An Economic Report to the Governor of the State of Tennessee
On the State’s Economic Outlook

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Foreword

This 1997 volume, An Economic Report to the Governor of the State of Tennessee, is the twenty-first in a series of annual reports compiled in response to requests by state government officials for assistance in achieving greater interdepartmental consistency in planning and budgeting efforts sensitive to the overall economic environment. Both short-term, or business cycle-sensitive forecasts, and longer-term, or trend forecasts, are provided in this report.

The quarterly state forecast through the fourth quarter of 1998 and annual forecasts through 2005 represent the collective judgement of the staff of the Center for Business and Economic Research, College of Business Administration, at The University of Tennessee, Knoxville, in conjunction with the Quarterly and Annual Tennessee Econometric Models. The national forecasts were prepared by the WEFA group in Eddystone, Pennsylvania. Both the quarterly U.S. forecast and the annual U.S. forecast are current as of November 1996. Tennessee forecasts, also current as of November 1996, are based on an array of assumptions, particularly at the national level, which are described in Chapter 1. Chapter 2 provides detailed evaluations for major sectors of the Tennessee economy, and Chapter 3 presents the long-run forecast and outlook for the state. This year Chapter 4 concerns the issue of workforce development in Tennessee and possible options for the future.

The primary purpose of this annual volume–published, distributed, and financed through Department of Economic and Community Development, Department of Revenue, and Division of Employment Security–is to provide wide public dissemination of the most current possible economic analysis to planners and decision-makers in the public and private sectors.

Matthew N. Murray, Associate Director
Center for Business and Economic Research
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Executive Summary

The U.S. Outlook

Currently, available information indicates the U.S. economy will finish 1996 with modest inflation-adjusted annual gross domestic product (GDP) growth of 2.3 percent. This expectation comes in spite of the rapid pace of seasonally adjusted growth recorded during 1996:2. The economy is near full employment, but inflation is still under control, and despite recent rumblings concerning an over-valued stock market by Federal Reserve Chairman Alan Greenspan, the Federal Reserve Board is not anticipated to hike interest rates in the near future.

At a more disaggregated level, the consumer sector is expected to finish 1996 with inflation-adjusted growth of 2.4 percent. The currently high consumer debt-to-income ratio does not indicate impending declines in consumption expenditures. In fact, evidence indicates that this ratio lags rather than leads consumer expenditures. And inflation-adjusted private investment is expected to finish 1996 with 4.9 percent annual growth. The government sector is expected to contribute little to growth in 1996, and the international sector is anticipated to detract from growth in 1996.

The stage is set for moderate, stable growth for 1997. None of the broad categories of GDP—consumption, investment, government spending or the international sector—is likely to be the engine of a resurgence of rapid growth. At the same time, the risks of a further slowdown (including recession) remain remote.

Highlights of the U.S. forecast for 1997 include the following projections:

- Inflation-adjusted GDP will grow at a modest annual rate of 2.1 percent.
- The economy will remain near full employment, with a civilian unemployment rate of 5.5 percent.
- Inflation as measured by the CPI will remain under control at 2.8 percent.
- The federal funds interest rate will be 5.0 percent, the bank prime lending rate will equal 8.0 percent, and the effective mortgage rate will equal 7.1 percent.

Tennessee Short-Term Economic Overview

For two years there has been talk of a slowdown in economic growth for the national and state economies. The slowdown has finally arrived and firmly entrenched itself, producing signs of stress for the state economy. Prominent is the loss of over 14,000 jobs in the state's nondurable goods manufacturing sector between 1995:3 and 1996:3 and sharply lower growth in state sales tax collections. Overall job growth statistics provide another telling sign, with growth in
1995:3-1996:3 falling a full percentage point below the growth registered in the prior three years. Finally, state sales tax collections grew only 5.9 percent in 1995/96 and are growing at a similar rate in the current fiscal year, versus over 10 percent in the prior fiscal year.

Despite these trouble spots, the state's economic foundation remains solid, and there is ample evidence of sustained economic strength. Examples include a statewide unemployment rate that inched below 5 percent in 1996:2 and reasonably strong job growth outside of the manufacturing sector. In addition, population growth has been exceptionally strong since the beginning of the decade, reflecting the state's attractiveness as a place to work and conduct business.

Recent growth patterns show net losses in manufacturing employment but job gains in other sectors of the state economy. The pattern of job growth in the past year has shifted increasingly away from the state's metropolitan areas. Similarly, the core counties of the state's larger metropolitan areas have shown weak population growth over the past several years. And while the statewide unemployment rate is below 5 percent, 16 counties have unemployment rates in excess of 10 percent.

The short-term economic outlook calls for stable and moderate economic growth for Tennessee through 1998, similar to projections for the national economy. The risks of further deceleration in growth are slim, as are the chances for sharply stronger growth. Selected highlights of the short-term outlook follow.

- Nonagricultural job growth will be 2.0 percent in 1997 and 2.1 percent in 1998, considerably lower than the 3.4 percent average gain registered between 1993 and 1996.
- Manufacturing will experience job losses of 0.1 percent in 1997 and slight growth of 0.5 percent in 1998. Nondurable goods employment will shrink in each year of the forecast. Jobs in services will be up 3.4 percent and 3.2 percent, respectively, in 1997 and 1998. Trade jobs will expand at a 3.2 percent pace in 1997 and will grow 3.0 percent in 1998.
- The Tennessee unemployment rate will average 5.1 percent in both 1997 and 1998.
- Nominal personal income will grow 5.5 percent in 1977 and 5.6 percent in 1998. Nominal per capita personal income is projected to rise 4.2 percent and 4.1 percent in 1997 and 1998.
- Taxable sales will be up 4.5 percent in 1997 and 4.6 percent in 1998. For fiscal year 1997–98, taxable sales are projected to rise 4.6 percent.

**Agricultural Outlook**

The coming year will be the first full year under the 1996 farm bill, which radically changed the character of federal income support for agriculture. What had become the traditional structure of commodity programs – target prices, base acreages, and deficiency payments – was eliminated in the new bill. In their place are Production Flexibility Contracts which provide farmers a steadily declining payment over the course of seven-year contracts.

Overall for the entire nation, nearly all eligible farmers have enrolled in the new contracts, and Tennessee has been no exception. Nearly 99 percent of eligible Tennessee farmers will be operating under Production Flexibility Contracts during the next seven years, and 99.7 percent of eligible cotton...
farmers have enrolled, according to the U.S. Department of Agriculture.

Whether the contracts actually will mark the end of federal involvement in agriculture, as proponents claimed during the legislative process in 1995-96, remains uncertain. What is known, however, is that Tennessee agriculture will benefit from the bill, especially in the next few years when federal payments are substantially higher than what farmers would have received under the old policy regime.

Over the past decade and a half, the federal government has phased out the use of buffer stock programs designed to stabilize commodity prices and ensure adequate supplies in short-crop years. Before the 1996 farm bill was signed into law, the only mechanism in use specifically designed to control crop supply was the Acreage Reduction Program. The 1996 legislation eliminated that option.

Now, the only option available in times of tight supplies is the release of Conservation Reserve Program lands—and many of those lands are marginal and would not return to production in most cases. So without government stocks to stabilize prices, farmers can expect more volatility in years with low carryover stocks.

Another important factor is what happens internationally. For example, a large share of the summer’s price movement in wheat stems from China’s cancellation of wheat purchases. China can indeed become a major importer of U.S. agricultural goods in the coming years, but it can be the source of dashed export hopes just as easily.

These conditions are not going to go away any time soon. Further, it is doubtful—unless low-supply situations drive consumer food prices substantially higher—that the federal government will return to a more intrusive role in U.S. agriculture. Integration of the pork and poultry industries is expected to continue, and export demand can be expected to remain difficult to second-guess.

In such a policy environment, agriculture had better get used to supply and price volatility, and not just for feed grains.

The shifting of 30,000 acres of cotton production to corn will cost the overall Tennessee economy an estimated $8.5 million in total income and output from other industries for 1997. Also, 112 jobs will be lost with the shift.

Shifting 20,000 acres of West Tennessee cotton production to wheat production will cost the state an estimated $20.6 million in total income and output from other industries in 1997. In this case, 119 jobs will be lost due to the shift in production.

Overall, $29.1 million in total income and output, plus an estimated 231 jobs, will be lost to the overall economy as a result of the hypothetical production shifts.

Although these impacts are nearly insignificant when compared with the overall economy, they may pose significant economic impacts for the regions and industries in which they are centralized. Further, a 50,000-acre shift represents 7.9 percent shift in forecasted 1997 cotton acreage. Greater shifts would increase these impacts. At any rate, it should be realized that as farmers change their production mixes to increase their profit, it is not solely farm profits which are affected. Under volatile market conditions, the effect of agriculture’s shifting between crops can create economic ripples which may be felt through the entire economy.

**Long-Term Outlook**

Tennessee’s long-term historical economic growth can be attributed to a small number of factors. Most prominent are invest-
ments by both the public and private sectors, labor force growth, and productivity growth. Tennessee’s future growth will hinge on further growth in these same factors.

Continued investments by the public sector on infrastructure and human capital, and new investments by the private sector on productive facilities and equipment are critical to the economic well-being of individuals, firms and the state economy as a whole. One of Tennessee’s most important historical advantages—an abundant labor force—has withered in the face of rapid economic growth. The state now faces an employment constraint in various regions and occupational classifications. Growth in the future will increasingly rely on the quality of the states’ workforce. In many respects the Tennessee is in a foot race with our competitors around the globe, many of whom are pursuing aggressive policies to chance growth. This is especially the case with education and investment are increasingly seen as the engines of long-term economic prosperity. As these competitive pressures increase further, Tennessee will confront many challenges in staying on the forefront.

Selected highlights of the long-term forecast include:

- Growth in inflation-adjusted GSP will be 3.2 percent (compound annual growth rate, CAGR) between 1996 and 2005.
- Between 1996 and 2005, Tennessee will create 706,000 new jobs, as nonagricultural employment grows at 2.7 percent (CAGR) over the forecast horizon. U.S. employment growth is projected to advance at the slower pace of 1.3 percent (CAGR).
- Tennessee taxable sales are expected to rebound over the longer term, with nominal growth rates rising above 6 percent in 2002.
- Tennessee personal income will sustain its exceptional growth, rising 3.6 percent (CAGR) versus 2.2 percent (CAGR) for the U.S.

Workforce Development

Workforce development is the key to Tennessee’s future economic successes. In the past Tennessee has done a good job of creating an attractive environment for business in terms of its government performance, quality of life, abundant resources, and entrepreneurial spirit, but its economic development efforts have been curtailed by a labor force that is ill-prepared for the competitive challenges of tomorrow’s rapidly changing economy.

In the next few years, Tennessee will be given a tremendous opportunity to develop its workforce into a well-educated, well-trained, productive engine for economic growth and international competitiveness. Past experience with workforce development suggests that if Tennessee is to make the most of this opportunity, it must move away from large-scale government job training programs and fragmented service delivery and instead concentrate its energy and resources on proven agendas: education, general training, and improved information access.

In terms of educational attainment, Tennessee compares favorably to its international trading partners, but lags its neighbors in the Southeast and the nation as a whole. The state must soon meet the educational attainment standards of the rest of the nation if it is to remain competitive. This is especially true for higher education—roughly 28 percent of all new jobs in Tennessee over the next ten years will require formal education beyond high school.
Furthermore, those with higher education typically earn higher incomes and experience more stable employment patterns. The State of Tennessee has the potential to see significant financial returns from encouraging its residents to pursue higher education, including a larger tax base and fewer outlays for income transfers such as unemployment compensation.

Improving the quality of primary and secondary education is the key ingredient in attracting better-paying jobs to Tennessee. Business and community leaders in Tennessee have often pointed to inadequate primary and secondary education as the main culprit hampering the state’s workforce development. Tennessee is well underway in reforming primary and secondary education in the state, as evidenced in its Basic Education Program, 21st Century Schools Plan, and other state-level reform initiatives. In today’s internationally competitive economy, schools in Tennessee and the rest of the nation must meet a world standard, and unfortunately, most have failed to achieve this level as yet, especially with regard to mathematics and science instruction.

Perhaps the greatest deficiency in Tennessee’s education and training system is the lack of sufficient training for youth who do not attend college. Tennessee schools generally have done a good job of preparing young people for college, but most have not done as well in preparing non-college-bound youth for the world of work. There are several options available for enhancing the prospects of those who enter the workforce directly from high school, including career academies, occupationally oriented magnet schools, and apprenticeship programs. Other less costly alternatives are public-private partnerships between employers and schools and improved counseling services and curriculum structures for non-college-bound youth. Tech Prep programs, which combine the last two years of high school and two years of community college into an integrated career-oriented program, also provide a promising option for training tomorrow’s youth.

Although most attention currently is directed at the education and training of youth, older adults are likely to see less stability in their employment given in the future, the increased dynamics of the state economy. Thus, training for older adults is likely to receive higher priority in coming years. Since less educated workers tend to have the most difficult time finding high-wage employment and are the most likely individuals to suffer technology related job losses, Tennessee should see significant future benefits from any efforts to promote adult education among the less educated. Especially important is encouraging working-age adults who never finished high school to earn GED or similar credentials.

An important but often overlooked aspect of workforce development is access to quality employment information, especially job-matching. Too often employers have labor needs that can be met by unemployed workers in their community, yet positions remain unfilled because workers are unaware of existing job vacancies. The best thing Tennessee can do to simplify job-matching in the state is to establish a means for collecting comprehensive information from both employers and job-seekers, organize the information in an easily accessible and uniform format, and provide the information in a central, universally accessible location. The Internet and other recent innovations in information technology provide promising formats with which Tennessee can share this employment information. Integrating other employment and related services into a labor
market information center, such as Tennessee’s One-Stop Career Advancement Center System, would provide even greater accountability and fiscal management.

Tennessee has already made great progress toward its goal of developing a world-class workforce that is highly skilled and adaptable to changing economic conditions, but much remains to be done. Tennessee’s government agencies and vibrant business community are committed to reaching this goal, and although the objectives are far-reaching, and with the proper focus and a valiant effort, they are certainly attainable.
The U.S. Economic Outlook

Recent Economic Trends

Despite forecasters’ expectations for a year of modest growth in 1996—even a possible recession—the economy actually began with a bang, not a whimper.

Following modest first-quarter growth, inflation-adjusted gross domestic product (GDP) grew at an exceptionally strong seasonally adjusted annual rate of 4.7 percent during the second quarter. At the same time, the civilian unemployment rate dipped 0.2 percentage points to 5.4 percent, and inflation, measured by the consumer price index (CPI), jumped 0.6 percentage points to a seasonally adjusted annual rate of 3.8 percent. Ironically, as of November 6, 1995, inflation-adjusted gross domestic product had been expected to grow at a rate of 2.2 percent during 1996. The unemployment rate during 1996 was expected to come in at 5.8 percent, and inflation as measured by the urban CPI was expected to finish at 2.5 percent. But when the economy began heating up, concern abounded that the Federal Reserve Board (FED), an inflation hawk if there ever was one, would raise interest rates in fear that the economy was overheating. All this occurred in the wake of late 1995 expectations that the economy was in all likelihood on a moderate, balanced growth path and, at worst, headed for recession in 1996.

But things settled down when the government announced that inflation-adjusted GDP grew at a modest 2.2 percent seasonally adjusted annual rate during the third quarter of 1996. Final sales (i.e., GDP minus business inventory accumulation) grew a mere 0.3 percent in the third quarter, with most inventory accumulation unintended. The inventory buildup of the third quarter can be viewed as a signal that fourth-quarter growth will be lackluster. Most analysts again feel the economy is on a moderate growth path.
The Index of Leading Economic Indicators seems to be in line with predictions for moderate growth in 1997. August 1996 growth of 0.2 percent in this key index was followed by September growth of 0.1 percent. This recent trend of positive, but declining, growth in the Index of Leading Economic Indicators is a historical hallmark for positive, but declining, growth in inflation-adjusted GDP.

Current expectations are for inflation-adjusted GDP growth to finish out 1996 at an annual rate of 2.3 percent, followed by a 2.1 percent rate in 1997, as depicted in Figure 1.1. The August-through-October data for 1996 indicate that job growth is slowing, with total employment gains averaging only 152,000 compared to summer 1996 three-month averages of nearly 250,000 per month. Growth in compensation costs, consisting of wages, salaries, and benefits, is expected to be modest. In this noninflationary environment, FED action to raise interest rates is deemed unlikely.

Currently available information signals moderate consumption growth in 1996 and 1997 at annual rates of 2.4 percent and 2.1 percent, respectively. These expectations come in spite of the fact that the April 1996 consumer debt-to-income ratio equaled 20.9 percent—a new record.

Following boom years in 1992-94, gross private domestic investment cooled off in 1995, finishing the year with modest annual growth of 3.1 percent. Strong growth in the transportation industry, particularly the airlines, indicates at least modest investment growth in 1996 and 1997. Expectations are for gross private domestic investment to finish 1996 and 1997 at annual rates of 4.9 percent and 4.7 percent, respectively.

The government sector has contributed little to GDP growth during 1996, and is expected to contribute even less during 1997. In particular, inflation-adjusted government spending growth is expected to finish 1996 and 1997 at rates of 0.8 percent and 0.5 percent, respectively. Barring unforeseen national or international events, the government sector will not be an engine of growth in the near term. Nevertheless, the extent to which the second Clinton Administration and the new Congress choose to deal with the impending Medicare and Social Security funding crises may well have important long-run consequences for growth.

Contrary to previous expectations, net exports are no longer seen as a near-term avenue for growth. Due to a strengthening of the U.S. dollar relative to the currencies of key U.S. trading partners and lax foreign growth, inflation-adjusted net export growth fell 1 percent at a seasonally adjusted annual rate during the third quarter of 1996.

The overall picture for the U.S. economy appears to be one of moderate growth. The current U.S. expansion, having persisted over 50 months, can be considered mature, and a mature economy, like all things growing older, tends to slow down. Nevertheless, the 1960s expansion lasted 105 months, and the 1980s expansion persisted 90 months, and currently available information does not indicate impending recession in 1997.

The Outlook for 1997

GDP can be broken down into four categories: personal consumption expenditures, gross private domestic investment, government consumption and gross investment, and net exports (i.e., exports of U.S. goods and services minus imports of foreign goods and services). The following
sections consider each of these components in turn, focusing on the outlook for 1997.

Consumption

Personal consumption expenditures, which account for about two-thirds of GDP, are expected to finish 1996 with inflation-adjusted annual growth of 2.4 percent, followed by 2.1 percent annual growth in 1997, as shown in Figure 1.2. Viewed by historical standards, this represents moderately slow growth. Following a lackluster year in 1995, inflation-adjusted durable goods expenditures are expected to finish 1996 up 5.6 percent. Motor vehicle and parts sales are expected to finish 1996 with anemic inflation-adjusted annual growth of 1.3 percent. Particularly hard hit will be new automobile sales, which are expected to decline 7.4 percent from their inflation-adjusted 1995 levels and 4.2 percent from their anticipated 1996 levels.

The tight market has led car manufacturers toward aggressive marketing promotions. For example, the industry has been offering rebates as large as $2,000 on new 1997 models. Due to price cuts of up to $4,000 on Japanese luxury models, U.S. and European luxury car manufacturers have likewise been forced to slash prices. While these aggressive marketing tactics may be successful in boosting the number of cars sold, expect expenditures on new automobiles to decline.

The expected slow growth in durable goods expenditures comes at a time when debt-to-income ratio of the consumer sector is at seemingly high levels. Indeed, the April 1996 level of 20.9 percent provided a new historical record. This has generated fears, particularly among Wall Street analysts, of lower consumer spending in the near term. However, econometric evidence provided by

When Will the Next Recession Occur?

The U.S. economy is in the midst of its third longest post-World War II expansion. Over 55 months old, the expansion is maturing, and many analysts are beginning to ask the dreaded question of when we will see our next recession. The WEFA Group, which provides CBFR with its national outlook, uses several models to predict recessions.

Here we consider WEFA’s Recession Barometer, which combines two indicators of recession — the yield curve and the ratio of leading to lagging economic indicators.

The yield curve measures the distance between long- and short-term interest rates. Expectations of future inflation raise interest rates. Since long-term interest rates tend to adjust more slowly than their short-term counterparts, the distance between the two tends to dissipate when expectations of inflation are revised upwards. This phenomenon, known as a flattening of the yield curve, can signal an impending recession or, at least, a slowdown in economic growth. WEFA measures the yield curve using the difference between interest rates on the 10-year Treasury note and the 3-month Treasury note. In October, the yield curve increased to 1.6, indicating less likelihood of recession.

The ratio of leading to lagging economic indicators tends to decline prior to a drop in the index of leading economic indicators. The reason is that when leading economic indicators are growing slowly, lagging economic indicators tend to be exhibiting moderate growth. Thus, the ratio of leading to lagging economic indicators can decline even when the index of leading economic indicators is rising. The ratio of leading to lagging economic indicator tends to equal about 0.95 when the economy is in recession. During September, this ratio rose to 1.01, indicating decreased likelihood of impending recession. WEFA’s Recession Barometer currently indicates a 10-15 percent chance of
the WEFA Group indicates this is not the case. In particular, WEFA finds that while consumer spending is a leading indicator of the debt-to-income ratio, the debt-to-income ratio is not useful as a predictor of consumer spending.

WEFA’s econometric evidence makes good economic sense. In particular, abstracting from asset holdings, rational consumers base current spending decisions on their expected current and future income streams. If consumers are willing to take on a high level of debt to spend more today, then they must expect that their income streams will be sufficient to eventually pay off these debts. Thus, the currently high levels consumer borrowing are an indicator that consumers expect high disposable income in the future. Since individual consumers are likely in the best position to evaluate their own income prospects, a high debt-to-income ratio need not portend impending declines in consumer spending.

Of course, this interpretation of the high debt-to-income ratio begs the question of what might be driving such rosy income expectations. The bulk of household income comes from labor. Since income expectations are important determinants of consumption behavior, it follows that anticipated employment and inflation-adjusted wage prospects are important factors in consumer spending. The civilian unemployment rate is expected to finish 1996 and 1997 at annual rates of 5.4 percent and 5.5 percent, respectively. The economy is near full employment by historical standards. When the economy is approaching full employment, growth in jobs tends to slow. This is precisely what is anticipated for 1996 and 1997. Following strong annual establishment employment growth of 3.1 percent and 2.7 percent in 1994 and 1995, respectively, these rates are expected to decline to 2.0 percent in 1996 and 1.7 percent in 1997. It should be emphasized that these anticipated declines do not indicate a failing economy. Rather, they indicate the economy is near full employment.

In this sellers’ market, laborers can expect to see a rise in their inflation-adjusted compensation (i.e., wages, salaries, and benefits). Per-hour compensation is expected to finish 1996 and 1997 with annual growth rates of 3.5 percent in each year. At the same time, inflation, as measured by the consumer price index, is expected to finish 1996 and 1997 at annual rates of 2.9 percent and 2.8 percent, respectively. This means that the typical laborer is expected to realize only modest gains in inflation-adjusted compensation in the near term. With average weekly hours worked expected to remain fairly stable through 1996-97, inflation-adjusted disposable income is expected finish 1996 with a respectable growth rate of 2.8
percent, followed by more modest growth of 2.0 percent in 1997.

While rapid compensation growth is often perceived as a signal of impending inflation increases, it is interesting to note that the inflation-adjusted compensation gains are not expected to drive up inflation in the near term. The reason is that the gains in inflation-adjusted compensation are anticipated to come in part from productivity increases, not aggregate labor demand. In particular, private nonfarm productivity is expected to rise from 101.4 in 1995 to 101.8 in 1996 and 102.4 in 1997. But these are small gains in productivity. With inflation at 2 percent and earnings up 3.5 percent, productivity growth of about 1.5 percent is needed before wage costs start pushing up inflation.

In summary, inflation-adjusted personal consumption expenditures as a whole are expected to finish 1996 and 1997 with modest growth of 2.4 percent and 2.1 percent, respectively. While the high debt-to-income ratio does not indicate impending declines in consumer expenditure, it does limit the consumer's role as engine of growth. Consumer price inflation remains well under control, and the consumption sector does not appear to signal recession in 1997.

Investment

Gross private domestic investment consists of fixed investment (including nonresidential plant and equipment and residential structures) and changes in business inventories. Gross private domestic investment is historically the most volatile component of U.S. GDP. While typically constituting less than one-fifth of GDP, it is also considered by many to be the most important GDP category, since downturns in business investment spending often precede downward cyclical movements in GDP.

Further, recent breakthroughs in economic growth theory emphasize the importance of investment in determining the trend component of inflation-adjusted GDP. In particular, current investment can permanently raise the balanced growth path of the U.S. economy.

Following a boom in 1992, 1993, and especially, 1994, growth in inflation-adjusted gross private domestic investment plunged to a mere 3.1 percent in 1995. (See Figure 1.3.) Prospects for 1996 and 1997 look better, with inflation-adjusted gross private domestic investment expected to grow at annual rates of 4.9 percent and 4.7 percent, respectively.

Among the categories of fixed investment, the shining star has been information processing equipment. It appears that American business is indeed building the bridge into the 21st century. Following stellar inflation-adjusted growth of 18.0 percent in 1995, information processing equipment is anticipated to produce an encore performance in 1996 with inflation-adjusted annual growth of 20.4 percent. Nevertheless, producers' durable equipment as a whole is expected to grow only at an inflation-adjusted annual rate of 8.6 percent due to anticipated lackluster performances of industrial and transportation durable equipment. With inflation-adjusted information processing equipment growth expected to decline to 12.5 percent, growth in inflation-adjusted producers' durable equipment is anticipated to decline to 6.9 percent in 1997. This would be its worst performance since 1992.

Following strong growth between 1992 and 1994, inflation-adjusted residential structures performed abysmally in 1995, with annual growth of 2.3 percent. In 1996, residential structures are anticipated grow at a modest inflation-adjusted rate of 5.4 percent. The outlook for 1997 is more anemic, with
inflation-adjusted residential structures expected to grow a mere 1.8 percent annually. Slow growth in residential structures is a bad sign for U.S. construction industry. While housing starts are expected to increase from 1.36 million in 1995 (an unusually bad year) to 1.47 million in 1996, they are expected to decline to 1.43 million in 1997.

The outlook for the housing market is mixed. While the effective mortgage rate climbed from 7.53 percent in the fourth quarter of 1995 to 7.84 percent in the second quarter of 1996, it is expected to finish 1996 down 0.15 basis points at 7.7 percent. A further decline, to 7.14 percent, is anticipated for 1997. These anticipated declines are based on expectations of lackluster home buyer demand, a hallmark of a maturing expansion. The situation could look much worse if the FED decides to raise interest rates—a possibility which WEFA has discounted in its forecast.

**Government**

Federal, state, and local government purchases of goods and services directly account for less than one-fifth of GDP. Governments also influence GDP through tax and interest rates policy. Taxes affect GDP by influencing consumption and investment decisions. The government influences interest rates both through its direct participation in capital markets and indirectly through the Federal Reserve's response to government spending and tax decisions.

At the aggregate level, inflation-adjusted government consumption and gross investment are expected to finish 1996 0.8 percent higher than in 1995 and to finish 1997 0.5 percent higher than in 1996 (see Figure 1.4). Since government expenditures are expected to grow more slowly than GDP, government expenditures as a share of GDP are expected to decline in both 1996 and 1997. These expectations reflect two currently
Will Clinton's Plan Balance the Federal budget by 2002?

During the 1996 Presidential campaign, both Democrats and Republicans claimed to have a plan to balance the federal budget by 2002. The election has come and gone, and to the victor go the responsibilities. WEFA has examined whether Clinton's plan can be reasonably expected to achieve its goal. The key aspects of Clinton's plan involve increasing the growth rate of corporate taxes, reducing the growth rate of personal taxes, and reducing growth in Medicare, Medicaid, and other mandatory federal spending.

WEFA simulated the impact of this plan using their quarterly economic model and the CBO baseline economic outlook. They find that, due to a projected downturn in economic growth during the six-year budget window, 1997-2002, the Clinton plan does not balance the budget. They predict that, under the Clinton plan, the federal budget deficit will be in the neighborhood of $150 billion by 2002. The Clinton plan does, however, lead to reductions in long-term interest rates and inflation, but these reductions come at the price of increased unemployment through 2002. WEFA believes that there are feasible policies that could be implemented to bring the budget in balance by 2002.

popular goals in the U.S. political arena. The first goal is to reduce the deficit. As shown in Figure 1.5, progress is expected over the near term in reducing the deficit. The second is to keep taxes low. Insofar as government revenues are procyclical, consistent resolution of these two objectives requires that government expenditures grow more slowly than GDP. While state and local governments constitute the lion's share of total government expenditures, it is anticipated that downsizing will be concentrated at the federal level. For instance, in 1996, inflation-adjusted federal government consumption and investment is expected to decline 1.3 percent from 1995 levels, while inflation-adjusted state and local expenditures are expected to increase 2.0 percent. This reflects a third currently popular objective in the U.S. political arena, a shifting of responsibilities from federal to state and local governments. This objective is anticipated to manifest itself even more starkly in 1997, when inflation-adjusted federal expenditures are expected to decline 3.0 percent, while inflation-adjusted state and local expenditures are expected to increase 2.5 percent.

![Figure 1.5: Unified Federal Surplus](image-url)
While the current fashionability of decentralization is well documented, it is less clear why such an objective will be good for the U.S. economy. The typical argument relates to efficiency. In particular, it is often claimed that large federal bureaucracies are wasteful. Shifting the burden of providing government services to the state and local levels is then thought to reduce inefficiency by downsizing/eliminating the federal bureaucracies, and placing service delivery closer to taxpayers. Nevertheless, state and local governments themselves have bureaucracies, and it stands to reason that shifting responsibilities to these governments will require growth in these institutions.

The International Sector

The international sector includes exports of U.S. goods and services and imports of foreign goods and services. A rise in exports of U.S. goods and services increases U.S. GDP, while a rise in imports of foreign goods and services decreases U.S. GDP. Due to trade liberalization efforts and reductions in transactions costs of international trade, net exports (i.e., exports of U.S. goods and services minus imports of foreign goods and services) are becoming increasingly important to U.S. economic growth.

Contrary to 1995 expectations, the U.S. dollar has strengthened considerably relative to that of our key trading partners. From the perspective of the American consumer, this has made foreign goods and services more attractive relative to their domestic counterparts. At the same time, foreign economic growth has been slower than expected, diminishing the demand from abroad for products produced in the U.S. The combination of slow foreign growth with a stronger U.S. dollar have led to downward revisions in expectations for inflation-adjusted export growth and upward revisions in expectations for inflation-adjusted import growth. Inflation-adjusted exports are now anticipated to finish 1996 up only 5.6 percent from their 1995 level, and to finish 1997 up only 6.0 percent from their anticipated 1996 level. On the other hand, expectations for inflation-adjusted import growth have remained fairly stable at annual rates of 6.5 percent in 1996 and 6.3 percent in 1997. Consequently, the trade deficit is anticipated to widen in both 1996 and 1997 relative to its 1995 level.

Nevertheless, certain U.S. industries are expected to exhibit strong export performances. Following four straight years of negative export growth, the commercial aircraft industry is anticipated to finish 1996 with inflation-adjusted export growth of 7.8 percent, followed by 4.4 percent growth in 1997. In the wake of seemingly unsustainable export growth in 1995, inflation-adjusted computer equipment exports are anticipated to
grow even faster in 1996 at an annual rate of 43.3 percent.

Due in large part to a recovering Japanese economy, the U.S. trade deficit with Japan showed substantial improvement in August of 1996. On the other hand, our trade deficit with China hit record-breaking levels during the same month. While Mexico's economy showed signs of improvement in 1996, the U.S.–Mexico trade deficit worsened. Taken as whole, net exports are expected to detract from inflation-adjusted GDP growth in 1996 and 1997.

**Forecast Summary and Conclusion**

Following moderate 1995 expectations, the 1996 U.S. economy boomed in the second quarter, with inflation-adjusted gross domestic product growing at a seasonally adjusted annual rate of 4.7 percent. During the same quarter, consumer inflation jumped 0.6 percentage points, to a seasonally adjusted annual rate of 3.8 percent. This led to concerns that the economy was overheating and raised the likelihood of FED intervention in the form of higher interest rates. The most recent evidence indicates the economy is not overheating, and the current view is that moderate growth will take place in 1997.

Based on currently available information, expect the 1997 U.S. economy to be characterized by the following:

- Inflation-adjusted GDP will grow at a modest 2.1 percent annual rate.
- The economy will be near full employment with a civilian unemployment rate of 5.5 percent.
- Inflation as measured by the consumer price index will equal 2.8 percent.
- The Federal Funds rate will equal 5.0 percent, the Bank Prime lending rate will equal 8.0 percent, and the effective mortgage rate will equal 7.1 percent.
- In nominal terms (i.e., without inflation-adjustment), the federal budget deficit will be reduced to 121.7 billion.

**Endnotes**

1. As of November 6, 1995, WEFA predicted 1996 inflation-adjusted GDP growth of 2.5 percent measured in fixed-weight 1987 dollars. However, their expectation for chain-weighted 1992 dollars was 2.2 percent.

2. Late in 1996, Federal Reserve Chairman Alan Greenspan seemed to give the impression that the stock market was overvalued, leaving open the possibility of an interest rate hike. The next day U.S. and international stock markets tumbled. Nonetheless, the FED held interest rates constant at its December meetings.
Tennessee Short-term Economic Overview

Introduction

The last two issues of An Economic Report to the Governor have projected a slowdown in economic growth for the state economy. This slowdown has now firmly entrenched itself, and some specific problem areas have surfaced. Especially prominent is weakness in the state's manufacturing sector and the loss of over 14,000 jobs in the nondurable goods sector between the third quarter of 1995 and the third quarter of 1996. Another weak spot is sharply lower growth in retail sales and state sales tax collections. In fiscal year 1995/96, sales tax collections were up only 5.6 percent compared to 9.7 percent growth in the previous fiscal year. At the same time, other indicators point to an economy that remains fundamentally healthy, but simply on a slower growth path. The state unemployment rate moved under 5 percent following 1996:1; reasonably strong rates of job creation have taken place outside the manufacturing sector, and personal income has continued to register solid gains. All in all, while the Tennessee economy has in fact slowed, there is little risk of further deceleration over the near term.

In the remainder of this chapter, recent state economic conditions are described in greater detail and prospects for 1997 and 1998 are outlined. The last section of the chapter examines the state's agricultural sector.

Recent Economic Conditions

Tennessee Labor Markets

Employment growth has slowed appreciably from the rapid pace set between 1993 and 1995, a pattern consistent with an economy that is in the mature phase of a prolonged growth cycle following recession. Business investment growth has slowed, and the dollar's appreciation (see Chapter 1) has made Tennessee's products less competitive in global markets. Tennessee's exports were up 20.6 percent in 1994, with growth slowing to 15.2 percent in 1995. The dollar's appreciation will likely slow growth further in 1996 and 1997, making it difficult for the state's manufacturing sector to engineer solid job gains.

Figure 2.1 provides an illustration of the slowdown in statewide employment gains by contrasting average annual job growth between 1992:3 and 1995:3 with growth between 1995:3 and 1996:3. Overall employment growth has slipped by a full percentage point, with few sectors avoiding the slowdown. The state's mining and manufacturing sectors have actually contracted in the more recent period shown.
Only the government and construction sectors show stronger growth than in earlier years. (The rise in the government sector is due to increased employment at the local-government level.) Somewhat surprising—and at the same time encouraging—is the surge in construction employment above already exceptionally strong growth rates.

Figure 2.2 provides an alternative perspective of employment growth over the same time horizon, focusing on the state's major metropolitan areas rather than sectors of the economy. Only two of these metropolitan areas, Nashville and Memphis, have been able to sustain positive employment growth between 1995:3 and 1996:3. Yet even for Nashville, the positive rate of job creation is less than one-third the pace set in the earlier periods shown. Knoxville has witnessed the sharpest deterioration in employment growth, with the number of jobs slipping by 1 percent.

A noteworthy aspect of the data portrayed in Figures 2.1 and 2.2 is that statewide job growth between 1995:3 and 1996:3 (2.3 percent) is well in excess of the growth rates recorded by any of the state's major metropolitan areas. The implication is that employment growth is considerably stronger outside the state's metropolitan areas.

The state's unemployment rate has shown improvement since 1995 despite the overall slowdown in economic activity. The unemployment rate averaged 5.2 percent in 1995, rising to 5.3 percent in 1996:1. But the rate of unemployment has slipped since then, falling to 4.8 percent in the second quarter and to 4.6 percent in the third quarter of 1996. The unemployment rate for Tennessee compares favorably to the relatively higher rates recorded for the national economy over the same periods.

Figure 2.3 shows unemployment rates (not seasonally adjusted) for the state's larger metropolitan areas for the month of October, 1996. All of the regions shown have lower unemployment rates than the state average. These relatively low unemployment rates have been sustained despite the anemic rates of job creation noted above. There were 16 counties across the state with unemployment rates
below 4 percent in October, a truly remarkable achievement. At the same time, there were 16 counties with unemployment rates in excess of 10 percent. The latter tend to be small and geographically isolated.

**Income**

The state economy has enjoyed strong growth in personal income in the last several years. In particular, total personal income growth and per capita personal income growth between 1993 and 1995 have surpassed growth for the U.S. economy. But the margin narrowed in 1995 as U.S. economic growth accelerated and Tennessee's strong growth began to slow.

Tennessee led all of the southeastern states in per capita personal income growth between 1985 and 1993 and surpassed U.S. growth by a full percentage point. Figure 2.4 shows a more recent interstate comparison for 1994-1995. Tennessee leads the U.S. by the slimmest of margins and finds itself in the middle of the pack within the southeastern states.

The state's relatively strong personal income growth vis-a-vis the nation as a whole over the longer term has allowed economic well-being in Tennessee to more closely mirror that for the U.S. In 1996 per capita personal income in Tennessee was 91 percent of the national average.

**Taxable Sales**

The state's weakening revenue situation has been well documented. A primary culprit has been lower-than-expected growth in retail sales and sales tax collections, a situation that is depicted in Figure 2.5 for the six most recent fiscal years. Fiscal year 1990/91 reflects slow growth due to a national recession, with sales tax collections rebounding in the subsequent year. Sales tax revenues spiked further in 1992–93, growing at nearly a 14 percent pace. But tax
collections slowed sharply in the most recent fiscal year, up only 5.9 percent.

This trend in sales tax collections is especially disturbing in light of the relative strength of the state economy. Yet the pattern of growth shown in Figure 2.5 is not an uncommon occurrence over the course of the business cycle. To place this issue in perspective, Figure 2.6 illustrates the "elasticity" of taxable sales (adjusted for rate changes) with respect to personal income, beginning with 1971. (Elasticity is the percentage change in taxable sales divided by the percentage change in state personal income.) Elasticities tend to be lowest in years of economic decline and then climb sharply after the economy rebounds, often rising above 1.0. Generally, growth is triggered by the pent-up demand for consumer durables (such as appliances and automobiles), and renewed strength in residential housing and business investment. But as the economy continues to grow after a downturn, the elasticity begins to slip in the magnitude, as sales growth comes back in line with income growth. This pattern rang true in late 1970s and the mid-to-late 1980s, as well as the mid-1990s. Even without a recession, history suggests that future quarters will be characterized by somewhat slower growth in taxable sales and sales tax collections than has been the case in recent years.

Population

Population growth has been exceptionally strong at the midpoint of the decade, with the state's population growing 7.8 percent between 1990 and 1995 versus 5.6 percent for the U.S. The rapid population growth is partially responsible for the good employment growth and strong sales tax pattern recorded in 1992-95. At the same time, many regions of the state have experienced serious growing pains from this expansion, including congestion and tightness in local labor markets.

Growth has been most pronounced in Middle Tennessee, as shown by Figure 2.7, which depicts the ten most rapidly growing counties in the state. Fastest growth has been in Williamson and Rutherford Counties, where population is up 26.0 percent and 24.9
percent, respectively. Figure 2.8 illustrates the ten slowest growing counties for 1990-95. Only one county, Clay, has witnessed a contraction in population, while many other counties have seen stagnant population growth.

A surprise is that the state's largest counties generally have experienced weak population growth, while their surrounding counties have grown appreciably. Growth in Knox County was the strongest of the big-four counties, coming in at 7.6 percent. Shelby County has grown 4.7 percent, while Davidson County's population is up only 3.9 percent and Hamilton County has grown only 2.9 percent.

**Short-Term Forecast**

Selected features of the short-term economic outlook are presented in Table 2.1 for both the state and national economies. (For additional detail on the short-term forecast, see the Appendix tables to this report.) At the end of 1996, calendar year growth in nonagricultural jobs is expected to be 2.5 percent and nominal personal income is expected to have increased 4.6 percent. (CBER expects an upward revision of the historical personal income figures for 1996.) Tennessee will have outperformed the U.S. economy in job growth (2.0 percent) but will trail in personal income growth (5.4 percent). Projected economic growth rates for the state economy in 1997 and 1998 remain reasonably strong, and the pace of income and job creation in Tennessee is expected to surpass growth for the U.S. as a whole. The general outlook calls for slower but stable growth over the next two years.

**Labor Markets**

Job growth for the state economy is projected to be 2.0 percent in 1997 and 2.1 percent in 1998, sharply lower than the 3.4 percent average gain registered between 1993 and 1996. Job growth is expected to be somewhat slower for the national economy as well in the next two years, climbing 1.7 percent in 1997 and up only 1.4 percent in 1998.

Prospects for job growth in 1997 and 1998 across broad sectors of the state economy are shown in Figure 2.9. The construction sector
TABLE 2.1
Selected U.S. and Tennessee Indicators
is expected to lead all sectors, sustaining strong growth in excess of 4 percent in the next two years. The slower growth relative to recent years reflects many factors, including relatively lower economy-wide growth in job, income and business investment. The trade sector, which includes both wholesale and retail trade, will grow 3.2 percent in 1997 and 3.0 percent in 1998. The services sector, the largest employment sector of the state economy (accounting for one of four nonagricultural jobs in 1996) will expand at a 3.4 percent pace in 1997 and will grow 3.2 percent in 1998. Most of the job growth in the trade and services sectors will take place in and around the state's major metropolitan areas, consistent with current job location patterns for these sectors. Job growth in finance, insurance and real estate (FIRE) will be in the 2.0–2.3 percent range, while employment in transportation, communication and public utilities (TCPU) will be 1.0 percent in 1997 and 1998.

The state's manufacturing sector, contributing one out of every five state jobs, will contract further in 1997 (down 0.1 percent) and then rebound slightly (up 0.5 percent) as national manufacturing employment rebounds in 1998. Unfortunately, nondurable goods employment will slip in each year of the short-term forecast, with job losses totaling 3,300 in 1997 and 1,500 in 1998. Job erosion will be especially pronounced in the textile, apparel and leather sectors, which have borne the brunt of recent job losses. An important caveat is that the sharp acceleration in job losses in 1995 and 1996 came as a surprise, and further unanticipated shocks may arise in the future.

Prospects are considerably brighter for the state's durable goods manufacturing sector, which is expected to enjoy job growth of 1.0 percent in 1997 and 1.4 percent in 1998.

Fabricated metals, electrical machinery and transportation equipment will experience especially strong growth.

The Tennessee unemployment rate will hold steady at 5.1 percent in 1997 and 1998. At the same time, there may be some volatility in unemployment statistics on a month-to-month basis, as is often the case. The U.S. unemployment rate is projected to be 5.5 percent in 1997, rising to 5.8 percent in 1998.

**Personal Income**

Growth in nominal Tennessee personal income will be 5.5 percent in 1997 and 5.4 percent in 1998. As shown in Figure 2.10, this is much slower than was the case in 1994 and 1995, but it represents an improvement over 1996. Inflation-adjusted personal income is expected to rise 3.0 percent in 1997 and 2.8 percent in 1998, reflecting nonaccelerating inflation of about 2.6 percent. Nominal per capita personal income will be up 4.2 percent and 4.1 percent in 1997 and 1998, respectively, comparing well to the 3.5 percent and 3.8 percent growth rates projected for the national economy.
Wage and salary income, the single-largest component of personal income, will advance 5.6 percent in 1997 and 5.3 percent in 1998. Roughly comparable growth will be recorded by other labor income. Proprietor's income is expected to increase 5.7 percent and 7.1 percent in the following two years, while rent, interest and dividend income will grow 5.5 percent in 1997 and 4.8 percent in 1998.

**Taxable Sales**

After recording 4.6 percent growth in taxable sales for 1996, little change in sales growth is anticipated in the near term, with nominal taxable sales projected to rise 4.5 percent in 1997 and 4.6 percent in 1998. Inflation-adjusted taxable sales will climb 2.0 percent in 1997 and 1998.

Automobile dealer sales, which account for over 10 percent of sales tax collections, are expected to improve somewhat in 1997 and 1998 from the sluggish pace of 1996. Purchases from manufacturers, miscellaneous nondurable goods and TVCPU sales will be especially strong, but liquor and food stores will continue to show rather weak growth.

**Outlook for Tennessee Agriculture: A Quick Primer**

With its diverse geography, Tennessee naturally has a diverse agricultural sector compared with states in the Cornbelt or Great Plains, which produce relatively few agricultural commodities. The flat West Tennessee region is dominated by cotton and soybeans production. Farming in the middle portion of the state is dominated by tobacco and beef cattle operations, while the mountainous East Tennessee region focuses on tobacco and dairy operations.

Though these commodities are important for Tennessee, Figure 2.11 illustrates that they by no means monopolize crop production. Both corn and nursery operations have ranked fourth and fifth (often switching places) in terms of cash receipts for Tennessee farmers since 1990. Other important crops include wheat, floriculture, hay, and vegetables. Moreover, cattle operations generate more income in the aggregate than any other single commodity in Tennessee.

In all, production agriculture generates more than $2 billion in annual cash receipts for Tennessee farmers. Farm profit in recent years, however, has fluctuated sharply from a $799 million peak in net cash income for 1992’s record production year to $614.7 million in 1995.

Net cash income in 1996 was expected to be substantially higher than the prior year due to the second consecutive year of high prices for many crops in 1996. Tennessee enjoyed generally good weather, while corn prices rose well above $3.00 per bushel, and
soybean prices were higher due to tight national feed grain stocks.

In fact, Tennessee land planted in corn and soybeans in 1996 grew 30,000 acres and 20,000 acres, respectively, over 1995 plantings. Tobacco acreage and production in 1996 were significantly higher than the prior year, which had been characterized by disease and drought. On the other hand, cotton production fell somewhat in 1996, due primarily to declining acreage.

Despite state-level acreage gains in feed grains, the tight national supply forced livestock feed prices higher, and cattle prices dropped concurrent with a spate of herd downsizing. Tennessee producers were caught in a price squeeze, as the state recorded its largest number of beef cows since 1987 and near-record numbers of heifers. Because the majority of Tennessee livestock producers run cow/calf operations, the squeeze from higher feed prices in 1996 came indirectly. High corn prices directly affect the cost to finish cattle (i.e., to bring animals to a marketable weight) and, in turn, push down feeder cattle prices.

Also, milk production in 1996 was expected to be down 16 percent, continuing a downward trend begun in the mid-1980s. Pork producers, on the other hand, weathered the higher feed prices relatively well, as higher demand kept prices up. Tennessee hog numbers in 1996, however, were down slightly from the previous year.

**Tennessee Outlook under the New Farm Bill**

The analytical portion of this outlook for Tennessee agriculture will examine three issues: 1) the projected performance of the state’s crop sector through 2002; 2) issues of risk and volatility which may not be captured in that forecast; and 3) the potential impact of a changing crop mix on the overall Tennessee economy.

The coming year will be the first full year under the 1996 farm bill, which radically changed the character of federal income support for agriculture. What had become the traditional structure of commodity programs – target prices, base acreages, and deficiency payments – was eliminated in the new bill. In their place are Production Flexibility Contracts which provide farmers a steadily declining payment over the course of seven-year contracts.

Overall for the entire nation, nearly all eligible farmers enrolled in the new contracts, and Tennessee was no exception. Nearly 99 percent of eligible Tennessee farmers will be
operating under Production Flexibility Contracts during the next seven years, and 99.7 percent of eligible cotton farmers enrolled, according to the U.S. Department of Agriculture.

Whether the contracts actually will mark the end of federal involvement in agriculture, as proponents claimed during the legislative process in 1995-96, remains uncertain. What is known, however, is that Tennessee agriculture will benefit from the bill especially in the next few years when federal payments are substantially higher than what farmers would have received under the old policy regime.

One of the most important features of the new bill is that federal payments are almost completely divorced from farm production decisions. Farmers enrolled in commodity programs now have the ability to respond to market forces and to change their crop mixes in response to changes in commodity prices. This dramatic change in agriculture is the catalyst for the final portion of this outlook. To evaluate the implications of this change, 1996’s changes in cotton, corn, and soybean acreage will be examined in terms of their impacts on employment, output, value-added, and income.

**Forecast Results**

Total acreage planted for all purposes to the seven major crops (corn, grain sorghum, oats, barley, wheat, soybeans, and cotton) trends quite flat during 1997-2002, growing by only 34,000 acres to reach 3.1 million acres in 2002. Slight acreage gains are evident for cotton, soybeans, and wheat (Figure 2.12). Despite the gains in corn acreage this year, corn trends down until rebounding in 2001; by
2002, however, corn acreage planted for all purposes does not reach its 1997 level.

Acreage expands primarily because prices generally trend up over the final years of the forecast period. Corn and wheat prices dip somewhat during the middle portion of the forecast period but recover to at least 20 cents per bushel above 1997 levels by the year 2002. Cotton prices rise slowly but steadily over the forecast period, ending 4 cents per pound above the 1997 level of 66 cents per pound. Per-acre returns to production (excluding government payments) of the seven major crops end the forecast period above 1997 levels (Figure 2.13) as a result of the higher prices and generally stable production costs. Corn, wheat, and soybeans returns per acre, however, dip in the earlier years of the forecast as agriculture adjusts to the tight stock situation of 1996. Total net returns (including government payments) to the seven crops follow a similar trend, dipping somewhat in 1998-99 before rebounding and reaching $475.5 million in 2002 – an increase of 9.3 percent from 1997 returns.

**Supply and Price Volatility**

The above analysis assumes average weather and production conditions. How agriculture actually performs, however, will depend greatly on real conditions. Given the structure of the 1996 farm bill’s commodity programs, agriculture faces considerably greater risk and volatility than in previous years. This increased volatility is not precisely captured in the analytical results.

How does the new farm bill increase volatility and risk? Over the past decade and a half, the federal government has phased out the use of buffer stock programs designed to stabilize commodity prices and ensure adequate supplies in short-crop years. Before the 1996 farm bill was signed into law, the only mechanism in use specifically designed to control crop supply was the Acreage Reduction Program. The 1996 legislation eliminated that option.

Now, the only option available in times of tight supplies is the release of Conservation Reserve Program lands—and many of those lands are marginal and would not return to production in most cases. So without government stocks to stabilize prices, farmers can expect more volatility in years with low carry-over stocks.

Another important factor is what happens internationally. For example, a large share of the summer’s price movement in wheat stems from China’s cancellation of wheat purchases. China can indeed become a major importer of U.S. agricultural goods in the coming years, but it can be the source of dashed export hopes just as easily.

These conditions are not going to go away any time soon. Further, it is doubtful—unless low-supply situations drive consumer food prices substantially higher—that the federal government will return to a more intrusive role in U.S. agriculture. Integration of the pork and poultry industries is expected to continue, and export demand can be expected to remain difficult to second-guess.

In such a policy environment, agriculture had better get used to supply and price volatility, and not just for feed grains.

**Potential Effects of 1996 Bill on the State Economy**

The 1996 farm bill allows farmers almost complete freedom in their production decisions and, as a result, substantial changes in the crops produced in Tennessee can occur as farmers pursue different crop mixes to increase their profits. Furthermore, the production of various crops requires varying
combinations of chemical, labor, and other inputs as well as different levels of value-added activity. The final portion of this outlook examines the potential effects of such changes on the overall Tennessee economy.

This analysis examines the impact of the acreage gain in corn (30,000 acres) and wheat acreage (20,000 acres) which occurred in 1996. To simplify the analysis, it is assumed that all of this acreage shifts away from cotton production and further, that the entire production shift occurred in the westernmost regions of the state. The effects on the Tennessee economy’s output, employment, value-added, and personal and total income are estimated as illustrated in Table 2.2.

As presented here, these categories reflect the combined results of estimating direct, indirect, and induced effects—the latter two of which measure the economic “ripples” (or multiplier effects) created by the direct effects of agricultural production. Prices used in the analysis are 1997 estimates (which are consistent with the above forecast) for the West Tennessee region.

The results show that farmers’ increased ability to pursue different agricultural activities does indeed have implications for the Tennessee economy (Table 2.3).

The shifting of 30,000 acres of cotton production to corn costs the overall Tennessee economy an estimated $8.5 million in total income and output from other industries for 1997. Also, 112 jobs are lost with the shift.

Shifting 20,000 acres of West Tennessee cotton production to wheat production costs the state an estimated $20.6 million in total income and output from other industries in 1997. In this case, 119 jobs are lost due to the shift in production. The job losses result from fewer chemical input purchases and lower machinery costs associated with reduced input applications, as
TABLE 2.2
Economic Effect Categories for Production Shift Analysis

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>The output generated in other industries</td>
</tr>
<tr>
<td>Employment</td>
<td>The full-time equivalent (FTE) jobs created</td>
</tr>
<tr>
<td>Value-Added</td>
<td>Employee compensation, proprietary income, and other property-type income generated by value-added activities</td>
</tr>
<tr>
<td>Personal Income</td>
<td>Employee compensation</td>
</tr>
<tr>
<td>Total Income</td>
<td>All employee compensation, proprietary income, and other property-type income</td>
</tr>
</tbody>
</table>

TABLE 2.3
Effects of Shifting West Tennessee Cotton Production to Other Crops

<table>
<thead>
<tr>
<th>Total Impact of Shifting Acreage from Cotton Production to:</th>
<th>Corn (30,000 acres)</th>
<th>Wheat (20,000 acres)</th>
<th>Combined Effects of Production Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>-112</td>
<td>-119</td>
<td>-231</td>
</tr>
<tr>
<td>Output</td>
<td>-$5.13</td>
<td>-$13.30</td>
<td>-$18.43</td>
</tr>
<tr>
<td>Value-Added</td>
<td>-$1.75</td>
<td>-$3.82</td>
<td>-$5.57</td>
</tr>
<tr>
<td>Total Income</td>
<td>-$1.57</td>
<td>-$3.48</td>
<td>-$5.05</td>
</tr>
<tr>
<td>Personal Income</td>
<td>-$0.99</td>
<td>-$1.94</td>
<td>-$2.93</td>
</tr>
<tr>
<td>Sum of Income, Value Added and Output Effects</td>
<td>-$8.45</td>
<td>-$20.60</td>
<td>-$29.05</td>
</tr>
</tbody>
</table>

well as lower cotton production available for value-added activity.

Overall, $29.1 million in total income and output, plus an estimated 231 jobs, are lost to the overall economy as a result of the hypothetical production shifts. These results stem from the fact that cotton production requires additional chemical and other inputs than do corn and wheat production. Also, a great deal of cotton value-added activity occurs within the state.

Although these impacts are nearly insignificant when compared with the overall economy, they may pose significant economic impacts for the regions and industries in which they are centralized. Further, a 50,000-acre shift represents 7.9 percent shift in forecasted 1997 cotton acreage. Greater shifts would increase these impacts. At any rate, it should be realized that as farmers change their production mixes to increase their profit, it is not solely farm profits which are affected. Under volatile market conditions, the effect of agriculture’s shifting between crops can create economic ripples which may be felt through the entire economy.

Endnotes

1. Unless otherwise noted, all historical data are derived from publications issued by the Tennessee Agricultural Statistics Service, particularly Farm Facts and Tennessee Agricultural Statistics: 1996.
The past thirty years have seen many changes in the structure and behavior of the Tennessee economy. A good example is the sharp decline in the share of state employment in the manufacturing sector (especially nondurable goods manufacturing) and rapid employment growth in the services sector. The state has also enjoyed exceptionally high growth rates in output and earnings, raising the standard of living for Tennesseans. A notable success story has been the state’s ability to engineer stronger rates of economic growth than the nation as a whole. This growth has enabled Tennessee per capita personal income, a common yardstick of economic well-being, to climb to 91 percent of the national average in 1995. This and other success stories have not come without hard work.

Breaking from the emphasis on short-run economic performance found in Chapters I and 2, the focus here turns to long-term historical and projected trends in the Tennessee economy. For perspective, the discussion begins with a historical sketch of the Tennessee economy, paying special attention to the determinants of economic growth and how they interact. The chapter concludes with a long-term trend forecast of Tennessee economic performance through the year 2005.

A Historical Perspective on the Long-Term Determinants of Economic Growth

There are many broad measures of economic growth, including employment, personal income and retail sales. Gross state product (GSP) is perhaps the broadest measure, capturing the market value of all goods and services produced in the state. Explaining historical and future growth in GSP requires, first, an understanding of the factors that influence the economy’s growth path.

The determinants of growth in GSP are the growth rates of capital, labor and productivity in Tennessee. Investments in private capital (equipment, machines and structures) by business firms and infrastructure by state and local governments are both essential to the state’s economic prosperity. The existing stock of infrastructure and private capital—including computers, structures and roads—will age, wear out, and become obsolete. For the capital stock to grow, and for the overall economy to grow, new investment must exceed the amount of capital that becomes nonproductive through age or obsolescence. Especially important are capital investments that infuse the state with cutting edge technologies and new production techniques.
These are the types of investments that are vital if the state is to maintain its competitive edge.

Over the past twenty-five years, investment by the private sector has stimulated broader economic growth in Tennessee by increasing the amount of capital available to workers. These investments are important since the more capital a worker is able to use on the job, the greater is the worker’s productivity. Private investment in new manufacturing capital was approximately $1.6 billion (inflation-adjusted 1992 dollars) in 1972. By 1992, this figure had doubled, with firms spending $3.2 billion on new manufacturing capital. The magnitude of investment by manufacturing firms and Tennessee state government for capital goods is illustrated in Figure 3.1.

Capital investments by state government include infrastructure such as roads, highways, bridges, and sewerage. Market forces and federal/state regulations also influence infrastructure development, especially for utilities (gas, water, electricity, natural gas) and telecommunication firms. Government expenditures on capital remained relatively constant throughout the 1970s and 1980s. In 1972, Tennessee state government spent about $1.9 billion (inflation-adjusted 1992 dollars) on capital. After peaking at above $2 billion in 1987, expenditures declined to slightly over $1.2 billion in 1992. Substantial year-to-year variations in state capital spending take place to meet unique and special needs, a good example of which is the state’s investment in prison facilities in the late 1980s.

Investment by government on infrastructure enhances growth potential by enticing new firms to locate in Tennessee. Firms utilize many inputs in the production of goods and services, and quality infrastructure is one of these inputs. When a firm chooses a location for a new facility, a critical deciding factor is the quality of available infrastructure. Poor quality infrastructure may not allow the firm to realize its full profit potential, causing a company to choose a site in another state or country. In order to keep attracting new firms, and to encourage existing firms to expand, Tennessee must remain committed to its investment in public infrastructure.

The second determinant of economic growth is increases in labor supply and employment. Historically, one of Tennessee's key economic advantages has been an abundant labor supply that has accommodated the needs of business and industry. Despite rapid population growth during the 1990s (see Chapter 2), other demographic trends (including the gradual aging of the population) mean that Tennessee will face labor constraints in many regions and occupation classifications. While workers may benefit as wages rise, industry could be discouraged from locating in Tennessee.

One of the primary sources of labor force growth in Tennessee and the U.S. in recent decades has been the influx of women
to the workplace. Table 3.1 provides a breakdown of labor force participation by year and by sex for the 1990s. Throughout this decade, female participation rates have increased substantially as more and more women have left the home to enter the work force due to labor-saving devices (such as home appliances) and the need for economic security. Although participation rates by women have steadily increased, the growth in female participation rates has slowed over the longer term. This suggests that further labor force gains arising from women entering the workplace will be modest compared to gains in previous decades. Coupled with relatively stable participation rates for other individuals, this trend heightens the importance of improvements in labor force quality as a means of fostering future growth.

A third source of economic growth for Tennessee has been improvements in productivity. Productivity, which is defined as the amount of output produced per worker, must improve if the state is to compete in the global economy and if earnings and economic well-being are to be allowed to grow. Productivity gains come about in a number of ways, including improved management and organizational skills, new technologies and, more generally, investments in human capital through education and training. Improvements in productivity manifests itself in modern factories that utilize modern equipment operated by skilled workers, in turn supported by high quality public infrastructure. Strong productivity growth provides Tennessee businesses and workers an advantage in national and international markets through increased efficiency and lower costs.

Productivity has generally risen over the long term for both the Tennessee and national economies. Tennessee’s output per worker has more than doubled since 1970, increasing to $48,300 in 1995—a $27,000 increase since 1970. Tennessee has experienced a resurgence of productivity growth rates in the 1990s that rival the golden age of productivity expansion of the 1950s and 1960s. Since 1990 productivity has grown at a compound annual rate of 4.2 percent in Tennessee—significantly above the national level of productivity growth.

Although Tennessee’s favorable business climate, with low taxes and solid infrastructure, provides the state with an important comparative advantage over

<table>
<thead>
<tr>
<th>Year</th>
<th>Labor Force</th>
<th>Labor Force Participation Rate</th>
<th>Total Labor Force Participation Rate</th>
<th>Labor Force Composition (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>2664</td>
<td>74.4</td>
<td>60.2</td>
<td>63.7</td>
</tr>
<tr>
<td>1993</td>
<td>2500</td>
<td>72.3</td>
<td>56.2</td>
<td>60.1</td>
</tr>
<tr>
<td>1992</td>
<td>2440</td>
<td>72.4</td>
<td>55.6</td>
<td>59.4</td>
</tr>
<tr>
<td>1991</td>
<td>2416</td>
<td>73.8</td>
<td>53.9</td>
<td>59.1</td>
</tr>
</tbody>
</table>
numerous other states, policies that encourage investment by firms and enhance the skill of Tennessee’s workers will be needed to yield further productivity growth and earnings gains. In the coming years, as other states actively pursue economic development policies, Tennessee will have to work hard to maintain its strong growth in order to compete for economic activity. The key is for Tennessee to remain aggressive and on the frontier of the innovation of development policy, broadly defined. The state must sustain its positive business climate by maintaining reasonable tax burdens that at the same time do not compromise infrastructure quality and the ability to provide services to state residents. As industrial recruitment and other development policies evolve in Tennessee, efforts must increasingly be directed to attracting high quality firms as a source of new investment. These are firms that are modern, competitive, and pay their workers a salary at least as good as the state average. Further economic gains can be realized by developing quality labor through workforce development, as discussed more fully in Chapter 4. High quality workers are created through investments in human capital, which creates the store of knowledge and skills that an individual can apply on the job. Human capital is formed through an individual’s investments in general education, specific training, and on-the-job training. Workers who possess large stocks of human capital will become increasingly important in the years to come as jobs demand greater skills, flexibility and adaptability.

The Long-Term Forecast

The long-term forecast provides insight into the projected performance of the Tennessee economy until the year 2005.

Unlike the short-run forecast discussed in Chapter 2, the long-term forecast places emphasis on trend behavior in the economy instead of focusing on unpredictable short-run fluctuations in output and employment caused by unforeseeable events like energy shocks, severe weather events, or an unexpected change in interest rates. Due to the states’ integration with the national economy, the long-term outlook examines the potential path of growth for both the U.S. and Tennessee.

Output

Tennessee’s economic future looks bright as the state will continue to engineer strong growth in inflation-adjusted output into the next century. Gross state product will grow at a compound annual growth rate (CAGR) of 3.6 percent between 1996 and 2005. As seen in Figure 3.2, Tennessee will enjoy stronger output growth than the U.S. economy in each year of the forecast, as the national economy grows at 2.1 percent CAGR until 2005.

FIGURE 3.2
Inflation-Adjusted Gross Output
Tennessee and the U.S.
Inflation-adjusted output in the state’s manufacturing sector will expand at a 3.2 percent (CAGR) pace through the forecast horizon, with especially strong growth taking place in durable goods manufacturing. Despite recent job losses in nondurable goods manufacturing, output is expected to grow 1.7 percent (CAGR) through 2005. Together, nondurable and durable goods manufacturing output will slip from 24 percent of total gross state product in 1996 to 23 percent of total production in 2005, as shown in Figure 3.3. The services and trade sectors will also enjoy strong growth through the next decade.

Employment

Nonagricultural employment will see strong growth over the entire forecast horizon. Table 3.2 shows that Tennessee will create approximately 706,000 jobs between 1996 and 2005. Tennessee employment will grow at a robust 2.7 percent CAGR, while the U.S. grows at the slower pace of 1.3 percent (CAGR) between 1996 and 2005.

Manufacturing employment is expected to struggle through the short-term forecast period (1998) before picking up some steam and returning to trend. Growth between 1996 and 2005 is projected at 0.4 percent (CAGR), as positive employment growth in durable goods more than offsets job losses in nondurable goods manufacturing. The services sector, which accounted for 25.7 percent of all nonagricultural jobs in 1996, will show strong growth in excess of 3 percent through 2005. The wholesale and retail trade sector, representing 23.8 percent of all jobs in 1996, is expected to grow by 3.5 percent (CAGR) through the forecast period.

Accompanying Tennessee’s strong employment growth will be unemployment rates below the national average. As shown in Figure 3.4, the unemployment rate in Tennessee will remain in the low 5 percent range between 1997 and 2005. The unemployment rate in the national economy will hover around 5.8 percent for the entire

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**FIGURE 3.3**
Distribution of Gross State Product by Sector

**FIGURE 3.4**
Unemployment Rate—Tennessee and U.S.
TABLE 3.2
Tennessee Nonagricultural Employment and Growth Rates by Sector

<table>
<thead>
<tr>
<th></th>
<th>Employment (1000's)</th>
<th></th>
<th>Share of Employment (%)</th>
<th></th>
<th>Compound Annual Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Nonagricultural Employment</td>
<td>2566.1</td>
<td>3271.9</td>
<td>-</td>
<td>-</td>
<td>2.7</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>529.9</td>
<td>550.3</td>
<td>20.7</td>
<td>16.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Durable Goods Manufacturing</td>
<td>289.9</td>
<td>330.8</td>
<td>11.3</td>
<td>10.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Nondurable Good Manufacturing</td>
<td>240.0</td>
<td>219.5</td>
<td>9.4</td>
<td>6.7</td>
<td>-1.0</td>
</tr>
<tr>
<td>Services</td>
<td>659.1</td>
<td>984.3</td>
<td>25.7</td>
<td>30.1</td>
<td>4.6</td>
</tr>
<tr>
<td>FIRE</td>
<td>113.0</td>
<td>138.0</td>
<td>4.4</td>
<td>4.2</td>
<td>2.2</td>
</tr>
<tr>
<td>TCPU</td>
<td>138.3</td>
<td>162.1</td>
<td>5.4</td>
<td>5.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Government</td>
<td>392.8</td>
<td>443.2</td>
<td>15.3</td>
<td>13.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Trade</td>
<td>612.0</td>
<td>834.2</td>
<td>23.8</td>
<td>25.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Construction</td>
<td>116.5</td>
<td>155.6</td>
<td>4.5</td>
<td>4.8</td>
<td>3.3</td>
</tr>
<tr>
<td>Mining</td>
<td>4.5</td>
<td>4.3</td>
<td>0.2</td>
<td>0.1</td>
<td>-0.5</td>
</tr>
</tbody>
</table>

Source: Center for Business and Economic Research, College of Business Administration, The University of Tennessee, Knoxville.

forecast, ending 2005 with a 5.7 percent unemployment rate.

**Inflation and Interest Rates**

In both the near and long term, inflation is not expected to surface as a serious problem for either the Tennessee or U.S. economy. As measured by the GDP implicit deflator, inflation will remain in check, peaking at 2.9 percent in 2003. Tennessee will experience inflation at a slightly higher rate than the national economy. Inflation, using the GSP implicit deflator, was 2.8 percent in 1996 and will gradually inch above 3 percent through 2005. The bank prime lending rate is expected to fall to 8.3 percent in 1996 and further to 7.7 percent in 2005. Lower interest rates hold the promise of stimulating growth, especially in the housing and durable goods sectors.

**Productivity**

Productivity will continue to register solid gains. Inflation-adjusted output per worker will reach $46,685 by 2005, for growth of 0.9 percent (CAGR). Inflation-adjusted manufacturing output per
manufacturing worker in 2005 will be $64,673 versus $50,694 in 1996.

**Personal Income**

The standard of living in Tennessee promises further improvement through strong growth in Tennessee personal income. Inflation-adjusted personal income will grow at a compound annual rate of 3.6 percent in Tennessee versus 2.2 CAGR in the U.S. over the forecast horizon. In 1996, inflation-adjusted per capita personal income in Tennessee was $19,737. By 2005, per capita personal income will reach $24,552. As shown in Figure 3.5, Tennessee per capita personal income will continue to close in on the national average through 2005.

![FIGURE 3.5](image-url)

**FIGURE 3.5**

Tennessee Per Capita Personal Income as a Percentage of U.S. Per Capita Personal Income
Workforce Development in Tennessee: Options For The Future

Not only has the Tennessee state economy enjoyed vigorous growth in recent decades, but the future holds the promise of continued economic gains. Evidence of the state’s economic health includes industrial output which has shown steady improvement, unemployment rates which for the last few years have remained consistently below the U.S. average, and per capita personal income that continues to converge to the national benchmark. Nonetheless, the work of economic development is never done. While Tennessee has enjoyed some economic successes of late, it cannot afford to savor them. The economy is more competitive today than it has ever been, and even a modicum of complacency would likely result in many lost opportunities for economic development. As this chapter will show, Tennessee has done much to create an environment conducive to economic expansion, but deficiencies in its labor force have prevented the state from realizing its full economic potential. Undeniably, developing the workforce is the key to building economic prosperity for Tennessee in the next century. The state clearly recognizes this need, as evidenced by the Tennessee Board for Economic Growth’s emphasis on workforce development in its recent report to the Governor.4

The Public Sector Role in Workforce Development

In an ideal world, labor markets would provide accurate signals of the quality and availability of future jobs, and would relay information regarding the steps necessary to qualify for those jobs. Individuals would then use this labor market information, along with judgements based on their innate abilities and intelligence, to make optimal decisions about how much education and training to undertake. In this sense, education and training can be viewed as an investment in human capital — an investment undertaken in hopes of earning a positive return in the form of future wages, benefits, and job satisfaction. Also, in an ideal world, market signals would guarantee that there were enough workers at various levels to meet the needs of employers, and there would be at most a very limited role for public sector labor policies.

Unfortunately, there are substantial monetary and time costs involved in acquiring the information necessary to make sound human capital investment decisions, and often these costs are prohibitive. Furthermore, once workers have information about job
opportunities, they may face impediments that hinder their responses. For example, they may not have quality education or training available to them, or they may not have sufficient background to qualify for additional education or training. Given the competitiveness of today’s economy, an exclusive reliance on markets to allocate workers to jobs is not likely to provide businesses with the kind and number of employees they need. If individuals are unable to respond to the incentives of the labor market, the public sector often must step in to correct problems. However, government must be careful not to overstep its bounds and interfere in activities that are better left to the private sector. The interests of society are best served when government works in concert with individuals and businesses to achieve mutually agreed-upon goals.

**The Scope of Workforce Development**

Initial government involvement in the labor market took shape during the 1930s, when the country was mired in the depths of the Great Depression. Public policies, aimed at addressing the unemployment problem caused by general downturns in economic activity, usually involved some action to stimulate production, thereby increasing the demand for labor. Soon thereafter, the *Employment Act of 1946* gave legislative sanction to the federal government’s role in the labor market, specifically giving government the responsibility for maintaining full employment. By the 1950s, demand-side labor policies (i.e., policies that encourage employers to hire workers) had helped to render a prosperous economy, but some unemployment still remained. The focus of labor policy was then broadened to include problems of labor force participation and employability. Workforce development initiatives are designed to address these problems.

Workforce development had its birth in the *Manpower Development and Training Act* (1962), which initiated federal programs that emphasized the training of unemployed workers in economically depressed areas. Since then, most federal programs have continued to concentrate their efforts on job training, and have been primarily limited to disadvantaged individuals such as AFDC recipients or “at-risk” youth (through, for example, the JOBS program). Nevertheless, workforce development is much broader in scope than these federal programs suggest. Workforce development encompasses all individuals, not just the chronically unemployed or disadvantaged, and incorporates all means for enhancing the quality of society’s pool of workers, encouraging participation in the labor force, and facilitating the connection of workers with productive, lucrative jobs. Assisting disadvantaged individuals with job searches and training is an important objective of workforce development, but equally important is ensuring that currently employed workers have the opportunity to upgrade their skills, that young people have an adequate education infrastructure within which they can pursue their career objectives, and that labor market information is readily available to all in a central, organized location.

**The Changing State Role in Workforce Development**

In the past, workforce development efforts have been concentrated at the federal level, but over time some of the burden of workforce development, at least on the administrative end, was transferred to states and local communities. The impetus for much of this decentralization was the conclusion that state
and local problems would be better handled at the state and local level. Local governments probably are better able to gauge the needs of their communities, and service provision is likely to be more efficient. Currently, Congress is developing plans for the consolidation of federal funds for many workforce development programs, especially training programs, into block grants which would give states more flexibility in the design and implementation of their own policies. The reasoning behind consolidation is partly one of fiscal restraint at the federal level, as was the case with recent welfare reform legislation and the Reagan-era block grants. But equally important is the continued belief that workforce development programs can be operated more efficiently and effectively at the state and sub-state levels of government.

Tennessee has recently been at the forefront of similarly focused reforms, implementing TennCare as a Medicaid replacement in 1994 and Families First as an overhaul of the state’s welfare system in 1996. Tennessee is considering workforce development as its next major reform objective, with the goal of bringing better jobs to the state and preparing the state’s labor force for increased national and international competition in the coming century.

The decentralization of formerly federal programs provides a tremendous opportunity for states such as Tennessee to weave what has become a morass of disconnected efforts into an integrated, efficient system for workforce development. The benefits of decentralization may come at some cost, however, as states will most likely receive less money under block grants than they do through the current funding structure.

Problems of Past Workforce Development Efforts

If Tennessee is to be successful in its workforce development endeavors, it must disentangle itself from the web of government-sponsored job training programs and focus on programs that have been shown to be effective. Past experience at the federal level shows that large scale government job training programs such as the Job Training Partnership Act (JTPA) and the Job Corps do not work. Although the U.S. Department of labor alone funds approximately $5 billion annually in job training programs, research has failed to show more than a slight return to that investment. A recent study of JTPA, for example, found that the program had no effect on the earnings of participants under the age of 21, and only a minimal effect on the earnings of adult participants, primarily women. The failure of government job training programs is not confined to the United States, as similar deficiencies have been found across the globe.

The reason why government-sponsored job programs generally are ineffective, whether in the United States or elsewhere, is not that public professionals are not committed to workforce development or that they lack the resources to develop good programs, but that it is impossible for any individual or institution, not just the government, to accurately predict the need for specific skills in the future. The general consensus among employers is that their fundamental need is not for individuals with specific skills, but for workers with enough basic knowledge to make them trainable on the job. Research has shown the most effective workforce development programs to be those that enhance the basic skills of participants, and that additional education goes much further in improving the earnings
and prospects of workers than any type of specific training. Efforts by the government to connect workers with job openings or private training opportunities have seen the greatest success.

There are two major issues that Tennessee must confront in its workforce development effort: inadequate human capital formation and inadequate dissemination of labor market information. The pages that follow will address each of these issues, first analyzing the problems and needs, and then offering potential courses of action. Conspicuously absent from the discussion are governmentsponsored job training programs. Instead, the focus of this chapter is on education, general training, and improved information access—a proven agenda for developing the state’s workforce.

**Labor Force Quality**

This section addresses the issue of labor force quality in Tennessee, focusing on the quantity and quality of education and training in the state. Various facets of labor force quality are evaluated, often with a competitive perspective in which Tennessee is compared to other states in the Southeast, the nation as a whole, and its major international trading partners. Potential reform options are also examined in an effort to open discussion on Tennessee’s workforce development agenda.

The need for quality enhancements in Tennessee’s labor force are first communicated in the context of the general business climate in the state. The focus then turns to a more detailed investigation of the state’s labor force needs and reform options. This analysis begins with the broadest measure of labor force quality: educational attainment. From there, the future need for higher education is articulated along with an assessment of Tennessee’s capacity to meet that need. The discussion then turns to primary and secondary education in the state. After first evaluating basic academic education and presenting some current trends in education reform, attention is directed to the secondary school as a medium in which to prepare non-college-bound youth for the workplace. This is followed by discussions of alternatives to college for training high school graduates, and adult education and training.

**The Need for Quality Improvements in Tennessee’s Labor Force**

The numbers and quality of jobs Tennessee can attract are determined in large part by how competitive the state is with other states and nations. This competition for industry and jobs is carried out on many fronts, including labor force quality, but also through the governing environment, geographic centrality to markets, strength of the local economy, quality of life, and infrastructure quality. Tennessee must be competitive on every front in order to make the most of its economic development efforts. Table 4.1 provides index values that measure Tennessee’s competitive position relative to its closest neighbors in terms of several factors that influence business location decisions. The higher the index value, the more favorably the state compares with its competitors.8

Tennessee outscores most of its competitors in terms of quality of life, resource costs, and government performance, and is on par with its competitors in technology resources. Tennessee is not very competitive when it comes to labor force quality, however, especially regarding the level of educational attainment in its labor force and the quality of its education system.
This rather negative evaluation of Tennessee’s labor force by the state’s civic and business leaders is echoed by national organizations. The Corporation for Enterprise Development puts out an annual Development Report Card for the States which grades all 50 states on their economic development policies and prospects on a standard academic A-F scale. Although Tennessee received an “A” in business vitality, which is indicative of the state’s entrepreneurial spirit and structural diversity, it received a “C” in development capacity. Within the development capacity category is Human Resources, for which Tennessee received an “F” -- failure. As this section will illustrate, that dubious distinction for Tennessee’s workforce is not undeserved. Nevertheless, in viewing the evaluations of Tennessee by outsiders, it is important to remember that it is the impression of the state’s labor force that encourages or discourages business locations. Even if Tennessee produced the most highly skilled, well-trained labor force in the country, it would have failed in its efforts if did not convince the outside business community of the quality of the state’s workers.

Although in many regards Tennessee has done a good job of making itself attractive to industry, the state must do a better job of educating and training its workforce if it wants to remain competitive and attract the best possible employment opportunities for its residents. While in the past, Tennessee’s economic growth has been fueled in large part by growth in its pool of available workers, the quality of the state’s workforce is increasingly becoming much more important for economic growth than is its abundance of workers. Since the Tennessee economy is fully employed, the state no longer offers an especially abundant pool of workers.

### Table 4.1

<table>
<thead>
<tr>
<th>Competitive Factor</th>
<th>Index Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Life</td>
<td>13.8</td>
</tr>
<tr>
<td>Resource Costs</td>
<td>13.4</td>
</tr>
<tr>
<td>Government Performance</td>
<td>12.2</td>
</tr>
<tr>
<td>Technology Resources</td>
<td>9.0</td>
</tr>
<tr>
<td>Labor Force Education</td>
<td>6.8</td>
</tr>
<tr>
<td>Education Quality</td>
<td>5.8</td>
</tr>
</tbody>
</table>


### Educational Attainment

In order to evaluate the quality of Tennessee’s labor force, there must be some benchmark with which to make comparisons. Given the increasingly competitive and global nature of the economy, the labor force quality of other states and nations is a logical choice for such a benchmark. One important gauge of labor force quality is the level of educational attainment in the population. Table 4.2 compares Tennessee with the Southeast, the United States, and the G7 countries in terms of educational attainment.

Tennessee compares very favorably with the G7 nations in terms of educational attainment, both in the percentage of the population without a high school education and the proportion of residents who have sought formal post-secondary education. Approximately 37 percent of Tennesseans aged 25 and older have acquired at least some
formal education beyond high school, which is significantly higher than the G7 average of 21 percent. Furthermore, 67 percent of Tennessee’s population are high school graduates, compared with 63 percent (on average) for the G7 countries. All indications suggest that Tennessee is going to continue outperforming the world average in coming years. In 1988, the latest date for which meaningful comparisons can be made, 23.0 bachelors’ degrees were earned for every 100 people aged 22 in Tennessee, compared with 18.3 for the G7.\textsuperscript{11}

Despite the state’s favorable international comparison, there is plenty of room for improvement in educational attainment, an area in which Tennessee falls behind the Southeast and the rest of the nation. Accordingly, firms looking to site a plant in the U.S. may prefer other regions or states over Tennessee. Approximately 20.3 percent of the U.S. population holds a bachelor’s degree or higher, compared to 17.7 percent in the Southeast and only 15.7 percent in Tennessee. Tennessee is making substantial progress towards catching up with its neighbors in the Southeast and the rest of the nation, however. At the same time the data in Table 4.2 were collected, 23.4 percent of Tennesseans aged 18-24 were enrolled in a college or university, exceeding the Southeast average of 21.7 percent and closing in on the 24.9 percent U.S. average.\textsuperscript{12} It is important for Tennessee to continue to strive to meet the educational attainment standards of the rest of the nation, as higher education will become increasingly necessary in the future if the state economy is to remain competitive.

### Higher Education

One way to gain insight into the higher educational needs of Tennessee workers and employers in the near future is to look at the education requirements of the jobs that are

<table>
<thead>
<tr>
<th>Region</th>
<th>Not A High School Graduate</th>
<th>High School Graduate</th>
<th>Some College, No Degree</th>
<th>Associates Degree</th>
<th>Bachelor or Higher Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tennessee</td>
<td>33.0</td>
<td>30.0</td>
<td>16.9</td>
<td>4.2</td>
<td>15.9</td>
</tr>
<tr>
<td>Southeast</td>
<td>29.7</td>
<td>29.7</td>
<td>17.5</td>
<td>5.4</td>
<td>17.7</td>
</tr>
<tr>
<td>United States</td>
<td>24.8</td>
<td>30.0</td>
<td>18.7</td>
<td>6.2</td>
<td>20.3</td>
</tr>
<tr>
<td>G7 Average\textsuperscript{a}</td>
<td>37.0</td>
<td>42.0\textsuperscript{b}</td>
<td>21.0\textsuperscript{c}</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{a} 1988 data including those aged 25-64 only
\textsuperscript{b} High school graduate to one year of post-secondary education
\textsuperscript{c} More than one year of post-secondary education

expected to be available in Tennessee over the next ten years. Table 4.3 gives Tennessee employment projections by level of education required through the year 2005.

Employment projections indicate that higher education will be an increasingly valuable asset to Tennessee job hunters over the next ten years. In 1994, approximately 20.8 percent of all Tennessee jobs required a formal education at the level of an associate’s degree or higher, but by 2005, that figure will rise to 22.3 percent. Roughly 28 percent of all new jobs over the next ten years will require at least a two-year college education.

Although a higher education degree will not be necessary to qualify for the majority of new jobs in the state, the fastest-growing occupation categories are those requiring formal education beyond high school. Occupations requiring at least an associate’s degree are expected to grow 34.5 percent over the next decade, and over 60 percent of annual openings in these occupations will be due to growth and the other 40 percent to replacement needs. In contrast, occupations that do not require formal post-secondary education are projected to see slower growth of 23.4 percent, and slightly more than half of annual job openings will arise solely from replacement needs.

The last three columns of Table 4.3 compare total projected job openings, which

<table>
<thead>
<tr>
<th>Education Level</th>
<th>1994 Estimated Employment</th>
<th>2005 Projected Employment</th>
<th>Total Growth</th>
<th>Percent Growth</th>
<th>Total Openings</th>
<th>Projected Degrees Conferred</th>
<th>Degrees per Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Degree</td>
<td>34,028</td>
<td>43,917</td>
<td>9,889</td>
<td>29.1</td>
<td>16,632</td>
<td>15,540</td>
<td>0.93</td>
</tr>
<tr>
<td>Doctoral Degree</td>
<td>18,957</td>
<td>25,597</td>
<td>6,640</td>
<td>35.0</td>
<td>12,826</td>
<td>6,353</td>
<td>0.50</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>16,878</td>
<td>23,356</td>
<td>6,478</td>
<td>38.4</td>
<td>9,801</td>
<td>51,309</td>
<td>5.24</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>407,041</td>
<td>543,519</td>
<td>136,478</td>
<td>33.5</td>
<td>231,550</td>
<td>192,697</td>
<td>0.83</td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>312,870</td>
<td>432,246</td>
<td>28,363</td>
<td>42.4</td>
<td>41,085</td>
<td>66,756</td>
<td>1.62</td>
</tr>
<tr>
<td>High School Only</td>
<td>2,063,531</td>
<td>2,545,700</td>
<td>482,169</td>
<td>23.4</td>
<td>2,362,140</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: CBER projects greater employment growth rates than that shown here, which means employment is expected to be higher across all educational and training categories (see Chapter 3 of this volume).
Sources: Employment Projections data, Tennessee Department of Employment Security, OIDOE database; Occupation training codes, Tennessee Department of Employment Security, ALMISMA database; Education Projections, CBER. Employment projections were compiled in this format by CBER.
include openings due to both growth and replacement, to the number of university degrees that are expected to be conferred in Tennessee over the same time period. At first glance, the results of this comparison appear to indicate a lack of balance in Tennessee’s higher education system, as large surpluses are predicted for masters’ degrees and associates’ degrees, while shortages are projected for the number of bachelors’, professional, and doctoral degrees. When considered in light of some important qualifications, however, Tennessee’s higher education system does not appear to be as far off the mark.

First, the employment projections in Table 4.3 are categorized by the minimum level of education required for the job. Nevertheless, in reality, workers often obtain more education than the minimum necessary to qualify for a job. For example, much of the surplus of masters’ degrees and shortage of bachelors’ degrees relative to job openings can be explained by the large number of managers, and non-university teachers who hold masters degrees. Although these positions generally do not require education beyond a bachelor’s degree, approximately half of all master’s degrees earned in the United States are either M.Ed.’s or M.B.A.’s, and virtually all students who receive these degrees are teachers and managers, respectively.13

Secondly, it is important to note that the number of degrees that are expected to be conferred in Tennessee over the next ten years is only a rough estimate of the state’s capacity to meet the higher education needs of workers and employers over that horizon. Some Tennesseans attend colleges and universities in other states, while some out-of-state students attend Tennessee institutions. The education projections in Table 4.3 include degrees earned in Tennessee by students who reside in other states, and exclude degrees earned by Tennesseans outside the state. To the extent that the number of out-of-state students who attend Tennessee schools differs from the number of Tennesseans who attend institutions in other states, the projections of conferred university degrees will overestimate or underestimate the state’s higher education capacity.

Finally, geographic mobility of workers is likely to dampen the effects of any education imbalance that might occur. If the number of Tennessee workers with a particular level of education fall short of the needs of employers in the state, workers from other states would have an incentive to locate in Tennessee, which would in turn diminish the need for Tennessee firms to locate production capacity outside the state. Likewise, Tennessee graduates would likely relocate if there were not enough jobs in the state to meet their qualifications. Although emigration of educated workers would certainly be a discouraging policy outcome, migration of workers would reduce the education disincentives that might arise from a job shortfall.

Although Tennessee has done a pretty good job of promoting higher education in the state, the higher education needs of the state’s workforce will be much greater in the future. As labor force growth continues to slow in coming years (see Chapter 3), more and more of Tennessee’s economic growth will have to come from gains in productivity (output per worker), areas which research has shown to be significantly enhanced by higher education.

In addition to making the Tennessee economy more competitive, higher education also means increased income for workers and gives them more opportunities for advancement. As Figure 4.1 clearly demonstrates, there are high individual returns
to education, both in terms of annual earnings and in unemployment rates. Most striking is the earnings differential between workers holding bachelors’ degrees and those with associates’ degrees. In Tennessee, a bachelor’s degree earns 34.0 percent more than an (academic) associate’s degree, on average, and those who go on to pursue a master’s degree will typically earn 8.4 percent more than they would have with only a bachelor’s degree. Unemployment rates are also highly correlated with educational attainment.

The State of Tennessee has the potential to see great returns from encouraging its residents to pursue higher education, even in pure financial terms. The evidence strongly suggests that increased participation in higher education would result in a larger tax base and fewer outlays for income transfers such as unemployment compensation and Families First. Based on the average annual incomes reported in Figure 4.1, for every high school graduate who chooses to pursue a bachelor’s degree, the state government would earn an additional $325 per year in sales tax revenues alone, assuming that 45 percent of income is spent on sales-taxable items. Considering all state taxes, that figure would jump to approximately $675 annually. Although these are rather simple calculations and therefore should not be taken as a definitive return, they do highlight the substantial addition to state tax coffers that could arise from increased investment in higher education.

**Primary and Secondary Education**

Improving the quality of primary and secondary education is essential to attracting better paying jobs to Tennessee. Board members of Tennessee Tomorrow, Inc. (TTI), a statewide association of local leaders from the public and private sectors and members of the academic community, were asked to articulate their concerns about the business climate in Tennessee. When asked to identify areas that needed improvement, at least 70 percent of participants designated education quality (primary and secondary) and labor skills deficiencies as “top priorities.” No other issue, including government policy issues, infrastructure, wage levels, and proximity to markets received a “top priority” rating by more than 30 percent of participants. A recent survey by the National Association of Manufacturers illustrates the strong connection between industry competitiveness and the basic skills of the workforce. Approximately 40 percent of survey participants reported
they could not make technological upgrades because of low basic skills in the workforce, while 37 percent said that productivity improvements were less successful and 30 percent stated that they could not reorganize their workplaces because of the low skills. Because most basic skills are learned in primary and secondary school, the competitiveness of the Tennessee economy in the next century will be determined in large part by the quality of its public education system.

Although 33 percent of Tennesseans over the age of 25 do not have a high school education, improvements are coming with time. Only 25.7 percent of those between the ages of 18 and 24 have not completed high school. Over the next few decades, as the percentage of Tennesseans over age 25 without a high school diploma continues to decline, quantity increases in K-12 education will become more difficult and a larger share of the gains in primary and secondary education will have to come from quality improvements.

It is well established that the United States has the most respected higher education system in the world; however, its primary and secondary education systems have come under fire in recent years for being in a state of decline. In reality, American schools have made much progress over the last 25 years, as shown by both graduation rates and standardized test scores (excluding college entrance exams). The problem is one of standards, not of decline, and American schools must exceed their past performances. In today’s internationally competitive economy, schools in Tennessee and the rest of the nation must strive to meet a world standard, and unfortunately, most have failed to do so in recent years. Table 4.4 compares the quality of primary and secondary education in Tennessee to that of the Southeast, the nation, and its chief international competitors.

One important indicator of education quality is public expenditure on education. In 1988, the latest date for which international comparisons can be made, only two of the G7 countries, the United States and Canada, spent more public money per student on primary and secondary education than Tennessee. Although Tennessee did a good job of funding public education relative to other countries in 1988, it spent slightly less than the Southeast

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tennessee</td>
<td>2,888</td>
<td>19.4</td>
<td>258</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Southeast</td>
<td>2,978</td>
<td>17.4</td>
<td>257</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>United States</td>
<td>3,843</td>
<td>17.3</td>
<td>262</td>
<td>521</td>
<td>547</td>
</tr>
<tr>
<td>G7 Average</td>
<td>2,767</td>
<td>15.5</td>
<td>269</td>
<td>531</td>
<td>522</td>
</tr>
</tbody>
</table>

*U.S. dollars adjusted for purchasing power parity
average and only 75 percent of the national average. Moreover, only four states in the U.S. spent less money per student relative to per capita GSP than Tennessee.\(^7\) Since that time, Tennessee has made much progress in bringing its education spending more in line with the spending of other states. Between 1992 and 1994, Tennessee per pupil education expenditure as a percentage of the Southeast average increased from 82.2 percent to 93.1 percent. Moreover, from 1992 to 1996, Tennessee inflation-adjusted education spending per pupil rose at a compound annual growth rate of 6.0 percent, compared with 3.2 percent for the nation as a whole.

One reason for the low level of education spending in Tennessee relative to other states is that Tennessee’s government revenues are significantly smaller per capita than those of most other states.\(^8\) Tennessee has long been recognized as one of the most efficiently run states in the country; nevertheless, the relatively low per capita government revenues translate into fewer government resources for education quality improvements in Tennessee than are available in most other states. Tennessee has endeavored to increase education funding over the last several years. By the end of next fiscal year, the state will have invested $600 million in education reform through the Basic Education Program (BEP) an important improvement. While this investment offers the promise of improving Tennessee’s standing as shown in Table 4.4, the problem is that other states also realize the importance of investing in education, and have invested more. There is a new arms race brewing in the U.S., and the spoils of victory are economic development and high-wage jobs. Tennessee’s battle effort is likely to be constrained by its lack of revenues and complicated by increased spending by other states.

Another important indicator of education quality is the pupil/teacher ratio. On average, schools in the G7 countries have one teacher for every 15.5 students. Tennessee not only falls substantially short of this international standard (one teacher for every 19.4 students), but the state also falls well behind the pupil/teacher ratios in the Southeast (17.4) and the nation as a whole (17.3). Pupil/teacher ratios are important in that they indicate the amount of time that teachers are able to give to students on an individual basis. The larger the class sizes, the less time teachers have available to meet any special needs students might have, and the more constricted they are in making innovations to material or instructional methodology. Fortunately, Tennessee has recently made efforts to reach a higher standard in pupil/teacher ratios, as evidenced by the inclusion of smaller class sizes as a primary objective of its 21st Century Schools Plan and other state-level reform initiatives. But once again, other states (nations) may be moving in a similar direction.

Finally, a very objective and straightforward way to evaluate the quality of primary and secondary education in Tennessee is to compare standardized test scores in the state with those in other states and countries. In general, Tennessee scores are approximately equal to the Southeast average but lag national averages, and U.S. math and science scores fall well behind the scores of foreign students. Foreign schools tend to put much more emphasis on technical training such as math and science than do schools in the United States, which explains the U.S. deficiency in technical areas. As the workplace becomes more high-tech in future years, Tennessee and other states in the U.S. will likely find it necessary to put additional emphasis on math and science in their curriculums. One bright
spot is reading scores. U.S. students score substantially higher on average in reading than do students in other countries.

Options for reform. Education reform has become a hot-button issue in the 1990s, sparked in large part by a 1983 report by the National Commission for Excellence in Education which painted a bleak picture of America’s education system. Since that time, over 300 state-level commissions have issued their own evaluations and reform agendas, creating a virtual library of resources. Although a comprehensive evaluation of these proposals is well beyond the scope of this paper, the controversial school choice option and Tennessee’s 21st Century Schools Plan are discussed below to highlight some current issues of education reform in Tennessee.

School choice as a reform option has received considerable attention in the last few years. Proponents of school choice argue that allowing parents to choose a school for their child not only champions parental involvement in education, but also promotes competition among schools. Competition is expected to force schools to make improvements in an effort to retain (or attract) students and financial resources. Opponents of school choice, on the other hand, assert that less desirable schools will not improve due to a lack of resources, and that students remaining in these schools will have access to fewer resources than before. Research thus far has provided little evidence that private schools or public schools subjected to open enrollment produce substantially better outcomes than traditional public schools. Nevertheless, as Figure 4.2 illustrates, parents are significantly more satisfied with private schools and “chosen” public schools than they are with assigned public schools. Tennessee has public school choice in some areas, although parents often must pay tuition, with state and federal tax dollars following students to their school of choice.

Tennessee has already begun a pioneering effort in school reform with its 21st Century Schools Plan (1990). There were three primary objectives to this initiative. The first was to give added flexibility to local school systems in the hopes that fewer regulations and constraints would spawn novel ideas that could be implemented across the state. In the first three years alone, Tennessee eliminated over 3,700 state rules and regulations, and many school districts have already taken advantage of the increased flexibility to restructure their curriculums. The second objective was to improve the state’s assessment system. The former system was discarded and replaced with the Tennessee Comprehensive Assessment Program (TCAP) and the Tennessee Value Added Assessment System (TVAAS), the goal being to do a better job of tracking student performance over time.

**FIGURE 4.2**
Parents’ Perceptions of Children’s School, by Type of U.S. School, 1993

TABLE 4.5
Employment Projections
Jobs Requiring Only a High School Education, 1994-2005

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-secondary Vocational Training</td>
<td>137,810</td>
<td>169,636</td>
<td>31,826</td>
<td>23.1</td>
</tr>
<tr>
<td>Work Experience in a Related Occupation</td>
<td>190,470</td>
<td>237,728</td>
<td>47,258</td>
<td>24.8</td>
</tr>
<tr>
<td>Long-term On-the-job training (&gt; 12 months)</td>
<td>277,583</td>
<td>340,708</td>
<td>63,125</td>
<td>22.7</td>
</tr>
<tr>
<td>Moderate-term On-the-job-training (1-12 months)</td>
<td>409,751</td>
<td>461,651</td>
<td>51,900</td>
<td>12.7</td>
</tr>
<tr>
<td>Short-term On-the-job training (&lt; 1 month)</td>
<td>1,047,917</td>
<td>1,335,977</td>
<td>288,060</td>
<td>27.5</td>
</tr>
</tbody>
</table>

Note: CBER projects greater employment growth rates than that shown here, which means employment is expected to be higher across all education and training categories (see Chapter 3 of this volume).


Employment projections were compiled in this format by CBER.

Under TVAAS, the performance standard is improvement in the scores of individuals over time rather than groups, thus providing a better measure of accountability. An exit exam requirement was also put in place in 1995 to assess the preparedness of the state’s high school graduates for college or work. The final major objective was to overhaul the high school curriculum, which thus far has resulted in the elimination of the “general track” and the design of a common core of competencies in academic areas such as math, science, and language arts.

Noncollege education and training programs. Perhaps the most important objective of secondary education is to prepare students for college and the workplace. Secondary schools in Tennessee and the rest of the nation are focused almost entirely on preparing students for college, and as a result, most have done an acceptable job of preparing students for additional formal education. Unfortunately, many of these schools have not done an adequate job of preparing non-college-bound youth for the workplace. Furthermore, young people have few options for formal training once they do graduate from high school. Meanwhile, even the jobs at the lowest level of the occupation hierarchy are demanding more intensive training, and training needs are expected to be much greater in the future.

Table 4.5 shows that the fastest-growing occupations that do not call for formal post-secondary education are those necessitating more intensive training than that which can be acquired on the job—occupations that demand extensive experience in a related occupation or post-secondary vocational training. The only exception is occupations requiring solely short-term on-the-job training, such as food service workers, janitorial workers, and cashiers. The demand for these types of jobs generally rises with increases in the standard of living as people eat out more and purchase
more domestic services; however, they will always be low-paying jobs.

The most common way for non-college-bound youth to receive training in high school is vocational education. Traditionally, vocational education has provided trainees a set of skills that could be employed in a series of routine tasks directed by an immediate supervisor. Yesterday’s workplace, characterized by mass production and centralized decision-making, did not require workers to understand why they performed the tasks they did, how these tasks fit into the overall scheme of production, or how their skills could be applied in alternative situations. 23 In today’s rapidly changing economy, however, such a “laundry list” of skills is no longer sufficient to guarantee a lifetime of productive work.

First, skills become obsolete much faster today than they did in the past, and the pace of skill obsolescence is expected to accelerate in the future. Today’s employers want workers who are not only trained for a specific job at hand, but perhaps more importantly, are able to learn new skills as technology and/or the needs of the employer change. Future workers will be required to use the workplace to build their own knowledge and to enhance their skills.

Secondly, businesses have changed the structure of their organizations in response to increased international competition and the rapidly changing economic environment. Formerly separate functions have been integrated, responsibility has become less centralized, and employees at all levels have been called upon to become more actively involved in decisions of the firm. A case in point is the recent wave of corporate downsizing, which has eliminated a large number of middle managers from the nation’s workforce. Workers who were formerly engaged in predominantly routine tasks are now being asked to make value judgements and to work more closely with their professional colleagues.

For the reasons listed above, vocational education as traditionally practiced is not likely to be an effective means of training youth in the future, yet vocational training will be increasingly valuable to non-college-bound youth over time if they are to find meaningful, well-paying jobs. The problem is not with vocational education in and of itself, but with the way it is structured. One reform option that has received considerable attention recently is the integration of academic and vocational education. 24 Integrating academic content into vocational training ensures that student-trainees acquire a sufficient conceptual understanding of their occupations to adapt to future changes in their work environments. By integrating theory and practice, students gain new insights and motivation in academic subjects and realize a deeper content in their vocational studies. Research in the cognitive sciences has demonstrated that academic knowledge is best learned in a “real world” problem-solving context. 25 Moreover, because they develop their skills in a workplace atmosphere, they get practice in learning-in-context, which is necessary to utilize their academic training to adjust to changing work conditions. Finally, integrated academic and vocational education ensures that vocational students have the academic background necessary to continue their formal education at a more advanced level, should they choose to do so. Preserving the option of continuing studies not only secures for vocational students broader career choices, but also encourages more ambitious and academically talented students to acquire practical working skills.
Mediums for integrating academic and vocational training range from less thorough forms such as applied academics courses and interdisciplinary collaborations between two teachers, to fully integrated programs such as career academies, career-oriented clusters or majors, and occupationally oriented magnet schools. Career academies are organized as schools within schools, with a distinct subset of students in a high school taking a sequence of courses together. Each academy has a vocational theme such as electronics, health professions, or business, and is oriented toward an entire industry rather than a particular occupation within an industry. Even very traditional academic subjects such as mathematics, science, and English are taught under the guise of the occupation theme, and efforts are made to apply the course content to real work situations. Active involvement of local employers is also characteristic of career academies. Although only 100 career academies currently exist across the country, their highly documented successes promise to make them the new standard in vocational education. A cost-benefit analysis for one career academy cohort of 327 students in California showed a net benefit to taxpayers of $1.75 million from a $0.75 million expense. Magnet schools are similar in structure to career academies, but generally are physically separate entities with enrollment open to students beyond a regular attendance zone. Although the first magnet schools were opened about the time career academies were developed, there are thousands of magnet schools currently in existence around the country, including several in the state of Tennessee. The first national study of magnet schools in 1983 found that although these schools often involve extra costs for start-up and in some cases a small additional per-pupil expenditure (mostly for higher teacher salaries), they generally result in significant quality gains over traditional high schools, even when the magnet schools do not have highly selective admissions criteria. Moreover, the added costs have been shown to decline over time.

Another option for improving the prospects of non-college-bound youth is better counseling services in secondary schools. Most high school counselors are so overwhelmed with helping students in the college admissions process that little or no effort is expended on non-college-bound youth looking for advice on finding a job or preparing for work after high school. One promising solution to this problem is to designate certain guidance counselors or other staff members as a resource exclusively for those who intend to enter the labor force immediately after high school graduation. Some school systems in the United States have already made successful use of this approach. For example, in an effort to keep dropout-prone students in school and to make them more employable after graduation, the New York City school system employs several “job specialists” as regular members of the faculty. In addition to providing academic and employment counseling, job specialists help students locate part-time work during the school year and full-time employment during the summer months. They also are responsible for organizing and coordinating all other job-related services, developing training curricula with employers, and serving as a regular link between the school system and the business community.

Public-private partnerships in education can give a substantial boost to any effort to improve job readiness in high school graduates. Employers often complain that much of what is taught in schools is presented in a format that makes it irrelevant in the
workplace. Partnerships between local businesses and school districts can give employers an opportunity to contribute to the design of school curriculums, which provides them with a more qualified labor pool. In return, employers could provide on-the-job training, special presentations, and job-related material for inclusion in the classroom, or they could serve as mentors to students and teachers. Teachers would benefit by gaining access to real-world learning resources and state-of-the-art vocational expertise. Finally, students would not only gain more applicable knowledge and skills, but would also have additional opportunities for part-time and permanent jobs through their employer contacts.

One promising job training option that is used extensively and successfully in Europe and Asia, but rarely in the U.S., is apprenticeship programs. In Germany, over 70 percent of individuals in the 16-19 age group are enrolled in apprenticeship programs sponsored by over 500,000 different employers and covering 380 occupations. In the U.S., by contrast, less than two percent of high school graduates enter apprenticeship programs, and these are mostly in unionized construction trades and large-scale manufacturing. The three-year German programs involve four days per week on the job, followed by one day in “work school.” Apprentices benefit by earning a formal certification in their trade that is recognized throughout the country and the guarantee of a good job after completing the program. Employers benefit by ensuring themselves access to a continuous pool of qualified workers with a known standard of proficiency. Although there are aspects of the German system that would be unacceptable in Tennessee and the rest of the nation (there are restrictions on individual career choices, and many of the institutions that have developed in Germany over centuries probably could not be replicated in the U.S.), much can be learned from the German experience. An expansion of the use of apprenticeship programs in Tennessee would provide future workers with an opportunity to learn a marketable skill, an opportunity they are unlikely to have outside of the college system. Moreover, the development of industrywide, nationwide skill standards would assure apprenticeship participants that their knowledge and skills would be widely recognized throughout the business community, thereby giving them a greater incentive to put forth the time and effort necessary to learn a trade.

Community colleges serve as the cornerstone of most post-secondary training in Tennessee and the rest of the nation, and not surprisingly, some of the most innovative approaches to post-secondary job training are designed for these two-year colleges. One option that has received much attention in the workforce development community is Tech Prep. Similar to career academies and occupationally oriented magnet schools, Tech Prep programs are designed to integrate academic and experiential learning; however, they differ from other models in that they involve a clear articulation between high schools and community colleges. The most common form of Tech Prep is the 2+2 program, which encompasses the last two years of high school, followed by two years in a community college. Participants leave the program with an associate’s degree and certifiable skills, typically in applied science, engineering technology, health, or an industrial trade. Other Tech Prep programs are beginning to be developed as well, including a 4+2 program that begins in grade 9, and a 2+2+2 program that begins in high school, followed by two years in a community
college and finally two years in a four-year institution where participants earn a bachelor’s degree. The federal government has taken an increasing interest in Tech Prep programs over the last few years, as evidenced by the passage of the Carl D. Perkins Vocational and Applied Technology Act of 1990 (Perkins II). Among other things, this legislation allows states to use basic grant dollars to fund Tech Prep and targets federal policy toward implementing local 2+2 Tech Prep programs. More recently, the federal government has recognized Tech Prep as one of several options for improving the nation’s school-to-work transition system.

Adult Education

Although most of the discussion thus far has focused primarily on the education and training of Tennessee’s young people, it is recognized that in today’s rapidly changing economy, quality education and training must be available for adults as well as youth. This is very important in Tennessee as the low skill jobs of the past are replaced by more demanding positions. Training among young people usually receives the bulk of national attention because workers change careers so often during their early years in the labor market. In the future, however, older adults are likely to see less stability in their employment given the increased dynamics of the state economy. Thus, training for older adults is likely to receive higher priority in coming years.

Several options are available for adults who wish to improve their skills and hence their employability. A large number of adults that do not fall into the traditional college-age cohort have been attending colleges and technical schools in increasing numbers over the last decade, mostly on a part-time basis. Other adults attend basic education courses, GED preparation classes, or adult high school programs to improve their basic skills or to complete a high school diploma. Finally, a very common resource for adult education is employer-sponsored training programs or other job-specific courses.

Although those without formal education beyond high school would seem to have the greatest need for education and training, Figure 4.3 demonstrates that participation in adult education courses or programs in the United States is strongly correlated with educational attainment.

Only 16 percent of Americans with less than a high school diploma participated in adult education in 1994-95, compared to 31 percent of those with high school diplomas and 58 percent of those with bachelors’ degrees or higher. Those with higher levels of
educational attainment were not only more likely to participate in adult education, but were also more likely to participate in more than one activity over the course of the year. Differences in the type of adult education activities undertaken also appeared across educational attainment profiles. For non-high school graduates, personal development courses were the most common choice (7 percent), followed by adult basic education or GED preparation (5 percent). At the other end of the scale, adult education activities for those with college education generally were work related (38 percent).

Since less educated workers tend to have the most difficult time finding high-wage employment and are the most likely individuals to suffer technology-related job losses, Tennessee should see significant future benefits from any efforts to promote adult education among the less educated. Especially important is encouraging working-age adults who never finished high school to earn GED or similar credentials. The lack of a high school diploma or equivalency qualifies individuals for only the lowest end of the occupation spectrum. Also important is that Tennessee provide expanded access to adult education programs for workers who find themselves with obsolete skills.

**Information and Integrated Service Delivery**

Often there are a large number of job vacancies in the economy concurrent with a substantial number of qualified and unemployed workers. This seemingly incongruous situation is perceived by many, especially in the last few years, to be a problem of people not wanting to work or being unreasonable in their job expectations. While that may be true to some degree, a significant portion of the problem can be explained by an inadequate flow of information between employers and job-seekers. Improved information flows can enhance the labor market’s functioning and therefore facilitate economic growth.

**Job Matching**

Perhaps the greatest information need is job-matching. Too often employers have labor needs that can be met by unemployed workers in their community, yet positions remain unfilled because workers are unaware of existing job vacancies. Job-seekers frequently restrict their job search routines to scanning newspaper want-ads, pursuing personal contacts with family and friends, or “cold calling” potential employers. While these approaches sometimes can lead to successful careers, they are both limiting in scope and very costly. There is a common misperception that most job openings are advertised in the newspapers, despite overwhelming evidence to the contrary, and few people have access to more than a handful of employment opportunities through contacts with family and friends. By restricting themselves to newspaper ads and personal contacts, job-seekers impose severe limitations on their ability to find employment. Cold calling, while theoretically unlimited in scope, is by far the most inefficient way to search for work because it involves such an inordinate expense of time and effort compared to other job search options. Although these traditional means for finding a job are both ineffective and costly, job-seekers unfortunately have few other options. Conventional employment agencies may give some relief from the job-hunting ordeal, but the information they provide is far from comprehensive and often comes at a
considerable monetary cost to either the job-seeker or the employer. There is a great need in Tennessee and elsewhere for a centralized location where job-seekers can have access to comprehensive information regarding the number and kinds of jobs that are available in their communities.

The job matching dilemma is really a problem of information dissemination rather than information availability or quality. The information is out there to be found but is so scattered and disorganized that job-seekers and employers do not know where to look for it. Moreover, the information is not standardized, which makes comparisons across job opportunities or prospective hires difficult. The best thing Tennessee can do to simplify job matching in the state is to establish a means for collecting comprehensive information from both employers and job-seekers, organize the information in an easily accessible and uniform format, and provide the information in a central, universally accessible location. The Tennessee Department of Employment Security has already made significant progress in developing the infrastructure for accomplishing this task through ALEX, its computerized jobs information system. ALEX is part of a nationwide network of job listings known as America’s Job Bank (AJB). AJB links over 2,000 state employment services and averages over 500,000 job openings. Nevertheless, the state must do a better job of encouraging participation, marketing the services, and providing access if it wants to make its system more effective.

*Using the Internet to facilitate job matching.* The Internet, especially the World Wide Web, is increasingly being used as a medium for job-matching, and has the potential for being the standard job search tool in the future. The benefits of using the Internet for job-matching are substantial:

- Going online gives job-seekers access to potential employers that otherwise would have been inaccessible.
- A single resume or job announcement can reach millions of people.
- Putting information on the Internet costs very little if anything at all.
- Information can be easily updated or removed.
- Individuals have virtually costless access to comprehensive labor market information in a central location.

Many states (including Tennessee) and federal agencies have already begun to utilize the Internet as an interface between job-seekers and prospective employers. For example, workforce development professionals in Utah, Connecticut, and Michigan are working together with the U.S. Department of Labor to provide labor market information through the ALMIS Talent Bank, an Internet service that allows job-seekers to post their resumes in a simple, graphical web-browser form. This program will be made available to the Tennessee Department of Employment Security as soon as the U.S. Department of Labor completes the pilot study. Prospective employers can then read resumes after entering a username and password. Many other Internet Services, including Online Career Center, Career Mosaic, and The Monster Board allow interactive participation by both employer and job-seeker.

The Monster Board is a privately operated but free service provided by TMP Worldwide that provides an excellent model for other Internet-based labor market information services. Job-seekers may post online resumes, establish a computerized personal job search agent to help them isolate job
opportunities that meet their interests and qualifications, or review a selection of articles on job search techniques and other career advice. Employers have options that include listing job openings in an Employer Profile and searching the database for job-seekers that meet their employment criteria. The Monster Board has access to over 50,000 jobs worldwide and has received great reviews by employers. For example, a human resources manager at Price Waterhouse reported that over 5 percent of new hires come from the Monster Board, and that she receives over 15 e-mails and numerous faxes daily from people responding to job openings listed on the service.

Using the Internet to provide labor market information is one of the most effective and least costly means for Tennessee to facilitate job matching in the state, but is somewhat limited by the number of individuals who have access to the Internet. Although more and more people are discovering personal computing and the Internet every day, Tennessee’s job matching efforts would be greatly enhanced by providing an Internet gateway to job-seekers who otherwise would not have access. One way to accomplish this objective would be to equip employment service centers, schools, libraries or other state institutions for public Internet use. The Tennessee Department of Employment Security, which received a $164,000 grant in late 1996, is in the process of expanding Internet access for job applicants. Tennessee would likely see additional benefits from making existing state labor market information databases available to job-seekers and employers over the Internet.

Job Requirements

In addition to having information regarding current job availability in their communities, job-seekers also need to know the education and training expectations of prospective employers. A future option for enhancing this awareness is the Occupational Information Network (O*NET), which is expected to become fully operational by the 21st century. O*NET is currently under development by the Employment and Training Administration. It is intended to be a database which will identify the skills, abilities and requirements needed for jobs across the country. Included in the database are job descriptions, occupational outlooks, wage information, working environments, and job requirements such as basic skills, education, licensing, occupation-specific knowledge, training, and experience. Much of the information that will be incorporated in the new system is already available in various formats today, including the Directory of Occupational Titles, which O*NET is specifically designed to replace, ALMIS databases, the SCANS report, industry based skills standards, and many other sources. The problem is that this information generally is used only by professionals in government and industry and is not readily available to the general public. Job requirements information such as that contained in O*NET would be a very complimentary addition to job matching databases or other consolidated employment services. The Tennessee Department of Employment Security will begin using O*NET as soon as it becomes available.
Occupational Awareness

An often overlooked information problem is the lack of awareness among many individuals concerning the types of occupations that are available to them. The Dictionary of Occupational Titles currently lists almost 13,000 different job titles, but the average person is likely to be aware of only a fraction of that number. Tennessee must ensure that its residents have access to information regarding the types of jobs that will be available in the future so that workers may adequately prepare for those jobs today. For example, workers whose skills have become obsolete may need some direction in finding a new occupation. Access to this type of information is especially crucial for disadvantaged youth who generally are acquainted with only a narrow range of jobs through interactions with family and neighbors or through the media. Because they are not attuned to a large number of middle-range jobs, many of these youth have a very distorted view of the occupational hierarchy. They frequently aspire to prestigious professional careers, but feel they must settle for menial employment if these aspirations are not achieved. Youth in rural communities are likely to face similar information constraints. The New York City Job and Career Center provides an attractive model for increasing career awareness among young people. There high school students as well as high school drop-outs and unemployed adults have an opportunity to explore career options in a centralized location. Information is presented in traditional formats such as printed material, but also through more innovative approaches such as special exhibits, visual displays, and invited speakers. The Tennessee Occupational Information System, a computer-based system developed by the Tennessee Department of Employment Security to help individuals explore job availability, is a step in the right direction.

A central location where both employers and job-seekers can obtain comprehensive labor market information would go along way in providing labor market information to job seekers. One attractive option for consolidating information is to create a business directory of training resources and providers, as suggested by the Tennessee Board for Economic Growth. Integrating other employment and related services into a labor market information center would provide even greater benefits by providing for a more customer-oriented focus in service delivery, and greater accountability and fiscal management.

Integrating Employment and Related Services

As mentioned earlier, the federal government has made a commitment to give more responsibility to the states for implementing and administering economic and social programs formerly operated at the federal level. At the same time, the issues of welfare reform, education reform, and workforce development have become elevated in the public consciousness, putting increased demands on these programs and the agencies that operate them. Taken together with the current environment of fiscal restraint in the federal government, this means that states are being asked to do much more while receiving far fewer resources. As Tennessee takes charge of the state’s workforce development, it must find ways to make the delivery of employment services less costly. Tennessee cannot afford the inefficiencies of the current federal system. Integrating the delivery of employment and related services would go far
in alleviating this financial burden by eliminating redundancies across agencies, reducing the costs of overhead and staff, and using modern information and communications technologies to ensure the most efficient use of increasingly limited resources. Integrating employment and related services would not only substantially reduce costs, but, more importantly, would improve the quality of public services and provide more universal access, thereby resulting in better outcomes.

**One-Stop Career Advancement Centers.** The state of Tennessee is already making great strides in providing low cost, universal access to labor market information and integrated employment services. A statewide One-Stop Career Advancement Center System, which is designed to integrate a large number of services that are currently provided by multiple departments and agencies (see Table 4.6) has recently been proposed as a way to tabulate employment and related services. Four pilot One-Stop Centers would initially be located in Clarksville, Knoxville, Memphis, and Nashville, but eventually the system would be expanded to 14 centers corresponding to the labor regions defined by the Tennessee Department of Employment Security. Each of these centers would then have a rural satellite center(s) connected to it electronically to improve access. Much of the proposed system is designed to take advantage of recent innovations in electronic communications. For example, in addition to linking all the One-Stop Centers electronically, existing labor market information databases would be synthesized as the Tennessee CareerLink System to facilitate access. Eventually oversight authority for the One-Stop Career Advancement Center System would be transferred from the state government to non-service-providing Workforce Development Boards; however, administrators of individual centers would be given the flexibility to operate their centers in the way that best meets the needs of their local communities.

**Conclusion**

Workforce development is the key to Tennessee’s future economic successes. In the past Tennessee has done a good job of creating an attractive environment for business in terms of its government performance, quality of life, abundant resources, and entrepreneurial spirit, but its economic development efforts have been curtailed by a labor force that is ill-prepared for the competitive challenges of tomorrow’s rapidly changing economy.

There is a clear role for Tennessee’s public sector in workforce development, a role that cannot be met by individuals or business firms. The biggest hurdle in work force development is

<table>
<thead>
<tr>
<th>TABLE 4.6</th>
<th>Integrated Services that Would Be Provided by the Tennessee One-Stop Career Advancement System</th>
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<tbody>
<tr>
<td>Services</td>
<td>Former Agency/Department</td>
</tr>
<tr>
<td>Job training resources</td>
<td>U.S. Department of Labor Private Industry Councils (PICs)</td>
</tr>
<tr>
<td>Labor exchange, unemployment insurance, and job search assistance</td>
<td>Tennessee Department of Employment Security</td>
</tr>
<tr>
<td>Income support, child care and transportation assistance, medical insurance coverage, and food stamps</td>
<td>Tennessee Department of Human Services</td>
</tr>
<tr>
<td>Access to Tennessee education and training institutions</td>
<td>Various public and private institutions</td>
</tr>
</tbody>
</table>

Source: One-Stop Career Advancement Center, Executive Summary, 1996.
organization and coordination, and only the government has the resources and power to consolidate the huge number of disconnected public and private efforts into an efficient workforce development system.

In the next few years, Tennessee will be given a tremendous opportunity to develop its workforce into a well-educated, well-trained, productive engine for economic growth and international competitiveness. Past experience with workforce development suggests that if Tennessee is to make the most of this opportunity, it must move away from large-scale government job training programs and fragmented service delivery and instead concentrate its energy and resources on proven agendas: education, general training, and improved information access. Potential workforce development options discussed in this chapter include the following:

- Improved counseling services and new curriculum structures for non-college-bound youth
- School choice
- Career academies, magnet schools, Tech Prep, or similar efforts to integrate academic and vocational training
- Apprenticeship programs
- Public-private partnerships between schools and employers
- Promotion of higher education and other forms of adult education
- Universal access to comprehensive labor market information for both job-seekers and employers in a centralized location
- Increased use of the Internet and other new technologies to facilitate job matching
- Consolidation of existing employment and related services into a single coordinated workforce development system

As Tennessee sets out to improve the quality of its labor force, it must also remember that workforce development goes hand in hand with economic development. The state cannot itself make improvements in labor force quality; it must instead encourage investment in education and training and ensure that opportunities exist for all who wish to enhance their skills. Economic growth, specifically employment growth, creates a favorable environment for individuals in which to reassess their employment options. A consistently high level of economic activity increases their willingness to endure short-term costs for potential long-term gains. In that regard, one of the best ways for Tennessee to improve the quality of its workforce is to create an environment of economic expansion.

Tennessee has already made great progress toward its goal of developing a world-class workforce that is highly skilled and adaptable to changing economic conditions, but much remains to be done. Tennessee’s government agencies and vibrant business community are committed to reaching this goal, and although the objectives are far-reaching, with the proper focus and a valiant effort, they are certainly attainable.

Endnotes


8. For each factor the index value (range 0 to 18) gives the average number of the 18 primary competitor states (predominantly states in the southeast, Midwest, and southern plains) to which Tennessee compares equally or favorably. For example, to achieve an index value of 18, Tennessee would have to compare favorably to every state for each item in that category.


10. The G7 countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.


