data for the wealthiest households. The Pareto function is used to extend the upper interval of the income distributions from $200,000 or more to include the intervals $200,000–$249,999, $250,000–$499,999, and $500,000 or more. Finally, the models are calibrated to distinguish the change in average household income, for example, from the change in median income.

Average and median income for 2008 and 2013 are calculated in the same way that the Census 2000 average and median income are computed. Medians are calculated from the distributions using linear or Pareto interpolation; averages, from aggregate household income.[7] Differences arise from the distributions. The 2000 income base from the Census Bureau is different from the income tables that it reports to the public. ESRI's 2008/2013 income base is also different from the Census 2000 reported tables. Medians and averages for 2008/2013 represent the extended income distributions to $500,000 or more. It is the extended income distributions that provide the base for updating aggregate income. Using the midpoints of income intervals in the extended distribution, aggregate household income is calculated to be consistent with the distribution of household income—and the aggregate incomes that are estimated for the extended distributions of income by age of householder.

[7] For more information about the calculations used with Census 2000 data, see Census 2000 Summary File 3 Technical Documentation prepared by the U.S. Bureau of the Census, 2002.

Household income reported by age of householder is updated to be consistent with the 2008/2013 distributions of household income and age of householder. To update the age distribution of householders, the ratio of householders by age to population by age in 2000 is extrapolated to 2008/2013 and applied to the current age distributions. After the targets are set, the 2000 distributions of household income by age of householder by BG are fitted to current distributions of households by income and by age of householder.

Disposable Income

Disposable income represents an estimate of a household's purchasing power or, simply, after-tax income. The proportion of household income left after taxes is estimated from special studies conducted by the Census Bureau to simulate household taxes. With the release of the 2004 Annual Social and Economic Supplement (ASEC) to the Current Population Survey, a new tax model was implemented. The new model performs a statistical match of tax variables not collected in the ASEC with the 2000 Statistics of Income (SOI) file from the Internal Revenue Service. Post-2005 ASEC tax data implements the 2001 SOI file.[8] The tax model in ASEC is updated continually to reflect changes in tax code. Additional improvements have focused on improving the match of CPS records with the SOI file. These changes impact the time series of tax variables available and are reflected in this release of disposable income. ESRI's 2008 disposable income incorporates data from the 2007 ASEC. Four types of taxes are deducted: federal individual income taxes, state individual income taxes, Federal Insurance Contributions Act (FICA) (Social Security) and federal retirement payroll taxes, and property taxes for owner-occupied housing.

Sophisticated modeling techniques are used to improve the handling of top-coded earnings and tax data from the CPS. Internal Revenue Service tax rates are used as guidelines for model testing. ESRI then applied the proportions of after-tax earnings to income intervals that were cross-tabulated by age of householder for each state. State-specific proportions account for the variation in taxes by state. The proportions, or multipliers, are then applied to the age by income forecasts for block groups and counties to calculate disposable income.

Net Worth

Net worth is estimated with data on household wealth that is collected in the Surveys of Consumer Finance (SCF) from the Federal Reserve Board, from 1992–2004. From 2001 to 2004, inflation-adjusted average and median net worth grew annually at 2.0 percent and 0.5 percent, respectively. This growth rate is somewhat slower than the growth reported in previous surveys. Most of the recent growth is attributable to the appreciation in residential real estate, a rise in the number of new and second homeowners, and the growth in speculative investment properties. However, household debt also increased as a result of growing residential real estate portfolios. The amount of secured debt serviced as a share of household income also rose despite the decline in interest rates over this period. And although the stock market has rebounded since the last recession, the amount of corporate equities held by households has declined since 2001.

Between 2007 and 2008, the U.S. median net worth grew by only 0.2 percent to nearly $106,000. Average net worth declined by 1.8 percent to more than $508,000 during the same period. Losses were most prevalent among the youngest and oldest householders.

[8] Further information about the changes to tax variables in the latest Current Population Survey is available at http://www.census.gov/hhes/www/income/cpsasec2005taxmodeldoc.pdf. A detailed review of the tax model is available at http://www.census.gov/hhes/www/income/oharataxmodel.pdf and http://www.irs.gov/pub/irs-soi/06ohara.pdf.

Most householders are just experiencing slower growth compared to a year ago, when the economy and the housing market were better.

The size of the triennial surveys used in estimating net worth is approximately 25,000 households. The major strengths of the SCF surveys lie in their enhanced representation of wealthy households and in the comprehensive measurement of net worth components. By definition, net worth equals total household assets less any debts, secured or unsecured. Assets include own home, rental property, own business, IRA and Keogh accounts, pension plans, stocks, mutual funds, and motor vehicles. Examples of secured debt include home mortgages and vehicle loans; unsecured debt includes credit card and other bills or certain bank loans.

The first step in calculating net worth is to measure the relationship of net worth to household income by age of householder. The relationship is further differentiated by tenure because homeownership represents a major factor in household wealth. The next step is to model the relationship statistically to enhance the reliability of the estimates. This effort represents a model introduced in 2004 to reflect the recent trends in the housing market and their impact on net worth. With the recent decline in home value, the value of residential real estate is no longer the significant driver of growth in household net worth.

The extension of the 2000 household income distribution from an upper interval of $200,000 or more to $500,000 or more also enhances the calculation of net worth for the wealthiest households. The 2008 estimates of net worth reflect current income and homeownership with adjustments for inflation and updates based on economic growth since the 2004 SCF survey.

Use of Projections

Projections are necessarily derived from current events and past trends. The past and the present are known; the future must be extrapolated from this knowledge base. Even though projections represent the unknown, they are not uninformed. Guidelines for the development of projections also inform the use of those projections:

- The recent past provides a reasonable clue to the course of future events, especially if that information is tempered with a historical perspective.
- A stable rate of growth is easier to anticipate than rapid growth or decline.
- The risk inherent in projections is inversely related to the size of an area: the smaller the area, the greater the risk.
- The risk increases with the length of the projection interval. Any deviation of the projected trends from actual events is amplified over time.

ESRI revises its projections annually to draw on the most recent estimates and projections of local trends. However, this data can be complemented with personal knowledge of an area to provide the qualitative, anecdotal detail that is not captured in a national database. It is incumbent upon data users and producers to incorporate as much information as possible when assessing local trends, especially for areas that are subject to boom-bust cycles.

J-9735

ZIP Code Updates

Data for residential ZIP Codes is estimated by ESRI. Census 2000 geographic areas are the building blocks for ESRI's ZIP Codes. Because ZIP Code™ boundaries change frequently, census geography provides a comparatively stable base for the development of ZIP Code data. ZIP Code data has been estimated from block groups. BGs are assigned to residential ZIP Codes by overlaying the centroids of component blocks onto ZIP Code boundaries. Expressed as latitude-longitude coordinates, centroids approximate the geographic centers of blocks. If the centroid of a block falls within a ZIP Code, it is included in the residential inventory; otherwise, it is classified as nonresidential. Block data is then aggregated, and the ratio of block totals to block group data is used to apportion demographic characteristics to a ZIP Code.

The 2008/2013 updates include data for 30,067 U.S. residential ZIP Codes. This geodemographic method does not provide data for ZIP Codes with no assigned boundary. If a polygon is not defined for a ZIP Code or no blocks are assigned to a ZIP Code polygon, data cannot be retrieved. In most cases, information about post office box ZIP Codes or single address ZIP Codes is incorporated with the data for the enclosing, residential ZIP Code.

Data Source for Boundaries

Tele Atlas creates boundary files for ZIP Codes. The complete ZIP Code inventory includes both point and boundary ZIP Codes. ZIP Code boundaries are current as of November 2007.

Comparisons over Time

ZIP Codes are not amenable to time series analysis, thereby preventing a direct comparison with ZIP Codes from earlier updates. Changes typically include new residential ZIP Codes (74 in 2008), dropped ZIP Codes (13 in 2007), and boundary revisions. The 2008 inventory of residential ZIP Codes includes 11,044 ZIP Codes that have the same geocode as the 2007 inventory but a different population base as a result of boundary changes or slightly different block allocations. These changes reflect revisions of ZIP Codes by the U.S. Postal Service in addition to any changes in the techniques used by Tele Atlas to define ZIP Code boundaries.

ESRI's Data Development Team

Led by chief demographer Lynn Wombold, ESRI's data development team has a 30-year history of excellence in market intelligence. The combined expertise of the team's economists, statisticians, demographers, geographers, and analysts totals nearly a century of data and segmentation development experience. The team has crafted data methodologies, such as the demographic update, segmentation, the diversity index, and the Retail MarketPlace database, that are now industry benchmarks.

ESRI
380 New York Street
Redlands, California
92373-8100 USA

Phone: 909-793-2853
Fax: 909-793-5953
E-mail: info@esri.com

For more than 35 years, ESRI has been helping people make better decisions through management and analysis of geographic information. A full-service GIS company, ESRI offers a framework for implementing GIS technology and business logic in any organization from personal GIS on the desktop to enterprise-wide GIS servers (including the Web) and mobile devices. ESRI GIS solutions are flexible and can be customized to meet the needs of our users.

For More Information

1-800-GIS-XPRT (1-800-447-9778)

www.esri.com

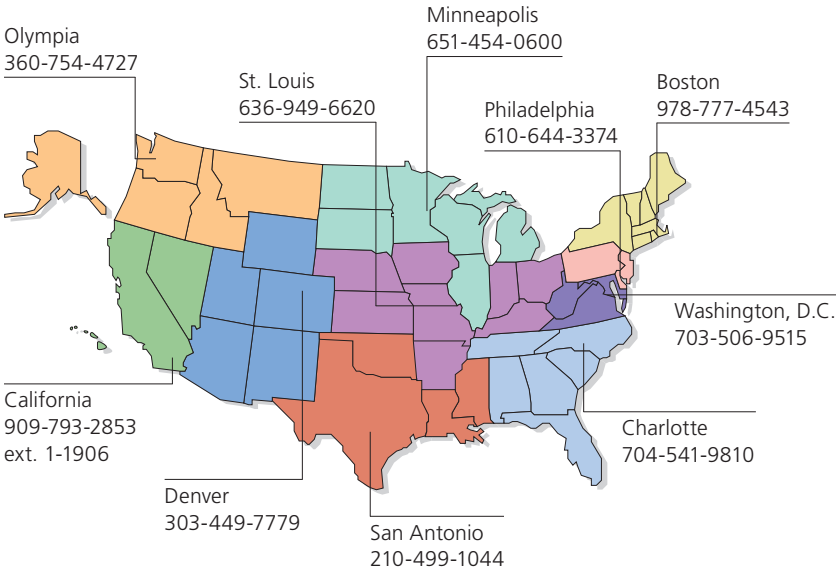
Locate an ESRI value-added reseller near you at

www.esri.com/resellers

Outside the United States, contact your local ESRI distributor. For the number of your distributor, call ESRI at 909-793-2853, ext. 1-1235, or visit our Web site at

www.esri.com/distributors

ESRI Regional Offices



ESRI International Offices

Australia
www.esriaustralia.com.au

Belgium/Luxembourg
www.esribelux.com

Bulgaria
www.esribulgaria.com

Canada
www.esricanada.com

Chile
www.esri-chile.com

China (Beijing)
www.esrichina-bj.cn

China (Hong Kong)
www.esrichina-hk.com

Eastern Africa
www.esriea.co.ke

Finland
www.esri-finland.com

France
www.esrifrance.fr

Germany/Switzerland
www.esri-germany.de
www.esri-suisse.ch

Hungary
www.esrihu.hu

India
www.esriindia.com

Indonesia
www.esrisa.com.my

Italy
www.esriitalia.it

Japan
www.esrij.com

Korea
www.esrikr.com

Malaysia
www.esrisa.com.my

Netherlands
www.esri.nl

Northeast Africa
www.esrinea.com

Poland
www.esripolska.com.pl

Portugal
www.esri-portugal.pt

Romania
www.esriro.ro

Singapore
www.esrisa.com

Spain
www.esri-es.com

Sweden
www.esri-sgroup.se

Thailand
www.esrith.com

Turkey
www.esriturkey.com.tr

United Kingdom
www.esriuk.com

Venezuela
www.esriven.com

GSA Federal Supply Schedule
No. GS-35F-5086H

Printed in USA