The State’s Economic Outlook

January 2008
Contributors to this Report

An Economic Report to the Governor of the State of Tennessee

Authors
Center for Business and Economic Research
Matthew N. Murray, Associate Director and Project Director
William F. Fox, Director
Donald J. Bruce, Research Associate Professor
Vickie C. Cunningham, Research Associate
Katherine Harper, Graduate Research Assistant
R. Brad Kiser, Research Associate
Zachary W. Richards, Graduate Research Assistant
Martin Tackie, Graduate Research Assistant

Agricultural Policy Analysis Center, Department of Agricultural Economics
Harwood D. Schaffer, Research Associate
Kelly H. Tiller, Assistant Professor
Daryll E. Ray, Blasingame Chair of Excellence Professor

Project Support Staff
Betty A. Drinnen, Program Resource Specialist
Matthew J. Harper, Research Associate
LeAnn Luna, Research Assistant Professor
Julie L. Marshall, Research Associate
Carrie B. McCamey, Communications Coordinator
Joan Snoderly, Research Associate
Angela R. Thacker, Research Associate

The preparation of this report was financed in part by the following agencies: the Tennessee Department of Finance and Administration, the Tennessee Department of Economic and Community Development, the Tennessee Department of Revenue, the Tennessee Department of Labor and Workforce Development, and the Appalachian Regional Commission.

This material is the result of tax-supported research and as such is not copyrightable. It may be freely reprinted with the customary crediting of the source.

UT Publication Authorization Number E01-1490-005-08.
Preface

This 2008 volume of An Economic Report to the Governor of the State of Tennessee is the thirty-second 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 first quarter of 2010 and annual forecast through 2017 represent the collective judgment of the staff of the University of Tennessee’s Center for Business and Economic Research in conjunction with the Quarterly and Annual Tennessee Econometric Models. The national forecasts were prepared by Global Insight, Inc. Tennessee forecasts, current as of January 2008, are based on an array of assumptions, particularly at the national level, which are described in Chapter One. Chapter Two details evaluations for major sectors of the Tennessee economy, with an agriculture section provided by the University of Tennessee Agricultural Policy Analysis Center. Chapter Three presents the long-run outlook and forecast for the state. Chapter Four discusses welfare policy changes and the extent to which graduates from Tennessee’s institutions of higher education contribute to the state’s economy.

The primary purpose of this annual volume—published, distributed, and financed through the Tennessee Department of Finance and Administration, Tennessee Department of Economic and Community Development, the Tennessee Department of Revenue, the Tennessee Department of Labor and Workforce Development, and the Appalachian Regional Commission—is to provide wide public dissemination of the most-current possible economic analysis to planners and decision-makers in the public and private sectors.
Contents

Chapter 1: The U.S. Economy ................................................................. 1
  1.1. Introduction ................................................................................ 1
  1.2. The U.S. Economy: Year in Review ........................................... 3
      Components of GDP ...................................................................... 3
      Inflation and Prices ..................................................................... 7
      The Labor Market ........................................................................ 7
  1.3. The U.S. Forecast ....................................................................... 12
      Investment and Interest Rates ....................................................... 12
      Consumption and the Labor Market ............................................. 13
      Government Spending .................................................................. 13
      Net Exports .................................................................................. 14
      Prices and Inflation ..................................................................... 14
  1.4. Alternative Scenarios ................................................................. 15
  1.5. Forecast Summary and Conclusions .......................................... 16

Chapter 2: The Tennessee Economy: Short-Term Outlook .... 17
  2.1. Introduction ............................................................................... 17
  2.2. The Current Economic Environment ........................................ 18
      State Labor Markets ...................................................................... 18
      Personal Income, Wages and Taxable Sales ................................... 20
      Tennessee’s Housing Market .......................................................... 21
  2.3. Short-Term Outlook .................................................................... 26
      State Labor Markets ...................................................................... 26
      Personal Income, Wages and Taxable Sales ................................... 28
  2.4. Situation and Outlook for Tennessee Agriculture ..................... 29
      Overview of Agriculture in Tennessee ......................................... 29
      Year in Review ............................................................................. 29
      Tennessee Agriculture .................................................................... 29
      Agricultural Products in Tennessee .............................................. 30
      Tennessee Agricultural Sector Outlook ....................................... 31
      Farm Income .................................................................................. 31
      Crops Outlook ............................................................................... 31
      Livestock Outlook ......................................................................... 32
      Ag Sector Issues and Opportunities ............................................ 33
      Biofuels ......................................................................................... 33
      Tennessee Agricultural Enhancement Initiative .......................... 33
      Future Farm Policy ....................................................................... 34

Chapter 3: The Tennessee Economy: Long-Term Outlook .. 37
  3.1. Introduction ............................................................................... 37
  3.2. Long-Term Historical Trends .................................................... 38
      Employment Trends ....................................................................... 38
      State Gross Domestic Product and Per Capita Personal Income .... 40
      Population and Labor Force ......................................................... 42
      Business Leaders’ Attitudes Toward Education in Tennessee ....... 49
Contents, continued

3.3 Long-Term Economic Outlook ..................................................... 49
  Labor Market Outlook ................................................................. 55
  Income and Output ................................................................. 55
3.4 Tennessee’s Economic Outlook ............................................... 55

Chapter 4: Policy Watch ........................................................... 57
  Overview ........................................................................................ 57
      4a.1. Introduction ........................................................................ 58
      4a.2. A Brief History of Welfare Programs in the U.S.
            and Tennessee ........................................................................ 59
            The AFDC Era: 1935–1996 ...................................................... 59
            The 1996 Welfare Reforms ...................................................... 59
            The Welfare Reform Reauthorization of 2005 .................... 60
            What Activities Count as Work? ........................................... 61
      4a.3. The New Families First ......................................................... 64
            Education as a Work Activity ................................................. 64
            Time Limit Policies ............................................................... 64
            Tennessee’s New Diversion Program .................................... 64
            Performance-Based Contracting .............................................. 64
      4a.4. Future Welfare Policy Challenges in Tennessee .......... 66
            Education .............................................................................. 66
            Work Activity Participation Rate Requirements .................. 66
            Time Limits ........................................................................... 66
            Diversion Assistance .............................................................. 66
            References ............................................................................ 67
  4b. School-to-Work: Do Tennessee’s Higher Education
      Graduates Work in Tennessee .................................................. 68
      4b.1. Introduction ........................................................................ 68
      4b.2. State-Level Labor Market and Earnings Trends .......... 69
            Participation by Degree Type ................................................. 70
            Average Wages of Tennessee Graduates in the Tennessee
            Labor Market ........................................................................ 71
      4b.3. Employment and Earnings Trends by Institution ....... 76
            The Basic Question Revisited: Working or Not .................... 77
            Full-Time Wages of Tennessee Higher Education Graduates in
            the Tennessee Labor Market: Comparing Institutions .......... 78
      4b.4. Employment and Earnings Trends by Field of Study .. 82
            Workforce Participation Trends among Graduates: Comparing
            Fields of Study ...................................................................... 82
            Wage Trends among Graduates: Comparing Fields of Study .... 85
      4b.5. Conclusions ....................................................................... 88
Contents, Figures and Tables

Chapter 1: The U.S. Economy ................................................................. 1
  Figure 1.1. Inflation-Adjusted GDP Growth .......................................... 3
  Figure 1.2. Mortgage Rates and New Home Sales ............................... 4
  Figure 1.3. Home Prices and Housing Starts ................................. 5
  Figure 1.4. Inflation-Adjusted Exports and Imports............................ 6
  Figure 1.5. Inflation ................................................................. 7
  Figure 1.6. Average Gasoline and Oil Prices ...................................... 8
  Figure 1.7. Unemployment Rate ..................................................... 8
  Figure 1.8. Employment Growth .................................................... 9
  Figure 1.9. Disposable Personal Income ........................................... 9
  Figure 1.10. Worker Productivity .................................................. 10
  Figure 1.11. Foreign Exchange Rate .............................................. 11
  Figure 1.12. Expected Annual Percentage of Growth in the Primary Components of GDP ...................................................... 12

Chapter 2: The Tennessee Economy: Short-Term Outlook .................. 17
  Figure 2.1. Private Employment Growth: June 2006 to June 2007 .......... 18
  Figure 2.2. Monthly Unemployment Rate (seasonally adjusted),
              January 2006 to December 2007 ....................................... 20
  Figure 2.3. Monthly Unemployment Insurance Claims,
              January 2006 to December 2007 ....................................... 21
  Table 2.1: Per Capita Personal Income, 2005 (current dollars) .......... 22
  Figure 2.4. Tennessee Sales Tax Collections: Building Materials and
              Home Furnishings, January 2006 to October 2007 ............. 23
  Figure 2.5. Tennessee Realty Transfer and Mortgage Tax Collections .. 24
  Figure 2.6. Single-Family Building Permits, Tennessee Metropolitan
              Statistical Areas: March 2001 to November 2007 ............... 25
  Figure 2.7. Tennessee Job Growth by Sector, 2008 and 2009 .............. 26
  Table 2.2: Selected U.S. and Tennessee Economic Indicators,
              Seasonally Adjusted ...................................................... 27
  Figure 2.8. Leading Tennessee Commodities for Cash Receipts, 2006 .... 30

Chapter 3: The Tennessee Economy: Long-Term Outlook .................. 37
  Figure 3.1: Total Nonfarm Employment Growth, U.S. and Southeastern
              States: 1997 to 2007 ...................................................... 38
  Figure 3.2. Annual Private Employment Growth: 2000 to 2006 ............ 39
  Figure 3.3. Population Growth: 2000 to 2006 ................................ 39
  Figure 3.4. Percentage Change in Manufacturing Employment: 1997 to 2006 ...... 40
  Figure 3.5. Percentage Change in Number of Manufacturing
              Establishments: 1998 to 2005 ........................................ 40
  Figure 3.6: Per Capita Personal Income, U.S. and Southeastern States:
              1990, 2000, and 2006 ..................................................... 42
  Table 3.1. Population, U.S. and Southeastern States:
              1997, 2007, and 2020 ..................................................... 43
  Figure 3.7: Labor Force Participation Rate, U.S. and Tennessee: 1990 to 2017... 44
  Figure 3.8: U.S. Labor Force Growth by Gender ............................ 45
  Figure 3.9: U.S. Labor Force Growth by Race and Ethnicity ............ 46
Chapter 4: Policy Watch ........................................................... 57
Figure 4a.1. Welfare Programs History ................................................................. 59
Figure 4a.2. Tennessee Welfare Timeline ................................................................. 60
Table 4a.1. How Certain Educational Activities Count in the New Work Activities Definitions ................................................................. 61
Table 4a.2a. “Core” Activities ................................................................................. 62
Table 4a.2b. “Non-Core” Activities ............................................................................ 63
Figure 4a.3. Families First Contractor Zones ............................................................. 65
Figure 4a.4. Percentage of Higher Education Graduates Working in Tennessee .......... 71
Figure 4a.5. In-State and Out-of-State Student Participation in the Tennessee Labor Market ................................................................. 72
Table 4b.1. Average Annual Wages by Select Degrees ................................................ 73
Figure 4b.1. Workforce Participation by Degree Type .................................................. 74
Figure 4b.2. Average Annual Wages for All Full-time Workers .................................... 74
Figure 4b.3. Average Annual Wages by Select Degrees ................................................. 75
Figure 4b.4. Trend in Graduates Working in Tennessee ................................................ 76
Figure 4b.5. Trend in Graduates Working in Tennessee: Associate’s Degrees ............... 77
Figure 4b.6. Trend in Graduates Working in Tennessee: Bachelor’s Degrees ... 78
Table 4b.2. Wage CAGRs for Graduates of Tennessee Public Institutions ................. 79
Figure 4b.7. Trend in Wages for Graduates Working in Tennessee ................................ 80
Figure 4b.8. Trend in Wages for Graduates Working in Tennessee: Associate’s Degrees ... 80
Figure 4b.9. Trend in Graduates Working in Tennessee: Bachelor’s Degrees ............. 81
Table 4b.3. Trend in Graduates Working in Tennessee: Bachelor’s Degrees .... 83
Table 4b.4. Trend in Graduates’ Wages: Bachelor’s Degrees ........................................ 85
Education and welfare together represent a sizable share of state government spending in Tennessee. Because of the importance of these programs to the state budget and the citizens of the state, the Center for Business and Economic Research has maintained an active research agenda focusing on both education policy and welfare policy. In this chapter we provide policy research briefs that share some of our findings from two recent endeavors. The first is a profile of changes made by the state legislature to the state’s Families First program in the last legislative session. The second part of the chapter explores the extent to which graduates from Tennessee’s institutions of higher education contribute to the state’s economy. For a comprehensive look at our research on these and other state policy matters, see http://cber.bus.utk.edu.
4a. Welfare Assistance in Tennessee: A Policy Update

4a.1. Introduction

Tennessee experienced several major changes to its welfare policies in the past year. Tennessee’s welfare program, Families First, must now align with federal rules following the mid-2007 expiration of a waiver that enabled the state Department of Human Services (DHS) to diverge from federal rules in various ways. The purpose of this policy update is to review the most significant changes in Tennessee welfare policy since the expiration of the waiver.

Following a brief historical overview of U.S. and Tennessee welfare policies, we discuss the major features of the newly-reauthorized federal welfare program. We then present an overview of the changes that were made to bring Tennessee’s program into compliance with federal rules. The discussion ends with a presentation of several salient welfare policy issues on the horizon in Tennessee.
4a.2. A Brief History of Welfare Programs in the U.S. and Tennessee

**The AFDC Era: 1935–1996**

Broad-based assistance to needy families began with the implementation of the Aid to Families with Dependent Children (AFDC) program in 1935. Throughout the course of its 61-year history, AFDC was characterized by cash payments to families with few restrictions on receiving benefits and little differentiation between states’ programs. The AFDC program was criticized for discouraging work effort, since benefit amounts were reduced dollar-for-dollar as labor earnings increased.

**The 1996 Welfare Reforms**

Partly in response to this criticism, a number of states including Tennessee began to reform their welfare programs in the 1980s and early 1990s, leading up to a major federal welfare reform—the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996. PRWORA replaced AFDC with the Temporary Assistance to Needy Families (TANF) program.

PRWORA was indeed a substantial departure from “welfare as we knew it” under the old AFDC program. The new TANF system, using block grants from the federal government to the states, gave states increased flexibility along with increased administrative and policy responsibilities. Two of the most significant changes to the welfare system were the addition of a 60-month limit on lifetime benefit receipt, and requirements that able-bodied adults engage in some form of work activity.


Tennessee was one of the states that were granted waivers from AFDC rules before PRWORA was enacted. Some of these pre-PRWORA waivers, including Tennessee’s, were honored and therefore Tennessee was not subject to many aspects of the reformed federal welfare program. Interestingly, Tennessee’s 1996 welfare program—Families First—had many of the same features of the new TANF program at the time.¹ Like TANF participants in other states, Families First participants were subject to work requirements and time limits. There were a few important differences between Families First and TANF programs in other states.

For one, Tennessee was among several states that opted to implement an interim time limit in addition to the 60-month requirement required by TANF. During the waiver era of Families First, recipients could receive benefits for 18 months at one time but were required to leave the program for at least three months before returning to Families First. In addition to monthly checks, support services such as education, job training, child care, transportation, and mental health services, were provided

---

¹ For a complete summary of Families First policies see Center for Business and Economic Research (2000).

---

Figure 4a.1. Welfare Programs History

- **AFDC 1935**: Cash assistance, Few limits on requirements
- **TANF 1996**: Block grants to states, Welfare to work requirements
- **TANF 2007**: Increased accountability for states, Stricter requirements for training, education
to remove barriers to work activity. Tennessee’s menu of support services was relatively more extensive than those in other states.

Education was a significant component of Tennessee’s Families First welfare program, which used the federal waiver’s flexibility to emphasize adult education and training more than the federal law. Under the waiver, Families First recognized the importance of training by allowing for a wider array of non-work activities to count toward the fulfillment of work requirements. Tennessee also did not limit the duration of adult education or English as a Second Language (ESL) participation for Families First recipients. However, those allowances were coupled with a heavier 40-hour work requirement per week, as opposed to 30 hours under the 1996 federal TANF guidelines. Most importantly, in Tennessee, up to 20 of these 40 hours could be used for the purposes of education and training.

Previous CBER research has explored the relative importance of work and education or training as components of overall work requirements for welfare recipients. While work-first strategies were successful in some areas, many welfare recipients lacked the education or skills needed to succeed in the labor market. Those who participated in education or training activities as part of their work requirement were generally found to fare at least as well as those in work-only activities.

The Welfare Reform Reauthorization of 2005

The 1996 welfare reform law was reauthorized in a revised form as part of the Deficit Reduction Act (DRA) of 2005. Key elements of the revisions, which were made effective in 2006, are stricter definitions of work activities and more binding requirements regarding federally-mandated work activity participation rates. Unlike most states, Tennessee did not need to immediately comply with these new regulations because its waiver from federal rules lasted until June 30, 2007. We return to a discussion of Tennessee’s response to the expiration of its waiver below.

The 2005 federal legislation continued the 60-month lifetime limit for federal TANF cash assistance and continued to allow states to exempt up to 20 percent of their cases from the limit. However, while the reauthorization maintained the original law’s requirement that 50 percent of states’ welfare caseloads (and 90 percent

---

2 See Bruce, Deskins, and Thacker (2003) and Deskins and Bruce (2004) for analyses of work requirements in Tennessee.
4a.2. A Brief History of Welfare Programs in the U.S. and Tennessee, continued

of two-parent families) fulfill statutory work requirements, the benchmark year for caseload reduction credits was changed from 1995 to 2005.

To demonstrate the importance of this, consider the following brief example. Before reauthorization, states enjoyed lower work requirement participation rates if their caseloads declined relative to 1995 levels. If a state’s caseload fell by 20 percent, for example, it only had to have 30 percent (or 50 minus 20) of its caseload engaged in work activities. As a result of moving the benchmark year for caseload reduction credits to 2005, a year in which caseloads were typically much lower than in 1995, virtually all states are now facing higher work activity participation rate requirements. They also face significant financial penalties if those requirements are not met.

**What Activities Count as Work?**

To fulfill work requirements, TANF recipients (including those in Tennessee) must now participate for 20 hours per week (or 30 hours in cases where the youngest child is 6 years old or older) in one or more of the 12 work activities named in the statute. “Core” activities (from which at least 20 hours/week of participation must come) include unsubsidized employment

<table>
<thead>
<tr>
<th>Activity</th>
<th>Is it countable as: vocational educational training?</th>
<th>Is it countable as: job skills training?</th>
<th>Is it countable as: education directly related to employment for someone without high school diploma or GED</th>
<th>Is it countable as: satisfactory school attendance?</th>
<th>Is it countable as: on-the-job training</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESL</td>
<td>Yes-- if included as preparation for specific occupation</td>
<td>Yes-- if instruction is explicitly focused on skills for employment or combined with job training</td>
<td>Yes</td>
<td>Yes-- if linked to attending a secondary school or leading to a GED.</td>
<td>Yes-- if provided by employer in the workplace.</td>
</tr>
<tr>
<td>Basic Education</td>
<td>Yes-- if included as preparation for specific occupation</td>
<td>Yes-- if instruction is explicitly focused on skills for employment or combined with job training</td>
<td>Yes</td>
<td>Yes-- if linked to attending a secondary school or leading to a GED.</td>
<td>Yes-- if provided by employer in the workplace.</td>
</tr>
<tr>
<td>High School Equivalency</td>
<td>No</td>
<td>Yes-- if prerequisite for a job or occupation.</td>
<td>Yes-- if prerequisite for a job or occupation.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Post-secondary Education</td>
<td>Yes-- if related to an occupation, excluding a BA or advanced degree.</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: CBPP/CLASP (2006). Note: Specific models of the education activities described above may not be countable, depending on the interpretation of the regulations.
### Table 4a.2a. “Core” Activities
(from which at least 20 hours/week of participation must come)

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Federal Definitions Under New Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsubsidized employment</td>
<td>Full- or part-time employment in the public or private sector that is not subsidized by TANF or any other public program.</td>
</tr>
<tr>
<td>Subsidized private sector employment</td>
<td>Employment in the private sector for which the employer receives a subsidy from TANF or other public funds to offset some or all of the wages and costs of employing a recipient.</td>
</tr>
<tr>
<td>Subsidized public sector employment</td>
<td>Employment in the public sector for which the employer receives a subsidy from TANF or other public funds to offset some or all of the wages and costs of employing a recipient.</td>
</tr>
<tr>
<td>On-the-job training</td>
<td>Training in the public or private sector for a paid employee while he or she is engaged in productive work and that provides knowledge and skills essential to the job.</td>
</tr>
<tr>
<td>Job search and job readiness assistance</td>
<td>In addition to job searches, activities may include life skills training, and short-term substance abuse treatment, mental health treatment, or rehabilitation activities for those who are otherwise employable. Because Tennessee is currently designated as a “needy state” the federal government allows 12 weeks of Job Search and Job Readiness Assistance per client per year in intervals of no more than four (4) consecutive weeks.</td>
</tr>
<tr>
<td>Work experience</td>
<td>A work activity which provides an individual unable to locate unsubsidized employment with an opportunity to gain general skills, knowledge, and work habits to improve their employability.</td>
</tr>
<tr>
<td>Community service programs</td>
<td>Structured programs in which TANF recipients perform work for the direct benefit of the community under the auspices of public or nonprofit organizations. Community service programs must be limited to projects that serve a useful community purpose and improve the employability of recipients not otherwise able to obtain employment.</td>
</tr>
<tr>
<td>Vocational educational training not to exceed 12 months</td>
<td>Organized educational programs that are directly related to the preparation of individuals for employment in current or emerging occupations requiring training other than a baccalaureate or advanced degree, including work-focused general education and language instruction.</td>
</tr>
<tr>
<td>Child care for an individual participating in a community service program</td>
<td>Providing child care to enable another TANF recipient to participate in a community service program.</td>
</tr>
</tbody>
</table>
and subsidized private or public sector employment. On-the-job training in the public or private sector counts as a core activity only when a paid employee engages in productive work that provides knowledge and skills essential to the full and adequate performance of the job. Indeed, on-the-job training in Tennessee is actually being counted as paid employment or work experience. Table 4a.1, drawn from a recent report from the Center on Budget and Policy Priorities and the Center for Law and Social Policy, clearly lays out the situations in which certain education activities can count toward work requirement hours. Tables 4a.2a and 4a.2b lists and defines the various categories of “core” and “non-core” work activities in the new TANF regime.

Another change brought about at the federal level by the DRA of 2005 is that a larger pool of families is now subject to the work requirements. Families receiving assistance in separate state programs, who were previously excluded from the participation rates, are now included. The 2005 legislation also added new accountability measures for states, especially related to work verification, and implemented penalties for non-compliance with the state’s required Work Verification Plan. Penalties range from a one to five percent reduction in a state’s TANF grant for each year of non-compliance. Additional measures focus on limiting recipients’ excused absences from work and requiring education and training to be directly related to a specific job. Each of these additional measures, while focusing benefits more directly on work, also add administrative burdens to the states.

### Table 4a.2b. “Non-Core” Activities (cannot count without 20 hours/week from “core” activities)

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Federal Definitions Under New Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job skills training directly related to employment</td>
<td>Training or education for job skills required by an employer to provide an individual with the ability to obtain employment or to advance or adapt to the changing demands of the workplace.</td>
</tr>
<tr>
<td>Education directly related to employment</td>
<td>Education related to a specific occupation, job, or job offer.</td>
</tr>
<tr>
<td>Satisfactory attendance at secondary school or in a GED program</td>
<td>Regular attendance, in accordance with the requirements of the secondary school or course of study, at a secondary school or in a course of study leading to a certificate of general equivalence, in the case of a recipient who has not completed secondary school or received such a certificate.</td>
</tr>
</tbody>
</table>
4a.3. The New Families First

Education as a Work Activity

Tennessee made a number of changes to its Families First program following the elimination of the waiver in mid-2007, primarily to meet the requirements of DRA 2005. Perhaps most importantly, post-secondary education, adult basic education and job skills training as previously defined under the waiver are no longer includable activities. The allowable activities are now categorized as job skills training directly related to employment and education directly related to employment. In addition, vocational education is now only includable for 12 months and a maximum of 30 percent of the caseload at any time can participate in vocational educational training.

Time Limit Policies

Tennessee also eliminated the 18-month interim time limit. Families are no longer ineligible for assistance for 3 months after an 18-month spell; they can now receive assistance for a continuous 60-month period provided they remain eligible in terms of program requirements. Tennessee also instituted a 6-month extension period for families reaching the 60-month lifetime limit. This policy change is only in effect until July 1, 2008, and will not be available to families who reach their lifetime limit after that date. This extension is intended to help families make the transition into the post-waiver Families First program. From July through September, 2007, the state granted 48 6-month extensions. Under the old waiver program, families did not reach time limits as quickly due to time clock interruptions. In certain circumstances, Families First participants will have the opportunity to receive good-cause extensions to the lifetime time limit.

Tennessee’s New Diversion Program

A second post-waiver program change involved the creation of a one-time assistance program intended to divert families from ongoing monthly cash assistance under the traditional Families First program. Under this type of diversion program, previously not allowable under Tennessee law, short-term assistance is used to divert potential and current recipients from ongoing welfare assistance, thus reducing state welfare caseloads and expenditures and keeping recipients from reaching lifetime eligibility limits. Diversion programs in other states provide vouchers for car repair, child care, housing, food, and other daily or employment-related needs in addition to or instead of cash assistance.

Tennessee’s diversion program offers lump-sum payments of $1,200 to qualifying families who would otherwise be eligible for full TANF program participation. Families receiving lump-sum payments must have short-term needs that would be better addressed with a one-time payment than through full program participation. They also face restrictions regarding future participation in the regular Families First program. Participation in the diversion payment program does not count towards the 60-month lifetime limit and also includes eligibility for subsidized childcare. Based on the first three months of this diversion program, DHS reports the diversion program reduced 27 cases from the program.

Performance-Based Contracting

An important feature of the post-waiver Families First program is a new contractor model, which divides the state into five zones, each served by a different contractor who reports to the Tennessee Department of Human Services. Shelby and Davidson Counties are their own zones, while the remaining counties are divided into three regional zones for the western, central and eastern portions of the state. Figure 4a.3 presents a map of the new contractor zones.

The contractors’ main responsibility is to move Families First clients into employment, thus enabling the state to meet the federally-mandated work
4a.3. The New Families First, continued

activity participation rate. Contractors are responsible for conducting career assessments, identifying barriers to employment, developing employment plans, providing support services needed for full engagement, and providing employment placement, retention and wage progression activities. DHS staffers continue to handle matters of program eligibility, but recipients with work requirements are referred to the contractors.

Each contractor is required to meet a monthly target work participation rate (WPR) calculated by the state. To calculate the actual WPR, each month the state determines how many individuals were referred to the contractor that month, and how many individuals remain as open cases in the contractor’s caseload from prior months. The resulting sum is the denominator of the WPR. The numerator is the number of individuals who meet the criteria for full engagement with 20 hours in “core” activities and 30 hours of total work activities, unless otherwise exempt.

Contractors currently track and report the number of absences, excused or unexcused, for each individual who is required to participate in work activities. To be considered as participating for purposes of the federal work participation rate, the recipient is now allowed only 10 absences per 12 month period, with a maximum of 2 absences per month, regardless of whether the absence is considered excused or unexcused. Under the waiver, only non-excused absences were considered in this calculation. Under the new contractor model, contractors must retain attendance documentation to substantiate the number of hours reported. The state then reviews this documentation, in addition to documentation that verifies that the work activities meet applicable federal definitions, as part of the regular contract compliance review monitoring process.

Figure 4a.3. Families First Contractor Zones

Source: Tennessee Department of Human Services.
4a.4. Future Welfare Policy Challenges in Tennessee

Education
Among the most significant changes to Families First policies are new limitations on education and training activities. While it is true that recipients generally have lower weekly work hour requirements in the post-waiver program, fewer of those hours can be directed toward education and training activities. Further, fewer education and training activities can be counted toward work requirements, and recipients can only pursue those activities for a limited amount of time.

A hallmark of the waiver era of Families First was a focus on skill development via education and training. The post-waiver changes discussed above will make it harder for recipients to pursue and complete education programs while on Families First. Indeed, it is easy to imagine that the lowest-skilled segment of the Families First caseload will simply choose to leave the program. It will be important for program officials to monitor the effects of these changes on program participation decisions, educational attainment, skill development, and long-term economic well being among participants and eventual program leavers.

Work Activity Participation Rate Requirements
It remains to be seen how Tennessee will meet the higher work activity participation rate requirements. While caseload reduction credits and other special provisions will help lower the actual required rate below the federally-mandated 50 percent, the fact remains that a larger percentage of the Families First caseload will need to find and keep suitable work activities in order for the state to avoid severe financial penalties. The 90 percent work participation rate for two-participant households may prove especially difficult to meet, and thus might require the state to change how two-participant households are treated under Families First.

The new performance-based contracting model will surely help in this regard, as contractors bear the primary responsibility to match program participants with work activities. Outcomes will need to be tracked across contractor zones within Tennessee in order to see if certain methods prove to be more effective. Indeed, the variation in approaches across the five contractor zones provides a very useful mechanism to test relative strengths and weaknesses of those approaches. Program officials should also monitor the experiences in other states that are facing similar work activity participation rate requirements.

Time Limits
The removal of the 18-month interim time limit could have important implications not only for participant well being but also for state program budgets. For example, families might not work as hard to achieve self-sufficiency if they know that they can stay on the program for up to 60 months. The average length of assistance spells might increase. Coupled with the more restrictive education and training policies, it is possible that program dependency could actually increase. Adding to this possibility is the softening of the 60-month lifetime limit, in the form of extensions for those who were on the program before the waiver expired. As more and more Families First recipients approach their lifetime time limits, it will be important to track their well being, and to possibly target state funds to the neediest of those whose federal eligibility expires.

Diversion Assistance
Tennessee’s new diversion program might help those in need of short-term assistance to get back on their feet more quickly. While this new feature of the Families First program holds much promise, program officials will want to track those who receive the larger one-time diversion assistance to ensure that (a) diversion assistance is limited to those who would not be better
served in the full Families First program and (b) diversion recipients fare as well as those who participate in the full program. The state might also consider providing in-kind services such as child care assistance as an alternative to the one-time cash payment.

References


Tennessee’s public higher education institutions—nine public universities, 13 public community colleges, and 27 technology centers—currently enroll 284,464 students.¹ As the state continues to make investments to educate students in preparation for entering the workforce and enhance the quality of life of state residents, the question arises: How much does Tennessee’s economy benefit from Tennessee’s higher education graduates who are working in the state?

All states experience some degree of a “brain-drain” when graduates leave their state. This brain-drain can come after states’ considerable investments in recruiting and training students. Until now, little information has been available on the propensity of people to work in Tennessee after their education. The lack of information makes it very difficult to assess the statewide returns to education investments. While data on the ability of other states to retain their graduates as workers is not available, it is possible to examine the returns to Tennessee from investments in higher education by examining the propensity of people who attend Tennessee public institutions of higher education to work in Tennessee after graduation.

To paint this picture of Tennessee’s higher education graduates, the Tennessee Higher Education Commission (THEC) contracted with the Center for Business and Economic Research to conduct a series of analyses using available state data. The research summarized here highlights findings from the first three installments of this study.² Section 4b.2 examines the propensity of Tennessee’s higher education graduates (both in-state students and out-of-state students, regardless of institution) to work in the state after graduation, and for those who do, provides information about full-time or part-time employment status and earnings. Sections 4.3 and 4.4 assess these workforce participation and wage issues in more detail, breaking down the trends for each public institution and by field of study, respectively.


² Published reports can be found at http://cber.bus.utk.edu/tnhe.htm.
4b.2. State-Level Labor Market and Earnings Trends

We start with a very practical question: do Tennessee’s higher education graduates work in Tennessee after earning their degree?1 In their first quarter out of school, 67.2 percent of graduates are working in Tennessee for employers who are part of the state’s unemployment insurance system. An additional 6.2 percent are not earning wages but are enrolled in a Tennessee higher-education institution. Of the approximately 206,000 graduates, almost three-quarters remain in Tennessee—either in the labor market or enrolled in a higher-education institution. This leaves 26.6 percent of Tennessee’s graduates who are neither working in Tennessee and part of the unemployment insurance system nor continuing their education at a Tennessee higher-education institution. However, as described below many of these individuals may still be working in the state. The percentage of working graduates declines to 64.6 percent after one year and after seven years, it has fallen to 55.5 percent.

Full-time and part-time employment must be determined based on earnings since the TDLWD quarterly wage records only indicate employment and do not distinguish between full- and part-time work status. For this study an individual’s employment is considered part-time when his or her wage record for that quarter equals less than the earnings of a fully-employed minimum wage earner. This approach does not result in a precise measurement of full- and part-time employment. For example, the part-time employees identified here include employees who work less than 40-hours a week (perhaps the best definition of part-time) and employees who are employed full-time but earn less than the minimum wage for the quarter, such as some people who work only part of the quarter. Similarly, full-time employees include both people who are fully employed for the quarter and some people who are less than fully employed but earn more per hour than the minimum wage.

A relatively large share (17.6 percent) of Tennessee’s graduates is employed part-time during their first quarter out of school. After just one year, the number of graduates

---

1 Employment and wage data can only be obtained for individual workers from the TDLWD ES202 series that are reported quarterly by all employers who are part of the Tennessee unemployment insurance system. Most employers in the state are liable under the Tennessee Employment Security Law. Liability is based on criteria set by federal law and include: all governmental employers; certain nonprofit, domestic, and agricultural employers; and all other employers who have a total payroll of $1,500 or more in any quarter in the current or previous calendar year, or who have at least one employee for any day during 20 different weeks during the current or previous calendar year. (TDLWD, <http://www.state.tn.us/labor-wfd/ui/ui.htm>). Not included in these data are, for example, the self-employed, employees or officers in a non-profit organization with three or fewer employees, and other domestic, agricultural, and for-profit businesses who do not meet the requirements outlined above.
4b.2. State-Level Labor Market and Earnings Trends, continued

employed part-time is cut in half; and as more time passes, part-time employment continues to decline. As can be seen, the decline in work participation is almost entirely a fall off in the work participation of part-timers, as the percentage of full-time workers is relatively stable after the initial increase, falling only from 54.9 percent to 52.5 percent, as part-time workers fell from 9.7 to 3.0 percent. Figure 4b.1 illustrates the overall employment trend as well as the full-time and part-time portions.

A key issue is whether the propensity to work in Tennessee differs between people who began school as a state resident and those who came from outside the state to receive their education. These distinctions are examined based on students’ residency status at the time they graduated from a Tennessee institution. From the approximately 206,000 students who graduated during this time period, just over 25,000 (12.2 percent) were out-of-state students. It is evident that a much smaller share of out-of-state students stay and work in Tennessee (see Figure 4b.2). Of course, we do not know where they go—they might have returned to their home state, another state or country, or perhaps they continue to live in Tennessee but do not work as part of the unemployment insurance system—but we do know that a small share of out-of-state students continue to work in Tennessee after graduation. One year after graduation, 69.7 percent of in-state students are working in Tennessee compared with 25.6 percent of out-of-state students.

Participation by Degree Type

Just over one-half of the graduates

Data and Methodology

The data analyzed are from two sources: the Tennessee Department of Labor and Workforce Development (TDLWD) and THEC. Tennessee higher-education institutions awarded just over 232,000 degrees to 207,600 different people between 1997 and 2005.1 Almost 12 percent of the degrees awarded were to out-of-state students (just over 25,000).2

When linking the education data to the graduation data, employment data are evaluated beginning the first full quarter after the graduation term: winter graduates could potentially enter the labor market in the second quarter, spring graduates in the third quarter, summer graduates in the fourth quarter, and fall graduates in the first quarter of the next year. We examine the percentage of Tennessee graduates who are working in each quarter as a percentage of those who could be working in the particular quarter. The analysis allows us to examine graduates for up to 29 quarters (or seven years) after graduation.3 These same trends can be studied based on various characteristics, such as whether student residency during school was in-state or out-of-state, whether they worked full-time or part-time in that quarter, or whether they also enrolled in additional education in a Tennessee institution during that quarter. This analysis does not track particular people over time but rather average quarterly labor market participation.

---

1 The actual number of graduates who could be matched to TDLWD records was 206,431, because records for 1,169 graduates did not contain valid social security numbers.
2 Out-of-state students are those who have out-of-state residency at the time of their graduation.
3 The analysis was cut off after 29 quarters because so few graduates could be studied for longer time periods.
from 1996/97 to 2004/05 earned bachelor’s degrees from Tennessee’s higher-education institutions (see Figure 4b.3). Almost three-quarters (73.7 percent) of graduates earned bachelor’s degrees or higher including master’s, doctoral, professional, or educational specialist degrees; the remaining quarter earned either a certificate\(^2\) or an associate’s degree.

Figure 4b.4 shows the propensity to work in Tennessee based on the degree that was earned. Those earning associate’s degrees are much more likely to work in Tennessee than other degree-earners. In fact, after one year, 73.3 percent of associate’s-degree earners are working in Tennessee while only 62.4 percent of bachelor’s-degree earners and 40.0 percent of doctoral-degree earners remain in the state. This result should be expected since those with more advanced degrees enjoy a broader set of job options across a broader geographic area. As is evident in Figure 4b.4, the relative decline over a seven-year period is also slower for associate’s degree earners than for others; as would be expected, the relative decline over time is fastest for doctoral- and professional-degree earners.

### Average Wages of Tennessee Graduates

In 2005, the nearly 120,000 students who graduated between 1997 and 2005 and were working in Tennessee earned over $4.4 billion.\(^3\) These graduates earned 5.0 percent of total Tennessee wage and salary income and made up 4.2 percent of the state’s total workers. The average working graduate earned $38,927 in 2005, regardless of the degree earned or length of time working in Tennessee; the average salary of everyone else working in Tennessee was $32,565, or 16.3 percent less than graduates.\(^4\)

It is important to note that the wages reported here have been annualized and adjusted so that comparisons can be made based on the length of time graduates are out of school after obtaining a degree, rather than based on the year in which they graduated. The data for earlier

\(^2\) A small number of certificates (less than 1 percent) were awarded post-baccalaureate.

\(^3\) Including workers that were outside the unemployment insurance system, more than $5.0 billion was earned.

\(^4\) "Everyone else working in Tennessee" in 2005 would include graduates from Tennessee’s higher education institutions before 1996/97 as well as workers who earned degrees in other states or countries and workers without higher education degrees.
4b.2. State-Level Labor Market and Earnings Trends, continued

years are adjusted for both inflation and real productivity changes over time, which should eliminate the effects of any fluctuations in the economy tied to specific historical time periods.\(^5\) In other words, the wages reported for the 17th quarter out of school (for instance) represent the same relative wages for graduates from the academic years of 1996/97 through 2000/01, even though the occasion of “17 quarters out” occurs in different calendar years.

As one would expect, in the first quarter after graduation, workers do not earn as much as they do in subsequent quarters—at least in part because graduates may not start working until the middle of the quarter and do not earn wages for a full quarter. As shown in Figure 4b.5, the average annual earnings for full-time workers during their first quarter was $32,696 but then rises over $2,000 in just one quarter to $34,720. Thereafter, the average annual earnings for full-time workers grow at a 5.7 percent compound annual growth rate (CAGR) to $50,418 just seven years later. Inflation, as measured by the consumer price index, rose only 2.5 percent annually during this time period.

Figure 4b.6 breaks average wages down by the level of degree earned in Tennessee. As expected, the higher the degree earned, the higher the average wages. As shown in Table 4b.1, one year after graduation, doctoral graduates earn an average of $57,097 annually, after four years, they earn $65,361, and by seven years, $68,760. At the other end of the spectrum, associate’s degree graduates earn $33,326 on average one year after graduation; $38,952 four years later; and $42,921 after seven years. Figure 4b.6 shows that in the first few quarters after graduation, associate’s and bachelor’s

\(^5\) Wage data are deflated by both the consumer price index (CPI) and changes in output per worker over time.
degree graduates earn approximately the same average wages; however, over time, bachelor’s degree graduates earn more. Just seven years after graduation, bachelor’s degree holders are earning almost $7,000 more annually than associate’s degree holders.

Table 4b.1 shows average full-time wages for Tennessee higher education graduates at several different points after graduation. The final row shows the compound annual growth rate for each degree level; these growth rates are calculated from the full-time workers’ second quarter in the Tennessee labor market to the 25th quarter in the labor market, or just under six years. Bachelor’s degree holders who are working full-time experience average annual wage growth of 7.2 percent. Master’s degree holders experience the slowest growth rate among these degree levels at 3.7 percent, but this still exceeds inflation.

6 The CAGR for Educational Specialist holders is the lowest of all degree types, at just 1.3 percent.

---

### Table 4b.1. Average annual wages by select degrees

<table>
<thead>
<tr>
<th></th>
<th>Associate’s</th>
<th>Bachelor’s</th>
<th>Master’s</th>
<th>Doctoral</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 quarter out</td>
<td>$30,678</td>
<td>$28,549</td>
<td>$42,979</td>
<td>$52,390</td>
</tr>
<tr>
<td>1 year out</td>
<td>$33,326</td>
<td>$33,421</td>
<td>$45,723</td>
<td>$57,097</td>
</tr>
<tr>
<td>4 years out</td>
<td>$38,952</td>
<td>$41,403</td>
<td>$52,701</td>
<td>$65,361</td>
</tr>
<tr>
<td>7 years out</td>
<td>$42,921</td>
<td>$49,811</td>
<td>$59,056</td>
<td>$68,760</td>
</tr>
<tr>
<td>CAGR from Q2 to Q25</td>
<td>4.3%</td>
<td>7.1%</td>
<td>3.8%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>
4b.2. State-Level Labor Market and Earnings Trends, continued

Figure 4b.4. Workforce Participation by Degree Type

Figure 4b.5. Average Annual Wages for All Full-time Workers
4b.2. State-Level Labor Market and Earnings Trends, continued

**Figure 4b.6. Average Annual Wages by Select Degrees**

- Doctoral
- Master's
- Bachelor's
- Associate's
4b.3. Employment and Earnings Trends by Institution

This second installment of the project studying Tennessee’s higher education graduates focused on comparisons among Tennessee’s public institutions of higher education. To facilitate meaningful and readable comparisons, most of the following analysis examines broad groups of schools, focusing on three major affiliations of Tennessee’s public institutions: The University of Tennessee, Tennessee Board of Regents Universities, and Tennessee Board of Regents (TBR) Community Colleges.

Some differences exist among graduates of Tennessee’s public institutions, both in Tennessee labor force participation and in wages. Some of the differences can be attributed to the degree mix of each institution’s graduates, but additional differences remain even after accounting for the mix. Graduates of The University of Tennessee are less likely than other graduates to stay in the state and join its labor force, regardless of degree type (though there are differences among the University’s campuses). Graduates of Tennessee Board of Regents Universities are more likely to join the Tennessee labor force, but not nearly as likely as community college graduates, among whom nearly three-fourths join the labor force immediately upon graduation. Wages are higher, on average, for University of Tennessee graduates, but mostly because of difference in the type of degree earned. Wage growth is fairly consistent across the institutions within degree levels, with differences being fairly small in magnitude.

Figure 4b.7. Trend in Graduates Working in Tennessee
The Basic Question Revisited: Working or Not

As reported in section 4.2, 67.2 percent of graduates work in Tennessee in a position covered by the Unemployment Insurance system in their first quarter after graduation. This percentage tends to decline over time, dropping to 55.5 percent within seven years of graduation.

Now we dig deeper to determine whether these numbers are consistent across the state’s different higher education institutions. The percent of graduates remaining varies considerably among individual institutions as well as between The University of Tennessee and TBR institutions. Less than 59 percent of University of Tennessee graduates work in Tennessee in the first quarter after graduation, compared to 68 percent for TBR Universities and more than 75 percent for TBR Community Colleges. However, the trends over time across institutions are very similar and reflect the overall trend of graduates leaving the state (Figure 4b.7).

While the differences between institutions illustrated in Figure 4b.7 might seem dramatic, it is reasonable to assume that the type of degree earned explains some of this difference. Associate’s degree earners are much more likely to stay in the state than bachelor’s degree earners, and graduate and professional degree earners are less likely to join the Tennessee workforce than bachelor’s degree recipients. Each Tennessee public institution offers a different complement of degree types, and the graduates attaining these degrees are

---

1 Approximately 12,000 students earned multiple degrees in Tennessee’s public higher-education institutions during the 1996/97-2004/05 time period. For the purposes of this report, graduates are counted only for their highest degree earned. In the case of multiple degrees of comparable level, only the most recent degree is considered.
not necessarily in comparable proportions. Thus, a more meaningful comparison is to examine the trends by degree type. Figure 4b.8 shows the trend of associate’s degree recipients in the workforce. TBR Community College graduates have a greater tendency to join and remain in the Tennessee workforce than TBR University graduates, even when comparing only associate degree earners.

Similar differences can be found between TBR institutions and The University of Tennessee for bachelor’s degree earners. About 69 percent of TBR graduates are in the Tennessee workforce one quarter after graduation, compared to just 61 percent of University of Tennessee graduates (Figure 4b.9).

A similar pattern emerges for master’s, education specialist, and doctorate degree earners, with TBR institution graduates more likely to work in Tennessee than their University of Tennessee counterparts for the entire seven-year timeframe. Graduates with professional degrees, however, seem to behave more similarly from institution to institution. TBR University graduates and University of Tennessee graduates both have workforce participation rates between 45 and 50 percent one quarter after graduation, and this rate declines similarly over time.

Full-Time Wages of Tennessee Higher Education Graduates in the Tennessee Labor Market: Comparing Institutions

Analyzed here are the earnings of graduates working full-time in the Tennessee labor force as time passes after graduation. As with workforce participation, there are wage differences among the institutions. However, unlike the case of participation rates, the earnings growth trends vary somewhat, with earnings...
4b.3. Employment and Earnings Trends by Institution, continued

growing more quickly for graduates of some institutions than for graduates of others (Figure 4b.10).

Once again, we can expect some of the differences to be explained by degree type, which varies considerably across institutions. For those earning associate’s degrees, average wages are consistently higher for TBR University graduates than TBR Community College graduates, but graduates from both groups experience similar wage growth during their first seven years in the Tennessee workforce (Figure 4b.11).

As Table 4b.2 shows, not all of the variation in wage growth is explained by degree type, and there are some differences between institutions. The CAGR for wages at each institution and for each degree type are listed; the CAGR is calculated from the second quarter after graduation through the 25th quarter after graduation.

One such difference exists for bachelor’s degree earners, among whom wage growth for University of Tennessee graduates is slightly faster than growth for TBR University graduates. Average initial wages (one quarter after graduation) are approximately $1,000 higher for graduates of TBR Universities, but 23 quarters later, they are approximately $3,000 lower than those of University of Tennessee graduates (Figure 4b.12).

There is much less variation among graduates with Education Specialist degrees since so many are employed by state or local government. Initial wages and wage growth are very similar for University of Tennessee graduates and TBR University graduates, and growth rates are considerably slower for these workers than for graduates with other types of degrees.

The most significant difference in wages can be found among professional degree earners, where initial average wages differ by more than $15,000, with University of Tennessee graduates earning just over $50,000 on average and TBR University graduates earning just under $35,000 on average (Figure 4b.13). This gap fluctuates over time, but after seven years in the workforce, the average difference widens to just over $25,000. Much of the difference is explained by earnings of graduates from The University of Tennessee Medical School.

Wages start considerably higher for master’s and doctorate degree holders than for those with bachelor’s degrees, but wage growth for these advanced degrees is slower. Average wages for graduates with master’s degrees are comparable for TBR University graduates and University of Tennessee graduates, with a comparable growth rate and average starting wage. There are small differences, initially and over time, between doctoral degree graduates from the two institutions.

| Table 4b.2. Wage CAGRs for Graduates of Tennessee Public Institutions |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                             | Associate’s      | Bachelor’s      | Master’s        | Doctoral        | Ed. Specialist  | Professional    |
| All Institutions            | 4.3%            | 7.1%            | 3.8%            | 4.2%            | 1.3%            | 13.1%           |
| University of Tennessee     | -               | 8.3%            | 3.7%            | 4.2%            | 1.3%            | 13.0%           |
| TBR Universities            | 4.6%            | 6.4%            | 3.8%            | 3.3%            | 1.3%            | 13.5%           |
| TBR Community Colleges      | 5.1%            | -               | -               | -               | -               | -               |
4b.3. Employment and Earnings Trends by Institution, continued

Figure 4b10. Trend in Wages for Graduates Working in Tennessee

Figure 4b11. Trend in Wages for Graduates Working in Tennessee: Associate’s Degrees
4b.3. Employment and Earnings Trends by Institution, continued

Figure 4b.12. Trend in Wages for Graduates Working in Tennessee: Bachelor’s Degrees

Figure 4b.13. Trend in Wages for Graduates Working in Tennessee: Professional Degrees
The third installment of this research agenda focused on the various fields of study that graduates pursued and labor and wage trends for graduates in these fields over time. This section focuses on work and earnings trends for 35 broad fields of study. Each field is broken down by degree level (Associate, Bachelor, Master, Education Specialist, Doctorate, and Professional) to achieve more meaningful comparisons.

Considerable differences in workforce participation exist among the various fields of study. Graduates in the fields of Education and Health Professions and Related Clinical Sciences are more likely to stay in Tennessee after graduation and enter the workforce compared to most of the other fields at each degree level, with the exception of the medical professional degree. However, the decline in workforce participation over time is similar across most fields.

There is also significant separation in average wages among graduates from the various fields. Consistently high wages and strong annual wage growth rates can be found in the fields of Engineering, Engineering Technologies/Technicians, Health Professions and Related Clinical Sciences, and Business, Management, Marketing, and Related Support Services. The high wages occur across degree types. Communication, Journalism, and Related Programs and Computer and Information Sciences and Support Services are also fields in which especially fast wage growth occurs, resulting in higher wages in later quarters relative to the other fields.

**Workforce Participation Trends among Graduates: Comparing Fields of Study**

An overall declining trend in work participation is observed for associate’s degree graduates from most fields. About 75 percent are working in Tennessee three quarters after graduation, but this proportion decreases to just under 68 percent by 25 quarters after graduation.

In some cases, the proportion of graduates working full-time in Tennessee remains consistent over time (e.g., Legal Professions and Studies) or even increases (e.g., Liberal Arts and Sciences, General Studies and Humanities), but combined full- and part-time workforce participation declines in every field of study.

The percent of associate’s degree graduates remaining in Tennessee over time varies considerably among fields. The highest initial workforce participation rates are found among graduates in the fields of Science Technologies/Technicians (88 percent working full- or part-time), Health Professions and Related Clinical Sciences (87 percent), and Security and Protective Services (85 percent). Security and Protective Services graduates have the highest likelihood of remaining in the Tennessee workforce after 25 quarters (78 percent).

A more substantial downward trend in Tennessee workforce participation is evident among bachelor’s degree earners (Table 4b.3). Less than 65 percent are working in Tennessee three quarters after graduation, and this proportion decreases to just over half by 25 quarters after graduation. Again, some fields show a small increase in full-time workers over the time period (e.g., Agriculture, Agriculture Operations, and Related Science), but all show declines in total workforce participation.

The highest initial workforce participation rates are found among graduates in the fields of Health Professions and Related Clinical Sciences (75 percent), Education (74 percent), and Multi/Interdisciplinary Studies (74 percent). After 25 quarters, each of these fields has approximately 62 percent of their graduates in the Tennessee workforce.

As with bachelor’s degree earners, more than 60 percent of master’s earners are working in Tennessee three quarters after graduation. This proportion falls to about 50 percent by the 25th quarter after graduation.
### Table 4b.3. Trend in Graduates Working in Tennessee: Bachelor’s Degrees

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>3rd Quarter</th>
<th>13th Quarter</th>
<th>25th Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Full Time</td>
<td>53.3%</td>
<td>52.5%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>11.0%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Agriculture, Agriculture Operations, and Related Science</td>
<td>Full Time</td>
<td>46.5%</td>
<td>48.0%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>11.4%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Architecture and Related Services</td>
<td>Full Time</td>
<td>46.3%</td>
<td>43.2%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>2.3%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Area, Ethnic, Cultural, and Gender Studies</td>
<td>Full Time</td>
<td>40.0%</td>
<td>40.2%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>14.4%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Biological and Biomedical Sciences</td>
<td>Full Time</td>
<td>40.4%</td>
<td>36.8%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>14.6%</td>
<td>7.4%</td>
</tr>
<tr>
<td>Business, Management, Marketing, and Related Support Services</td>
<td>Full Time</td>
<td>60.0%</td>
<td>58.4%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>7.8%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Communication, Journalism, and Related Programs</td>
<td>Full Time</td>
<td>52.9%</td>
<td>51.7%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>12.1%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Communications Technologies/Technicians and Support Services</td>
<td>Full Time</td>
<td>43.5%</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>17.4%</td>
<td>--</td>
</tr>
<tr>
<td>Computer and Information Sciences and Support Services</td>
<td>Full Time</td>
<td>49.2%</td>
<td>47.4%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>6.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Education</td>
<td>Full Time</td>
<td>62.4%</td>
<td>60.2%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>12.0%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Engineering</td>
<td>Full Time</td>
<td>45.2%</td>
<td>44.6%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>3.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Engineering Technologies/Technicians</td>
<td>Full Time</td>
<td>58.2%</td>
<td>56.3%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>5.7%</td>
<td>2.8%</td>
</tr>
<tr>
<td>English Language and Literature/Letters</td>
<td>Full Time</td>
<td>44.3%</td>
<td>43.2%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>16.2%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Family and Consumer Sciences/Human Sciences</td>
<td>Full Time</td>
<td>52.2%</td>
<td>54.5%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>14.2%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Foreign Languages, Literatures, and Linguistics</td>
<td>Full Time</td>
<td>37.5%</td>
<td>35.1%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>11.9%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Legal Professions and Studies</td>
<td>Full Time</td>
<td>61.0%</td>
<td>52.2%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>10.0%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Liberal Arts and Sciences, General Studies and Humanities</td>
<td>Full Time</td>
<td>56.1%</td>
<td>52.9%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>11.3%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Health Professions and Related Clinical Sciences</td>
<td>Full Time</td>
<td>69.8%</td>
<td>63.5%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>5.1%</td>
<td>3.4%</td>
</tr>
<tr>
<td>History</td>
<td>Full Time</td>
<td>41.7%</td>
<td>42.5%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>17.0%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Mathematics and Statistics</td>
<td>Full Time</td>
<td>42.9%</td>
<td>45.7%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>11.1%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Multi/Interdisciplinary Studies</td>
<td>Full Time</td>
<td>57.5%</td>
<td>61.4%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>16.0%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Natural Resources and Conservation</td>
<td>Full Time</td>
<td>44.0%</td>
<td>49.3%</td>
</tr>
<tr>
<td></td>
<td>Part Time</td>
<td>13.4%</td>
<td>6.4%</td>
</tr>
</tbody>
</table>
This downward trend exists in nearly all fields, but for some fields the proportions are considerably higher or lower. Graduates with a master’s degree in Education are particularly likely to work in the state, with more than three-fourths working in Tennessee three quarters after graduation, and nearly two-thirds working in Tennessee 25 quarters after graduation. Graduates with an education specialist degree are particularly likely to remain in the state to work. More than 85 percent of these graduates are working in Tennessee three quarters after graduation and more than 78 percent remain in the workforce after 25 quarters.

Graduates with a doctorate degree are the least likely to remain in Tennessee to work, with less than half in the Tennessee workforce three quarters after graduation and less than one-third in the workforce 25 quarters after graduation. The field of Education is a significant exception, with nearly two-thirds working in the third quarter after graduation and more than half remaining in the workforce in the 25th quarter. The only other fields with more than one-third of graduates working in Tennessee after the 25th quarter are English Language and Literature/Letters (36 percent), History (36 percent), and Health Professions and Related Clinical Sciences (36 percent).

Among professional degree earners, just over half are in the Tennessee workforce three quarters after graduation, and just over 40 percent remain in the workforce after 25 quarters. There is a substantial difference between those receiving law degrees and medical degrees, with law degree recipients being more likely to work in Tennessee after three quarters by about 15 percentage points. However, there is less attrition among medical degree earners over time, resulting in a narrowing of the difference to just over five percentage points 25 quarters after graduation.
### 4b.4. Employment and Earnings Trends by Field of Study, continued

#### Wage Trends among Graduates: Comparing Fields of Study

Associate’s degree earners who remain in Tennessee and work full-time three quarters after graduation have an average wage of $32,417. By the 25th quarter, this average wage grows to $41,859, for a CAGR of 4.8 percent. The highest average wages after three quarters belong to graduates in the fields of Security and Protective Services ($38,052) and Engineering Technologies/Technicians ($36,146). Graduates achieve the fastest wage growth and often the highest wages with degrees in the fields of Precision Production (8.2 percent annual growth), Science Technologies/Technicians (7.8 percent) and Computer and Information Sciences and Support Services (7.3 percent).

Wages for bachelor’s degree earners begin slightly lower than wages for associate’s degree earners, but grow much more rapidly. They also vary dramatically among fields of study. Graduates in the field of Liberal Arts and Sciences and in the General Studies and Humanities area, for example, earn above average wages ($32,904) in quarter three, but with a slow growth rate of 1.2 percent annually, their wages in quarter 25 ($35,057) are substantially below the average for bachelor’s holders overall (Table 4b.4).

The highest average wages three quarters after graduation are earned by graduates in the fields of Engineering ($43,661), Health Professions and related Clinical Sciences ($42,232), and Engineering Technologies/Related Clinical Sciences ($41,859).

### Table 4b.4. Trend in Graduates’ Wages: Bachelor’s Degrees

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>3rd Quarter</th>
<th>13th Quarter</th>
<th>25th Quarter</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>$31,455</td>
<td>$38,803</td>
<td>$46,085</td>
<td>7.2%</td>
</tr>
<tr>
<td>Agriculture, Agriculture Operations, and Related Science</td>
<td>$27,170</td>
<td>$35,064</td>
<td>$43,309</td>
<td>8.8%</td>
</tr>
<tr>
<td>Architecture and Related Services</td>
<td>$31,863</td>
<td>$41,579</td>
<td>$64,499</td>
<td>13.7%</td>
</tr>
<tr>
<td>Area, Ethnic, Cultural, and Gender Studies</td>
<td>$26,355</td>
<td>$37,373</td>
<td>$48,575</td>
<td>11.8%</td>
</tr>
<tr>
<td>Biological and Biomedical Sciences</td>
<td>$26,024</td>
<td>$36,039</td>
<td>$47,887</td>
<td>11.7%</td>
</tr>
<tr>
<td>Business, Management, Marketing, and Related Support Services</td>
<td>$33,039</td>
<td>$43,092</td>
<td>$55,372</td>
<td>9.8%</td>
</tr>
<tr>
<td>Communication, Journalism, and Related Programs</td>
<td>$26,807</td>
<td>$35,480</td>
<td>$40,952</td>
<td>8.0%</td>
</tr>
<tr>
<td>Communications Technologies/Technicians and Support Services</td>
<td>$28,358</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Computer and Information Sciences and Support Services</td>
<td>$38,482</td>
<td>$48,677</td>
<td>$56,024</td>
<td>7.1%</td>
</tr>
<tr>
<td>Education</td>
<td>$31,408</td>
<td>$35,870</td>
<td>$40,533</td>
<td>4.7%</td>
</tr>
<tr>
<td>Engineering</td>
<td>$43,661</td>
<td>$53,462</td>
<td>$60,702</td>
<td>6.2%</td>
</tr>
<tr>
<td>Engineering Technologies/Technicians</td>
<td>$40,440</td>
<td>$47,580</td>
<td>$56,691</td>
<td>6.3%</td>
</tr>
<tr>
<td>English Language and Literature/Letters</td>
<td>$26,116</td>
<td>$32,662</td>
<td>$41,261</td>
<td>8.7%</td>
</tr>
<tr>
<td>Family and Consumer Sciences/Human Sciences</td>
<td>$26,227</td>
<td>$32,432</td>
<td>$37,202</td>
<td>6.6%</td>
</tr>
<tr>
<td>Foreign Languages, Literatures, and Linguistics</td>
<td>$27,659</td>
<td>$35,391</td>
<td>$41,048</td>
<td>7.4%</td>
</tr>
</tbody>
</table>
4b.4. Employment and Earnings Trends by Field of Study, continued

Technicians ($40,440). Graduates in Architecture and Related Services have the fastest annual wage growth rate (13.7 percent), more than doubling their average wage from the third quarter to the 25th. They also have the highest average wage in the 25th quarter ($64,449). Graduates in Area, Ethnic, Cultural, and Gender Studies (11.8 percent) and Biological and Biomedical Sciences (11.7 percent) also see very high annual wage growth.

Master’s degree earners who remain in Tennessee and are working three quarters after graduation have an average wage of $45,513. These wages vary considerably among fields of study. The highest average wages after three quarters belong to graduates in the fields of Business, Management, Marketing, and Related Support Services ($58,910) and Engineering ($56,795). Graduates achieve the fastest wage growth with degrees in the fields of Communication, Journalism, and Related Programs (9.2 percent annual growth) and Physical Sciences (7.2 percent). Computer and Information Sciences and Support Services wages also grow quickly with a 6.7 percent annual growth rate, and by the 25th quarter these graduates are second in average wages at $79,901. Business, Management, Marketing, and Related Support Services continue to have the highest wages with $82,703.

Graduates with an Education Specialist Degree come almost exclusively from the field of education. Average wages three

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>3rd Quarter</th>
<th>13th Quarter</th>
<th>25th Quarter</th>
<th>CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Professions and Related Clinical Sciences</td>
<td>$42,232</td>
<td>$47,918</td>
<td>$52,933</td>
<td>4.2%</td>
</tr>
<tr>
<td>History</td>
<td>$26,733</td>
<td>$33,765</td>
<td>$41,124</td>
<td>8.1%</td>
</tr>
<tr>
<td>Legal Professions and Studies</td>
<td>$28,327</td>
<td>$33,254</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Liberal Arts and Sciences, General Studies and Humanities</td>
<td>$32,904</td>
<td>$33,554</td>
<td>$35,057</td>
<td>1.2%</td>
</tr>
<tr>
<td>Mathematics and Statistics</td>
<td>$31,791</td>
<td>$39,736</td>
<td>$42,538</td>
<td>5.4%</td>
</tr>
<tr>
<td>Multi/Interdisciplinary Studies</td>
<td>$30,720</td>
<td>$34,226</td>
<td>$37,627</td>
<td>3.8%</td>
</tr>
<tr>
<td>Natural Resources and Conservation</td>
<td>$24,873</td>
<td>$31,630</td>
<td>$36,264</td>
<td>7.1%</td>
</tr>
<tr>
<td>Parks, Recreation, Leisure, and Fitness Studies</td>
<td>$26,611</td>
<td>$34,526</td>
<td>$41,421</td>
<td>8.4%</td>
</tr>
<tr>
<td>Philosophy and Religious Studies</td>
<td>$23,358</td>
<td>$32,176</td>
<td>$40,615</td>
<td>10.6%</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>$30,207</td>
<td>$42,012</td>
<td>$49,683</td>
<td>9.5%</td>
</tr>
<tr>
<td>Psychology</td>
<td>$25,832</td>
<td>$32,157</td>
<td>$38,354</td>
<td>7.5%</td>
</tr>
<tr>
<td>Public Administration and Social Service Professions</td>
<td>$25,747</td>
<td>$30,371</td>
<td>$33,943</td>
<td>5.2%</td>
</tr>
<tr>
<td>Security and Protective Services</td>
<td>$27,830</td>
<td>$34,936</td>
<td>$39,554</td>
<td>6.6%</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>$27,283</td>
<td>$34,151</td>
<td>$40,590</td>
<td>7.5%</td>
</tr>
<tr>
<td>Transportation and Materials Moving</td>
<td>$26,741</td>
<td>$36,158</td>
<td>$46,324</td>
<td>10.5%</td>
</tr>
<tr>
<td>Visual and Performing Arts</td>
<td>$25,701</td>
<td>$32,463</td>
<td>$37,479</td>
<td>7.1%</td>
</tr>
</tbody>
</table>
4b.4. Employment and Earnings Trends by Field of Study, continued

quarters after graduation ($49,948) are higher than the average wage for those with master’s degree (all fields combined), but wage growth is considerably slower at 1.5 percent annually. By the 25th quarter after graduation, average wages for Education Specialist Degree earners are below those for master’s degree earners, but remain almost $10,000 greater than master’s degree earners in the field of education.

Doctoral degree earners have the highest average wages three quarters after graduation ($55,497) of all degree earners. The highest average wages come from the fields of Engineering ($67,920) and Business, Management, Marketing, and Related Support Services ($66,443). After 25 quarters, Engineering remains among the highest in average wages (second with $86,897), but graduates earn the highest average wages with doctorate degrees in Psychology ($88,018).

Graduates earning their first professional degree come exclusively from two fields: law and medicine. Average wages three quarters after graduation are about $10,000 apart, with the average graduate in Legal Professions and Studies earning $48,996 and the average Health Professions and related Clinical Studies graduate earning $58,396. Wages for graduates with medical degrees, however, grow significantly more quickly (17.7 percent annually) than those for graduates with law degrees (9.3 percent). By the 25th quarter after graduation, the difference between the two average wages is more than $60,000.
4b.5. Conclusions

Tennessee’s institutions of higher education provide an important service to students and the economy at large. Students earn higher incomes enhancing quality of life for themselves and their families. A better educated workforce in turn enhances the state’s prospects for a healthier path of economic development. Graduates from Tennessee’s public institutions of higher education certainly make a substantial direct contribution to the state’s economy: in 2005, nearly 120,000 Tennessee higher-education graduates within the study period were working in Tennessee and earned over $4.4 billion in income. Within two years of graduation, about two-thirds of graduates are working in the state. This percentage declines over time, but the leaving workers are replaced by new graduates, effectively re-stocking Tennessee’s labor force with educated and trained workers.

Labor force participation rates and wages vary considerably by degree type, with wages getting progressively higher for higher level degrees and in-state participation rates getting progressively lower. The exception is the Education Specialist degree, with which graduates earn initial wages comparable to master's degree earners, but with very slow growth over time. This is more about the field than the degree type, however, with graduates in education earning lower average wages (but with higher workforce participation rates) across all degree types.

Both Tennessee Board of Regents graduates and University of Tennessee graduates make a major impact on the Tennessee economy, but workforce participation and earnings vary between institutions, even when controlling for degree type. TBR institution graduates are more likely to remain in the workforce over time, but generally have lower wages and slower wage growth than their University of Tennessee counterparts. This can perhaps partly be explained by the mix of degree offerings at the respective institutions, but there do seem to be inherent differences between institutions not attributable to this factor.

Field of study is a major factor in explaining variations in wages and workforce participation, with some fields’ graduates earning substantially more than other graduates with the same degree type. Engineering, Health Professions and Related Clinical Sciences, and Business, Management, Marketing, and Related Support Services graduates earn high wages, on average, across degree types. Health Professions and Related Clinical Sciences is also a field with high workforce participation, along with Education.

The state’s institutions of higher education continue to graduate productive workers, a majority of whom remain in the state to contribute within its labor force and enhance the state’s competitiveness. The “brain drain” that the state of Tennessee suffers as many of its graduates leave the state to pursue employment is offset by an influx of new graduates each year, assuring a consistent supply of able workers. The health of these institutions is vital to the workforce and ultimately to the Tennessee economy.