APPENDIX C:

Woods and Poole Economics, Inc.
Projection Methodology

Anchorage Borough, Alaska
2008 Data Pamphlet
Technical Description of the Woods & Poole Economices, Inc.
2008 Regional Projections and Database

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 2008 regional projections and is described in the "Overview of the 2008 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 2040 of total United States personal income, earnings by industry, employment by industry, population, inflation, and other variables are made. Second, the country is divided into 179 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 6 following this chapter); in the 2008 Woods & Poole model, EA definitions released by the BEA in

May 2007 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, utilities, real estate, 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 and insurance sector or wholesale trade sector in New York City, for example, and the accommodation and food services 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 accommodation and food services 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]).

Table 1. Economic Area "Non-Basic" Sectors Considered as "Basic" in the 2008 Woods & Poole Regional Model

UTILITIES
- Birmingham-Hoover-Cullman, AL
- Bismarck, ND
- Clarksburg, WV + Morgantown, WV
- Duluth, MN-WI
- Farmington, NM
- Gulfport-Biloxi-Pascagoula, MS
- Helena, MT
- Wichita Falls, TX

WHOLESALE TRADE
- Atlanta-Sandy Springs-Gainesville, GA-AL
- Charlotte-Gastonia-Salisbury, NC-SC
- Chicago-Naperville-Michigan City, IL-IN-WI
- Dallas-Fort Worth, TX
- Fargo-Wahpeton, ND-MN
- Houston-Baytown-Huntsville, TX
- Idaho Falls-Blackfoot, ID
- Memphis, TN-MS-AR
- New York-Newark-Bridgeport, NY-NJ-CT-PA

RETAIL TRADE
- Alpena, MI
- Bangor, ME
- Cape Girardeau-Jackson, MO-IL
- Duluth, MN-WI
- Eugene-Springfield, OR
- Kearney, NE
- Marinette, WI-MI
- McAllen-Edinburg-Pharr, TX

Sarasota-Bradenton-Venice, FL
Tampa-St. Petersburg-Clearwater, FL
Traverse City, MI

TRANSPORTATION and WAREHOUSING
Anchorage, AK
Fayetteville-Springdale-Rogers, AR-MO
Jacksonville, FL
Joplin, MO
Kearney, NE
Memphis, TN-MS-AR
New Orleans-Metairie-Bogalusa, LA
Pendleton-Hermiston, OR
Redding, CA
Scotts Bluff, NE
State College, PA

INFORMATION
Atlanta-Sandy Springs-Gainesville, GA-AL
Boston-Worcester-Manchester, MA-NH
Cedar Rapids, IA
Colorado Springs, CO
Columbus-Auburn-Opelika, GA-AL
Dallas-Fort Worth, TX
Denver-Aurora-Boulder, CO
Kansas City-Overland Park-Kansas City, MO-KS
Los Angeles-Long Beach-Riverside, CA
New York-Newark-Bridgeport, NY-NJ-CT-PA
San Angelo, TX
San Jose-San Francisco-Oakland, CA
Seattle-Tacoma-Olympia, WA
Washington-Baltimore-Northern Virginia, DC-MD-VA-WV

FINANCE and INSURANCE
Chicago-Naperville-Michigan City, IL-IN-WI
Dallas-Fort Worth, TX
Des Moines-Newton-Pella, IA
Hartford-West Hartford-Willimantic, CT
Jacksonville, FL
Kansas City-Overland Park-Kansas City, MO-KS
New York-Newark-Bridgeport, NY-NJ-CT-PA
Omaha-Council Bluffs-Fremont, NE-IA
Philadelphia-Camden-Vineland, PA-NJ-DE-MD
Phoenix-Mesa-Scottsdale, AZ
Sioux Falls, SD
Tampa-St. Petersburg-Clearwater, FL

REAL ESTATE and RENTAL and LEASING
- Alpena, MI
- Austin-Round Rock, TX
- Bend-Prineville, OR
- Denver-Aurora-Boulder, CO
- Honolulu, HI
- Los Angeles-Long Beach-Riverside, CA
- Miami-Fort Lauderdale-Miami Beach, FL
- Orlando-The Villages, FL
- Pensacola-Ferry Pass-Brent, FL
- Phoenix-Mesa-Scottsdale, AZ
- San Diego-Carlsbad-San Marcos, CA
- San Jose-San Francisco-Oakland, CA
- Sarasota-Bradenton-Venice, FL
- Seattle-Tacoma-Olympia, WA
- Tucson, AZ

PROFESSIONAL and TECHNICAL SERVICES
- Albuquerque, NM
- Austin-Round Rock, TX
- Boston-Worcester-Manchester, MA-NH
- Chicago-Naperville-Michigan City, IL-IN-WI
- Colorado Springs, CO
- Denver-Aurora-Boulder, CO
- Detroit-Warren-Flint, MI
- Houston-Baytown-Huntsville, TX
- Idaho Falls-Blackfoot, ID
- Los Angeles-Long Beach-Riverside, CA
- Miami-Fort Lauderdale-Miami Beach, FL
- New York-Newark-Bridgeport, NY-NJ-CT-PA
- Philadelphia-Camden-Vineland, PA-NJ-DE-MD
- San Diego-Carlsbad-San Marcos, CA
- San Jose-San Francisco-Oakland, CA
- Washington-Baltimore-Northern Virginia, DC-MD-VA-WV

MANAGEMENT of COMPANIES and ENTERPRISES
- Boise City-Nampa, ID
- Charlotte-Gastonia-Salisbury, NC-SC
- Cincinnati-Middletown-Wilmington, OH-KY-IN
- Fayetteville-Springdale-Rogers, AR-MO
- Minneapolis-St. Paul-St. Cloud, MN-WI
- Richmond, VA
- Roanoke, VA
- San Jose-San Francisco-Oakland, CA
- St. Louis-St. Charles-Farmington, MO-IL

ADMINISTRATIVE and WASTE SERVICES
- Albuquerque, NM
- Augusta-Richmond County, GA-SC
- Jacksonville, FL
- Las Vegas-Paradise-Pahrump, NV
- Miami-Fort Lauderdale-Miami Beach, FL
- Orlando-The Villages, FL
- Phoenix-Mesa-Scottsdale, AZ
- Sarasota-Bradenton-Venice, FL
- Tampa-St. Petersburg-Clearwater, FL

EDUCATIONAL SERVICES
- Albany-Schenectady-Amsterdam, NY
- Boston-Worcester-Manchester, MA-NH
- Burlington-South Burlington, VT
- Hartford-West Hartford-Willimantic, CT
- New Orleans-Metairie-Bogalusa, LA
- New York-Newark-Bridgeport, NY-NJ-CT-PA
- Philadelphia-Camden-Vineland, PA-NJ-DE-MD
- Pittsburgh-New Castle, PA
- Rochester-Batavia-Seneca Falls, NY
- Scranton--Wilkes-Barre, PA
- South Bend-Mishawaka, IN-MI
- St. Louis-St. Charles-Farmington, MO-IL
- Syracuse-Auburn, NY
- Washington-Baltimore-Northern Virginia, DC-MD-VA-WV

HEALTH CARE and SOCIAL ASSISTANCE
- Albany-Schenectady-Amsterdam, NY
- Bangor, ME
- Bismarck, ND
- Cape Girardeau-Jackson, MO-IL
- Duluth, MN-WI
- McAllen-Edinburg-Pharr, TX
- Pittsburgh-New Castle, PA
- Portland-Lewiston-South Portland, ME
- Pueblo, CO
- Scranton--Wilkes-Barre, PA
- Springfield, IL

ARTS, ENTERTAINMENT, and RECREATION
- Flagstaff, AZ
- Gulfport-Biloxi-Pascagoula, MS
- Helena, MT
- Lake Charles-Jennings, LA

Las Vegas-Paradise-Pahrump, NV
Los Angeles-Long Beach-Riverside, CA
Missoula, MT
Orlando-The Villages, FL
Reno-Sparks, NV
Santa Fe-Espanola, NM
Sarasota-Bradenton-Venice, FL
Shreveport-Bossier City-Minden, LA

ACCOMMODATION and FOOD SERVICES
Alpena, MI
Flagstaff, AZ
Gulfport-Biloxi-Pascagoula, MS
Honolulu, HI
Las Vegas-Paradise-Pahrump, NV
Reno-Sparks, NV

OTHER SERVICES, EXCEPT PUBLIC ADMIN.
Abilene, TX
Alpena, MI
Amarillo, TX
Beaumont-Port Arthur, TX
Corpus Christi-Kingsville, TX
Lafayette-Acadiana, LA
Lewiston, ID-WA
Lubbock-Levelland, TX
McAllen-Edinburg-Pharr, TX
Miami-Fort Lauderdale-Miami Beach, FL
Midland-Odessa, TX
Mobile-Daphne-Fairhope, AL
Monroe-Bastrop, LA
San Angelo, TX
Springfield, IL
Wichita Falls, TX

FEDERAL CIVILIAN GOVERNMENT
Anchorage, AK
Charleston-North Charleston, SC
El Paso, TX
Flagstaff, AZ
Gulfport-Biloxi-Pascagoula, MS
Honolulu, HI
Huntsville-Decatur, AL
Macon-Warner Robins-Fort Valley, GA
Pensacola-Ferry Pass-Brent, FL
San Antonio, TX

Texarkana, TX-Texarkana, AR
Virginia Beach-Norfolk-Newport News, VA-NC
Washington-Baltimore-Northern Virginia, DC-MD-VA-WV

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 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-Elyria 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-Baytown-Huntsville TX Economic Area is defined as Angelina, Austin, Brazoria, Brazos, Burleson, Calhoun, Chambers, Colorado, DeWitt, Fayette, Fort Bend, Galveston, Goliad, Grimes, Harris, Houston, Jackson, Lavaca, Leon, Liberty, Madison, Matagorda, Montgomery, Nacogdoches, Polk, Robertson, Sabine, San Augustine, San Jacinto, Shelby, Trinity, Victoria, Walker, Waller, Washington, and Wharton counties. The Sioux City-Vermillion IA-NE-SD Economic Area is defined as Monona, O'Brien, Osceloa, Plymouth, Sioux, and Woodbury counties in Iowa; Antelope, Boyd, Cedar, Dakota, Dixon, Holt, Knox, Madison, Pierce, Stanton, Thurston, Wayne, and Wheeler counties in Nebraska; and Bon Homme, Clay, Union and Yankton counties in South Dakota. The Seattle-Tacoma-Olympia WA Economic Area is defined as Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Kittitas, Lewis, Mason, Pacific, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom counties.

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 1970 to 2006. 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 times a dummy variable for the years 1971 to 1985, 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. Historically the largest manufacturing sectors in the Houston Economic Area were 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 were 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 2040 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, 2007-2040, are based on Bureau of the Census population estimates for 2000 through 2006. Woods & Poole forecasts these U.S. estimates with a cohort-component model based on the year to year change in U.S. population by single year of age, race, and sex. Forecast fertility, mortality, and international migration are estimated from the Census population estimates and are applied exogenously to the Woods & Poole U.S. projections. Woods & Poole produces only a "middle" U.S. population forecast - this forecast is similar to the Census "middle" forecast scenario for the U.S. population. 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.

The Accuracy of the Projections

Unlike other sciences, economics and demographics cannot rely on experimentation to test theories and verify hypotheses. Rather, historical data are analyzed and theories are developed that explain the historical data. The resulting models are then used to make a projection. Woods & Poole projections, like all economic and demographic projections, utilizes this approach: analyzing historical data to make estimates of future data. There are, of course, inherent limitations to projections, and the Woods & Poole projections should never be interpreted as an infallible prediction of the future; future data may differ significantly from Woods & Poole projections and Woods & Poole does not guarantee the accuracy of the projections. In all Woods & Poole publications, the word "forecast" is used as a synonym for "projection" and refers to Woods & Poole estimated data for any year from 2007 to 2040 (2008 to 2040 for population); in Woods & Poole publications "projections", or "forecasts", both mean estimates of future data (2007 to 2040, or 2008 to 2040 for population).

One key limitation to all projections, and Woods & Poole projections in particular, is that the future is never known with any certainty. The model on which the projections are based may not accurately reflect future events. In addition, there is always the possibility of an unanticipated shock to the economy, or of some other event that was not foreseen based on an analysis of historical data. For instance, a local government may enact a new industrial policy that has an unexpected, beneficial effect on employment growth. Or an abrupt economic change, although anticipated, may occur with much greater intensity or in a shorter time period than expected. For example, the projection may assume an increase in the price of a commodity, such as oil, over a five-year period, but an embargo may raise the price to that level in only one year. In addition, the projections may not be accurate because historical data is revised; or because the projection model does not accurately reflect demographic or economic phenomena; or because the projections contain errors; or because the smooth growth path of the long-term projections inaccurately reflects important variance in economic or demographic growth for particular regions; or because assumptions about national or regional growth, upon which the projections are based, turn out to be incorrect. In addition, there are many other types of economic and demographic events that could create outcomes far different from Woods & Poole's projections.

Another limitation results from doing forecasts for small geographic

areas for small data series. Statistically, models are more reliable the larger the area and/or the series being studied. Small area forecasts, such as county population for White men age 84, are subject to more error because of the small sample size. This error can be reduced, although never eliminated, by constraining the small area forecasts to the forecast totals for a larger area or series; this is the method used by Woods & Poole.

One way to evaluate the effectiveness of a projection method is to compare previous projections to current data; although such a comparison does not indicate the potential accuracy of current or future projections, it can be useful to measure the magnitude of error of previous projections. Table 3 illustrates how well Woods & Poole regional models projected employment, population, and personal income over a 1-year to 10-year forecast horizon for various geographies.

One statistic used to evaluate the projections is the Average Absolute Percent Error (AAPE), which is the average of the absolute values of the percent difference from the projected data to the actual data. The lower the AAPE, the more accurate the projection (e.g., Woods & Poole's 3-year population projections have been accurate within ñ1.8% for states and ñ3.2% for counties). All Woods & Poole projections are evaluated for each projection horizon; thus, the AAPE for 1-year projections is calculated based on all Woods & Poole one-year projections (there have been twenty 1-year projections and eleven 10-year projections). Changes to historical data are not adjusted when calculating the AAPEs. Thus, if a projection was made using historical data that were subsequently revised, the AAPE is calculated based on the revised data, probably inflating the AAPE, particularly for short-term projections. For example, projections of 1993 employment done in 1984 were made using a different definition of employment; in the 1984 forecast, U.S. total employment in 1980 was estimated to be 106.4 million jobs. However, since then, the definition of employment has been revised several times by the Department of Commerce and now U.S. total employment in 1980 is estimated to be 114.2 million jobs; therefore, the AAPEs are calculated based on revised data so they incorporate not only forecast error but definitional changes as well, probably inflating the AAPEs.

The longer the forecast horizon, the larger the AAPE. Thus for all Metropolitan Statistical Areas (MSAs), 1-year population projections have been accurate within ñ1.3% compared to ñ5.7% for the 10-year projection. In addition, population projections, the most stable series and the data least subject to historical revision, have the lowest AAPEs.

Personal income has the highest AAPE for all geographies because, in addition to projecting the level of personal income, there is an implicit price inflation forecast built into the income projections. In the early 1980s after a period of rapid inflation, the Woods & Poole personal income projections had relatively high AAPEs (the 10-year personal income forecast had an AAPE of ñ16.2% for counties). As inflation mitigated in the 1980s, the AAPEs for personal income dropped sharply; the 5-year AAPE dropped to ñ9.7% for counties.

Generally, the smaller the geography, the larger the AAPEs for all variables. For all counties, the AAPE for 8-year population projections was ñ7.1%. However, for counties with population under 50,000 in 2000, the 8-year projection AAPE was ñ7.5%. Similarly, for larger geographies, the AAPEs are usually lower. The AAPE for counties with 2000 population between 50,000 and 100,000 was ñ6.0%; for counties with population over 100,000 the AAPE was ñ5.8%. AAPEs for smaller variables tend to be higher than AAPEs for larger variables. Thus, the AAPE for retail trade employment would probably be higher than the AAPE for total employment, holding geographic area size and forecast horizon constant.

The accuracy of Woods & Poole's projections has been comparable to the accuracy of other regional forecasting programs. Figure 2 compares Woods & Poole's projections to Department of Commerce Bureau of Economic Analysis (BEA) and Census Bureau projections over comparable forecast horizons. The Woods & Poole 8-year forecast AAPEs for states for the year 1990 for employment and personal income were slightly below the BEA AAPEs, and slightly above the BEA for population. Similarly, the Woods & Poole 1-year to 5-year population projections AAPE for states were slightly below the 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 -1.7% with a standard deviation of 11.9% (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 +0.51% with a standard deviation of 7.4%.

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 2006 for employment and earnings by one-digit Standard Industrial Classification (SIC) code (1969 to 2000) and by one-digit North American Industry Classification System (NAICS) code (2001 to 2006), 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 2007-2040 (2008-2040 for population) are projected by Woods & Poole.

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. total employment is 114.2 million jobs. When using the historical data, it is important to use the current revision and not combine this data with previous versions since there may be definitional changes in the data.

Gross Domestic Product by State

Gross Domestic Product by State, formerly Gross State Product (GSP), is called Gross Regional Product (GRP) in the Woods & Poole database. GRP is historical for the United States total, regions, and states for the years 1969-2007 from the Bureau of Economic Analysis Gross Domestic Product by State series. All county, and metropolitan area, historical GRP data, 1969-2007, is estimated by Woods & Poole by allocating state GRP in a particular year to counties within the state based on the proportion of total state earnings of employees originating in a particular county. County GRP estimates are constrained to state totals for the years 1969-2007. All GRP data is establishment based.

Employment

The employment data in the Woods & Poole database are a complete measure of the number of full- and part-time jobs by place of work. Historical data, 1969-2006, are from the U.S. Department of Commerce, Bureau of Economic Analysis. The employment data include wage and salary workers, proprietors, private household employees, and miscellaneous workers. Wage and salary employment data are based on an establishment survey in which employers are asked the number of full- and part-time workers at a given establishment. Because part-time workers are included, a person holding two part-time jobs would be counted twice. Also, since the wage and salary employment data are based on an establishment survey, jobs are counted by place of work and not place of residence of the worker; thus, a job in the New York Metropolitan Area is counted in the New York Metropolitan Area regardless of where the worker lives.

Data on proprietors include farm and non-farm proprietors by sector. Proprietors include not only those people who devote the majority of their time to their proprietorship, but people who devote any time at all to a proprietorship. Thus, a person who has a full-time wage and salary job and on nights and weekends runs a small business legally defined as a proprietorship would be counted twice. The employment data therefore include full- and part-time proprietors.

Private household employment data include persons employed by a household on the premises, such as full-time baby-sitters, housekeepers, gardeners, and butlers. Miscellaneous employment data include judges and all elected officials, persons working only on commission in sectors such as real estate and insurance, students employed by the colleges or universities in which they are enrolled, and unincorporated subcontractors in sectors such as construction.

The employment data used by Woods & Poole comprise the most complete

definition of the number of jobs by county. Woods & Poole data may be higher than that from other sources because they measure more kinds of employment.

There are three other commonly used government sources for employment data: the Bureau of Labor Statistics (BLS), the Bureau of the Census, and the National Income and Product Accounts (NIPA). These sources of employment data differ from the data used by Woods & Poole. The BLS establishment data are generally much lower than the Woods & Poole data because agricultural workers, the military, proprietors, households, and miscellaneous employment are not included; the exclusion of proprietors from the BLS data is the most significant difference. Data from the Census (and some survey data from the BLS) are based on employment by place of residence and differ fundamentally in concept from the Woods & Poole employment data by place of work; Census employment data are generally lower than Woods & Poole data, but not always. Since Census data are based on a household survey, persons holding two jobs would be counted only once, and, therefore, the data would be lower than Woods & Poole. However, Census survey data for counties that have a large number of commuters and relatively few jobs within the county could yield employment data higher than Woods & Poole. Employment data in the National Income and Product Accounts are close to Woods & Poole data, except that part-time proprietors and certain miscellaneous employees are excluded; therefore, these data are usually lower.

Employment by Sector

The employment data is by two-digit North American Industry Classification System (NAICS) industry. The two-digit industries are defined in the 1997 North American Industry Classification System Manual. The employment data in the Woods & Poole 2008 database is no longer based on the Standard Industrial Classification (SIC) system definitions. For the years 1969-2000 BEA provided employment industry data by SIC rather than by NAICS; Woods & Poole has estimated the NAICS industry data for 1969-2000 from the BEA SIC 1969-2000 employment industry data and the NAICS employment industry data for the years 2001-2006.

As a rule, employment is classified in a given industry depending on the primary activity of the establishment. For example, employees of a large oil company are classified in many different sectors depending on the specific establishment in which they worked, even though the company as a whole would be considered a mining company: employees at a refinery are in manufacturing; employees at the company headquarters are in management; pipeline operators are in transportation; and oil

field workers are in mining. If a given establishment is engaged in activities in different sectors, all employees are classified according to the primary activity of the establishment regardless of their actual occupations; thus, a secretary for a trucking company is a transportation worker and an accountant at a small plumbing company is a construction worker. The main exception to this rule is the classification of government workers in the Woods & Poole database: all government employees are classified in Federal civilian, Federal military, or state and local government employment, regardless of the usual classification of the establishment in which they work. Definitions for each sector, based on NAICS industries, in the Woods & Poole database are as follows:

Farming includes establishments such as farms, orchards, greenhouses, and nurseries primarily engaged in the production of crops, plants, vines, trees (excluding forestry operations), and specialties such as Christmas trees, sod, bulbs, and flower seed. It also includes establishments such as ranches, dairies, feedlots, egg production facilities, and poultry hatcheries primarily engaged in the keeping, grazing, or feeding of cattle, hogs, sheep, goats, poultry of all kinds, and special animals such as horses, bees, pets, fish farming, and animals raised for fur.

Forestry, fishing, related activities, and other includes establishments primarily engaged in harvesting timber, and harvesting fish and other animals from their natural habitats. The sector also includes agricultural support establishments that perform one or more activities associated with farm operation, such as soil preparation, planting, harvesting, and management, on a contract or fee basis. Excluded are establishments primarily engaged in agricultural research and establishments primarily engaged in administering programs for regulating and conserving land, mineral, wildlife, and forest use. Other consists of jobs held by U.S. residents who are employed by international organizations and by foreign embassies and consulates in the United States.

Mining includes establishments that extract naturally occurring mineral solids (e.g. coal and ores), liquid minerals (e.g. crude petroleum), and gases (e.g. natural gas.) Mining includes quarrying, well operations, beneficiating (e.g., crushing, screening, washing, and flotation), and other preparation customarily performed at the mine site, or as a part of mining activity.

Utilities includes establishments engaged in the provision of electric power, natural gas, steam supply, water supply, and sewage removal. Utilities include electric power generation, electric power

transmission, electric power distribution, natural gas distribution, steam supply provision, steam supply distribution, water treatment, water distribution, sewage collection, sewage treatment, and disposal of waste through sewer systems and sewage treatment facilities. Excluded from this sector are establishments primarily engaged in waste management services that collect, treat, and dispose of waste materials but do not use sewer systems or sewage treatment facilities. Also excluded from this sector are federal or state or local government operated establishments.

Construction includes establishments primarily engaged in building new structures and roads, alterations, additions, reconstruction, installations, and repairs. It includes general contractors engaged in building residential and nonresidential structures; contractors engaged in heavy construction, such as bridges, roads, tunnels, and pipelines; and special trade contracting, such as plumbing, electrical work, masonry, and carpentry. Construction includes establishments primarily engaged in the preparation of sites for new construction, including demolition, and establishments primarily engaged in subdividing land for sale as building sites. Construction work done may include new work, additions, alterations, or maintenance and repairs.

Manufacturing includes establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The assembling of component parts of manufactured products is considered manufacturing, except in cases where the component parts are associated with structures. Manufacturing establishments can be plants, factories, or mills as well as bakeries, candy stores, and custom tailors. Manufacturing establishments may either process materials or may contract with other establishments to process their materials for them. Broadly defined, manufacturing industries include the following: food processing, such as canning, baking, meat processing, and beverages; tobacco products; textile mill products, such as fabric, carpets and rugs; apparel; wood products, including logging, sawmills, prefabricated homes, and mobile homes; furniture; paper; printing; chemicals, such as plastics, paints, and drugs; petroleum refining; rubber and plastics; leather products; stone, clay, and glass; primary metals, such as steel, copper, aluminum, and including finished products such as wire, beams, and pipe; fabricated metals, such as cans, sheet metal, cutlery, and ordnance; industrial machinery, including computers, office equipment, and engines; electronics and electrical equipment; transportation equipment, such as cars, trucks, ships, and airplanes; instruments; and miscellaneous industries, such as jewelry, musical instruments, and toys. Excluded from manufacturing is

publishing of printed materials.

Wholesale trade includes establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing. Wholesale establishments are primarily engaged in selling merchandise to retailers; or to industrial, commercial, institutional, farm, construction contractors; or to professional business users; or to other wholesalers or brokers. The merchandise sold by wholesalers includes all goods used by institutions, such as schools and hospitals, as well as virtually all goods sold at the retail level. Wholesalers can be merchant wholesalers who purchase goods from manufacturers or other wholesalers and sell them; sales branches of manufacturing, mining, or farm companies engaged in marketing the products of the company to retail establishments; or agents, merchandise or commodity brokers, and commission merchants.

Retail trade includes establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. Retail trade includes store retailers such as motor vehicle and parts dealers including automobile, motorcycle and boat dealers as well as tire and automobile parts stores; furniture and home furnishing stores; electronics and appliance stores; food and beverage stores, including supermarkets, convenience stores, butchers, and bakeries; health and personal care stores such as pharmacies and optical goods stores; gasoline stations; clothing and clothing accessory stores; sporting goods, hobby, book and music stores; department stores; and miscellaneous establishments, including office supply stores, mobile home dealers, thrift shops, florists, tobacco stores, and pet shops. Retail trade also includes nonstore retailers such as Internet and catalog sellers, as well as home delivery establishments such as heating oil dealers. Retail trade excludes eating and drinking places, including restaurants, bars, and take-out stands.

Transportation and warehousing includes industries providing transportation of passengers and cargo and warehousing and storage for goods. Establishments in these industries use transportation equipment or transportation related facilities as a productive asset. Transportation includes railroads, highway passenger transportation, trucking, shipping, air transportation, pipelines, and transportation services. Transportation also includes private postal services, and courier services but excludes the U.S. Postal Service. Warehousing includes refrigerated storage and grain elevators.

Information includes establishments engaged in producing and distributing information and cultural products; providing the means to transmit or distribute these products as well as data or communications; and processing data. The main components of this sector are the publishing industries, including software publishing, and both traditional publishing and publishing exclusively on the Internet; the motion picture and sound recording industries; movie theaters; the broadcasting industries, including traditional broadcasting and those broadcasting exclusively over the Internet; the telecommunications industries; the industries known as Internet service providers and Web search portals; data processing industries; and the information services industries.

Finance and insurance includes establishments primarily either engaged in or facilitating financial transactions (e.g. transactions involving the creation, liquidation, or change in ownership of financial assets.) Establishments include depository institutions, such as commercial banks, credit unions savings and loans, and foreign banks; credit institutions; credit card processing; investment companies; brokers and dealers in securities and commodity contracts; security and commodity exchanges; carriers of all types of insurance; insurance agents and insurance brokers. Also included are central banks and monetary authorities charged with monetary control.

Real estate and rental and leasing includes establishments primarily engaged in renting, leasing, or otherwise allowing the use of tangible or intangible assets, and establishments providing related services. Real estate includes real estate leasing establishments, real estate agencies and brokerages, property management establishments, appraisals establishments, and escrow agencies. Rental and leasing includes car and truck rental, consumer goods rentals such as video stores and and formal wear rental stores, and commercial equipment renting and leasing construction, transportation, office and farm equipment. Also included are establishments that lease nonfinancial and noncopyrighted intangible assets such are patents and trademarks.

Professional and technical services includes establishments that specialize in performing professional, scientific, and technical activities for others. These activities include legal advice and representation; accounting, bookkeeping, and payroll services; architectural, engineering, and specialized design services; computer services; consulting services; research services; advertising services; photographic services; translation and interpretation services; veterinary services; and other professional, scientific, and technical services. Excluded are establishments primarily engaged

in providing office administrative services, such as financial planning, billing and recordkeeping, personnel, and physical distribution and logistics.

Management of companies and enterprises includes bank holding establishments, other holding establishments, corporate management establishments as well as regional and subsidiary management establishments. Company or enterprise headquarters are included.

Administrative and waste management includes establishments engaged in office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services. Among many other establishments administrative includes call centers, tele-marketers, janitorial services, armored cars, temporary employment agencies, locksmiths, landscaping, and travel agencies. Waste management includes, among other establishments, solid waste collections and disposal, landfill operations and septic tank maintenance. Excluded from administrative and waste management are establishments involved in administering, overseeing, and managing other establishments of the company or enterprise. Also excluded are government establishments engaged in administering, overseeing, and managing governmental programs.

Educational services includes private elementary schools, junior colleges, colleges, universities, and professional schools. Also included are trade and vocational schools, business and secretarial schools, computer training services, language schools, fine arts training, sports training establishments, driving schools, flight schools and establishments that provide test preparation and tutoring. Educational services may be provided imparted in educational institutions, the workplace, or the home through correspondence, television, or other means. Public schools, including colleges and universities, are excluded from educational services.

Health care and social assistance includes establishments providing health care and social assistance for individuals. Health care establishments include ambulatory care services (e.g. physician offices, dentists, specialists, HMOs, dialysis centers, blood banks, ambulance services), hospitals, and nursing and residential care facilities. Social assistance establishments include individual and family services (e.g. adoption agencies and youth centers) and community services such as food banks and homeless shelters. Excluded from this sector are aerobic classes and nonmedical diet and weight reducing centers. Also excluded are public hospitals and clinics.

Arts, entertainment, and recreation includes establishments that are involved in producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; establishments that preserve and exhibit objects and sites of historical, cultural, or educational interest; and establishments that operate facilities or provide services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure time interests. The sector includes establishments engaged in the performing arts, sporting events, museums, zoos, amusement and theme parks, golf courses, marinas, casinos, and gambling establishments. Excluded are movie theaters.

Accommodation and food services includes hotels, motels, casino hotels, bed and breakfasts, campgrounds and recreational vehicle parks and other lodging places as well as eating and drinking places, including restaurants, bars, and take-out stands. Also included are caterers and food service contractors.

Other services, except public administration includes churches and establishments engaged in equipment and machinery repairing, promoting or administering religious activities, grantmaking, advocacy, and establishments providing drycleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services. Private households that engage in employing workers on or about the premises in activities primarily concerned with the operation of the household are included in this sector.

Federal civilian includes all Federal government workers regardless of their establishment classification. Federal civilian employment includes executive offices and legislative bodies; courts; public order and safety; correctional institutions; taxation; administration and delivery of human resource programs, such as health, education, and public assistance services; housing and urban development programs; environmental programs; regulators, including air traffic controllers and public service commissions; the U.S. Postal Service; and other Federal government agencies.

Federal military includes Air Force, Army, Coast Guard, Marine Corps, Merchant Marine, National Guard, and Navy. Personnel deployed abroad are counted in their home base or port. Reserves who receive regular training are included. Civilians working on a military base are classified in the sector appropriate to their occupation.

State and local government is defined the same as Federal civilian except that the activities are run by state and local governments. At

the local level, this includes all public schools as well as police and fire departments; at the state level, it includes all public junior colleges, colleges, and universities.

Earnings

Earnings of employees is the sum of wages and salaries, other labor income, and proprietors' income. Earnings also includes personal contributions for social insurance, but does not include residence adjustment; each of these components is defined in the discussion of total personal income that follows. As with employment, the historical earnings data (1969-2006) are from the U.S. Department of Commerce, Bureau of Economic Analysis. Also, like employment, earnings data are by place of work, so that earnings of an employee who works in one county but resides in another are counted in the county where the job is.

The two-digit NAICS sectors for earnings are defined the same as for employment in the preceding section. The two-digit industries are defined in the 1997 North American Industry Classification System Manual. As with employment, earnings data in the Woods & Poole 2008 database is no longer based on the Standard Industrial Classification (SIC) system definitions. For the years 1969-2000 BEA provided earnings industry data by SIC rather than by NAICS; Woods & Poole has estimated the NAICS industry data for 1969-2000 from the BEA SIC 1969-2000 earnings industry data and the NAICS earnings industry data for the years 2001-2006.

Earnings relates to workers' compensation and is not a measure of company earnings or profits. Earnings-by-sector data are sometimes used as a surrogate variable for output by sector at the regional level where output data are not generally available.

Personal Income

The historical data (1969-2006) for total personal income are from the U.S. Department of Commerce, Bureau of Economic Analysis. Total personal income is the income received by persons from all sources, that is, from participation in production, from both government and business transfer payments, and from government interest, which is treated like a transfer payment. Persons consist of individuals, nonprofit institutions serving individuals, private uninsured welfare funds, and private trust funds. Personal income is the sum of wages and salaries, other labor income, proprietors' income, rental income of persons, dividend income, personal interest income, and transfer payments less personal contributions for social insurance. Definitions

for the sources of personal income follow:

Wages and salaries consists of monetary remuneration of employees, including compensation of corporate officers; commissions, tips, and bonuses; and receipts-in-kind that represent income to the recipients.

Other labor income consists of employer payments to private and government employee retirement plans, private group health and life insurance plans, privately administered workers' compensation plans, and supplemental unemployment benefit plans.

Proprietors' income includes inventory valuation and capital consumption adjustments and is defined as the income, including income-in-kind, of proprietorships and partnerships, and of tax-exempt cooperatives. Inventory valuation adjustment is the difference between the cost of inventory withdrawals as valued in determining profits before tax, and the cost of withdrawals valued at current replacement costs. Capital consumption adjustment is depreciation and damage to a proprietor's fixed capital less the value of the current services of the fixed capital assets owned by and used by the proprietor.

Dividend income consists of the payments in cash or other assets, excluding the corporation's own stock, made by corporations located in the United States or abroad to persons who are U.S. residents; it excludes that portion of dividends paid by regulated investment companies (mutual funds) related to capital gains distributions. Interest is the interest income (monetary and imputed) of persons from all sources. Rental income is the net income of persons from the rental of real property except for the income of persons primarily engaged in the real estate business; the imputed net rental income of the owner-occupants of nonfarm dwellings; and the royalties received from patents, copyrights, and the right to natural resources.

Transfer payments to persons are payments to persons for which no current services are performed. They consist of payments to individuals by Federal, state, and local governments and by businesses. Government payments to individuals include retirement and disability insurance benefits, medical payments (mainly Medicare and Medicaid), income maintenance benefits, unemployment insurance benefits, veterans benefits, and Federal grants and loans to students. Business payments to persons consists primarily of liability payments for personal injury.

Personal social insurance contributions are subtracted in the calculation of personal income and consist of the contributions, or payments, by employees, by the self-employed, and by other individuals

who participate in the following government programs: Old-age, survivors, and disability insurance (social security); hospital insurance; supplementary medical insurance; unemployment insurance; railroad retirement; veterans life insurance; and temporary disability insurance. These contributions are excluded from personal income by definition, but the components of personal income upon which these contributions are based-mainly wage and salary disbursements and proprietors' income-are presented gross of these contributions.

Residence adjustment is the net amount of personal income of persons residing in a specific geographic area but receiving the income outside that geographic area. For example, a person who earns income in one county but lives in a different county would have that income counted under residence adjustment; the county in which the person lives would have a positive residence adjustment and the county in which the person works would have a negative adjustment. Residence adjustment adjusts the earned component of personal income, which is establishment-based by place of work, to population, which is by place of residence. When total personal income is adjusted this way, personal income per capita can be calculated. Residence adjustment is a net number for a given county; if it is negative, it means that there is net commuting into the county; if it is positive, it means that there is net commuting out of the county.

As with employment, the definition of total personal income used by Woods & Poole is the most comprehensive one available. Another commonly used measure of income is money income of persons. Money income is the concept used by the Bureau of the Census and is widely used in other sources. When Woods & Poole's income data are higher than data from another source, once inflation adjustments are taken into account, it is probably because the other source uses money income base data. Total personal income includes all of money income plus the exclusions to money income. Money income excludes payments-in-kind such as food stamps, agricultural payments-in-kind, and the value of in-kind medical payments; the imputed rental value of owner-occupied housing; the imputed value of certain interest payments such as the value to consumers of free non-interest bearing checking accounts; all other labor income; capital consumption adjustments for proprietors; inventory valuation adjustments, although sometimes this is negative; and lump-sum payments such as liability judgments and consumer defaults on debts to businesses. For the U.S. as a whole, money income is about 25% less than total personal income; at the regional level, the difference varies depending on the specific composition of total personal income.

Another commonly used measure of income is disposable income, which is

defined as total personal income less personal tax and non-tax payments. Disposable income is the income available to persons for spending or saving. Tax payments are payments, net of refunds, made by persons to the government; it includes taxes such as income, estate and gift, and personal property taxes, but it excludes personal contributions to social insurance. Non-tax payments include tuition and fees paid to schools and hospitals operated mainly by the government, donations to such institutions, passport fees, and fines and penalties.

Retail Sales

Data for retail sales by kind of business are from the 1972, 1977, 1982, 1987, 1992, 1997, 2002 Census of Retail Trade (U.S. Department of Commerce, Bureau of the Census). Retail sales data for 1972, 1977, 1982, 1987, 1992, and 1997 has been changed by Woods & Poole from SIC classifications to estimated NAICS kind of business classifications to be consistent with 2002 Census of Retail Trade data. The intervening historical data for the years 1969-71, 1973-76, 1978-81, 1983-86, 1988-91, 1993-96, and 1998-2001 are also estimated by Woods & Poole. These estimates are made by interpolating retail sales by kind of business per capita for the intervening years (e.g., 1973-76). These proportions are then multiplied by population for the intervening years to estimate retail sales by kind of business. The estimates are then constrained to U.S. retail sales by kind of business for the intervening years. U.S. retail sales data for 1969-2002 are from the Bureau of Economic Analysis but are revised by Woods & Poole to be consistent with the sum of the county retail sales data for the Census years. Therefore, retail sales data for the U.S. are the sum of county retail sales as published in the Census of Retail Trade and differ from the U.S. data published monthly by the Department of Commerce.

Some county data from the Census of Retail Trade are withheld because of Federal information disclosure policies. All withheld data have been estimated by Woods & Poole; the techniques used to make these estimates are described below in the section titled "Estimation of Missing Historical Data."

Retail sales are counted, as are employment and earnings, on an establishment basis. Mail-order sales are counted at the point from which the merchandise is sent and not at the point at which it is received. Retail sales are classified by kind of business according to the principal lines of commodities sold (e.g., groceries or hardware) or the usual trade designation (e.g., drug store or cigar store). In some cases, an establishment sells goods in several different business groups, such as a convenience store with gasoline pumps. In these

cases, all the establishment's sales are classified in the business group that is the primary activity of the establishment; therefore, the retail sales data by kind of business does not reflect retail sales by merchandise line. The specific kinds of business, on an NAICS basis, are described as follows:

Motor vehicle and parts dealers include establishments selling new and used cars and trucks, boats, recreational vehicles, utility trailers, aircraft, snowmobiles, motorcycles, snowmobiles, and mopeds. It also includes dealers selling new automobile parts and accessories, such as tires, as well as automobile repair shops maintained by establishments engaged in the sale of new automobiles. Establishments selling medium and heavy-duty trucks are generally excluded.

Furniture and home furnishings stores include establishments primarily selling new furniture, floor coverings, draperies and window treatments, glassware and china. Bath, linen, matress and lamp stores are included. Used furniture, appliance, and electronics stores are excluded.

Electronics and appliance stores include establishments selling new consumer electronics, televisions, radios, home appliances, computers, cameras and photography supplies.

Building material and garden equipment and supplies dealers include retail establishments primarily engaged in selling lumber and other building materials; paint, glass, and wallpaper; hardware; nursery stock; lawn and garden supplies; and outdoor power equipment. It includes lumber and other building materials dealers, and paint, glass, and wallpaper stores selling to the general public, even if sales to contractors account for a larger proportion of total sales. Dealers selling mobile homes are excluded.

Food and beverage stores include establishments primarily engaged in selling for home preparation and consumption. Food stores include grocery stores, such as supermarkets and convenience stores; meat and fish markets; fruit and vegetable markets; candy, nut, and confectionery stores; dairy product stores; retail bakers; and miscellaneous stores such as beer, wine and liquor stores, health food stores, and coffee and tea stores.

Health and personal care stores include pharmacies and drug stores; cosmetic, beauty supplies and perfume stores; optical goods stores; health supplement stores; and convalescent supply stores.

Gasoline stations include establishments primarily selling gasoline and

automotive lubricants. These establishments frequently sell other merchandise, such as tires, batteries, accessories, and other automobile parts, or perform minor repair work. Establishments called garages but deriving more than half of their receipts from the sale of gasoline and automotive lubricants are included. Gasoline stations combined with other activities such as convenience stores or car washes are classified by their primary activity as determined by sales.

Clothing and clothing accessories include retail stores primarily engaged in selling clothing of all kinds and related articles for personal wear and adornment. These establishments include men's, boys', women's, infants' and girls' clothing stores; shoe stores; and specialty stores, such as swimwear, wigs, lingerie, luggage and handbags. Establishments that meet the diversity criterion for department stores are not included. Excluded are custom tailors and athletic uniform stores

Sporting goods, hobby, book, and music stores include sporting good stores (including bicycle stores, golf pro shops, exercise equipment stores and gun shops); hobby, toy and game stores; sewing and needlework stores; musical instrument and supply stores; book stores, newsstands, and music stores. Excluded are used book stores.

General merchandise stores include department stores, general discount stores, variety stores, warehouse clubs, and miscellaneous general merchandise stores. These stores all sell a number of lines of merchandise, such as dry goods, apparel and accessories, furniture and home furnishings, small wares, hardware, and food in one establishment.

Miscellaneous retail stores include florists; office supply, stationery and gift stores; used merchandise stores such as thrift stores, used book stores, and antique shops; pet shops; art dealers; mobile home dealers; swimming pool stores; and tobacco stores.

Nonstore retailers include Internet sellers; mail order and catalog sellers; television and infomercial sellers; door-to-door sellers; vending machine operators; and direct selling establishments such as heating oil dealers, bottled gas dealers, newspaper delivery, and bottled water providers.

Constant and Current Dollars

All earnings, personal income, and retail sales data in the Woods & Poole database are presented in 2004 dollars. These are called "constant" dollars and are used to measure the "real" change in earnings and income when inflation is taken into account. For example,

it would be incorrect to assume that Americans were more than twice as wealthy in 1980 as in 1970 even though income per capita increased from $4,081 to $10,114; during those ten years the general price level increased more than 97%, and $10,114 in 1980 could not buy as much as $10,114 could in 1970. When adjusted for the rate of inflation by making income per capita "constant" in 2004 dollars, the increase from 1970 to 1980 was only 26% ($16,725 to $21,052).

In the Woods & Poole database, the personal consumption expenditure deflator is used to convert current dollars into constant dollars; the chain-type deflator, revised by the BEA in 2000, is used by Woods & Poole. The personal consumption expenditure deflator for each year from 1969 to 2040 is listed in Table 4. To convert current dollar data to 2004 dollars, divide the current dollars by the deflator for the appropriate year in Table 4 divided by 100. To convert constant 2004 dollar data into current dollars, multiply the constant dollars by the deflator for the appropriate year in Table 4 divided by 100. The same deflator is used for the U.S. and all counties in the Woods & Poole database; hence, the rate of inflation (the percent difference year to year in the deflator) is assumed to be constant for all parts of the country.

Table 4. Personal Consumption Expenditure Deflator
(2004 = 100)

1969	23.30
1970	24.40
1971	25.44
1972	26.32
1973	27.75
1974	30.62
1975	33.17
1976	35.01
1977	37.28
1978	39.90
1979	43.42
1980	48.05
1981	52.33
1982	55.22
1983	57.60
1984	59.78
1985	61.75

1986	63.26
1987	65.45
1988	68.04
1989	71.01
1990	74.27
1991	76.96
1992	79.18
1993	81.01
1994	82.71
1995	84.49
1996	86.30
1997	87.76
1998	88.55
1999	90.02
2000	92.26
2001	94.19
2002	95.53
2003	97.42
2004	100.00
2005	102.95
2006	105.80
2007	108.49
2008	111.69
2009	115.02
2010	118.48
2011	122.10
2012	125.90
2013	129.88
2014	134.05
2015	138.42
2016	143.00
2017	147.80
2018	152.84
2019	158.13
2020	163.68
2021	169.51
2022	175.63
2023	182.06
2024	188.81

2025	195.91
2026	203.30
2027	210.98
2028	218.98
2029	227.30
2030	235.96
2031	244.97
2032	254.36
2033	264.12
2034	274.29
2035	284.88
2036	295.88
2037	307.30
2038	319.16
2039	331.48
2040	344.27

Note: Chain-type deflator; historical data, 1969-2007, from U.S. Dept. of Commerce; projected data, 2008-2040, from Woods & Poole Economics, Inc.

Population

The historical population data for the years 1969 to 2007 is from the U.S. Department of Commerce, Bureau of the Census. The historical population data in the 2008 Woods & Poole database includes 2000 Census results. The historical county total population and population by single year of age by race and sex for the years 1991-1999 and 2001-2007 was estimated by Woods & Poole using 1990 and 2000 Census results and Bureau of the Census intercensal and postcensal estimates. The historical county population by single year of age by race and sex for the years 1971-1979 and 1981-1989 is estimated by using single year of age data from the 1970, 1980, and 1990 Census of Population for counties, and U.S. annual population by single year of age by race and sex.

Population is defined as July 1 residential population and includes: civilian population; military population except personnel stationed overseas; college residents; institutional populations, such as prison inmates and residents of mental institutions, nursing homes, and hospitals; and estimates of undocumented aliens. Excluded are persons residing in Puerto Rico, U.S. territories and possessions, and U.S. citizens living abroad.

For the years 1990 to 2040 the population data is broken down by five race/ethnic groups: White not including Hispanic or Latino (i.e. Non-Hispanic), Black Non-Hispanic, Native American or American Indian Non-Hispanic, Asian American and Pacific Islanders Non-Hispanic, and Hispanic or Latino. Population by race as defined by the Census Bureau reflects self-identification by respondents and does not denote any clear-cut scientific definition of biological stock. White population includes people who identify themselves as White and people who do not identify themselves by any race but identify themselves by nationality, such as Canadian, German, Italian, Arab, Lebanese, Near Eastern, or Polish. Black population includes people who identify themselves as Black and people who do not identify themselves by any race but identify themselves by nationality, such as African American, Afro-American, Black Puerto Rican, Jamaican, Nigerian, West Indian, or Haitian. Native American population includes people who identify themselves as Alaska Native or American Indian by Indian tribe or classify themselves as Canadian Indian, French American Indian, Spanish-American Indian, Eskimos, Aleuts, and Alaska Indians. Asian American and Pacific Islander population are people who identify themselves as having origins in any of the original peoples of the Far East, Southeast Asia,or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, Vietnam, Hawaii, Guam, Samoa, or other Pacific Islands.

Hispanic or Latino population are people whose origins are from Spain, the Spanish-speaking countries of Central or South America, the Dominican Republic, and who identify themselves generally as Spanish, Spanish-American, Hispanic, Hispano, Latino, and so on. Hispanic population is not a race group but rather a description of ethnic origin. Although Hispanics are part of the other four race groups they split out separately in the Woods & Poole database so that the four race groups plus Hispanic equals total population.

Hispanic data are historical for 1970, 1980, and 1990-2006 from the decennial censuses, adjusted to July 1, and from Census Bureau intercensal and postcensal population estimates. For counties with Hispanic population greater than 40,000, actual historical data for 1981-1985 from a special Census Bureau report are included. Census Bureau data are also included for the U.S. for 1969-1990, and for states for 1981-1985 and 1990. Hispanic data for all other years are estimated. The Woods & Poole Hispanic population data for 1980 differ significantly from the final 1980 Census for some states, e.g., Alabama and Mississippi; this is because of post-1980 Census Bureau revisions to the 1980 Census that are incorporated in the Woods & Poole data.

For the years 1970 to 1989 the population in the Woods & Poole database is available in three race groups which sum to total population: White, Black, and Other. All three of these race groups include Hispanic population. The Hispanic data for 1970 to 1989 is provided separately. Although the total Hispanic population and the population by age and gender for the years 1970 to 1989 are consistent with the data 1990 to 2040, the population by race data is not.

The Woods & Poole database includes 2000 Census population data, adjusted to July 1, for total population by single year of age, race and sex. However, the 2000 Census race classifications were adjusted to create a consistent time-series for the years 1990 to 2000. The 2000 Census classification Some Other Race was distributed as follows: of the 15.36 million people classifying themselves as Some Other Race, 14.89 million were Hispanic and were therefore added to Hispanic population; the remaining 468,000 were distributed to the other four race groups proportionally by age and gender. The 2000 Census classifications for Two or More Races were distributed as follows: of the 6.8 million people classifying themselves as Two or More Races, 2.22 million were Hispanic and were added to the Hispanic population; the remaining 4.60 million were distributed to the other four race groups proportionally by age and gender.

The population data in the Woods & Poole database are generally consistent with data from other sources, including the Census Bureau. The most significant difference between the Census Bureau data used by Woods & Poole and the actual 1970, 1980, 1990, and 2000 Census results is that Woods & Poole data are July 1-based and the decennial census data are April 1-based. Decennial census data were adjusted forward from April 1 to July 1 to make them consistent with population data for other years as well as with the employment and income data, which are also July 1-based.

Households

The data for households are from Census Bureau counts in 1970, 1980, 1990, and 2000 and Census Bureau estimates for 1985. As with population, the household data from the decennial censuses were adjusted from April 1 to July 1. The 1985 Census Bureau estimate was already July 1-based. All other years of county household data (i.e., 1969, 1971-1979, 1981-1984, 1986-1989, and 1991-1999) are estimates. Household data for the U.S. and states, 1969-2000, are based on Census Bureau data.

Household data for total number of households, group quarters

population, and average size of households from the 1990 and 2000 Census, adjusted to a July-1 base, are included in the Woods & Poole database.

Households are defined as occupied housing units. A housing unit is a house, an apartment, a group of rooms, or a single room occupied as separate living quarters. The occupants of a housing unit may be a single family, one person living alone, two or more families living together, or any group of related or unrelated persons who share living quarters. All people are part of a household except those who reside in group quarters. Group quarters include living arrangements such as prisons, homes for the aged, rooming houses, college dormitories, and military barracks. The average size of households is defined as total population less group quarters population divided by the number of households. Mean household income is defined as total personal income less estimated income of group quarters population divided by the number of households.

Households by Income Bracket

The number of households by income bracket is historical only for 1990 and 2000 and is based on Census data for household income in the years 1989 and 1999, respectively. The income brackets are in 2000 dollars and since the brackets themselves are not adjusted over the projection horizon all brackets from 2001 to 2040 are also in 2000 dollars. The 2000 Census income brackets are retained for the projection years; as a result, in the Woods & Poole projections, there is a heaping of households into the higher income brackets because of projected real increases in total personal income. The projection of the number of households by income bracket is made simply by changing the median income for the years 2001 to 2040 in relation to projected mean household income, and retaining the income distribution around the 2000 median. The lack of historical time series data for county households by income bracket means that the projections are based on a single observation point; projections based on extrapolations from a single data point are less reliable that projections based on time-series data.

Woods & Poole Wealth Index

The Woods & Poole Wealth Index is a measure of relative total personal income per capita weighted by the source of income. The Wealth Index is the weighted average of regional income per capita divided by U.S. income per capita (80% of the index); plus the regional proportion of income from dividends/interest/rent divided by the U.S. proportion (10% of the index); plus the U.S. proportion of income from transfers

divided by the regional proportion (10% of the index). Thus, relative income per capita is weighted positively for a relatively high proportion of income from dividends, interest, and rent, and negatively for a relatively high proportion of income from transfer payments. Because the imputed rent of owner-occupied homes is added to rental income of persons in calculating total personal income, some of the appreciated value of owner-occupied homes is included in rental income. Since dividends, interest, and rent income are a good indicator of assets, the Woods & Poole Wealth Index attempts to measure relative wealth.

Comparative Data

Some Woods & Poole statistical tables and data files contain summary data on unemployment, number of business establishments, and educational attainment. These data are provided for comparison purposes and are not part of the Woods & Poole forecasting model.

Labor force and unemployment data are from the Bureau of Labor Statistics. Data are provided for the civilian labor force, employment, unemployment, and the unemployment rate for 1998 to 2007. Employment is defined by the Bureau of Labor Statistics and excludes military employment and proprietors. Civilian labor force is defined as people who are either employed or who are unemployed and looking for work; civilian labor force is the sum of the employed and unemployed. The unemployment rate is the number of people unemployed divided by the civilian labor force. The monthly data are not seasonally adjusted. The labor force, employment, and unemployment data are all by place of residence and not by place of work.

Business establishments by size and industry is from the Bureau of the Census. Data are provided for the total number of business establishments and the number with fewer than fifty employees and the number with fifty or more employees by one-digit NAICS industries. The data are for March 2005 and March 2006 and are not an annual average. The number of business establishments excludes proprietors and government. The industry groups are based on 1997 North American Industry Classification System (NAICS) definitions. The data on the number of business establishments includes establishments by industry that are statewide and not part of any particular county. In the Woods & Poole database, statewide establishments are distributed proportionally to counties within the state based on the number of establishments by industry within a particular county; therefore, Woods & Poole county data may differ from other published data.

Educational attainment data for the years 1970, 1980, 1990, and 2000

are from the Bureau of the Census. The percent of the population age 25 or more not completing high school, completing high school, and completing four or more years of college is reported. The educational attainment data are based on self-reporting by decennial Census respondents and are not matched to actual school enrollment or graduation data.

Land area is from the 2000 Census and is in square miles. The data are for all U.S. counties; the land area for geographic units larger than county (including the U.S. as a whole) is calculated by summing county land area.

Estimation of Missing Historical Data

Some historical earnings and employment data by sector was withheld by the Department of Commerce because of Federal information disclosure policies. Data are usually withheld in small sectors in a specific county; the reporting of this data would divulge confidential employment and earnings information about specific companies in that area. In order to make the database consistent, and facilitate the forecasting model, all missing data points were estimated by Woods & Poole. In sum, approximately 4% of all data in the historical database were withheld and had to be estimated.

The algorithms used to estimate the missing data were applied in two stages. First, a "best guess" of the missing data was obtained. For example, in the case of mining employment, missing data for a county were estimated by observing the relationship between that county's mining employment in reported years and statewide mining employment for the same years. This method took into account, when possible, fluctuations in a series because of business cycles during the historical period. When sufficient years in a series were reported to provide statistical reliability (this occurred in approximately 33% of the cases where data were withheld), business cycles were all estimated separately, thus enabling reliable estimates to be made of the missing data points. In other cases, where too many years in a series were withheld, business cycles were not taken into account, but the same method of observing the relationship between county series, in reported years, to the state series in the same years was used (this occurred in approximately 61% of the cases). In approximately 6% of the cases, the data for a county series, such as mining employment, were withheld for every year, and the relational method would not work. In these cases, the relationship between total economic activity in the county to the state, in a non-cyclical manner, was used to derive "best guess" results.

Once the "best guess" results were estimated, an iterative procedure was used to simultaneously constrain the "best guess" to the county control total, (i.e., total employment in the above example) and the state total for the series (i.e., state mining employment in the above example). This iterative procedure, beginning with the "best guess" solution, produced, for all missing data points, a convergence point that is used as historical data. However, since the data are truly withheld by the government, there is no mathematically tractable solution to the problem of missing data. Estimated withheld data are indicated for employment and earnings of employees in the Woods & Poole database printed tables with an "e" following the estimated data; estimated withheld data for retail sales by kind of business and other data series is not indicated in the Woods & Poole database.

Average Annual Rate of Growth

In some statistical tables in Woods & Poole publications, data are presented for the average annual rate of growth for a particular variable over a specified time period. The average annual rate of growth is the compounded growth of a variable over time. Thus, a 3.0% average annual rate of growth between 1970 and 1980 for population would mean that, on average, the population increased 3.0% each year between 1970 and 1980.

An average annual rate of growth can be calculated by dividing the data year t+n by data year t and calculating the nth root of the quotient (where n is the number of years between t and t+n). Subtract one and multiply by 100 to convert the growth into percent. A negative average annual rate of growth would mean a decline in the variable over time.

Rounding of Data

Data for the U.S., states, Metropolitan Statistical Areas (MSAs), Designated Market Areas (DMAs), and other regions are the sum of counties. Due to rounding, the subtotals in Woods & Poole data tables may not exactly equal the components. Special calculations in some data tables (e.g., population growth rates) also may not exactly equal the data because of rounding. Since the U.S. and state data are based on county estimates, they may differ from U.S. and state data available from other sources.

County Definitions

The county definitions and county-equivalent definitions used in the Woods & Poole database are defined by the BEA. In New England, counties were created by summing townships and creating

county-equivalent areas. Parishes in Louisiana, Boroughs in Alaska, and Independent Cities in Maryland, Missouri, and Nevada are called counties in the Woods & Poole database. In some states, notably Virginia, counties exist with independent cities. In cases where boundaries between counties and independent cities (or counties and other counties) have changed since 1969, new county groups are created to maintain the consistency of the historical data. Table 5 lists all the special county groupings in the Woods & Poole database.

Broomfield County Colorado (FIPS 08014) is a new county created after the 2000 Census from portions of Boulder, Adams, Jefferson and Weld counties; it is not included separately in the 2008 Woods & Poole database.

Federal Information Processing Standards (FIPS) codes are defined by the National Institute of Standards and Technology to give numeric "names" to geographic areas such as states and counties. Each state has a two-digit FIPS code (Alabama is 01 and Wyoming is 56) and counties have five-digit codes with the first two digits being the state code: Autauga AL is 01001 and Weston WY is 56045.

Table 5. Woods & Poole Special County Definitions
(FIPS codes in Parentheses)

Northwest Arctic Borough, AK (02188)
- Kobuk, AK (02140)

Remainder of Alaska, AK (02999)
- Aleutian Islands, AK (02010)
- Aleutian Islands East Borough, AK (02013)
- Aleutian Islands West Census Area, AK (02016)
- Bethel Census Area, AK (02050)
- Denali Borough, AK (02068)
- Dillingham Census Area, AK (02070)
- Haines Borough, AK (02100)
- Kenai Peninsula Borough, AK (02122)
- Lake and Peninsula Borough, AK (02164)
- North Slope Borough, AK (02185)
- Prince of Wales-Outer Ketchikan, AK (02201)
- Sitka Borough, AK (02220)
- Skagway-Yukatat-Angoon, AK (02231)
- Skagway-Hoonah-Angoon Census Area, AK (02232)
- Southeast Fairbanks Census Area, AK (02240)
- Valdez-Cordova Census Area, AK (02261)
- Wrangell-Petersburg Census Area, AK (02280)
- Yakutat Borough, AK (02282)

Yukon-Koyukuk, AK (02290)

Yuma + La Paz, AZ (04027)
La Paz, AZ (04012)
Yuma, AZ (04027)

Miami-Dade, FL (12086)
Dade, FL (12025)

Maui + Kalawao, HI (15901)
Kalawao, HI (15005)
Maui, HI (15009)

Fremont, ID (16043)
Fremont, ID (16043)
Yellowstone Park, ID

Park, MT (30067)
Park, MT (30067)
Yellowstone Park, MT (30113)

Valencia + Cibola, NM (35061)
Cibola, NM (35006)
Valencia, NM (35061)

Halifax, VA (51083)
Halifax, VA (51083)
South Boston City, VA (51780)

Albemarle + Charlottesville, VA (51901)
Albemarle, VA (51003)
Charlottesville City, VA (51540)

Alleghany + Clifton Forge + Covington, VA (51903)
Alleghany, VA (51005)
Clifton Forge City, VA (51560)
Covington City, VA (51580)

Augusta + Staunton + Waynesboro, VA (51907)
Augusta, VA (51015)
Staunton City, VA (51790)
Waynesboro City, VA (51820)

Bedford + Bedford City, VA (51909)
Bedford, VA (51019)
Bedford City, VA (51515)

Campbell + Lynchburg, VA (51911)
Campbell, VA (51031)
Lynchburg City, VA (51680)

Carroll + Galax, VA (51913)
Carroll, VA (51035)
Galax City, VA (51640)

Dinwiddie + Colonial Heights + Petersburg, VA (51918)
Dinwiddie, VA (51053)
Colonial Heights City, VA (51570)
Petersburg City, VA (51730)

Fairfax + Fairfax City + Falls Church City, VA (51919)
Fairfax, VA (51059)
Fairfax City, VA (51600)
Falls Church City, VA (51610)

Frederick + Winchester, VA (51921)
Frederick, VA (51069)
Winchester City, VA (51840)

Greensville + Emporia, VA (51923)
Greensville, VA (51081)
Emporia City, VA (51595)

Henry + Martinsville, VA (51929)
Henry, VA (51089)
Martinsville City, VA (51690)

James City + Williamsburg, VA (51931)
James City County, VA (51095)
Williamsburg City, VA (51830)

Montgomery + Radford, VA (51933)
Montgomery, VA (51121)
Radford City, VA (51750)

Pittsylvania + Danville, VA (51939)
Pittsylvania, VA (51143)
Danville City, VA (51590)

Prince George + Hopewell, VA (51941)
Prince George, VA (51149)
Hopewell City, VA (51670)

Prince William + Manassas + Manassas Park, VA (51942)
Prince William, VA (51153)
Manassas City, VA (51683)
Manassas Park City, VA (51685)

Roanoke + Salem, VA (51944)
Roanoke, VA (51161)
Salem City, VA (51775)

Rockbridge + Buena Vista + Lexington, VA (51945)
Rockbridge, VA (51163)
Buena Vista City, VA (51530)
Lexington City, VA (51678)

Rockingham + Harrisonburg, VA (51947)
Rockingham, VA (51165)
Harrisonburg City, VA (51660)

Southampton + Franklin, VA (51949)
Southampton, VA (51175)
Franklin City, VA (51620)

Spotsylvania + Fredericksburg, VA (51951)
Spotsylvania, VA (51177)
Fredericksburg City, VA (51630)

Washington + Bristol, VA (51953)
Washington, VA (51191)
Bristol City, VA (51520)

Wise + Norton, VA (51955)
Wise, VA (51195)
Norton City, VA (51720)

York + Poquoson, VA (51958)
York, VA (51199)
Poquoson City, VA (51735)

Shawano (includes Menominee), WI (55901)
Menominee, WI (55078)
Shawano, WI (55115)

Metropolitan Area Definitions

Metropolitan Statistical Areas (MSAs), Combined Metropolitan

Statistical Areas (CSAs), Micropolitan Statistical Areas (MICROs), and Metropolitan Divisions (MDIVs) in the Woods & Poole database are as defined in the December 2005, Office of Management and Budget (OMB) "Revised Definitions of Metropolitan Statistical Areas, New Definitions of Micropolitan Statistical Areas and Combined Statistical Areas, and Guidance on Uses of the Statistical Definitions of These Areas" (OMB BULLETIN NO. 06-01).

All Woods & Poole historical data back to 1969 is revised to reflect the new 2005 OMB Metropolitan Area (MSA, CSA, MICRO, and MDIV) definitions. There are 361 MSAs, 120 CSAs, 577 MICROs, and 29 MDIVs in the 2008 Woods & Poole database. A list of all CSAs, MSAs, MICROs, and MDIVs and their component counties can be found in Appendices 2, 3, 4 and 5, respectively. These Appendices follow this chapter and begin on page 40. Although CSAs can be defined in terms of MSAs and MICROs, in the Woods & Poole database, and in Appendix 2, they are defined in terms of counties.

New England City and Town Areas (NECTAs) and Combined New England City and Town Areas (CNECTAs) are not in the Woods & Poole database because they are defined with geographic units smaller than counties. The 19 MSAs, CSAs, and MICROs in Puerto Rico are also not included in the Woods & Poole database.

MSAs, as defined by the OMB, have at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. Micropolitan Statistical Areas - a new set of statistical areas - have at least one urban cluster of at least 10,000 but less than 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. The central cities that form the basis on MSAs and MICROs are generally included in their titles, as well as the name of each state into which the MSA or MICRO extends. MSAs and MICROs are defined in terms of whole counties (or equivalent entities), including in the six New England States. If the specified criteria are met, a MSA containing a single core with a population of 2.5 million or more may be subdivided to form smaller groupings of counties referred to as Metropolitan Divisions. MDIVs are not comparable to either MSAs or MICROs and should not be ranked together.

According to the OMB if specified criteria are met, adjacent MSAs and MICROs, in various combinations, may become the components of a new set of areas called Combined Statistical Areas. For instance, a CSA may comprise two or more MSAs, a MSA and a MICRO, two or more MICROs, or multiple MSAs and MICROs. In the Woods & Poole database CSAs are

defined in terms of counties. According to the OMB combinations for adjacent areas with an employment interchange of 25 or more are automatic. Combinations for adjacent areas with an employment interchange of at least 15 but less than 25 are based on local opinion as expressed through the Congressional delegations.

DMAs and Regions

Television Designated Market Areas (DMAs) are defined in the September 2006 U.S. Television Household Estimates published by Nielsen Media Research, Inc. DMAs are geographic definitions of television markets based on measured viewing patterns. DMAs are aggregates of counties, and generally each county is in only one DMA. A list of all DMAs and their component counties can be found in Appendix 7 following this chapter. In the few cases where a county is split into more than one DMA, an estimated proportion of the population, employment, households, and income in the county have been assigned to each DMA. The specific proportions used for split counties are listed parenthetically in Appendix 7.

The eight regions in the Woods & Poole database are aggregates of states and are defined by the Bureau of Economic Analysis. A list of all BEA regions and their component states can be found in Appendix 1 following this chapter. The BEA regions used by Woods & Poole differ from the nine regions defined by the Census Bureau and used in their publications.

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TECHNICAL MEMORANDUM

To: Tom Nelson, Municipality of Anchorage

From: David Zehnder, Joe DeCredico, and Jesse Walker

Subject: Addendum to Anchorage Industrial Land Assessment; EPS #18615

Date: April 24, 2009

The EPS Team presented the results of the Anchorage Industrial Land Assessment (ILA) Final Report at the April 10, 2009, Work Session of the Anchorage Assembly. During this meeting, several issues and questions were discussed in detail, and the EPS Team has pledged to ensure that all comments are clarified and resolved. One such comment pertains to the amount of non-industrial land that has been constructed in the past on I-1 and I-2 industrial land in the Municipality of Anchorage (MOA).

Accordingly, the EPS Team has created this Addendum to the March 31, 2009, ILA, which includes **Table 1**, which shows the total amount of development on I-1 and I-2 land classified into these seven relevant categories:

- Industrial
- Residential
- Retail
- Office
- Office Warehouse
- Lodging
- Other

Please note that the data presented in **Table 1** come from the MOA's building permit database and may not match exactly with the land use categories seen elsewhere in the report. The building permit database historically has been used by building-related departments in the MOA and is based on observations collected during assessments or other duties performed by MOA staff. As shown in **Table 1**, Industrial uses historically have accounted for only approximately 30 percent of

The Economics of Land Use

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the development on I-1 land. Industrial development has consumed a significantly higher proportion of I-2 land, at approximately 53 percent. Overall, industrial uses occupy approximately 38 percent of I-1 and I-2 land throughout the MOA. The remaining 62 percent is consumed by office, office warehouse, retail, residential, and other uses.

If you have questions about the information presented in this technical memorandum, please call David Zehnder or Jesse Walker at (916) 649-8010.

Table 1
Anchorage Industrial Land Assessment
Summary of Land Uses on I-1 and I-2 Parcels

Land Use	I-1 Acres	I-1 % of Total	I-2 Acres	I-2 % of Total	Combined Acres	Combined % of Total
Industrial	551.1	**30.1%**	472.6	**53.0%**	1,023.7	**37.6%**
Residential	2.7	**0.1%**	0.0	**0.0%**	2.7	**0.1%**
Retail	260.1	**14.2%**	12.4	**1.4%**	272.6	**10.0%**
Office	162.1	**8.9%**	31.3	**3.5%**	193.4	**7.1%**
Office Warehouse [1]	270.2	**14.8%**	155.9	**17.5%**	426.1	**15.7%**
Lodging	16.0	**0.9%**	0.0	**0.0%**	16.0	**0.6%**
Other [2]	567.6	**31.0%**	219.5	**24.6%**	787.1	**28.9%**
Total	**1,829.8**	**100.0%**	**891.7**	**100.0%**	**2,721.6**	**100.0%**

"summary"

Source: MOA Building Permit Database

[1] "Office Warehouse" category can consist of buildings that are either primarily office or primarily warehouse.
[2] "Other" category includes the following uses: auto service, clubhouse, day care center, hangar, mixed use residential/commercial, religious, school, self-service station, social/fraternal hall, telephone equipment building, tennis club, and veterinary clinic.