Benchmarking East Tennessee’s Economic Capacity

By:

DRI/McGraw-Hill
Economic Competitiveness Group
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Economic Capacity: Key Foundations of an Economy

The economic vital cycle of a region is based on the responsiveness of public and private suppliers of inputs such as technology, skills, and financing to the evolving needs of the region’s industries. These suppliers are the region’s economic infrastructure.
Economic Infrastructure Can be Classified in Six Categories

**Human Resources:** Systems to prepare, advance, and renew skills to meet changing industry needs.

**Technology:** Systems to discover, develop, and deploy technology into the marketplace.

**Financial Resources:** Systems to fund the initiation, expansion, and modernization of industry.
Economic Infrastructure Can be Classified in Six Categories

Physical Infrastructure: Transportation, communication, energy, and environmental systems

Quality of Life: Sources of affordable housing, health and social services, public safety, culture and recreation to attract and retain work force.

Tax & Regulation: Business, property, and income taxes; work force, production and transaction regulations; and administrative systems that enable or inhibit business operations.
Economic infrastructure is particularly crucial to the development of a region’s economic strategy for two major reasons:

1. Unlike businesses which come and go, the elements of the economic infrastructure are the region’s geographic assets. People, technology, and capital may appear to be fluid, but if they don’t exist they must be brought in for business to succeed.

2. Improving the economic infrastructure improves the outlook for all. Sometimes called “the policy space,” the economic infrastructure are the areas in which collaboration pays off.
Three Questions of Economic Infrastructure Analysis

1. Disparities, concerns, and resources within the region
   - Can the 15 counties act as an economic unit?

2. Comparative advantage
   - How does East Tennessee's economic infrastructure compare with that of a competitive reference group?

3. Competitive advantage
   - How can East Tennessee translate its economic infrastructure into economic performance -- how can it grow its clusters?
Three Questions of Economic Infrastructure Analysis

1. Can the 15 counties act as an economic unit?
   — are there equal educational opportunities?
   — are there disparities in financial and technological resources?
   — how well does technology and the physical infrastructure serve to link the counties?
Human Resources
Percent of workforce with less than 9th grade education

U.S. Avg. = 12.1%

Union = 42.5%

Knox = 12.8%

Source: Corporation for Enterprise Development
Analysis by County
Human Resources
Percent of workforce with
4+ years of college education

U.S. Avg. = 23.8%

Morgan = 4.6%

Knox = 28%

Source: Corporation for Enterprise Development
Analysis by County
Human Resources: Entrepreneurship
Growth rate in number of proprietors

U.S. Avg. = 8.3
Scott = 8.4
Sevier = 22.8

Source: Corporation for Enterprise Development
Analysis by County
Technology
Percentage of technicians in workforce

U.S. Avg. = 3.4%

Union = 1%

Anderson = 5.5%

Source: Corporation for Enterprise Development
Analysis by County
Capital
Bank deposits per capita

Grainger = $3,328

Sevier = $9,300

U.S. Avg. = $9,431

Source: Corporation for Enterprise Development
Analysis by County
Physical Infrastructure
Change in non-residential construction ($000), 1985-1989

Campbell = (-$406)

Knox = $25,519

Source: Corporation for Enterprise Development
Analysis by County

DRI/McGraw-Hill
Three Questions of Economic Infrastructure Analysis

2. How does East Tennessee's economic infrastructure compare with that of a competitive reference group?
East Tennessee’s Comparative Advantages: Benchmarking a Reference Group

East Tennessee’s Challenge and Vision:

- Respond to the dual threat of slowing growth in manufacturing and reduced government spending
- Take advantage of the region’s technology resources to both manage the transition and become one of the few highly flexible, technology-intensive emerging economies

It was with this challenge and vision in mind that East Tennessee’s Reference Group was chosen.
East Tennessee’s Reference Group

15 Mid-Sized Technology Intensive Economies

- Portland
- San Jose
- Denver
- Colorado Springs
- Memphis
- Albuquerque
- Knoxville
- Austin
- San Antonio
- Jacksonville
- Orlando
- Raleigh Durham
- Chattanooga
- Tucson

DRI/McGraw-Hill
The Knoxville area is not large or fast growing compared to this reference group.
Nor is it an Economic Performance Leader

### Overall Economic Performance

<table>
<thead>
<tr>
<th>Region</th>
<th>Rank</th>
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<tbody>
<tr>
<td>Raleigh/Durham</td>
<td>1</td>
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<tr>
<td>San Jose</td>
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<td>Tucson</td>
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<tr>
<td>San Antonio</td>
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<table>
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<tr>
<th>Region</th>
<th>Employment Growth</th>
<th>% Change in Employment</th>
<th>Unemployment Rate</th>
<th>Labor Force Participation Rate</th>
<th>Average Earnings per Job</th>
<th>Growth in Average Earnings</th>
<th>Per Capita Income</th>
<th>Growth in Per Capita Income</th>
<th>Net Migration</th>
<th>% Pop</th>
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<td>Portland</td>
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<td>San Antonio</td>
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<td>Tucson</td>
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<td>18.9</td>
<td>14763</td>
<td>22.1</td>
<td>90,593</td>
<td>60.8</td>
</tr>
</tbody>
</table>
But these cities are not East Tennessee’s competition; rather, they represent a yardstick for measuring the region’s performance in its economic infrastructure.
Human Resources: The Critical Foundation

Human Resources are arguably the critical foundation for the success of any region in today's economy:

- Most industries spend more on labor than on any other input to production.
- The capacity to supply the right mix of work skills at the right time enables regions to attract new industries, and increase productivity and market share of existing industries.
- The economy of the 1990s is becoming increasingly knowledge-intensive, emphasizing specialized technical and professional skills.
- As industry restructuring becomes a continual part of global competition, the ability to redirect and retrain the work force becomes increasingly important.
Human Resources: The Critical Foundation

Human resources are a product of the educational system and recruitment by industry over time. This foundation is increasingly fluid but essentially local in nature.
Human Resources: Key Indicators

Overall Human Resources*

San Jose --

Chattanooga -- Knoxville (10)

*Three sub-indices:
- Workforce Characteristics
- Entrepreneurship
- Educational Capacity
Human Resources: Key Indicators

Workforce Characteristics

San Jose --

Memphis, Chattanooga--

-- Knoxville (12)

- Percentages of workforce with less than 9th grade education, high school only, partial advanced, and college degree.
- Percentage of managers and professionals in workforce
- Percentage of professional specialists in workforce
- Percentage of precision craft and repair workers in workforce

Source: Bureau of Labor Statistics, compiled by Corp. for Enterprise Development
Analysis by Commute Zone
Human Resources: Key Indicators

- Proprietor employment to wage and salary employment ratio
- Ratio of proprietor income to wage and salary income
- Growth in proprietor income
- Average proprietor income
- Percentage change in proprietor income

Source: Bureau of Labor Statistics, compiled by Corp. for Enterprise Development
Analysis by Commute Zone
Human Resources: Key Indicators

Educational Capacity

San Jose --

Colorado Springs --

-- Knoxville (11)

- Size and variety of public K-12
- Private school options for K-12
- Number and size of colleges and universities

Source: Index created by Places Rated Almanac
Analysis by Metropolitan Statistical Area
Human Resources: Sound Bites

Strengths

- The region has the highest percentage of precision craft and repair workers among reference group—other technology/manufacturing centers often lack technician-level skills.

- The self-employed in East Tennessee are plentiful and doing well for themselves—ranking 5th in Avg. salary only $700 less than the reference group leader San Jose

Weaknesses

- A dangerously high 16.9% of the East Tennessee workforce has less than a 9th grade education—the U.S. average is 12.1%
Technology

Access to technology is growing in importance for several reasons:

- Technology historically has been a central contributor to productivity gains and economic growth.
- Most industries nationwide are spending an increasing share of their input costs on technology.
- The pace of technological change is accelerating, particularly in industries such as computers, communications, and medicine.
- New technologies are redefining work relationships and replacing many production and clerical jobs.
boundaries. Resources, as new ideas are rapidly diffused across
Technology is increasingly the most global of
interaction with other researchers and innovators.
Sources of technology include local equipment
Technology
Technology: Key Indicators

Technology Overall*

*Two sub-indices:
- Manufacturing Modernization
- Technology Resources
Technology: Key Indicators

Manufacturing Modernization

- Value added per worker hour, 1987
- New capital expenditures per worker, 1987
- Value of shipments per worker, 1987
- Change ($) in new industrial buildings, 1985-89
- Percent of technicians in workforce, 1990

- Percent of precision production workers in labor force, 1990
- Ratio of precision production workers to operators and assemblers, 1990
- Percent change in value added per worker, 1982-1987

Source: Bureau of Labor Statistics, compiled by Corp. for Enterprise Development Analysis by Commute Zone
Technology: Key Indicators

Technology Resources

Denver, Colorado Springs--

Orlando, Jacksonville-- -- Knoxville (10)

- Small Business Innovation Research Grants per capita, 1990-91
- Federal Research & Development dollars per capita, 1991
- University Research & Development dollars per capita, 1992
- Science & Engineering Graduate Students per capita 1992
- Patents granted per capita, 1992
- PhD Scientists & Engineers per 1,000 workers, 1991

Source: Corporation for Enterprise Development
Analysis by State
Technology: Sound Bites

Strengths

- Knoxville ranks 7th among the cities in science and technology PhDs per 100,000 workers—and this indicator is taken from the state level. It can be assumed that with comparable MSA information, the region would perform even better.

- Also not surprisingly, Knoxville has historically done well in federal R&D investment—building a technology capacity.

Weaknesses

- There is dramatic disparity among these technology cities in value added per worker—a good indicator of ability to turn technology capacity into economic performance:
  
  - San Jose = 92.74
  - Albuquerque = 27.27

  Knoxville comes in near the bottom at 40.57, short of the national average 47.97.
Technology: Key Indicators

Technology Resources

Denver, Colorado Springs---

Orlando, Jacksonville--- -- Knoxville (10)

- Small Business Innovation Research Grants per capita, 1990-91
- Federal Research & Development dollars per capita, 1991
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Knoxville comes in near the bottom at 40.57, short of the national average 47.97.
Capital: The Enabling Factor

Regions with a fast pace enterprise formation and healthy industrial clusters usually are surrounded by financial institutions that understand the specific needs of its each industrial sector and make available the financial instruments needed at each stage of development:

- Finance is an important vehicle for conducting business transactions in all clusters.

- Finance is the fuel the powers real estate development, banking, insurance, investment advising, and other activities in the Business, Professional & Financial Services cluster.

- Investment in new technologies, improved physical infrastructure, or the creation and expansion of new business cannot take place without access to sufficient capital.
Capital: The Enabling Factor

Most sources of financial resources are private: banks, savings institutions, equity markets, venture capital funds, and similar sources. However, the government plays a role in development and infrastructure financing and small business lending. The availability of capital in an area is more important than the mere amount.
Capital: Key Indicators

Overall Capital

San Jose --

Chattanooga--

-- Knoxville (11)

- Commercial and Industrial loans per worker, 1993
- Ratio of Loans to Deposits, 1993
- Total bank deposits per capita, 1989
Capital: Key Indicators

Commercial & Industrial Loans per worker
- Raleigh Durham
- Tucson
-- Knoxville (6)

Analysis by State

Ratio of Loans to Deposits
- Raleigh Durham
- Knoxville (7)
- Denver, Colorado Springs

Analysis by State

Total Bank Deposits per Capita
- San Jose
-- Knoxville (7)
- Colorado Springs

Analysis by Commute Zone

Source: Bureau of Labor Statistics, compiled by Corp. for Enterprise Development
Knoxville’s “middle of the road” rankings in capital availability drive down its composite score when compared to cities which might excel in one or two areas. It could be that the banking community and the resources they have to work with are a strong foundation for growth.

How has local banking behavior changed in the last five years?
Physical Infrastructure: Local Transactions and Global Connections

Physical infrastructure includes systems that provide on-site support to businesses, as well as connections with outside markets, suppliers and investors, including:

- Transportation (highways, bridges, railroads, airports);
- Communications (telephones, television, data transmission);
- Energy (electricity, natural gas, petroleum, other sources);
- Environmental systems (water, waste disposal)
Physical infrastructure is inherently the most local of all foundations, and is the product of a variety of public and private sources.
Physical Infrastructure: Key Indicators

Physical Infrastructure Overall*

Salt Lake City--

Orlando-- -- Knoxville (10)

*Sub-indices:
- Transportation
- Housing
- Sewage Treatment Needs
- Energy Costs
Physical Infrastructure: Key Indicators

Transportation

Salt Lake City--

-- Knoxville (15)

- Average daily commute time
- Access to national highways
- Public transportation availability
- Scheduled domestic air service
- Passenger rail

Source: Places Rated Almanac
Analysis by MSA
Physical Infrastructure: Key Indicators

**Housing**
- San Antonio
- Knoxville (3)
- San Jose

**Sewage Treatment**
- Albuquerque
- Raleigh Durham
- Knoxville (9)

**Energy Costs**
- Portland
- Knoxville (3)
- San Jose

Analysis by State
Physical Infrastructure: Sound Bites

Strengths

- Access to housing and low energy costs are physical infrastructure plusses for Knoxville. In the reference group, energy costs range from $0.0964/kWh in San Jose to $0.043/kWh in Portland. Knoxville’s cost is at about $0.053/kWh

Weaknesses

- Perhaps because of size, Knoxville ranks last, 15th, when it comes to transportation. Most of the reference group have more transportation amenities. For instance, Knoxville ranks 13th with 54 city buses—Raleigh Durham at 12th has 88 and Denver has the most at 540. Likewise, Knoxville hosts an average of 215 flight per day—more flights than only Chattanooga (80).

- Although it does not have big city amenities Knoxville seems still to have a big city commute. In commute time, Knoxville ranks 6th at 45.8 minutes
Quality of Life: A Region’s Unique Features

Quality of life includes both basic and distinctive attributes that make a place safe, physically attractive, and intellectually challenging, including:

- Climate and natural resources;
- Public safety and welfare systems;
- Housing quality, availability and cost;
- Health care quality, accessibility, and cost;
- Recreational and cultural amenities;
- Cost-of-living
Quality of Life Is Growing in Importance in Economic Development

Quality of life is difficult to measure and highly subjective, but it is nonetheless an important contributor to economic growth and an increasing focus of development efforts:

- Housing, health care, and other amenities are important factors in attracting and retaining skilled workers
- Climate, scenery, and recreational and cultural assets help lure business and personal travelers
- A robust cultural environment helps stimulate creative thinking, design, and research work
Quality of Life Is Growing in Importance in Economic Development

Quality of life issues are usually local in scope, and frequently difficult to address. Many aspects of quality of life are unchangeable (climate, geography), and solutions to other problems such as crime or living costs are often linked to issues facing other foundations. Yet, a strategic focus on quality of life can help attract and retain new businesses and workers alike.
Quality of Life Issues Are Important in Business Location Decisions

<table>
<thead>
<tr>
<th>Criteria</th>
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<td>Occupancy/Construction Costs</td>
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<td><strong>Low Crime Rate</strong></td>
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<td>State and Local Incentives</td>
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<td>Availability of Skilled Labor</td>
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<td>Availability of Land</td>
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<td>Rating of Public Schools</td>
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<td><strong>Housing Availability and Costs</strong></td>
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<td>Nearness to Major Markets</td>
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<td>Right-to-work State</td>
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<td>Nearness to Suppliers</td>
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<td>Availability of Unskilled Labor</td>
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<td><strong>Recreational Opportunities</strong></td>
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Percent of respondents rating each category as "important" or "very important"
Quality of Life: Key Indicators

Quality of Life Overall*

*Includes sub-indices:
- Crime
- Health care
- Climate
- Arts
- Recreation
- Cost of Living

-- Knoxville (1)

-- Austin--
Quality of Life: Key Indicators

Crime

- Violent Crime Rate
- Property Crime Rate
  (weighted to VCR)

Jacksonville vs. Knoxville (1)
Quality of Life: Key Indicators

Health Care

Number and size of health care assets:

- Office-based physicians
  - general practitioners
  - medical specialists
  - surgical specialists
- General hospitals

-- Raleigh Durham

Austin -- -- Knoxville (11)
Quality of Life: Key Indicators

Climate

San Jose -- Knoxville (3)

San Antonio --

- Average daily temperature
- Weather conditions (favors mildness)
Quality of Life: Key Indicators

The Arts

San Jose --

Chattanooga--

-- Knoxville (8)

- Number of concert radio stations
- Total number of touring artists bookings at local campus and civic auditoriums
- Number of resident symphony orchestras, opera companies, professional theatres, and ballet companies
- Number of nonprofit institutions whose main function is exhibiting art to the public
- Number of public libraries
Quality of Life: Key Indicators

- Number and quality of recreation facilities: golf course, restaurants, movie theaters
- Number and quality of attractions: zoos, aquariums, theme parks, pari-mutual betting, professional sport teams, NCAA sport teams
- Size of outdoor recreation assets: miles of coastline, protected acreage
Quality of Life: Key Indicators

Cost of Living

Chattanooga --

San Jose --

-- Knoxville (2)

- Typical household income
- Typical state and local taxes
- Housing cost:
  - Average price
  - Utilities
  - Property taxes

Living cost:
  - College tuition
  - Groceries
  - Health care
  - Transportation
Strengths

- Climate and recreation surely go hand and hand. Knoxville not only ranks second in the reference group for recreation but also ranks 18th among national MSAs (Tuscon, the leader, ranks 10th).
- Knoxville is a big winner when it comes to crime. The average annual violent crime rate is 366 compared to the U.S./Canadian average of 408. Jacksonville’s, the reference group trailer, is 1,064.

Weaknesses

- Of QoL indicators, Knoxville scores lowest on health care although the numbers seem to show that facilities and physicians can meet the population’s needs. But is the area attracting new medical talent? Is it remaining on the cutting edge of medical practice? Maybe not, for instance, only 1 of Knoxville’s 10 hospitals is AMA residency accredited as compared to 6 of Raleigh-Durham’s 10 hospitals.
Tax and regulatory environment includes the impact of an assortment of public policies:

- Personal, business, and property tax rates.
- Tax incentives and economic development programs.
- Health, safety and workforce regulations.
- Zoning and building permit procedures.
- Other administrative systems.
Tax and Regulatory Environment: The Public-Private Interface

For most regions, East Tennessee's tax and regulatory environment is complex and the product of a myriad of decisions at every level of government. Stakeholders in East Tennessee's economy have heavy influence over local (city and county) tax and regulatory policy, but face the reality that many important decisions are made in Nashville, Washington, or (increasingly) in cities spanning the globe.
Tax and Regulatory Environment: The Notion of a “Favorable” Tax and Regulatory Environment is Changing

A “pro-competitive” tax policy relies on more than just low tax rates:

- The overall burden should be in line with benefits received in the form of government services.
- The overall burden should not be significantly out of line with those of other regions.
- The tax system should create an environment of stability for business planning.
- Tax administration should be even-handed, efficient, and easy to understand.
Tax and Regulatory Environment: The Notion of a "Favorable" Tax and Regulatory Environment is Changing

The quality of regulations is more important than the quantity:

- The regulatory system should foster stability and predictability.
- Regulatory processes such as permitting should be as simple and expedient as possible.
- The relationship between government and business should be professional and nonadversarial.
Tax & Regulatory: Key Indicators

Tax & Regulatory Overall

- Local tax levels per capita, 1987
- Index of state tax stability and balance among taxes, 1993
- Cost of worker’s compensation insurance to employer per $100 payroll, 1988
- State’s net worth of unemployment insurance fund, 1988

Raleigh/Durham---

Austin ---

-- Knoxville (7)

Source: Corporation for Enterprise Development, Grant Thorton Manufacturing Climate Study
Three Questions of Economic Infrastructure Analysis

3. How can East Tennesee translate its economic infrastructure into economic performance—how can it grow its clusters?
Over the next few months, the 21st Century Jobs Initiative will be convening a series of meetings with each of the region’s eight industry clusters. These groups will create action plans for improving the economic infrastructure for the region and their industry.

Key questions for the working groups:
— What are the specific needs of East Tennessee’s clusters?
— How can the region be flexible to meet differing cluster needs?
— How can East Tennessee best build on its strengths?
— In what areas can collaborative action improve the region’s overall competitiveness?