One of TACIR's goals is to bring useful information to Tennessee's residents and to everyone who is interested in understanding the challenges public policy makers face. As part of that continuing effort, we developed a set of indicators that anyone can use to assess what's going on in their own county. We have previously issued reports on local economic activity and personal & family economic well-being. This is our first report measuring human capital. We will soon update earlier reports and publish a new report measuring quality of life.

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Human Capital
Status and Momentum of Tennessee's Counties

by Scott White, Intern

Part of what attracts businesses to Tennessee is the human capital of its workers. Human capital is desirable from a personal standpoint because it allows us to make more informed decisions, lead healthier lives, and attract potential employers.   Another quality of human capital is that it sticks with us; no matter what happens to our physical possessions, we will carry our inner resources with us for the rest of our lives.   This edition of Fast Facts is an attempt to measure the amount of human capital across the 95 counties of Tennessee and the relative rates of change of these values, known as momentum. To do this, we identified five readily available and current measures of human capital in Tennessee, combined them into a single statistic, and looked at how they have changed over time.

Human capital is increasing throughout Tennessee, but there is still room for improvement.

No county in Tennessee has a perfect score when it comes to human capital. This is partly because labor force participation rates across the state declined during the recession and have not fully recovered since. In its 2013 Economic Report to the Governor, the UT Center for Business and Economic Research (CBER) predicts that the labor force will contract again in 2013 but post modest gains in 2014. Despite the recession, there were 19 counties with higher rates of labor force participation in 2011 than they had in 2000.

In contrast to the decline in labor force participation, the average education level of residents has improved in every county in Tennessee. However, Tennessee still ranks in the bottom 10 states nationally when it comes to average years of education.

Many counties with low human capital scores had short life expectancies as well. Some things about our health we can't control, but there are many we can. A 2012 report says Tennessee has the 3rd highest proportion of people in the nation who live a sedentary lifestyle (35%), as well as the 4th highest violent crime rate (613 per 100,000 people in 2011). Tennessee also has a higher teen pregnancy rate than 42 other states. Improvement in these areas will help increase the quality of human capital throughout the state.

Eighty-one percent (81%) of Tennessee counties scored less than 5 on the 10-point scale. This means most counties were closer to the lowest ranked county (Lake) than they were to the highest (Williamson). This makes sense considering that Tennessee ranks in the bottom quarter of states nationally in four out of the five indicators used in this index. When looking at Map 1, it's easy to see that some of the richest counties in terms of human capital are located near large urban centers such as Nashville and Knoxville. Moore County, home of the Jack Daniel's distillery, is the only real exception to this pattern. Many rural areas scored in the orange tier or below (1.0-3.9), which means that there is great potential for growth in these regions.

Map 1. Human Capital
County Ratings for Current Status (2011)
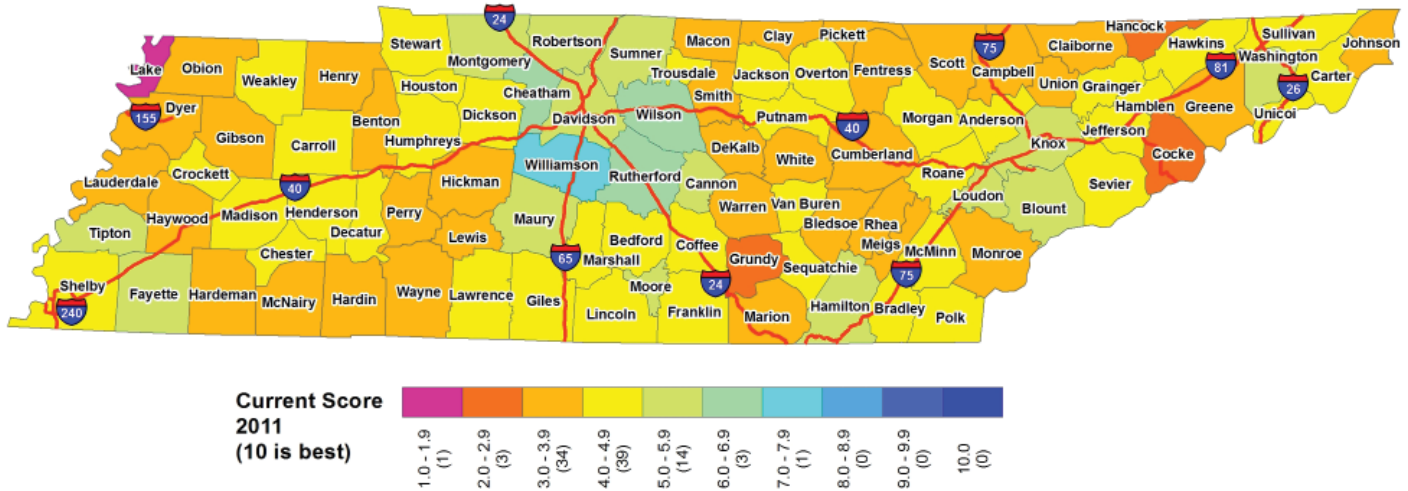
More than three quarters (78%) of counties had momentum scores over 5. In contrast to the current scores, only one county ranked in the orange tier (3.0-3.9) of momentum scores. Just as many high-momentum counties have low current scores as have higher ones. Davidson County had the most momentum in terms of human capital, while Macon County had the least momentum because of declining life expectancy, an increase in teen pregnancy, and lower labor force participation. Fayette County had one of the highest momentum scores because both life expectancy and labor force participation increased substantially. Most (89 of 95) counties had momentum scores between 4 and 7, showing that growth in human capital is largely consistent across Tennessee.

Map 2. Human Capital
County Ratings for Momentum (2000-2011)
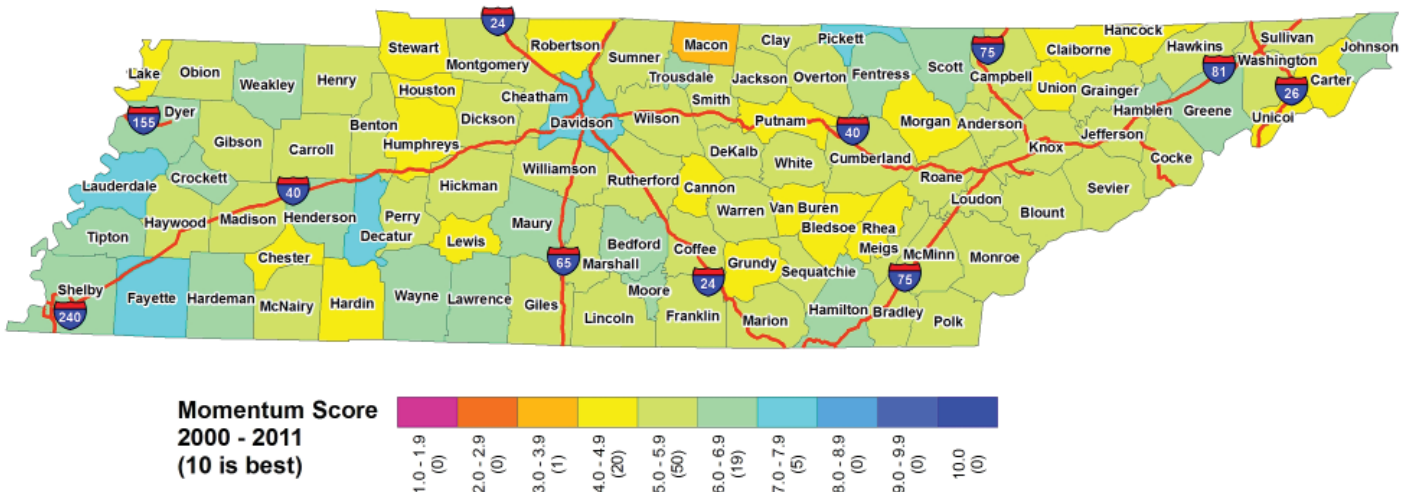
Human Capital

	Current Status		Momentum	
	10-pt Scale	Rank	10-pt Scale	Rank
Anderson	4.8	24	5.4	51
Bedford	4.3	39	6.0	24
Benton	3.7	76	5.2	59
Bledsoe	4.0	60	4.3	89
Blount	5.5	9	6.0	27
Bradley	4.6	31	5.6	46
Campbell	3.0	90	5.1	67
Cannon	5.0	17	4.8	81
Carroll	4.3	43	6.0	28
Carter	4.5	36	4.6	83
Cheatham	6.1	3	5.2	62
Chester	4.9	21	4.8	78
Claiborne	3.3	83	4.7	82
Clay	3.6	79	5.3	56
Cocke	2.7	92	5.0	71
Coffee	4.2	44	5.0	73
Crockett	4.3	42	6.7	8
Cumberland	4.0	58	5.7	37
Davidson	5.2	15	7.5	1
Decatur	4.1	47	7.0	5
DeKalb	3.6	77	5.2	60
Dickson	5.0	19	5.4	50
Dyer	3.8	72	6.1	19
Fayette	5.5	8	7.3	3
Fentress	3.2	86	6.0	23
Franklin	4.7	28	5.0	74
Gibson	4.0	57	6.0	26
Giles	4.5	35	5.6	43
Grainger	4.2	46	5.8	33
Greene	3.9	68	6.1	21
Grundy	2.5	94	4.1	91
Hamblen	4.0	56	6.5	10
Hamilton	5.2	14	6.2	18
Hancock	2.7	93	4.6	84
Hardeman	3.0	89	6.4	12
Hardin	3.3	84	4.1	93
Hawkins	4.6	29	5.7	39
Haywood	3.4	81	5.8	36
Henderson	4.3	41	6.4	14
Henry	4.0	61	6.0	25
Hickman	4.0	63	5.9	31
Houston	4.1	49	4.3	88
Humphreys	4.3	40	4.4	87
Jackson	4.1	50	5.3	53
Jefferson	5.0	20	5.2	64
Johnson	3.1	88	6.3	17
Knox	5.5	10	5.9	32
Lake	1.2	95	4.6	85

	Current Status		Momentum	
	10-pt Scale	Rank	10-pt Scale	Rank
Lauderdale	3.2	85	7.1	4
Lawrence	4.1	51	6.7	7
Lewis	3.8	71	4.2	90
Lincoln	4.7	26	5.1	69
Loudon	5.3	12	6.0	29
McMinn	4.1	52	5.3	58
McNairy	3.9	67	5.2	63
Macon	3.4	82	3.8	95
Madison	4.6	30	5.5	47
Marion	3.9	69	5.0	70
Marshall	4.6	32	5.3	57
Maury	5.0	18	6.4	16
Meigs	3.9	64	5.3	55
Monroe	3.8	70	5.7	41
Montgomery	5.5	7	5.6	44
Moore	5.9	5	6.6	9
Morgan	4.1	48	4.9	76
Obion	3.9	65	5.1	68
Overton	4.0	55	5.9	30
Perry	3.7	74	5.4	48
Pickett	4.0	62	7.3	2
Polk	4.4	37	5.8	35
Putnam	4.2	45	4.0	94
Rhea	3.1	87	4.4	86
Roane	4.9	23	5.1	66
Robertson	5.1	16	4.8	79
Rutherford	6.1	4	5.7	40
Scott	3.0	91	6.4	15
Sequatchie	4.4	38	5.3	54
Sevier	4.8	25	5.6	45
Shelby	4.0	54	6.9	6
Smith	3.9	66	5.0	72
Stewart	4.6	33	4.8	80
Sullivan	4.7	27	5.4	49
Sumner	5.9	6	5.6	42
Tipton	5.4	11	6.5	11
Trousdale	4.6	34	6.1	22
Unicoi	4.1	53	4.1	92
Union	3.6	78	4.8	77
Van Buren	4.0	59	4.9	75
Warren	3.7	75	5.4	52
Washington	5.2	13	5.8	34
Wayne	3.4	80	6.1	20
Weakley	4.9	22	6.4	13
White	3.7	73	5.7	38
Williamson	7.8	1	5.1	65
Wilson	6.2	2	5.2	61

Note: Rankings are based on unrounded ratings. Ties would occur only if the unrounded ratings were identical.

What goes into TACIR's evaluation of human capital?

We started by asking what traits a business in Tennessee would look for in potential employees. The first thing that comes to mind is education. One measure that takes into account all levels of education is expected years of schooling, which is the average amount of time a resident of a county spends in school. TACIR uses this measure rather than just one graduation rate because it reflects the entire level of education in a county. Many employers provide health insurance and would prefer healthy employees so that costs remain low. We use life expectancy as a measure of overall health. Employers also prefer employees who are part of a stable social environment, and an important feature of any stable social environment is the ability of parents to care for their children. We use teen pregnancy rates to estimate the number of parents who are able to contribute to a stable social environment. The local population may not be the right age or have the right skills to participate in the workforce, so the labor force participation rate is included to approximate hire-ability. Finally, employers would like to hire workers who are attractive to other businesses but at lower wages. The percentage of workers who commute out of county is used as an indicator of the amount of labor available at discount rates.

How does TACIR combine all of those different measures into one?

It's not easy, but it's not highly technical. If you've had a college course in statistics, you probably know how. And if you have an ordinary spreadsheet package like Excel, you can easily do it. Some high school math classes include these methods. The measures used are either in years or percentages.

One way to combine these measures would be simply to rank the counties for each one and then combine, maybe average, the rankings. But rankings fail to indicate how far apart the actual numbers are. Another way to combine them, admittedly more complicated, is to use a statistical measure called the standard deviation to determine how far each county is from the average of all counties. You can subtract the figure for each county by the average and divide the difference by the standard deviation to get something that is arbitrarily called a z-score. Z-scores show how far a number is from the average. Z-scores for different measures—like expected years of schooling and percent of population participating in the labor force—can be combined and still show how close or far apart the original numbers are.

That sounds complicated. How does TACIR make it easier to understand?

We take those z-scores for each county and measure, average them for each county, then shrink the results so they fit in a ten-point scale. Ten is the best a county can do and represents having the most human capital overall, if not for every category. On the other end of the scale, a one represents a county that has very little human capital overall, although there may be counties with less in certain categories. Let's take labor force participation as an example. In an extreme though unlikely scenario, no person in a certain county would participate in the labor force. That county would certainly get a one (the worst possible number). That one would then be averaged with whatever that county got in the other four categories. This average is what appears for each county on page 3 of this report. Momentum in that table is similar, but represents the change from 2000 to 2010.