

6,038,803 reasons to care*

EDUCATION CROSSROADS



Opportunity for You, Me, and Tennessee

<http://www.educationcrossroads.com>

79,572 children were born in Tennessee in 2004.

This year (3 years later), approximately 14,000 3- and 4-year-olds will be enrolled in a Tennessee pre-kindergarten program.

The state spends about \$7,000 per child for each year he or she attends K–12 school.

The American states now spend more on Medicaid than elementary and secondary education.

Only 7 out of every 10 teenagers who entered 9th grade in 2004 will graduate high school in May 2008 with their classmates.

The other 3 teenagers will not.

Between 1967 and 2004, households headed by someone with a high school degree or less actually saw their earnings *decline*.

In 2005, someone with a bachelor's degree in Tennessee earned \$51,554 per year, while someone with a high school degree earned \$28,645 per year.

Tuition at Tennessee's higher education institutions remains relatively low compared to other states.

The state's most rapidly growing jobs require at least some post-secondary education.

Tennessee's business leaders tell us they want to locate where the workforce is well educated.

Infant mortality rates fall as a mother's educational attainment rises.

A high-school dropout lives 2.5 fewer years than the average person.

In 2003, cigarette companies spent over \$15.2 billion on advertising.

In 2006, TennCare spending totalled \$6.9 billion.

Education has everything to do with it. *Quality* education has everything to do with all of it.

Education crossroads: opportunity for you, me, Tennessee, and society

Explore many paths—

We have 6,038,803 reasons to care.

6,038,803 reasons to care*

EDUCATION CROSSROADS

Center for Business and Economic Research

The University of Tennessee
College of Business Administration
Knoxville, Tennessee 37996-4334
<http://cber.bus.utk.edu>

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Opportunity for You, Me, and Tennessee

****How many reasons to care?***

Every single person living in Tennessee = (at least) one reason to care about education.

**Census Bureau estimate for 2006, <http://cber.bus.utk.edu/census/06stpop.xls>*

Welcome

Education Crossroads Preface

As the world economy transforms itself, it has become increasingly apparent that education is the most essential ingredient to our future economic security. We cannot affect in any meaningful way the external forces that bear down upon us here in Tennessee. Globalization, exchange rates, outsourcing, interest rates, and so on are simply beyond our control. Like the weather, we can complain; but it is to no avail. We do, however, have the power to influence our future through the investments in education that we make as individuals, parents and members of our community. These investments represent the best insurance policy we could possibly buy to protect us from the risks of the marketplace. The state makes investments as well; the budget for the 2007–08 fiscal year includes a \$290 million increase in funding that will flow through a revised version of the basic education program. When fully implemented in the years ahead, this influx will mean \$524 million in new education money each year.

So what is this book about? As you can tell from the title, it is about education. More to the point, it is about how education affects our lives and the lives of those around us. As individuals, we tend to earn more income and have greater economic security when we have a better education. We also choose healthier lifestyles. Children in families with well-educated parents benefit from their parents' income and lifestyle choices. Society at large bears many of the costs associated with a poorly educated population. For example, lifestyle choices like smoking are closely linked to educational attainment. Yet all of us bear the consequences of cancer through the loss of friends and loved ones and through the costs to the health care system.

Our state and our home communities don't stack up well in terms of adult educational attainment. In fact, we lag the nation in most measures of attainment as well as in investment in education. As a result, our income lags the nation, and many Tennessee communities experience sluggish growth, if not outright economic contraction. Finally, education affects the state budget and the budgets of cities and counties across Tennessee. Poorly educated individuals dominate the Families First and TennCare rolls as well as our prison system. These are examples of some of the issues we explore and document with data in this book.

Why is the book entitled *Education Crossroads*? Because it is about taking one more step down the education path. For each of us as individuals, and for each of our schools and communities, this path may be very different. We will likely take different turns along the way. But the key is to take one more step. Instead of dropping out and bearing the lifetime consequences of this choice, take another step toward graduating. Instead of being satisfied with a high school diploma, go to a technical school and get a certificate in the trades or pursue a college degree, either of which can provide greater economic security than simply a high school degree alone.

A note about data and numbers. We have tried to rely on data that are easily accessed and verified through online and other sources. As this book moved closer to completion, we quit updating data, a process that could go on forever. Some of the data we used will look old. A good example is educational attainment data linked to income for 2000. More recent data are simply not available. There are also apple and orange problems with data, in particular data in dollar denominations for different years. We decided to live with apples and oranges, because we think this enhances the transparency of this report by allowing you to verify facts and figures directly with the source. Despite these decisions, it is important to understand that even as more recent data become available, it is unlikely that these relationships will change in any appreciable way.

Some will take exception to the content of this book — here are some reasons why. First, we make no effort to offer solutions to the many problems confronting our education system. It would be presumptuous for us to do so. But we do need to work together and talk among ourselves to address these problems, building on a common understanding of the important role education plays in our society. *If we cannot articulate and document how education matters, we cannot develop the momentum for change.* This book is about documenting how education matters in order to empower stakeholders.

Second, some will view this book as simply a prop to support public education in Tennessee. This is not our intent. This book is about education, including public and private education, home schooling, formal and informal education, and so on. An important goal of this book is to motivate people to embrace education — and **take one more step** — regardless of its form.

Third is our heavy reliance on measures of educational attainment rather than measures of achievement and knowledge acquisition. This is simply a matter of practicality. We know there are kids who graduate from high school who are functionally illiterate. And we know there are people who have little or no formal education who have become learned and prosperous. Even so, attainment still says something significant about who we are and what we aspire to.

A fourth issue is the question of correlation versus causation. Can we say with certainty that education causes us to make lifestyle choices that affect ourselves, our children and others? How confident can we be that low levels of attainment are the causal influence on welfare participation and incarceration rates? Of course we cannot make such statements with certainty — so we don't. But how could education affect, for example, lifestyle choices and thus our health status? There are two mechanisms. One argument is that those who are better educated will enjoy a higher stream of lifetime earnings, and in order to protect these returns on the education investment, people choose healthier lifestyles. Another argument is that better educated people have access to better information on how lifestyle choices may affect personal well-being and that they adjust their behavior accordingly. There is evidence that education exerts an independent influence on many of the choices we make, even the propensity to donate blood. The evidence goes beyond simple correlations; in the end, you will have to make up your own mind on how important a role education plays in affecting your life and all of our lives.

Finally, you will see a form of repetition take place as you move from chapter to chapter, something that is especially true of chapters 3 through 6. This is intentional. One of our goals is to look at the differing ways education affects us and present this information to different stakeholder groups. So in one instance, we speak to the role of education in enhancing a worker's income, but in another instance we look at how communities with a better educated population enjoy higher per capita income. In the first instance, our interest is in the well-being of the individual and the family; in the second, our focus is the economy and the well-being of our communities. As another example, we look in one place at parental educational attainment and the likelihood of a child being on welfare, but another chapter considers the relatively low level of educational attainment of the entire welfare population. These are different but also complementary perspectives on the influences of education.

Now it's time to take *one step forward* and turn the page.

Center for Business and Economic Research
The University of Tennessee, Knoxville
College of Business Administration
Knoxville, Tennessee 37996-4334
<http://cber.bus.utk.edu>

Project Director: Matthew N. Murray, Ph.D., Associate Director and Professor of Economics
Designer: Stacia E. Couch, Research Associate

CBER Research Team

William F. Fox, Director and Professor of Economics
Matthew N. Murray, Associate Director and Professor of Economics
Donald J. Bruce, Research Associate Professor
LeAnn Luna, Research Assistant Professor

Stacia E. Couch, Research Associate
Vickie C. Cunningham, Research Associate
Betty A. Drinnen, Program Resource Specialist
Will Hamblen, Undergraduate Research Assistant
Katherine (Kate) Harper, Graduate Research Assistant
Matthew J. Harper, Research Associate
Paul Henderson, Undergraduate Student Assistant
Mary Elizabeth (Beth) Howard, Graduate Research Assistant
Luke Jones, Graduate Research Assistant
R. Brad Kiser, Research Associate
Albert Lin, Undergraduate Research Assistant
Julie L. Marshall, Research Associate
Carrie B. McCamey, Communications Coordinator
Nathan Murray, Undergraduate Student Assistant
Zachary (Zach) W. Richards, Graduate Research Assistant
Bryan M. Shone, Graduate Research Assistant
Joan M. Snoderly, Research Associate
Martin Tackie, Graduate Research Assistant
Angela R. Thacker, Research Associate
Laura D. Ullrich, Graduate Research Assistant
Ann B. Watts, Graduate Research Assistant
Kelly M. Woodruff, Graduate Research Assistant
Zhou (Sandy) Yang, Graduate Research Assistant

EDUCATION CROSSROADS

Future. The changing economic environment.

Education and quality of life; The forces of change — 1-shifting fortunes: the decline of manufacturing, 2-the urban-rural divide, 3-we compete against the world, 4-perceptions help drive economic development, 5-where will the skilled workers be found?, 6-labor force of the future, 7-persistent income disparities, 8-more from less: the promise of productivity growth; Then, where do we go from here?

Foundation. Tennessee's assets.

This journey will take you through — pre-kindergarten, public education funding, teacher quality, K–12 curriculum, advanced placement courses, TCAP, comparisons to national achievement, testing outcomes, educational attainment at the state and county levels, dropouts, comparisons to international achievement and spending, the education pipeline (and other opportunities for growth).

Prosperity. Strengthening our economic prosperity.

Topics include: higher incomes, more labor force participation, lower unemployment, more jobs, less poverty, opportunities in emerging industries; perspectives include: value of education, effects of higher education; and Tennessee's business leaders weigh in.

Family. At our very core.

The family and the education investment decision—a-benefits of investing in education and b-factors affecting investments in education; Education and the role of gender and race; But when it comes to family, it goes beyond money to a-financial security and investment, b-personal lifestyle choices, and c-the well-being of children.

Citizenship. Spillovers to society.

Why look at spillovers to society?; And what might the spillovers be?; Participation in the democratic process, smoking, health outcomes: is there a relationship, the arts, infant immunizations, blood donations, volunteerism and charitable giving, school quality and the housing market.

Public sector. Pieces of the fiscal puzzle.

Our fiscal health: government budgets; Big picture: the fiscal consequences of dropping out; Spending in Tennessee <Families First, Public housing, Food stamps, Justice system, TennCare, TENNderCARE, Cover Tennessee>; Revenue in Tennessee <Education and sales tax revenue, Education and property tax revenue>; What does it all mean?

Opportunity for You, Me, and Tennessee

Proceed to the front

THE CHANGING ECONOMIC ENVIRONMENT

“Right now our nation is perched at the precipice of change. . . . We have learned from studying our global environment that what happens in any one place on the planet influences the rest of the ecosystem and that is true of education, too.” (The National Children’s Book and Literacy Alliance)

Education and quality of life

The forces of change —

- 1-shifting fortunes: the decline of manufacturing
- 2-the urban-rural divide
- 3-we compete against the world
- 4-perceptions help drive economic development
- 5-where will the skilled workers be found?
- 6-labor force of the future
- 7-persistent income disparities
- 8-more from less: the promise of productivity growth

Then, where do we go from here?

future

FUTURE

the changing economic environment



Most of today's baby boomers had a father who held just one job over his entire lifetime. The story line might go something like this: the father dropped out of high school, enlisted, and came off the farm to serve in World War II. Upon returning to the states, he took a job in a factory. The factory environment wasn't ideal, nothing like the freedom offered by the farm; but after the war, it was a small price to pay for a good-paying job and some security. Besides, the factory gave generous health insurance packages to the worker and his family. There were layoffs over the ups and downs of the business cycle, but all in all, it was a good job. By putting some money away from each paycheck, the family sent a child to college, the first child in the family tree to earn a college degree. This college-educated daughter then took a job, received a nice fringe benefit package, earned a good salary, and supported her family. Upon retirement, her parents, the retired factory worker and his wife, enjoyed a modest pension that, together with Social Security provided good economic security. She, however, continues to struggle with the demands and changes of today's economy.

Was this the American dream or a myth? Perhaps it is a little bit of both. Many families did, in fact, enjoy prosperity while having little formal education in their backgrounds. In years past, there were good job and career opportunities for those with little education. And workers could expect to hold only a couple of jobs over their working lives. Prosperity and security often went hand in hand.

Whether we like it or not, the economic environment today is markedly different than it was 50 years ago. Good jobs for those with only a high school degree have become scarce. You can find a job; but the pay is low, and there is no health insurance or long-term security. Better jobs go to those with a better education.

the changing economic environment

Also, states now fight aggressively for jobs with economic development incentives that can tally over \$100,000 per worker, shifting jobs across the country. Globalization has translated into intense competition for domestic businesses, in turn squeezing worker earnings and putting jobs at risk. High-paying manufacturing jobs are increasingly hard to find. Rural communities fight to maintain an economic foundation and tax base in the face of declining agriculture and the loss of industrial jobs. The rich are getting richer while lower income workers see stagnant earnings. Investments in equipment and computer technology allow firms to produce more with less, but in many instances, this means fewer workers and thus layoffs.

Is the glass half full or half empty? The answer is yes. As with most things, how you look at it depends on your perspective. In many respects, times are more difficult today than they were 50 years ago. But there is also greater opportunity today for those who have the chance and motivation to pursue it. As we sit here in Tennessee, we should recognize that the forces of change cannot be stopped. However, if we choose wisely, the forces of change can be harnessed to our advantage.

How do we do this? One means is by investing in people—from young children to adults—through education and training. Education offers the promise of improved quality of life for the family, greater competitiveness for business, and a more vital economic base for local communities. We cannot affect our external environment—things like interest rates or the rise of the global economy—in any meaningful way. But we can choose how much we invest in education and training.

FUTURE

education and quality of life

A better educated workforce means greater regional prosperity

Education certainly enhances well-being by improving earnings potential and diminishing the likelihood of unemployment; the worker benefits from education as does his or her family. By the same token, regions with a better educated population tend to have higher levels of per capita income, lower unemployment rates, a larger labor force and a lower incidence of poverty. Education matters to both workers and communities.

But these economic and monetary benefits are just a few examples of how education affects us in positive ways. People with more education tend to live better lifestyles. For example, they smoke less, exercise more often, have a lower incidence of diabetes, and live longer. More education also translates into greater economic security for the family, including higher homeownership and personal savings rates and a higher likelihood of having private health insurance.

“Education empowers people and strengthens nations. It is a powerful ‘equalizer’, opening doors to all to lift themselves out of poverty” (The World Bank, 2005).

The story doesn’t end there. Children who live in households with better educated parents enjoy better quality lifestyles. These children have lower infant mortality rates and are more likely to be immunized for communicable diseases. And they are more likely to finish high school and attend college. And so the cycle continues.

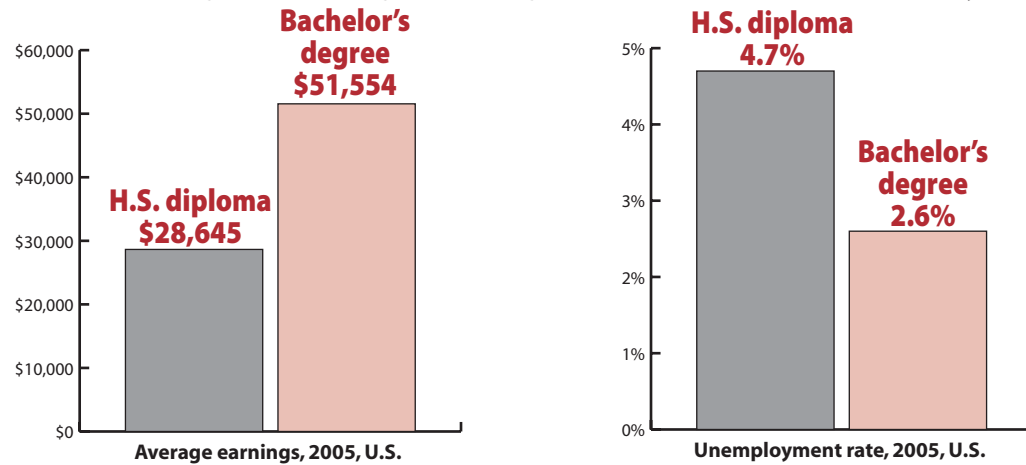
Let’s travel a bit further down this path. Society at large also benefits from an educated population. Less smoking means fewer deaths and lower health care delivery costs for everyone. Higher immunization rates benefit the immunized child but also reduce the chance that another child contracts disease. Educated people are less likely to be in prison and less likely to be on welfare, reducing the costs borne by government. They are also more likely to vote and participate in the affairs of their community.

Changes in U.S. educational attainment over the past century

- ☐ In 1900, less than 14% of all Americans graduated from high school. By 2005, that number increased to over 85% for those 25 and older (U.S. Department of Labor, 2001 & U.S. Census Bureau).
- ☐ In 1910, the first year for which estimates are available, less than 3% of the population had graduated from a school of higher learning. By 2005, the figure was 36% for adults aged 25 and over (U.S. Department of Labor, 2001 & U.S. Census Bureau).

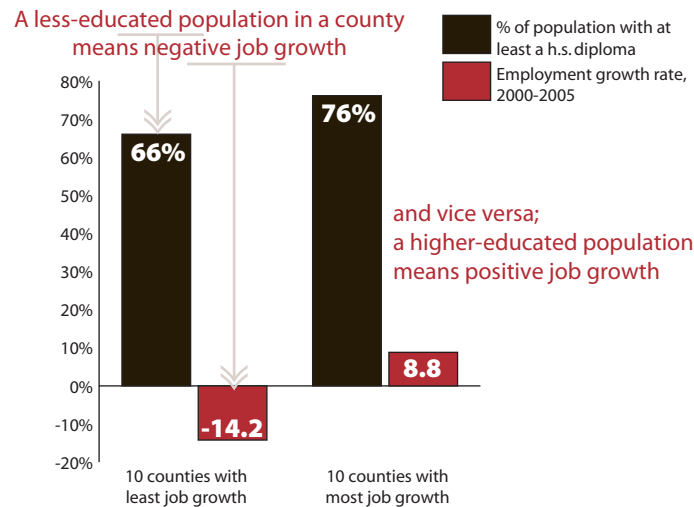
education and quality of life

A bachelor's degree means higher earnings and lower likelihood of unemployment



Source: U.S. Census Bureau.

A better educated workforce means greater regional prosperity, as shown here by job growth



Source: CBER-UT; TN Department of Labor and Workforce Development.

A variety of forces are at play, each altering the economic environment —

FUTURE

the forces of change

A variety of forces are at play, each altering the economic environment that surrounds us, each with implications for the economic security of workers, families and communities in Tennessee. These forces of change are complicated and often interwoven with one another. They can be viewed as a glass half empty or a glass half full—there are threats and risks certainly, but there are also exciting and potentially rewarding opportunities. The key to taking advantage of these emerging opportunities is education.

1-shifting fortunes: the decline of manufacturing

Tennessee has long relied on manufacturing as its primary engine of economic development. Manufacturing jobs generally pay well and often provide workers and their families with important benefits like health insurance. But Tennessee, like the rest of the country, is seeing its manufacturing employment base decline. Manufacturing jobs in the state and nation have declined each year since 1999. At the same time, job growth has been strong in various service sectors of the state economy. Education and health services, along with professional and business services, have seen especially strong growth. These trends are projected to continue into the foreseeable future.

Some industrial sectors have been hit particularly hard, notably apparel manufacturers. In 1990 there were 62,049 jobs in the state's apparel industry; by 2006 employment stood at only 7,482, a loss of 54,567 positions. Some manufacturers have fought the trend and have been able to engineer job gains, including those in the transportation equipment sector where 18,217 jobs were added between 1990 and 2006. But the overall trend for manufacturing has been fewer and fewer jobs.

Many of the jobs being lost are relatively low-skilled, low-wage jobs that can be easily shifted offshore or displaced through investments in equipment and computer technology. As these jobs erode, workers struggle to find new positions that provide comparable earnings, communities see upward pressure on unemployment rates, and the state sees more people applying for unemployment insurance and welfare benefits. Unfortunately many of the new jobs being created don't go to the workers who just lost their jobs. Retraining and retooling of worker skills is one remedy, but this can be a challenge for people with little savings who have spent much of their working lives on an apparel assembly line.

The new jobs being created in manufacturing, as well as in many of the service sectors, require greater skills on the part of the worker and greater investments in equipment and computer technology on the part of the employer. The new jobs often pay very well, though that is not always the case. Leisure and hospitality services—a foundation of the state's tourism trade—has seen healthy job growth, but the positions paid only 47.4% of the statewide average in 2006. Many of these jobs require little education and training and, in turn, offer little long-term economic security for workers and their families.



Remember these old pencil sharpeners? Bet not many of you are using them anymore. Bet you have upgraded once, maybe twice. You've probably even upgraded your pencils. Economic transition is not a new phenomenon, but that doesn't make it any easier to deal with on a day-to-day basis. Change is not easy; and while education and training cannot stop the forces of change, investments in people can help them adapt and find greater economic security in the face of a changing economic environment.

the forces of change

The plight of displaced workers

In just a 2-year period, 3.8 million workers across the U.S. lost or left jobs they had worked in for 3 years or more because their employer closed or moved, because their position or shift was abolished, or because there was insufficient work for them to do (BLS, 2006).

Over 1 million of these displaced workers were from manufacturing firms, most often producing durable goods like computers and electronic products, primary metals and fabricated metal products, and transportation equipment.

People working in managerial, professional, and related occupations—regardless of their industry—account for 34% of these displaced workers, but people with experience in these occupations find replacement jobs faster than occupations like production, transportation, and moving occupations, occupations often associated with the manufacturing industry.

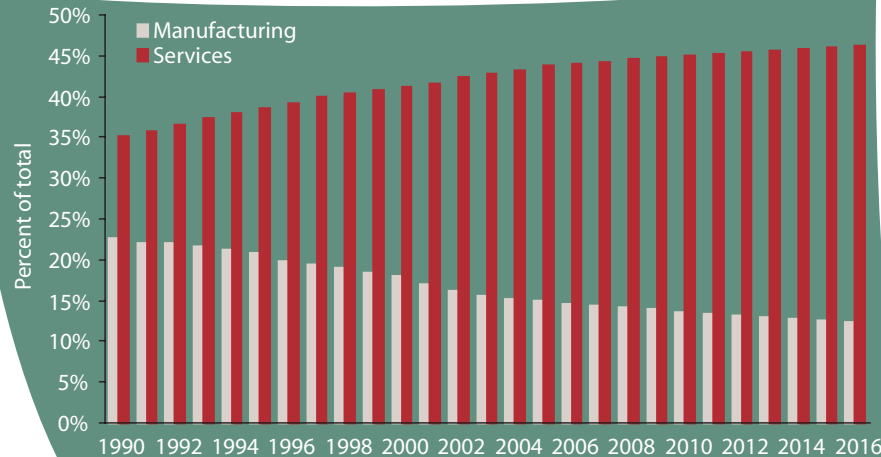
In January 2006, 30% of all displaced workers were still not employed.

Even when these workers were able to replace their jobs, they often replaced them with lower paying positions. In fact, 29% lost 20% or more of their income in their new jobs.

Older displaced workers had a harder time becoming reemployed, as did women and Hispanics.

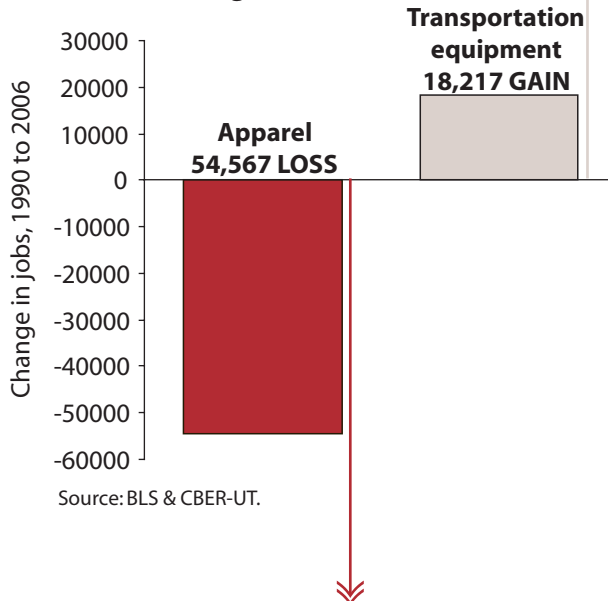
Another 4.3 million workers who worked in a company for less than 3 years also lost or left their jobs for the same reasons.

Manufacturing jobs decline while service jobs rise as a share of the economy



Source: BLS & CBERR-UT.

Fortune and misfortune in manufacturing



Source: BLS & CBERR-UT.

1-shifting fortunes: the decline of manufacturing

2-the urban-rural divide

The state is no longer as dependent on agriculture as it once was. While Tennessee ranks 4th among the states in the number of farms, it ranks 44th in the size of the average farm. Between 1995 and 2005 the state saw the number of farms fall by 8,000, and further losses can be expected in the years ahead. Today most Tennessee farmers today supplement their income with off-farm employment. For many farm profitability is weak. As an illustration, in 2005, 57% of net farm income came from government payments (CBER-UT, 2007). As farming declines in relative importance, the situation for rural Tennessee is aggravated by declines in manufacturing employment. In the post-World War II period, manufacturing helped absorb workers from farm communities across the state. In fact, manufacturing became a larger share of the economic pie in most rural economies than in metropolitan economies in Tennessee.

Education has become more important to farmers as technologies like computers and global positioning satellite systems have become commonplace on the farm, but this is just one piece of the education puzzle. Today's farmers need to have some understanding of things like global agricultural markets and possible interactions between pesticides, herbicides and fertilizers and the environment. There is evidence for both the U.S. and for developing countries that better educated farmers are more likely to adopt new technologies that can enhance agricultural productivity.

Education is important to both farm and non-farm workers in rural communities in Tennessee.

Rural places in Tennessee are being squeezed by the decline of traditional farming opportunities as well as by weaknesses in the industrial base. It is striking that 22 Tennessee counties still relied on the industrial sector for more 40% or more of their non-farm job base in 2005. In contrast (in 2006), 14.5% of all jobs in the state were in manufacturing, although about 1 in 10 jobs for the nation were in manufacturing. Topping the list in Tennessee is Perry County, where nearly two-thirds (64.3%) of all jobs are in manufacturing. McNairy County closes out the top 10 list with 45.1% of its job base in manufacturing. This sustained reliance on industrial activity places a large number of rural communities in Tennessee at great risk as manufacturing declines further in the years ahead.

Metropolitan Tennessee has been the prime beneficiary of service sector growth as manufacturing has languished. Urban counties in the state generally enjoy higher wages, stronger rates of job growth, and lower unemployment rates than their rural counterparts. For example, in 2005 the average wage in urban counties in Tennessee was \$37,056 whereas the average in rural counties was \$27,856.

Urban counties tend to have a better educated workforce and spend more on ele-

mentary and secondary education, which helps support the economic development process. Of course there are many people in urban places who have not benefited from this growth, and many people in rural communities who have thrived. There are significant pockets of poverty in all of our metropolitan areas where many workers do not earn a living wage.

The challenges confronting rural Tennessee are numerous. Isolation, limited transportation access, small labor pools, and poorly funded schools are among the constraints. But rural places in the state also have advantages like the natural environment, which can be utilized as people increasingly look at quality of life considerations when making job and residency choices.

Urban communities confront their own challenges in raising living standards for lower income households. But like their rural counterparts, urban areas also have important strengths to build upon.

For both rural and urban communities in Tennessee, education, labor force training and carefully-crafted job recruitment and retention strategies that recognize and embrace the changing economic environment may be the best development strategies for promoting new economic opportunity.

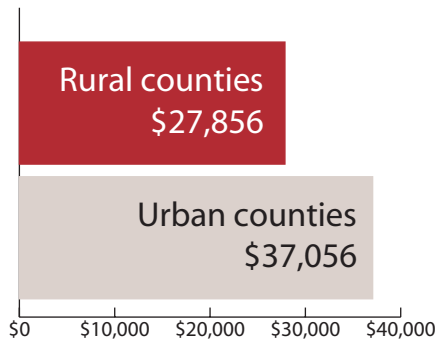
(Continued on page 12)

Rural counties in Tennessee are overly reliant on manufacturing

	Total private employment, 2005	Manufacturing employment, 2005	Manufacturing as a % of total private	Rank
Perry	2,151	1,384	64.3	1
Rhea	8,576	4,593	53.6	2
Grainger	2,549	1,326	52.0	3
Meigs	1,229	623	50.7	4
Marshall	8,283	4,195	50.6	5
Unicoi	3,756	1,824	48.6	6
Warren	12,892	6,106	47.4	7
Monroe	12,176	5,676	46.6	8
Cheatham	6,330	2,945	46.5	9
McNairy	6,579	2,969	45.1	10

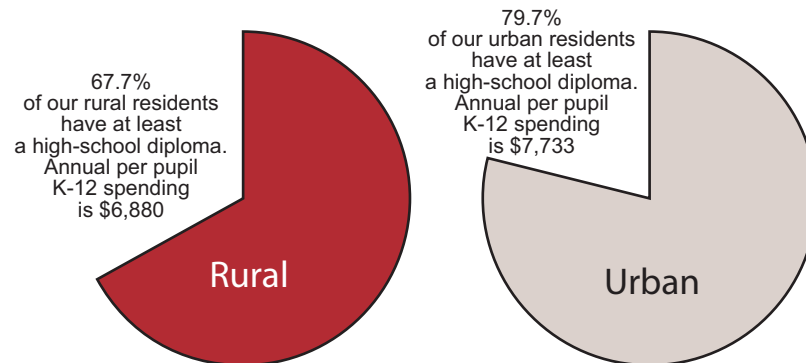
Source: BLS, Quarterly Census of Employment and Wages.

Urban counties in Tennessee enjoy higher average earnings



Source: Bureau of Economic Analysis & CBER-UT, 2004.

Urban counties in Tennessee have a better educated workforce and higher spending on K-12 education



Source: TN Department of Education, FY06 Annual Statistical Report.

FUTURE

the forces of change

2-the urban-rural divide

“Rural policymakers in particular are concerned about the loss of well-educated workers from their local communities. Known as a ‘brain drain,’ this phenomenon not only deprives local employers of an educated workforce, but it also represents a drain on local resources because the communities that invested in the education of these workers do not reap any returns on that investment” (Goetz & Rupasingha, 2005, p. 6).

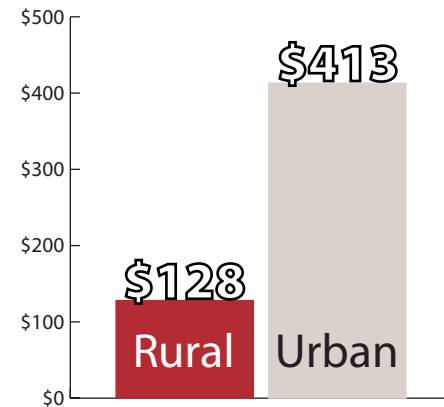
Recent research sheds light on the link between a community’s educational attainment and the county’s per capita income. The numbers speak for themselves. If a rural community improves the level of achievement of its adult workforce, the returns to the community at large are substantially lower than if the same achievement gain were engineered in an urban community. There are many explanations for this finding. Some basic problems in many rural communities include the small number of well-paid jobs and the lack of economic diversity that causes jobs to shift to other places.

Another recent study focused on job and income growth. The findings are important:

“Specifically, a 5 percentage point increase in adults attending college resulted, on average, in a 3.5% increase in the growth rate of per capita income in nonmetro areas and a 9.0% increase in the growth rate in the metro counties. For employment change, the 5 percentage point increase in college attendees contributed to a 5.5% increase in the nonmetro employment growth rate and a 6.8% increase in the metro employment growth rate” (Barkley, Henry & Li, 2005, p. 12).

Together the results show that education matters to economic development generally, though the returns to education investments are not as pronounced in rural communities as they are in urban places. Unfortunately, the lower rates of return in rural places may discourage educational investments on the part of individuals and weaken support for public schools because of the brain drain to metropolitan places. But such reactions would be unfortunate and simply reinforce the divide between urban and rural Tennessee.

Across the nation, the returns to education are positive across the board but much higher in urban counties than rural counties



Dollars per capita that result from a one percentage point increase in number of adults with at least a high school diploma

Source: Goetz & Rupasingha, 2005.

3-we compete against the world



**And
it
hits
home**

Cleveland, Tennessee, is set to lose 370 jobs from the Whirlpool Corporation cooking products plant this year (2007). The production jobs will be shifted to another facility in Tulsa, Oklahoma, and a yet-to-be determined location in Mexico in an effort to improve productivity and efficiency in their global manufacturing and distribution networks (Manufacturing.net, 2007; Reuters, 2007).

Whirlpool makes this change because of declining demand for its appliance shipments in North America and its quest to cut production costs. The plant will retain approximately 2,000 employees in the area, but the loss reflects a 15.6% reduction in Whirlpool's jobs in the local community.

FUTURE

the forces of change

3-we compete against the world, continued

Many workers in Tennessee today compete directly or indirectly against workers in other countries. Not that long ago we worried about losing jobs to another state or community. As in football and basketball, Alabama and Kentucky were our competitors. Today the jobs are going offshore and outsourcing has become a buzzword in the media. Look at the label on a piece of clothing or on a home appliance. Where were they made? Some blame the current state of affairs on free trade agreements that have helped open up borders to international commerce, but these free trade agreements have simply sped up the unstoppable process of globalization.

Over time both the nation and state have become increasingly integrated with the international economy. In 1970, total U.S. imports plus exports—one measure of the extent of global integration—were just over 10% of gross domestic product. But by 2006, this figure had climbed to over 27% of gross domestic product, an increase of about 270%.

Tennessee has become a major player in the international arena with international exports accounting for more than 15% of state gross domestic product in 2006. The state's leading export product was transportation equipment with exports valued at \$4.8 billion in 2006. Computers and electronic products came in second at \$3.3 billion.

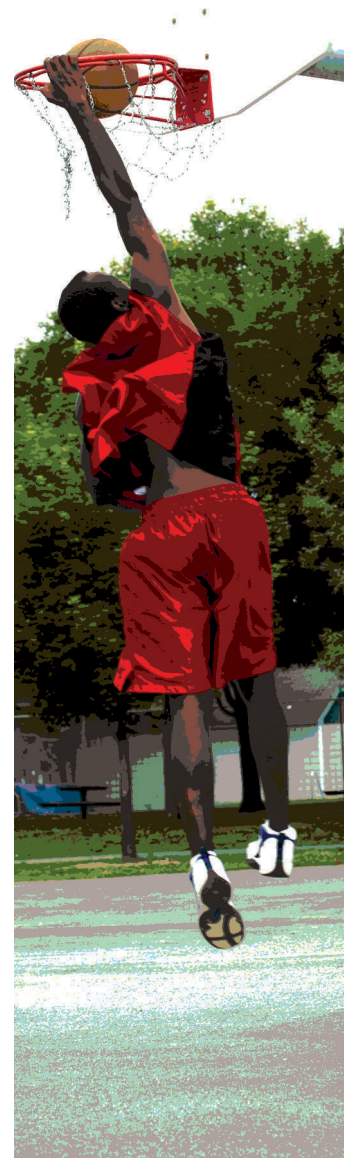
U.S. banks, brokerage firms, insurance companies, mutual funds, and other financial services firms are expected to relocate more than 500,000 jobs offshore, representing 8% of their workforces, by 2009, according to a study conducted by the management consultancy firm A. T. Kearney, Inc. (2003).

We export products to countries throughout the world. Canada is the leading buyer of products from Tennessee with purchases totaling \$6.9 billion in 2006, or nearly 1/3 of all Tennessee exports. But the Netherlands, Germany, the United Kingdom, Japan, China and Mexico also purchase a large share of total Tennessee exports.

The scope of globalization has gone beyond where many might have imagined decades ago. We knew that manufactured products like apparel would be at risk. But did we anticipate the mass movement of call centers to Bangalore, India? More striking still, who would have imagined that significant numbers of Americans would seek medical care in other countries, including care in developing countries? The growth in the service sector suggests that a much broader array of jobs are at risk from globalization than previously envisioned.

International borders can be expected to become more open, increasing the flow of goods and people. Internet access will expand broadly in the years ahead, increasing the flow of ideas and consumer and business services. We hear people in Tennessee saying the world is getting flatter, playing off a popular best-selling book. Tennessee does not have the capacity to stop these trends, even if it wanted to.

So what can we do to protect our economic security? **Invest in people** to make workers and their employers more competitive in the international marketplace. Jobs will still be lost, and the economy will continue to transition; but workers may find they are more adept at dealing with change through increased human capital investments. Moreover new jobs offering good opportunities to workers in Tennessee will be created. The transportation equipment sector in Tennessee—which we often associate with the cars we drive—is also a leading export sector. We can compete if we make the right choices.



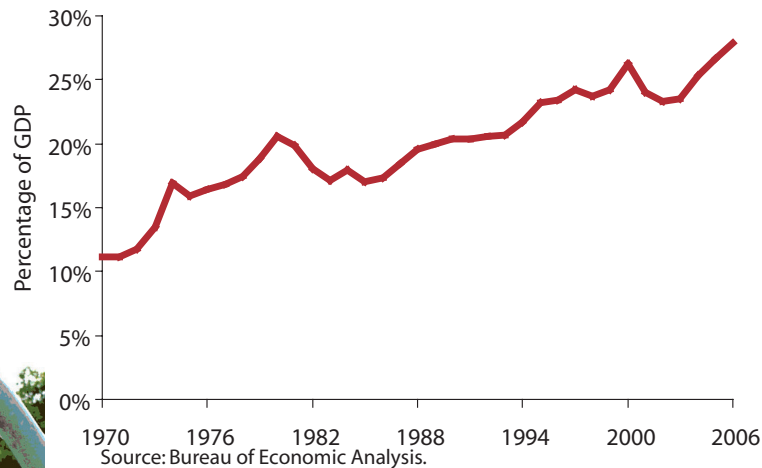
Outsourcing Medical Care?

What is a "medical tourist"? It's not someone who visits hospitals for fun. Instead it is someone who chooses to go abroad for health care, often because the cost is lower. Most so-called medical tourists finance their own health services when they travel abroad, but Asian hospital operators are now courting American health insurers and

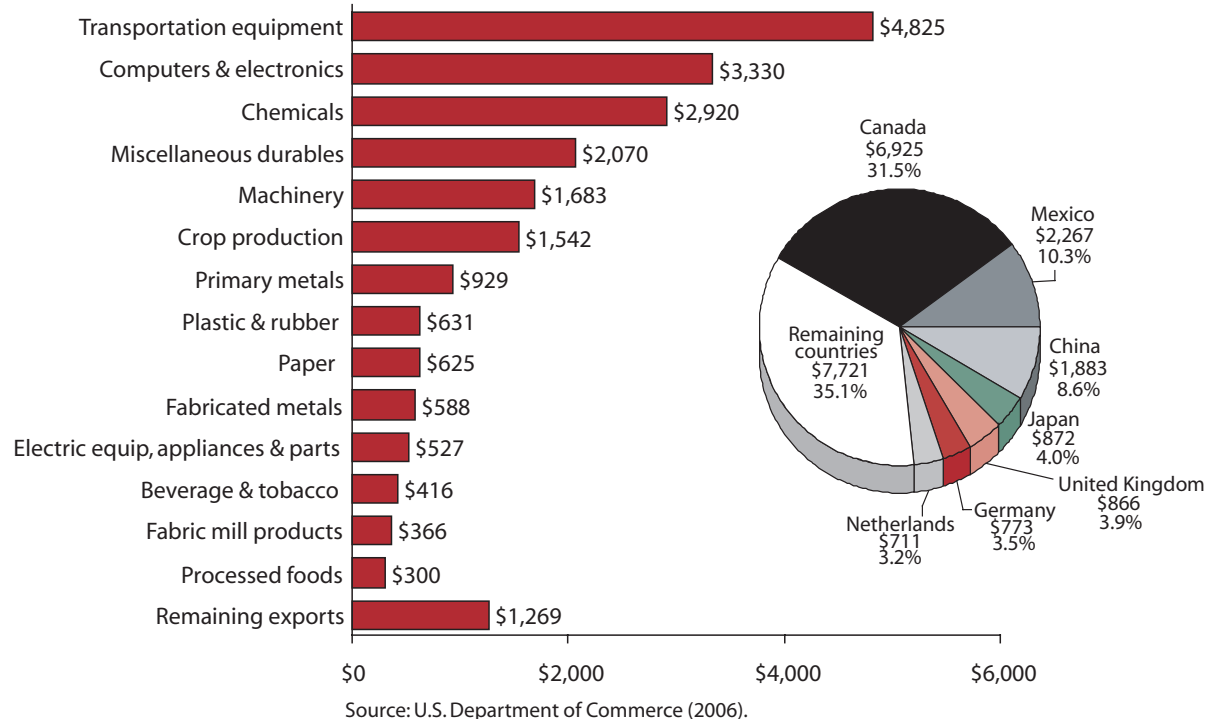
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U.S. Economy Increasingly Tied to International Commerce

U.S Imports Plus Exports as a Percentage of Gross Domestic Product, 1970 to 2006



What We Export and to Whom: Tennessee Total Exports, 2006 (millions of U.S. dollars)



3-we compete against the world

FUTURE

the forces of change

4-perceptions help drive economic development

Whether we like it or not, perceptions can affect the state's path of economic development. Businesses want to locate where there is a trained and productive workforce that can support interstate and international competitiveness. And people want to live in communities where there are good employment opportunities and good schools for their children.

Unfortunately Tennessee receives poor marks when it comes to evaluations of its workforce, system of public education and preparedness for economic development. Consider some candidate rankings:

Development Report Card, Human Resource Development Capacity, 2007	44th
Camelot Index, Educated Population, 2006	40th
Smartest State Award, 2006–2007	41st
Beacon Hill Institute Competitiveness Report, Human Resources, 2006	42nd

Each of the indexes is based on a unique methodology and array of data. But in most instances the indexes are simple if not transparent and rely on public data. For example, the Camelot Index is based on 5 factors specific to each state: the rank on the Armed Services Qualification Test, pupil-teacher ratios in public schools, high school dropout rates, average in-state college tuition and fees, and college entrance examination scores. Most people will not take the time to probe beneath the surface of the rankings to find out what they really mean.

continued from previous page

employers who are trying to rein in costs. BlueCross BlueShield of South Carolina now allows policy holders to acquire services from a low-cost hospital in Thailand. So then people receive the treatment they desire and health insurers can help rein in costs. "But the hospital operators are bracing for a backlash from the rich countries' medical vested interests whose jobs are, in effect, being outsourced" (The Economist, 2007, p. 62).



the forces of change

There are other rankings that focus on livability, but education remains an important element of these indexes. For example, Forbes provides rankings of best cities and best states to locate a business. Educational attainment of the adult population is one of a small number of components used in the Forbes index. *Money* magazine ranks cities in their Best Place to Live index. Mathematics and English test scores are used in the Best Places index. So the rankings important not only in terms of assessments of the workforce, but also in terms of quality of life. And quality of life affects where people choose to live and work.

Perception is a critical factor in attracting expanding companies.

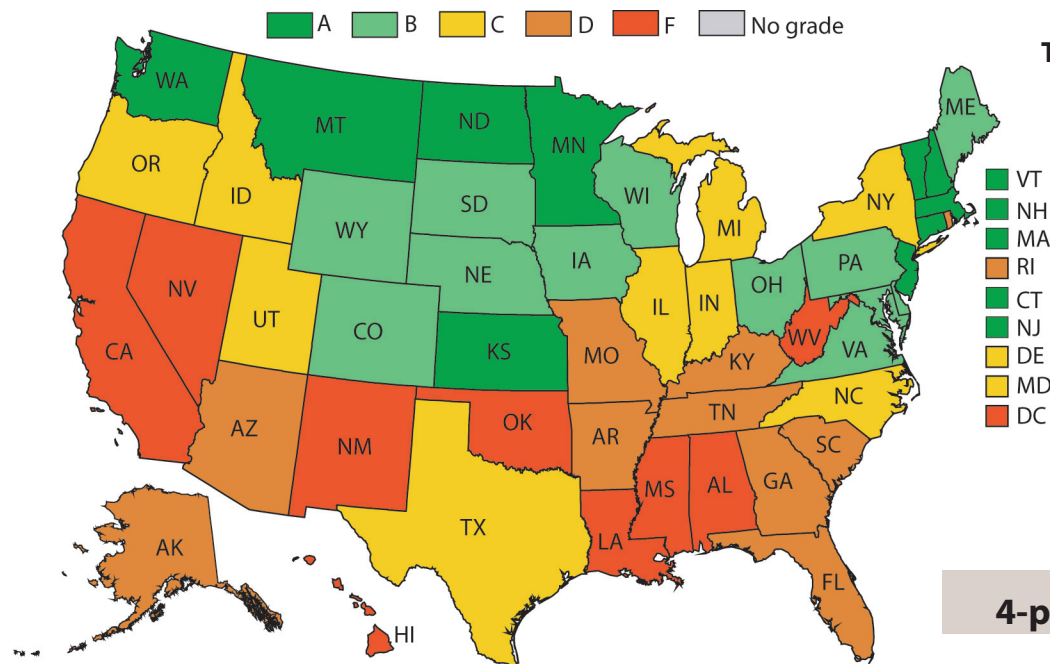
(Krizner, *Expansion Management*, 2007)

The news certainly isn't all bad. For example, *Expansion Management*—an online publication that helps businesses find attractive places for doing business—included Chattanooga, Knoxville, Memphis and Nashville in their 50 Hottest Cities index for 2007. A beauty contest of sorts, the list is based on a survey of site consultants.

How does someone reconcile the rankings of education and workforce with rankings of hottest cities? The punchline is that the state does have a good general business climate due to a variety of factors including locational advantages, climate, low taxes and limited regulation. But we have a sore spot as well: a relatively poorly educated adult population and low levels of investment in education.

Perceptions are not reality. We know Tennessee can be a great place to live, work and raise a family. But perceptions can shape our prospects for economic development. We should not be driven by rankings per se, but they should serve as a wake-up call and press us to consider the important role education can play in our future.

A business perspective: Would you take this grade home to your parents?



Tennessee earns a **D** in academic achievement, according to the U.S. Chamber of Commerce's Education Report Card (2007)

4-perceptions help drive economic development

5-where will the skilled workers be found?

The labor market is changing rapidly as the population ages and as the influx of immigrants continues. Now add the higher skill requirements for occupations expected to grow rapidly in the years ahead and the decline in jobs where low skills have in the past been adequate. *Will there be enough workers to meet the needs of Tennessee employers in the years ahead?* Will workers from Tennessee have the skills needed to allow them to compete in the marketplace? What will happen to workers who do not have the appropriate education and training?

Demographic changes in the labor market

Aging. Tennessee's population is expected to see strong growth in the next 2 decades. But the underlying demographics will change markedly. Our working lives are growing longer. But nonetheless, older people, both men and women, are less likely to work than their younger counterparts. Older workers can be a good deal for their employers. They have a good work ethic and have much experience to bring to the job. But older workers also bring unique needs and potential problems that employers must recognize as well.

The labor force participation rate—the share of adults who hold a job or who are seeking employment—is expected to fall in the years ahead due to the aging of the population. The aging of the population together with relatively modest fertility rates means a shrinking pool of potential workers for American employers.

- The national labor force participation rate—the share of the adult working-age population that is either employed or seeking employment—will peak in 2008 and then drift downward for the foreseeable future (Global Insight, 2006).
- The overall labor force is expected to grow 5.4% between 2005 and 2010. But growth from 2010 to 2015 will total only 3.0% (Global Insight, 2006).
- The labor force under age 65 will grow 5.2% between 2005 and 2010. However, this same group will grow only 2.0% in the 2010 to 2015 window, a compound annual rate of less than half of 1% (Global Insight, 2006).

Foreign-born workers. As the population ages you can expect minorities and immigrants to become a larger share of the population and workforce. As a result, the workforce itself will see significant change. Historically, immigrants tended to be more educated than native-born Americans. According to the 2000 Census, foreign-born Tennesseans are more likely to have a post-high-school degree than U.S.-born Tennesseans. But the numbers depend greatly on the country of origin. For example, immigrants from Asian countries have significantly higher levels of educational attainment than do immigrants from Latin American countries.

“This is the first generation of American-born men who don't have substantially more education than their father's generation” (Lawrence Katz, Harvard Professor of Economics, as quoted in Wessel, 2007, p. A2).

What's more:

“About 76 million baby boomers, or those born between 1946 and 1964, are set to retire in large numbers by the end of the decade. Boomers make up about one-third of the U.S. workforce, and there aren't enough younger workers to replace them. Labor shortages in key industries will force a radical rethinking of recruitment, retention, flexible work schedules and retirement” (Reeves, 2005).

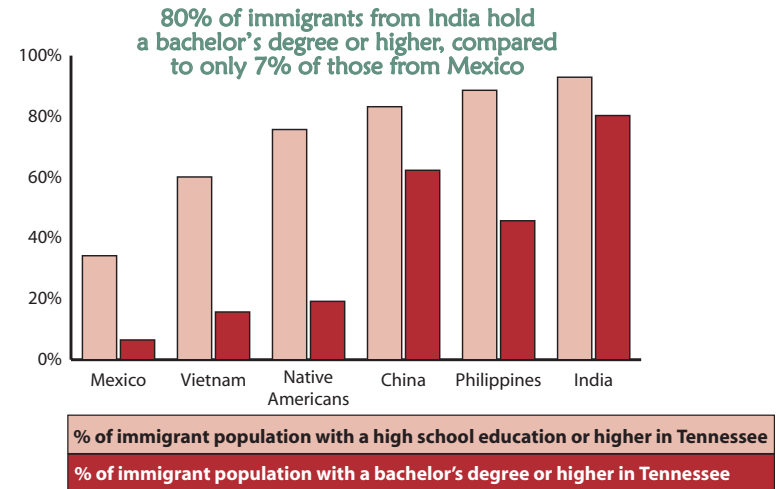
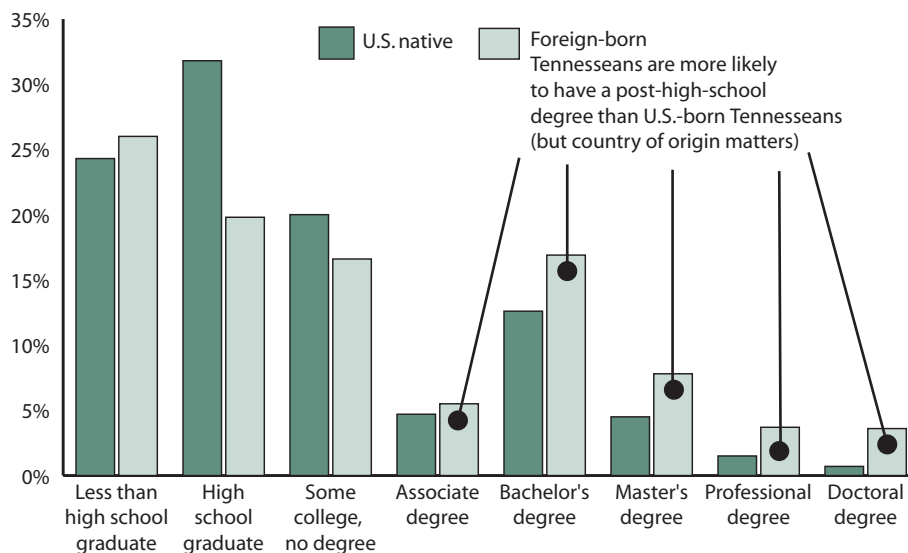
On average, the current population of immigrants is well educated. According to the 2000 U.S. Census, American Community Survey:

- 17.0% of all immigrants have less than a high school education versus 19.6% for U.S. residents and 24.1% for Tennesseans.
- Nearly 25% of all immigrants have a bachelor's or graduate degree while 24% of all U.S. residents and 19.6% of Tennessee residents attained a bachelor's degree or higher.

But the situation is changing. The U.S. Census Bureau's 2005 American Community Survey (as cited by the Migration Policy Institute, n.d.) showed that in 2005, 3.8% of Tennessee's population was foreign born:

- Of the total foreign-born population in Tennessee in 2005, 28.9% were born in Mexico, 6.5% in India, and 3.6% in China.
- Tennessee ranks 3rd out of 50 states in the percentage change in the foreign-born population between 2000 and 2005. The foreign-born population in Tennessee grew by 42.6% between 2000 and 2005.
- The Hispanic population is growing rapidly, in fact faster than any other immigrant group. In 2005, only 3.0% of the state population was Hispanic. Unfortunately Hispanics are poorly educated when compared to the state population and to other immigrant groups.

On average, the current stock of immigrants is well educated



FUTURE

the forces of change

6-labor force of the future

"In the new economy of the 21st century . . . businesses depend largely on innovation. To stay competitive, they have to generate products and services that are better or cheaper than those of their rivals, and they must innovate faster than their rivals. Thus, demand is growing for people who can spur innovation by identifying and solving new problems or figuring out what clients and customers might need or want."

(emphasis added)

— Robert Reich, Professor of Public Policy,
University of California at Berkeley and former
U.S. Secretary of Labor

Many of the occupations expected to see strong growth in the years ahead require more education and training than was required in the past. At the same time, jobs requiring little education are vanishing rapidly, at least in the U.S. We will need to change our expectations and see stronger investments in education if we expect to attract and retain quality jobs in Tennessee.

The shortage of skilled workers is real and will continue to grow:

- By 2014, the workforce will have openings for 9 million more degree holders than will be available.

There will be 3 million surplus openings for 2-year degree holders, 4 million for 4-year degree holders, and 2 million for advanced degree holders (Hecker, 2005).

- A survey by the National Association of Manufacturers (NAM, 2005) found that 90% of businesses said they had a "moderate to serious" shortage of qualified skilled production employees—up from 80% in 2001.
- Business leaders in Tennessee recognize that "other countries are graduating more engineers and technical people than we are" and that Tennessee will have trouble competing in the global market if that trend continues (CBER-UT, 2007).

If you look at the occupations expected to have strong growth, you will note that the jobs generally require more education:

U.S. employment projections by education cluster, 2004-2014 (in thousands)

	2004-2014 Change		
	Number	Percent distribution	Percent
HS graduate or less	6,923	36.6	10.1
Some college	5,246	27.7	12.6
Bachelor's degree or higher	6,759	35.7	19.0
Total	18,928	100.0	13.0

Source: BLS.

Times are changing: The U.S. outlook

Consider first the situation for the nation as a whole. As of 2004, those with a high school diploma or less held about 47% of the jobs in the U.S. Of the almost 19 million new jobs expected to be created between 2004 and 2014, less than 37% will be held by that education cluster. Bachelor's degree holders (or higher) held 24% of all U.S. jobs in 2004. However, by 2014, that percentage will rise to almost 36%; in other words, by 2014, 36% of new jobs will be held by college graduates. These projections are consistent with a shift to a more knowledge-based, information economy. This also indicates that uneducated workers will be competing for a shrinking share of the total number of available jobs, putting further downward pressure on wages.

According to the U.S. Bureau of Labor Statistics, a bachelor's degree is the most common post-secondary education level of workers in 3 of the 5 future fastest-growing occupations. For example, there are projected to be 682,000 computer software applications engineers in the U.S. in 2014, up from 460,000 in 2004—a difference of 222,000 reflecting growth of 48.4%. Of those workers in 2004, over 83% held a bachelor's degree or higher, and the median annual income was \$74,980. The 5 fastest-growing occupations had an average of about 46% of the workers with college degrees, while only 23% had a high school diploma or less. Not only do these growing occupations require educated workers, but they also pay well. The 5 fastest-growing occupations had an average median annual income of \$49,586. Other median annual incomes are shown on page 21 in the tables.

In contrast, all 5 occupations expected to decline the fastest are typically held by those with a high school education or less. Textile knitting and weaving machine setters, operators, and tenders are expected to lose 26,000 jobs from 2004 to 2014, a 56.2% setback. It is no surprise that 90% of such

jobs are held by those who have only a high school education or less. In 4 out of those 5 occupations, workers with a high school education or less made up 3/4 of the total workers or more. These disappearing occupations do not pay well either. The average median annual income of workers in the 5 fastest declining occupations was \$27,102.

In summary, employment projections for the U.S. show that the fastest growing occupations are ones that require more education and thus pay well, while the occupations with the largest job losses are the ones in which workers are generally not educated past high school. Conversely, these jobs generally do not pay well. Workers must be well educated and equipped with skills in order to take on the jobs of the future.

U.S. highlights

- In 2004, 24% of the 145.6 million jobs in the U.S. were in occupations that generally required a bachelor's degree or higher. However, between 2004 and 2014, almost 36% of the 18.9 million new jobs are projected to be filled by those with a bachelor's degree or higher (Hecker, 2005).
- Similarly, in 2004, about 47% of jobs were in occupations that generally required a high school degree or less. However, only 37% of new jobs over the 2004–14 period are projected to be filled by those with a high school education or less (Hecker, 2005).
- 24 of the 30 (80%) projected fastest growing occupations in the U.S. for 2004–14 require some form of postsecondary education (associate's degree, vocational certificate, bachelor's degree (Hecker, 2005).
- NONE of the 30 largest declining occupations require postsecondary education (Hecker, 2005).

U.S. occupations with the fastest projected growth, 2004-2014

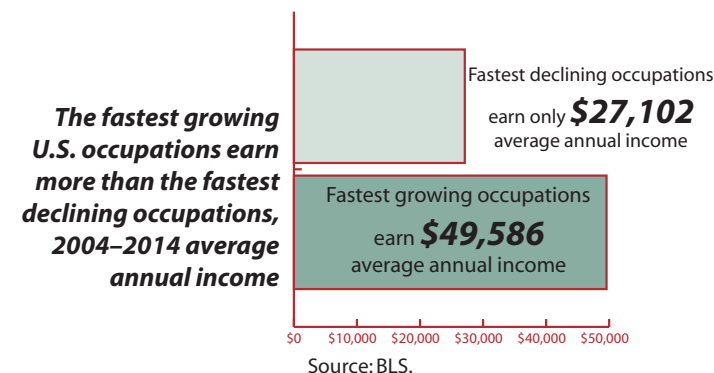
Occupation	New positions, 2004-2014	2004-2014 change (percent)	2004 Median annual earnings	Post-secondary education or training category	Percent of workers aged 25-44, by educational attainment		
					High school or less	Some college	Bachelor's degree or higher
Home health aides	350,000	56	18,330	Short-term on-the-job training	60.7	32.8	6.6
Network systems and data communications analysts	126,000	54.6	60,600	Bachelor's degree	9.4	30.9	59.7
Medical assistants	202,000	52.1	24,610	Moderate-term on-the-job training	35.3	53.4	11.4
Physician assistants	31,000	49.6	69,410	Bachelor's degree	5.8	25.6	68.6
Computer software engineers, applications	222,000	48.4	74,980	Bachelor's degree	3.9	13.0	83.2

Source: BLS.

U.S. occupations with the fastest projected losses, 2004-2014

Occupation	Positions lost, 2004-2014	2004-2014 change (percent)	2004 Median annual earnings	Post-secondary education or training category	Percent of workers aged 25-44, by educational attainment		
					High school or less	Some college	Bachelor's degree or higher
Textile knitting and weaving machine setters, operators, and tenders	-26,000	-56.2	23,880	Long-term on-the-job training	90.1	3.7	6.2
Textile winding, twisting, and drawing out machine setters, operators, and tenders	-24,000	-45.5	22,620	Moderate-term on-the-job training	91.4	7.0	1.6
Textile bleaching and dyeing machine operators and tenders	-10,000	-45.3	21,960	Moderate-term on-the-job training	88.4	7.5	4.2
Meter readers, utilities	-22,000	-44.9	29,440	Short-term on-the-job training	60.0	36.3	3.7
Shuttle car operators	-1,000	-42.4	37,610	Short-term on-the-job training	76.0	19.6	4.4

Source: BLS.



FUTURE

the forces of change

6-labor force of the future

Tennessee occupations with the fastest projected growth, 2004-2014

Occupation	2004	2014	2004-2014 Change		Average Hourly Earnings		Post-secondary education or training category
	Employment	Employment	(number)	(percent)	Entry-level	Mean (All)	
Network systems & data communications analysts	2,680	4,410	1,730	64.6%	\$16.75	\$27.52	Bachelor's degree
Court reporters	70	110	40	57.1%	\$9.88	\$31.61	Postsecondary vocational award
Computer software engineers, systems software	2,740	4,270	1,530	55.8%	\$23.10	\$32.43	Bachelor's degree
Database administrators	1,450	2,180	730	50.3%	\$17.08	\$28.55	Bachelor's degree
Computer software engineers, applications	3,090	4,640	1,550	50.2%	\$20.53	\$32.45	Bachelor's degree
Conveyor operators & tenders	2,570	3,800	1,230	47.9%	***	***	Short-term on-the-job training
Medical assistants	8,290	12,170	3,880	46.8%	\$9.07	\$11.38	Moderate-term on-the-job training
Network & computer systems administrators	3,870	5,650	1,780	46.0%	\$18.03	\$27.62	Bachelor's degree
Desktop publishers	800	1,160	360	45.0%	\$9.41	\$13.78	Postsecondary vocational award
Physician assistants	600	870	270	45.0%	\$20.56	\$31.58	Bachelor's degree
			Average		\$16.05	\$26.32	

Tennessee occupations with the fastest projected losses, 2004-2014

Occupation	2004	2014	2004-2014 Change		Average Hourly Earnings		Post-secondary education or training category
	Employment	Employment	(number)	(percent)	Entry-level	Mean (All)	
Railroad brake, signal, & switch operators	590	340	-250	-42.4%	***	***	Moderate-term on-the-job training
Textile knitting & weaving machine setters, operators, & tenders	650	380	-270	-41.5%	\$7.70	\$10.54	Long-term on-the-job training
Meter readers, utilities	1,480	930	-550	-37.2%	\$9.17	\$14.29	Short-term on-the-job training
Textile bleaching & dyeing machine operators & tenders	270	170	-100	-37.0%	\$10.20	\$13.33	Moderate-term on-the-job training
Mail clerks & mail machine operators, except postal service	1,790	1,130	-660	-36.9%	\$8.51	\$11.82	Short-term on-the-job training
Credit authorizers, checkers, & clerks	1,080	700	-380	-35.2%	\$10.08	\$16.31	Short-term on-the-job training
File clerks	3,700	2,430	-1,270	-34.3%	\$7.43	\$10.44	Short-term on-the-job training
Furniture finishers	810	550	-260	-32.1%	\$8.86	\$12.08	Long-term on-the-job training
Telephone operators	220	150	-70	-31.8%	***	***	Short-term on-the-job training
Textile winding, twisting, & drawing out machine setters, operators, & tenders	1,890	1,330	-560	-29.6%	\$8.60	\$12.14	Moderate-term on-the-job training
			Average		\$8.82	\$12.62	

*** means information is not available

Source: Tennessee Department of Labor and Workforce Development, www.careerinfonet.org.

Closer to home, times are also changing

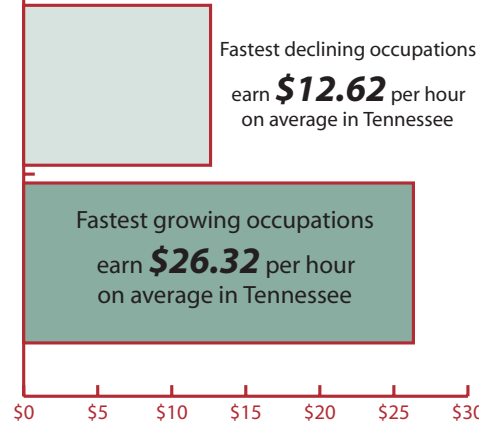
Now consider the situation in Tennessee where the trend is even more striking. Occupational projections for the state indicate that the jobs of the future in our state require more education while the disappearing jobs required very little education. In fact, NONE of the 10 fastest declining jobs in Tennessee require any postsecondary education, only varying degrees of on-the-job training. On the other hand, the 5 fastest growing (and 8 of the top 10) jobs require a bachelor's degree or some postsecondary vocational award.

The 10 occupations in Tennessee that are projected to see the strongest growth provide average earnings of \$26.32 per hour while the 10 fastest declining occupations earn an average of only \$12.62 per hour. Assuming a 40 hour workweek this is a difference of \$28,496 per year. Young workers just starting out in their professional lives also benefit greatly from investing in education. The fast-growing occupations pay an average entry-level wage of \$16.05 per hour compared to \$8.82 for the fast-declining occupations.

Tennessee highlights

- None of the 10 fastest declining jobs in Tennessee require postsecondary education.
- The fastest declining jobs pay an average of only \$12.62 an hour.
- The 5 fastest expanding occupations in Tennessee require a college degree or postsecondary vocational award (including 8 of the top 10).
- The fastest growing jobs pay an average \$26.32 per hour, more than double the average hourly rate of workers in the declining occupations.
- The 8 top growing occupations that require a college degree or postsecondary vocational award pay an average of \$28.19 per hour.

Growing Tennessee occupations forecasted pay more than twice that of declining occupations



Source: Tennessee Department of Labor and Workforce Development, www.careerinfonet.org.

***“The fact is that income inequality is real—
it’s been rising for more than 25 years.***

The reason is clear:

***We have an economy that increasingly rewards
education and skills because of that education...***

***The key to rising in this economy is skills –
and the government’s job is to make sure we have an
education system that delivers them.”***

– President George W. Bush,

January 31, 2007 on Wall Street

7-persistent income disparities



“Although we Americans strive to provide equality of economic opportunity, we do not guarantee equality of economic outcomes, nor should we.

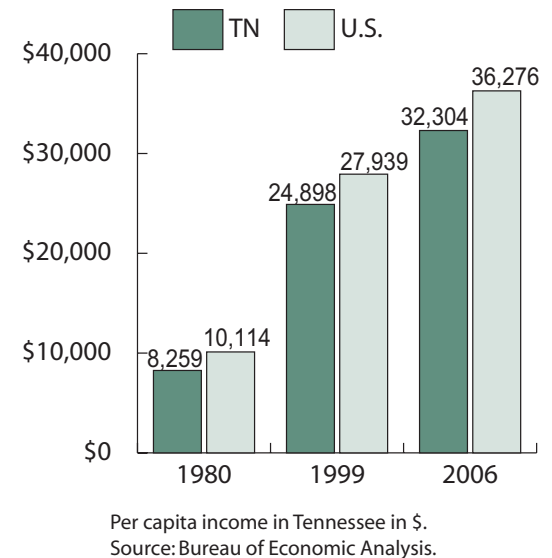
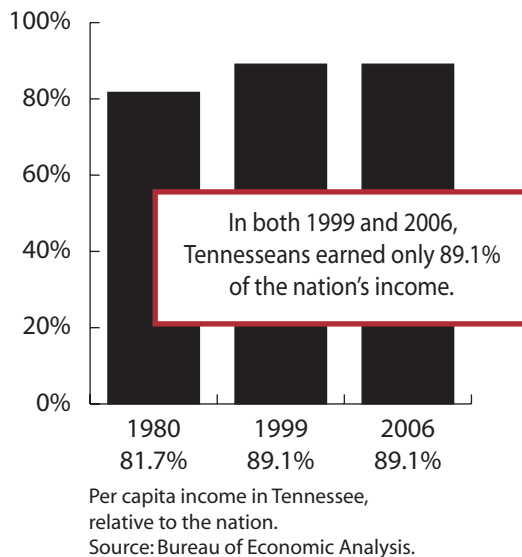
That said, we also believe that no one should be allowed to slip too far down the economic ladder...

Catching up: Tennessee’s income trails the nation (from CBER-UT, 2007 unless otherwise noted)

Workers and households in Tennessee earn less than their national counterparts. Per capita personal income—the sum of all income that individuals in Tennessee earn—trails the national average. In 2006, Tennessee per capita income was \$32,304 versus \$36,276 for the average person in the U.S. Substantial per capita income growth took place in the 1980s and 1990s allowing the state to gain some ground against the U.S. However, the state has seen no net improvement in its standing relative to the nation since 1999.

Wage and income levels for a state or community are influenced by many factors. One important factor is the mix of occupations and industries. Statewide, the annual average wage for a non-farm worker was \$38,551 in 2006. Workers in the financial activities sector earned \$55,025 while workers in the information services sector earned \$47,459.

Education levels are also a prime determinant of earnings and income levels. Better educated people earn more, communities with a better educated workforce have higher income levels, and countries with a better educated population enjoy higher income levels. This is a theme you will hear and see in pictures again and again throughout this book.



There are also substantial income disparities between rich and poor U.S. citizens. The disparities appear to have become more pronounced since the late 1970s due to a higher concentration of income at the top of the distribution. This cluster at the high end of the income distribution has given rise to a new class of American society often tagged as the ultra rich, a group of well-educated individuals who have seen

the challenge for policy is not to eliminate inequality per se but rather to spread economic opportunity as widely as possible.

Policies that focus on education, job training, and skills and that facilitate job search and job mobility seem to me to be a promising means for moving toward that goal.”

–Ben Bernanke, Federal Reserve Chairman



their earnings rise faster than their less-educated counterparts. Although several factors have affected this widening gap in income, less-educated and thus low-skilled workers have not been able to take advantage of improvements in technology in the same way that relatively skilled workers have (Gramlich & Long, 1996).

Trends in U.S. income inequality

- ▶ The top 20% of earners received 42% of all after-tax income in 1979, a figure that soared to 50% by 2004.
- ▶ The bottom 20% of earners received 7% of all after-tax income in 1979, a figure that dropped to 5% by 2004.
- ▶ From 1967 to 2001, the top 5% of U.S. earners have received a 28% increase in the share of household income.
- ▶ The share of income held by the top 1% of all taxpayers reached its highest level since 1928 in 2005.

Tennessee has witnessed similar disparities in income to that of the U.S. In fact, Tennessee's distribution of income for high versus low income is skewed more than the average state.

Trends in Tennessee's income inequality

- ▶ Of the 12 southeastern states, Tennessee had the third-worst disparity between incomes in the poorest versus richest county in 2004.
- ▶ In 2004, the county with the highest per capita income was Williamson County (\$44,298), while Hancock County's per capita income was only \$14,885. Per capita income in Hancock County is only about 1/3 of income in Williamson County.

Some will push for taxes on higher income households, while others may push for a higher minimum wage to reduce the growing income disparities. But these policies deal with income distribution after the fact, after the income has accrued to people in society. A better remedy is to address the issue at an earlier stage in the pipeline. Improvements in access to education and training that expand economic opportunity will likely establish the best chance of supporting workers at the bottom of the income distribution.

FUTURE

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8-more for less: the promise of productivity growth

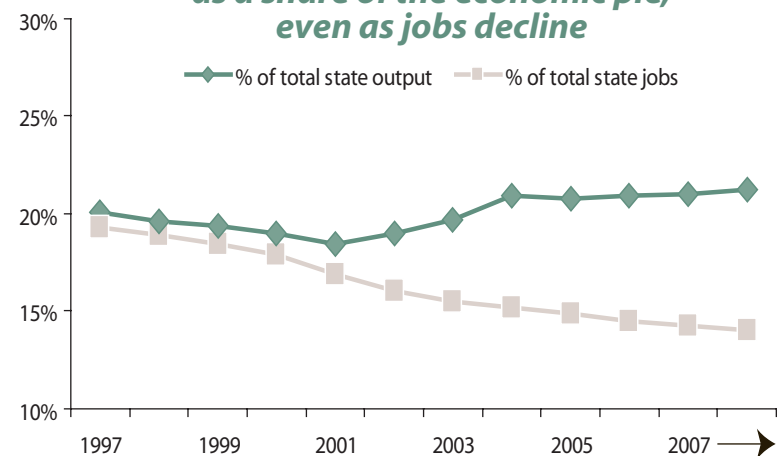
The bad news: manufacturing jobs are in decline. ***The good news:*** manufacturing production continues to expand. How can businesses produce more at the same time that they employ fewer workers? Well it's not alchemy. The answer lies in productivity gains, or improvements in the amount of output a worker can produce on the job. Productivity gains are important because they translate into more goods and services for consumers, higher earnings for workers, and improved competitiveness for businesses.

The state's manufacturing sector has seen strong growth in productivity in recent years. To put the situation in perspective, consider 2004. Adjusting for inflation, manufacturing production was up 12.6% at the same time that manufacturing employment slipped nearly 0.4% (CBER-UT, 2007). That is an incredible pace of productivity advance, though it will not likely be replicated.

Productivity gains are important for all sectors of the economy, not just manufacturing. And the issue is of national as well as state importance. The nation's rate of productivity growth slowed in the 1970s raising concerns about a stagnating national economy and loss of clout in the international arena. The slowdown was attributed to many factors, including lower investments in education and training. Productivity rebounded in the 1990s and contributed to a decade of strong economic growth that benefited both Tennessee and the nation. Much of the growth of the current decade—including the post-2001 recession period called the "jobless expansion"—has been attributed to investments in equipment, especially computer technology.

Productivity advances arise primarily from 4 broad sources. The first is through business investments in new equipment and computer technology. As Tennessee recruits new businesses to the state and nurtures those already here, it is important to focus on firms and

Manufacturing output in Tennessee expands as a share of the economic pie, even as jobs decline



Source: CBER-UT.



the forces of change

sectors that offer the promise of increased investment and business competitiveness in the years ahead and facilitate these investments.

Second is the development of technologies through research and development. This research takes place in many companies as well as in universities. The state as a whole needs to take greater advantage of its institutions of higher education and key assets like Oak Ridge National Laboratory where important research is undertaken that may benefit society and the economy.

The third source of productivity gain is infrastructure like highways and broad-band Internet technology that encourages commerce and economic activity. These types of investments must be carefully evaluated to ensure they provide a sound return on any public sector investment.

The final source of productivity advance is investments in people—human capital. These investments include early childhood education, elementary and secondary education, post-secondary education, adult training and retraining, and formal and informal on-the-job training. Both hard skills (like reading, writing, mathematics and computer literacy) and soft skills (like leadership, motivation and initiative) are important to a worker's productivity.

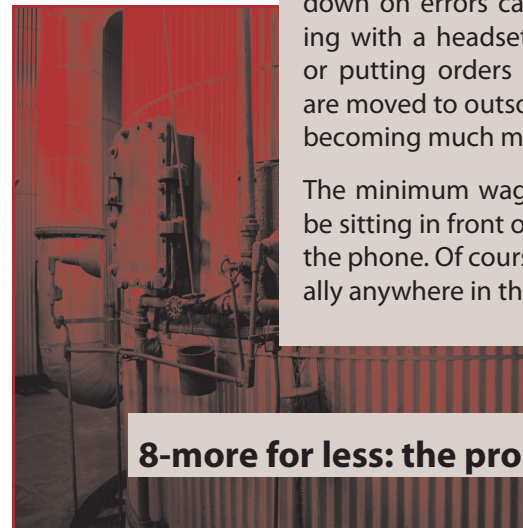
Who is responsible for making these investments? We all are. Families need to nurture their children to ensure they do well in school and value education. Taxpayers need to demand the very best from their public schools. Workers need to press their employers for training opportunities. Employers must in turn demand hard skills and soft skills alike from those they hire. Those who find themselves displaced from their job must reinvest in themselves to enable new economic opportunities.

Is this the future of fast food?

Saving 10 seconds in a fast food drive-thru may not sound like a lot, but many companies see this small efficiency improvement as the next big step forward in the food service industry. Wendy's and McDonald's have both implemented pilot programs to determine if outsourcing their drive-thru window services can improve wait time. Results have been surprisingly positive. Dennis Lombardi, Executive Vice President of Food-Services Strategies for WD Partners (Wendy's) says, "You can move orders faster, increase the average check by selling them extras ... and improve order accuracy" (Abelson, 2006). These improvements have already been seen. One test market consisting of six Wendy's stores from California, Florida, and Washington D.C. using a call center in New Hampshire has reported a 12% increase in sales.

The call center, using technology patented by the Massachusetts company Exit 41, handles drive-thru orders, allowing in-store associates to focus on order accuracy, making quality food, and assisting customers in the store. Call center associates, then, focus on the customer's order, making sure to offer premiums such as upsizing the drink or fries and offering dessert. The system purports to cut down on errors caused by drive-thru workers multitasking with a headset on, taking orders while filling drinks or putting orders together. As more and more services are moved to outsourced call centers, many industries are becoming much more streamlined.

The minimum wage fast food job of the future may just be sitting in front of a computer screen taking orders over the phone. Of course, these jobs could be filled from virtually anywhere in the world.



8-more for less: the promise of productivity growth

FUTURE

where do we go from here?



Who we become tomorrow depends on the choices we make today. This fact is true for each of us as individuals, but it is equally true as we make choices for our families and our communities. If we value education and invest in learning, we increase the chance of a better quality of life tomorrow. It's not just about higher earnings, it's about better lifestyles and quality of life as well.

But we start from a deficit. There is a substantial education investment gap in Tennessee, something we elaborate on in the chapter that follows.

[Here is a preview.](#)

Tennessee's workforce does not stack up well against the workforces in other states; by most measures, we have relatively low levels of academic achievement compared to the nation. And our spending is low by national standards as well. These gaps mean we are not realizing our full potential.

Let's look at one canary in the coal mine. Where we stand today can be captured by the Quality Counts project published by Education Week (2007) which focuses on elementary and secondary education. The Quality Counts' measures are based on hard data. The goal of Quality Counts is " ... to connect educational outcomes during school-aged years to both early-childhood and post-education benchmarks" (FFIS, 2007, p. 2).

There are 3 separate components to Quality Counts; here is where Tennessee stands:

<u>Chance for success index</u>	<u>44th</u>
<u>School-age years index</u>	<u>40th</u>
<u>Achievement index</u>	<u>40th</u>

The chance for success index focuses on the early years of a child's life and accounts for family circumstances (e.g. poverty) and pre-school enrollments. The school-age index includes National Assessment of Education Progress test scores (discussed in the chapter that follows) and high school graduation rates. Finally, the achievement component accounts for test scores, changes in test score performance, and changes in graduation rates. This canary says we have a problem as we rank in the bottom 10 on all 3 categories.

where do we go from here?

Here are some other facts and figures to help put this all in perspective. Please continue to the *Foundation* section of this report for more details.

- ▶ Tennessee ranked 43rd out of 51 states and the District of Columbia with 2005 per pupil expenditures of \$6,855.
- ▶ We spend about 75 cents per student on education for every dollar the average state spends. At the same time, our per capita personal income is about 89% of the national average.
- ▶ Spending varies widely across the state: per pupil spending in 2006 ranged from \$5,415.55 in the Gibson County Special School District to \$9,824.61 in the Franklin City School District, a difference of over \$4,409.
- ▶ Students in Tennessee are less likely than their national counterparts to take advanced courses in mathematics and the sciences or advanced placement examinations.
- ▶ Only 17% of Tennessee students taking the ACT met the ACT benchmark score in all 4 subjects in 2006—compared to a national average of 21%.
- ▶ Between 1990 and 2003, Tennessee typically ranked in the bottom 20% of states on both 4th and 8th grade reading and math scores of the National Assessment of Education Progress.
- ▶ We are losing the college education footrace. Only 16.0% of Tennesseans held at least a bachelor's degree in 1990 versus over 20.0% for the nation, a difference of 4.0 percentage points. By 2000, Tennessee's average rose to 19.6% while the national average climbed to 24.4%, a difference of 4.8 percentage points.
- ▶ In 2000, 40% of the adult population in 9 Tennessee counties had less than a high school education; the same year the U.S. average was only 19.6%.
- ▶ Our freshman high school graduation rate has improved, but it still trails the nation.

Education matters. It affects our economic well-being; it affects our economic development outlook. As we will explore throughout this book, there are also important consequences for families, society at large, and state and local government.

What does it mean to the family? It means a lot. When parents are well educated, families have a higher quality of life as shown in measures like a greater likelihood of homeownership, a lower likelihood of smoking, a lower incidence of diabetes, and a better chance of having private health insurance. The list goes on. See *Family* at pages 104-135.

Parental choices have important implications for children. For example, children with better educated parents are more likely to graduate from high school and attend college. Children who have been raised by parents who are on welfare are themselves more likely than the average person to be on welfare when they grow up.

What does it mean for society? As educational attainment rises, so does time devoted to charitable activities. Parents are also more likely to vaccinate their children against communicable diseases to the benefit of all. Society as a whole benefits from improved lifestyle choices, e.g., a lower incidence of lung cancer and thus lower health care costs. If the overall community is well educated, we find stronger participation in local schools and a greater likelihood of participating in the democratic process. See *Citizenship* at pages 136-149.

What does it mean for state and local governments in Tennessee? Local communities with a well educated population enjoy larger sales and property tax bases to fund services, including education. Better educated people are less likely to draw on expensive government programs like Families First and TennCare, and they are less likely to be incarcerated. See *Public Sector* at pages 151-179.

We are at a crossroads and the future is in our hands. Join us as we explore the implications of education on our lives throughout this book. We have 6,038,803 reasons to care.

again, we have 6,038,803 reasons to care

Introduction

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From where we must build

TENNESSEE'S ASSETS

“It’s a mystery. With all the energy devoted to expanding prekindergarten programs, leaving no K-12 child behind, improving community colleges and sweetening aid for college students, how can the U.S. be short of educated workers?” (David Wessel, WSJ, 2007)

This journey will take you through —

pre-kindergarten
public education funding
teacher quality
K-12 curriculum
advanced placement courses
TCAP
comparisons to national achievement
testing outcomes
educational attainment at the state and county levels
dropouts
comparisons to international achievement and spending
the education pipeline (and other opportunities for growth)





foundation

FOUNDATION

pre-kindergarten

A national poll of American business leaders showed 80% agree that there is a need for investment in effective Pre-K programs to improve the workforce, to remain competitive in the global economy, and for the long-term success of the U.S. economy. (Zogby, et al., 2005)



What is pre-kindergarten?

- High-quality Pre-K is a program directly connected with the K-12 system and geared specifically for the academic and social development of children during their peak learning years. In a high-quality pre-K classroom, children engage in structured learning, interacting with one another and with teachers in activities that target key areas of child development.
- Children establish relationships with teachers and peers to help develop socially and emotionally; record their thoughts in pictures or writing to build early literacy and foster self expression; act out stories in dramatic play to learn language and communication skills; use blocks and beads to learn about fundamental mathematical concepts like shapes, numbers and patterns; and observe animals, plants, and the environment to acquire scientific knowledge and a fascination for their world. Taking on responsibilities such as line leader helps children gain a sense of their role in a community while engaging in indoor and outdoor activities promotes healthy physical development.

Why is pre-kindergarten important?

- Development in these early years is critical. “The early childhood years have value not only as a preparation time for the later accomplishments in school and beyond that have galvanized public attention, but they also have value in their own right as a time of extraordinary growth and change” (Shonkoff & Phillips, 2000, p. 368).
- **From birth to age 5, the human brain develops more rapidly than during any other subsequent period.** Children make remarkable gains in their linguistic, cognitive, emotional, social, regulatory and moral capacities, which serve as the foundations for subsequent growth (Shonkoff & Phillips, 2000, p. 5). To the extent that early childhood education can provide attention to these dimensions and nurture early learning, quality Pre-K has the potential to make a significant difference in a child’s development.

The nation's concern

- Many people across the U.S. are realizing the potential of Pre-K. Efforts to increase the availability of Pre-K education are on the rise. In the 2005–06 academic year, state-funded Pre-K in the U.S. served 942,766 3- and 4-year-olds, an 18% increase from 2004/05. This increase was primarily attributable to the addition of Florida's voluntary Pre-K program (Barnett, et al., 2006).
- Between the 2001–02 and 2004–05 academic years, **state spending on Pre-K rose to nearly \$3 billion, an increase of 7.5% after adjusting for inflation** (Barnett, et al., 2006, p. 4).
- In 2006, 31 states and the District of Columbia appropriated more than 450 million new dollars for early education, an increase of nearly 12% over 2005 (Pre-K Now, 2006).



Tennessee's milestones

Year	Action
1998–99	State began its pilot Pre-K program for at-risk students, enrolling 600 children ages 3 and 4
2005–06	<p>New budget proposal expanded the existing pilot program by earmarking \$25 million each year in lottery excess</p> <p>This \$25 million added 300 classrooms for at-risk 4-year-olds, resulting in a total of 446 Pre-K classrooms and a total enrollment of 9,000 children</p> <p>As of 2005–06, local school districts are accountable for matching state dollars for new programs, based on their state/local match requirement</p> <p>With \$10 million from state general revenues, total Pre-K spending by state government stood at \$35 million</p> <p>All but 13 counties in the state had some form of state-supported Pre-K program</p>
2006–07	<p>A \$20 million budget increase in state general revenues is allocated to Pre-K, a 57.1% increase from the prior year</p> <p>The expanded funding created 230 new classrooms and is expected to boost enrollment by 5,000 additional children this year</p> <p>Still, according to the National Institute for Early Education Research, it would cost approximately \$193 million to provide Pre-K access to all 4-year-olds in the state, given its 2004–05 expenditure level— an additional \$138 million over the 2006–07 budget</p>

Sources: Tennessee Department of Education, 2006; State of Tennessee, 2007a, 2007b; Pre-K Now, 2006, 2007; Barnett, et al., 2006.

“Last year we had 12 four-year-olds enrolled in our preschool program. All of these children qualified as speech or learning impaired and received services as such. As these children prepare to enroll in Kindergarten next fall, a re-evaluation revealed that 7 of the 12 no longer met the standards for a disability. VERY EFFECTIVE!!!!”

— Teacher Leslie Brewer,
Henry County Schools
(Tennessee Department of
Education, 2006)

pre-kindergarten

State-funded pre-kindergarten varies widely over 3 key program measures. Although states have increased their support of Pre-K in recent years, deficits remain. The *State of Preschool: 2006 State Preschool Yearbook* published by the National Institute for Early Education Research (NIEER) provides state profiles and rankings over the measures of access, resources, and quality for the 2005–06 academic year.

Access to Programs

Budget & Resources

Quality Care

- ... 2005–06 is the first year that any states met all 10 quality benchmarks. Those states are Alabama and North Carolina.
- ... **Tennessee was 1 of 6 states that met 9 quality benchmarks.** In 2005–06, Tennessee failed to meet the requirement that assistant teachers have a CDA or equivalent.
- ... Other top states included Arkansas, Illinois, Oklahoma, Louisiana, and New Jersey.
- ... 13 states meet 5 or fewer of NIEER's quality benchmarks.
- ... Most states met 6.5 benchmarks.

NIEER QUALITY BENCHMARKS

- 1) Early learning standards are comprehensive
- 2) The teacher has at least a BA
- 3) The teacher specializes in Pre-K
- 4) The assistant teacher has a CDA or equivalent
- 5) The teacher and assistant receive at least 15 hours of in-service training per year
- 6) The class size is 20 or fewer students
- 7) The staff-child ratio is 1:10 or better
- 8) Vision, hearing, and health screening and at least one support service are available
- 9) At least one meal is offered per day
- 10) Site visits are used to monitor adherence to program standards

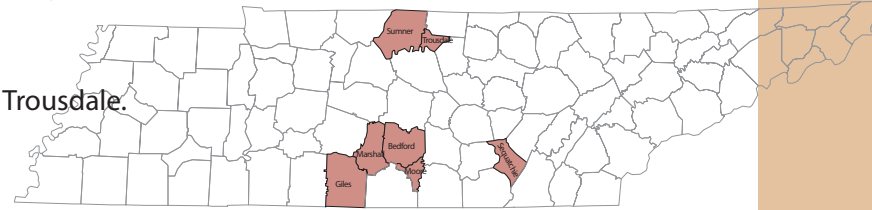
Quality determines educational value

Although access is important, it is not acceptable to forgo high-quality for more access. "Research has confirmed the role of quality care in promoting the health and development of young children" (Shonkoff & Phillips, 2000, p. 368).

Tennessee's high-quality rankings should show positive impacts on our children.

Who has access and who doesn't?

- ... Just 11% of the state's 4-year-olds were enrolled in pre-kindergarten programs in 2005–06, ranking 23rd out of the 38 states with programs.
- ... 7 Tennessee counties do not have any form of state-supported Pre-K program at all: Bedford, Giles, Marshall, Moore, Sequatchie, Sumner and Trousdale.
- ... Oklahoma, in 1st place for access, enrolled 70% of its 4-year-olds; Georgia took 2nd with 52% enrollment.
- ... Since 2004–05, Tennessee has made significant access improvements, adding 300 classrooms in 2005–06 and 230 more classrooms in 2006–07 to enroll an additional 11,000 children.
- ... Nationally, 20% of 4-year-olds and 3% of 3-year-olds were enrolled in state-funded Pre-K 2005–06; the percentage of the 4-year-old population enrolled in state Pre-K has increased by 6 percentage points since 2001–02.
- ... Florida, Georgia, and Oklahoma offer Pre-K to all 4-year-olds and other states are moving in that direction.
- ... No state offers Pre-K to all 3-year-olds.
- ... Most state-funded Pre-K initiatives focus on children from low-income families or at-risk children. But some experts believe that all children need the benefits of a high-quality Pre-K education (Pre-K Now, 2007). Although "there is no lower age limit on the need to invest in learning and development" (Barnett, et al., 2006, p. 11), many state-funded Pre-K initiatives still continue to target only 4-year-olds, leaving many 3-year-olds out.



It is important to realize that state spending is not the only source of financial support for many state Pre-K programs. Programs also derive support from federal and local sources; therefore, state expenditures do not equal total financial support. Despite this fact, state spending per child is a key influence on program quality and is an indicator of each state's commitment to expand access.

Tennessee spent \$4,061 per child on approximately 8,600 kids, ranking 12th out of the 38 states with programs, 2005–06.

New Jersey spent the most per child with \$9,305 per child enrolled.

South Carolina spent the least at \$1,085 per child enrolled.

In general, states with the highest spending per child fully fund their Pre-K programs, while states with the lowest levels of spending rely primarily on outside sources.

Average state Pre-K spending per child enrolled was \$3,482.

Since 2004–05, Tennessee has increased funding for its Pre-K program, earmarking \$25 million each year in lottery excess for Pre-K in 2005–06, and then allocating an additional \$20 million in state general revenues to Pre-K in 2006–07.

A record 31 state legislatures committed to increase funding for Pre-K in FY07; no state legislature authorized a decrease.

Still, in the 2005–06 school year, inflation-adjusted state Pre-K spending per child continued on a downward trend, falling in 27 out of 37 states. State Pre-K spending per child has fallen by more than 17% since 2001–02, which the authors of the *2006 State Preschool Yearbook* attribute to states increasing enrollment without sufficient funding increases and states failing to keep pace with inflation (Barnett, et al., 2006, p. 8).

Tennessee plans to further expand its Pre-K program in FY08 with an additional \$25 million from its general fund to add another 250 classrooms.

According to Tennessee's FY08 taxpayer's budget, 42 cents of your state tax dollar is expected to go to education.

public education funding in Tennessee

One of the most important government programs supported by tax dollars is public education. Public education served 88.4% of all kindergarten through grade 12 students in 2005 (U.S. Department of Education, 2006). At one time, the local property tax was the primary means of funding K-12 public education in the U.S. However, substantial differences in wealth across local school districts meant that spending could differ widely across districts — and in many states it did. Many state courts—including the Supreme Court in Tennessee—have ruled that large differentials in spending are unconstitutional. To narrow the spending differentials, states increased funding support for elementary and secondary education.

How does Tennessee pay for public elementary and secondary education?

- Total K-12 spending in Tennessee was \$6,471,664,394 in 2005–06.
- Local governments supported 43.7% of K-12 spending while the state contributed 44.8% of funding in 2005–06.
- The percentage of total school revenues coming from state resources has actually decreased from 49.6% in 1997 to 44.8% in 2005.
- During the same time period, the share of education dollars appropriated by the federal government has increased from 8.9% to 11.5%. The most recent increases in federal K-12 funding are primarily due to the implementation of the No Child Left Behind (NCLB) Act in 2002.
- The majority of federal education funding goes towards special education. Under the Individuals with Disabilities Education Improvement Act (P.L. No. 108-446) of 1975, the federal government committed to funding 40% of the total cost of special education.

The Basic Education Program (BEP)

The state of Tennessee provides revenues for public elementary and secondary education that supplement local funds through the Basic Education Program (BEP). This mechanism distributes state funds to school districts on the basis of their need and their capacity to generate funds from local taxes.

The BEP was instituted in Tennessee during the 1992–93 school year in response to the Supreme Court decision, *Small Schools v. McWherter*, with the following mandate: the State Board of Education must “develop and adopt policies, formulas, and guidelines for the fair and equitable distribution and use of public funds among public schools and for the funding of all requirements of state laws, rules, regulations and other required expenses” (Tenn. Code Ann. §49-3-351).

The BEP replaced Tennessee’s former school funding mechanism known as the Tennessee Foundation Program, active from 1977 until 1992. For further information on the BEP, please see the education reports produced by the Tennessee Advisory Commission on Intergovernmental Relations at <http://state.tn.us/tacir/publications.htm#>.

The National Education Association (2006) estimates that total revenue receipts for public primary and secondary education nationwide exceeded \$472 billion in 2005. This figure breaks down to \$41.4 billion, or 8.8%, from the federal government; \$220.2 billion, or 48.6%, from state governments; and \$201.4 billion, or 44.3%, from local governments.



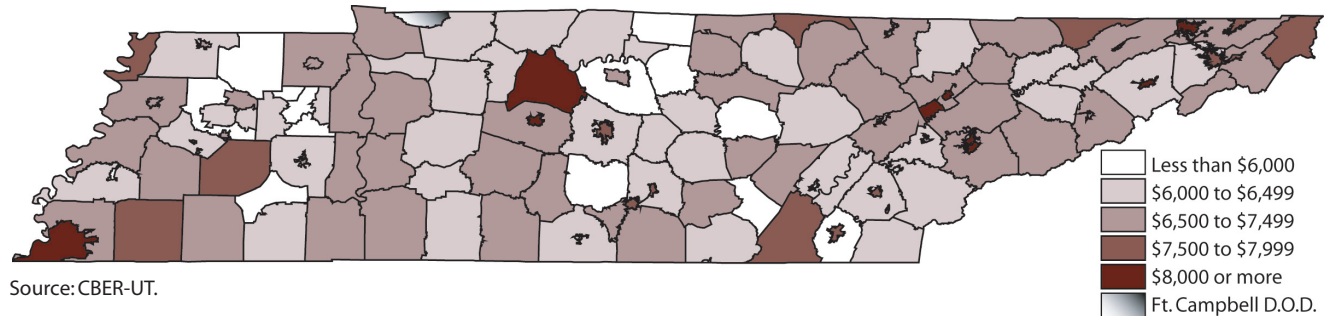
public education funding in Tennessee

Education spending levels

Education spending varies significantly across states as well as across school districts in Tennessee.

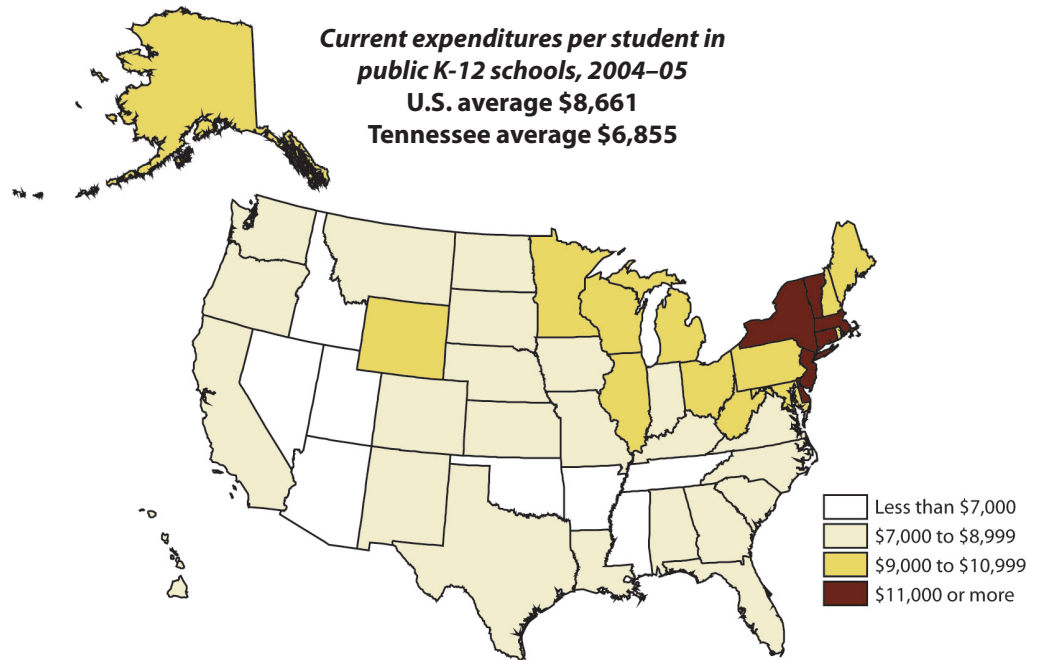
- Per pupil current expenditures in 2006 (calculated using average daily membership) ranged from \$5,415.55 in the Gibson County Special School District to \$9,824.61 in the Franklin City School District.

Current expenditures per student by Tennessee public school district, 2006



- Tennessee spending for K-12 education typically ranks toward the bottom of all U.S. states. The most recent data compiled by the NEA shows Tennessee ranked 43rd out of 51 states and the District of Columbia with 2005 per pupil current expenditures of \$6,855.
- Washington, D.C. ranks 1st with per pupil spending that exceeds \$15,000 which is more than twice the spending in Tennessee.
- Utah comes in at 51st with per pupil current expenditures of \$5,032.
- Only 8 U.S. states spend less than \$7,000 per pupil: Tennessee, Alabama, Arizona, Arkansas, Idaho, Nevada, Oklahoma, and Utah.

Current expenditures per student in public K-12 schools, 2004–05
U.S. average \$8,661
Tennessee average \$6,855



Why do we always have to talk about money?, you ask.
 Please continue —



public education funding in Tennessee

Because money matters. (It is *our* money, after all.)

How much money we spend and how we spend it.

It matters.

Still, a long-standing debate exists over whether or not increased school funding leads to significant improvements in student outcomes like test scores. Despite this debate, few would argue that less spending would be helpful to student performance.

Eric Hanushek (1996), an education economist, reviewed a vast amount of research and famously concluded that “no strong or systematic relationship exists between school expenditures and student performance” (p. 56). Hanushek’s conclusion is that outside factors, including home environment, matter much more than the money spent within the school. However, other studies have challenged Hanushek’s argument and have found a significant relationship between school spending and outcomes, namely test scores. Hanushek himself has more recently concluded that money matters in some instances. In particular, higher-skilled teachers can significantly improve student outcomes.

Obviously, throwing more money into a low-performing education pipeline may not produce a strong payoff. But if carefully allocated, money may yield a significant difference in student performance.

It is “essential that ... public educators stop demanding we throw more money at a system ... [and] start embracing innovative measures. [It is also] essential for [the] business community to offer meaningful assistance and lend expertise to come alongside with a fair and just approach to accountability, i.e., help fix legitimate challenges facing public educators while holding the system accountable for producing graduates with high level critical thinking skills that will make Tennessee a viable, sustainable place to do business.”

— *Opinion from business leader at a health care and social assistance company employing 4,500 people in suburban Tennessee* (CBER-UT, 2007)

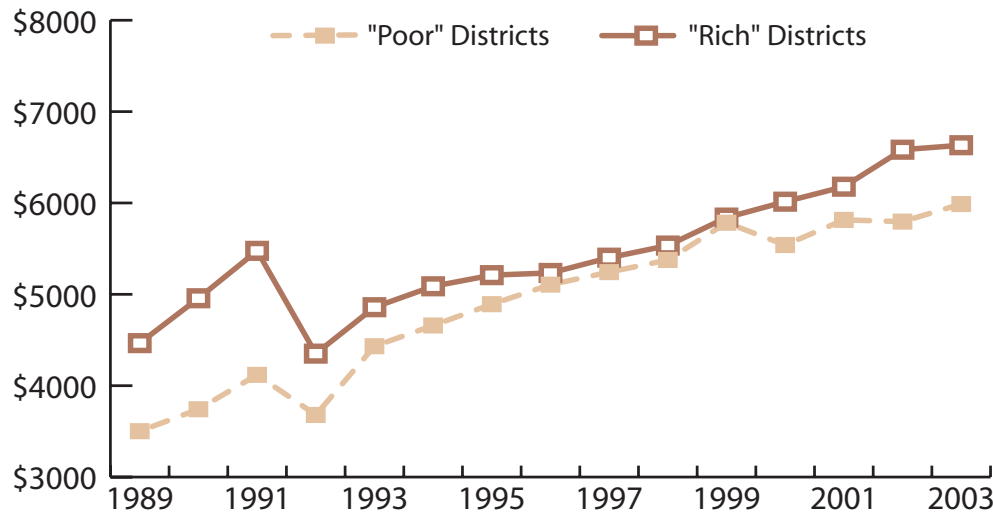
public education funding in Tennessee

The BEP & the rich versus the poor

The main goal of the BEP is to reduce the disparity in spending between Tennessee school districts. The disparity originally existed because wealthier districts—districts with more taxable property and sales—have a larger tax base and could therefore generate more tax dollars for schools. The BEP has helped narrow spending differences; it was not intended to equalize funding.

- The figure below presents the average per pupil spending levels in “rich” districts as well as the average per pupil spending levels in “poor” districts. “Poor” districts are defined as districts whose real per capita income falls at or below the 10th percentile. “Rich” districts are defined as districts whose real per capita income falls at or above the 90th percentile.
- The gap in spending appears to widen again beginning in the 1999–2000 school year, the year following full funding of the BEP.

“Rich” districts consistently spend more money per student than “poor” districts



Source: CBER-UT calculations from Tennessee Department of Education and BLS.

Okay, money matters, but what about the teachers?, you ask.
Please continue —



teacher quality

No one can deny that teaching is a tough job,
but teaching can be rewarding.

And what could be more important than mentoring our future leaders?

It is perhaps one of the most important jobs in society today. Teachers face pressures from their students as well as parents and school administrators. Now, they are bound by a maze of federal, state and local responsibilities and mandates, more than ever before. The hours are long and the commitment must be deep. But again, it can be highly rewarding and inspiring.

Inspiring enough to compel Vicki, an assistant principal in Chattanooga, to submit the following essay to the *This I Believe* series, a national media project engaging millions of people in writing, sharing, and discussing the core values and beliefs that guide their daily lives. (Reprinted by arrangement with This I Believe, Inc. To read and hear other essays and to submit your own, visit www.thisibelieve.org.)

“Every day I come into an almost 100-year-old building and make sure that both it and the teachers are ready to educate over 300 Pre-K–fifth grade children who live in poverty. As my day unfolds I deal with many things, both tangible and intangible. The restrooms aren’t clean enough....a student is ill....another student is very angry. I also work with new teachers, giving them ideas to use and support that will hopefully empower them to have a long and successful teaching career.

Every day I come to work and I say to myself, “Today I am here for Greg, or Cierra, or Enchanta.” I put a child who comes to my mind in the blank. I believe that my difficult job is worth a day of quality education for my students. I am the assistant principal of an improving urban school in Chattanooga, TN.

I believe deeply that the success of our nation depends on how we treat our population of people in poverty. The majority of these people, single moms and their children, work hard, love deeply, and are committed to each other. The majorities of these people are not lazy, are not criminals, and are not ‘stupid’. People in poverty are dealing with incredible difficulties, and I believe that it is our responsibility to walk hand in hand with them to help the children out of the trap of generational poverty.

Every day when I come to work I can be assured of my heart swelling with pride as a fourth grade student reduces fractions to the lowest common denominator, or when a fifth grade girl uses peer mediation to solve a conflict instead of fighting. I can be assured of a joy that is indescribable as a student comes to me, flings her arms around my neck, and with shining eyes and says “I knew you would be here today! I knew it!”

I believe that working in an urban school is both the most difficult and most rewarding job anyone can have. I don’t live in an ivory tower; I live in the hearts of my students. I help make sure they not only have their basic needs met such as clothing and food, but I have the privilege of being there as they have moments of understanding, moments of triumph, moments that they and their parents forget how difficult life can be.

I believe that our urban kids are not diamonds ‘in the rough’, but are shining examples of triumph over adversity, examples of intelligence and caring, strength and character. I believe that my life is being well spent—and for that I am content and blessed.”

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teacher quality

Teacher quality: what does the research say?

There is mounting evidence that teacher quality really does matter to student performance.

- Measures of teacher preparation and certification are by far the strongest correlates of student achievement in reading and mathematics, both before and after controlling for student poverty and language status (Darling-Hammond, 2000).
- Teacher quality is more strongly related to student outcomes than other types of investment such as teacher salaries, class size reductions and overall spending levels (Darling-Hammond, 2000).
- The difference between having a good teacher and having a bad teacher can exceed 1 grade-level equivalent in annual achievement growth (Hanushek, 1992). [Good and bad are defined by experience and educational attainment.]
- Of all teacher attributes we can measure—things like teacher experience, degree level and class size—only years of teacher experience is significantly related to student outcomes (Hanushek, 1992).
- Variations in teacher quality account for 7.5% of the total variation in student achievement—a much larger share than any other school characteristic (Rivkin, Hanushek & Kain, 2005).

Teacher education levels in Tennessee and the nation

Tennessee compares reasonably well to the rest of the nation with regard to the average education level of its teachers. In fact, Tennessee has a higher percentage of teachers with a specialist or doctorate degree compared to the national average (NCES, 2005). On top of that, 8.0% of Tennessee teachers have an education beyond a master's degree, while only 6.1% of teachers nationwide have a degree beyond a master's.

Average educational attainment, primary and secondary teachers, 2000

	<i>Bachelor's</i>	<i>Master's</i>	<i>Ed Specialist</i>	<i>Doctoral</i>
Tennessee	50.9%	41.1%	6.1%	1.0%
U.S.	52.0%	41.9%	4.7%	0.7%

Source: NCES, Digest of Education Statistics 2005 <http://nces.ed.gov/programs/digest/d05/index.asp>.

While teachers in Tennessee are relatively well educated, many teach in classes outside their field of expertise. Unfortunately, Tennessee ranks 49th (50 states & D.C.) in the percentage of secondary classes (7th–12th grade) led by teachers lacking at least a minor in the field in which they teach (Rocha, 2005).

One study from Tennessee showed that students placed for 3 years in a row with teachers with a minor in the subject area performed 50 points better on a 100-point scale than students placed with ineffective teachers (Center for American Progress, 2005).

Secondary classrooms led by out-of-field teachers

<i>State</i>	<i>%</i>
Mississippi	30%
Nevada	30%
Ohio	30%
Texas	30%
West Virginia	30%
Georgia	31%
Kentucky	32%
Hawaii	33%
Arizona	35%
New Mexico	35%
Tennessee	36%
Delaware	37%
Louisiana	40%

Source: Rocha, 2005 (2000 data).

Well, what difference does the curriculum make to success?, you ask.
Please continue —



“Knowledge alone, without knowing how to apply it is inadequate.
Students need both rigorous and relevant standards ...

—Willard R. Daggett, Ed.D., President of the International Center for Leadership in Education

Advanced middle school and high school courses

Most students in Tennessee do not take the same number of advanced courses in mathematics and sciences as their counterparts in other states. This deficiency contributes to relatively lower test scores in Tennessee and means students are not as well prepared as they should be for study after high school.

Students in Tennessee also lag the nation in advanced placement tests taken in high school. A lack of AP courses can prolong the time a student must attend college while at the same time crowding out the opportunity to take other courses while in college.

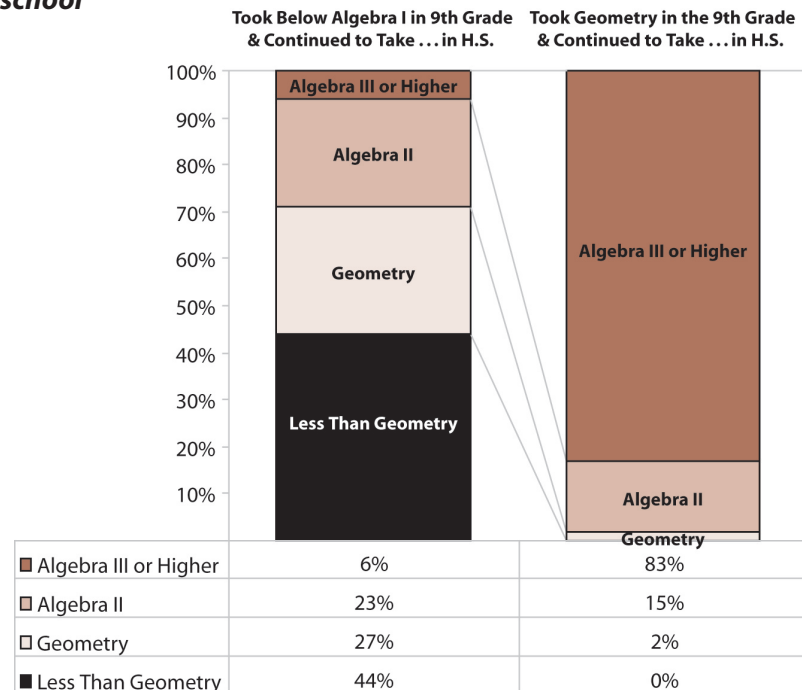
- In 2005, 26% of Tennessee’s 8th graders completed Algebra I or higher and 21% scored at or above the proficient level in mathematics on the NAEP (SREB, 2006).
- In comparison, 50% of 8th graders in Maryland completed Algebra I or higher and 30% scored at or above the proficient level in mathematics (SREB, 2006).

Advanced courses in middle school and high school are an important gateway to subsequent academic success.

Math courses and the future

- Students who take a math course below Algebra I in the 9th grade are much less likely to take an advanced math course (Algebra III or higher) in high school. Among 2005 graduates, only 6% of students who took below Algebra I in the ninth grade went on to complete Algebra III or higher (U.S. Department of Education, 2007).
- 34% of students who took Algebra I in the 9th grade completed an advanced math course prior to graduating.
- The vast majority (83%) of students who took Geometry in the 9th grade went on to complete an advanced math course.

9th graders who take below Algebra I are less likely to take advanced math at all during high school



Source: U.S. Department of Education, 2007.

What math and science courses do students in top-performing states* take?

	Tennessee	U.S. average	Top states
8 th graders taking Algebra	19%	22%	35%
9 th - 12 th graders taking at least 1 upper-level math course	53%	53%	64%
9 th - 12 th graders taking at least 1 upper-level science course	21%	31%	40%

*Top-performing states = median of top 5 performing states.
Source: The Education Trust, 2006.

Not surprisingly, NAEP scores are highest for those graduates who complete more challenging and higher level mathematics and science courses

But don't take our word for it. Here are the academic profiles of graduates who scored at the *Advanced* achievement levels on NAEP assessments in mathematics and science, right next to those who scored *Below the Basic* achievement levels. Who wins?

Mathematics — Advanced

89% took calculus
85% had a top 25% mathematics GPA
86% took an AP/IB** mathematics course

Science — Advanced

95% took a science class beyond chemistry
81% had a top 25% science GPA
61% took an AP/IB** science course

Mathematics — Below Basic

1% took calculus
7% had a top 25% mathematics GPA
1% an AP/IB** mathematics course

Science — Below Basic

26% took a science class beyond chemistry
9% had a top 25% science GPA
3% took an AP/IB** science course

**IB=International Baccalaureate

...if they are to be prepared to function in a technological, information based society."
Please continue for info on advanced coursework and more —



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k-12 curriculum: advanced placement courses

Opportunities for students to take advanced placement courses exist,
but the opportunities are unequal.

See how Tennessee's students fare.

Many students have the opportunity to take advanced placement tests in high school. In many instances students can receive college credit for the exam; they also serve as an important signal about how serious and prepared a student is for college. Unfortunately students in Tennessee do not have the same opportunity as students in many other states to take these exams, but the situation does appear to be improving.

- In 2006, 67% of Tennessee's public high schools offered AP courses, up from 54% in 1996.
- The number of AP exams given to Tennessee students increased from 94 exams per 1,000 in 1996 to 193 per 1,000 in 2006.
- In 2006, 63% of all Tennessee AP test-takers scored at least a 3 (on a 5-point scale) on the exam. This percentage has remained relatively constant since 1996, and **it is the highest passing rate among southeastern states.**

So as shown in the following table, Tennessee has the highest passing rates of the southeastern states but the lowest percentage of public schools offering AP classes and the fewest number of 11th and 12th graders taking the exam per 1,000 students.

**67.1% of public schools in Tennessee offer AP classes, so just 193 of every 1,000 11th and 12th graders in Tennessee take AP exams —
The good news: a high number of them passed**

	Public schools offering AP classes (%)	AP exams taken for every 1,000 students (11th and 12th graders)	Passing grades (3 or above on 5-point scale) (%)
Florida	88.0	414	47.7
Georgia	89.1	296	55.8
Kentucky	89.6	219	51.4
Maryland	97.4	507	64.9
South Carolina	87.6	247	55.8
Tennessee	67.1	193	62.9
Virginia	96.6	439	60.6
Total U.S.	70.8	270	59.4

Source: The College Board, 2006 & Southern Regional Education Board, 2006.

K-12 curriculum: advanced placement courses

What Do We Mean by Unequal Opportunity?

In a system where all students have equal access to these opportunities, the percentage of students taking the test, categorized by race and ethnicity, would be proportional to their representation in public K-12 enrollment (The Education Trust, 2006). Unfortunately, it isn't.

Keeping in mind that AP tests are graded on a 1–5 scale, with a 5 indicating a strong performance and 3 generally being the lowest score for which students can receive college credit —

- White students in Tennessee make up a disproportionate percentage of AP test takers. 70% of all public school students are white while 81% of students taking the Calculus exam, 82% of students taking the English exam, and 76% of students taking the Biology exam are white. In contrast, 25% of all K-12 students Tennessee are African-American while only 10% of students taking the AP Calculus or English exam and 12% taking Biology are African-American.
- White and Asian students tend to score higher on the AP exams in Tennessee than students of other races. White students in Tennessee have AP passage rates higher than the overall state average while African-American and Hispanic students fall below the average on the 3 most commonly taken AP exams.

Who takes Advanced Placement tests in Tennessee, and do they pass?

	Public K-12 enrollment (%)	Calculus AB (%)		English language and composition (%)		Biology (%)	
		Who takes it?	Who passes it?	Who takes it?	Who passes it?	Who takes it?	Who passes it?
African American	25	10	25	10	30	12	30
Asian	1	7	53	6	69	10	68
Latino	3	2	47	1	54	1	n.a.
Native American	0	0	n.a.	0	n.a.	0	n.a.
White	70	81	60	82	70	76	65
Overall	n=941,091	n=1,958	56%	n=2,004	66%	n=1,536	60%

Source: The Education Trust, 2006.

Advanced opportunities are nice, but what about the mandatory tests everyone takes?

Please continue —



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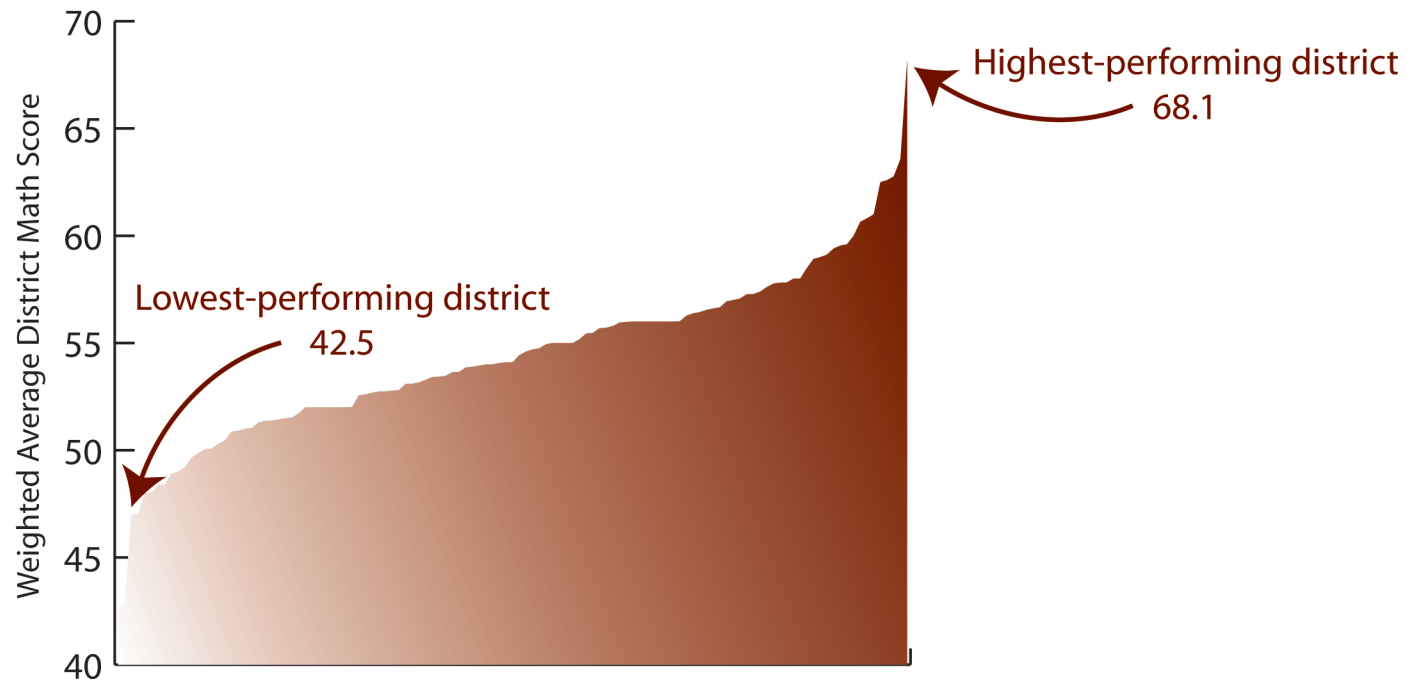
TCAP

The Tennessee Comprehensive Assessment Program is a state-mandated program to assess student learning. Our children and teens know all about it.

Schools administer TCAP tests every spring to all Tennessee 3rd through 8th graders. The tests consist of a multiple choice assessment measuring students' knowledge of mathematics, language arts, reading, science and social studies. Results are reported to parents, teachers, and administrators. Schools can also administer TCAP tests to kindergartners, 1st, and/or 2nd graders. At the high school level, students also take the TCAP End of Course and Gateway exams under the state's High School Examinations Policy. For more information, see the Department of Education's Division of Assessment, Evaluation, and Research Web site at <<http://www.state.tn.us/education/assessment/>>.

As with other measures of educational outcomes in Tennessee, there is substantial variation in scores across school districts. The illustration shows that the lowest performing district had a weighted average math score of 42.5 in 2005. The top performing system, on the other hand, produced a score of 68.1, a difference of 25.6 points or 60.2%.

Substantial variations in performance exist across school districts



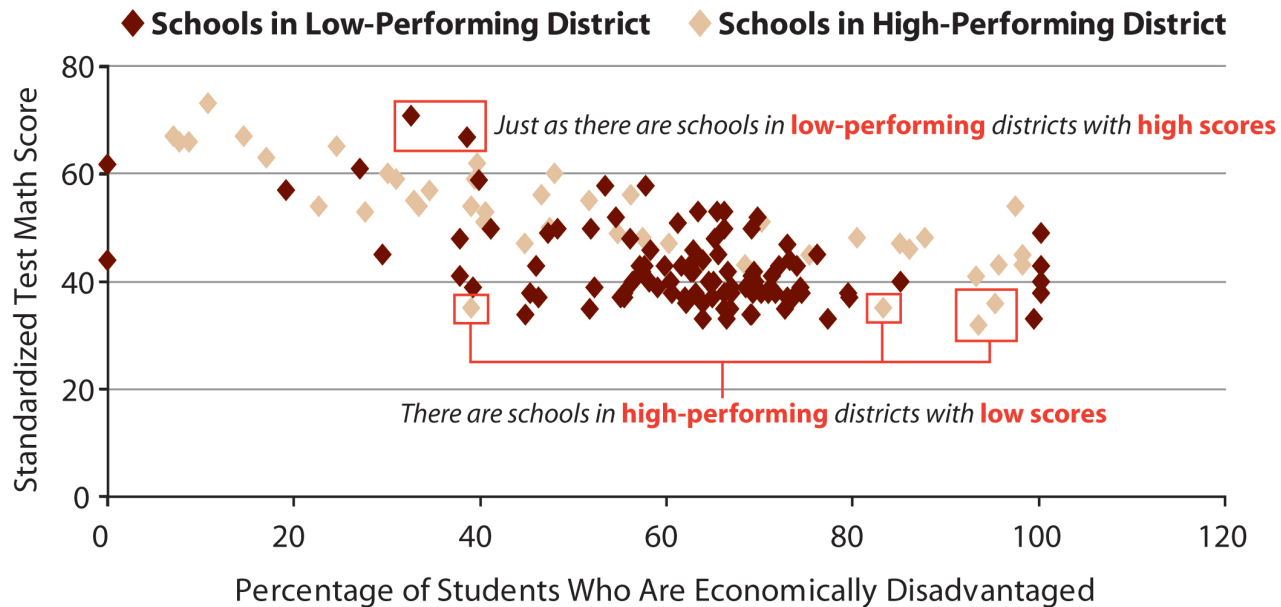
Source: CBER-UT calculations from Tennessee Department of Education data.

Words of caution against lumping districts together based on their average scores: The individual factor

Every school district has both high-performing and low-performing schools and students. For illustrative purposes, we have looked at 2 school districts in Tennessee, 1 with relatively high average test scores and another with relatively low scores. In the high-performing district, there are a number of schools that have a large share of low scores as well as disadvantaged students (low-performing schools tend to have large shares of disadvantaged students). And even in the low-performing district, there are schools with high performance.

One lesson is that an average test score performance can mask significant variations in the performance of individual schools and students. Second, and very much related, every district needs to nurture both ends of the distribution. Low-performing districts need to focus on poor-performing students and schools, but they should also provide opportunities for high performers. Similarly, districts that perform well need to support their better quality students but also be attentive to the unique needs of other students.

And even within districts, substantial variations in performance exist across schools



Source: CBER-UT calculations from Tennessee Department of Education data.

How do our students stack up against the rest of the U.S.?
Please continue —



comparisons to national achievement

“As in most southern states, the scores of Tennessee students on standard achievement tests are *below* the national average” (Grissmer & Flanagan, 2006).

Tennessee student achievement in a national context

How do students from Tennessee’s public schools stack up against their peers in other states?

The answer is not very good.

One means of making such a comparison is the National Assessment of Educational Progress (NAEP, n.d.), also known as “the Nation’s Report Card.” It is the only nationally representative and ongoing assessment of what America’s students know and can do in various subject areas. Tests are conducted periodically in reading, math, science, writing, U.S. history, civics, geography, and the arts. The results are based on public school students only. The main NAEP assessment is usually administered at grades 4 and 8 at the state level.

Here are some numbers to put the situation in context (Grissmer & Flanagan, 2006):

- ▶ Between 1990 and 2003, Tennessee almost always ranked in the bottom 20% of states on both 4th and 8th grade reading and math scores.
- ▶ On the 2003 tests, North Carolina, Virginia and Kentucky had higher scores than Tennessee. Tennessee scored higher than Alabama.
- ▶ Arkansas, Georgia, South Carolina and West Virginia typically had scores similar to those of Tennessee.
- ▶ Tennessee has seen below average gains in test scores between 1990 and 2003.
- ▶ Tennessee students score relatively higher on the science test than they do on the math and reading tests.
- ▶ Tennessee ranked 41st out of 48 states in the 2003 NAEP reading assessment for 8th graders, with an average score more than 5 percentage points below the national average.
- ▶ Tennessee fares better in science than in math, ranking 26th out of the 37 states that conduct the NAEP science exam at the 8th grade level.
- ▶ Tennessee 8th graders scored less than 4 percentage points below the national average.
- ▶ While female students complete more challenging curricula and earn higher GPAs, they do not perform as well on NAEP as males with the same academic records (Shettle, et al., 2007).

comparisons to national achievement

Tennessee does have achievement standards for students in elementary and secondary schools. These provisions are driven by the federal No Child Left Behind Act which requires all students to be proficient in math and reading by 2014. NCLB, however, allows states to select their own tests and proficiency standards. This leads some states to achieve seemingly high levels of proficiency by setting standards low. At the same time, other states appear to have lower levels of proficiency simply because they have instituted high standards.

How rigorous are Tennessee's achievement standards?

- Education Next has awarded Tennessee with the "Cream Puff Award" and has given Tennessee's state standards a grade of F. This is based on the fact that the Tennessee proficiency levels, as measured by the state-administered test, are significantly higher than those seen in the NAEP assessment (Peterson & Hess, 2006).
- Maine, South Carolina, Missouri and Wyoming have set their state standards closest to the NAEP standards of proficiency. Their average disparity between the NAEP and the state test was less than 5% in 2003 (Rocha, 2005).
- Texas, Tennessee, and North Carolina have the lowest state proficiency standards. These states have an average gap of 50% (Rocha, 2005).

	Overall grade	4th grade		8th grade	
		Math	Reading	Math	Reading
Arkansas	B-	B	B+	B	C
Georgia	D-	D	F	D-	F
Kentucky	C+	-	C	B-	-
Mississippi	D-	F	F	D+	C-
Missouri	A	B	-	A	-
North Carolina	F	D-	D-	F	F
Tennessee	F	F	F	F	F
Virginia	D+	-	-	D-	C-

Source: Peterson & Hess, 2006.

Gaps between NAEP and state test scores, 4th grade math— Missouri has a gap of 0 to go with its A

	NAEP	State test	Gap
Arkansas	28%	62%	34
Georgia	27%	80%	53
Kentucky	31%	62%	31
Mississippi	18%	87%	69
Missouri	34%	34%	0
North Carolina	33%	81%	48
Tennessee	26%	80%	54
Virginia	35%	73%	38

Source: Rocha, 2005.

—and in 8th grade math—

	NAEP	State test	Gap
Arkansas	27%	42%	15
Georgia	26%	81%	55
Kentucky	34%	57%	23
Mississippi	21%	57%	36
Missouri	34%	32%	-2
North Carolina	29%	86%	57
Tennessee	26%	80%	54
Virginia	36%	70%	34

And how do we compare on college entrance exams?
Let's take a look —



College entrance examinations: ACT or SAT

Students across the country generally take 1 of 2 college entrance examinations, the ACT or SAT. Where you live influences which test you will take. In 2006, 93% of Tennessee high school graduates took the ACT test, up from 75% in 1996. Nationally only 40% of all high school graduates take the ACT exam, as most choose to take the SAT (SREB, 2006).

Performance on college entrance examinations is important. Scores reflect how well students have been prepared for college through high school. They also have an important bearing on where students go to college and whether they receive financial assistance. A careful review of ACT score suggests that students in Tennessee generally are not as well prepared as other students. In addition there are sharp disparities in scores for students from different ethnic backgrounds.

Some facts on Tennessee's 2006 ACT scores from ACT's Profile Report

- 8% of Tennessee students who took the ACT took less than 3 years of high school math courses. Of these students, 9% were college ready. Nationally 11% of students taking the ACT took less than 3 years of high school math. However, of these students, 18% met the college ready benchmark.
- 36% of the students who took the ACT in Tennessee took the minimum core (Algebra I, Algebra II, and Geometry). A mere 11% of these students were college ready. Nationwide, only 17% of students taking the ACT take the minimum core (14% of this group were college ready).
- Of the students who took courses beyond the minimum core in Tennessee (Algebra III or higher), 56% were college ready. This number is slightly higher than the national average at 54%.
- In fall 2005, 40% of all Tennessee's first-time college freshmen enrolled in remedial studies (SREB, 2006).

The comparison of ACT scores across states is difficult because students in some states are much more likely to take the SAT than the ACT. In states where the SAT is the predominant college entrance test, those students taking the ACT tend to be students of higher quality who are contemplating attending out-of-state schools. Therefore, it is important to compare Tennessee's ACT scores to others states where the vast majority of college-bound students take the ACT (ACT, Inc.).

- In 2006, there were 11 states in which greater than 75% of high school juniors and seniors took the ACT. The average ACT composite score in those 11 states was 20.8. Tennessee's average score was slightly below the average at 20.7.
- Tennessee comes in above average in English scores. Tennessee's average score is 20.8, and the average of the comparison group is 20.5.

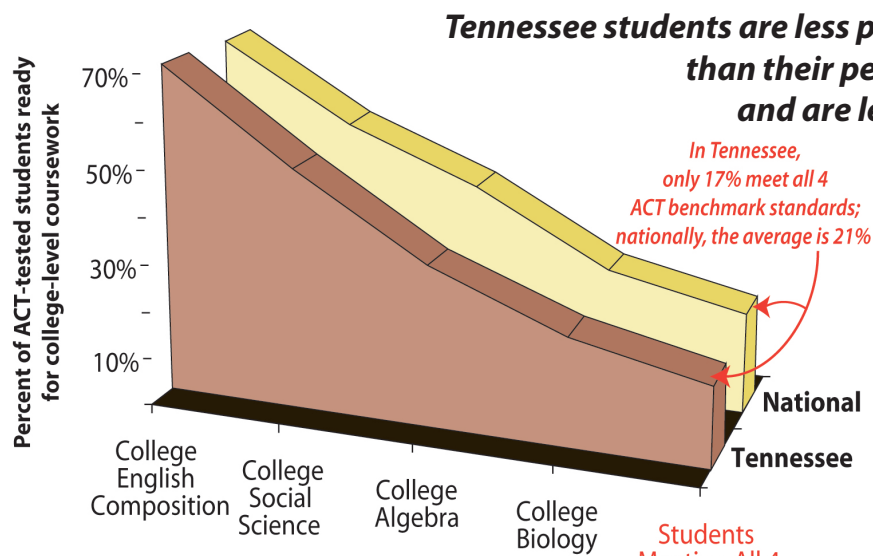
FOUNDATION

testing outcomes

Average scores in states in which at least 75% of high school seniors take the ACT

	% of students taking the ACT	Average composite	Average English	Average Math	Average Reading	Average Science
Arkansas	75%	20.6	20.7	19.9	20.9	20.3
Kansas	75%	21.8	21.3	21.5	22.3	21.6
South Dakota	75%	21.8	21.0	21.6	22.0	21.8
Kentucky	76%	20.6	20.2	19.9	21.1	20.5
Nebraska	76%	21.9	21.5	21.6	22.2	21.8
Alabama	79%	20.2	20.3	19.5	20.6	20.1
North Dakota	80%	21.4	20.5	21.4	21.6	21.5
Mississippi	93%	18.8	19.1	18.0	19.1	18.7
Tennessee	93%	20.7	20.8	19.9	21.1	20.3
Colorado	100%	20.3	19.7	19.9	20.8	20.4
Illinois	100%	20.5	20.2	20.3	20.6	20.4

Source: ACT, Inc., n.d.b.



Tennessee students are less prepared for college-level coursework than their peers in all subjects but English composition and are least prepared for college-level coursework in algebra and biology

In Tennessee, only 17% meet all 4 ACT benchmark standards; nationally, the average is 21%

ACT English Benchmark Score=18 ACT Reading Benchmark Score=21 ACT Algebra Benchmark Score=22 ACT Biology Benchmark Score=24 Students Meeting All 4 ACT Benchmark Standards

A benchmark score is the minimum score needed on an ACT subject-area to indicate a 50% chance of obtaining a B or higher or about a 75% chance of obtaining a C or higher in the corresponding credit-bearing college course.

Source: ACT, Inc., n.d.b.

There's more.
Please continue —



A closer look: Tennessee's ACT scores by race

ACT scores vary significantly by race in Tennessee (ACT, Inc., n.d.a.).

- 70% of all Tennessee high school students taking the ACT meet the ACT College Readiness Benchmark Score in English.
- 78% of white students meet the English benchmark while only 42% of African-American students meet the same benchmark.
- Only 34% of Tennessee students taking the ACT meet the college readiness benchmark in mathematics. These results also vary widely with 39% of white students and only 10% of African-American students reaching the benchmark.
- Asian-Americans and Pacific Islanders do significantly better on the ACT math exam than their peers with 56% attaining the college-ready benchmark.



What do these discrepancies suggest?

“The American economy will do best if all Americans have the opportunity to develop and express their talents,” say researchers at the Hamilton Project in their *Economic Strategy to Advance Opportunity, Prosperity and Growth* for the nation (Bendor, Bordoff, & Furman, 2007, p. 4).

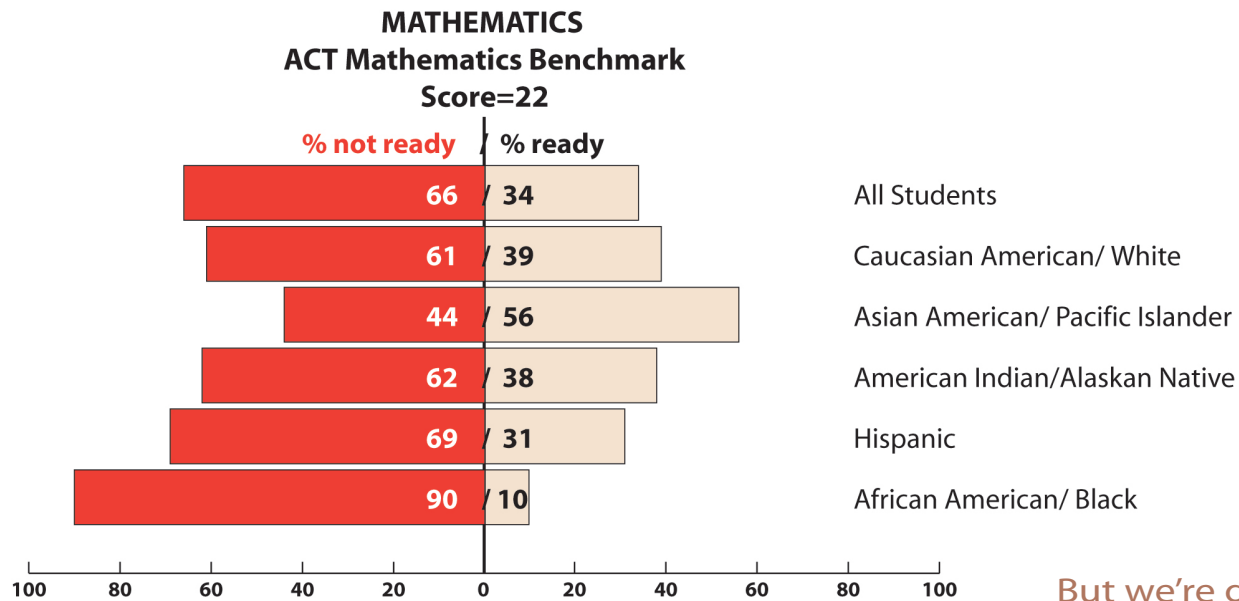
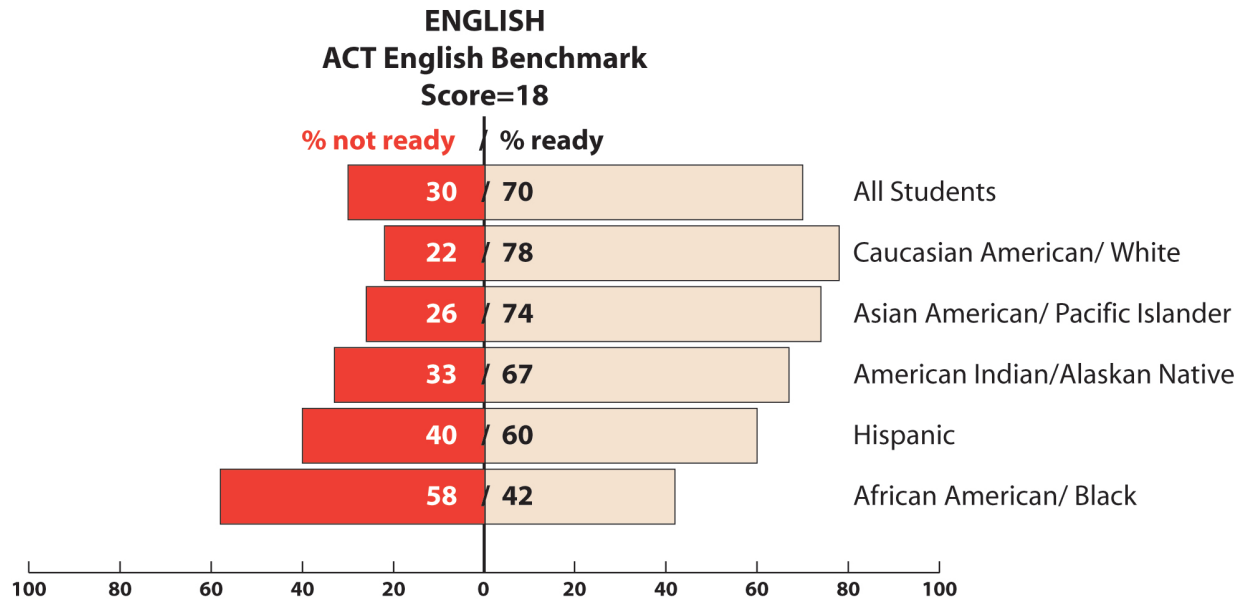
Yet the imbalances in Tennessee's ACT scores between Caucasian/ white and other races and ethnicities (African American/ Black in particular) indicate that not all Tennesseans have the same opportunity to advance. Presumably a whole host of characteristics contribute to these imbalances—low incomes, more single-parent homes, lower parental education levels, propensity to be on welfare, poor peer influences, and more.

And college preparedness is just the beginning of the story. Only 7% of students from families with low socioeconomic status achieve a bachelor's degree, compared with 63% of students from families with high socioeconomic status (Bendor, Bordoff, & Furman, 2007).

FOUNDATION

testing outcomes

% of students meeting ACT college readiness benchmark scores by race/ethnicity, English and Mathematics



Source: ACT, Inc., n.d.a.

But we're getting better, aren't we?
Yes! Let's see —



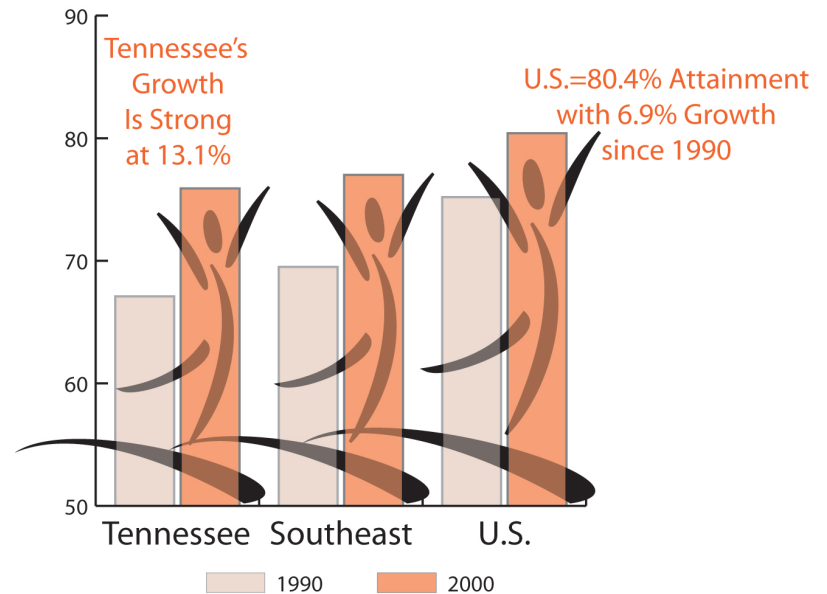
educational attainment: state level

The Foot Race

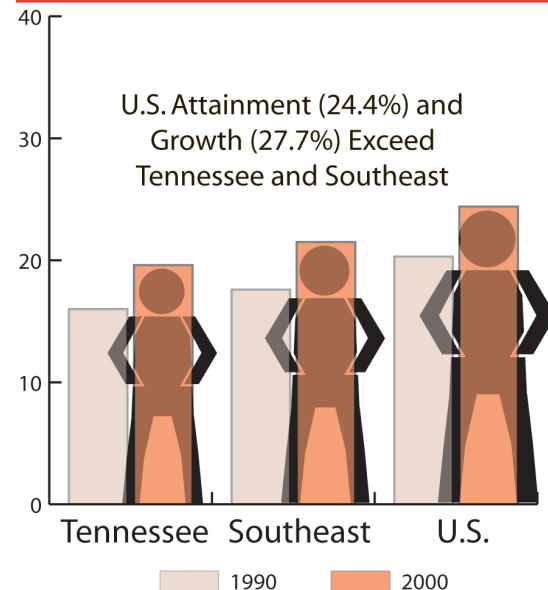
You might as well call it a foot race, so put on your best sneakers. If we look only at ourselves, we can see that things are improving. Education spending has increased, Pre-K programs serve more students each year, more and more teenagers are graduating from high school, more and more students are attending and graduating from college. But guess what? The same is true for other states across the country. And countries around the world are investing more and more in education to better enable their competition in the global marketplace. Tennessee has gained some ground in this foot race—notably high school graduates—but by many measures, our relative standing has not changed.

- ★ In 1990, only 67.1% of Tennesseans had at least a high school diploma. By 2000, that number had grown to 75.9%. This represents a growth rate of 13.1% over 10 years.
- ★ In both 1990 and 2000, Tennessee lagged the Southeast and the U.S. as a whole in the share of adults with a high school diploma. However, Tennessee had a higher rate of growth than both the southeastern states and the nation between 1990 and 2000. The U.S. growth rate was only 6.9% compared to 13.1% for Tennessee. Since we start from a lower baseline, we need stronger growth to allow us to catch up to others.
- ★ Tennessee has narrowed the high school gap with respect to both the Southeast and the nation as a whole.

% of people with at least a high school diploma, 1990 and 2000



% of people with at least a bachelor's degree, 1990 and 2000



Source: U.S. Census Bureau, Census 2000, Public Use Microdata 5% Sample.

educational attainment: state level

What about college degree attainment?

Tennessee has been running, but not quite as fast, and the college attainment gap has widened.

- ★ Tennessee continues to lag both the Southeast and the nation in the percentage of adult residents with at least a bachelor's degree and the disparity has actually grown over time.
- ★ Only 16.0% of Tennesseans held at least a bachelor's degree in 1990 compared to a national average of over 20%, a difference of 4.0 percentage points. By 2000, Tennessee's average rose to 19.6% while the national average climbed to 24.4%, a difference of 4.8 percentage points.
- ★ Tennessee's growth rate of 22.5% was slightly higher than the average growth rate in the Southeast but lower than the nation's 27.7% rate.

K-12 spending and attainment?

An important input to achievement and educational outcomes is spending in support of education. While educational attainment is rising in Tennessee and other states, so is spending. Despite the growth in spending in Tennessee, we continue to lag the national average in per student K-12 expenditures by a significant margin.

Consider per pupil spending for Tennessee and the average for all states, both of which have grown since 1995. The ratio of Tennessee to U.S. average spending per pupil has been relatively stable for the period shown. In short, we spend about 75 cents for

10-year trend in expenditures per student, 1995 to 2005

School year	U.S. average	Tennessee average	Tennessee-to-U.S. ratio
1994–95	\$5,535	\$4,076	0.74
1995–96	\$5,699	\$4,219	0.74
1996–97	\$5,949	\$4,372	0.73
1997–98	\$6,214	\$4,563	0.73
1998–99	\$6,513	\$4,853	0.75
1999–2000	\$6,891	\$5,103	0.74
2000–01	\$7,324	\$5,386	0.74
2001–02	\$7,676	\$5,570	0.73
2002–03	\$8,064	\$5,796	0.72
2003–04	\$8,340	\$6,107	0.73
2004–05	\$8,661	\$6,613	0.76

Source: NEA, 2006.

every dollar spent by other states on education (NEA, 2006). Tennessee is a relatively poor state by national standards, with per capita income at about 89% of the national average in 2006 (CBER-UT, 2007). But our per pupil spending is only about 75% of the national average, reflecting a choice we have made regarding our commitment to the future.

Why is the foot race important? We need to see improvements in the educational attainment of the adult population in order to improve quality of life and competitiveness. But it is equally important to see our standing relative to the nation and the Southeast improve as well. Relative standing matters in terms of perceptions, where emerging businesses will choose to locate, where quality jobs are created and where people want to live.

The race is on.
Keep it moving —



educational attainment: county level

There were 9 Tennessee counties
in 2000 where 4 out of every 10 adults
did not graduate from high school.

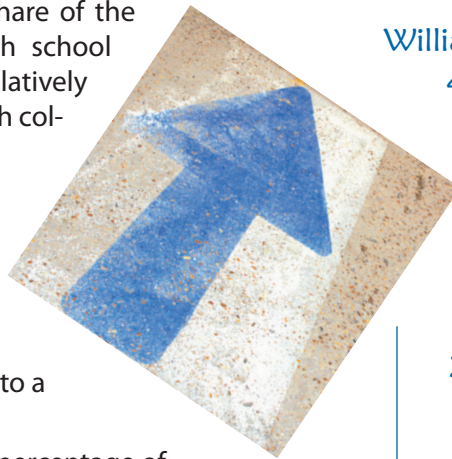
Educational attainment across Tennessee counties

There are striking differences in educational attainment across communities in Tennessee. A good illustration is offered by the share of the adult population that did not have a high school education as of 2000. There were 9 Tennessee counties in 2000 where more than 40% of the adult population had less than a high school education. To put this in perspective, the U.S. average was only 19.6%.

Those counties with higher educational attainment levels enjoy higher income levels and stronger rates of job growth.

Communities that have a small share of the population with less than a high school degree, not surprisingly, have relatively larger shares of the population with college degrees.

- ▶ As of 2000, 12.2% of Tennessee residents over the age of 25 had an educational attainment level at or above a bachelor's degree. This can be compared to a national average of 24.4%.
- ▶ Only 4 counties have a higher percentage of college graduates than the national average.
- ▶ In an astounding 41 counties in Tennessee, less than 10% of adults have a bachelor's degree or higher. That's only 1 out of every 10 people.



Williamson
44.4%
Davidson
30.5%
Knox
29.1%
Shelby
25.3%

We have grouped Tennessee's 95 counties into 5 groups based on the share of the adult population that holds a bachelor's degree; each group has 19 counties. Even in the 4th quintile, the group of 19 counties with the second-highest attainment levels in the state, average attainment is only about one-half of the national average. The educational attainment of the bottom 19 counties—the first quintile—is only about one-quarter of the attainment for the nation.

Good news

These counties have bachelor's degree or higher attainment levels HIGHER than the national average.

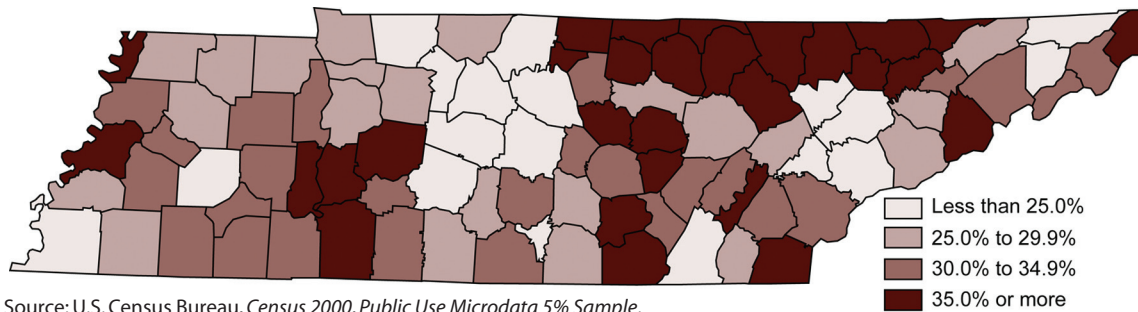
Remember: the national average = 24.4%

Tennessee's 5th Quintile Highest Attainment at 22.1%
4th Quintile 2nd Highest Attainment at 12.8%
3rd Quintile 3rd Highest Attainment at 10.4%
2nd Quintile 2nd to Lowest Attainment at 8.6%
1st Quintile Lowest Attainment at 6.8%

Source: Census 2000.

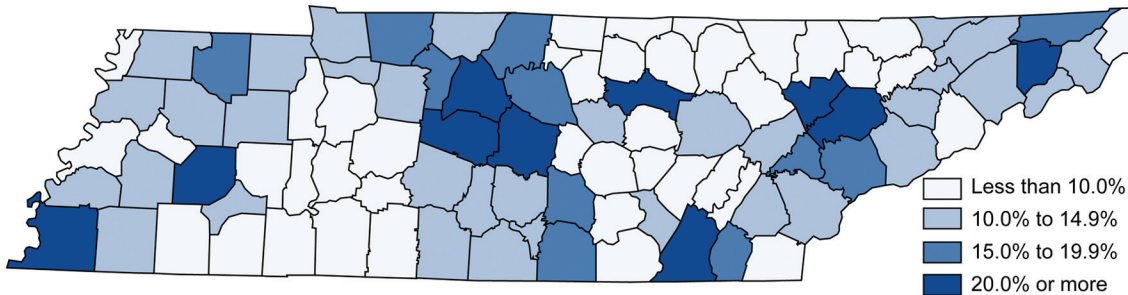
educational attainment: county level

% of individuals living in the county with less than a high school education, 2000
Tennessee average = 24.1%



Source: U.S. Census Bureau, *Census 2000, Public Use Microdata 5% Sample*.

% of individuals aged 25 and older living in the county with a bachelor's degree or higher, 2000
Tennessee average = 19.6%



Source: U.S. Census Bureau, *Census 2000, Public Use Microdata 5% Sample*.

Education is rewarded by the labor market

Levels of education are closely linked to participation in the labor market and individual earnings in the marketplace.

- ▶ As educational attainment increases, so does the propensity to work. Nearly 58% of Tennessee residents over the age of 25 who did not graduate from high school did not have earned income in 1999.
- ▶ Only 17.7% of Tennessee residents with a bachelor's degree had no earned income.
- ▶ There is a clear positive relationship between educational attainment and earnings.
- ▶ Tennessee workers who earned a bachelor's degree from a Tennessee higher education institution experienced an average annual growth rate in their wages of 7.3%, exceeding inflation (Fox, Couch, & Thacker, 2007).

See *Prosperity* at pages 80–103 for more details.

In this race, we don't want to lose our teammates. But we do.
What difference does it make? —



educational attainment: dropouts

“It ought to be our goal as a nation. We shouldn’t let this number of students drop out. I think it’s a moral crisis that we’re failing students this way.”

Melinda Gates on *All Things Considered*, April 25, 2007

Students drop out of high school for many reasons. Some are simply poor performers, while some are bored. Regardless of the reason, dropping out may have long-term consequences for the economic security of the individual.

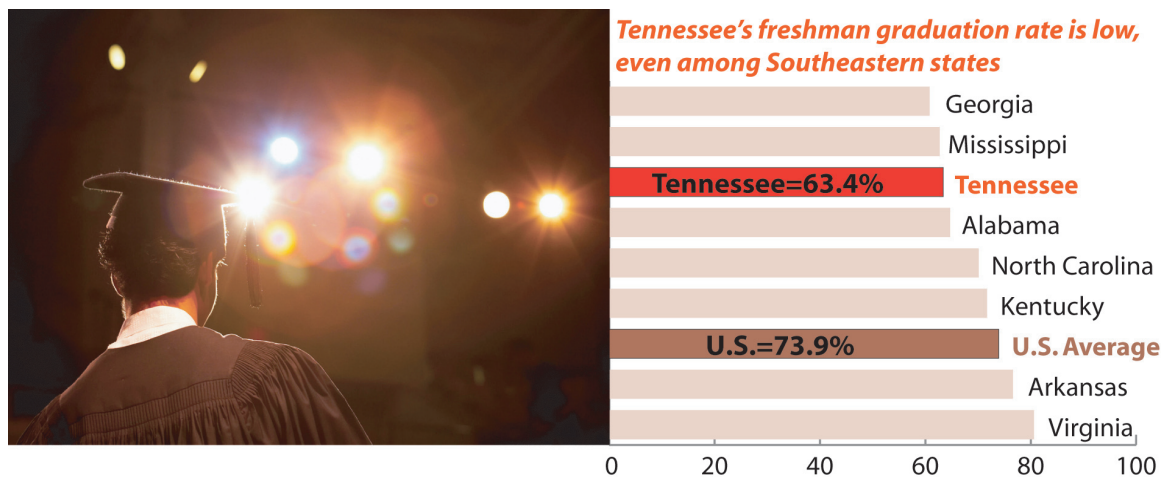
Freshman graduation rates help estimate the percentage of high school students who graduate on time. The rate for 2002–03 is computed by dividing the number of regular diplomas issued in the school year by the number of estimated first-time 9th graders in 1999–2000. The estimated number of first-time 9th graders is the mean of membership in grades 8, 9, and 10 in school years 1998–98, 1999–2000, and 2000–01, respectively (NCES, 2006).

- ▶ In 2002, the average freshman graduation rate of public high school students in the U.S. was 72.6%. By the next year that number had improved to 73.9%.
- ▶ In the same years, Tennessee had freshman graduation rates of 59.6% and 63.4%. While the state showed improvement, graduation rates continued to trail the nation by a significant margin.
- ▶ The southeastern states as a whole tend to have graduation rates that are lower than the national average. Tennessee’s rates are similar to Mississippi, Georgia and Alabama. Some bordering states, including Virginia, Missouri, and Arkansas, have graduation rates that are substantially higher than those seen in Tennessee.

This isn’t just talk either. The Gates back it up with a new \$60 million initiative to ensure education reform has a prominent place in the coming presidential campaign.

The program, *Strong American Schools*, is a jointly funded effort by the Bill and Melinda Gates Foundation and the Eli and Edythe Broad Foundation.

Average freshman graduation rate of public high school students, 2003



Source: NCES, 2006.

educational attainment: dropouts

Dropouts: A national crisis

The situation for the nation's dropouts has never been bright. But conditions are deteriorating. A report from the Educational Testing Service entitled *One-third of a nation: Rising dropout rates and declining opportunities* (Barton, 2005) is revealing. "High percentages of young dropouts are either not employed or are not even in the labor force. Most wander through life like lost travelers, without guidance or goals, and many end up in prisons" (Barton, 2005, p. 5).

Consider those in the 25–34 year age group who hold full time jobs. These individuals are important as they are in the formative years of developing a household and supporting their children.

- ★ According to the ETS report, in 1971 male dropouts earned \$35,087 (in 2002 dollars), falling to \$23,903 in 2002, a decline of 35 percent. Female dropouts saw earnings fall from \$19,888 to \$17,114 over the same time period.

As earnings are falling for dropouts, the situation for the nation as a whole has also deteriorated when compared to other countries. The nation's high school completion rate has fallen, and we are now ranked 10th across the globe.

- ★ "Only the kind of national resolve being shown to raise student academic achievement can reverse these adverse trends for this third of the nation's youth. Increasing student achievement in the early years may well lead to increases in school completion since it is the low achievers who are more prone to dropping out" (Barton, 2005, p. 5)

The incidence rate for dropping out varies dramatically across demographic groups—not everyone has the same risk of falling out of the education pipeline. For instance, in the case of young people in the 16-24 age group dropping out of high school, if you were white, you had a 57% chance of holding a job. But if you were black, the odds of having a job were only 35% (Barton, 2005, p. 41).

The crisis in sum

- ★ "Even high school dropouts who are employed, compared to those who are better educated, will be the most affected by future economic slowdowns, the constant change in the structure of the economy, and ever-advancing technology. A steadily expanding young prison population will be drawing disproportionately from this population and will be returning similarly undereducated young people back to society, where they will face the additional employment handicap of having been in prison" (Barton, 2005, p. 40).

No question: Bill and Melinda Gates have the right idea.
Now how do we look compared to the rest of the world?



comparisons to international achievement

“A lot of the jobs that are starting to go abroad today are very high-end research jobs, because not only is the talent abroad cheaper, but a lot of it is as educated as American workers—or even more so.”
—Thomas L. Friedman in *The World Is Flat*

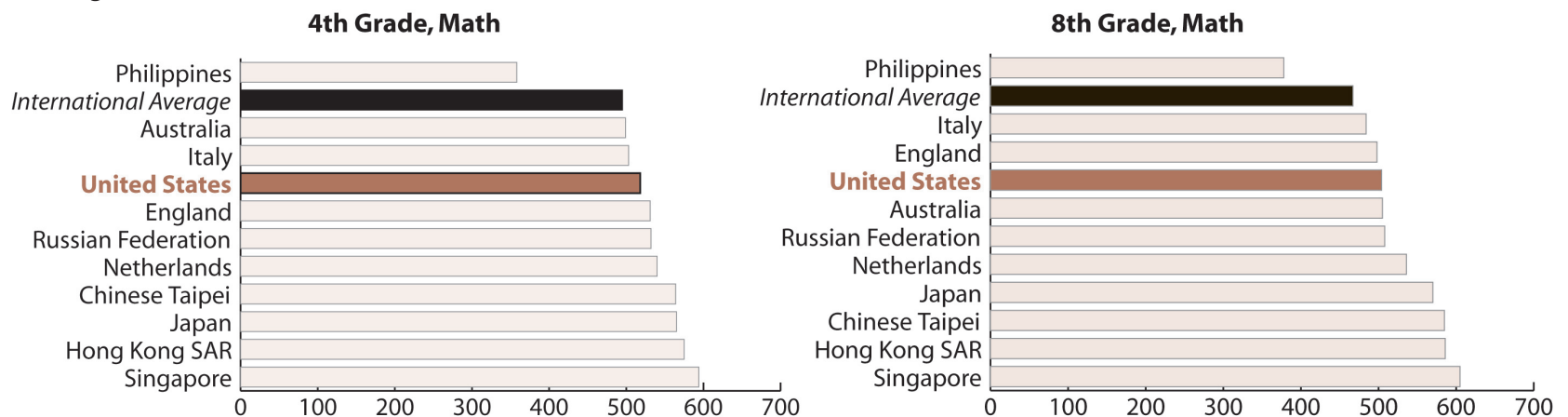
An international perspective from TIMSS

How do students from Tennessee stack up against their counterparts abroad? Unfortunately there is no direct means of making such a comparison. There are, however, tests administered at the national level and some insights can be gleaned from their results.

The Trends in Mathematics and Science Study (TIMSS) is conducted every 4 years in order to track the attainment levels and growth in attainment of 4th and 8th graders around the world.

- ☐ 50 countries participate in TIMSS though not all participate in every test.
- ☐ The U.S. performs above the international average in both mathematics and science at both the 4th and the 8th grade level. For 4th grade mathematics, the U.S. is 13th out of 28 countries; for 8th grade mathematics, 18th out of 50 countries
- ☐ However, U.S. students perform at a level below many other nations including Japan, Hong Kong, Russia and the Netherlands.

Average TIMSS scores for selected countries, 2003



Source: IEA, n.d. See <http://timss.bc.edu/timss2003.html> for more information on comparisons.

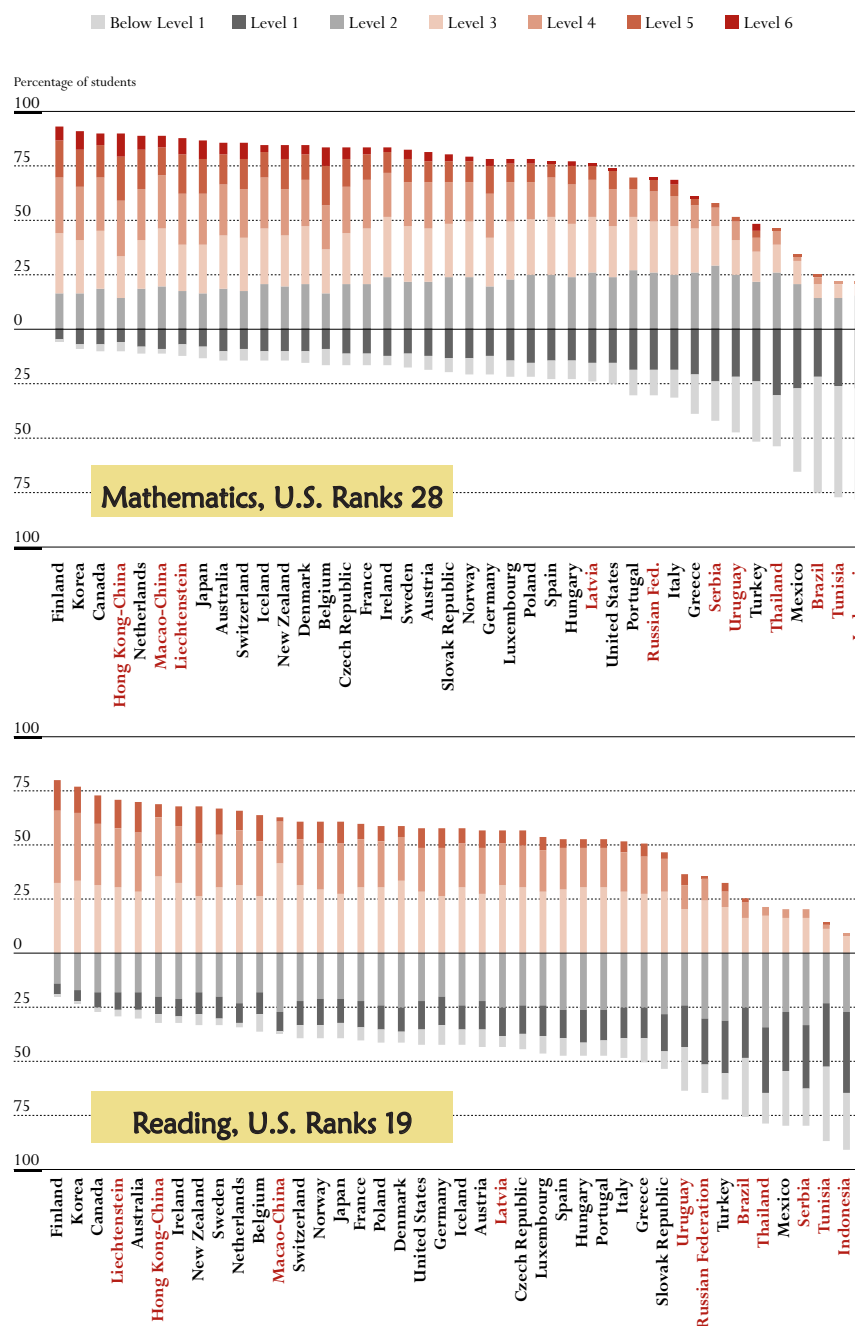
comparisons to international achievement

Another look: Proficiencies in math and reading via PISA

An alternative testing instrument is the Programme for International Student Assessment (PISA) framework, administered by the Organisation for Economic Co-operation and Development (OECD). The TIMSS framework tends to rely on the traditional content one would find in the classroom, i.e., common bodies of knowledge like understanding fractions. PISA, on the other hand, is more general in scope. For example, rather than capturing whether students are good readers or whether they can recognize specific words, the reading literacy test reflects the students abilities to respond to what they have read across a varied set of texts (OECD, 2004). The PISA tests thinking and real-world applications.

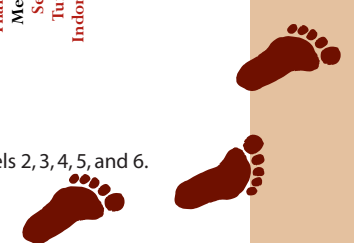
It is given to 15-year-olds regardless of grade level, so not all students tested are in the same grade at the time of testing. Compulsory schooling laws vary among the 40 countries, and some countries do not have compulsory schooling for 15-year-olds. This means that only better quality students may remain to be tested in some countries.

- 🌐 The U.S. ranks 28th out of 40 countries included in the PISA with regard to proficiency in mathematics.
- 🌐 Finland, Korea and Canada have the 3 highest performance levels while Brazil, Tunisia and Indonesia have the 3 lowest levels of performance.
- 🌐 U.S. performance is better with regard to the PISA reading literacy test. The U.S. ranks 19th out of 40 countries.
- 🌐 The U.S. outperforms Austria, Germany, Hungary, Iceland, Latvia, Luxembourg, Spain, the Czech Republic, and the Slovak Republic in reading, but scores below them in math.



Source: OECD, 2004 & OECD PISA 2003 database, Tables 2.5a and 6.1.

Note: Countries are ranked in descending order of percentage of 15-year-olds in Levels 2, 3, 4, 5, and 6.



comparisons to international spending

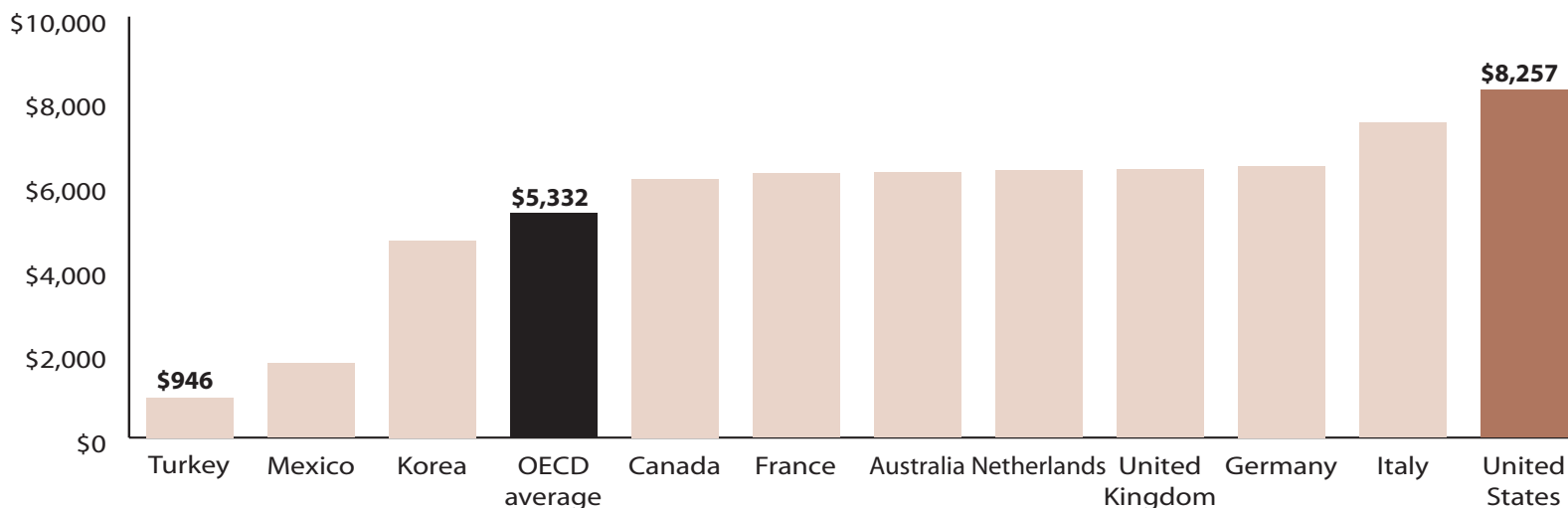
Lower test scores but higher spending?

Test scores in the U.S. certainly aren't impressive when compared to other countries around the world. Our spending, on the other hand, is very high by international standards. The lack of connection between overall spending and test score achievement has raised concerns about the focus and quality of elementary and secondary education in the U.S.

There are some good explanations for the relatively higher spending in the U.S. For example, public schools in America provide a broader scope of services, both in the classroom and outside the classroom (e.g., meals and transportation services). While teachers are paid more, they also work longer hours. Nonetheless, the spending-achievement gap for the U.S. serves as an important caution: additional spending on public education should be used to support programs that are known to provide sound returns on the investment.

- 🌐 Spending on public education varies significantly around the world. Of the countries included in the OECD (Organisation for Economic Co-operation and Development), per pupil spending ranges from \$946 (Turkey) to \$8,257 (U.S.) (OECD, n.d.)
- 🌐 The U.S. spends the most money per pupil of any country represented in the OECD. The outcomes in the U.S. as shown on the previous page, however, are not at the top of the range (OECD, n.d.)
- 🌐 Students from the Netherlands consistently perform better than students from the U.S. on the TIMSS test, but the Netherlands only spends \$6,351 per pupil (OECD, n.d.)

Average per pupil spending in OECD countries



Source: IEA, n.d.



comparisons to international spending

Why these investments matter to us on the international scene

Why do our investments and returns matter in an international context? Because we are in a foot race with other countries around the world to improve quality of life, create quality jobs, and promote economic development. A brain drain of sorts is taking place. No, the best and brightest Americans are not moving abroad; however, other countries are of growing importance in turning out highly-educated workers and creating jobs within their own borders.

Consider the case for science and engineering:

- ★ China graduated 4 times the number of engineers as the United States in 2005. Japan's population is half that of the United States, yet they graduate twice as many engineers each year from their undergraduate programs (High Tech Brain Drain, 2005).
- ★ Enrollment in science and engineering programs is growing at a rate 10 times faster in China than it is in the U.S. (The Raytheon Corporation, n.d.).
- ★ Nearly 2/3 of Chinese college students graduate with a math, science or engineering degree compared to only 1/3 of students in the U.S. (The Raytheon Corporation, n.d.).
- ★ Between 1994 and 2001, engineering and science graduate school enrollment by U.S. citizens decreased by 10% (The Raytheon Corporation, n.d.).
- ★ By 2010, over 90% of the world's scientists and engineers will be living in Asia (Information Technology Industrial Council, n.d.).
- ★ In 2002, foreign students accounted for more than half of all engineering and math doctorates in the U.S. (Information Technology Industrial Council, n.d.).
- ★ South Korea, with 1/6 of our population, graduates as many engineers yearly as the U.S. (Information Technology Industrial Council, n.d.).
- ★ Between 1998 and 2008, jobs requiring training in science, engineering, or technical skills will increase by 51%. This is 4 times faster than the rate of overall job growth (IEA, n.d.).
- ★ Only about 5% of the college students in the U.S. in 2004 were majoring in engineering (IEA, n.d.).
- ★ Of the 10,000+ Tennessee high school juniors and seniors we asked who plan to go to college after graduation, less than 6% plan to major in engineering (Fox, Kiser, & Couch, 2006).

Speaking of our high school students —
what are they doing?



the education pipeline

An alarming 14% of almost 11,000 juniors and seniors surveyed in 42 high schools across the state tell us they haven't decided what they are going to do once they graduate from high school. Five percent indicate that a high school diploma is the highest degree they plan to achieve in their lifetimes (Fox, Kiser & Couch, 2006).

Aligning all levels of education

Aligning the levels of education covered in this *Foundation* section on pages 33–65 with post-secondary education is the goal of P–16 initiatives in many states. Tennessee's P–16 initiative is defined as “a student-focused, comprehensive and integrated system that links all education levels from preschool (P) through the senior year of college (16). It is a powerful framework for policymakers to use to improve teaching and learning and thus better prepare students for living, learning and working in a changing world” (Tennessee Board of Regents, n.d.).

To shed light on how Tennessee's students proceed through P–16, we must look carefully at all of the issues already discussed—achievement, test scores, and dropout rates. But we must also look to what is often referred to as the education pipeline—or the series of checkpoints students must pass to reach the finish line in their personal education footrace, grade 16. What are the checkpoints in this race?

Pages 66–75 explore how the education pipeline prepares Tennessee students for higher education: who participates in higher education, barriers to participation (including affordability); and ultimately, who reaches the finish line with a degree or certificate.

John B. Simpson, president of the University of Buffalo, in his *Inside Higher Ed* critique of recent higher education studies, points out that “[s]uccess will come only when public higher education works in lock-step with primary and secondary education systems to ensure that students have the intellectual and emotional preparation for success, and the financial support to achieve it” (Simpson, 2007).

But education is not just about obtaining an advanced college degree; college is not for everyone. Fortunately there are good job opportunities out there for people who will undergo the training that is required to get such a job. Registered nurses, carpenters, plumbers, electricians, various construction positions, and stone masons are just a few examples of good quality jobs for which there are often too few applicants.

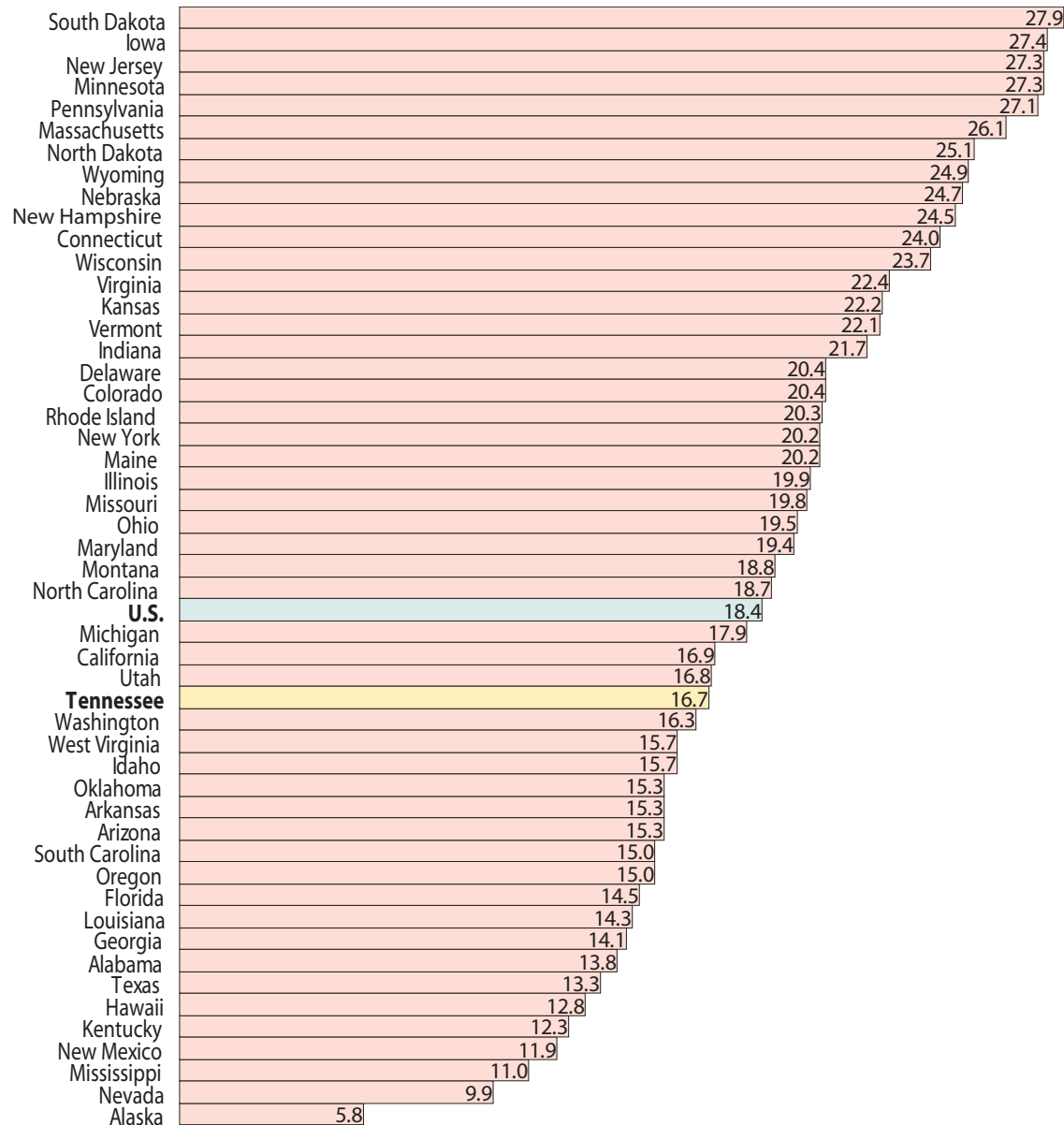
Training for such jobs may take place in technical schools which offer formal degrees or certificates. Additional training as an apprentice is common within the trade professions. Licensure requirements are often required to work in the trades, though this varies by state and locality.

According to the Bureau of Labor Statistics Occupational Outlook Handbook (n.d.), in the construction industry, “job opportunities are expected to be excellent, as demand for skilled pipelayers, plumbers, pipefitters, and steamfitters is expected to outpace the supply of workers trained in this craft. Many employers report difficulty finding potential workers with the right qualifications. In addition, many people currently working in these trades are expected to retire over the next 10 years, which will create additional job openings.”

In Tennessee, blue collar jobs can pay well. From a sampling of 9 blue-collar occupations—brick mason, carpenter, cement mason and concrete finisher, construction and building inspector, electrician, plumber, pipefitter and steamfitter, sheet

continued on page 74

Tennessee and the Southeast in general lag the nation in the percentage of 9th graders who made it through the entire pipeline, 2004



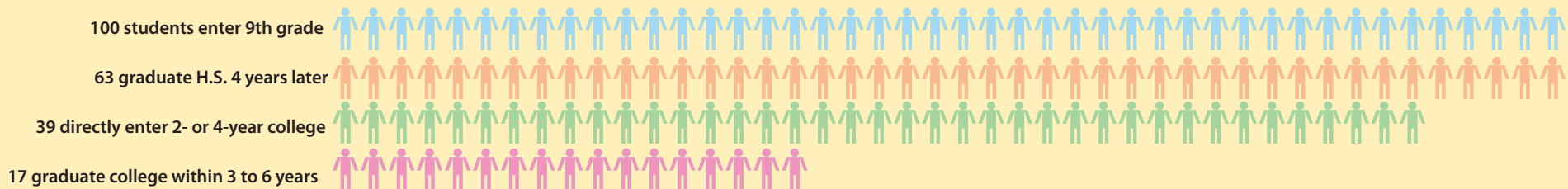
Percentage of 9th graders who graduate from high school on time, go directly to college, return for their second year, and graduate within 150% of program time

Source: NCEHMS, 2007.



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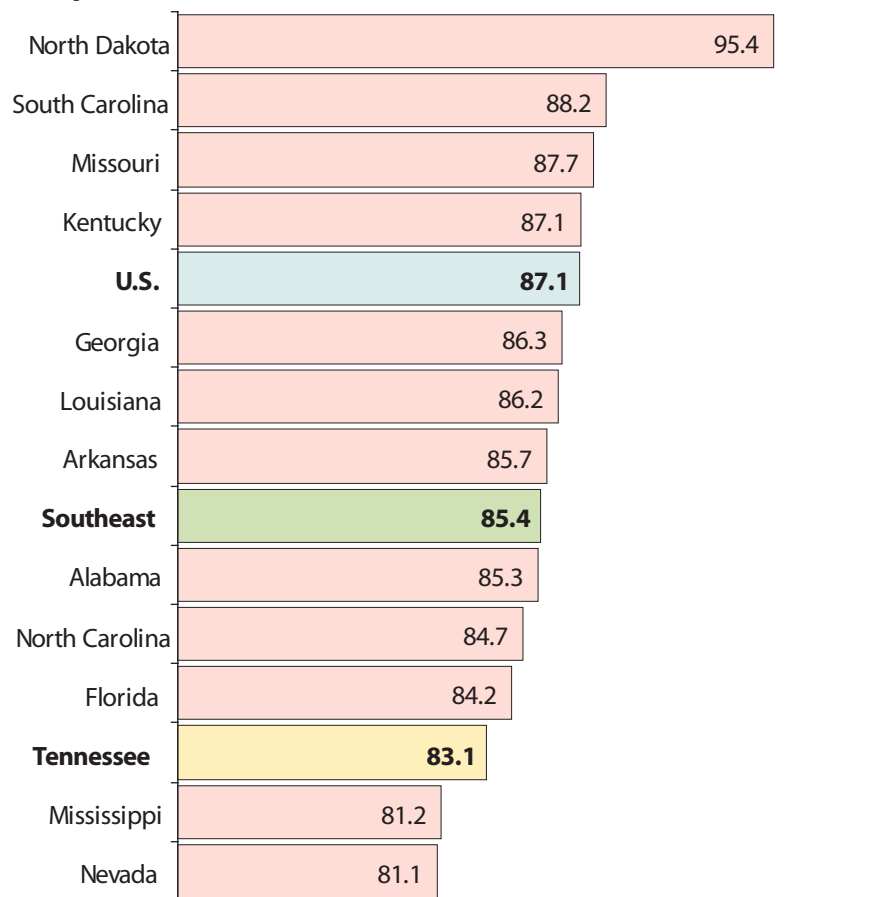
the education pipeline



Let's say we take roll at the entrance to the education pipeline. By writing down the names of 100 Tennessee 9th graders as they walk through the doors on their first day of high school. Four years later we take out our list of students. Sixty-three out of the original 100 will be graduating from high school this year. Of those 63 students who graduate from high school in 4 years, 39 will directly enter a 2-year or 4-year college. Of these students, only about 17 will graduate from a two-year college within 3 years or a from 4-year college within 6 years.

Our education pipeline ranked 31st in the nation in 2004 (NCHEMS, 2007). Just 16.7% of 9th graders in Tennessee graduated in a timely fashion from high school, went directly to college, returned for their second year and graduated within 150% of the degree program's expected time of completion. The national average in 2004 was 18.4%. Too many students in Tennessee and other states fail to make it through this education pipeline. More needs to be done to identify and overcome bottlenecks in the pipeline; so much is at stake.

Tennessee, at 83.1% ranks 3rd worst (just ahead of Mississippi and Nevada) in the U.S. and 2nd worst in the Southeast for high school completion

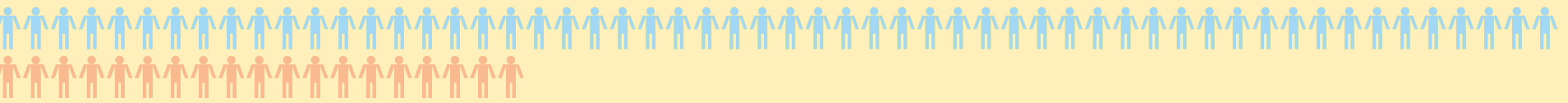


Percent of 18-24 year olds with H.S. credential (2002-04)

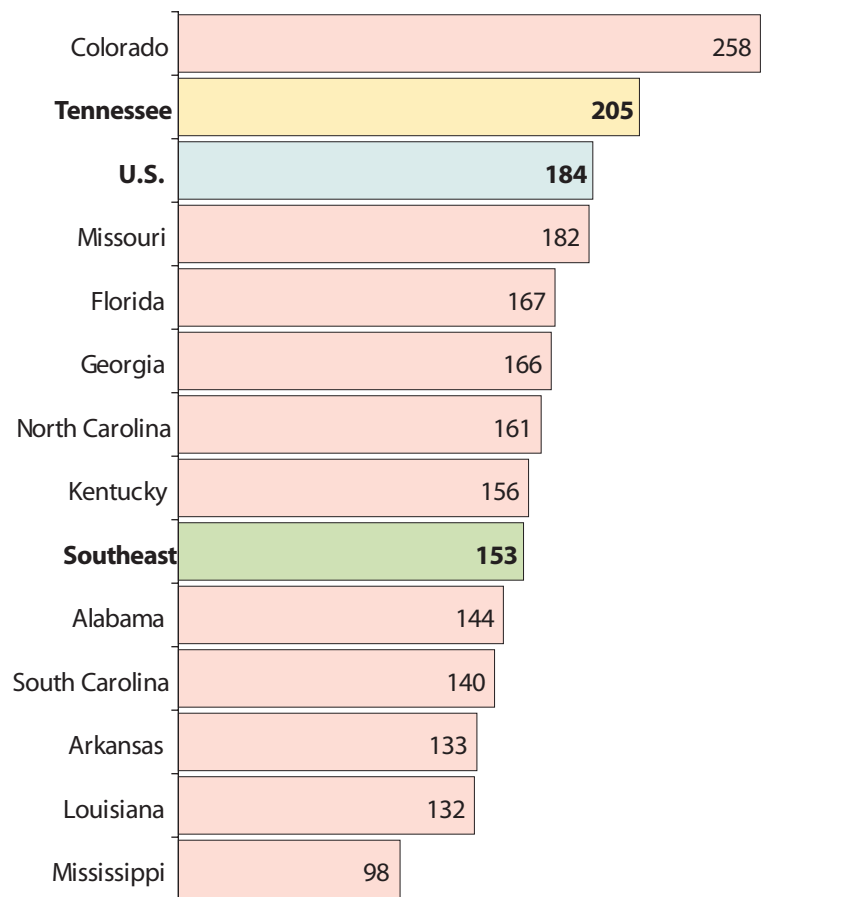
Source: NCPPHE, 2006a and 2006b.

FOUNDATION

the education pipeline



Tennessee students post higher scores on college entrance exams



Number of scores in the top 20 percent nationally on either SAT or ACT college entrance exams per 1,000 high school graduates (2005)

Source: NCPPHE, 2006a and 2006b.

PREPARATION

The pipeline for entering college starts early. Critical steps on the way include graduating from high school and performing well on college entrance examinations. Tennessee ranks poorly by national standards in the share of young people earning a high school degree.

Failure to earn a high school degree likely compromises one's chance of entering college. Only 83.1% of Tennessee's young people in the 18–24 age group have a high school credential—more than 12 percentage points below the top state (North Dakota) and just 2.1 percentage points better than the worst state (Nevada).

Students from Tennessee do reasonably well when it comes to performance on college entrance examinations. Of the Tennessee high school students who do graduate, the proportion of them who score in the top 20% on SAT/ACT college entrance exams outpaces the national average as well as the rest of the Southeastern states.



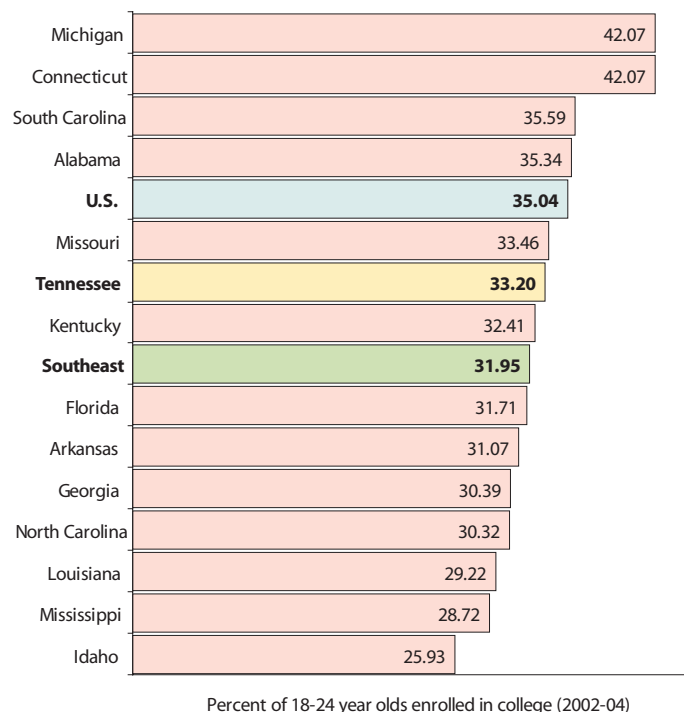
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the education pipeline

PARTICIPATION. Assuming that a Tennessee student has met some key preparatory requirements, the next major step is to actually enter the higher education pipeline by enrolling in college. College enrollment rates in Tennessee do not stack up well when compared to other states. About 33% of Tennessee's 18- to 24-year-olds were enrolled in college over the years 2002–04, about 2 percentage points less than the U.S. average.

There is some good news: Tennessee has made important strides in college participation since the early 1990s. The percent of 9th graders completing high school and entering college by age 19 rose from 24% in 1992 to 36% in 2002. Over the same period the national average fell from 40% to 38% (NCPPE, 2006a).

About 33% of Tennessee's 18- to 24-year-olds are enrolled in college, which is only slightly below the U.S. average (35%) but well below top states like Michigan and Connecticut



Source: NCPPE, 2006a and 2006b.

WHO ATTENDS COLLEGE? College participation rates in Tennessee vary substantially across different segments of the population. Not everyone in our state has the same chance to attend a college or university. Out of 100 white students in the 18–24 age group, about 36 will attend college. But out of 100 non-white students, only about 26 will attend college.

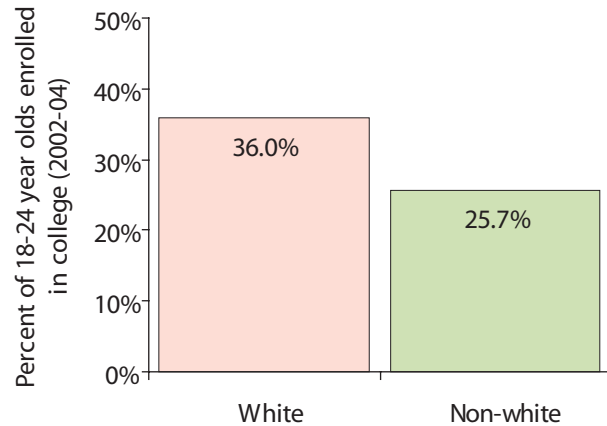
RACE. The outlook for reducing the difference between white and non-white college enrollment rates does not look good. Given that graduating from high school is a key step to entering college, it is alarming to see that between 1992 and 2004 the gap between the percent of white young adults with a high school credential and the percent of non-white young adults with a high school credential actually widened. If you are white, the odds of going to college increased; but if you are not white, the odds of attending college slipped.

INCOME. Family income is another good predictor of whether a child will graduate from high school and attend college. A student from a family with an income in the bottom 20% of all families has a 74% chance of holding a high school credential. In sharp contrast, a student from a family with an income in the top 20% has a 94% chance of holding a high school credential. The gap is even larger for college enrollment. A student from a family with an income in the lowest 20% is only a little more than half as likely as a student from a family with an income in the highest 20% to be enrolled in college.

GENDER. Females make up a significantly larger portion of total enrollment than males at both part-time and full-time colleges in Tennessee. Women constitute 63% of enrollment in Tennessee's part-time colleges and 57% of enrollment in Tennessee's full-time colleges (NCPPE, 2006b). 64.4% of female juniors and seniors in 41 high schools across Tennessee told us they intended to start a college program within one year after graduation. Only 48.8% of males said the same (Fox, Kiser, & Couch, 2006).

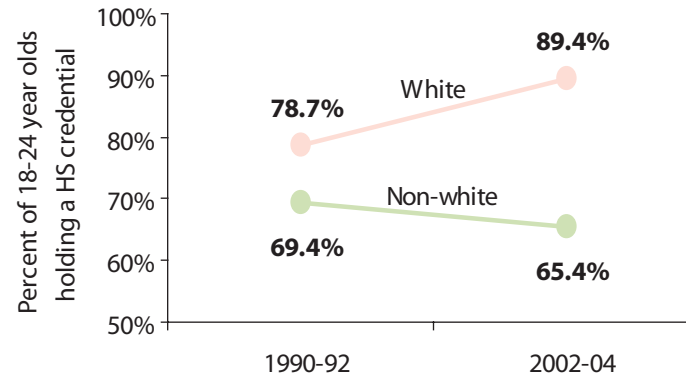
the education pipeline

There is a marked difference between the college-going rates of white young adults and non-white young adults. About 36% of white 18- to 24-year-olds are enrolled in college compared to about 26% of non-white 18- to 24-year-olds.



Source: NCPPHE, 2006a and 2006b.

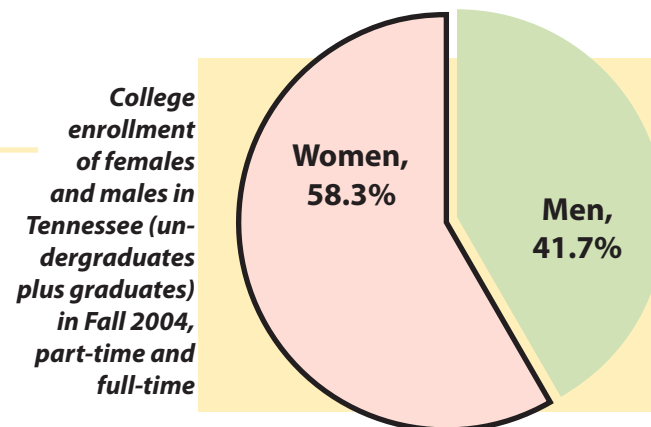
Between 1992 and 2004, the percent of white Tennesseans aged 18 to 24 who hold a high school credential has increased by 10. Over the same period, the percent of non-whites in the same category fell by 4.



Source: NCPPHE, 2006a and 2006b.

	Family income in bottom 20%	Family income in top 20%
% of 18- to 24-year-olds holding a high school credential (2002-2004)	74%	94%
% of 18- to 24-year-olds enrolled in college (2002-2004)	35%	66%

Source: NCPPHE, 2006a and 2006b.



Source: NCPPHE, 2006a and 2006b.

Unfortunately, low college enrollment rates are not confined to young people in Tennessee.

Our adult participation rate in postsecondary education is the 4th lowest in the nation. Less than 3% of Tennessee's 25- to 49-year-olds participated in at least some form of postsecondary education in the fall of 2003.

In contrast, the Southeast average was 3.2%, the U.S. average was 3.9%. New Mexico's participation rate topped the list at 6.1% (NCPPE, 2006a).

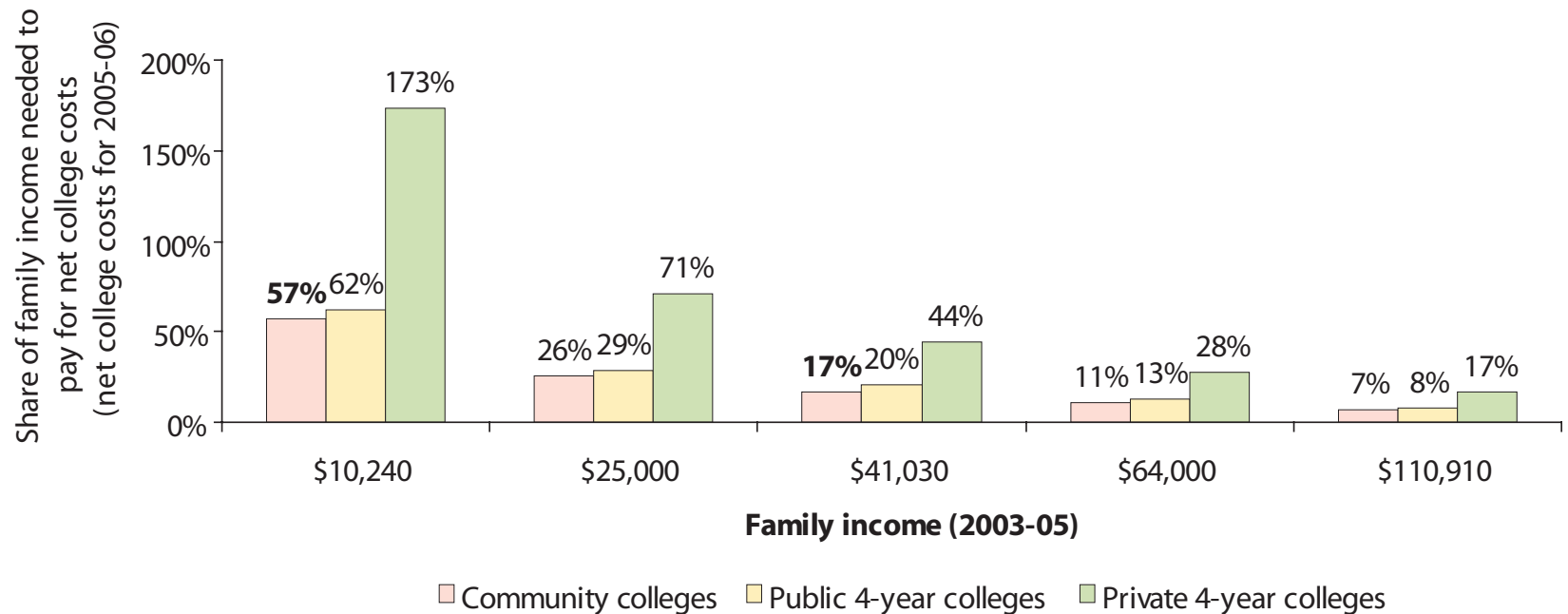
the education pipeline

AFFORDABILITY. A growing barrier affecting a student’s ability to progress through the higher education pipeline is the rising cost of tuition. Financial considerations play an important role in determining whether a young person can attend college. Out-of-pocket costs can be a large share of income for lower income households making it harder for children to go to school. These same households likely have less savings to draw upon, have poorer credit ratings that raise the cost of borrowing, and are renters meaning they have no homeowner equity to use to fund college.

Consider a Tennessee household with an annual income of \$10,240. For this family, a child attending a community college would eat up 57% of household income. But for a family with income of \$41,030, community college costs would represent only 17% of household income. In fact, the share of family income needed to pay for higher education in Tennessee is lower than the U.S. average. Looking at the average share of family income needed to pay for net college costs across the 5 income groups, the U.S. average share of family income needed is 24% for community college, 31% for public 4-year college, and 72% for private 4-year college, compared with 23%, 26%, and 66% in Tennessee (NCPPE, 2006b).

The evidence shows that escalating tuition is a national trend affecting access to higher education. For example, in just 2 years between 2003–04 and 2005–06, tuition and fees at public 4-year institutions rose by 17% (Knapp et al., 2006, p. 3). As tuition has risen, some major sources of funding for higher education have not kept pace. In 1977 Higher Education appropriations made up 7.3% of state spending, but have since declined to only 5.3% in 2000 (Committee for Economic Development, 2005, p. 15). Pell Grants, which are the largest source of need-based funding that the federal government provides, are below the inflation-adjusted levels that prevailed in the 1970s. Higher tuition and lagging financial support from other sources result in higher costs that can make it harder to afford attending college.

Tennessee’s lower income families require a larger percentage of their income to pay for net college costs



Source: NCPPE, 2006b.

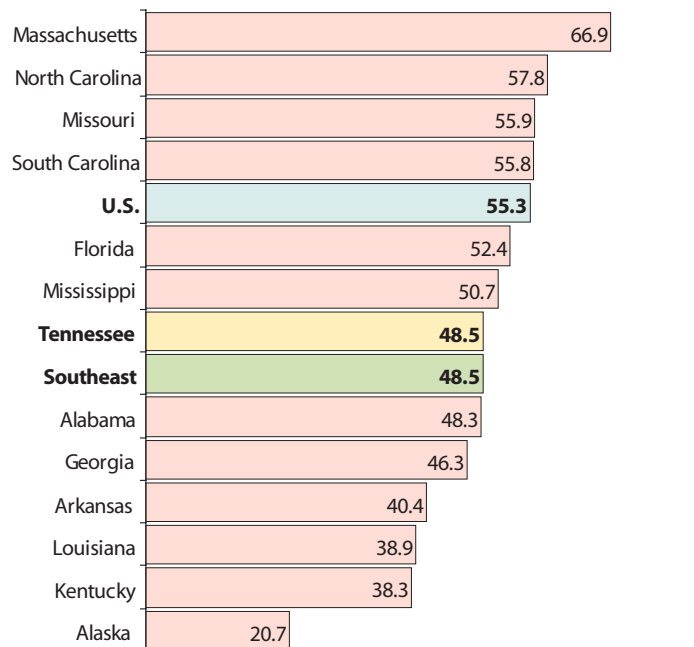
the education pipeline

COMPLETION. Let's look at the final stretch of the education pipeline—completion rates. If you are a first-year college student in Tennessee, you have less than a 50-50 chance of finishing college within 6 years.

Persistence in college is important for finishing, and finishing on time. This means that the more students who return for their second year of college, the better the chance that those students will make it all the way through the pipeline. Tennessee has gained significant ground in the persistence of its community college students. Fifteen years ago 50% of first-year Tennessee community college students would return for a second year. Over the past 15 years the share of Tennessee community college students returning for a second year has increased by 16%, in contrast to a 5% decline in the national average. Now, 58% of Tennessee's first-year community college students will stay for a second year, compared with a national average of just 53% (Measuring Up 2006 Database). And there have been further improvements.

Between 1991–92 and 2003–04 the percent of enrolled Tennessee undergraduates earning degrees and certificates saw a large gain. The number of certificates awarded per 100 enrolled undergraduates increased by 194%, the number of AAs awarded per 100 undergraduates increased by 20%, and the number of BAs awarded per 100 undergraduates increased by 19%. Overall, the total number of degrees and certificates awarded per 100 undergraduates increased by 29% in Tennessee, exceeding the U.S. average increase of 18% over the same period (Measuring Up 2006 Database). The state must continue to outperform the nation in the years ahead if it wants to catch up and surpass the nation in the share of adults with college degrees.

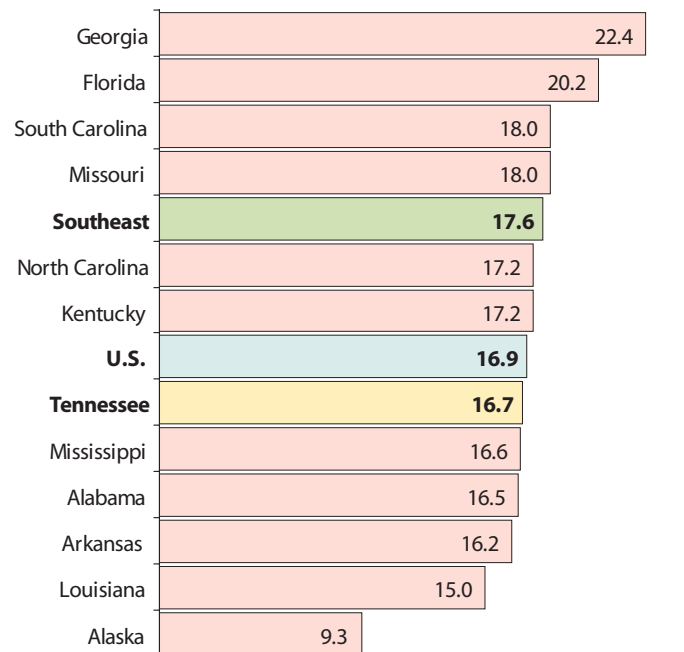
If you are a first-year college student in Tennessee, you have less than a 50-50 shot of completing your bachelor's degree within 6 years



Percent of first-time, full-time students completing a BA degree within 6 years (2003-04)

Source: NCPPHE, 2006b.

For every 100 undergraduate students enrolled, 16.7 certificates, degrees, or diplomas are awarded



Total certificates, degrees, and diplomas awarded per 100 undergraduate students enrolled (2003-04)

Source: NCPPHE, 2006b.



the education pipeline

WHAT IS THE STANDING OF YOUR LOCAL COMMUNITY? We have seen how Tennessee compares with other states on key aspects of the education pipeline. But a strong education pipeline is every bit as important for the economic competitiveness of counties and cities in Tennessee. Communities across the state vary widely in the educational attainment of the adult population. Some communities have strong local schools that build on a healthy tax base and avid support from parents and the community at large; these same communities also enjoy the benefits of a more educated citizenry.

Let's consider The Educational Needs Index, which provides an assessment of the standing of individual counties. The index includes several components: the share of the population with a high school degree, associate's degree, bachelor's degree, and the attainment gap between young and old workers. And it allows identification of counties with the "least critical" and "most critical" educational needs. Fifty-five percent of our 95 counties are listed as "most critical" (Educational Needs Index State Report for Tennessee, p. 11).

The adjacent charts show the standing for the top 5 and bottom 5 counties for the 3 attainment measures that enter into the calculation of the index. As you can see from the numbers, there are huge disparities across communities in Tennessee. For example, in terms of high school completion, Williamson County finds itself at the top with a record that is 29.2% ahead of Grundy County. The differences between the top and the bottom for associate's and bachelor's degrees are more dramatic still.

Education Factor

in 5 Most Critical Counties

Lake	1.725
Grundy	1.465
Union	1.333
Johnson	1.293
Fentress	1.226

in 5 Least Critical Counties

Wilson	-0.343
Rutherford	-0.384
Davidson	-0.653
Knox	-0.697
Williamson	-1.159

* Average is 1.000.

Source: Educational Needs Index State Report, 2006.

continued from page 66

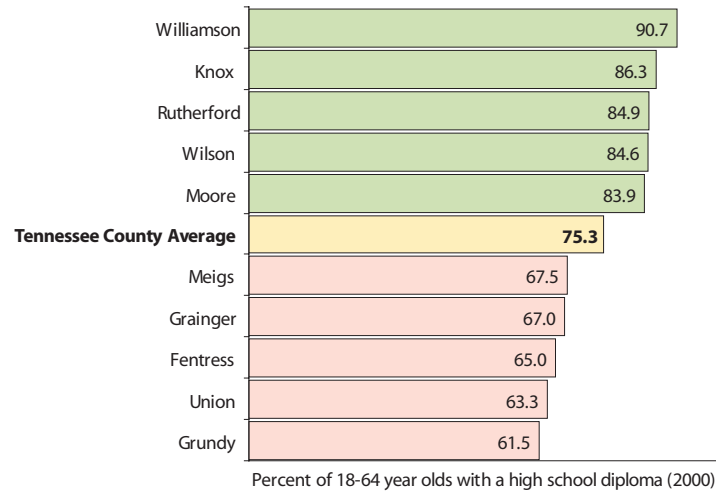
metal worker, stone mason, and tile and marble setter—the median annual income is at least \$26,000 per year, and none require a college education (BLS, n.d.). In order for workers to gain the skills necessary to perform their jobs, however, other forms of education are essential. Each trade typically requires some form of on-the-job training or professional licensure, and workers with less skill or experience can expect to earn less than the median while more skilled or experienced workers may earn substantially more.

Registered nurses are another example of an occupation that is both well-paid and growing rapidly but that does not require a formal bachelor's degree; about 42% of registered nurses in the U.S. do not have a bachelor's degree (BLS). Yet nurses are paid relatively well since they are in high demand and will continue to be as the population of both Tennessee and the U.S. continues to age. There are projected to be 13,260 more registered nurses in Tennessee in 2014 than there were in 2004.

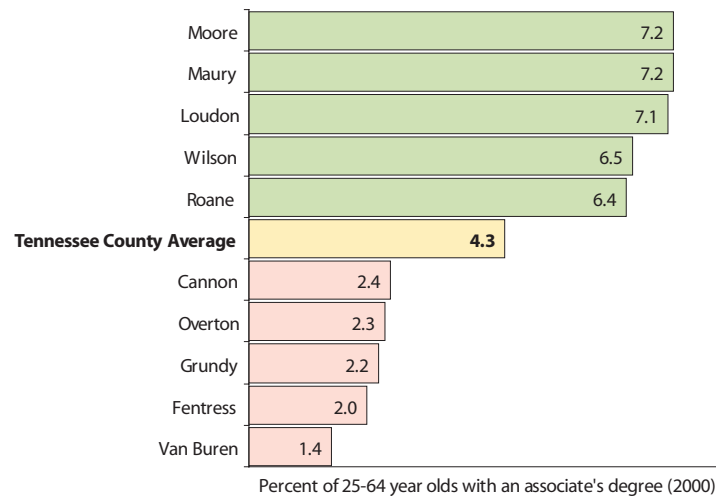
A Tennessee nurse in the bottom 10% of earners still received an income of \$36,400 per year (TN Department of Labor and Workforce Development, www.careerinfonet.org). Nurses with this level of pay are most likely in entry-level positions and probably have very little experience. Despite their short tenure, they still earn significantly higher than the average Tennessean. The most highly paid nurses are those with the most experience, and these nurses earn almost \$70,000 per year in Tennessee. Within the state, nurses are paid well regardless of the area in which they live. For example, the median annual salary of nurses is \$53,900 in Nashville and \$52,400 in Memphis; both are higher than the statewide median of \$48,900.

**Top 5 counties,
bottom 5 counties,
and the county average in**

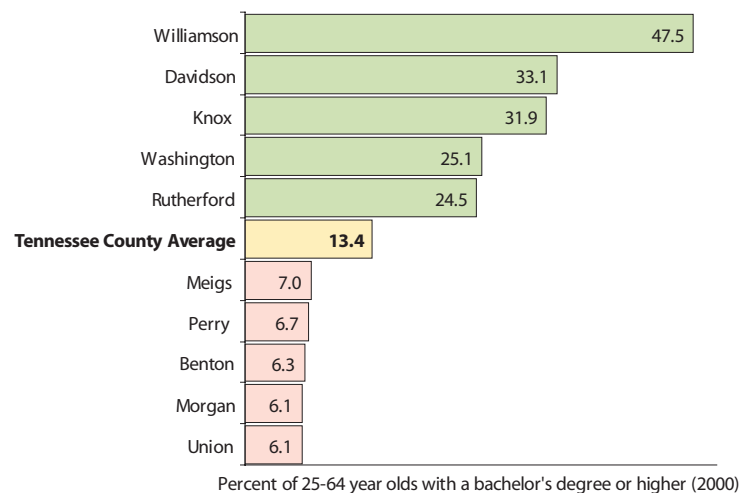
High school completion



Associate's degree



Bachelor's degree or more



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Economic vitality

STRENGTHENING OUR ECONOMIC ADVANTAGE

“Investment in education benefits the individual, society, and the world as a whole. Broadbased education of good quality is among the most powerful instruments known to reduce poverty and inequality.

With proven benefits for personal health, it also strengthens nations’ economic health, by laying the foundation for sustained economic growth.

For individuals and nations, it is key to creating, applying, and spreading knowledge—and thus to the development of dynamic, globally competitive economies.” (The World Bank, 2002)

Topics include—

higher incomes
more labor force participation
lower unemployment
more jobs
less poverty
opportunities in emerging industries

Perspectives include—

value of education
effects of higher education

And Tennessee’s business leaders weigh in

prosperity

Economic Development Positive *inputs* = positive *outcomes*

Business Investment



Skilled Workforce

“If Tennessee is to continue to grow economically, it must prepare a workforce that can sustain or improve growth. This will require more rigor in schools and a more highly trained workforce. We need to be prepared to pay the cost to prepare a competitive workforce.”

—Opinion from a business leader at a small business in metropolitan Tennessee (CBER-UT, 2007)



Business Research

Government / Infrastructure

ingredients for regional economic development

Imagine a blender.

You are making a milkshake, let's say.

What you pour into your frosty mug relies solely on what you throw into the blender.

You can't get a milkshake without milk.

And if you want chocolate,
well, you know what to do.

Now imagine you are making "economic development" in your blender. (It's not a stretch — imagine —)

You are making "economic development" in your blender because "economic development" is vital to your prosperity.

You know without it, you and the people in your community might have fewer career opportunities, lower-paying jobs, higher unemployment. You might even have to rely more heavily on government services like food stamps and free lunches.

So how do you make "economic development"?

- Attract good businesses and good employers to your community, county, region, and state.
- Help those businesses make the best goods and services possible so they can compete.
- Encourage businesses to keep up with changes through research and development.
- Provide infrastructure for businesses, like roads, highways, and laws.
- Last, but not least, offer these employers good, quality, skilled workers at all job levels.

As you might expect, if you neglect any of these ingredients, your "economic development" will suffer—just like your chocolate milkshake won't be quite right without the chocolate syrup.

What does quality education have to do with economic development?

With a well-educated workforce, we see higher incomes, more labor force participation, lower unemployment, more jobs, less poverty, and opportunities in emerging industries.

(see pages 84–93)

A variety of perspectives exist about the value of education to development, effects of higher education on the regional economy, and entrepreneurship.

Our own Tennessee business leaders have opinions.

(see pages 94–97)

Regardless of the perspective, businesses are attracted to an area because of the skill of the workforce (among other reasons, of course) and as a result the economy grows.

(see pages 98–99)

Education pays

Education pays, not only for the income-earner and his or her family but also for the company the person works for and the community in which he or she lives. For the individual worker, differences in education yield substantial monetary payoffs:

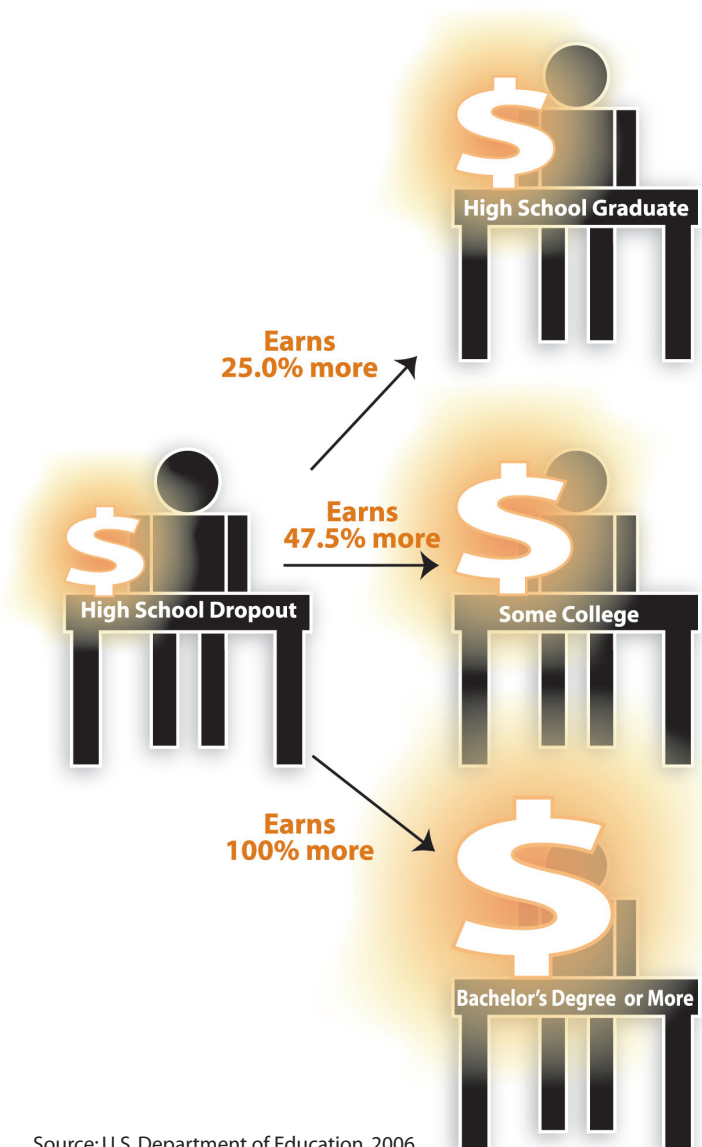
- Men with college degrees earned 62% more and women 65% more in hourly compensation than did those with a high school degree at the end of the 20th century (U.S. Department of Labor, 2001).
- Between 1980 and 2004, average earnings increased with education across the board—for the total population as well as for male, female, white, black, and Hispanic populations (U.S. Department of Education, 2006).

Individual returns from education are enormous and are growing over time. Consider the situation for young adults pictured at right. Young adults, aged 25–34 who worked full-time, in terms of inflation-adjusted earnings (2004) show very large differences in earnings when compared to a high-school dropout (for Tennessee dropout rates, see pages 56–61).

In 1980, the median earnings of a high school graduate were 21% more than a high school dropout, while the median earnings for an individual with a bachelor’s degree or higher were almost 52% more. In 2004, a high school graduate earned 25% more than the dropout while those with a college degree earned 100% more, double that of the high school dropout. A worker who has taken some college courses earns 48% more than a high school dropout. These income differentials may very well expand in the new economy as the need for skilled workers rises faster than supply while the demand for unskilled workers declines.

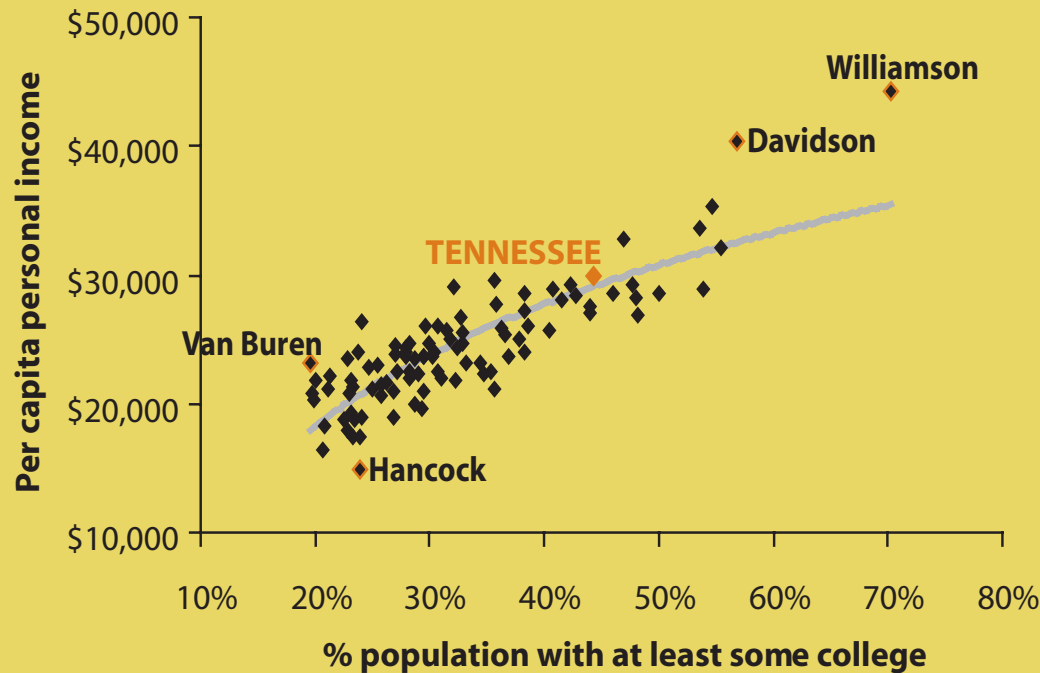
Again, the higher wages tied to education do not benefit only the individual and his or her family. These higher wages flow through the local economy, generating wealth and translating into higher earnings for the entire community. Tennessee data indicate a clear positive relationship between education and income, to wit, counties with a more highly educated population have higher levels of personal income. However, this is just the tip of the proverbial iceberg.

What education does to earnings —



Source: U.S. Department of Education, 2006.

Average per capita personal incomes are higher in counties with more residents who have taken some college courses



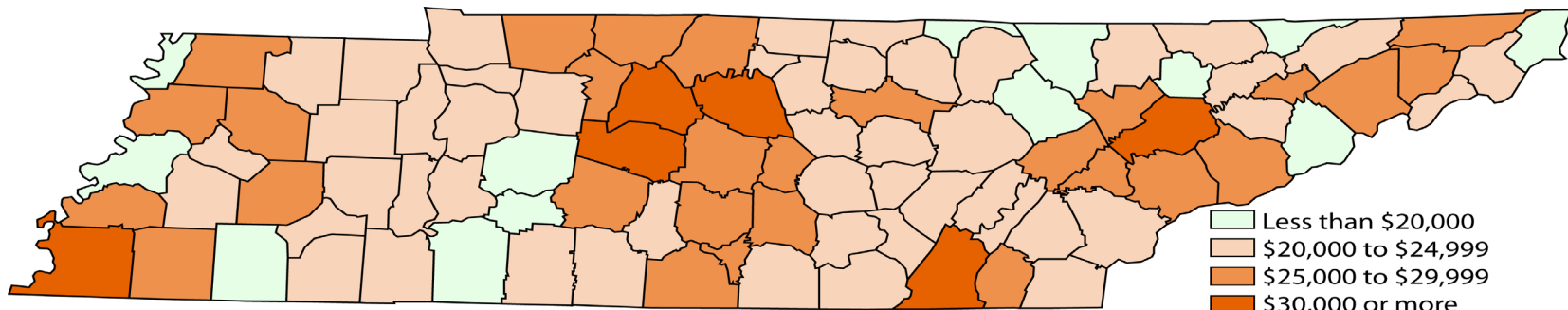
Source: CBER-UT, 2000, 2004.

Urban and rural income differences

There is a significant income disparity between rural and urban counties. The counties in Tennessee's larger metropolitan areas tend to be the ones with higher per capita incomes (see map on this page), including Shelby, Fayette, and Tipton in the Memphis area; Davidson, Williamson, Rutherford, and Wilson in the Nashville area; Knox, Blount, Loudon, and Anderson in the Knoxville area; Hamilton and Bradley in the Chattanooga area; and Sullivan and Washington in the Tri-Cities area. These counties all have relatively high per capita personal income (ranging between \$26,800 and \$44,200). Counties such as Pickett, Lewis, Hancock, and Lake are very rural, with per capita incomes of less than \$19,700 per year.

A primary explanation for the urban-rural income divide is disparity in the educational attainments of the adult population. Urban communities not only have a better educated population, but they also enjoy a stronger tax base to support higher levels of spending on education. This is no coincidence: higher income translates directly into a broader sales and property tax base that can be used to support government services.

Tennessee's urban counties exhibit higher incomes than their rural counterparts



Per Capita Personal Income, 2004. Source: CBER-UT.

PROSPERITY

beyond higher incomes

If the higher incomes that come with education are just the tip of the iceberg of education's effect on the Tennessee economy and workforce viability, what lies below the tip? A highly educated populace also means—for one—more people are working. In other words, workers with higher levels of education are more likely to participate in the labor force since their returns from working are higher.

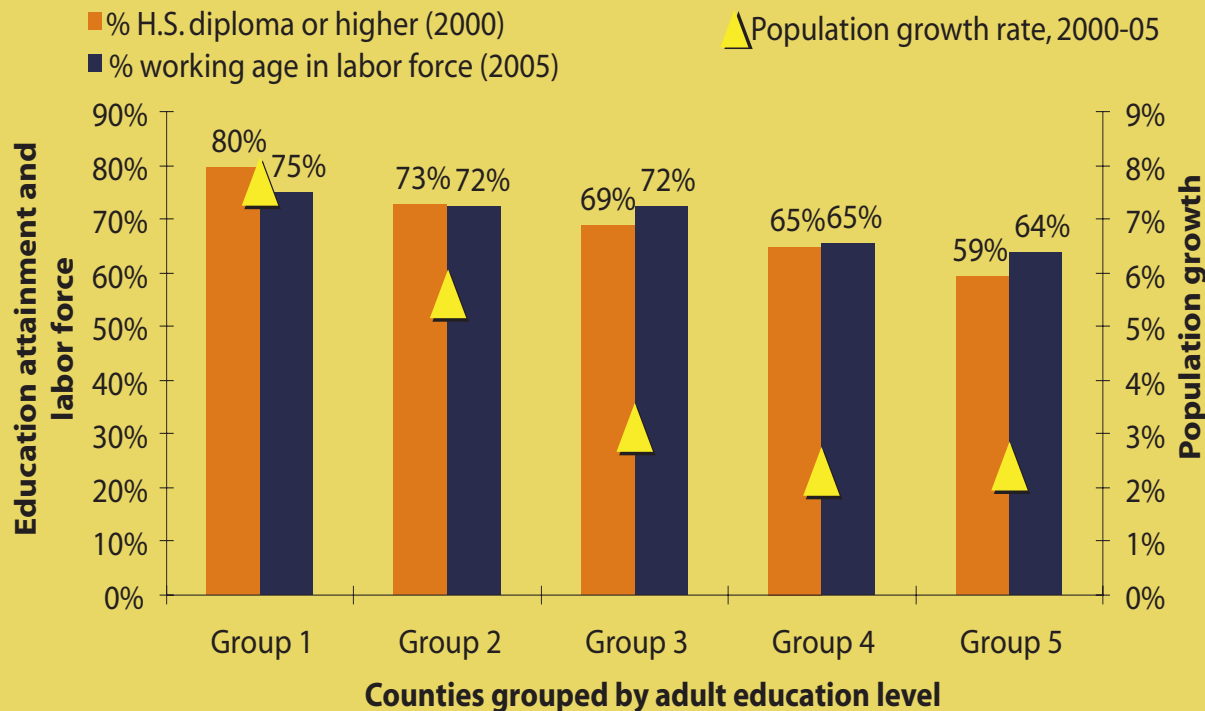
So then, Tennessee counties with a more educated populace have a higher percentage of their working-age adults participating in the labor force. A larger workforce will make a community more attractive for the location and expansion of business. This in turn means more job options for workers.

To illustrate the linkage between education and the labor force, we have grouped counties together in five groups by the percentage of adults with a high school diploma or higher. Each group contains 19 counties. For example, Group 2 had an average high school attainment rate of 72.6% and an average of 72.3% of its residents aged 16 to 64 were either working or actively seeking a job. As you can see below, the counties with a better educated population have a larger share of adults participating in the labor force.

Education
serves as a
m e c h a n i s m
that draws people
into communities.

There is also an important linkage between population growth and education. Take a look at the triangles on the graphic below—as education levels of the population increase, counties experience a higher rate of population growth and enjoy a higher share of their population participating in the labor force. This suggests that education serves as a mechanism to draw people into communities. These patterns are consistent across a variety of measures of county educational attainment.

Labor force participation and population growth are stronger in counties where educational attainment is high



Source: CBER-UT.

beyond higher incomes

Let's uncover more of what lies beneath the iceberg.

Look beyond the obvious.

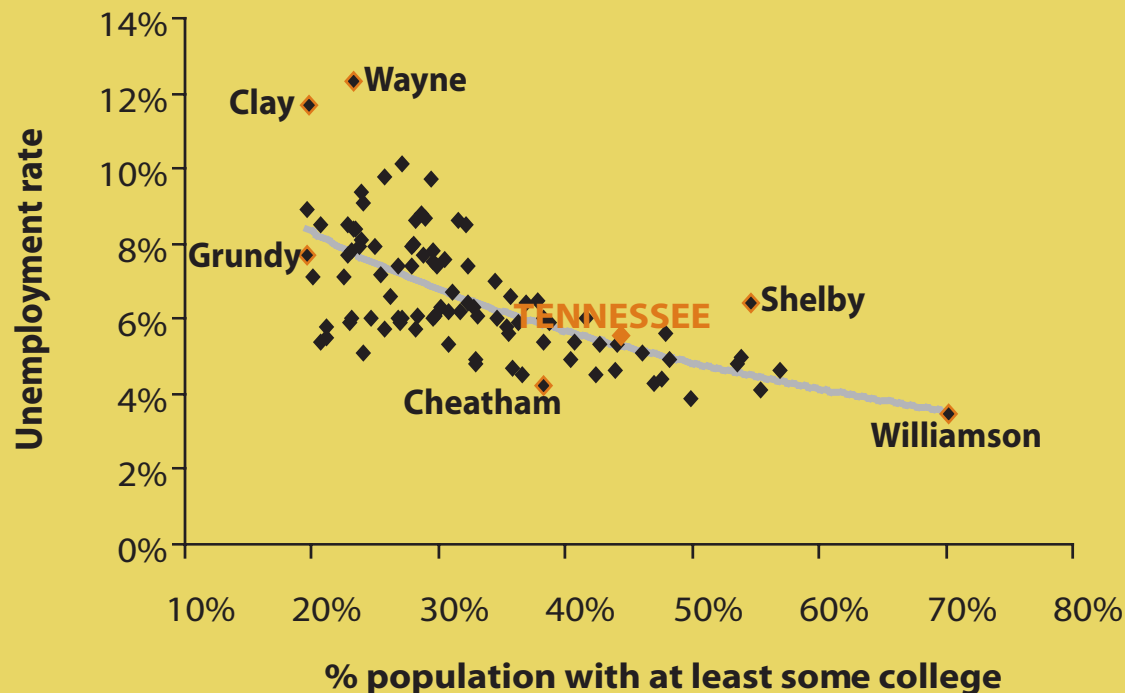
More education also supports lower rates of unemployment within Tennessee counties.

In Tennessee, counties that have higher portions of their population with at least some college have generally lower unemployment rates. Communities with poorly skilled workforces experience higher unemployment rates, which translates into more foregone income, less production on the part of businesses, and a greater burden on the community at large.

Like the other relationships considered here, this trend is consistent regardless of the measure of educational attainment used.

Dare to uncover what's beneath the iceberg —

Unemployment rates are lower in counties with residents who've taken some college courses



Sources: CBER-UT and BLS, 2000, 2005.

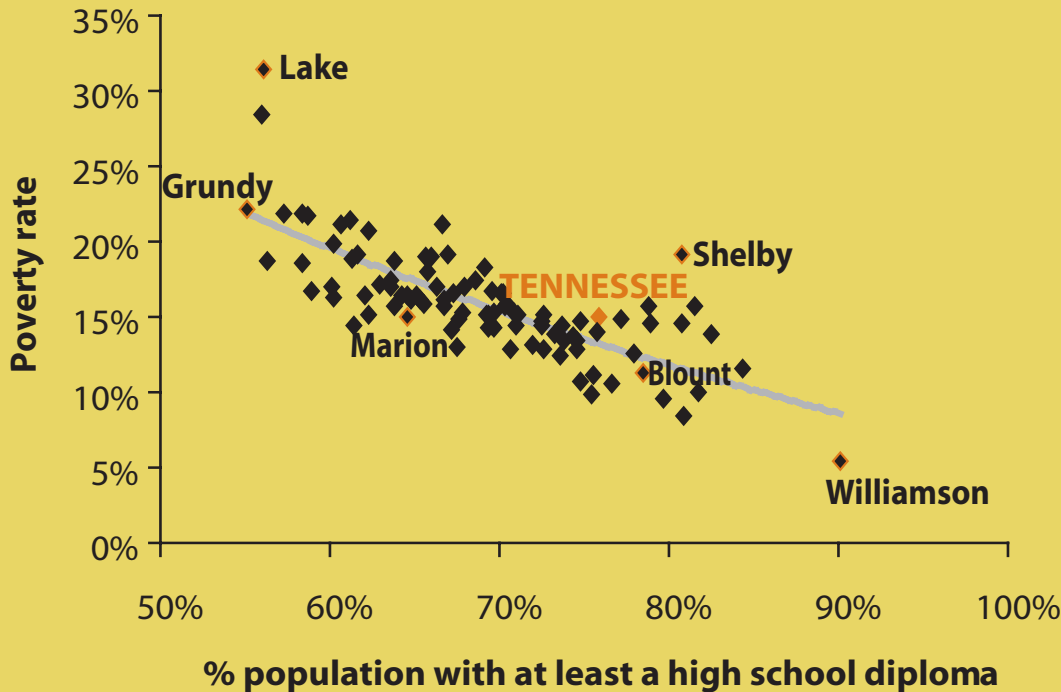
PROSPERITY

less poverty in our communities

COUNTIES WITH HIGHER LEVELS OF EDUCATION EXHIBIT LOWER POVERTY RATES AND LESS RELIANCE ON FOOD STAMPS —

lower utilization of these programs reduces the fiscal burden on local governments, allowing more and higher-quality public services to be provided to communities or supporting lower taxes.

Poverty rates are lower in better educated counties



Sources: U.S. Census Bureau and CBER-UT, 2000, 2004.

An educated population affects the entire income distribution, including the low-income component. In fact, counties with higher levels of education exhibit lower poverty rates, shown in the graph at left. For instance, 9 out of 10 adults in Williamson County have at least a high school diploma, and the county has the lowest poverty rate in the state at just 5.4%. Statewide, less than 8 out of 10 adults have at least a high school diploma, but the poverty rate is almost 10 percentage points higher, at 15.0%.

Other measures of poverty echo these results. Poor households frequently rely on government assistance programs, such as food stamps and free or reduced school lunches for children. Counties with higher levels of education also have generally lower participation rates in these low-earner programs. The top 10 counties in Tennessee in 2000, in terms of the percentage of the residents having completed high school, had an average of less than 7% of their residents receiving food stamps. In sharp contrast, the 10 least-educated counties had an average of almost 16% of their residents receiving food stamps, more than double those of the highly educated counties.

Another commonly used measure of poverty is the percentage of school children who receive free and reduced-price school lunches since it is a means-tested program and recipients are generally children from low-income households. Again, the trend is unmistakable: a more educated Tennessee county significantly reduces the percentage of its children receiving free/reduced-price lunches. Lower participation in antipoverty programs such as food stamps, free/reduced-price school lunches, and Families First is indicative of a healthy local economy and a more prosperous community. Lower utilization of these programs also reduces the fiscal burden on state and local governments.

less poverty in our communities

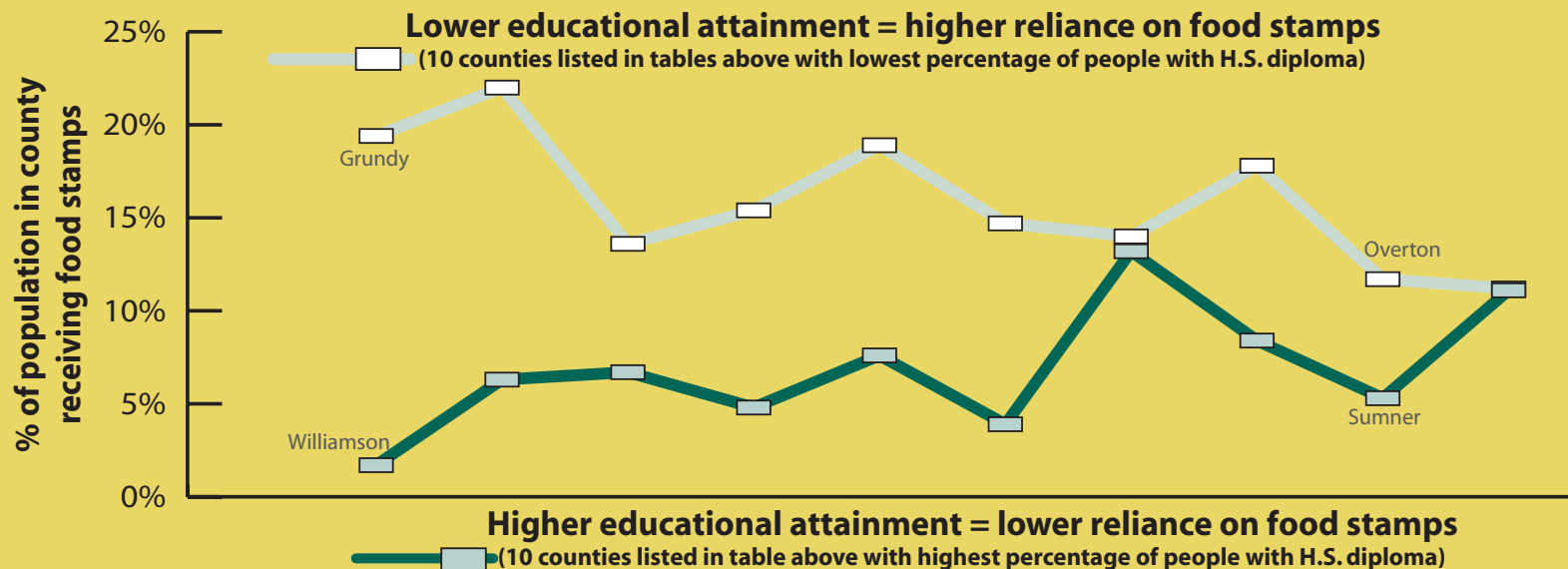
Education can help families avoid reliance on food stamps

10 counties with <i>highest</i> percentage of adults with H.S. diplomas		
County	Population with at least a H.S. diploma (%)	Population receiving food stamps (%)
Williamson	90.1	1.7
Montgomery	84.3	6.3
Knox	82.5	6.7
Rutherford	81.8	4.8
Davidson	81.5	7.6
Wilson	80.9	3.9
Shelby	80.8	13.2
Hamilton	80.7	8.4
Sumner	79.7	5.3
Anderson	78.9	11.1
Average	82.1	6.9
Tennessee	75.9	9.3

Sources: CBER-UT and CLIKS.

10 counties with <i>lowest</i> percentage of adults with H.S. diplomas		
County	Population with at least a H.S. diploma (%)	Population receiving food stamps (%)
Grundy	55.2	19.4
Hancock	55.9	22.0
Luke	56.0	13.6
Union	56.3	15.4
Fentress	57.3	18.9
Johnson	58.4	14.7
Clay	58.4	14.0
Campbell	58.7	17.8
Overton	59.0	11.7
Grainger	60.1	11.2
Average	57.5	15.9
Tennessee	75.9	9.3

Sources: CBER-UT and CLIKS.



Sources: CBER-UT and CLIKS.

Education not only impacts income, employment, and poverty levels, but drives the growth process as well. Businesses that foster innovation and create jobs (as new products are designed, developed, and produced) build on a larger and better trained local workforce. Businesses from outside will prefer to locate in communities with a high quality workforce to better enable them to compete in the global marketplace.

From 2000 to 2005, the top ten counties in terms of employment growth saw job gains of 8.8%. These counties had an average of over 3/4 of their populations with at least a high school diploma. For example, in Rutherford County, almost 82% of adults graduated from high school. Job growth in Rutherford from 2000 to 2005 was almost 11%. *It is striking that the ten counties with the lowest growth lost, on average, 14.2% of their jobs over the same period.* Only 2/3 of the population in those counties had a high school diploma or higher. Van Buren County, with only 62% of adults completing at least high school, lost almost 13% of its jobs in those six years. Counties with a better educated workforce are less likely to lose jobs and more likely to attract new businesses and experience strong and sustainable job growth. Put together, counties with these characteristics will have greater economic security for workers, families, and the economy.

An educated workforce promotes county job growth

Top 10 counties by employment growth, 2000 to 2005		
County	Population with at least a H.S. diploma (%)	Employment growth (%)
Williamson	90.1	11.0
Sevier	74.6	10.8
Rutherford	81.8	10.8
Fayette	70.6	9.0
Decatur	63.6	8.8
Loudon	75.6	8.5
Bedford	69.7	8.1
Blount	78.4	7.9
Cumberland	72.5	6.7
Montgomery	84.3	6.7
Average	76.1	8.8
Tennessee	75.9	-0.1

Sources: CBER-UT and TN Department of Labor and Workforce Development.

Bottom 10 counties by employment growth, 2000 to 2005		
County	Population with at least a H.S. diploma (%)	Employment growth (%)
Pickett	62.9	-19.0
Lauderdale	62.3	-18.0
Hancock	55.9	-15.4
Gibson	70.9	-14.4
Bledsoe	66.0	-14.0
Giles	72.5	-13.5
Madison	78.8	-13.4
Van Buren	62.0	-12.9
Clay	58.4	-10.7
Weakley	70.3	-10.4
Average	66.0	-14.2
Tennessee	75.9	-0.1

Sources: CBER-UT and TN Department of Labor and Workforce Development.

Higher education institutions foster job growth and other benefits

- Institutions of higher learning tend to be large employers, providing stable jobs to support their employees and generating payrolls that support families and retail activity.
- Colleges and universities often have cooperative programs with local K–12 school systems and non-degree programs for continuing adult education.
- Communities that contain colleges and universities have a higher percentage of better educated citizens, partly because the institution’s teachers, professors, and administrators live there. There is a direct effect, but also a potentially important peer effect on expectations and attitudes in the community.
- These communities receive a stable stream of skilled graduates, some of whom will choose to locate there permanently, while others will stay at least temporarily. These educated workers will pay taxes, vote, and generally contribute to the society overall.
- The presence of universities, especially those actively involved in research, attracts higher amounts of outside funding from grants and contracts, particularly from the federal government.
- Technology and its licensing generate additional revenue from outside companies as well as attracting new well-paying industries to the community.
- Universities turn out research that can lead to the creation of new businesses and contribute to a local workforce that is skilled in budding technologies.
- Colleges and universities host many cultural events that benefit the community, such as plays, concerts, exhibits, and lectures.

A study conducted by the National Association of State Universities and Land-Grant Colleges in 2001 found that state-supported universities “remain powerful engines for economic stability and growth” (NASULGC, 2001, p. 3).

- Every dollar of state money invested in a NASULGC institution generates an average return of \$5.
- For every \$100 spent directly by a NASULGC institution, an additional \$138 is spent by employees (\$64), students (\$60), and visitors (\$14).
- NASULGC institutions account for an average of \$60 million annually in state and local taxes paid by employees, students, and visitors.
- The average number of jobs provided is 6,562, not including part-time student employees.
- For every job on a public university campus, an additional 1.6 jobs are generated off-campus.
- Two-thirds of public university graduates remain in-state for significant periods of time after graduating.
- Public universities received an average of \$105 million from out-of-state research grants and contracts.
- 65% of NASULGC institutions reported having a research park and/or business incubator.

opportunities in emerging industries

In Tennessee, the average high-tech wage paid 60% more than other private sector wages, at \$55,889 per year (American Electronics Association, 2006).

Growth and high wages in the high-tech industry

The high-tech industry is an example of a sector of the economy that requires an educated workforce; and, in turn, rewards its employees with high levels of compensation. Compared with the rest of the economy, these jobs tend to pay more, offer superior benefits, and are more productive. Better educated workers are able to find employment in high-wage industries, particularly industries that specialize in technology.

For the entire U.S., workers in high-tech positions earned an annual income of \$72,440 compared to the private sector average of \$39,134. This means that high-tech workers earned over 85% more than the private sector average in 2004.

This wage differential was even larger prior to the end of the tech bubble and declined throughout the recession of 2001–2002. It has since been back on the rise and should continue to climb as the shortage of qualified workers grows larger.

Tennessee wages and trends

In Tennessee, high-tech wages were over 60% more than the private sector average in 2004, up from 57% in 2003. While this gap is not as large as the U.S. overall, it is still substantial. Not surprisingly, given the high wages, these jobs are extremely demanding and require advanced skills. A Tennessean is much more likely to be hired by a high-tech firm and achieve this increase when equipped with proper education and training.

The high-tech industry not only pays high wages to its employees, but it is also vital to the strength of the economy. It accounts for a substantial portion of U.S. exports. In fact, in 2005, the high-tech industry was the largest exporter of manufactured goods, generating almost \$200 billion (AEA, 2006). Tennessee plays a critical role in these exports and is becoming an even bigger player. From 2004 to 2005, Tennessee had the 5th largest growth in high-tech exports of all U.S. states, increasing its exports by over \$700 million. High-tech goods already make up over 20% of Tennessee's overall exports.

Highlights of the Tennessee high-tech industry

- Tennessee ranked 3rd among all states in 2004 in consumer electronics employment.
- Tennessee had the 5th largest growth in high-tech exports in 2004.
- High-tech exports from Tennessee increased by over \$700 million in 2004.
- Tennessee ranked 25th in overall high-tech employment in 2004.
- Tennessee ranked 35th in average high-tech wage in 2004.
- High-tech goods make up over 20% of Tennessee's total exports (AEA, 2006).

High-tech goods should continue to grow as a share of U.S. exports, and it is this growth that will contribute to the looming skilled labor shortage. **The only way to sustain this growth is through building the skills of the workforce.** In order for Tennessee's high-tech industry to continue to grow and reap these rewards, the workforce must be educated and prepared for the emerging demands.

opportunities in emerging industries

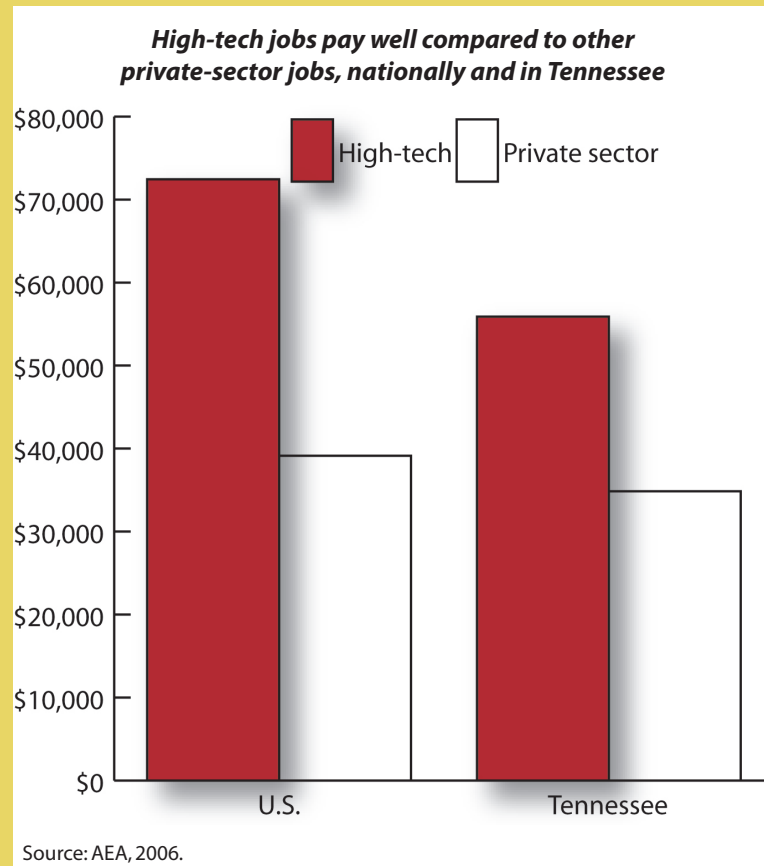
From the business perspective

Many businesses obviously benefit from improvements in technology. Technology allows transactions to be completed more efficiently and with less cost. Businesses are better able to control costs when they have access to national and global markets for inputs. In that manner, technology aids in keeping prices low.

Benefits of a technological economy (which require an educated workforce):

- keeps costs low for business inputs
- opens global markets for local businesses to sell goods
- helps suppress inflation
- creates high-productivity and thus high-wage jobs

We need more technically skilled employees and are unable to find people who want to make a career.
 —Opinion from a business leader at a services firm in rural Tennessee



Crossroads— Explore technical program options for —

High school students

Tech Prep Program — minimum of 2 years of high school coursework + 2 years of post-secondary coursework = immediate work place skills and a faster route to a technical job or degree program

Programs are offered through 13 Tech Prep consortia covering the entire state with articulation agreements between high schools and community colleges

Federally funded and administered through the Tennessee Board of Regents

Adults

Tennessee Technology Centers: programs designed to put adult Tennesseans into high-tech jobs, effectively and quickly

27 centers across the state offering both day and evening courses

Accredited by the Council on Occupational Education

Programs of study might include (depending on location): business systems technology, automotive technology, practical nursing, surgery technology, early childhood education, and many more

Education capital

Capital, capital, capital. We would not have growth without it. Business financial capital supports investment. These investments are commonly thought of as capital equipment, like machinery and computers. But our workforce can also be thought of as capital.

What is this capital worth?

The U.S. Office of Management and Budget estimates that it would cost over \$50 trillion to re-educate the entire workforce at today's prices. It calls this value "education capital." OMB admits that the \$50 trillion is a conservative estimate.

By way of comparison to our nation's other assets, education capital is valued at almost 4 times that of *all* privately owned commercial buildings and equipment in the U.S. at \$13 trillion (OMB 2007, p. 196).

"As Tennessee transitions into an economic era in which its fortunes will be determined more by the human capital potential of our citizens than by the state's physical capital and natural resources, higher education must begin to play a larger role in critical policy areas such as public health, industrial training, and recruitment, economic and community development, and adult literacy" (Tennessee Higher Education Commission, 2005, p. 4).

Universities and economic development

How do institutions of higher learning, especially research universities, contribute to state and local economic development? Here are some examples:

1. Creation of knowledge
2. Human capital development
3. Transfer of existing know-how
4. Technological innovation
5. Capital investment
6. Regional leadership
7. Knowledge infrastructure production
8. Influence on regional milieu (Goldstein, Mayer & Luger, 1995)

It's not just speculation. Statistical studies have shown that institutions of higher education contribute positively to regional economic development:

- Research and knowledge generated by universities spill over into innovation-intensive industries, forming clusters near universities (Audretsch & Feldman, 1996). *Think about St. Jude's Children Hospital in Memphis, Vanderbilt University in Nashville, and the University of Tennessee's linkages to Oak Ridge National Laboratory in East Tennessee.*
- In some industries, firms locate near universities to increase the interaction between their R&D divisions and high-quality university faculty and to access knowledge "spillovers," especially in knowledge and technology-intensive industries. These spillovers also generate new firms in addition to attracting existing ones from other places (Zucker, Darby & Armstrong, 1998, Audretsch, Lehmann & Warning, 2005).

- Companies located near research universities introduce innovation more quickly than rival firms not so located and are thus more competitive in the marketplace (Feldman, 1999; Jaffe, 1989).
- There is a strong relationship between the reputation of university doctoral programs in science and engineering and technology-based economic development (Hill & Lendel, 2004).

Here in Tennessee, education partnerships and training appear to be important business strategies. Slightly over 1/3 (36.5%) of businesses who responded to a recent survey have some form of education/training partnership with a local high school, community college, technical institute, or university (CBER-UT, 2007). And they report that those partnerships are successful in a number of ways. For more opinions from our state's business leaders, please see pages 96–97 of this chapter.



perspectives on economic development

Spotlight on Eastman Chemical Company, Kingsport, Tennessee

A BUSINESS INVESTS IN EDUCATION

Even in the dark, Eastman Chemical Company's presence in Kingsport is highly visible. The "blue flame"—as the locals call it—makes it difficult to ignore the power of the largest employer in the area as well as one of the largest chemical manufacturing sites in North America. Occupying more than 500 buildings and approximately 6,000 acres of land, Eastman's Tennessee operations in Kingsport employ over 7,000 of Eastman's total 12,000 employees. A Fortune 500 company with \$95 million in earnings in the fourth quarter of 2006, Eastman Chemical Company is consistently one of the top ten nongovernmental employers in the state.

But changes in the plastic package and container industry and in the world market for these products are forcing Eastman Chemical Company to make adjustments. And those adjustments resulted in a 4.5 percent drop in its stock prices earlier this year. The company fell short of expectations for the fourth quarter due to weakness in polymers sales, one of Eastman's product lines currently undergoing restructuring due to overproduction and increased competition in the world market.

Eastman Chemical Company closed its PET operations in Spain. Plants remain in Argentina, Mexico, the Netherlands, and the UK, but those plants must undergo fixes as well. Eastman's PET plant in Columbia, South Carolina is also shutting down older assets and building a new plant with more efficient processes at a lower cost.

While these changes have yet to directly affect the Kingsport plant, stock losses and market changes will continue to weigh on the minds of Eastman's leadership while they look for opportunities for restructuring to increase efficiencies and cut costs. It weighs on the minds of the community as well, considering that one out of every 17 jobs in the Kingsport area is a job at Eastman.

But where does a large corporation look for opportunity in the face of change? To education. In February of this year, Eastman announced a \$1 million investment for a new program: training local elementary and middle school math teachers to prepare youth for the future during a two-week intensive workshop at ETSU. Teachers in Kingsport City schools as well as Sullivan and Washington County schools will receive free \$1,000 tuition, a \$600 stipend for completing the workshop, and \$700 to purchase classroom supplies, complements of Eastman.

Entrepreneurship: stepping out

Small businesses, defined as those with fewer than 500 employees, are vital to the U.S. economy in a variety of ways. First is the sheer number of small firms in the U.S. They account for 99.7% of all firms. Second, they employ millions of workers—over half of all private sector employees—accounting for 45% of the total U.S. private payroll. Third, and most significant for future economic growth and vitality, small businesses are highly productive and drive innovation: 60-80% of all net new jobs created in the last decade were generated by small businesses. These firms produce 13 to 14 times more patents per employee than large patenting firms (SBA, 2006).

The creation of small businesses is typically through individual entrepreneurship. The overwhelming majority (almost 90%) of entrepreneurs have at least a high school diploma or equivalent (Childress, Smith-Mello & Schirmer, 1998). Research has shown that education increases the probability of starting a business (Evans & Leighton, 1989). These entrepreneurial ventures foster innovation, create high-quality jobs, and stabilize local economies by diversifying the economic base.

perspectives on economic development

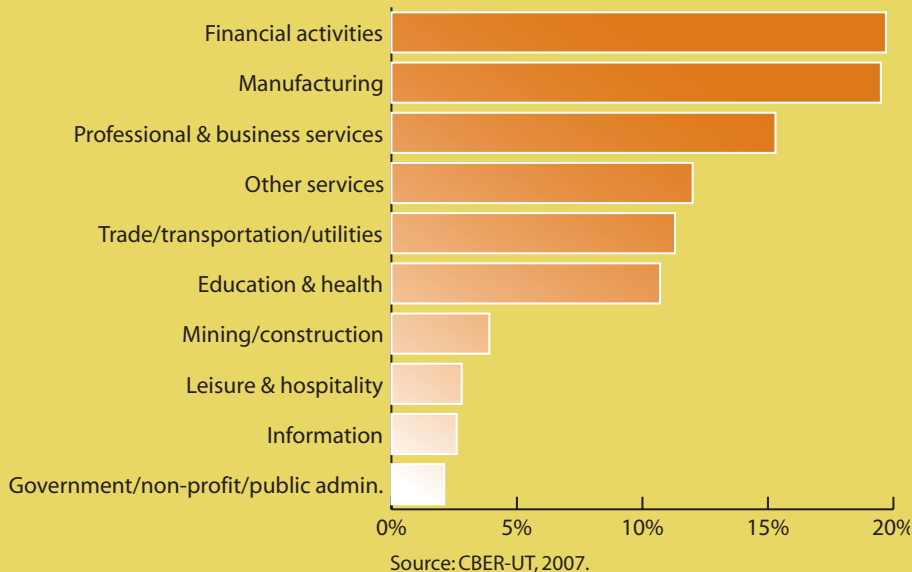


What do Tennessee's business leaders think?

There is no better way to get information than to go to some of the people who are on the front line. So we decided to survey business leaders in Tennessee to get a sense of their attitudes toward education. The questions we asked focused on many facets of education, including the quality of our public schools and the skills readiness of the workforce. The survey was developed by the Center for Business and Economic Research at the University of Tennessee and administered electronically with the assistance of the Tennessee Chamber of Commerce and Industry. Complete responses were received from 618 businesses with facilities in our state.

Virtually all broad industry groups are represented in the survey, with the largest number of respondents coming from the financial (19.7%) and manufacturing (19.5%) sectors. The businesses are spread across the state, with 56.8% located in metropolitan areas, 18.2% in the suburbs and the remaining 25.0% in rural areas. While we received responses from both large and small firms, the average employment for the respondents was quite high at 448 employees. (Almost one in four firms report fewer than 10 employees.) Just over 1/3 (35.6%) of the firms produce for the Tennessee

Industries represented in business survey



market, while the remainder produce for a regional, national or international market. Whether producing for a local or global customer, you can expect these businesses to encounter stiff competition in the market, which means they need good workers.

Survey respondents said that education was important to people's lives, to the business's competitiveness in the marketplace, and to the health of the state economy.

- * Nearly 3/4 of respondents believe that education is important to the well-being of Tennessee families (73.9%) and to the well-being of county economies (73.5%).
- * Nearly 3/4 (73.1%) of respondents believe a skilled workforce is important to their company's competitiveness.
- * 91.1% said the nearby presence of a university or community college in their area enhanced the quality of life in the community.
- * Nearly 3/4 (73.5%) of respondents rank investments in education and a skilled workforce as important to Tennessee's ability to compete in the global economy of the future.

Unfortunately, business leaders did not give Tennessee's public schools high marks. Almost 1/2 said that our schools were worse than the public schools in the average state and more than 1/2 gave our schools a grade of C.

The next paragraphs and the table on page 97 provide additional detail from the survey.

Despite overall poor grades, there are still a good number of businesses who give our public schools a grade of A or B and very few businesses who gave our schools a failing grade. Despite the presence of weak schools in Tennessee, there are also many excellent schools.

As you can see from the numbers, the grades deteriorate when you get to characteristics more indicative of people than schools, things like discipline and leadership. Over half of these business leaders gave schools a D or an F in teaching discipline/ work ethic and critical thinking. Perhaps these poor grades are a reflection not only of the schools but also of the overall culture in which we live, where many people have very low expectations and a lack of

perspectives on economic development

Business leaders grade Tennessee public schools (% who gave the schools this grade)					
Quality of	A	B	C	D	F
Basic skills	1.3	20.0	52.1	24.5	2.1
Computer literacy	2.7	30.5	45.1	19.6	2.2
Technical/ vocational training	1.7	25.4	48.5	20.6	3.8
College prep	2.0	23.4	47.5	23.4	3.8
Providing highly-qualified teachers	2.6	23.7	46.9	20.1	6.8
Arts, extra-curricular activities	3.2	22.6	36.2	27.1	10.9
Discipline, work ethic	0.4	9.7	32.4	40.6	17.0
Leadership	0.5	11.0	46.6	32.1	9.7
Initiative	0.4	9.3	45.1	34.5	10.7
Life skills	0.2	13.2	40.6	36.3	9.7
Critical thinking	0.4	7.9	34.1	39.3	18.4

Sources: CBER-UT, 2007.

commitment to their employers and their own self-improvement. Certainly the schools can affect these measures, but personal, household, and community influences may be equally if not more important.

Tennessee businesses find workers with higher levels of educational attainment to be better prepared for work. Respondents were asked to assess applicants for typical entry-level jobs as poorly or adequately prepared, based on the applicant's educational attainment. The percentage of applicants deemed to be adequately prepared with high school/GED qualifications was only 40.9%. However, 80.8% of applicants with a certificate from a 2-year college and 91.0% of applicants with a bachelor's degree were viewed as adequate.

Most firms think the difficulty of finding good workers will simply get worse in the years ahead. In ten years, 2/3 of respondents expect it to be harder to find qualified/educated workers from the Tennessee workforce. Over 26% expect it to be much harder to find qualified/educated workers in ten years while less than 1%

think it will be much easier. If we do not create quality workers in Tennessee, businesses will suffer, encouraging them to locate elsewhere.

Education partnerships and training appear to be important business strategies. Slightly over 1/3 (36.5%) of respondents have some form of education/training partnership with a local high school, community college, technical institute, or university. It is particularly encouraging that well over 4/5 (88.2%) of the companies with an education/training partnership report the partnership as having a beneficial impact on their workforce. On the other hand, only 11.8% think the partnership had no impact. More generally, 70.8% of these people considered the nearby presence of the college/university to be an asset when hiring and 53.9% said the nearby presence makes the recruitment of executive/managerial staff easier.

The majority of firms (55.0%) support the training of their workforce through a tuition reimbursement program, while 18.6% provide paid leave. Almost 1/3 of those surveyed (29.4%) reward workers for advancing their educational attainment.

Almost every firm surveyed (94.2%) report that they budget for employee training. Nearly half (48.3%) of them now spend more to train employees than they did three years ago. Only 3.5% of the firms spend less on training than three years ago, and only 5.8% have no training budget. The average annual expenditure per worker for training was \$4,152.

The types of training vary across firms: Basic skills education (14.6%), Specialized technical training (70.7%), Computer literacy, (51.9%), Supervisory training (55.9%), Executive training (33.7%), and None of the above (10.4%).

Sometimes they are prepared for the job but not the life skills to maintain the job. Punctuality, responsibility, taking care of [their basic life needs is a problem for most young employees.

— Opinion from a business leader at a finance and insurance firm in suburban Tennessee

Business location decisions

Does education really influence where businesses choose to locate their enterprise and create jobs? There is strong evidence from both surveys and statistical studies that education not only matters but is in fact a primary factor in determining where firms choose to do business. This is especially true in high-paying research and development operations which help drive job growth and productivity advances. Moreover, studies have also indicated that highly educated individuals are very mobile and have strong preferences to live near other highly educated individuals in areas that are perceived to have a high quality of life (Malecki & Bradbury, 1992). Thus, knowledge-intensive firms follow educated workers to these areas.

- A survey of over 200 multinational companies sponsored by the National Academy of Sciences found that the quality of research and development (R&D) personnel was the single most important factor contributing to a firm's decision to locate R&D facilities in a given area (Thursby & Thursby, 2006).
- The same survey revealed that proximity to universities and potential for collaboration with university faculty also factored significantly in a firm's location choice. **These factors proved to be more important than tax incentives.**
- A 2005 survey by the Council on Competitiveness indicated that a small science and engineering talent pool and a poor local K-12 school system ranked as the 2nd and 4th most important factors that would eliminate an area from a firm's list of prospective location sites (Council on Competitiveness, 2005).
- Sixty-five percent of executives surveyed stated that the quality of the local education system is either "very" or "critically" important in their decision of where to invest in R&D. Education quality was more important than other factors such as capital and rental costs, tax burdens, and government incentive packages (Economist Intelligence Unit, 2004).
- The availability of qualified managers and local industry expertise ranked 1st and 2nd, respectively, in terms of the number of executives indicating that the factor is either "very" or "critically" important in their decision of where to locate R&D operations (Economist Intelligence Unit, 2004).
- An *Industrial Week* survey of 1,000 business executives indicated that the education level of a location was becoming increasingly important in the consideration of future plant locations (Goldstein, 1985).
- A review of surveys on factors affecting business location decisions revealed that the presence of skilled labor is commonly cited as a top reason for the selection by high-tech firms (Gottlieb, 1994).



Over the past 30 years, cities with a well-educated population have seen stronger growth in the adult population with a college degree than cities that start with a poorly-educated population. This tendency appears to be driven by shifts in labor demand, as there is an increasing wage premium for skilled people working in skilled cities.

The Divergence of Human Capital Levels Across Cities,
Christopher R. Berry and Edward L. Glaeser, Harvard Institute
of Economic Research, Discussion Paper Number 2091.

business location decisions

Statistical studies have shown that areas with a better educated workforce experience more business startups and increase the likelihood that a firm chooses to locate in the region.

- The better educated an area's population is, the more likely it can attract foreign-owned manufacturing firms (Friedman et al., 1992; Coughlin & Segev, 2000).
- Local characteristics like educational attainment of the population and other characteristics of the labor market directly affect the profitability of a firm and in turn encourage businesses to locate in counties with a well-educated population (Rosenthal & Strange, 2001).
- The presence of skilled (educated) labor is critical to the use and production of information technology (Bresnahan et al., 2002). A poorly educated county is less likely to produce and/or use information technology and will experience low demand for skilled workers.
- A strong K-12 educational system is vital for developing talent and attracting businesses; specialized training and talent are often more important to firms than the size of the local workforce; and universities are the major cause of innovation in almost all regions (Porter, 2003).
- Research and development firms are shown to be drawn to universities to recruit highly-educated graduates and provide up-to-date training for their current employees (Malecki & Bradbury, 1992; Harding, 1989).
- Access to quality labor is extremely influential in the location decisions of service-based firms, regardless of whether the size of the potential market areas is large (state) or small (town/city) (Schmenner, 1994).
- In a series of studies, evidence has been found that various measures of educational attainment and education quality have a positive effect on the economic growth rates of countries. (For example, see Robert J. Barro, *The Determinants of Economic Growth: A Cross Country Empirical Study*, Cambridge and London, MIT Press: 1997.)



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Family matters

AT OUR VERY CORE

“We work to create a world in which families can prosper. We work to create communities in which they are safe, to help them if they fall ill, to improve their choice of jobs. And most important—our biggest responsibility—we work to help them make things better for the next generation by doing our part to educate children.” (Tennessee Governor Phil Bredesen, January 20, 2007)

The family and the education investment decision—

a-benefits of investing in education

b-factors affecting investments in education

Education and the role of gender and race

But when it comes to family, it goes beyond money —

a-financial security and investment

b-personal lifestyle choices

c-the well-being of children

family

the education investment decision

Education is an investment in the future

The investment may be continuation of high school to the point of graduation, college attendance and graduation, or participation in a technical training program. Investing in education doesn't require formal schooling. For example, many participate in on-the-job training programs, acquiring skills that benefit both the worker and the employer. Similarly, individuals in the trades may learn much of what they know from working on the job site, which is their classroom.

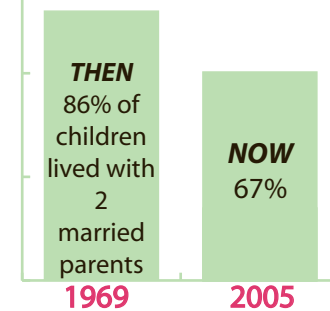
The benefits of education investments include not only higher earnings but also greater economic security and a better quality of life for the worker and the family, both today and into the future. The evolving nature of the economy has made investments in education even more important than in the past. At one time, a high school degree was sufficient to open the door of economic opportunity. But this is no longer the case. Today, many heads of households with only a high school degree struggle to earn a living wage and provide for their family; even those with more advanced degrees find more competition than ever in the labor market. Many of the children who drop out from high school today have a bleak future in our society. Dropouts will find economic security to be elusive over the course of their working lives.

Decision-making over investments in education is often a team process within the family. In the traditional two-parent household, it is common for one spouse to work as another goes to school. The couple can pool their resources and together do what they might not be able to achieve alone. Families can also provide a nurturing environment for children, encouraging them to be curious and seek new knowledge. As we show in this chapter, there is strong evidence that parental support and nurturing provide significant benefits to the child. Families typically provide financial support for their children's schooling, but opportunity extends far beyond financial support.

Changes in the characteristics of the average American family may affect education investment choices and thus economic opportunity and quality of life. The number of stereo-typical American families made up of 2 parents and 2 children has declined over the years. Single-parent households are becoming more common regardless of race, and these same households are typically financially constrained because there is only 1 bread winner. It is now less common for adults to have a spouse to help support education and training costs and to maintain a household. Lower household income also means less money to support the schooling of children. And a single working parent may have less time to spend nurturing the child's educational growth.

School teachers and principals report that children in single-parent families have less homework supervision, less supervision at home, fewer parents volunteering in the schools, and more frequent discipline problems (Postsecondary Education OPPORTUNITY, 1994).

That was then, this is now



The share of children living with 2 married parents.
Source: Child Trends Databank, n.d.

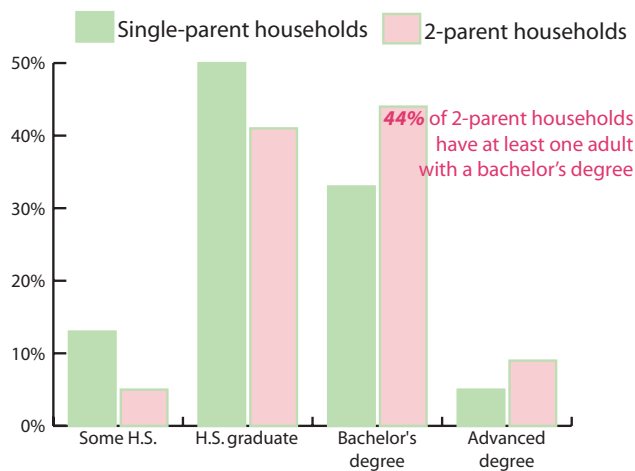


the education investment decision

Two-parent households tend to enjoy higher levels of educational attainment and higher incomes than single-parent households. For example, 44% of two-parent households have at least one adult who holds a college degree; whereas only 33% of adults in single-parent households hold a college degree, as reported by high school students across the state (Fox, Kiser & Couch, 2006). On the other end of the scale, 13% of adults who head a single-parent household have less than a high school degree while the figure is just 5% for two-parent households.

Median income is much higher for married couples with children than for single-parent households with children. Census data show that for Tennessee married couples with children, median income in 1999 was \$52,047. For male householders with no wife present in the home, median income was \$26,932, but for women the figure was much lower still at \$17,912.

Traditional two-parent households in Tennessee tend to have higher levels of education



Source: Fox, Kiser & Couch, 2006.

“There is considerable concern about single-parent families, particularly in relation to child well-being. First, such families, especially those maintained by women, have a high incidence of poverty. Second, it is believed that growing up in a family with only one adult may have long-term negative consequences for children, both economic and social” (Blau, Ferber & Winkler, 2002).

Factors affecting investments in education

The decision on whether to invest in education can be viewed as a standard investment decision. One looks at the costs of the investment (e.g. tuition costs) and weighs these against the returns (e.g. higher income) that accrue over time. Once the rate of return is determined, one can decide whether the investment is viable or not by considering alternative investment strategies.

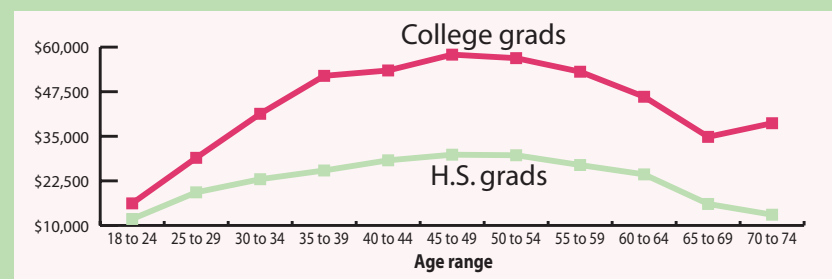
Here are some of the key factors affecting the decision to invest in more education:

- Age
- Out-of-pocket costs (e.g. tuition)
- Earnings potential
- Shortsightedness/myopia
- Ability
- Family circumstances, including employment status

Age matters. An older individual will have fewer working years than a young person will have to reap the benefits of the education investment. This is a basic reflection on how returns flow from an investment, just like a savings account.

The graph below helps explain this story — look at one of the lines for one of the attainment categories. Notice that it takes many years to move to the point on the line where annual earnings then reach their highest level. Even after the peak, average earnings tend to remain above the earnings that accrued while very young. Individuals who make education investments while young can enjoy a lifetime of relatively higher income as shown. This is one reason why it is important to encourage young people to invest in education. But older workers, e.g., 50 or older who loses their jobs, will have less incentive to invest since the payback period on the education investment will be shorter. This is one reason why it is often difficult to move older workers into formal education programs.

Age matters: College grads consistently earn more than high school grads over the lifecycle



Source: Postsecondary Education OPPORTUNITY, 1993.

the education investment decision



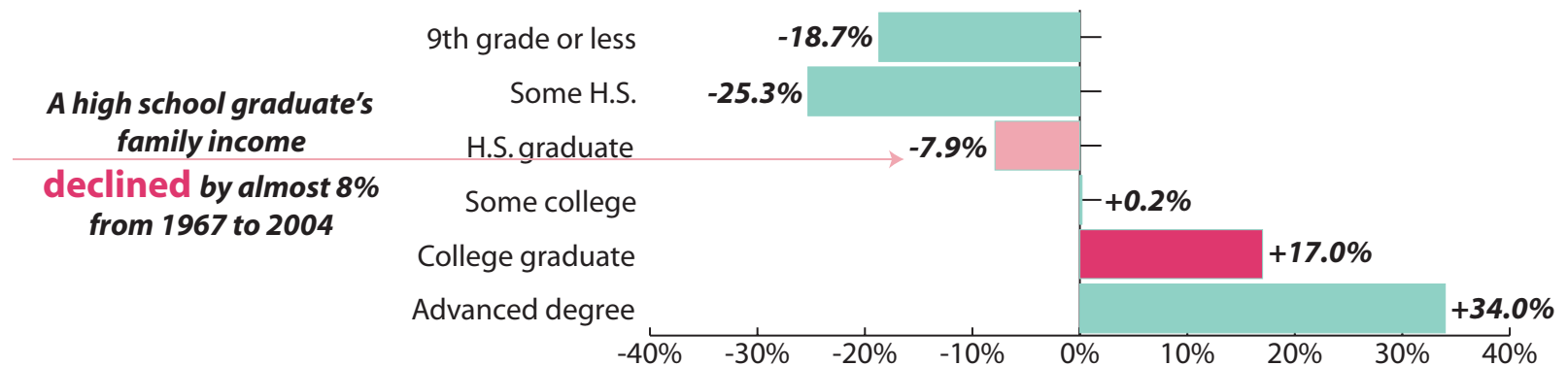
"For someone earning the national median household income of \$42,000, an extra year of training could provide an additional \$4,200 a year. Over the span of a career, that could easily add up to \$30,000 or \$40,000 of present value. If the year's education costs less than that, there is a net gain" (Bernasek, 2005, p. 1).

Benefits of investing in education. Greater investments in education yield substantial benefits to workers and their families. For the worker, education enhances earnings and reduces both the incidence and length of unemployment. (See also the *Prosperity* chapter of this book.) In addition, education investments increase job satisfaction, job security and quality of life. National data show the huge income premium that better educated individuals earn in the marketplace. For example, a person who graduated from high school earned \$28,645 per year in 2005 compared with only \$19,169 for someone who dropped out of high school (U.S. Census Bureau, 2005).

Earnings are not only higher, but individuals with more education also experienced rising incomes from 1967 to 2004. For example, a householder with a college degree saw income increase by 17% over this period. However, a householder with a high school education saw earnings decline by 7.9% (Postsecondary Education OPPORTUNITY, 2006).

continued on page 110

Change in average annual income for families by educational attainment of householder, 1967–2004



Source: Postsecondary Education OPPORTUNITY, 2006.

A high school graduate's family income declined by almost 8% from 1967 to 2004

the education investment decision

Factors affecting investments in education, continued from page 107.

“The policy drift since 1980 has led to the affordability of crisis for students from the bottom half of the parental income distribution, below about \$62,240 (in 2004). It is this income range that minorities are disproportionately concentrated. While 42.6% of the white undergraduates have parental incomes below \$62,240, the percentages are much higher for minorities”

(Postsecondary Education OPPORTUNITY, 2006).

Out-of-pocket costs. Getting an education can be expensive. In college one has to pay tuition and fees, purchase textbooks and supplies, and perhaps borrow money for those and other expenses. Training in the trades will also require tuition payments, and there may be other costs like buying tools that support the trade. The higher these costs are the less attractive the education investment will be. Low interest rate student loans and state subsidized tuition for technical schools and college are examples of policies that are intended to encourage people to make education investments. Since both individuals and society benefit from an education, it makes sense to promote further investments.

“The federal Advisory Committee on Student Financial Assistance has estimated very conservatively that during the 1990s 1.0 to 1.6 million college-qualified students from low and moderate income families were denied a college degree due to price barriers” (Postsecondary Education OPPORTUNITY, 2006).

Tennessee has generally supported relatively low tuition rates for public colleges and universities. But tuition costs in our state and other states are rising rapidly. There are many reasons, but one important factor is the public’s general disdain for taxes. The nation as a whole has progressively scored lower in terms of college affordability. Over 40 states scored grade ‘F’ for college affordability in 2006 versus just 3 states in 2000 (Postsecondary Education OPPORTUNITY, 2006).

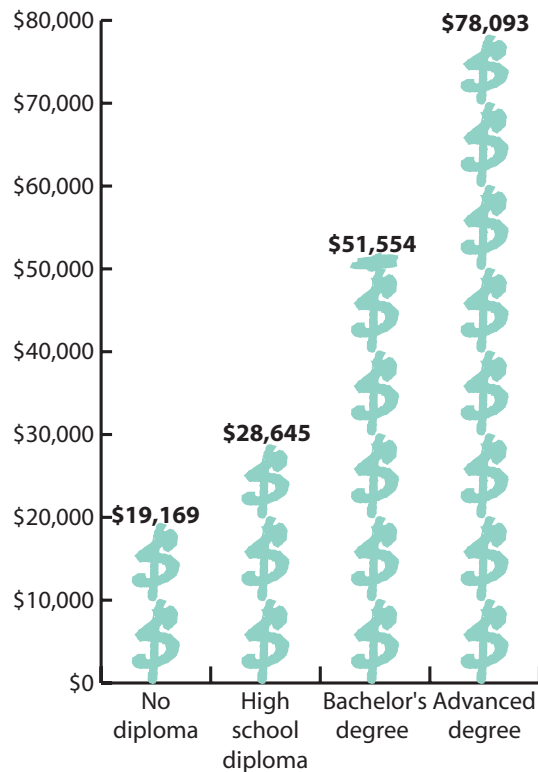
Tennessee ranked 10th since 2000 for the change in undergraduate tuition and required fees at state colleges and universities. Between 2003 and 2004 the change in tuition cost was \$944, which was above the national average of \$692.

The number of states (including Tennessee) with a failing grade for college affordability has increased since 2000

- 2000 = 3
- 2002 = 13
- 2004 = 36
- 2006 = 43

Source: Postsecondary Education OPPORTUNITY, 2006.

Earnings rise with higher investments in education



Average earnings by education, 2004, U.S.
Source: U.S. Census Bureau, 2005.

the education investment decision

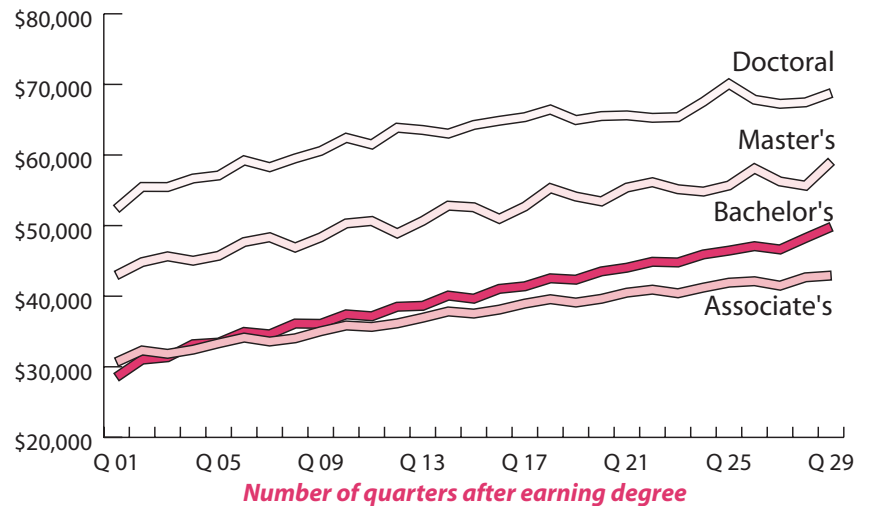
Benefits of investing in education, continued

Let's bring the story closer to home. This figure shows the income stream of individuals who obtained their post-secondary education from a Tennessee institution of higher education. The returns on investments in education generally rise the more years one is out of college, regardless of the degree obtained (Fox, Couch & Thacker, 2007). Doctoral degree holders from Tennessee institutions, on average, earn well over \$25,000 more per year than associate degree holders 7 years after leaving school. Tennesseans with a master's degree earn about \$38,000 on average while bachelor's degree holders earn about \$22,000 a year after leaving school.



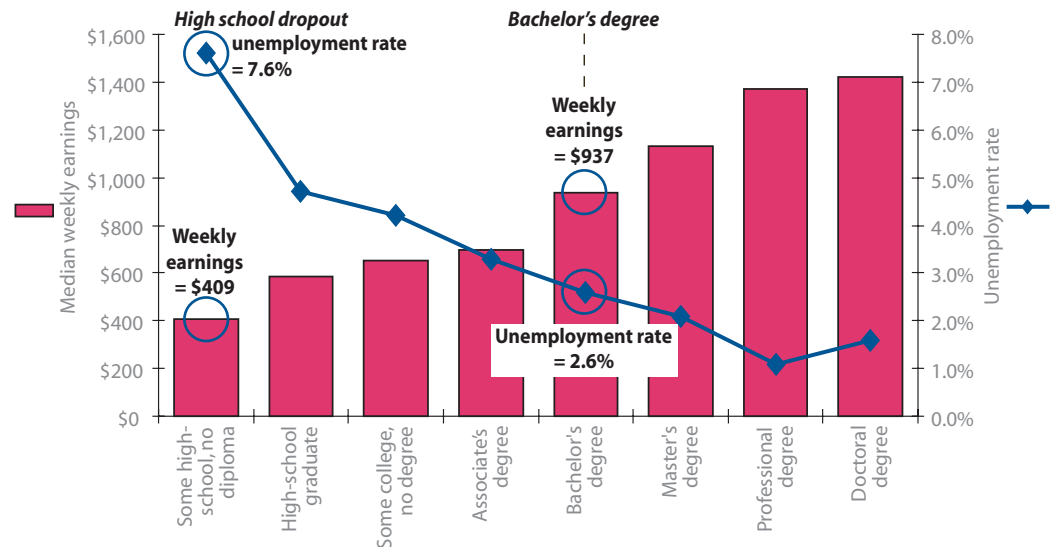
Here is an alternative perspective on average earnings for Tennesseans in various educational attainment categories. Once again earnings can be seen to climb consistently with educational attainment while, at the same time, the unemployment rate tends to fall. Individuals with a bachelor's degree earn well over twice per week what a high school dropout earns. At the same time, bachelor's degree holders have unemployment rates that are less than one-half the rates of high school dropouts.

Average annual earnings of workers in Tennessee who graduated from a Tennessee institution between 1997 and 2005



Source: Fox, Couch & Thacker, 2007.

Unemployment and earnings for full-time wage and salary workers, age 25 and over, Tennessee, 2005



Source: U.S. Census Bureau & BLS.

the education investment decision

Factors affecting investments in education, continued from page 109.

Earnings potential. The potential to earn more should encourage people to invest more in education. But people need to have good information on the returns from education generally, as well as the returns from specific degrees, occupations and training programs. Absent this information, individuals cannot make wise decisions about their futures. Young people in particular need to see early on in their lives how education can affect them over their lifespan.

As we show elsewhere, there are earnings differentials for different groups of society that may affect the education investment decision. For example, women tend to earn less than men in the marketplace. If everything else is the same, this makes investments in education less attractive to women since the rate of return will be diminished relative to men. However, it is still the case that women will earn more as they invest more in education.

Shortsightedness. Shortsightedness (or myopia) may diminish one's motivation to invest in education. Those who are not especially forward looking—notably children—may make choices that compromise their long-term economic security. Dropping out of high school is a good example. Even adults may look too narrowly at the short run and avoid sound education investments. This shortsightedness provides another reason for society to play a role in encouraging education investments of all kinds.

Ability differences matter. An individual with a good work ethic, self discipline and high mental ability will likely see stronger returns in the form of better school performance and thus better job opportunities. Individuals with greater ability can be expected to make greater investments in education. But everyone can benefit from more education, not simply the most able. Even the least able in our society can do more with more education.

Family circumstances. A variety of personal and family circumstances can affect the education investment decision. Individuals with children to care for may be less likely to invest in education because of family obligations; going to school means someone else has to watch the kids, and this can be expensive. Individuals with stable jobs, even low-paying jobs, may be less likely to invest more in education because of their uncertainty about how new skills would be rewarded by the market and because there may be the need to take time off of work. Employer support for tuition and paid time off for schooling can help offset these disincentives. Single-parent households in particular may find that out-of-pocket costs are too high to allow education investments to take place. These same households may also lack the support network needed to help foster investments in education.

So Is education a good investment? You have already seen some of the numbers on earnings and unemployment rates that suggest there is a big payoff to education. Labor economists have used the investment framework sketched above to formally estimate rates of return to education investment. These calculations take into account the tuition and other costs associated with education investments and compare these to the income earnings stream people realize over their working lives. Here is a sample of the estimates of the rate of return from an additional year of schooling in higher education in the U.S.

<i>Study</i>	<i>Return from 1 additional year of schooling</i>
Miller et al.	6.4%
Ashenfelter and Kruger	8.4%
Behrman et al.	9.4%
Ashenfelter and Rouse	10.2%
Rouse	10.5%
Behrman and Rosenzweig	11.8%
Average	9.5%

Source: Hyclak, Johns & Thornton, 2005, Table 6.2, p. 134.

The average from these studies is 9.5%. This is a handsome rate of return when compared to alternative investments like certificates of deposit. And it's a pretty safe investment as well.

“Almost two years ago—at age 50—I decided to go back to school. The business world in which I work measures success in degrees, and I did not have one. I had no opportunity for advancement or promotion in my company, and my managers knew I was not in demand at other companies without a degree. Knowing this, my employer had quite a bit of power over me. **And I wanted my own power.** I decided to start with an associate's degree so that I could work in management, earn more money, and learn and use new skills in the future. While I would always encourage young people to further their education while they're young, I would also tell my contemporaries: better late than never! The experience hasn't been bad at all; in fact, as graduation nears, the sense of accomplishment far outweighs the time and effort I have exerted. So, I am glad I gave some thought and energy to my own higher education. It has been a good investment in my peace of mind.”

~ Associate's degree candidate, age 52. Hendersonville, Tennessee

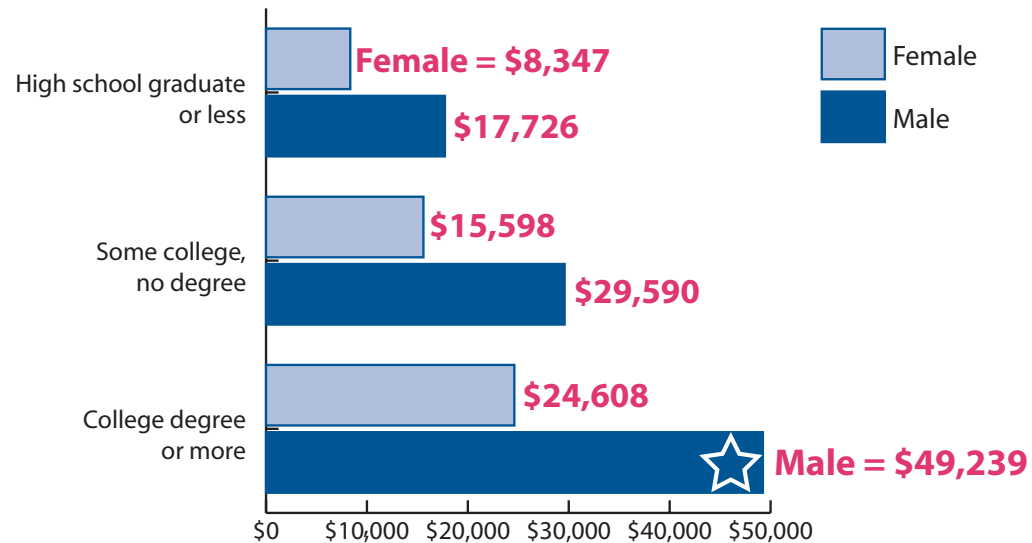
the role of gender and race



Gender and race. Gender and race have an important bearing on the rewards the labor market grants to the worker. These same personal characteristics may affect whether one pursues investments in education. Male and white workers across different levels of educational attainment earn more than female and black workers. These earnings gaps may generate a disincentive for education investments on the part of women and blacks since the rate of return on investments in education may be lower.

Male-female earnings differences are striking to say the least. Consider average wage and salary income. A female worker 25 years of age or older with a college degree earns, on average, \$24,608 per year; but an adult male with the same level of attainment earns \$49,239, a differential of 100% (U.S. Census Bureau). These differences reflect a host of different factors, including the types of jobs woman versus men hold in the market. Research has shown that when you take into account all of the factors that may affect earnings, including education and job experience, most of the differential vanishes. But an unexplained earnings difference of 9% in favor of males still remains (Blau & Kahn, 2004).

Male workers in Tennessee earn more than female workers with the same level of education



Total Wage & Salary Income by Educational Attainment and Gender, Age 25 years and older, Tennessee, 1999.
Source: U.S. Census Bureau, Census 2000, Public Use Microdata, 5% Sample: Tennessee.

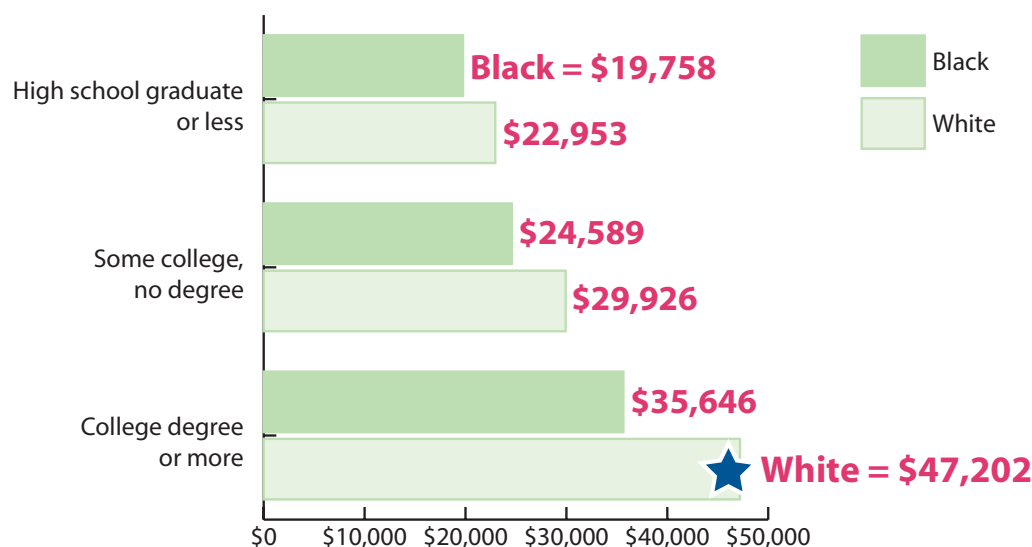
the role of gender and race

Noticeable gaps also exist in earnings across **different races** for people with similar levels of educational attainment. White workers are generally paid more than blacks. For example, a white worker 25 years or older with some college experience earns on average \$29,926 per year versus a black worker who earns \$24,589 (U.S. Census Bureau). But the evidence also shows that more education enhances the earnings of both whites and blacks.

Should a white or black individual attend college? Both would see substantial rates of return, and these returns should encourage young people to seek more education. The black student would see earnings rise by \$4,831 while the white student would see a \$6,973 gain. While both students would see a sharp increase in annual income, the return is smaller for the black student both in dollar terms (\$4,831 versus \$6,973) and relative to pre-college earnings. For the black student, the earnings increment is 24.5% of high school income (or \$4,831/\$19,758) while for the white student, it is 30.4% of high school income (or \$6,973/\$22,953).



White workers earn at least 16% more than black workers across different educational attainment levels



Total Wage & Salary Income by Educational Attainment and Race, Age 25 years and older, Tennessee, 1999.
 Source: U.S. Census Bureau, Census 2000, Public Use Microdata, 5% Sample: Tennessee.

beyond money

But when it comes to family, it goes beyond money

The evidence is pretty clear that workers who have more education also enjoy higher incomes, whether they are male or female, or black or white. But there are other important benefits the individual receives from more education. Some of these benefits have a material effect on economic well-being and security, while others reflect improved lifestyle. Here we consider the following financial security and investment issues: home ownership, technology and information, private health insurance, and imprisonment—all through the filter of how these issues affect our families.

a-financial security and investment

- ✓ home ownership
- technology and information
- private health insurance
- imprisonment

Benefits of home ownership

Owning a home is often viewed as an important aspect of the American dream. Homeownership bestows many benefits on the household, especially children (Rohe et al., 2000; *Realtor Magazine Online*, 2006), like:

- Homeownership is positively associated with self-satisfaction and happiness.
- Individuals who own their home are typically more satisfied with their dwelling unit or place of residence.
- Homeowners have been found to possess higher self esteem.
- Better physical health and psychological health are linked to ownership.
- Children of homeowners are less likely to exhibit behavioral problems such as a bad temper, being argumentative, and feeling worthless.
- Children of homeowners are less likely to have children while they are teenagers.

Importantly, homeownership is associated with greater educational attainment among children. Children of homeowners are less likely to drop out of high school; and they perform substantially better cognitively, scoring higher on both reading and math tests (Rohe et al., 2000). In fact, research suggests that a leading benefit of homeownership could be increased educational attainment for children since this likely translates into higher earnings and increased homeownership in the future (Rohe et al., 2000).

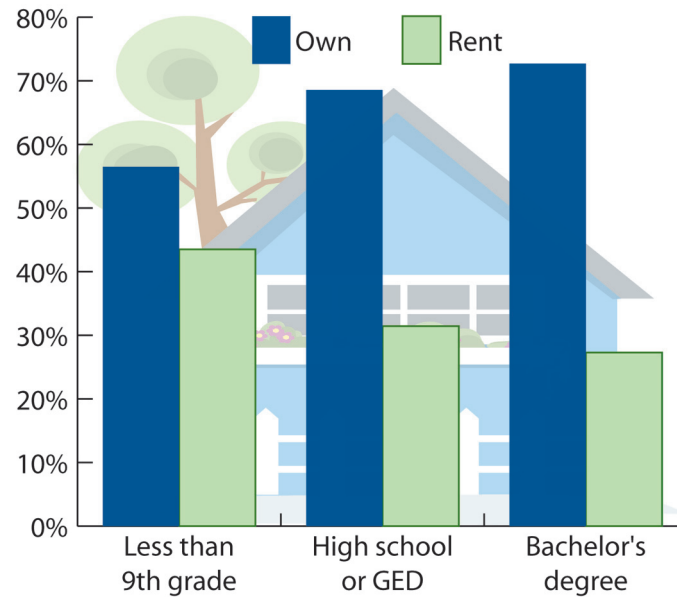
The evidence indicates that as educational attainment increases in the U.S., so does the likelihood that individuals own a home. Similarly, as educational attainment increases, individuals are less likely to rent.

- Individuals with a bachelor's degree are 15.2% more likely to own a home than those who have not completed high school.
- Household income plays a major role in the ability to purchase a home, and thus higher rates of poverty are associated with lower levels of educational attainment.

beyond money

As educational attainment increases in the U.S. and Tennessee, so, too, does home ownership.

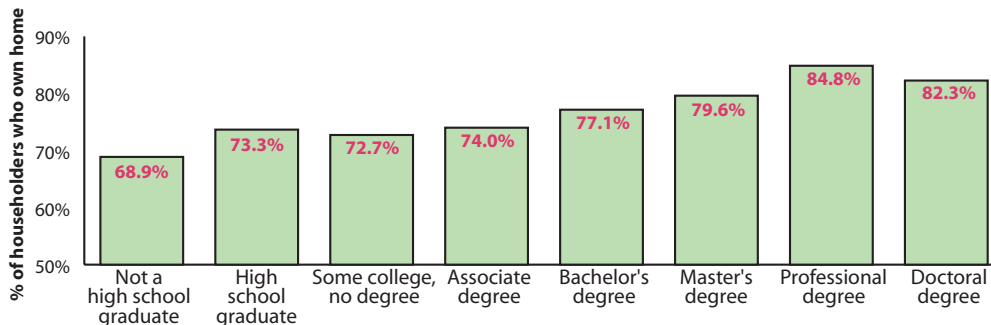
Children of homeowners are less likely to drop out of high school, and they perform substantially better cognitively, scoring higher on both reading and math tests (Rohe et al., 2000).



Source: U.S. Department of Housing and Urban Development, 2006.

Home ownership in Tennessee by household educational attainment levels

Here are some numbers for Tennessee on homeownership by educational attainment category. With only a couple of exceptions, homeownership rates rise along with educational attainment (U.S. Census Bureau). Individuals with bachelor's degrees have a 77.1% chance of owning a home, while those who have not graduated from high school have a lower chance of owning a home, at 68.9%. The likelihood of renting tends to decline with educational attainment. For example, 31.1% of householders with less than a high school degree rent versus only 22.9% of householders with a bachelor's degree.



Educational attainment of households aged 25 and older who are home owners, Tennessee
 Source: U.S. Census Bureau, Census 2000, Public Use Microdata, 5% Sample: Tennessee.

Beyond money

Technology and information overview

Information and communication are at the very heart of every piece of our lives. Exchanges take place through a person's social networks and through technology. A gap, known as the digital divide, exists between individuals who are able to benefit from technology and those who are not (DigitalDivide.org, 2007). It is a worldwide issue for underdeveloped countries that stand to be harmed to an even greater degree as the global environment develops more complex technology, but it is also a local issue for low-income families in the U.S. and Tennessee who may not be able to afford either the time or money it takes to access computers and the Internet.

a-financial security
and investment

home ownership

technology and information

private health insurance

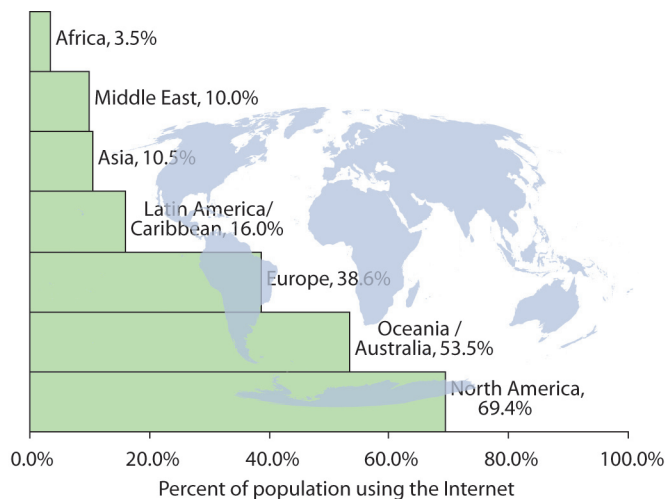
imprisonment

The term "digital divide" has undergone several transformations since the early 1990s. Initially, digital divide referred simply to Internet access. But access (or the lack thereof) has taken a back burner as an issue, considering that most Americans can access the Internet in the library or at a wireless cafe. In fact, research (as well as public and private funding) is now focusing on the condition of that access (such as low-performing technologies versus broadband and the cost of necessary software versus open-access software) and on the user's technical skills to utilize technology for his or her benefit. But, there are still people in many countries, as well as many Tennesseans, who do not have access to computers or the Internet; and this lack of access may hinder their ability to compete with those who do have access in terms of career opportunities, knowledge of current events, acquisition of information for informed purchasing, and more.

World access and usage

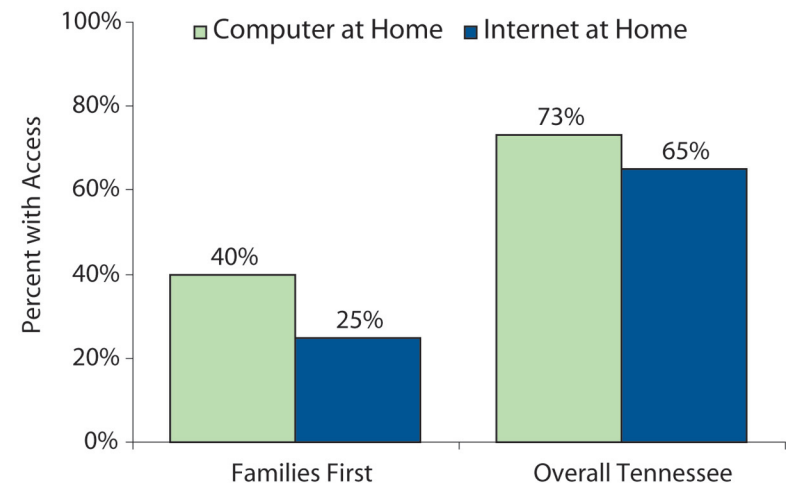
According to Internet World Stats, as of January, 2007, 1.1 billion people across the world currently have the capacity to use the Internet, which means they have access to the Internet and the basic skills necessary to use web technology (Internet World Stats, 2007). That is just 16.6% of the world population. Using the same definitions 69.4% of North Americans are currently using the Internet—of course that means that over 30% are not. In Tennessee, 65% of adults report having Internet access at home (Fox, Kiser & Couch, 2006).

World Internet usage



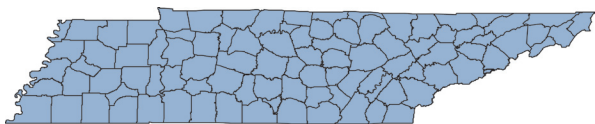
Source: Internet World Stats, 2007.

Tennessee's welfare recipients have less access



Source: Fox, Kiser & Couch, 2006 & CBER-UT, 2006.

beyond money



**Tennessee—
Who has access & who does not**

There is a relationship between educational attainment levels and computer and Internet access in Tennessee, evident in three different segments of the Tennessee population: adult households, high school students, and participants in the Families First program (who, as a group, have lower than average educational attainment levels).

- In all cases, the higher the education level, the more likely the individual is to have a computer and Internet access at home.
- Only 40% of Tennessee’s welfare recipients have a computer at home, versus 73% of the overall state population.
- Only 25% of Tennessee’s welfare recipients have Internet access at home, versus 65% of the overall state population.
- Over 90% of high school students who have a parent with a college degree have computer and Internet access at home, but just 72% of students with a parent who did not graduate from high school have computer access and even less (58%) have Internet access at home.
- Tennessee’s high school students who have access to a computer and the Internet at home are more likely to plan to attend college after high school than those students who do not.



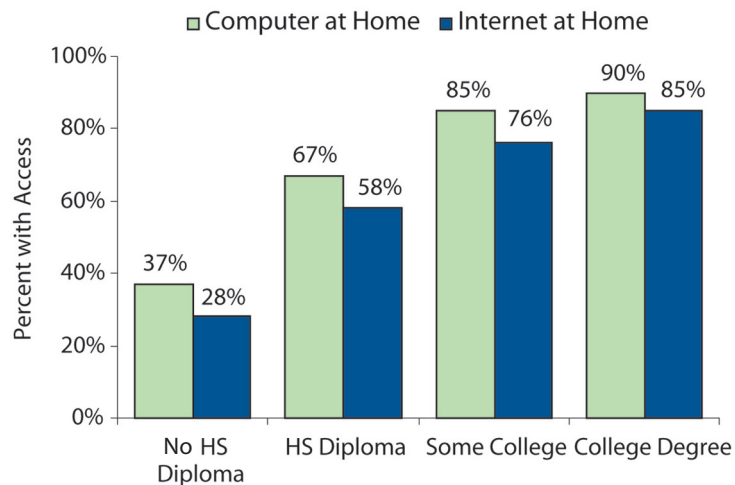
If I had a computer at home, I could

- create my budget in a spreadsheet
- type up my resume

If I had the Internet at home, I could

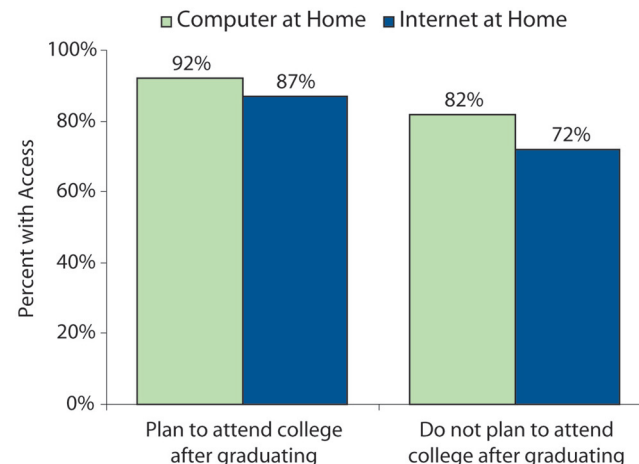
- email my granddaughter to see how her science test went today
- look for jobs in another city, state, or county
- post my resume for employers to see
- research the real value of that used car my neighbor wants to sell me
- spend more time at home and less time at work

Higher-educated adults have higher levels of access



Source: Fox, Kiser & Couch, 2006.

High school students with access to the computer and Internet at home have plans for college



Source: CBER-UT, 2006.

beyond money

There are 77.9 million children in America.

Nine million children are uninsured—about 11.6% of all American children (Children’s Defense Fund, 2007).

Marian Wright Edelman, of the Children’s Defense Fund, called the problem a “national disgrace.”

The crisis “not only costs lives of children and stress for families, but it also costs taxpayers money,” she added (Harris, 2007, p. 1).

Private insurance

The better job opportunities that go to the better educated provide an important bridge to private health insurance. In 2002, over 80% of Americans with a college degree were enrolled in a private insurance plan. For those with only a high school degree, the figure is 43% (MEPS, 2002). Nationwide nearly 26% of those with a high school degree or less were on a public health care program, and 31% did not have health insurance at all.

Further, uninsured rates are much higher for those with little education. For example, survey data from Tennessee show that 16.3% of adults with high school degrees or less are uninsured, compared to only 5.3% of adults with a bachelor’s degree (SSRI & CBER-UT, 2007). Public health insurance—TennCare in Tennessee—is relied on more heavily by the more poorly educated, particularly for children in household with low educational attainment levels; almost 50% of householders that have only a high school diploma have children on TennCare, compared to only 10.2% of householders with bachelor’s degrees or more.

a-financial security
and investment

home ownership

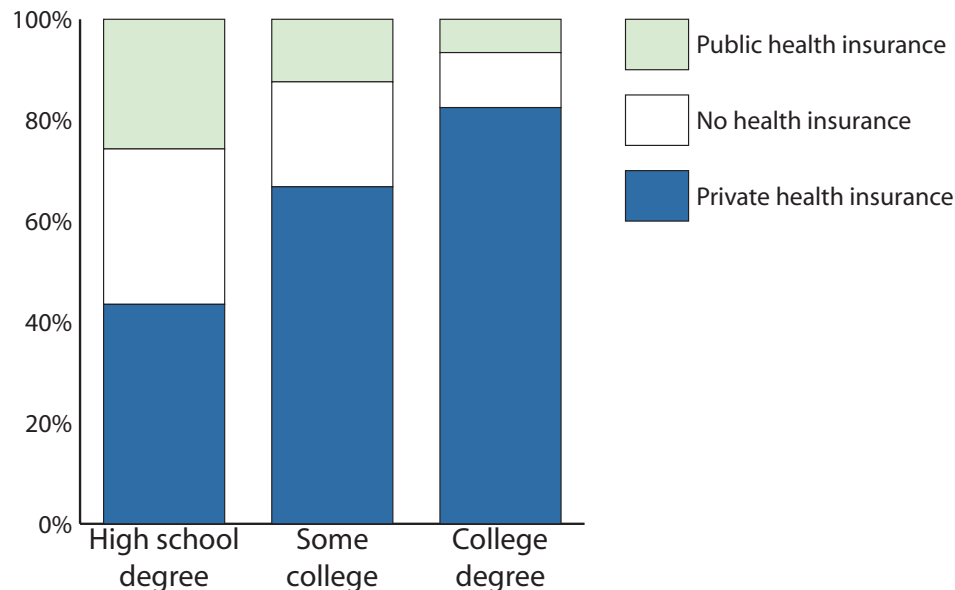
technology and information

private health insurance

imprisonment



Private insurance is more accessible to college graduates than high school graduates



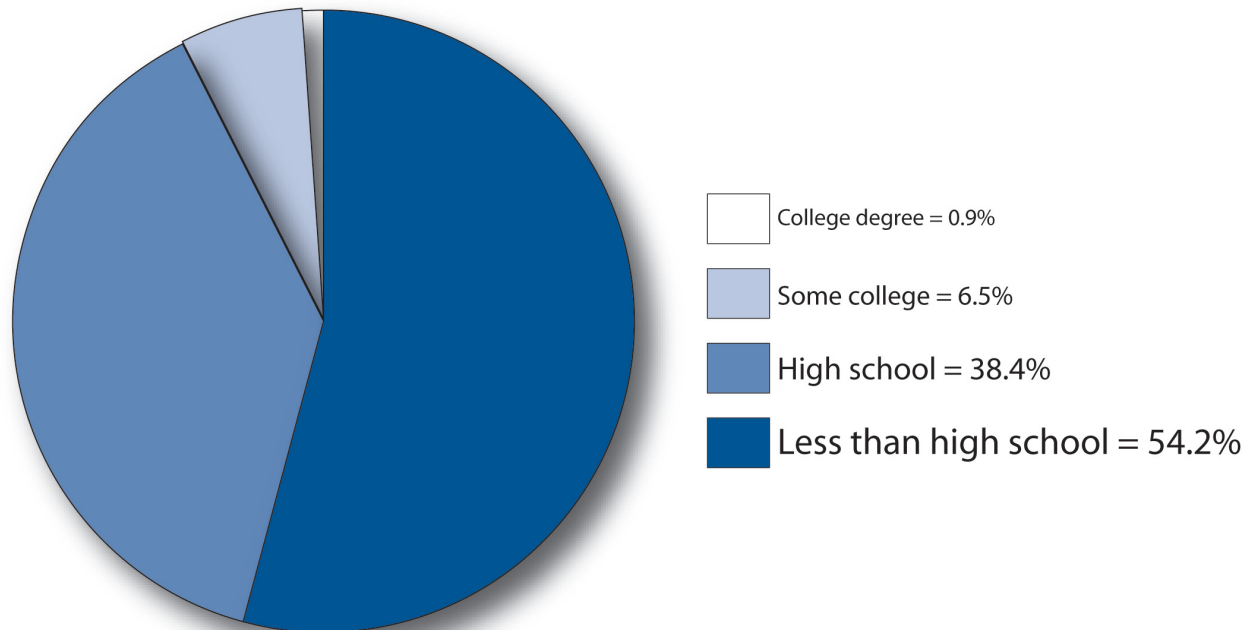
Source: MEPS, 2002.

Imprisonment

Imprisonment can have devastating consequences for the family. It means not only the loss of income, but also the loss of self esteem within the community (see adjacent box). In general, better educated people are less likely to serve time in prison. Fewer than 1% of prison inmates have a college degree while 54.2% have less than a high school degree. In fact, 92.6% of prisoners in the U.S. justice system have a high school diploma or less (U.S. Department of Justice, 2000).

For additional information about imprisonment and its effects on society, see *Family* at page 119 and *Public Sector* at pages 162–163.

The less educated have a greater likelihood of being in prison than college degree holders



Source: U.S. Department of Justice, 2000.

A February report in *The Journal of Social Welfare and Family Law* (Vol 29 No 1) explores the problems families of prisoners face, including both the emotional and financial difficulties in their struggle.

Author Roy Light says, “This research has shown that the effects on the innocent families of prisoners—particularly children—can be very far reaching.

The absence of a parent can cause emotional distress, educational problems and can lead to the break up of families.

All these effects have negative consequences in society and can lead to further problems for the children as they grow up.”

(University of the West of England, 2007, p. 1)

FAMILY

beyond money

We all make choices—some good and some bad—that affect our own well-being and the well-being of those around us. Educational attainment has been linked to important differences in lifestyle choices. But how?

Why does education matter to these choices? Does the lack of education *cause* bad lifestyle choices? Would more education *eliminate* bad lifestyle choices? Education certainly contributes to making sound lifestyle choices, but no matter how much education we have, we will likely make some bad choices. But evidence shows that education makes a difference in lifestyle choices in at least three important ways. First, education provides a strong foundation for learning about and understanding the consequences of our choices. Second, since better educated people tend to have higher incomes, they may choose healthier lifestyles to protect their lifetime stream of income. Third, families with less education who are living in poverty may have fewer resources for learning about and combating lifestyle choices; they might also have limited access to medical resources.

On the next 4 pages of the *Family* section, we explore 7 common lifestyle choices and the role educational attainment plays not only in these choices but also in some of their outcomes.

b-personal lifestyle choices

- ✓ smoking
- ✓ self-assessment of well-being
- exercise
- diabetes
- blood pressure
- obesity
- life expectancy

Smoking

The lifestyle choices of adults affect the family in many ways. **Smoking is a good example.** Cigarettes may divert household spending away from necessities, lead to problems of second-hand smoke for others in the household, and diminish the health status of the smoker. Poor health status also may have economic consequences for the family in the form of reduced earnings and higher health care costs.

The evidence shows that better educated people are less likely to use tobacco products.

Those with a high school degree or less not only have a greater likelihood of smoking, but they also smoke more, an average of 5.5 cigarettes per day. Only about 12% of those with a college degree smoke versus 28% of those with a high school degree or less.

Smoking and motherhood. “The children of nonsmokers and more highly educated mothers consumed a diet that conformed more closely to current guidelines on healthy eating.

These dietary differences may contribute to the excess of ill-health observed in the children of smokers and of less-educated mothers” (Rogers, Emmett & ALSPAC Study Team, 2003, p. 854).



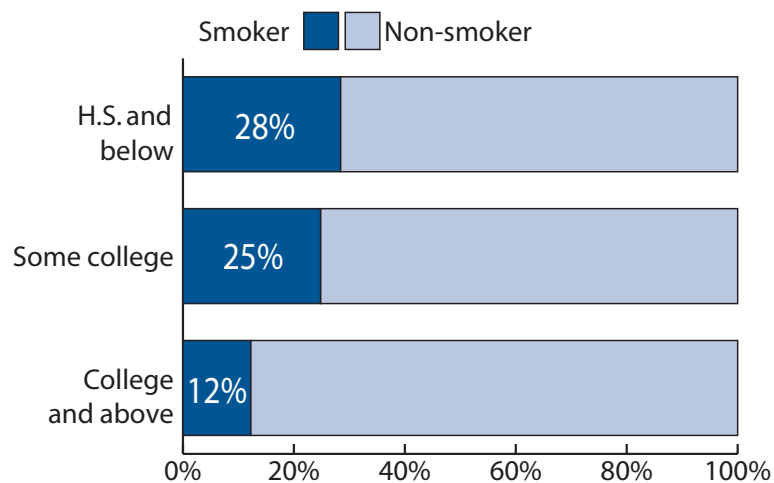
beyond money

Smoking in high school is more prevalent in Tennessee than the rest of the nation with 27.6% of high school students as current smokers and almost 15% reporting frequent smoking. **Each year 9,662 Tennesseans die as a direct result of cigarette smoking**, representing more than 135,000 years of potential life lost.



According to the American Cancer Society, an additional 8.6 million people are suffering from smoking-related chronic conditions (Campaign for a Healthy and Responsible Tennessee, 2002).

A higher percentage of high school graduates smoke (and smoke more) than college graduates



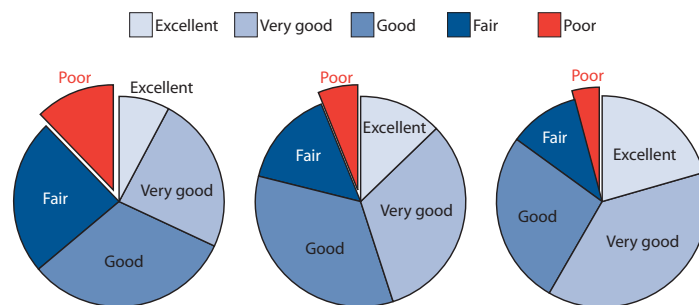
Source: MEPS, 2002.

Self-assessment of well-being

A nationally representative survey shows that a higher proportion of better educated individuals assess themselves as having excellent or very good health status than do individuals with low educational attainment. In contrast, among those with lower attainment levels there is a greater share of individuals who say they are in poor health.

Outcomes like this may reflect of choices that affect health status directly, like smoking. But it is likely more than this. For example, with their higher earnings, better educated individuals have greater access to quality health care and greater access to facilities like health clubs that enhance their physical well-being. These may be some of the factors that contribute to the better health status of educated people.

Individuals with higher educational attainment give a better assessment of their health status



H.S. and below Some college College and above

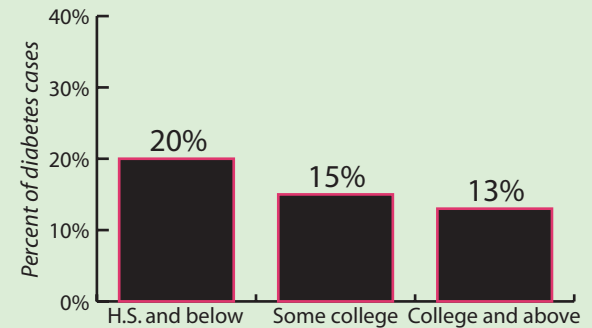
	Excellent health	Very good health	Good health	Fair health	Poor health
H.S. and below	8.0	24.0	32.0	24.0	12.0
Some college	13.0	32.0	34.0	15.0	6.0
College and above	21.0	38.0	27.0	11.0	4.0

Source: HRS, 2002.



Diabetes Cases Are More Prevalent with Low Levels of Education

Eating habits. Like smoking, eating habits are related to educational attainment. Educated individuals are likely more informed about the dangers of poor diets which contribute to health problems like diabetes and high blood pressure. About 20% of those with a high school degree or less are diabetic; for those with some college, only 15% are diabetic; for those with college and above, only 13% are diabetic (HRS, 2002).

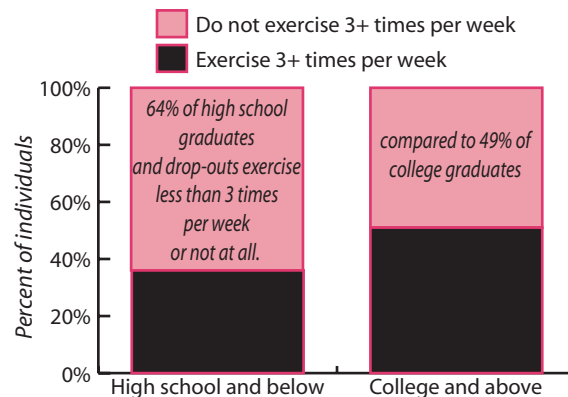


Source: HRS, 2002.

b-personal lifestyle choices

- smoking
- self-assessment of well-being
- exercise
- diabetes
- blood pressure
- obesity
- life expectancy

Individuals with a college degree exercise more



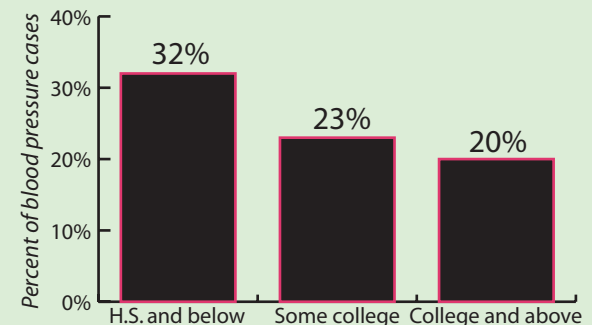
Source: MEPS, 2002.

Exercise. Exercise has been shown to improve physical and emotional health. And the better educated tend to exercise more. More than one-half of people with a college degree exercise 3 or more times per week. But only 36% of people with a high school degree or less exercise at least 3 times per week.



Hypertension cases are more prevalent with low levels of education

Blood Pressure. The story is similar for high blood pressure. Only about 20% of those with a college degree have high blood pressure, compared to over 30% of people with a high school degree or less (USDA, 2000).



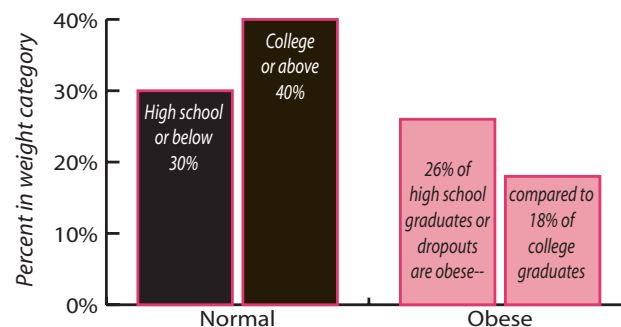
Source: USDA, 2000.



"Annual U.S. obesity-attributable medical expenditures are estimated at \$75 billion in 2003 dollars, and approximately one-half of these expenditures are financed by Medicare and Medicaid" (Finkelstein, Fiebelkorn & Wang, 2004, Abstract).

A smaller percentage of individuals with a college degree or more are obese

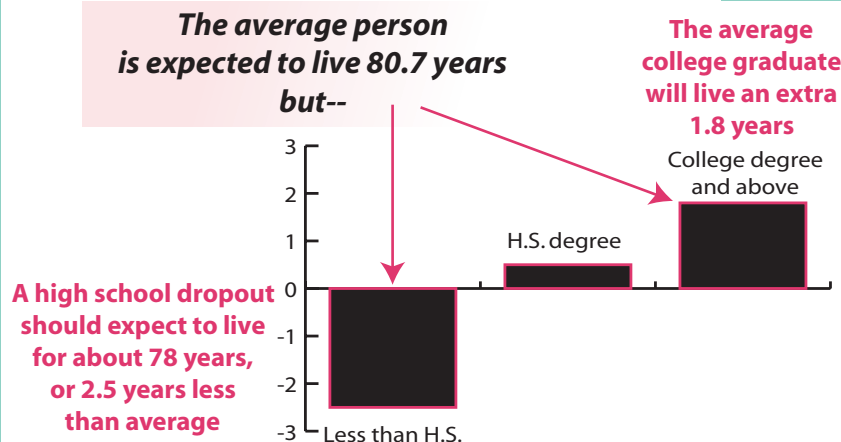
Weight matters. Obesity has become a national concern because it is linked to a raft of health care problems. Educational attainment is associated with the likelihood of being obese. Those with only a high school degree, had about a 1-in-4 chance of being obese (HRS, 2002). Those with a college degree had odds of less than 1-in-5 for obesity in the same year. Forty percent of college graduates were of normal weight in 2002 compare dto 30% of people with only a high school degree.



Source: HRS, 2002.

A person without a high school degree has a shorter life expectancy

Life Expectancy. The cumulative effect of all of our lifestyle choices will ultimately affect our life expectancy. You can probably anticipate the punchline already: individuals with more education enjoy a longer life expectancy. The average expected lifespan of a college degree holder is 1.8 years above the overall average life expectancy age of almost 81 years (Mirowsky & Ross, 2003). Individuals with less than a high school degree are expected to live for about 78 years, which is about 2.5 years below the average.



Source: Mirowsky & Ross, 2003.

the well-being of children

We have seen how education affects the earnings and well-being of adults. Children who have well-educated parents also enjoy a wide variety of benefits. They are more likely to attend college, pursue advanced education and training, and engage in healthier lifestyle choices. Better educated parents tend to offer a more nurturing environment in support of education.



In 1998, 46% of parents read to their kindergartners every day. Among those parents who read to their children, 62% of parents have high education and high income status, compared to 36% who have a low income and education level (Coley, 2002, p. 55-56 as cited by National Institute for Literacy, n.d.).

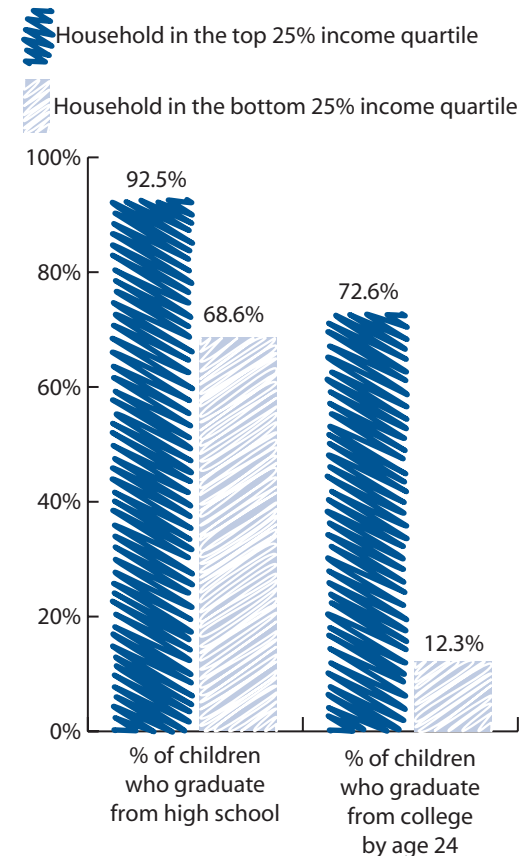
Parental income

Parental income and educational attainment are clearly linked to the academic success of children. Here are some facts to put things in perspective (Postsecondary Education OPPORTUNITY, 2006). If parental income is in the top quartile (i.e., the top 25%) a child has a 92.5% chance of graduating from high school. However, if the parent's income is in the bottom 25%, the chance of graduating from high school falls to 68.6%.

Even more strikingly, if your parent's income was in the top 25% of the income distribution in 2005, there was a 72.6% chance that you would have graduated from college by the age of 24. The odds of graduating from college by age 24 slip to 12.3% if your parent's income was in the bottom quartile. These numbers mean that a child in a family within the top income quartile is almost 6 times more likely to complete a bachelor's degree by age 24.

And if you look at these numbers closely, you can see that children from high-income families are more likely to graduate from *college* than their low-income counterparts are to graduate from *high school*.

Children from higher-income households enjoy higher educational attainment rates



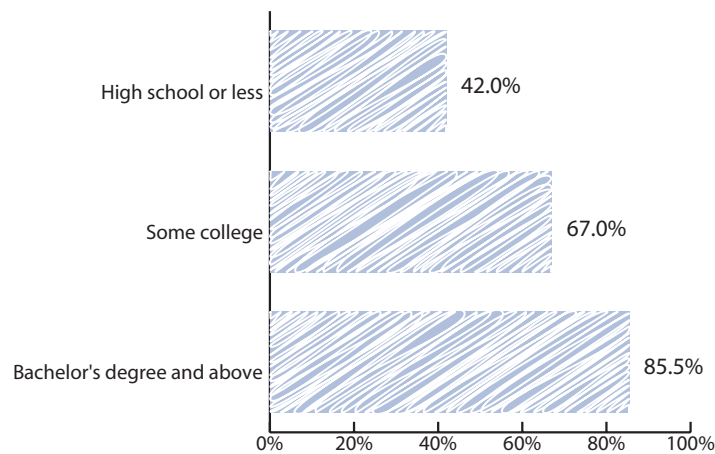
Source: Postsecondary Education OPPORTUNITY, 2006.

the well-being of children

Parent's educational attainment

The educational attainment of parents is also linked to child likelihood of attending college. The children of parents with at least a bachelor's degree had an 86% chance of attending college in 1996 while children of parents who have a high school degree or less had a 42% chance of attending college (Postsecondary Education OPPORTUNITY, 1999).

A Higher share of children who have well-educated parents attend college



Source: Postsecondary Education OPPORTUNITY, 1999.

“

“Like many other women in today’s world I am recently divorced at the age of 46. I chose to stay home for 22 years to raise my 3 children and support my husband who was a soldier in the Army for 18 of those 22 years. I now find myself a student at Hopkinsville Community College. I attend classes on Fort Campbell. I soon realized that my ability to support myself was almost non-existent. I had worked hard along side my husband to make him a better educated person so he would in turn take care of me.

Life is funny ...

Life is funny, I asked him to leave so it stands to reason that I now have to take care of myself. I like the feeling of being in school, learning new things, and meeting people of all ages. I thought I would feel different being older than some of my teachers. So far this college has been a positive experience. I am working part time and going to school full time, I am grateful that I can afford to do this.

If I could say just one thing to young women today it would be get an decent education, depend on no one, life has a way of not turning out the way we plan and a good education is not only a great example for younger women to follow, but it is something that can never be taken away from you for the rest of your life.

I will be a R.N. when I am finished school; I believe all the hard work will be worth it, but if I could turn back the hands of time I would have gone to school in my twenties not in my forties.”

”

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“When families are involved in their children’s educations, children earn higher grades and receive higher scores on tests, attend school more regularly, complete more homework, demonstrate more positive attitudes and behaviors, graduate from high school at higher rates, and are more likely to enroll in higher education than students with less involved families” (U.S. Department of Education, 1997, p. 1).

the well-being of children

Parents' education and teenagers' attitudes about education

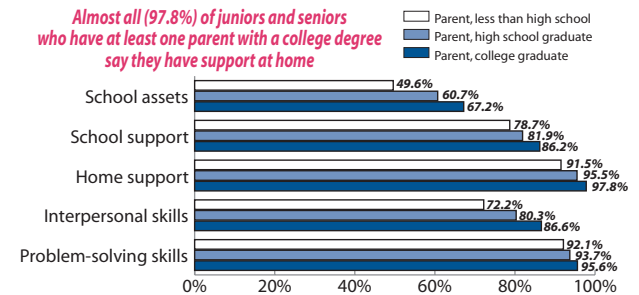
We have unique survey data from Tennessee that sheds additional light on how parental educational attainment affects children's attitude and performance in school. The data are from a survey of 10,976 public and private high school juniors and seniors across the state of Tennessee. These students voluntarily supplied a lot of information about their own education: how they feel about the courses they are taking, what grades and test scores they earn, the value they place on their coursework, whether or not they have support from their school and their families, and more. For the *Family* chapter of this book, we look at how students responded based on the highest level of education achieved by any parent in the home; these results are shown here. For additional information and more detailed responses from this survey, see Fox, Kiser & Couch (2006).

Many factors affect the performance of young people in high school. This chart shows several of these factors. Students with better educated parents generally have a more favorable attitude about their school assets, support from teachers and administrators, support in the home, their own interpersonal skills, and their problem solving skills.

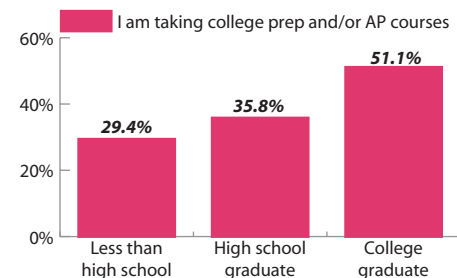
College preparatory and advanced placement tests facilitate the transition from high school to college and help reduce the time needed to complete a degree. High school students who have parents with no high school degree have less than a 30% chance of taking college preparatory and/or advanced placement courses. But if the parent is a college graduate, the odds rise to over 50%.

The more serious a student is about coursework, the better the student is likely to perform in the classroom. Unfortunately the data show that high schoolers generally don't feel their coursework is relevant. Nonetheless, children with better educated parents do find the coursework to be more important than children from other households.

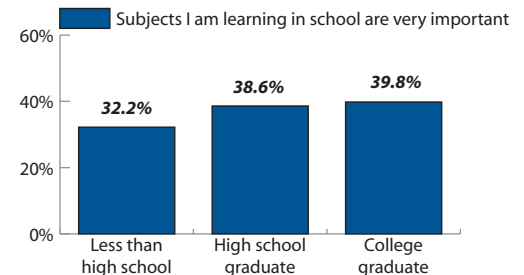
Percentage of Tennessee juniors and seniors with a favorable attitude about education-related factors, by parent's level of educational attainment



Percentage of Tennessee juniors and seniors taking college preparatory or advanced placement courses, by parent's level of educational attainment



Percentage of Tennessee juniors and seniors reporting current classes to be very important, by parent's level of educational attainment

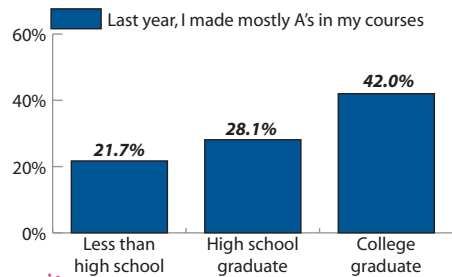


Source: Fox, Kiser & Couch, 2006.

the well-being of children



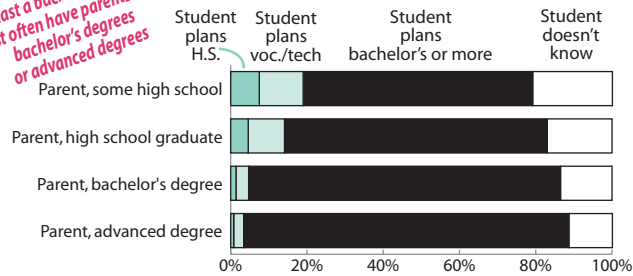
What else did these juniors and seniors tell us?



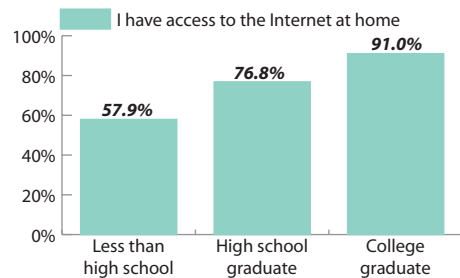
Percentage of Tennessee juniors and seniors making mostly A's, by parent's level of educational attainment

These Tennessee high school students get better grades when they have better educated parents. High school juniors and seniors with a college-educated parent report that they make A's in their classes more than 40% of the time, but for students who have parents who never graduated from high school, only about 22% report receiving A grades. These results might reflect varying expectations for academic success, both on the part of the parent for their child and on the part of the child for him or herself. In fact, juniors and seniors in households with better educated parents have higher aspirations for their own schooling. For example, of those children whose parents had only a high school degree, 69% expressed an interest in a bachelor's degree compared to 82% for children with parents who hold a bachelor's degree.

Students planning to obtain at least a bachelor's degree most often have parents with bachelor's degrees or advanced degrees



Children from households with well-educated parents have higher aspirations for their own educational attainment



Percentage of Tennessee juniors and seniors with access to the Internet at home, by parent's level of educational attainment

Source: Fox, Kiser & Couch, 2006.

We seldom hear the phrase "digital divide" anymore in reference to the gap in access to computers and the Internet. (See also pages 116–117, technology and information.) There are substantial differences in Internet access for children from Tennessee households with poorly educated parents versus well educated parents. The differences are striking. If the parent is a college graduate, about 9 out of 10 children will have Internet access. This slips to fewer than 6 out of 10 children if the parent has not graduated from high school.

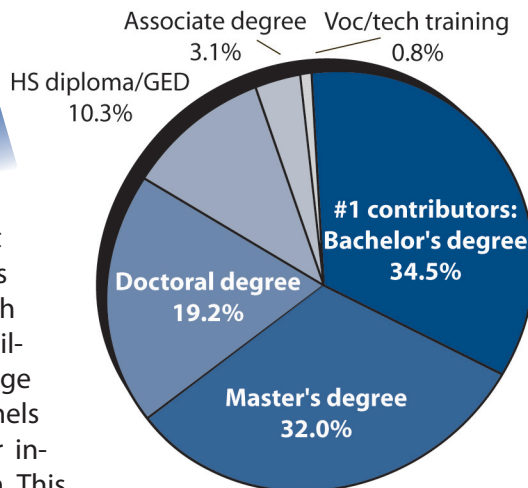
the well-being of children

Parental education and financial support for schooling.

Out-of-pocket costs have an important bearing on whether one continues schooling. In Tennessee, parents with more education invest more in their children's education. The Tennessee College Savings (529) Plan is one of the channels parents may use to encourage further investment in education by their children. This increases the likelihood of their children being debt free after college, and thus makes it less expensive for children to invest more in education.

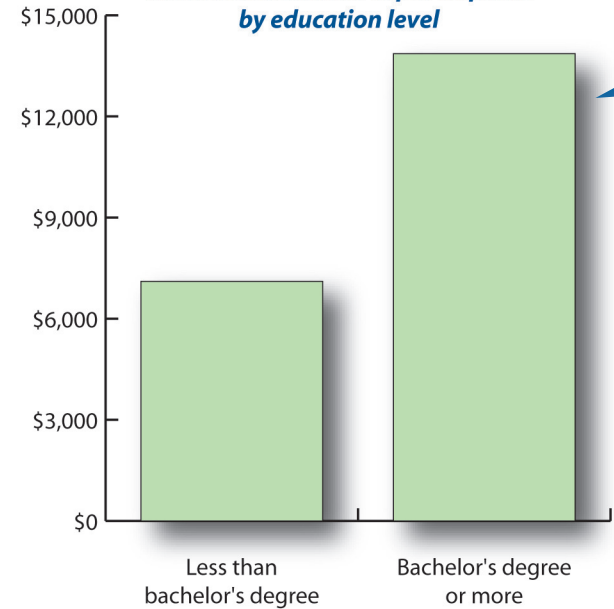
Only 10.3% of contributors to a 529 Plan have only a high school diploma or its equivalent. In contrast, 34.5% of contributors hold a bachelor's degree. Individuals with a bachelor's degree, on average, contribute about twice as much to 529 College Savings Plans as those who have a lower attainment status.

Education level of Tennessee 529 savings plan participants



Source: CBER-UT, 2006a.

Mean contributions of participants by education level



Source: CBER-UT, 2006a.

"In 2005, 14.8 million, or one in five children, lived in one of 7.1 million low-income working families. ... Low-income working families often face barriers to finding good jobs and achieving financial success. These barriers prevent them from ensuring that their children get the opportunities they need to help them become successful adults.

Improving access to health care, child care and **education and training** are among the policy interventions that are key to improving the lives and futures of working families."

Annie E. Casey Foundation, 2006, Number 3



the well-being of children

Parental education and the child's quality of life.

The health status, social well-being and lifestyle choices of children can be affected by the choices parents make and by parental educational attainment. Researchers at the University of Wisconsin have catalogued a wide array of benefits that accrue to society

from having an educated population (Wolfe & Haveman, 2001). Included on this list are a number of benefits to children that follow from having better educated parents:

- ★ Enhanced cognitive development.
- ★ Higher likelihood of graduating from high school.
- ★ Better child health status, including lower infant mortality rates, lower rates of low birth weight babies and higher vaccination rates.
- ★ Lower teen pregnancy rates when the mother has at least a high school education.

Next, we share a few more examples with a bit greater detail.

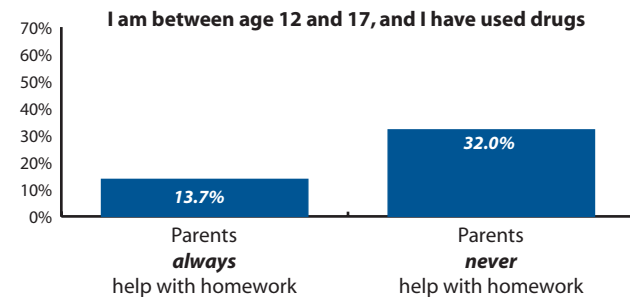
Studies have shown a connection between the educational attainment of parents and the likelihood that children in the household smoke. For example, one study from Australia found a link between the educational attainment of the mother and the chances that the child will end up smoking by the age of 14. This study took into account other family circumstances, including family income (Lawlor et al., 2005).

Another study focused on teenagers in Massachusetts. This study also found evidence that parental education was important. As the authors note, "The risk of adolescent smoking increased 28% with each step down in parental education..." (Soteriades & Difranza, 2003, p. 1155).

Children may not always like getting help from their parents with their homework. But there is evidence that this support helps children, including outside of the classroom. For example, only 13.7% of children aged 12 through 17 who have parents who commonly help with their homework have ever experimented with illegal drugs. In contrast, 32.0% of children who have parents who never offered homework help have taken drugs.

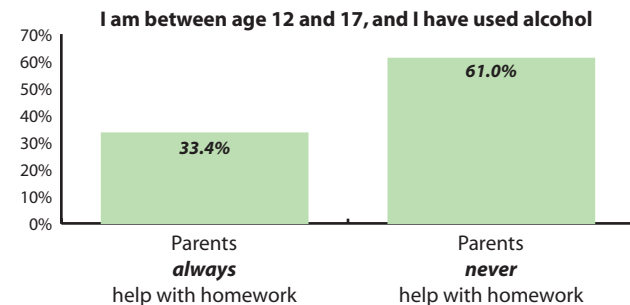
A similar story applies to alcohol use. When parents help with their child's homework on an ongoing basis, there is only a 33.4% chance that the child will experiment with alcoholic beverages. But if the parent has never helped with the child's homework, the odds of using alcohol jumps to 61.0%.

Parent's involvement in child's education reduces the likelihood of illicit drug use among 12- through 17-year-olds, nationally



Source: USDHHS, 2006

Parent's Involvement in Child's Education Reduces the Likelihood of Alcohol Use Among 12- through 17-year-olds, Nationally



Source: USDHHS, 2006

the well-being of children

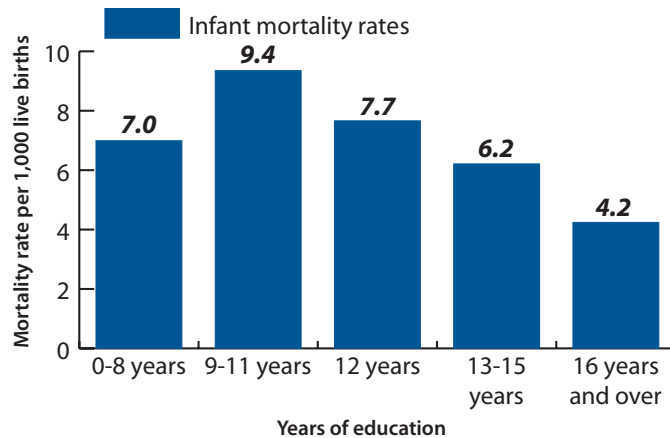
Welfare

A survey of Tennessee Families First participants showed strong evidence of the potential generational impact of educational attainment on welfare participation. In 2005, approximately 35% of Families First adult caretakers did not graduate from high school and did not hold any other certification or diploma. Almost half (46%) of their parents were also on welfare and one-third had grandparents on welfare (CBER-UT, 2006b).

“Greater exposure to welfare is significantly associated with children’s poorer educational attainment. The adverse effect appears to reflect the large negative effect of exposure to welfare during adolescence” (Ku & Plotnick, 2003, p. 151).

Infant mortality

Infant mortality rates decline when the mother has more years of education



Source: Mathews & MacDorman, 2006.

The Centers for Disease Control and Prevention (CDC) reported that the infant mortality rate in the U.S. was 6.84 for each 1,000 live births. Different demographic groups of the population display different infant mortality rates. It is interesting that infant mortality rates are higher for mothers born in the U.S. than mothers who were born in other countries. Mothers who smoked cigarettes generally had a higher incidence of infant mortality. For all mothers, the infant mortality rate for women who smoked was 11.25 and the rate for non-smoking mothers was 6.59%. The pattern was similar for all broad groups of the population.

Maternal educational attainment has also been linked to infant mortality rates by the CDC (Mathews & MacDorman, 2006). With the exception of the lowest attainment category, infant mortality rates decline as the education of the mother increases. The CDC speculates that this reflects the fact that most women in this category were born outside the U.S. where infant mortality rates are lower than for native born mothers.

Teenage pregnancy

“Research shows that when younger adolescents give birth, they are less likely to complete high school and more likely during their lives to have a larger number of children than are non-parenting teens. Children born to younger teen mothers may also experience poorer health outcomes, lower educational attainment, and higher rates of adolescent childbearing themselves when compared to children born to older mothers” (Advocates for Youth. (n.d.).

*the well-being of children****Child poverty in the context of “education » family » well-being”***

Harry Holzer, visiting fellow at the Urban Institute and a professor of Public Policy and associate dean at Georgetown Public Policy Institute, testified before the United States House Committee on Ways and Means: The Economic Costs of Child Poverty, January 24, 2007

Most arguments for reducing poverty in the United States, especially among children, rest on a moral case for doing so—one that emphasizes the unfairness of child poverty and how it runs counter to our national creed of equal opportunity for all.

But there is also an economic case for reducing child poverty. When children grow up in poverty, they are more likely as adults to have low earnings, which in turn reflect low productivity in the workforce. They are also more likely to engage in crime and to have poor health later in life. Their reduced productive activity generates a direct loss of goods and services to the U.S. economy. Any criminal acts that occur impose large monetary and other personal costs on their victims and on the taxpayer for administering our huge criminal justice system. And their poor health generates illness and early mortality that require large health care expenditures, impede productivity, and ultimately reduce their quality and quantity of life.

In each case, we reviewed a range of rigorous research studies that estimate the average statistical relationships between growing up in poverty, on the one hand, and one’s earnings, propensity to commit crime, and quality of health later in life, on the other. We also reviewed estimates of the costs per person that crime and poor health per person impose on the economy. Then we aggregated all of these average costs per poor child across the total number of children growing up in poverty in the United States to estimate the aggregate costs of child poverty to the U.S. economy. We had to make a number of critical assumptions about how to define and measure poverty, what level of income to use as a non-poverty benchmark, and which effects are really caused by growing up in poverty and not simply correlated with it. Wherever possible, we made conservative assumptions, in order to generate lower estimates.

Our results suggest that the costs to the United States associated with childhood poverty total about \$500 billion per year, or the equivalent of nearly 4 percent of GDP. More specifically, we estimate that childhood poverty each year

- Reduces productivity and economic output by about 1.3 percent of GDP;
- Raises the costs of crime by 1.3 percent of GDP; and
- Raises expenditures on health and reduces the value of health by 1.2 percent of GDP.



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A broader view

SPILLOVERS TO SOCIETY

**“Our most basic common link is that we all inhabit this planet.
We all breathe the same air.
We all cherish our children’s future.
And we are all mortal.”** (John F. Kennedy, June 10, 1963)

Why look at education spillovers to society?

And what might some of the spillovers be?

participation in the democratic process

smoking

health outcomes: is there a relationship

the arts

infant immunizations

blood donations

volunteerism and charitable giving

school quality and the housing market

citizenship



Motivation: Why look at spillovers to society?

People make sound investments in education when they are well informed and when it is in their best interest to do so. It can be said that self interest generally drives what we do, and deciding on how much to invest in education is no exception. As we have noted elsewhere, enhanced earnings and monetary gain are the primary lures to schooling and training since the earnings accrue directly to the individual. Of course, many people pursue education simply because they enjoy it.

Important community-wide spillover benefits are also associated with an individual's investment in more education, and these benefits are the very marks of good citizenship. Good citizens recognize, for example, that they have a responsibility to other people, the law, and the environment. This responsibility includes not only the actions we all can take that help support our local community, state, nation, and globe (like voting and volunteering)

but also the process of engaging in learning and education so that we can make other contributions to our community. (For more information on teaching children good citizenship, see Parenting.org and GeorgiaStandards.org.) Whether these spillovers are purposeful or just positive side-effects does not matter. And in fact, spillover benefits from education are one reason why there is public support for schooling.

Some of the personal benefits are discussed in other parts of this book. For example, we have highlighted the consequences for the family of having well-educated parents and have discussed the benefits for the economy from having a well-educated workforce. Here we take one more step down this path and highlight just a small number of other ways that education can positively or negatively affect the people and the world around us.

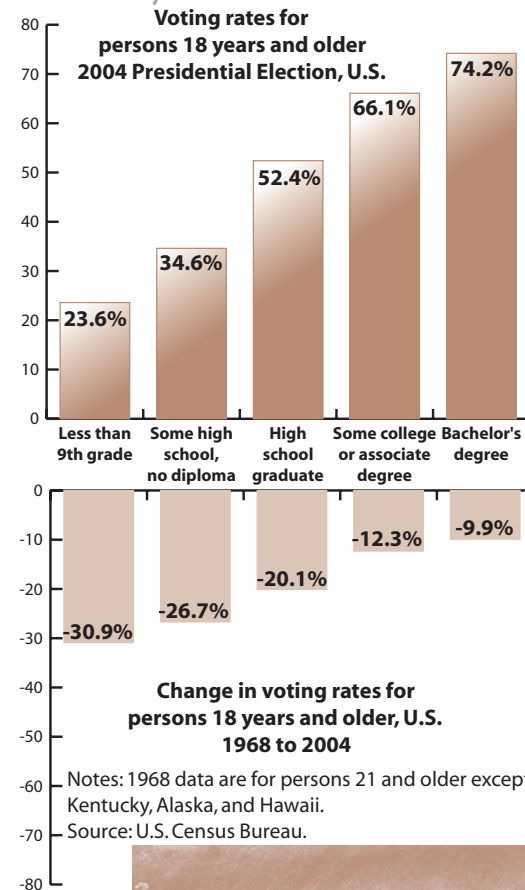
*spillovers to society***Participation in the democratic process**

Education is the cornerstone of a well-functioning democracy. The founders of our nation believed strongly that an informed electorate could make wiser choices at the ballot box than an uninformed electorate.

We often bemoan the low rate at which Americans go to the polls. In the 2004 presidential election, for example, just over one-half (54.6%) of eligible Tennesseans even bothered to vote (U.S. Census Bureau, 2005). But the better educated do tend to participate more in the voting process. For example, national data for the 2004 election show that 74.2% of college graduates voted while only 23.6% of those with less than a 9th grade education voted.

It is disappointing that voter participation has declined with the passage of time. But those with a college degree or advanced degree have seen the smallest declines. Between 1968 and 2004, those with less than a 9th grade education saw the largest drop at 30.9% whereas individuals with a bachelor's degree saw voting rates fall only 9.9%.

“A popular government without popular information or the means of acquiring it is but a prologue to Farce or Tragedy or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own Governors must arm themselves with the power knowledge gives” (James Madison, 1788).



spillovers to society

Smoking

According to the World Health Organization (2004), tobacco is the 2nd major cause of death in the world and is responsible for the death of 1 in 10 adults worldwide, or about 5 million deaths each year. Further, tobacco is the 4th most common risk factor for disease worldwide. The World Health Organization states that “in addition to the high public health costs of treating tobacco-caused diseases, tobacco kills people at the height of their productivity, depriving families of breadwinners and nations of a healthy workforce. Tobacco users are also less productive while they are alive due to increased sickness” (World Health Organization, 2004).

At one time, people were not aware of the hazards of smoking. But scientific research, public awareness campaigns, and cigarette warning labels have changed this misinformation. Nonetheless, many people—adults and youth alike—continue to smoke. The American Cancer Society (2006) estimates that there were 45 million adult smokers in 2005. They also estimate that 12% of middle-school-aged youth used some form of tobacco product in the same year.

Smoking tends to be more common among those with lower levels of educational attainment (American Cancer Society, 2006). It is believed that with more education people become more aware of the health consequences of tobacco use for themselves and others, and as a result, they smoke less. In addition, better educated people have a higher lifetime income stream to protect and so they may be more careful with important lifestyle choices like smoking.

The health consequences of smoking are many

- ▶ Cigarette smoking accounts for nearly 440,000 of the more than 2.4 million annual deaths in the United States (American Heart Association, 2007).
- ▶ Smoking, on average, reduces adult life expectancy by approximately 14 years (CDC, 2005a).
- ▶ Cigarette smokers have a higher risk of developing a variety of chronic disorders that compromise health. Studies show that cigarette smoking is a major cause of coronary heart disease, which leads to heart attack. Smoking also increases the risk of recurrent coronary heart disease after bypass surgery. Smoking increases blood pressure, decreases exercise tolerance and increases the tendency for blood to clot (AHA, 2007).

- ▶ The link between secondhand smoke and health status has also been established. Estimates suggest that as many as 40,000 people die from being exposed to other people’s smoke each year. About 35,000 of these nonsmokers die from coronary heart disease, including heart attack (AHA, 2007).

But the story does not end there. There are also substantial economic costs associated with smoking and tobacco use for the individual and society at large.

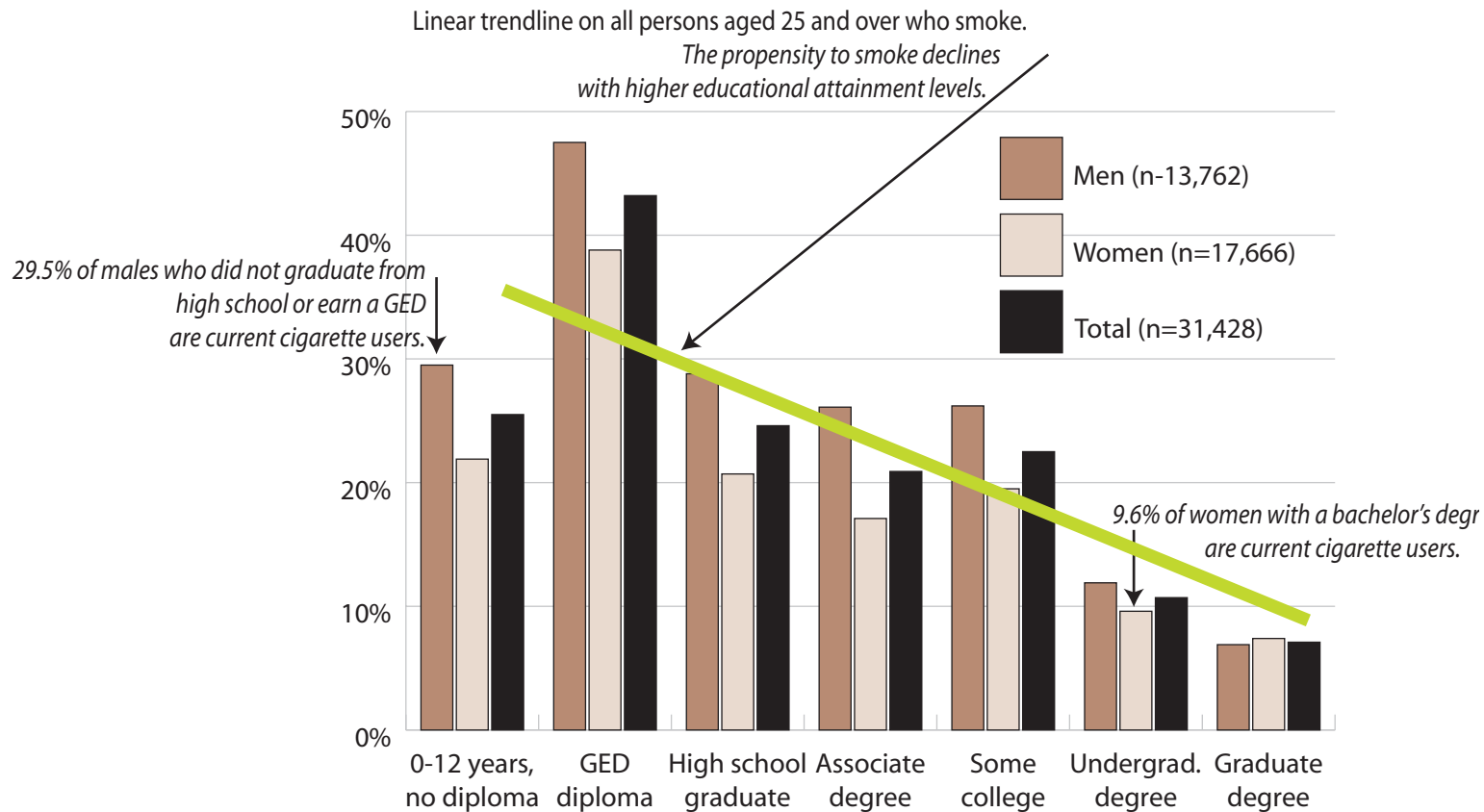
To smoke or to educate: What are our priorities?

In 2003, cigarette companies spent \$15.2 billion nationwide, or more than \$41 million per day, on advertising and promotion.

To put this in perspective, spending in Tennessee on public education totaled \$6.9 billion in 2005/06 (State of Tennessee, 2007 & CDC, 2007a).

- ▶ Cigarette and tobacco use may divert household spending away from necessities. Total U.S. expenditures on tobacco were estimated to be \$88.8 billion in 2005, of which \$82 billion was spent on cigarettes (CDC, 2007a).
- ▶ Adverse health effects mean substantial forgone earnings for an individual and the family.
- ▶ Individuals must pay more for insurance to provide health care to those with smoking-related health problems. Direct medical costs associated with smoking totaled \$75 billion between 1997 and 2001 (CDC, 2007a).
- ▶ Workers miss time from their jobs and may miss important on-the-job training opportunities that could otherwise enhance earnings.
- ▶ The overall economy produces less output to the detriment of all. Estimates for average annual smoking-attributable productivity losses are approximately \$61.9 billion for men and \$30.5 billion for women (CDC, 2005b).

Percentage of persons who are current cigarette smokers by education level



Notes: From the National Health Interview Survey, US, 2005. See source for additional notes, exclusions, and confidence intervals.
 Source: CDC, 2006.

spillovers to society

Health outcomes and education: Is there a relationship?

Evidence from the literature

“Many studies have documented that education is inversely associated with a wide array of clinical disease outcomes and death, and the relationship between education and cardiovascular disease and coronary heart disease in particular is among the most consistent and pronounced” (Medical News Today, 2006, p. 1).

“Education remains important when controlling other known determinants that also are associated with education, such as cognitive capacity and income. Nevertheless, a large number of possible pathways link education to health. People with more education attain more health knowledge and coping skills, develop a greater sense of personal efficacy, are more aware of issues of all kinds, and participate more actively in their communities. Higher educational attainment leads to better jobs, typically providing greater autonomy, higher incomes and fringe benefits (including health insurance), and greater respect. All of these factors lead to more opportunities to live in better neighborhoods, be protected from hazards, and have access to better community resources and services. These and other possible pathways raise questions of whether policies that are more specifically targeted, and perhaps easier to implement, can achieve comparable health benefits more efficiently” (Mechanic, 2006, p. 1179).

A recently released study on breast cancer treatment is disturbing. Apparently women who have low levels of education get insufficiently small doses of chemotherapy (Bakalar, 2007). The study notes, “about 32 percent of the women with less than a high school education received insufficient doses, compared with 14 percent of high school graduates” (Bakalar, 2007, p. 1). While the study does not offer a definitive statement on why this happens, there is speculation that doctors are doing this because the treatment process is long and arduous and more poorly educated woman may not fully understand the scope of the treatment process. Since chemotherapy leads to discomfort, giving poorly educated women lower doses may help keep them on the medical regimen.

Evidence from our own communities

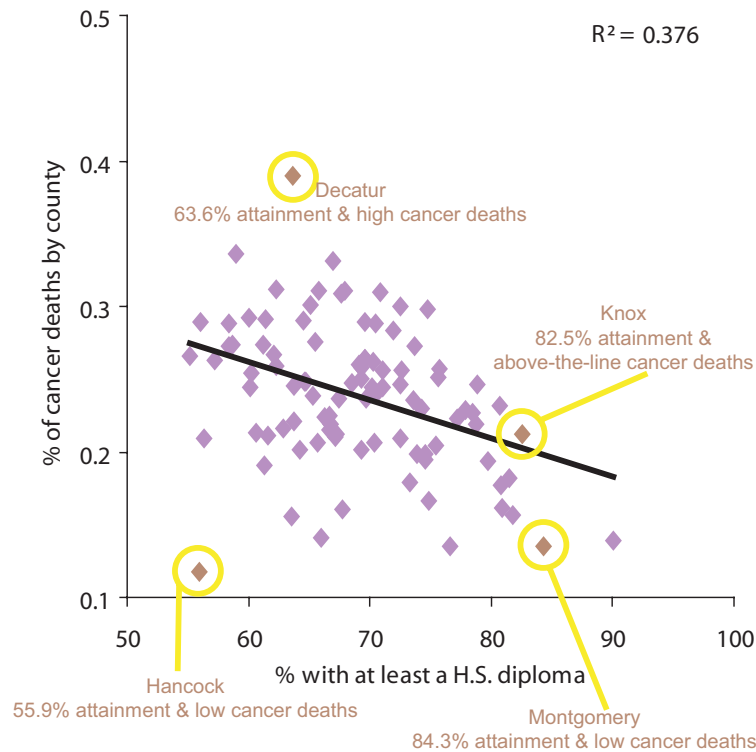
A 2004 Appalachian Regional Commission study evaluated disparities in health outcomes across the region. Author Joel Halverson at West Virginia University states, “there is a growing awareness in the public health community that a person’s health (both physical and mental) is linked to contextual circumstances and events in addition to the influence of individual risks” (p. xiv). Included in those contextual circumstances is, of course, educational attainment. Halverson looked for potential associations between educational attainment and health outcomes and found that certain regions experience adverse health outcomes for many diseases in addition to having generally higher rates of unemployment and poverty, as well as lower incomes and levels of educational attainment; however, he continues to explore these associations and seeks to develop methodologies to measure them appropriately.

Let’s consider cancer in our state

Almost 13,000 Tennesseans died of cancer in 2004, accounting for nearly 23% of all deaths in the state (Tennessee Department of Health, 2006).

We have looked at all 95 Tennessee counties and compared educational attainment with cancer deaths. There is a strong inverse correlation between the share of the adult population with at least a high school degree and cancer deaths. In other words, counties where higher percentages of the population hold at least a high school diploma tend to have lower cancer death rates, as a percentage of the county population. The pictures say a lot. Of course, a host of factors influence a community’s health status; that is why the dots are spread across the chart. But the dots are nonetheless clustered and the figure provide strong evidence that education is an important factor affecting county-level health status in terms of cancer deaths.

Relationship between high school or better education attainment and cancer death rates for Tennessee counties



Source: CBER-UT calculations from U.S. Census Bureau & Tennessee Department of Health, 2006.

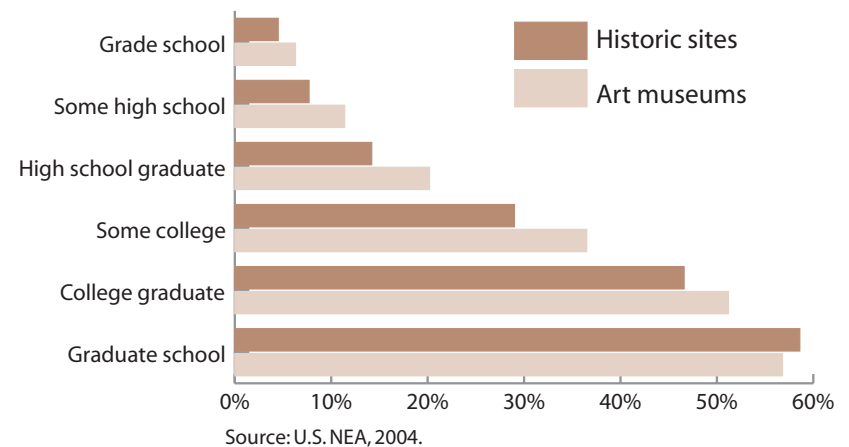
The arts

Exposure to the arts is an important part of the process of discovery for the mind, whether one is young or old. People can learn much about history and culture by studying the arts. Music, dance, painting, and so on also allow one to express creative spirit in ways that might not otherwise be possible.

Studying the arts may provide spillover benefits to the child. For example, according to the National Arts Education Public Awareness Campaign,

- ▶ The arts teach kids to be more tolerant and open.
- ▶ The arts allow kids to express themselves creatively.
- ▶ The arts promote individuality, bolster self-confidence, and improve overall academic performance.
- ▶ The arts can help troubled youth, providing an alternative to delinquent behavior and truancy while providing an improved attitude toward school.
- ▶ 89% of Americans believe that arts education is important enough to be taught in schools.

Strong community support of the arts means more opportunities for everyone to enjoy the arts. So who participates in the arts? Well, just about everyone does in one way or another. Information indicates that better educated people have higher attendance rates at both art museums and historic sites (U.S. NEA, 2004).



“... even altruistic parents may not take into account the consequences of the effects of their child raising decisions on those outside the family. For example, a child who is not immunized and later becomes hospitalized with a preventable illness, and/or infects others, imposes a burden on other citizens, a cost which may not be considered by the parents when they decide on their own investments in the child’s human capital.”
— J. Currie, *Mathematica Policy Research* (2001, IIIB).

people may get vaccinated, maybe I just won’t do it. The spillover benefits that accrue to society are the primary reason why government often subsidizes vaccinations for both children and adults.

Immunization is critical to the maintenance of people’s health and well-being. Because of strong immunization programs, small pox has been eradicated, polio is close to being eliminated, measles has been essentially eliminated from the western hemisphere, with rubella expected to follow soon (CDC Foundation, n.d.)

Here are some more detailed examples (CDC, 1999):

- ★ There were 48,164 smallpox cases in the U.S. in 1900–04, but there have been no reported cases since 1950.
- ★ In the 5 years before the measles vaccine was licensed (1958–62) there were 503,282 reported measles cases in the U.S.; in 1998 there were only 89 cases.
- ★ The average annual number of rubella cases in 1966–1968 (the 3 years before vaccine licensure) was 47,745, while there were only 345 cases in 1998.

We are lucky. These declines are not the case elsewhere as communicable diseases remain common. For example, worldwide in 2000, there were 1.7 million vaccine-preventable deaths among children, of which nearly 50% (or 777,000) were from measles (American Red Cross, 2002).

Dr. Anne Schuchat, the director of the CDC’s National Center for Infectious and Respiratory Diseases, announcing national infant immunization week this year, stated that through the use of infant immunization programs “millions of children have been

Infant immunizations

Communicable diseases cost us greatly. Health status may be compromised; health care costs can be high; families may lose loved ones; and society loses productive workers. Immunizations are a good example of how one person’s choice can affect the well-being of others. If I get vaccinated against a communicable disease, not only do I benefit but so do those around me. Conversely, my lack of vaccinations presents a risk to others. Also, since I can anticipate that many other

vaccinated, and millions of cases of disease, disability and death have been prevented. We can now protect more children from more vaccine-preventable diseases than ever before.”

The CDC estimates that 11,000 babies are born in the United States every day, each of whom will need to be immunized against 14 diseases before age 2. Although infant immunization coverage is at an all-time high in the U.S., more than 20% of the nation’s 2-year-olds are still not fully immunized against easily preventable infectious diseases (CDC, 2007b).

A mother’s education level appears to directly impact the probability of her child being immunized, though the differences are small. A primary explanation for these small numbers is the role played by schools and public health programs in getting to needy children. The table shows immunization rates by the mother’s education level for 3 different vaccines. The chance of a child being immunized tends to rise with maternal educational attainment. The DTP+ vaccine shows the most substantial immunization rate differential across the 3 attainment categories, a difference of 12 percentage points.

The chance of a child being immunized tends to rise with his/her mother’s education level

<i>Mother’s highest education level</i>	<i>MMR</i>	<i>DTP</i>	<i>DTP+</i>
Less than high school	91%	94%	77%
High school	92%	97%	83%
Some college	93%	99%	84%
College degree	92%	99%	89%

MMR=measles, mumps, rubella

DTP=3 or more of any diphtheria, tetanus, and pertussis vaccines

DTP+=4 or more doses of DTP, 3 or more doses of polio, 1 or more doses of any MCV, and 3 or more doses of Hib

Notes: For additional notes and confidence intervals, see original source.

Source: DHHS, 2006.



spillovers to society

Blood donations

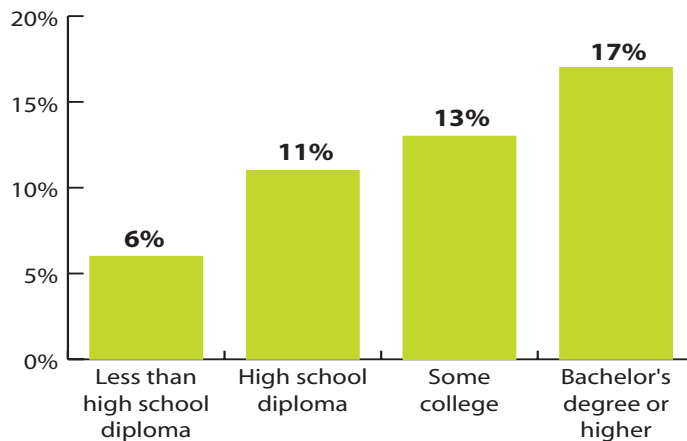
Millions of people a year receive blood transfusions. The Red Cross has been a national leader in supporting blood and plasma donations. When blood supplies slip below a 3-day stockpile, alerts are issued to encourage additional donations. Most of us have likely heard these pleas from the Red Cross and others. When the call goes out, we respond.

Giving blood is a good example of altruistic behavior: People make a gift without receiving anything in return other than the personal satisfaction of making the donation. Altruism indicates that people care fundamentally about the well-being of others in society.

People of all walks of life give blood—young and old, black and white, male and female. A statistical analysis of countries in the European Union, as well as Norway and Finland, showed that people with higher incomes and higher education tend to have a greater likelihood of ever having given blood (Healy, 2000).

There is also nationwide evidence that blood donations rise as educational attainment rises (College Board, 2004). Individuals who have graduated from high school are almost twice as likely as dropouts to give blood. People with a bachelor's degree are almost 3-times as likely to give blood as dropouts.

Blood donations, % who donate regularly, 1994



Source: College Board, 2004.

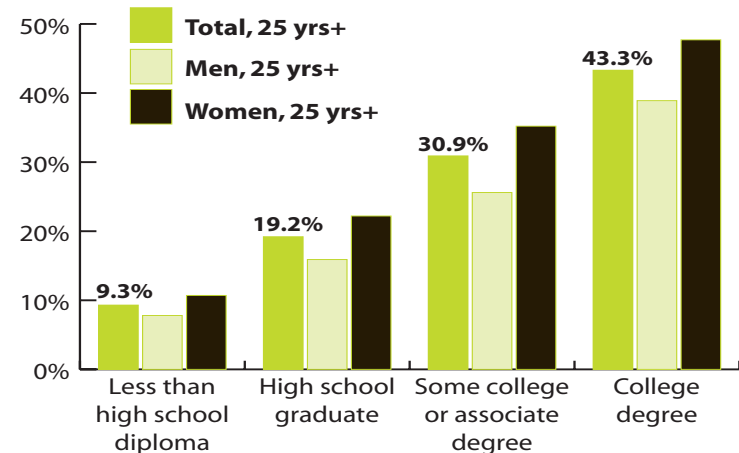
Volunteerism and charitable giving

Americans give to others in many ways, from cash donations to charity to financial support of their church to in-kind support of programs like Habitat for Humanity. When global calamity strikes, Americans lend a helping hand.

According to a report from the U.S. government, over 61 million people volunteered at least 1 time between September 2005 and September 2006, representing 26.7% of the population (BLS, 2007). Almost 3/4 of those who volunteered had some college or a college degree. People with different levels of education tend to support different causes. For example, individuals with less than a high school education spent relatively more time in support of food collection or distribution programs, while college graduates spent more time providing professional or managerial assistance or serving on a board or committee.

A recent study found that a 1% increase in the adult population with a graduate degree increases average giving per tax filer by about \$30.10 annually (Gittell & Tebaldi, 2006). This is consistent with previous research findings that adults who have completed postgraduate work have significantly higher average giving (almost 1 1/2 times the average level of giving per household income) as those with a high school diploma (White, 1989, p. 66, as cited by Gittell & Tebaldi, 2006).

Likelihood of volunteering is also linked to attainment



Source: BLS, 2007.

School quality and the housing market

The home is the largest and most important financial investment most Americans will ever make. Many factors affect where one chooses to live. For example, most people want to live in reasonably close proximity to their place of work. People generally prefer to live near desirable amenities like parks and shy away from noxious facilities like dumps and landfills. These amenities and dis-amenities have been found to affect local property values. For example, living near a lake or reservoir means higher property values, while living near a dump or waste facility diminishes property values (Farber, 1998; Lansford & Jones, 1995).

Proximity to schools and school quality also enter in the home-buying process for many households. Realtors know how commonly this comes up when they work with clients. The importance of schooling to the household becomes evident when the issue of rezoning or redistricting comes up. Many parents, as well as children, are upset if they are told they must attend another school. For children, it is often the loss of friends that is the driving force behind their opposition. For parents, it may be that they chose their place of residence because of the quality of the local school or area school district.

If parents make residency decisions based on school quality, might this affect the local housing market? For example, places with poor quality schools would not likely attract many people

who place a high value on quality education for their children. In these areas we might anticipate a relatively weak demand for property. By the same token, places with high quality schools might be magnets for parents who care more about the education of their own children as well as that of other children in the community. In such places the demand for residential housing may be greater. In these cases the quality of the local schools may have a spillover influence on local property values.

Researchers have studied this very question and found that school quality is associated with higher property values as intuition would suggest. Here are some examples (Zahirovic-Herbert, 2007):

- ... Higher standardized test scores in local areas have been found to be linked to higher property values in the same places. Test scores are viewed as a signal of schooling quality to home buyers.
- ... Report cards that grade public school quality were found to affect housing prices in Florida. Following the release of the report cards, each letter grade was associated with a 10% increase in the selling price of a home.
- ... Declining schools apparently have little or no effect on housing prices, though they can delay the time of sale by about 14%.

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Government budgets

EDUCATION WITHIN THE FISCAL PUZZLE

“Knowledge will forever govern ignorance; and a people who mean to be their own governors must arm themselves with the power which knowledge gives.” (James Madison, 1822)

Our fiscal health: government budgets

Big picture: the fiscal consequences of dropping out

Spending in Tennessee

Families First, Public housing, Food stamps, Justice system, TennCare, TENNderCARE, Cover Tennessee

Revenue in Tennessee

Education and sales tax revenue,
Education and property tax revenue

What does it all mean?

public sector

our fiscal health: government budgets

Our founding fathers knew how important education was to the maintenance of democracy

Education also has an important bearing on government budgets, and those effects are the focus of this chapter. Following a brief overview of government budgets generally, we consider a specific example of the fiscal consequences of high school dropouts for our federal, state, and local governments. Then, we cover the ways in which educational attainment affects both public sector spending and taxation in Tennessee in detail.

But first, taxes and expenditures can be complicated and understanding the inner-workings of the state's 600-plus page budget requires more energy than most people have. So perhaps an analogy will help illustrate the relationship education has with our tax system. Look at the state as if it were your body. There are certain basic activities you ask your body to do (breathe, pump your blood, process information) and sometimes you ask your body for some extras (exert energy, burn calories, provide warmth). Likewise, in this country, there are certain things we ask our government to do (protect us with armed forces and police forces; educate our children; provide assistance programs for the disabled, elderly, otherwise needy portion of the population, and more). Both your body and your government

requires inputs before they can perform these functions. Our bodies need fuel like food, water, and oxygen; and our governments need funding. How much fuel does our body need? Well, of course it depends on what we are going to ask it to perform—a 10-mile hike will require different (and yes, more) fuel than a nap on the couch. How much funding does our government need? Well, that too depends on what we ask it to perform—the more threats we are under, the more protection we will need; the more aged our population, the more funding our government will require to care for them through Medicare and Social Security.

So where does education fit into all of this? Education is not only one of the many things we ask our government to

perform, but it is also an important input to our government. It is like energy for the state's "body;" it helps the state create a strong tax base to generate tax revenue to fund what we ask our government to do. [Better educated people earn more income, thereby paying more money in taxes and improving the vitality of our state's "body."] And at the same time, the education of our population affects the demand for more government services. [Poorly educated people who often have low incomes and poor health consume more government services and contribute less to the tax base.] Very simply put (but for the sake of our analogy), the government cannot perform what we are currently asking it to perform our education input unless it is improved.

"Simply put, our nation's fiscal policy is on an unsustainable course.

As long-term budget simulations by the General Accounting Office [GAO], the Congressional Budget Office (CBO), and others show, over the long term we face a large and growing structural deficit due primarily to known demographic trends and rising health care costs.

Continuing on this unsustainable fiscal path will gradually erode, if not suddenly damage, our economy, our standard of living, and ultimately our national security.

Our current path also will increasingly constrain our ability to address emerging and unexpected budgetary needs" (David M. Walker, Comptroller General of the U.S., 2005).

our fiscal health: government budgets

Our fiscal health: Government budgets

The fiscal health of our public sector depends fundamentally on a healthy tax base. The health of the tax base in turn depends on the performance of workers and businesses in the economy. To the extent that education improves economic performance, the vitality of the tax base is enhanced. This can happen directly through higher worker earnings and indirectly through stronger business activity resulting from a better trained workforce. The expenditure side of the government budget is also affected by the educational attainment of the population. Those with less education are often more reliant on expensive government spending programs like food stamps and Medicaid because their incomes are lower. A better educated population would support a stronger tax base while at the same time reducing pressures on the spending side of the budget.

Most of us would rather not pay taxes. Of course, we would rather not have a house payment or car payment either. In the end, we pay our bills and we pay our taxes. Taxes support many services and programs, some of which we like and others that we don't care much about. We tend to like the services we receive and care a lot less for the services that others draw upon. Our general distaste for taxes, along with our differing views on what government should spend tax receipts on, means that the government budgeting process is always subject to debate and frequently clouded by acrimony.

Our budget challenges go deeper than the annual debate over taxing and spending. There are long-term problems confronting governments at all levels in the U.S. You may have heard people and pundits speak of "structural deficits." This phrase refers to a long-term imbalance between what we want our government to spend and our ability to support this spending through the tax system. The federal government faces a looming crisis over both Social Security and Medicare funding as the population ages. Solving these problems will not be easy, and the final resolution will likely include a mix of spending cuts and tax increases.

The problem is not confined to the federal government. Recent estimates suggest that Tennessee will confront a structural imbalance of 9.3% between revenues and expenditures in 2013 (State Policy Reports, 2007). Of course, these figures are hypothetical, and we will ultimately balance our budget in the years ahead. But they are suggestive of the imbalance between our desires for government spending and our dislike of taxes.

The states are struggling to finance their shares of Medicaid and welfare, provide adequate funding for education (including at-risk children), meet the demands of mandates like No Child Left Behind, and support infrastructure investments like roads. The revenue side of state budgets faces its own problems. The corporate income tax is in long-term decline as a share

of state tax revenue (though it has done well in the last few years), and the base of the sales tax is being eroded by both the growth of electronic commerce that easily escapes taxation and by services, which remain largely untaxed. Many local governments in Tennessee have serious expenditure problems to address because of strong population growth and the need to expand locally-provided services like education. As population pressures mount, there continues to be strong opposition to increases in local property taxes.

Many of the spending programs that are chewing up tax revenues are important, but they are still viewed as undesirable by many of us. Good examples are the criminal justice system, Medicaid, and welfare. While some feel it is too bad that we have to spend money on these programs, we have little choice. Prisons serve to punish and, perhaps, rehabilitate the guilty while protecting society at large. Welfare and Medicaid are costly programs, but we support them because of our collective concerns for the poor and the needy. Moreover, some of the welfare and Medicaid spending is a good investment, as with health care services for children, which can spare society greater costs later in the child's life. As we fund these programs, money is diverted away from other uses, whether it's out of our own pockets in the form of the taxes we pay or whether it's taken away from another government spending program.

big picture: the fiscal consequences of dropping out

Let's begin this journey by looking broadly at the way education may affect the fiscal health of our government using one recent study as an illustration. As a start, just consider the size of our government. Most of us think that the public sector in the U.S. is large, and it is. In fiscal year (FY) 2004, total government expenditures, including federal, state, and local spending, equaled \$3.75 trillion. Given the 115 million U.S. households in 2004, government spending is equivalent to about \$32,706 per household (Rector, Kim & Watkins, 2007). This spending is financed both through taxes we pay and through debt our government incurs.

Who pays taxes? We all pay some form of tax. At the federal level, low income households pay little or no income tax, though workers pay social security tax if employed. The lion's

share of federal income tax revenue comes from higher income taxpayers. At the state and local level people may pay sales, income and property taxes, as well as other more specific levies, depending on where they live.

In the end, income is the primary determinant of how much tax one pays, regardless of the tax. And as we have seen elsewhere in this book, education is a primary determinant of how much income one earns. The income a person earns directly affects income taxes, and income drives spending and home-buying decisions that determine how much is paid in sales and property taxes. The study we draw on here estimates that households headed by persons with less than a high school diploma paid on average \$9,689 in federal, state and local taxes in FY2004, while all other households averaged \$34,629 in taxes (Rector et al., 2007). We will accept the assumptions of this study, in part because even if the numbers were off by many thousands of dollars, the lesson would be the same.

Who benefits from government expenditures? Of course we all do. Some benefits accrue to anyone who wants them. Public schooling is a good example of a service we can use regardless of the taxes we pay. In other instances we pay tax when we use something provided by government, like the entrance fee to a park or a tax on gasoline that funds our roads. Access to many services will depend on the unique circumstances of individuals and families. Medicaid services, for example, can be an entitlement if your household income is low.

Education indirectly influences the services that different households receive from government. As an example, consider

Dropping out or staying plugged in

National data show that high school dropouts are much more likely to use welfare and other assistance programs over their lifetimes than are better educated individuals.

An individual with a high school diploma is 40.0% less likely to receive welfare benefits through Temporary Assistance to Needy Families (TANF) and 19.0% less likely to rely on food stamps than is a dropout.

A person with at least some college education is 62.0% less likely to rely on TANF, 54.0% less likely to receive food stamps, and 35.0% less likely to receive public housing assistance than is a dropout (Levin, Belfield, Muennig & Rouse, 2007).

spending in Tennessee

households headed by someone without a high school diploma. Just a couple of years ago there were about 17.7 million of these households, representing 1 in 7 of all households in the U.S. Households headed by persons without a high school diploma received benefits averaging \$43,084 from all levels government in FY2004. In contrast, other households received an average of \$30,819 in government services (Rector et al., 2007). The education link here is once again because of the association between attainment and income; less income means greater use of programs like welfare. However, it goes beyond this. For example, our prison population is dominated by very poorly educated individuals.

Now let's put the tax and spending pieces together. Estimates show that households headed by persons with less than a high school diploma produced an aggregate annual fiscal deficit—the shortfall between total taxes paid and total benefits received—of approximately \$483 billion in 2004. To put this figure in perspective, total Tennessee state government spending from all sources will be \$27.5 billion in 2007/08. Policies that focus on decreasing the number of high school dropouts could reduce these burdensome costs to federal, state and local governments. Higher levels of attainment would boost tax receipts while reducing pressures on the spending side of the government budget (Rector et al., 2007).

One might quibble with the assumptions and methods that were used to conduct this study. Such quibbling would not change the fundamental conclusions that the better educated pay more in taxes and that the less educated rely more heavily on government spending and transfer programs.

Introduction to spending in Tennessee

National patterns that link education to the public sector's budget apply to all states, including Tennessee. The situation is somewhat different here since, unlike the federal government and most states, we have no broad-based income tax. Instead our state relies heavily on the sales tax. (The state budget shows that the sales tax should account for 60% of state tax revenue in FY2007/08.) Local governments in Tennessee are similar to local governments elsewhere in the country in their reliance on the property tax for the majority of own-source tax revenue, though they also have access to the local sales tax. Like the national picture portrayed above, better educated individuals in Tennessee tend to earn higher incomes and therefore pay more in taxes to our state and local government.

The better educated in Tennessee also rely less on government programs such as TennCare (Medicaid) and Families First (welfare). This is important because programs like these are very expensive to operate. For example, health and social services spending—which includes state welfare and Medicaid expenditures—uses 30 cents of every dollar generated by the state through taxes. Our total spending on these programs exceeds the state's tax commitment because of financial support from the federal government.

Let's continue our journey through the public sector by looking more closely at budget issues here in Tennessee, starting with the spending side of the budget.

PUBLIC SECTOR

spending in Tennessee

Families First. Welfare programs are costly to operate, but they can be important in providing relief to needy families.

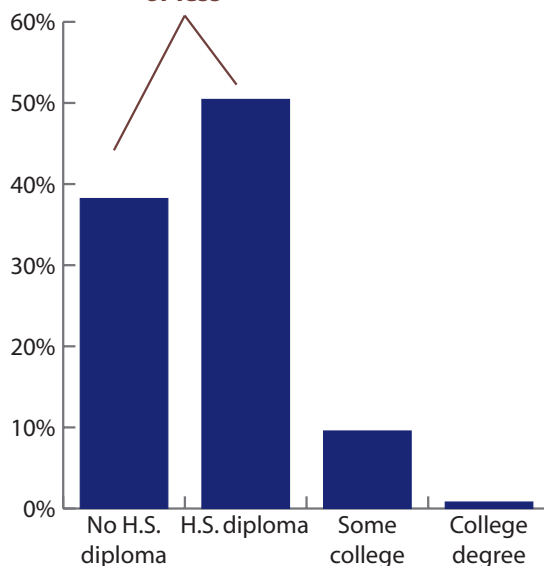
State welfare programs have changed markedly since passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 and the resulting implementation of Temporary Assistance to Needy Families (TANF). The shift to the new program was intended to reduce welfare dependency and lower program costs to federal and state taxpayers. A key objective was to move people to work and self-sufficiency.

The number of U.S. citizens receiving welfare assistance has declined significantly since the new policy was implemented. In Tennessee, the number of families (i.e. “assistance groups”) on welfare has declined from 95,909 in 1995 to 67,411 in 2005, and to 64,234 in January of 2007 (CBER-UT, 2006a; Tennessee Department of Human Services, 2007). Time limits that constrain the number of years a person can be on welfare—a feature of the new welfare programs—are one factor contributing to the smaller caseloads.

Tennessee’s Families First system is a “means tested” entitlement program in which benefits are tied to the family’s income. In other words, if your family’s income (i.e. “means”) falls below a certain level, you may be entitled to support. Relatively less educated individuals tend to rely more on cash assistance because their earnings are lower. This figure shows the highest level of education completed for adults receiving cash assistance from Tennessee’s Families First program in 2005 (CBER-UT, 2006b).

Educational attainment of Families First adults is generally very low

89% of adults on welfare have a high school diploma or less



Source: CBER-UT, 2006.

How can we put welfare spending in perspective?

Here is one way.

The average salary for a classroom teacher in Tennessee was \$42,485 in 2005/06 (Tennessee Department of Education, 2006).

Tennessee spent about \$37.3 million of its own money on welfare cash assistance in 2005/06.

So the state’s spending on welfare would support hiring **877 teachers a year.**

Total welfare spending in Tennessee was \$147.6 million, or enough to fund over **3,475 schoolteachers a year.**

PUBLIC SECTOR *spending in Tennessee*

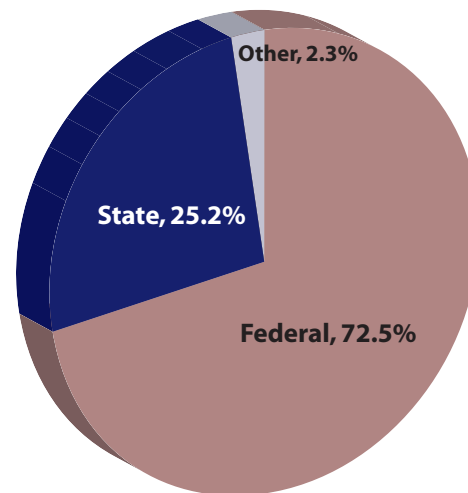
To place the role of education and the Families First program in context

- * About 38.2% of those adults receiving cash assistance did not graduate from high school (CBER-UT, 2006b). In contrast, only 24.1% of Tennessee residents had less than a high school diploma in 2000 (U.S. Census Bureau, 2000).
- * Only 9.6% of Families First adults have taken college courses, and less than 1.0% of Families First adults hold a college degree (CBER-UT, 2006b). In contrast, 24.3% of all Tennessee adults in 2000 had a college degree (U.S. Census Bureau, 2000).
- * The average years of schooling completed is 11.2 among Families First adults (CBER-UT, 2006b).

Despite reform and smaller caseloads, Families First continues to be an expensive program for federal and state governments to provide. The state budget for 2007/08 shows the following funding mix:

- * Total spending on cash assistance through Families First equaled \$147,632,300 in 2005–2006.
- * Tennessee spent \$37,253,900 of its own revenue in support of cash assistance in 2005–2006, just over a quarter of total spending on Families First in the state.
- * The federal government provided Tennessee with 72.5% of Families First funding, approximately \$106,998,200.
- * There were 68,088 “assistance groups” or families on Families First in July of 2006. Each assistance group received an average of \$2,168 in benefits per year.
- * Tennessee’s share of Families First financial support (i.e. spending from own-source revenue) translates into \$547 per assistance group and \$205 per Families First recipient.

The majority of Families First funding is provided by the federal government



Source: State of Tennessee, 2007.

spending in Tennessee

Families First, continued. TANF Work Requirements and Education. National evidence suggests that enrollment of welfare recipients in postsecondary education has declined due to welfare reform (Jacobs & Winslow, 2003). This is certainly an unintended outcome of the new policy. The Job Opportunities and Basic Skills (JOBS) program in 1995 reports that about 136,000 welfare recipients were enrolled in higher education, while only about 54,000 welfare recipients were reported as having engagement in higher education after the 1996 welfare reform took place (Jacobs & Winslow, 2003).

It is no surprise that many individuals believe the more stringent work requirements have had a negative impact on the educational attainment of welfare recipients. More importantly, data support the notion that states with less restrictive policies regarding work requirements have higher enrollment in post-secondary education (Jacobs & Winslow, 2003).

In defense of Families First, Tennessee is 1 of 3 states that imposed a full 40 hour work requirement on beneficiaries of cash assistance. However, Tennessee provided some flexibility in how work requirements are defined. A maximum of 20 hours per week could be spent on education and training including

- * Vocational education training
- * Post-secondary education
- * Secondary schools
- * Training prep education (like preparing for post-secondary education, job skills training, employer-specific training, self-initiated job skills training, and literacy tests/ adult education) (CBER-UT, 2005).

Unfortunately, these provisions expired at the end of the 2006/07 fiscal year.

Education and training are the primary means of keeping people off of welfare and moving welfare recipients to long term self-sufficiency and economic security. While education and training can be expensive, these expenditures can help save state and local governments other costs that might be associated with poorly educated individuals and households. We can either pay now or pay later. Why roll the dice?



PUBLIC SECTOR *spending in Tennessee*

From the literature

"How much would it cost and what would the benefits be if blacks and Hispanics graduated from high school, went to college, and graduated from college at the same rate as non-Hispanic whites?"

This is the focus of a report, *Closing the Education Gap: Benefits and Costs*, published by the prestigious RAND Corporation.

"The costs of education would be high, increasing by about 20% in California and 10% in the rest of the nation. ***But the benefits***, in the form of savings in public health and welfare expenditures and increased tax revenues from higher incomes, ***would be even higher***. Indeed, the added costs of providing more education to minorities would be recouped well within the lifetime of taxpayers called upon to make the additional investments."

"The nation is experiencing a rapid immigration driven increase in the share of Hispanics in the school age population. Failure to increase the educational attainment of this group would result in growing shares of new labor-force entrants having levels of education lower than those prevailing today; in increased income disparities between blacks and Hispanics, on one hand, and Asians and non-Hispanic whites, on the other; and in increased public expenditures for social and health programs for generations to come" (Vernez, Krop & Rydell, 1999, book description).

PUBLIC SECTOR

spending in Tennessee

Public housing. Low-income individuals in the U.S. and Tennessee are more dependent on assistance programs than individuals with higher levels of income, and public housing assistance programs are no exception. In 2005, the median income of households residing in U.S. public housing was \$10,738, less than one quarter of the nationwide median income (Econsult, 2007).

Spending for public housing has changed since it was first implemented under the U.S. Housing Act of 1937. Today, public housing relies heavily on federal subsidies to fund operating costs (Econsult, 2007). Providing public housing is an expensive task for the federal government:

- ▶ Over \$6 billion in federal appropriations were spent on public housing in fiscal year 2006.
- ▶ For more than 1.2 million American households, public housing provides an annual rent subsidy of \$5,964.
- ▶ Public Building Authorities across the country spend \$8.1 billion a year on facility improvements, maintenance and operations.
- ▶ Replacing an average public housing unit costs \$134,858.

Public housing has been criticized for many years due to the negative effects on surrounding neighborhoods and cultural perceptions that are associated with public housing (Freeman & Botein, 2002).

- ▶ Subsidized housing has been shown to contribute to declining property values in some situations.
- ▶ An increased concentration of poverty is often a result of more public housing.
- ▶ Subsidized housing is associated with higher levels of crime.

Efforts are now being made to integrate low-income households into areas with higher-income households to help mitigate these and other problems. And like welfare reform, evolving trends indicate that public housing programs have shifted their emphasis to self-sufficiency in order to lessen reliance on permanent housing support. Individuals who have succeeded most in these self-sufficiency programs are those with prior vocational training or education and those who have not previously experienced dependence on welfare. In particular, those individuals with a high school education, or any additional education, have a much greater chance for success (Kleit & Rohe, 2005).



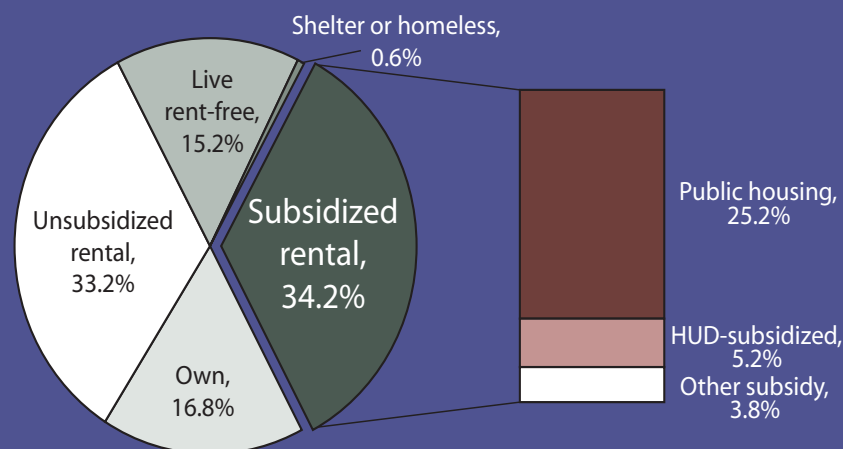
PUBLIC SECTOR *spending in Tennessee*

The Tennessee Housing Development Agency (THDA) was formed to provide more affordable housing options to low-income families throughout the state of Tennessee (State of Tennessee, 2007). Tens of thousands of families have benefited from these programs.

- ▶ THDA provides opportunities for households to receive mortgage loans at interest rates below the market rate. Also provided are subsidies for renters. THDA assists local housing providers in creating affordable housing plans.
- ▶ THDA spent over \$1.7 million in 2005–2006, the majority which of was funded by federal grants.
- ▶ Since 1973, THDA has created over 93,000 mortgages (THDA, 2006) and since 2000, they have helped more than 18,000 low-to-moderate income Tennessee households achieve homeownership.

Education can be an important piece of the puzzle in reducing the reliance on public housing in 2 ways. First, better educated people have a greater likelihood of securing private housing and mortgages by virtue of their higher incomes. Second, there is evidence showing that education facilitates the move from public to private housing. Homeownership is part of the American dream, and education is one means of realizing this dream.

Many hard-pressed families benefit from multiple federal and state assistance programs. In a survey of Tennessee's Families First welfare recipients (CBER-UT, 2006), a group that is not as well educated as the population at large, it was found that about 34.2% of assistance groups received subsidized rental payments. Only about 16.8% of these individuals own their homes.



Source: CBER-UT, 2006.



PUBLIC SECTOR

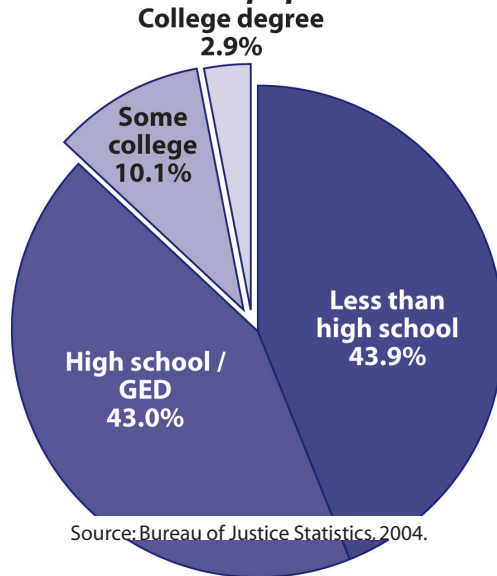
spending in Tennessee

Justice system. Educational attainment of U.S. inmates is low in comparison to the rest of the population. The pie graph here demonstrates the education levels for inmates across the U.S. in 2002 (Bureau of Justice Statistics, 2004).

- 12.3% of inmates in the U.S. had less than an eighth grade education.
- Nearly 44.0% of inmates had less than a high school education, compared to only 14.8% and 24.1% of U.S. and Tennessee populations 25 years and older.
- While 35.0% of the U.S. population and 24.3% of Tennesseans had a college degree, less than 3.0% of U.S. inmates had a college degree.

We can delve deeper into educational attainment of inmates by looking at attainment levels based on the crime the inmate committed.

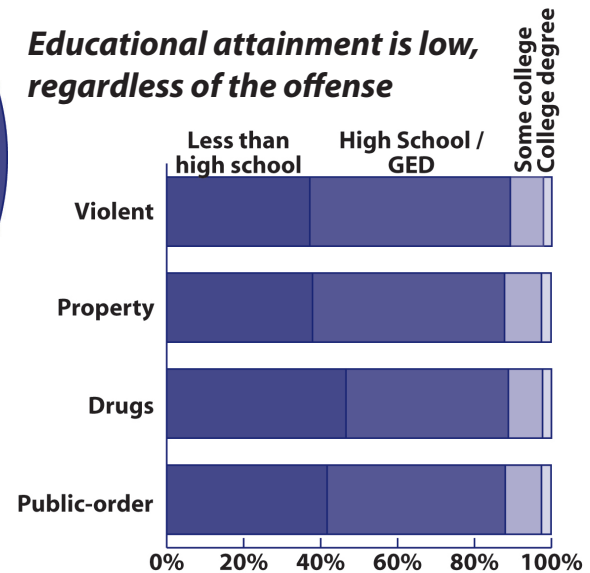
U.S. inmates are relatively less educated than the overall population



Source: Bureau of Justice Statistics, 2004.

Offenses are broken into four main categories: violent, property, drug, and public-order crimes. It is evident that individuals with at least some college education commit fewer offenses across all types. Of those inmates with a drug offense, 46.6% had less than a high school education, 42.2% had a high school diploma or GED, 8.9% had some college education, and 2.3% had a college degree.

Educational attainment is low, regardless of the offense



Source: Bureau of Justice Statistics, 2004.

Correctional education reduces likelihood of repeat offenses

Recidivism is common among offenders of all crimes. More than 2/3 of released inmates were rearrested within 3 years of their leaving jail (Bureau of Justice Statistics, 2002). However, rates of rearrest, reconviction, and reincarceration are all lower for those inmates who participated in correctional education (National Institute for Literacy, 2007).

- Non-participants in correctional education were *rearrested* at a rate of 57.0% compared to 48.0% for those who did participate.
- Those who were involved in correctional education were *reconvicted* at a rate of 27.0% while non-participants were reconvicted at a rate of 35.0%.
- *Reincarceration* rates for non-participants were 10.0% higher than for those who took part in correctional education.

\$2.27
 billion

Government spending on the Tennessee justice system

The justice system is an expensive piece of the state government spending pie, and statistics show prisoners are poorly educated relative to the overall population. In 2004, Tennessee spent \$2,272,249,000 in total justice system expenditures (Bureau of Justice Statistics, 2006). Spending on law, safety, and correction accounts for about 11.0% of government expenditures in Tennessee (State Budget of Tennessee, 2007–2008). Just over 33% of this funding comes from the state government, while the remaining 66.8% is provided by local governments (31.8% from counties and 35.0% from municipalities). All levels of government share in the costs of the justice system in Tennessee.

The justice system in Tennessee comprises 3 main sectors: police protection, judicial and legal systems, and corrections. The majority of spending on police protection in Tennessee comes from local governments, specifically municipalities. State government supports 43.1% of all spending on judicial and legal systems while local governments (including counties and municipalities) support about 56.9%. Approximately 56.5% of funding for corrections in Tennessee is provided by the state government.

The Tennessee Department of Correction (TDOC) is responsible for fulfilling the obligations of the courts through the incarceration of inmates. In 2006, total jail population in Tennessee was 23,474 inmates, equivalent to less than 0.4% of the Tennessee population (TDOC, 2006b).

How does inmate spending compare to spending per pupil in public schools?

The average annual cost to house an inmate in Tennessee in 2006 was \$21,502 (TDOC, 2007). In comparison, average spending per pupil in Tennessee was \$7,469 in fiscal year 2005–06 (Tennessee Department of Education Annual Statistical Report, 2005–06).

The average Tennessee inmate served time for 4 years and 1 month in fiscal year 2005–2006 (TDOC, 2006a). At a rate of \$21,502 per year, 1 inmate would cost nearly \$87,800 over his or her time served—enough to put at least 11 Tennessee students through 1 year of school.

PUBLIC SECTOR

spending in Tennessee

Food stamps. The major food assistance program to families in the U.S. is the Food Stamp Program. Like welfare, this is a means-tested program with benefits linked to household income. Relief is provided through an electronic benefits card rather than the paper stamps that were used years ago. Food stamp purchases are not subject to the sales tax.

The food stamp program is fully funded by the federal government.

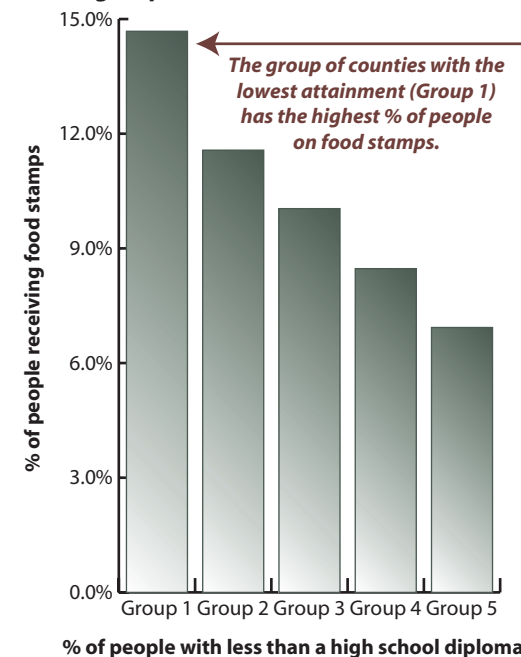
- * In FY2005, the State of Tennessee spent \$973,153,600 in federal funds on food stamps (State of Tennessee, 2007).
- * The number of food stamp recipients in Tennessee was 382,794 households, or 859,807 individuals, in July of 2006 (Tennessee Department of Human Services, 2006).
- * In 2006, about \$1,133 was received per recipient in Tennessee (Tennessee Department of Human Services, 2006; U.S. Census Bureau, 2006).

Total food stamp spending translates into about \$160 per person in Tennessee, while as noted above the per-recipient amount is \$1,133. The 10 counties with the highest incidence of food stamp reliance received more than \$240 per capita in food stamps per year. These counties tend to have a poorly educated adult workforce (see below). On the other hand, the 10 counties with the lowest reliance received less than \$115 per capita in food stamps per year (Tennessee Department of Human Services, 2006; U.S. Census Bureau, 2006). These numbers are illustrative since the federal benefit per recipient varies little. This means the variation in per capita spending across counties primarily reflects differences in the numbers of households receiving food stamps.

Because income is so closely linked to educational attainment, it is no surprise that food stamp recipients tend to be less educated than the population at large.

To the right we show counties grouped into quintiles based on the educational attainment of the county adult population. For the purposes of this illustration, we have used the share of the adult population with less than a high school degree, though the results are similar regardless of the attainment measure used. For each quintile, we show the average share of the county population that was on food stamps in 2000. For the 19 counties in the lowest attainment category, about 1 out of every 7 people (14.7% of the population) was on food stamps. For the 19 counties in the top attainment category, on the other hand, 1 out of every 14 people (or 6.9% of the population) was on food stamps.

Percent of people receiving food stamps by educational group



Source: CLIKS, 2000 & U.S. Census Bureau, 2000.

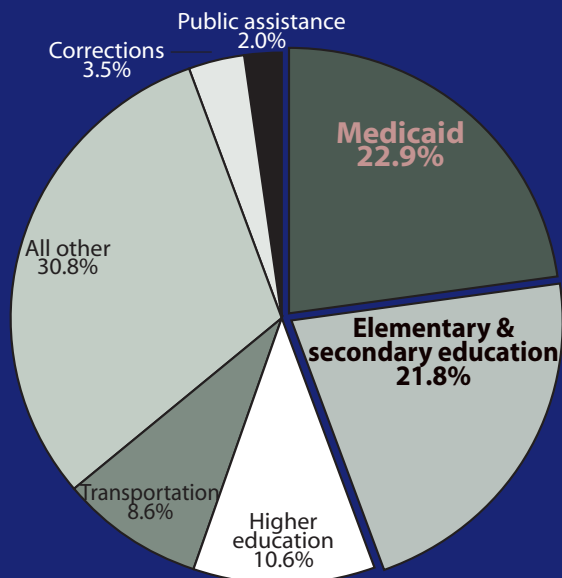
spending in Tennessee

Needs, priorities, choices

For years and years, K-12 spending was the largest single category of state spending for state governments in the U.S.

But 2005 was a year of change as total state spending on Medicaid across all states (\$283.0 billion) for the first time surpassed total state spending on K-12 education (\$269.2 billion) (NASBO, 2006).

What do state governments spend money on?



Source: NASBO, 2006

TennCare, TENNderCARE, and Cover Tennessee. In 1960, health care spending in the U.S. equaled about 5.0% of gross domestic product. This figure rose to 16.0% in 2004, and it is estimated that by 2014 health care costs will account for 18.7% of gross domestic product (The White House, 2006). As overall health care spending has grown so has spending on Medicaid and Medicare. (Tennessee's Medicaid program is called TennCare.) This rapid growth has severely strained state and federal budgets, the likely outcome being some combination of higher taxes and reduced spending in other areas of the budget. Medicaid, a program designed to provide health insurance to the poor, is now the most expensive government program designed for low-income individuals (Rosen, 2002). Medicare is a separate program funded by the federal government, which provides health insurance for the elderly. The long-term forecast for Medicare is grim, with huge spending increases anticipated as the population ages. The challenges confronting Medicare may be more daunting than those confronting the Social Security system.

The increased burden on federal and state governments due to significant growth in spending for Medicaid is unsustainable in the long run. In response, governments at all levels are making the push to expand enrollment in private insurance plans. For example, President Bush has developed a health insurance reform plan at the federal level that attempts to create a more efficient system where individuals can choose their health care package based on their own individual needs and preferences. In this system, the president pledges that more competition and market forces can promote efficiency and sustain the quality of health care at the same time that access is expanded. The reform proposed by the president allows health insurance to be carried across state borders (The White House, 2006).

The states are pursuing their own initiatives to rein in Medicaid costs, though there has been mixed success. California is the latest state to attempt to promote health insurance for all of its residents, following other states like Maine, Massachusetts, and Vermont. In California's proposal, Governor Arnold Schwarzenegger argued that extending health insurance coverage to all residents should be the responsibility of the government, employers, health care providers, and uninsured individuals themselves. This state response has developed at a time when some

spending in Tennessee

TennCare, TENNderCARE, and Cover Tennessee, continued

states (and all states in total) spend more on Medicaid than they do on elementary and secondary education. As more states contemplate health care insurance programs like this, it is likely that conversations will build regarding universal health care at the national level (Steinhauer, 2007).

Historically, many individuals in Tennessee have relied on TennCare because of their poor health status, because their employer did not provide health insurance, and/or because they could not afford to purchase private insurance. While TennCare is costly, the money does take care of many needy people. Like other states, Tennessee has enacted proposals to cover more people under private insurance systems. Cover Tennessee is the health care proposal developed by Governor Phil Bredesen that is intended to provide affordable and more portable health insurance options for working, low-income, uninsured Tennesseans (Cover Tennessee, 2007).

In the meantime, Tennessee continues to adjust the TennCare budget resources and spending following substantial reforms Governor Bredesen began in 2005. In early 2005 (the most recent year for which comprehensive enrollment data are available), TennCare covered significantly more individuals than the Medicaid programs offered by most states. The reason is that until the late-2005 reforms, TennCare served a substantial number of previously uninsured individuals, known as the medically eligible or expansion population, under the TennCare Standard program (Bureau of TennCare, 2005).

TennCare is a rather expensive government program, prompting the 2005 reforms to stall ever-increasing costs. In fiscal year 2005

- * Total expenditures on TennCare exceeded \$8.5 billion (Bureau of TennCare, 2005), or about \$6,312 per beneficiary.
- * Although the majority of funding was provided by the federal government, Tennessee state government supported more than \$2.5 billion (or 29.6%) of the total TennCare expenditures, or an average of \$1,870 per beneficiary.

The 2005 reforms changed eligibility requirements, benefit components, and premiums for its members. Adults, for instance, can now only obtain TennCare if they are Medicaid-eligible; the TennCare Standard program has been eliminated for adults. While an estimated 200,000 adults were disenrolled from TennCare during these reforms, no children lost their benefits. The Bureau of TennCare reported in its annual report for fiscal year 2005–06 that “TennCare is now stable and operating within its budget” (Bureau of TennCare, 2007, p. i).

- * In fiscal year 2006, TennCare’s total expenditures were \$6,918,716,800 (Bureau of TennCare, 2007), and TennCare enrolled about 1 out of every 5 Tennesseans and 4 out of every 10 children under age 19, or approximately 1,224,100 people.
- * TennCare estimates its total services expenditure per member to be \$4,285.28 (Bureau of TennCare, 2007).
- * Assuming that state expenditures are approximately 29.8% of total TennCare spending as they were in 2006 (State of Tennessee, 2007), state expenditures per TennCare member are approximately \$1,275.

Recent survey data for the state of Tennessee indicate that children on TennCare come from households with parents who have relatively lower levels of educational attainment. The same survey asked adults about whether they had private health insurance, and the responses were complementary, showing that the likelihood of having private insurance rises with adult educational attainment as well. These findings should not be a surprise. Those with less education generally have fewer skills and are less likely to hold a job where the employer offers health insurance. Less education also means lower income and thus less ability to purchase health insurance in the market. Both adults and children bear the consequences of low levels of educational attainment within the household.

“Every child in Tennessee deserves to grow up healthy and happy.
TENnderCARE is the state’s commitment to see that our children and teens have the best start at a healthy life.” — Phil Bredesen

TENnderCARE is a program that provides accessible health care resources for TennCare children from birth to the age of 21, including free check-ups, dental care, medical treatment, and behavioral health services (Bureau of TennCare, n.d.). These services are provided by a primary care provider (PCP) or through the health department. The support provided by TENnderCARE can help children while they are young and may reduce health care problems later in life to the benefit of the child and society.

TENnderCARE screenings for children are encouraged and include comprehensive health (physical and mental), complete physical exam, health education/anticipatory guidance, vision and hearing screening, developmental and behavioral screening, laboratory tests, immunizations.

Programs such as TENnderCARE help avoid obstacles that children and teens might encounter that keep them from realizing their full potential. By helping disadvantaged children early, kids are more likely to succeed and provide positive spillover benefits to society. Early intervention is critical. For example, programs such as Ludwig and Sawhill’s (2007) *Success by Ten* emphasize that intervention must be done early, often, and effectively for children to succeed, thus maximizing benefits to society through a better-educated population.

Research has found that early intervention programs aimed at helping high-risk children from disadvantaged families can provide substantial returns (Heckman & Masterov, 2007). For example, these children commit fewer felonies and misdemeanors, and they are less likely to become juvenile offenders. Benefits include

- ▶ Higher test scores
- ▶ Decreased grade retention
- ▶ Reduced time in special education
- ▶ Less crime and delinquency
- ▶ Increased high school graduation

In fact, specific programs, such as enriched preschool programs, provide evidence suggesting that those disadvantaged children who participate in such programs are 11.0% more likely to graduate from high school, 11.0% less likely to participate in special education programs, 15.0% less likely to repeat a grade, and 8.0% less likely to be arrested as a juvenile, compared to those children who do not participate in such programs.

Heckman and Masterov (2007) also find that economic outcomes are better for those children who come from disadvantaged families but participate in an early intervention program. One study reviewed by Heckman and Masterov shows that these children are

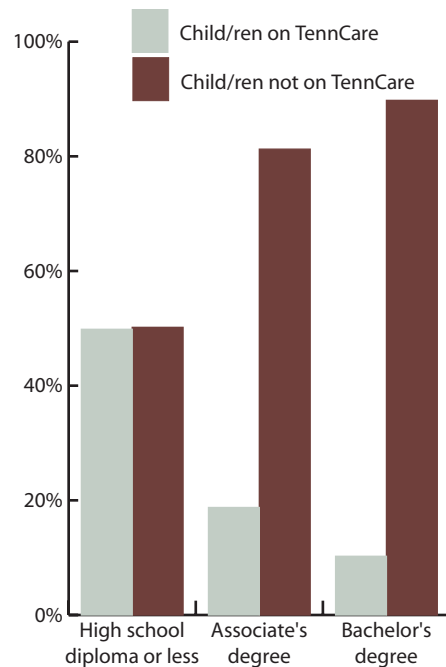
- ▶ 22.0% more likely to earn \$2,000 or more in monthly income
- ▶ 23.0% more likely to own a home
- ▶ 21.0% less likely to ever be on welfare as an adult

PUBLIC SECTOR

spending in Tennessee

TennCare, TENNderCARE, and Cover Tennessee, continued

Our communities and TennCare



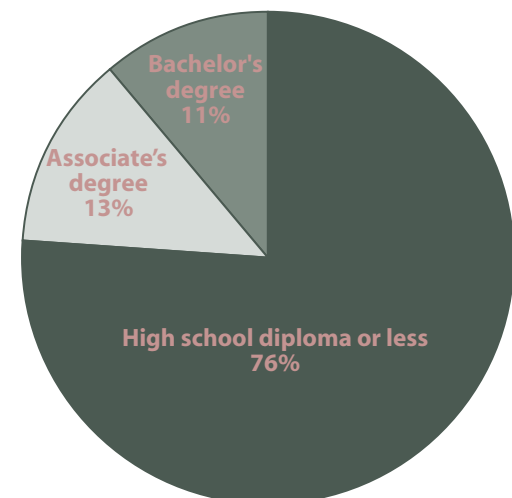
Source: SSRI & CBER-UT, 2007.

If the household head has only a high school diploma, the odds are about 50:50 that a child will be on TennCare (SSRI & CBER-UT, 2007). As educational attainment of the household head rises, the likelihood of the child being on TennCare diminishes. If the household head has a bachelor's degree, for example, the chance of being on TennCare falls to about 1 in 10.

Heads of households with higher levels of education are less dependent on TennCare for their children

Now look only at the children on TennCare and the educational attainment of the household head. Over three-quarters of the children on TennCare have household heads with no education beyond high school.

The majority of kids on TennCare have parents with low educational levels



Source: SSRI & CBER-UT, 2007.

From the literature

"Children in poor health may be less schoolready than other children. In addition to being less able to learn at school, they may miss more school days because of illness and may complete fewer years of schooling over their lives. Their poorer schooling, in turn, could limit their earnings potential, quality of life, and possibly their health as adults. A small but growing literature indicates that health in childhood is in fact a determinant of cognitive ability and educational attainment" (Case & Paxson, 2006, p. 159-160).

"Income-related disparities in childhood health are evident at birth or even before, and the disparities grow more pronounced as children grow older. Not only do poor children have more severe health problems than wealthier children, but they fare less well than healthier children who have the same problems. They also receive less and lower-quality medical care for their problems. And poor families may be less well equipped to manage their children's health problems, which could worsen their effects" (Case & Paxson, 2006, p. 151).

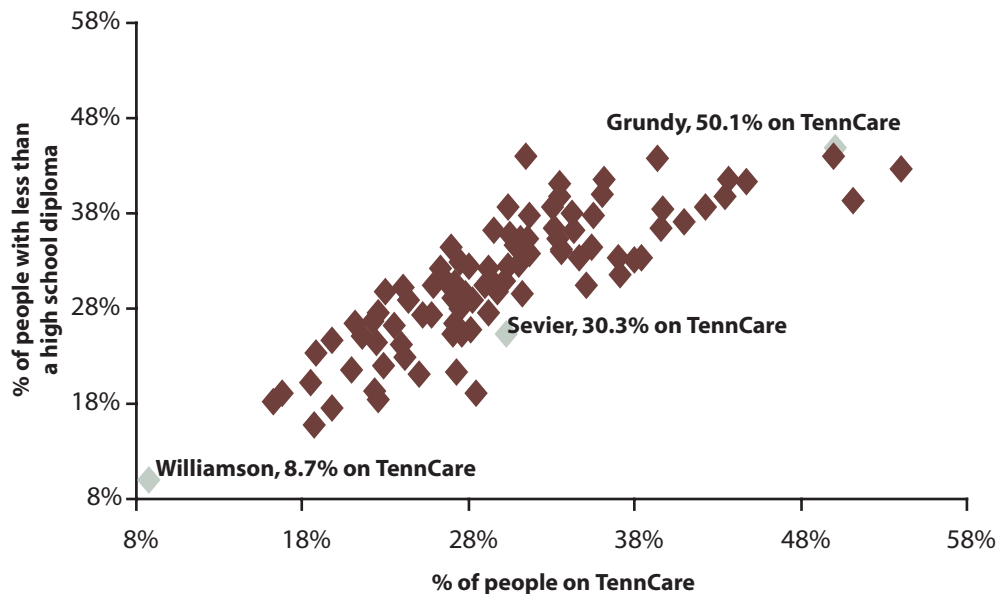
PUBLIC SECTOR spending in Tennessee

A complementary perspective using Tennessee survey data is shown in this figure that focuses on private insurance. It is clear that as adult educational attainment rises, so too does the probability that one has a private health insurance plan.

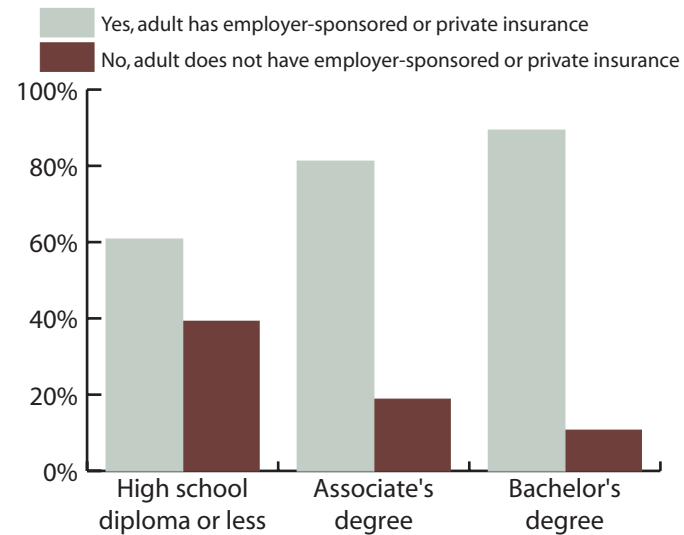
As educational attainment increases, so does the % of the population with employer-sponsored or private insurance

Let's turn the focus from individuals to our communities. A strong relationship exists between the educational attainment of the adult population and dependency on TennCare among Tennessee counties (CLIKS, 2000; U.S. Census Bureau, 2000). On the left scale, we show the share of the county adult population with less than a high school diploma, and on the bottom scale we show the share of the county population on TennCare. While there are certainly exceptions, there tend to be more people on TennCare in places where educational attainment is low.

Counties with fewer individuals with a high school education are more likely to depend on TennCare



Source: CLIKS, 2000 & U.S. Census Bureau, 2000.



Source: SSRI & CBER-UT, 2007.

Introduction to revenue in Tennessee

The federal government pays for a considerable share of the programs discussed in this chapter. Of course, we help support this spending through our federal tax payments, just like residents of other states. State government in Tennessee also contributes to the support of many visible programs like TennCare and Families First. While local governments are spared the direct burden of financing Medicaid and welfare programs, they do support local hospitals and health departments that incur costs from the low-income population. Moreover, local governments can be squeezed by fiscal pressures from above, both from the federal government and state government. The tighter federal and state budgets are, the bigger is the squeeze on local government finances.

As we noted earlier, 60 cents of every Tennessee state tax dollar comes from the sales tax. Many local governments, both cities and counties, also rely on the sales tax as an important revenue source. In fact, local governments must commit one-half of their sales tax collections to funding their public school system. Maintaining a strong sales tax base is obviously of critical importance to funding public services in Tennessee. The sales tax is being squeezed by a number of forces, including the growth of services, which are by and large not taxed, and the rise of electronic commerce, which can easily escape sales taxation. Legislated exemptions are another part of the story. Businesses pay a significant portion of the sales tax in Tennessee, so to help them remain competitive in the marketplace, they are often granted exemptions on some of the things they purchase. Consumers receive tax breaks as well, including popular programs like sales tax holidays and a lower sales tax rate on food. (See also TACIR & CBER, 2003, at http://state.tn.us/tacir/PDF_FILES/Taxes/primer.pdf for an overview of the state tax system in Tennessee.)

The property tax is the mainstay of local government finances in Tennessee. It is used to fund general government services, including police and fire protection, as well as a significant share of local government's cost of elementary and secondary education. So like the sales tax, we need a healthy property tax base to fund the government services that we all use. While the local property tax may not be subject to the same big squeeze as the sales tax, it faces its own unique set of problems. One example is the decline in manufacturing which means the erosion of an important part of the local property tax base. Another example is the recently enabled local property tax freeze for elderly households. If local governments adopt the freeze, it will help many lower-income elderly households, but it also means less money to fund government services.

Earlier in this chapter, we pointed out that the education of our population affects the demand for more government services. Is it true that poorly educated people contribute less to the tax base? Let's take a look at the sales and property taxes in Tennessee.

PUBLIC SECTOR

revenue in Tennessee

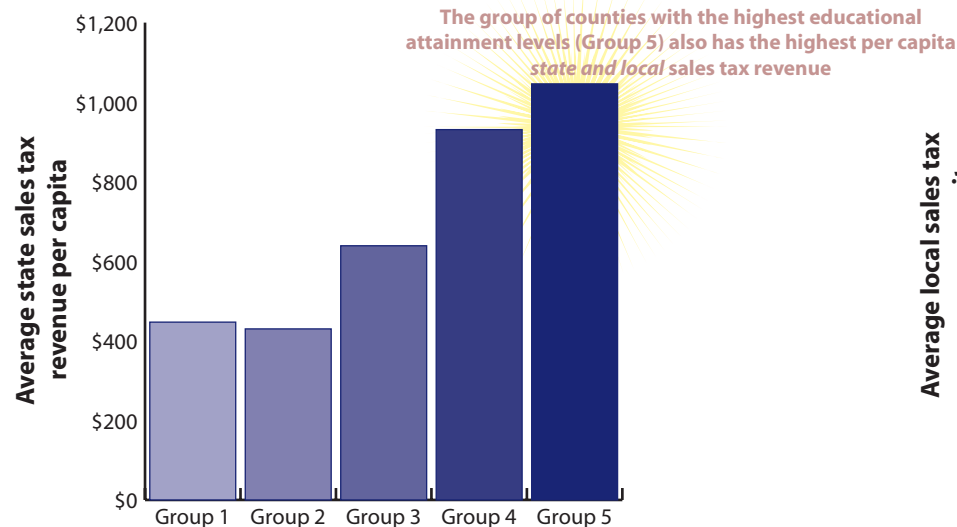
Education and sales tax revenue. To illustrate the way education can affect the revenue side of the government budget, we begin with a county-level focus built around the educational attainment of the adult population. Because of the extraordinarily high linkage between attainment and earnings, we expect to see counties with a better-educated population also have a stronger sales tax base. Tennessee's 95 counties have been divided up into 5 groups (i.e. into quintiles) with 19 counties in each group, based on the share of the adult population with at least a high school degree in 2000. We then look at the amount of state and local sales tax revenue per person within each of the 5 county groups using tax revenue data for 2005/06 and population data for 2006. The results are shown below.

Per capita state and local sales tax revenue is generally higher in counties with a better educated population. State sales tax revenue per capita for the top attainment group is \$1,046 versus only \$447 for the 19 counties in the bottom attainment group, a difference of 134%.

Unlike the state sales tax rate which is the same across the state, local rates show some variation across cities and counties. So differences in collections at the local level depend both on spending and tax rates. Nonetheless, the picture for local sales tax collections looks a lot like the picture for state tax revenue. The top 19 attainment counties have \$288 in per capita sales tax collections compared to \$128 for the bottom 19 counties, for a difference of 125%.

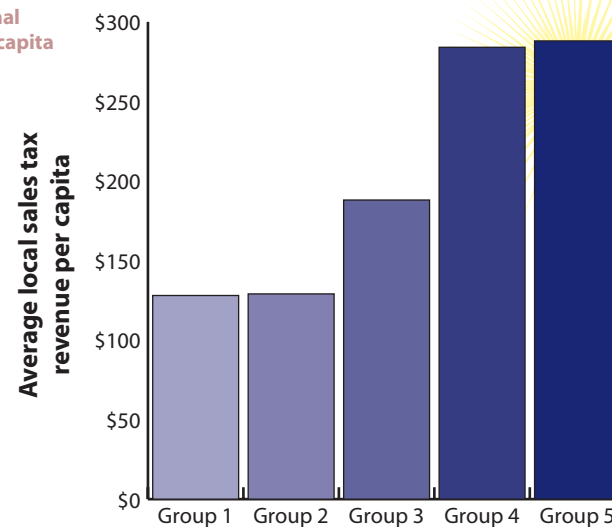
Think about what these differences mean in terms of our ability to fund state and local government services.

Average state sales tax revenue per capita by educational attainment group



Source: CBER-UT.

Average local sales tax revenue per capita by educational attainment group



Source: CBER-UT.

Education and Sales Tax Revenue, continued. Another way to look at the linkage between education and sales tax performance is to isolate the taxes paid by individuals with differing levels of attainment and thus differing levels of earnings in the marketplace. This proves to be a difficult puzzle to solve in practice. We start with the easiest piece of the puzzle, the relationship between educational attainment and income using Tennessee data for 2000. As we have shown elsewhere in this book, the differences are striking with the premium on more education rising across most attainment categories. A high school dropout earned only \$8,812 per year while someone with a high school diploma earned \$16,274 in 2000. The earnings for a bachelor's degree holder totaled \$36,042 in the same year, 121% more than a high school degree holder and 309% more than a high school dropout.

A problem with taking these attainment and income data the next step (estimated sales tax payments) is figuring out just how much people spend on things that are subject to the sales tax. Some things like rent and food stamp purchases, along with most services, are not taxed at all in Tennessee; food is taxed at a lower state rate than other goods, and many other products are subject to the 7% state tax rate and any local sales taxes imposed by cities and counties. In addition, businesses and tourists contribute to our sales tax base in Tennessee. Because of all of these problems, we have chosen a simplistic and transparent approach for illustrative purposes. The estimates should thus be viewed as merely suggestive of how educational attainment affects state and local sales tax collections.

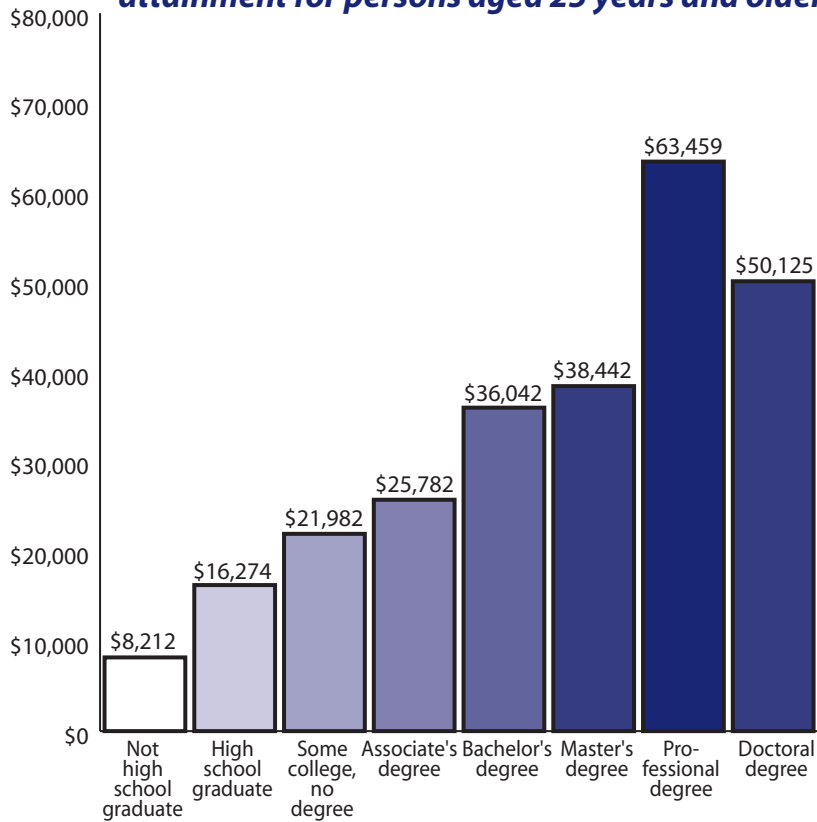
First we need to get a sense of the linkage between income and sales taxes. To resolve this problem, we rely on a fairly recent study that examined the equity of state tax systems, including the tax system in Tennessee (ITEP, 2003). The study reports the share of income paid in sales tax (along with other taxes) by income category using information on taxes for fiscal year 2002. These figures show that the share of income paid in sales tax falls with income, which means the sales tax is regressive. One limitation of these data is that they do not account for the sales tax rate increase that Tennessee enacted for 2003 and the years that followed. Because of this rate increase, the estimates we present will understate the amount of sales taxes people might pay.

We have tried to make the estimates more current by moving the earnings figures for 2000, which were presented above, to reflect a more recent year. To do this, we use national data on the change in earnings by level of educational attainment from 2000 to 2005, since state data are not available. The final step is to apply the estimates of the share of income paid in sales tax by income category from the study noted above.

The story here is quite clear. A high school dropout would pay only \$571 per year in sales tax while a person with a professional degree (e.g. a doctor or a lawyer) would pay the most in tax, a total of \$2,547. A high school graduate is estimated to pay \$1,087 in state and local sales tax, while someone with an associate's degree pays about \$1,427 in sales tax. If you jump to a bachelor's degree, the sales tax payments climb to \$1,663 per year.

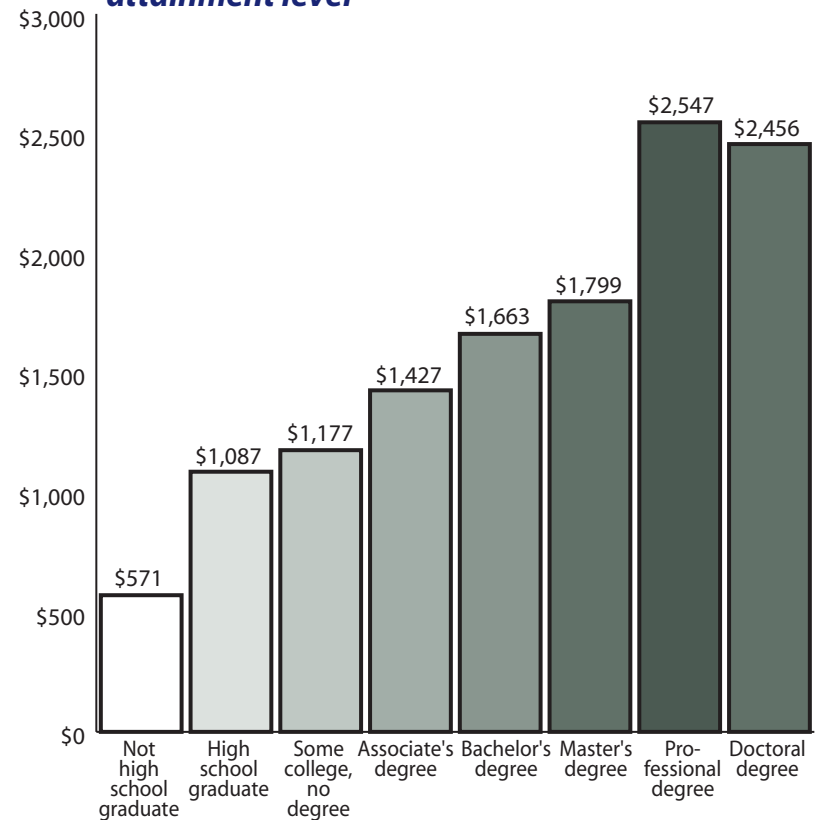
PUBLIC SECTOR revenue in Tennessee

Wage and salary income, by educational attainment for persons aged 25 years and older



Source: U.S. Census Bureau, Census 2000, *Public Use Microdata 5% Sample*.

Estimated sales tax payments by educational attainment level



Source: CBER-UT.

The story here is quite clear.

PUBLIC SECTOR

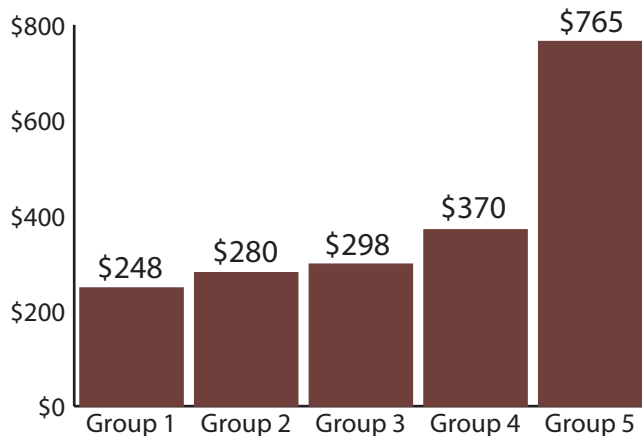
revenue in Tennessee

Education and Local Property Tax Revenue.

Since more education translates into higher earnings, we would expect the better educated to live in more expensive homes and pay relatively higher property taxes. As we have argued elsewhere, a better educated workforce also fosters a stronger economic development climate, which can easily translate into more business activity and thus a stronger commercial and industrial property tax base. So there are 2 channels whereby education might boost the vitality of the local property tax in Tennessee: residential property and business property.

As we did with the sales tax, let's begin with a county-level analysis of the role educational attainment might play in affecting the local property tax. Once again, we break Tennessee's counties into five groups based on the share of the adult population with at least a high school degree in 2000. For each of these 5 groups, we then consider average property tax revenue per capita, using population data and U.S. Census Bureau data for 2002 that account for all local property tax collections (including all types of property for cities and counties). Since these are revenue data, they account for both the size of the tax rate and the tax base. Rate differentials may help explain some of the variation shown across county groups. We do not have good data to account for the growth in the property tax base since 2002 so the numbers are not adjusted any further.

Average property tax revenue per capita by educational attainment



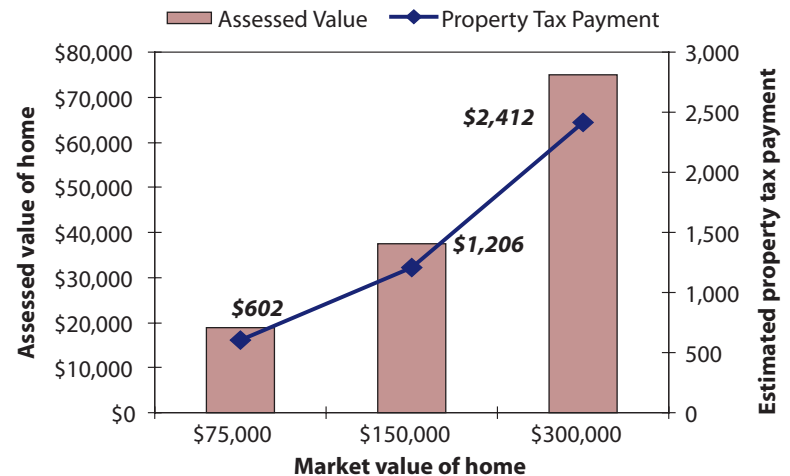
Source: CBER-UT.

The figures are again revealing. For the top attainment group, per capita property tax revenues were \$765 per year in 2002. Contrast this against the bottom category where revenues per capita were only \$248 per year. As with the sales tax, think about what this means to different communities when they try to fund public services and balance their budgets.

We do not have detailed data on educational attainment and home ownership patterns in Tennessee that would allow us to look at property tax burdens for different households. So as a simple illustration we have chosen 3 hypothetical property values—\$75,000, \$150,000 and \$300,000—and then calculated the amount of property tax revenue that would be paid using an average residential property tax rate for Tennessee cities and counties. The actual rate used in these examples is \$3.22 per hundred of assessed value (where assessed value is 25% of actual market value).

A home with a market value of \$75,000 would produce property tax revenue of only \$602 per year, compared to \$1,206 for a \$150,000 home and \$2,412 for a \$300,000 home. Of course, we cannot say anything specific about the educational attainment of these households; instead we are simply assuming that it is likely that people with a better education live in more expensive homes.

Estimated property tax payments for hypothetical property values



Source: CBER-UT.

So what?

What Does It All Mean?

We are not in a position to conduct a comprehensive assessment of net fiscal burdens for people with different levels of education in Tennessee like that presented for the U.S. by Rector et al. (2007) described above. But the numbers we have presented on expenditure programs and sales and property taxes, despite their simplicity, are nonetheless revealing. If we were to improve the educational attainment of our population, the spending pressures on our government would be diminished and our tax base would be stronger. This might allow us to enjoy lower taxes or spend our tax dollars in other ways. Returning to our earlier analogy, our body would have the resources it needs to perform what we ask it to perform.

As a simple illustration, consider a poor family of 3 where the household head has only a high school degree. The family is assumed to be on both TennCare and Families First and live in a home worth \$75,000. Note from the discussion above that Tennessee's share of spending per TennCare beneficiary is \$1,275, so the total TennCare costs for this family of 3 are \$3,825. Let's assume that the family receives the average amount of Tennessee's share of assistance group support from Families First, \$547. Adding these benefits together yields a total of \$4,372 in support from Tennessee taxpayers through state taxes.

A home worth \$75,000 would translate into a property tax bill of \$602, using a statewide average rate. Of course, this is local revenue and our state government sees none of it. Combined state and local sales tax payments would be \$1,087 using the figures presented above. Of this total, roughly 3/4 would flow to the state, and the remainder would go to the coffers of local government. Adding the taxes together produces a total of \$1,689 per year, but less than one-half of this is state revenue.

We have considered only a couple of pieces of the fiscal puzzle and have already produced a huge deficit for the state. The situation for local government, though, looks pretty rosy. Right?

But look again. What about schooling costs? In the 2003–04 fiscal year, Tennessee spent \$6,504 per pupil in public elementary and secondary schools. Of this total, 43.4%, or \$2,823 came from the state, while 45.6% or \$2,966 came from local sources. (The remainder came from the federal government.) So is the picture rosy for the local government? No, they don't receive enough sales and property tax revenue from this hypothetical household to fund even a single child in the public schools, let alone any other locally provided services the household might use. And state government's deficit has simply widened by considering education spending.

This simple illustration raises an important question: if a low-income household does not pay enough in sales and property taxes to support schooling and other services, how do we balance our budgets? Aside from federal aid, there are 3 mechanisms. First, households pay other taxes and fees in Tennessee, like the Hall income tax and motor vehicle registration fees. Second, higher income households pay a lot in taxes, but they generally don't rely on government services like TennCare. This helps pay for the government services consumed by low income people. Third is through taxes on businesses, like the state corporate excise tax on business profits and the local gross receipts tax.

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Education Crossroads

Big steps via small steps—continue the journey

Big Steps Forward. What would happen if we took some big steps down the education path? If you have spent much time reading this book, you realize that a lot could happen. What if we could move our college graduation rate to match the national average? What if the number of high school dropouts was cut in half? Better yet, what if we were able to reduce the dropout rate in Tennessee to zero? Any one of these improvements would be huge steps forward. Incomes would grow, family economic security would be enhanced, businesses would be more competitive, there would be less pressure on government budgets, and our communities would be stronger.

It's exciting to think about such big steps forward. **But how do we get there?** We can only get there by taking a series of small steps, just one step at a time. We have to think big and dream big, but ultimately it boils down to a series of small steps forward.

Big Steps Forward. What are small steps? They are the little things that we each do everyday that take us a bit further in our lives. Each step may seem inconsequential, like the pieces of straw in a haystack. But each piece of straw is important. Without the small steps, we cannot together take the big step forward.

Here is a good example of a small step—and a real one at that. Recently the Center for Business and Economic Research received a letter from an inmate housed at a federal correctional institution in Florida. Why in the world would he be contacting us? The inmate who wrote the letter explained that he had been in prison for 20 years and would be released in 2010. Since 2001, this inmate has been enrolled in a distance-learning MBA program in anticipation of his release. The inmate had come to the realization that he needs an education to ensure that he is employable when he returns to society. The prison has opened a Career Resource Center to help inmates prepare for their freedom and entry into the labor market. The inmate wrote "... we could desperately use any donations of business books, business educational materials, or publications that would help the men here gain some knowledge to turn our lives around."

This request is one small step forward on the part of one person, and yet it has the potential for enormous consequences for other inmates, their families, and society as a whole. There are lots of small steps that each and every one of us can take.

What are some small steps we might take?

Read to a child. Share the importance of learning with enthusiasm. There is good evidence that parental support of a child's education improves the child's academic performance and social well-being.

Does your son or granddaughter have a particular love for dinosaurs or birds or painting? Visit a museum, the library, a nature center. Explore free day-courses or school programs to ignite a passion.

Wouldn't you like to feel more comfortable at your computer? Wouldn't you like to say to your co-worker, "Oh, I know how to do that; I learned that in class last week." Ask your employer if you can attend a training class. Your employer might even pay for it, and then you will have skills to carry with you for the rest of your life.

Have you been meaning to go back to school? Perhaps get your GED or an associate's degree or turn that associate's degree into a bachelor's? Meet with a counselor or an advisor about what you would like to do. Brainstorm some funding options. Just one class at a time, one semester at a time, one small step at a time.

Maybe you feel like you have enough formal education. Are there still things you'd like to learn? Call your local community college and request a course catalog. Maybe you want to learn about investing your money for your future (IRAs, 401Ks, mutual funds, what does it all mean?). Maybe you enjoy gardening and have been thinking about improving the appearance of your home with landscaping. What will work best in your yard, with your soil, with your amount of rainfall?

There are some other steps that might be taken with some help from this book. Is education important to you and your family? Then share some of the information in this book with those in your family. Talk about it, maybe even argue about it.

Do you think education is important to your friends? What about those whom you encounter at church, at a club, a parent-teacher association, or a professional organization? Talk to them about education and what it means to all of us.

Maybe education matters because it directly relates to your job; perhaps you are a teacher or school guidance counselor or a principal. There is ample information in this book to share with others and to motivate additional inquiry into how education can affect the world around us. Are community investments in education important to you? Then talk to your local elected officials, including members of your local school board, about sustaining support for education.

Do you work with children or families who lack economic security? Perhaps you work for a nonprofit organization that helps children, like Big Brothers Big Sisters. Talk to the children about education; show the middle-school and high-school aged youth the pictures of what their earnings will look like. Talk to them about their choices and opportunities.

Do you need more information? Visit the Web site at <http://www.educationcrossroads.com>.

These are all examples of small steps. If we each take a small step, together we can take big steps.

Continue the journey.

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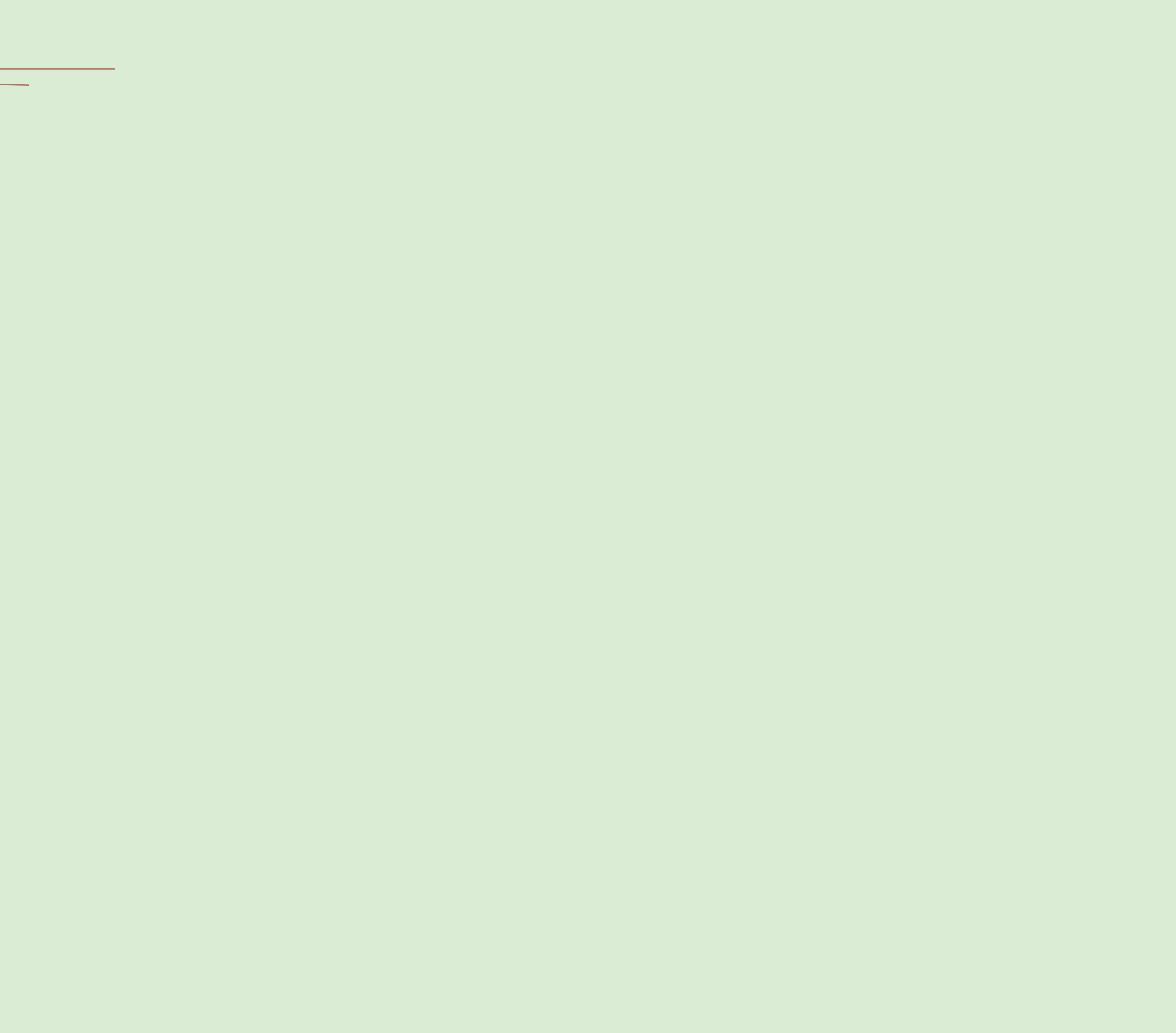
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79,572 children were born in Tennessee in 2004.

This year (3 years later), approximately 14,000 3- and 4-year-olds will be enrolled in a Tennessee pre-kindergarten program.

The state spends about \$7,000 per child for each year he or she attends K–12 school.

The American states now spend more on Medicaid than elementary and secondary education.

Only 7 out of every 10 teenagers who entered 9th grade in 2004 will graduate high school in May 2008 with their classmates.

The other 3 teenagers will not.

Between 1967 and 2004, households headed by someone with a high school degree or less actually saw their earnings *decline*.

In 2005, someone with a bachelor's degree in Tennessee earned \$51,554 per year, while someone with a high school degree earned \$28,645 per year.

Tuition at Tennessee's higher education institutions remains relatively low compared to other states.

The state's most rapidly growing jobs require at least some post-secondary education.

Tennessee's business leaders tell us they want to locate where the workforce is well educated.

Infant mortality rates fall as a mother's educational attainment rises.

A high-school dropout lives 2.5 fewer years than the average person.

In 2003, cigarette companies spent over \$15.2 billion on advertising.

In 2006, TennCare spending totalled \$6.9 billion.

Education has everything to do with it. *Quality* education has everything to do with all of it.

Education crossroads: opportunity for you, me, Tennessee, and society

Explore many paths—

We have 6,038,803 reasons to care.