

## **Appendix C: Woods & Poole Economics' Forecast Methodology**

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## Chapter 2. Technical Description of the Woods & Poole Economics, Inc. 2003 Regional Projections and Database

### Introduction

The Woods & Poole Economics, Inc. database contains more than 900 economic and demographic variables for every county in the United States for every year from 1970 to 2025. This comprehensive database includes detailed population data by age, sex, and race; employment and earnings by major industry; personal income by source of income; retail sales by kind of business; and data on the number of households, their size, and their income. All of these variables are projected for each year through 2025. In total, there are over 175 million statistics in the regional database. The regional model that produces the projection component of this database was developed by Woods & Poole. The regional projection methods are revised somewhat year to year to reflect new computational techniques and new sources of regional economic and demographic information. Each year, a new projection is produced based on an updated historical database and revised assumptions.

The fact that the proprietary Woods & Poole economic and demographic projections rely on a very detailed database, makes them one of the most comprehensive county-level projections available. A description of some characteristics of the database and projection model is contained in this chapter.

### Overview of the Projection Methods

The strength of Woods & Poole's economic and demographic projections stems from the comprehensive historical county database and the integrated nature of the projection model. The projection for each county in the United States is done simultaneously so that changes in one county will affect growth or decline in other counties. For example, growth in employment and population in Houston will affect growth in other metropolitan areas, such as Cleveland. This reflects the flow of economic activity around the country as new industries emerge or relocate in growing areas and as people migrate, in part because of job opportunities. The county projections are developed within the framework of the United States projection made by Woods & Poole. The U.S. projection is the control total for the 2003 regional projections and is described in the "Overview of the 2003 Projections" chapter included in Woods & Poole publications.

The regional projection technique used by Woods & Poole — linking the counties together to capture regional flows and constraining the results to a previously determined United States total — avoids a common pitfall in regional projections. Regional projections are sometimes made for a city or county without regard for potential growth in surrounding areas or other areas in the country. Such projections may be simple extrapolations of recent historical trends and, as a result, may be too optimistic or pessimistic. If these county projections were added together, the total might differ considerably from any conceivable national forecast scenario; this is the result of each regional projection being generated independently without interactive procedures and without being integrated into a consistent national projection.

The methods used by Woods & Poole to generate the county projections proceed in four stages. First, forecasts to 2025 of total United States personal

*Woods & Poole Economics, Inc. is a small, independent corporation that specializes in long-term county economic and demographic projections. Woods & Poole's database for every county in the U.S. contains projections through 2025 for more than 900 variables.*

income, earnings by industry, employment by industry, population, inflation, and other variables are made. Second, the country is divided into 172 Economic Areas (EAs) as defined by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). The EAs are aggregates of contiguous counties that attempt to measure cohesive economic regions in the United States (a list of all EAs and their component counties can be found in Appendix 4 following this chapter); in the 2003 Woods & Poole model, EA definitions released by the BEA in May 2002 are used. For each EA, a projection is made for employment, using an “export-base” approach; in some cases, the employment projections are adjusted to reflect the results of individual EA models or exogenous information about the EA economy. The employment projection for each EA is then used to estimate earnings in each EA. The employment and earnings projections then become the principal explanatory variables used to estimate population and number of households in each EA.

The third stage is to project population by age, sex, and race for each EA on the basis of net migration rates projected from employment opportunities. For stages two and three, the U.S. projection is the control total for the EA projections. The fourth stage replicates stages two and three except that it is performed at the county level, using the EAs as the control total for the county projections.



### The “Export-Base” Approach

The specific economic projection technique used by Woods & Poole to generate the employment, earnings, and income estimates for each county in the United States generally follow a standard economic “export-base” approach. This relatively simple approach to regional employment projections is one that has been used by a number of researchers (see [5] and [9]). Although this approach has been criticized by several empirical studies (e.g., [8]), given the availability of regional data it remains one of the most feasible methodologies.

Certain industrial sectors at the regional level are considered “basic.” This means that these sectors produce output that is not consumed locally but is “exported” out of the region for national or international consumption. This assumption allows these sectors to be linked closely to the national economy, and hence follow national trends in productivity and output growth. Normally, the “basic” sectors are mining, agriculture, manufacturing, and the Federal government. In contrast, “non-basic” sectors are those such as retail trade, transportation, communication, and construction, the output of which is usually consumed locally. The growth of the “non-basic” sectors depends largely on the growth of the “basic” sectors that form the basis of the region’s economy.

Intuitively, this approach has great appeal and there are numerous examples that seem to support the “export-base” theory. Automobile production in Detroit, for instance, is obviously much more sensitive to national and international price and demand for transportation equipment than to local demand. In Texas, oil and natural gas exploration and production are tied closely to the worldwide demand and supply of petroleum resources and not tied primarily to energy consumption in Texas.

Although the theory is appealing, some shortcomings do exist in the "export-base" approach. For example, some "basic" commodities produced locally are consumed locally. Producers of durable equipment used in other manufacturing processes are often affected not by the national demand for their product but by the regional demand. Machine tool makers that supply the local automobile industry in Detroit will prosper to the extent Detroit's automobile producers prosper. In Houston, the strength of the local oil industry will affect the demand and production of equipment for oil and natural gas production and exploration. In both of these instances, some durable manufacturing industries exist to serve local, not national, markets.

However, despite the shortcomings, the availability of relatively clean data for sub-national geographic areas makes the "export-base" approach very useful. The analytical framework for projections using the "export-base" approach entails estimating either demand equations or calculating historical growth rate differentials for output by sector. The principal explanatory variable, or the comparative data series for growth rate differentials, is the national demand for the output of that sector. Employment-by-sector data are often used as a surrogate variable since county output-by-sector data are not available; employment-by-sector data is used by Woods & Poole. Earnings projections are then obtained by using earnings-per-employee data either estimated as part of the model or imposed exogenously on the system. The complementary relationship could also be estimated, i.e., using an earnings forecast to derive employment based on earnings-per-employee data; this procedure has been used previously in some Woods & Poole regional models.

A modification of the "export-base" approach is used by Woods & Poole to account for regional variants to normal "basic"/"non-basic" industry definitions. Some "non-basic" sectors can be more appropriately modeled as "basic" sectors in certain regional economies. The finance sector or wholesale trade sector in New York City, for example, and the service sector in Las Vegas, are cases in which traditionally "non-basic" sectors are really "basic." New York is a worldwide financial and trade center and thus "exports" these services outside of the region; Las Vegas, as a vacation and entertainment center, similarly "exports" the output of its service sector to other parts of the country. Activity in these sectors, in these specific geographic areas, is therefore linked more closely to the performance of these same sectors in the surrounding regions and the nation as a whole than to the other "basic" industries in the region.

A list of Economic Areas that have traditionally "non-basic" sectors modeled as "basic" sectors is presented in Table 1. Areas with "non-basic" sectors modeled as "basic" are those areas with a proportion of "non-basic" sector employment relative to total employment greater than 1.5 standard deviations above the national mean for a specific sector. With the exception of two sectors that are always considered "non-basic," construction and state and local government, all "non-basic" sectors are evaluated for each EA using this method (see [5]).

In addition to following an "export-base" approach, Woods & Poole uses exogenous information about EA economies as well as some individual EA models to make projections. Although almost all EAs are not modeled

**Table 1. Economic Area "Non-Basic" Sectors Considered as "Basic" in the 2003 Woods & Poole Regional Model**

|   |
|---|
| <b>Transportation</b>                               |
| Anchorage, AK                                       |
| Atlanta, GA-AL-NC                                   |
| Casper, WY-ID-UT                                    |
| Charleston, WV-KY-OH                                |
| Duluth-Superior, MN-WI                              |
| Farmington, NM-CO                                   |
| Joplin, MO-KS-OK                                    |
| Kansas City, MO-KS                                  |
| Lafayette, LA                                       |
| New Orleans, LA-MS                                  |
| North Platte, NE-CO                                 |
| Scottsbluff, NE-WY                                  |
| <b>Wholesale Trade</b>                              |
| Atlanta, GA-AL-NC                                   |
| Charlotte-Gastonia-Rock Hill, NC-SC                 |
| Chicago-Gary-Kenosha, IL-IN-WI                      |
| Dallas-Fort Worth, TX-AR-OK                         |
| Fargo-Moorhead, ND-MN                               |
| Houston-Galveston-Brazoria, TX                      |
| Kansas City, MO-KS                                  |
| Memphis, TN-AR-MS-KY                                |
| New Orleans, LA-MS                                  |
| New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA   |
| Omaha, NE-IA-MO                                     |
| Richland-Kennewick-Pasco, WA                        |
| <b>Retail Trade</b>                                 |
| Eugene-Springfield, OR-CA                           |
| Flagstaff, AZ-UT                                    |
| Fort Myers-Cape Coral, FL                           |
| McAllen-Edinburg-Mission, TX                        |
| North Platte, NE-CO                                 |
| Northern Michigan, MI                               |
| Orlando, FL   |
| Salisbury, MD-DE-VA                                 |
| Sarasota-Bradenton, FL                              |
| Tampa-St. Petersburg-Clearwater, FL                 |
| <b>Finance, Insurance &amp; Real Estate</b>         |
| Austin-San Marcos, TX                               |
| Chicago-Gary-Kenosha, IL-IN-WI                      |
| Denver-Boulder-Greeley, CO-KS-NE                    |
| Fort Myers-Cape Coral, FL                           |
| Honolulu, HI  |
| Los Angeles-Riverside-Orange County, CA-AZ          |
| Miami-Fort Lauderdale, FL                           |
| New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA   |
| Phoenix-Mesa, AZ-NM                                 |
| Richmond-Petersburg, VA                             |
| San Francisco-Oakland-San Jose, CA                  |
| Sarasota-Bradenton, FL                              |
| Tampa-St. Petersburg-Clearwater, FL                 |
| <b>Services</b>                                     |
| Albuquerque, NM-AZ                                  |
| Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH-RI |
| Las Vegas, NV-AZ-UT                                 |
| Los Angeles-Riverside-Orange County, CA-AZ          |
| Miami-Fort Lauderdale, FL                           |
| New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA   |
| Orlando, FL   |
| Reno, NV-CA   |
| Rochester, MN-IA-WI                                 |
| Santa Fe, NM  |
| Sarasota-Bradenton, FL                              |
| Tampa-St. Petersburg-Clearwater, FL                 |
| Washington-Balt., DC-MD-VA-WV-PA                    |
| <b>Federal Civilian</b>                             |
| Albuquerque, NM-AZ                                  |
| Anchorage, AK                                       |
| Biloxi-Gulfport-Pascagoula, MS                      |
| Charleston-North Charleston, SC                     |
| El Paso, TX-NM                                      |
| Flagstaff, AZ-UT                                    |
| Honolulu, HI  |
| Huntsville, AL-TN                                   |
| Macon, GA   |
| Norfolk-Virginia Beach-Newport News, VA-NC          |
| Pensacola, FL                                       |
| Salt Lake City-Ogden, UT-ID                         |
| San Antonio, TX                                     |
| Washington-Balt., DC-MD-VA-WV-PA                    |

**Table 2. Sample Equations for Economic Areas**  
[T-statistics in brackets]

|   |   |                          |   |                          |                            |                            |             |
|---|---|--------------------------|---|--------------------------|----------------------------|----------------------------|-------------|
| <b>(1) Cleveland manufacturing employment</b> |   |                          |   |                          |                            |                            |             |
| $CA_t$  | = | $0.0131 \times UA_t$     | - | $181432 \times CB_{t-1}$ | + $0.8931 \times CA_{t-1}$ | $R^2=0.929$                |             |
|   |   | [2.55]                   |   | [2.00]                   | [17.71]                    |                            |             |
| <b>(2) Houston manufacturing employment</b>   |   |                          |   |                          |                            |                            |             |
| $HA_t$  | = | $0.7060 \times UB_{t+1}$ | + | $0.0944 \times UE_t$     | + $0.6062 \times HA_{t-1}$ | $R^2=0.855$                |             |
|   |   | [2.20]                   |   | [3.19]                   | [5.20]                     |                            |             |
| <b>(3) Houston mining employment</b>          |   |                          |   |                          |                            |                            |             |
| $HB_t$  | = | $0.7205 \times UB_t$     | + | $0.6670 \times HB_{t-1}$ |                            | $R^2=0.959$                |             |
|   |   | [7.37]                   |   | [14.02]                  |                            |                            |             |
| <b>(4) Sioux City IA farm employment</b>      |   |                          |   |                          |                            |                            |             |
| $XA_t$  | = | -2403                    | + | $0.001571 \times UC_t$   | + $0.7924 \times XA_{t-1}$ | $R^2=0.977$                |             |
|   |   | [2.77]                   |   | [2.78]                   | [9.61]                     |                            |             |
| <b>(5) Sioux City IA non-basic employment</b> |   |                          |   |                          |                            |                            |             |
| $XB_t$  | = | -6260                    | + | $0.4461 \times XC$       | + $0.8896 \times XB_{t-1}$ | $R^2=0.990$                |             |
|   |   | [2.62]                   |   | [3.86]                   | [24.05]                    |                            |             |
| <b>(6) Seattle manufacturing employment</b>   |   |                          |   |                          |                            |                            |             |
| $SA_t$  | = | 80432                    | - | $4823 \times UD_t$       | - $37250 \times DA_t$      | + $0.8120 \times SA_{t-1}$ | $R^2=0.939$ |
|   |   | [4.21]                   |   | [3.16]                   | [4.97]                     | [15.20]                    |             |
| <b>(7) Seattle non-basic employment</b>       |   |                          |   |                          |                            |                            |             |
| $SB$  | = | -899056                  | + | $0.7575 \times SC$       | - $57987 \times DA$        | - $13736 \times UD$        | $R^2=0.996$ |
|   |   | [18.62]                  |   | [72.62]                  | [2.78]                     | [3.51]                     |             |

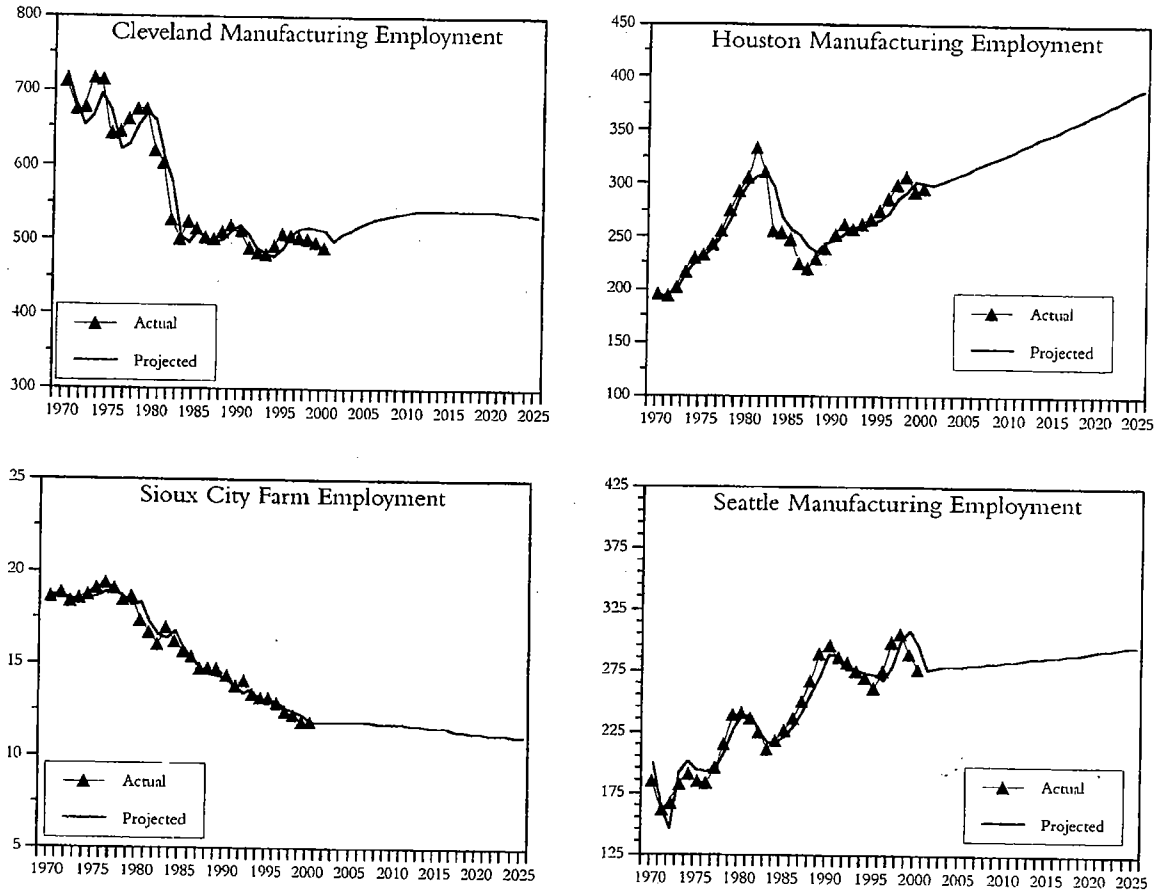
**Variables:**

|    |   |  |    |   |                                  |
|----|---|--|----|---|----------------------------------|
| DA | = | dummy variable 1970-72                 | SA | = | Seattle manufacturing employment |
| HA | = | Houston manufacturing employment       | SB | = | Seattle non-basic employment     |
| HB | = | Houston mining employment              | SC | = | Seattle population               |
| XA | = | Sioux City farm employment             | UA | = | U.S. manufacturing employment    |
| XB | = | Sioux City non-basic employment        | UB | = | U.S. mining earnings             |
| XC | = | Sioux City basic employment            | UC | = | U.S. farm employment             |
| CA | = | Cleveland manufacturing employment     | UD | = | U.S. unemployment rate           |
| CB | = | Cleveland relative manufacturing wages | UE | = | U.S. manufacturing earnings      |

individually, since most are assumed to fit a normative structure, certain EAs that have interesting features can be modeled separately. Areas that have had rapid growth (such as Houston) or severe economic recessions as in some heavy-industry EAs (such as Cleveland) lend themselves to individual models. These regional economies, at least in part, can be modeled separately. This is a simple "bottom-up" approach that can take into account the idiosyncrasies of individual areas (see [2], [3], [7]).

An example of the "bottom-up" approach is shown with the equations for Cleveland, Houston, Sioux City IA, and Seattle, presented in Table 2. The Cleveland-Akron OH-PA Economic Area is defined as Ashland, Ashtabula, Carroll, Columbiana, Crawford, Cuyahoga, Erie, Geauga, Harrison, Holmes, Huron, Lake, Lorain, Mahoning, Medina, Portage, Richland, Stark, Summit, Trumbull, Tuscarawas, and Wayne counties in Ohio; and Mercer county in Pennsylvania. The Houston-Galveston-Brazoria TX Economic Area is defined as Angelina, Austin, Brazoria, Brazos, Burleson, Calhoun, Chambers, Colorado, DeWitt, Fayette, Fort Bend, Freestone, Galveston, Goliad, Grimes, Harris, Houston, Jackson, Lavaca, Leon, Liberty, Limestone, Madison, Matagorda, Montgomery, Nacogdoches, Polk, Robertson, Sabine, San Augustine, San Jacinto, Shelby, Trinity, Victoria, Walker, Waller, Washington, and Wharton counties. The Sioux City IA-NE-SD Economic Area is defined as Cherokee, Ida, Monona, O'Brien, Plymouth, Sioux, and Woodbury counties in Iowa; Dakota, Dixon, and Thurston counties in Nebraska; and Union county in South Dakota. The Seattle-Tacoma-Bremerton WA Economic Area is defined as Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Lewis, Mason, Pacific, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom counties.

**Figure 1. Employment Projections for Selected Economic Areas, 1969-2025**



**Note:** Employment in thousands of jobs; historical data, 1969-2000, from U.S. Department of Commerce; projected data, 1969-2025, from Woods & Poole Economics, Inc.

The following discussion of these equations illustrates some of the logic and assumptions that go into the Woods & Poole model. The historical data used in the model equations is defined and explained in a later section of this chapter. Figure 1 illustrates graphically the degree of fit for several of the equations.

In equation (1) Cleveland manufacturing employment is a function of total U.S. manufacturing employment, the wages of Cleveland manufacturing workers relative to manufacturing workers for the U.S. as a whole, and a lagged dependent variable. All the coefficients are significant at a 95% confidence level, and together clearly explain historical manufacturing in Cleveland. It is interesting to note that the coefficient for relative wages is significant and negative. The ratio of earnings per manufacturing worker in Cleveland to U.S. earnings per manufacturing worker (this is the definition of relative wages) historically has always been greater than one, with a mean of 1.13 for the period 1969 to 2000. Relatively high wages explain, in part, the decline in manufacturing employment in areas such as Cleveland. Faced with relatively high wages, manufacturers have an incentive to increase the productivity of existing plants and save labor, move plants to other areas where wages are lower, or close plants permanently because of competition from other facilities able to produce the same goods more efficiently.

Equation (2) explains Houston manufacturing employment as a function of total U.S. mining earnings, U.S. manufacturing earnings, and a lagged dependent variable. U.S. mining earnings measures the expansion of domestic mining activity as oil and natural gas prices increased during the 1970s. The largest manufacturing sectors in the Houston Economic Area are the production of equipment used in the exploration and extraction of petroleum

resources and the production of refined fuels and chemicals from oil; both of these manufacturing sectors are dependent on the output of the mining sector for the U.S. as a whole. As the price of oil increased during the 1970s, demand for new extraction and exploration increased. Similarly, as prices fell in the 1980s, demand for new exploration waned. Both of these phenomena have affected Houston's manufacturing employment base.

Equation (3) measures Houston mining employment as a function of U.S. mining earnings and the dependent variable lagged one year. Mining employment in Houston, another "basic" sector, depends on total demand for domestic mining output. As the price of oil rises, marginal U.S. reserves, which are relatively more expensive to produce or refine, become competitive, and Houston (and U.S.) production increases. In addition, increased mining revenues allow more capital to be used in the production of oil when prices are high. When prices are low, Houston (and U.S.) production declines and imports generally rise.

In equation (4) Sioux City IA farm employment is a function of U.S. farm employment, the dependent variable lagged one year, and an intercept term. Farming, the largest "basic" sector in Sioux City, has experienced significant employment declines in recent years. Sioux City farm employment is related to U.S. farm employment in this equation because the reasons for job losses in Sioux City are related to nationwide changes in agriculture. In every decade this century, farm employment in the U.S. has declined as farm productivity has increased. The experience of Sioux City is like that of most other farming areas: employment has declined as output has remained steady or increased. The national projections of agricultural productivity growth are important to expected farm employment in Sioux City.

Equation (5) explains Sioux "non-basic" employment as a function of Sioux City "basic" employment, the dependent variable lagged one year, and an intercept term. This equation illustrates the relationship between "basic" employment losses and subsequent "non-basic" employment losses. As the population declined in Sioux City, so did "non-basic" employment.

In equation (6) Seattle manufacturing employment is a function of an intercept term, the U.S. unemployment rate, a dummy variable for 1970 to 1972, and a lagged dependent variable. The largest manufacturing sectors in Seattle — aircraft, lumber, and wood products — are sensitive to U.S. business cycles. U.S. business cycles are measured by the civilian unemployment rate, which has a negative coefficient in equation (6). The negative coefficient of the dummy variable for 1970 to 1972 adjusts the specification of the equation for the severe regional recession during that time.

Equation (7) explains Seattle "non-basic" employment as a function of an intercept term, Seattle population, a dummy variable for the 1970-72 regional recession, and the U.S. unemployment rate. The unemployment rate measures the sensitivity of Seattle employment to U.S. business cycles. "Non-basic" employment is also a function of the population of the region; as the population of Seattle has grown, the demand for "non-basic" sector employment has also increased. It is interesting that population is contemporaneous with the dependent variable, "non-basic" employment, in equation (7) but lagged in equation (5). In rapidly growing areas, such as Seattle, population increases have an immediate effect on employment

growth in “non-basic” industries. In some very rapidly growing areas of Texas in the late 1970s, population growth actually preceded “non-basic” employment growth. This is analogous to “boom towns” of the Old West as the economy catches up to the demand created by the new population growth and new businesses locate in the fast-growing area. However, in areas losing population, “non-basic” employment does not decline in step with population losses. Many “non-basic” businesses in a declining area will hang on as long as possible in anticipation of an upturn in the region’s economy. This reflects the local nature of most “non-basic” businesses and the desire of firms to protect their capital investment in a specific site.

### The Demographic Model

The demographic portion of the regional model follows a traditional cohort-component analysis based on calculated fertility and mortality in each county or EA. The “demand” for total population is estimated from the economic model: if the demand for labor is forecast to rise for a particular county or EA, then either the labor force participation rate will rise or population in-migration will be positive. The inverse is true for counties and EAs with projected declines in employment. Therefore, future EA and county migration patterns for population by age, sex, and race are based on employment opportunities. Individuals and families are assumed to migrate, at least in part, in response to employment opportunities (see [1], [4], and [6]) with two exceptions: for population aged 65 and over and for college or military-aged population, migration patterns over the forecast period are based on historical net migration and not economic conditions. The integration of economic and demographic regional analysis is a significant strength of the Woods & Poole approach.

The age, sex, and race distribution of the population is projected by aging the population by single year of age by sex and by race for each year through 2025 based on county or EA specific mortality, fertility, and migration rates estimated from historical data. In the Woods & Poole model, projected net mortality and migration are estimated based on the historical net change in population by age, race, and sex for a particular county or EA. Similarly, projected net births and migration of age zero population by race are estimated based on the historical change in age zero population by race per female population age 15 to 44 by race for a particular county or EA.

The United States population by age, sex, and race projections, 2002-2025, are based on Bureau of the Census population estimates. Woods & Poole adjusts these estimates to reflect current year population estimates. The U.S. population by age, sex, and race forecast is the control total for the EA projections. Each EA projection serves as the control totals for the county projections.

In the 2003 Woods & Poole database, Hispanic population, defined as persons of Spanish origin regardless of race, has been taken out of the other race groups (White, Black, Native American, and Asian American/Pacific Islanders). Hispanic population by age and sex is forecast in the same manner as White, Black, Native American, and Asian American/Pacific Islanders; these race groups are all now forecast as Non-Hispanic.

*In the Woods & Poole model population migration is a function of employment opportunities.*

Census AAPEs while the 1-year to 4-year Woods & Poole state population projection AAPEs were slightly below Census AAPEs.

Other statistics are sometimes used to evaluate forecasts. The AAPE is most commonly used as a measure of accuracy for projections when the units being compared are of different sizes (e.g., county population, the base of which can range from 100 for Loving, TX to 8 million for Los Angeles, CA). It has the advantage of being able to compare units of different sizes equally. In some models, the Root Mean Squared Error (RMSE) is used to measure accuracy. The RMSE has the disadvantage of giving modest errors for large units a greater weight than modest errors for small units (i.e., an error of 10,000 on a base of 2 million is given greater weight than an error of 1,000 on a base of 20,000, just the opposite of the AAPE).

Another useful statistic in evaluating forecasts is the simple average of all the percent errors: the Average Percent Error (APE). This measures the bias of the forecast. In Woods & Poole projections, employment for counties have always had a downward bias (the APE has been negative). The APE for all 5-year Woods & Poole county employment projections is -4.0% with a standard deviation of 12.0% (see Table 3). In contrast, the county population projections have always had an upward bias (the APE has been positive). The APE for all 5-year Woods & Poole county population projections is +0.3% with a standard deviation of 7.6%.

### Historical Data

Much of the historical economic data in the Woods & Poole regional databases are obtained from the Bureau of Economic Analysis (BEA) of the Department of Commerce. The historical data from the BEA include county-level data for each year 1969 through 2000 for employment by one-digit Standard Industrial Classification (SIC) code, earnings by one-digit SIC code, and personal income by source of income. Other sources of data include the 1970, 1980, 1990, and 2000 Censuses and post-Censal reports for population and household data, and the quinquennial Census of Retail Trade for retail sales data. Woods & Poole generally accepts the government data as given unless indicated otherwise in this chapter. The discussion which follows, of the historical data used by Woods & Poole, is not intended to be a complete explanation of the historical data; the user should consult the government sources of the historical data for a complete explanation. Some of the sources of government data used by Woods & Poole have technical explanations of how the historical data is collected, how the data can be used, and limitations to the data; the documentation may contain important information on the applicability of the data for particular applications and should be reviewed by users of the historical data; the documentation can be obtained from the U.S. Dept. of Commerce, the Government Printing Office or many public libraries. All data for the years 2001-2025 (2002-2025 for population) are projected by Woods & Poole.

*Historical data used by Woods & Poole are subject to significant revisions.*

Historical data are subject to revision from time to time. Historical employment and income data from the Bureau of Economic Analysis are revised on a regular basis. For example, historical data released by the Bureau of Economic Analysis in 1984 showed total employment for the United States in 1980 to be 106.4 million jobs; the current estimate of 1980 U.S.

