Measuring Human Development in the United States

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I. Introduction

For too long poverty and development in the United States have been measured solely by financial indicators like income or consumption. While human well-being depends some on monetary success, it is not the only factor. When you listen to underdeveloped communities, they might talk about money, but they will also talk about the isolation and the powerlessness they feel. People living in poverty lack opportunity and freedom, values that are the supposed touchstone of American life. There should be a shift from looking at poverty through a financial framework of growth and profits to a more human framework of opportunity and freedom.

Aid is mainly targeted at communities based on their income poverty level. For example, The US Housing and Urban Development Department (HUD) provides Community Development Block Grants to cities and counties to provide a suitable living environment and expand economic opportunities. Eligibility for this program is mainly determined by city or county-level income poverty levels (HUD Exchange). HUD is potentially missing some communities in desperate need of help, and a more holistic human poverty indicator should be the measure of need.

In search of such an indicator, I calculated a Human Development Index for every county in the United States. The Human Development Index (HDI) attempts to measure human well-being and capability. The United Nations Development Program (UNDP) created the HDI to emphasize that people and their capabilities should be the ultimate criteria for measuring development. The organization Measure of America has adapted HDI

to better fit an American context, and I have built upon their work to provide more targeted information about counties.

County-level HDI data descriptively explores human well-being and capability inside the United States. This index provides decision-makers with a measure of well-being and access to opportunity that synthesizes and prioritizes the information available to them. This data illuminates some underdeveloped areas that are potentially overlooked by policymakers and aid providers.

Section II of the paper covers the Human Development Index, discussing its philosophical founding's, how it is calculated, and the changes and iterations it has undergone. Section III covers my data and methodology in calculating county-level HDI. Section IV discusses the results of my calculations, and Section V makes conclusions about the results.

II. The Human Development Index

This section consists of three subsections. In the first subsection, I discuss the philosophical foundings of HDI. In the second subsection, I cover the creation and calculation of HDI. In the final subsection, I introduce the organization Measure of America and how their work with HDI provides a methodology for my analysis.

a. Capability Approach

GDP is not an adequate measure of the true development and well-being of individuals. As Senator Robert Kennedy famously said, "(GDP) measures everything, except that which makes life worthwhile." In response to the myopic focus on economic indicators like GDP, Nobel Laureate Amartya Sen developed a theory of development as capabilities

expansion. Sen initiated this theory in 1979, with his lecture *Equality of What?* and further developed it into his 1989 article *Development as Capability Expansion.* He argued that when evaluating well-being, the key factor is what people are actually able to be and do, saying: "economic growth cannot be sensibly treated as an end in itself. Development has to be more concerned with enhancing the lives we lead and the freedoms we enjoy." He recognized that GDP was simply a means to an end, and focusing solely on GDP ignores what people can actually accomplish with it. A person is more than just the sum of their possess.

Sen made sense of this concept of human well-being by addressing what he called "functionings." Functionings are what people can do with the things they possess or control. He provides an excellent example of this framework by discussing the commodity, bread. Obviously, bread has many characteristics, one of which is providing nutrition. In addition to its nutritional value, it also provides other benefits, for example it often plays a role in social gatherings, or even has religious purposes (Catholic Eucharist for example). However, when we compare the functionings of two people, we do not get much information from comparing their respective consumption of bread. The conversion of commodities into personal freedom or achievement depends on countless other factors. In the case of nutritional achievement, it depends on metabolic rates, body size, age, sex, activity levels, nutritional knowledge, etc. (Sen, *Commodities and Capabilities*). We should not confuse the role of commodities like bread as ends rather than means.

Sen then defines "capabilities". Capabilities are the freedoms that people have in terms of their functionings; their power over commodities and what they can do with them. An individual's capabilities shape the possibilities open to them, they determine their

freedom and opportunity to lead the kind of life they want. If someone is rich in capabilities, they have the ability to achieve their conception of happiness. If someone has few capabilities, their freedom to do and be what they want is restricted. Sen does not present a master list of capabilities everyone desires, instead the capabilities approach seeks to provide a life of genuine choice.

With this approach in mind, Sen pushed economists for more emphasis on education and health. Income is important to an individual but to convert income or commodities into functionings, people need health and education. Sen revolutionized how we define development, saying that true development is capability expansion.

b. Calculating the HDI

The Human Development Index, or HDI was developed by Dr. Mahbub ul Haq as part of the creation of the first annual global Human Development Report published by the United Nations Development Program in 1990. He built directly on Sen's capability approach, saying "while growth in national production … is absolutely necessary to meet essential human objectives, what is important is to study how this growth translates – or fails to translate – into human development in various societies." He goes on, "the purpose of development is to offer people more options. One of the options is access to income – not as an end itself but as a means to acquiring human well-being. But there are other options as well, including long life, knowledge, political freedom, personal security, community participation and guaranteed human rights." (UNDP).

Amartya Sen redefined human development as expanding people's freedoms and improving their well-being, and Dr. Mahbub translated that into an indicator of human development as an alternative to GDP. HDI is a composite measure made up of health,

education, and income indicators. There are many factors that affect an individual's capabilities and access to opportunity, however health, education, and income appropriately prioritize three measurable, important aspects of well-being.

HDI, as measured by the UNDP, gives all countries a score on a scale of 0 (lowest human development) to 1 (highest human development). The calculation of HDI has undergone changes since its inception, however it remains an index of health as measured by life expectancy at birth, education as measured by a weighted average of adult literacy (two-thirds) and gross school enrollment ratio (one-third), and standard of living or income as measured by real per capita GDP. An index is calculated for each variable with the simple formula:

$$\frac{\textit{Actual Value} - \textit{Minimum Goalpost}}{\textit{Maximum Goalpost} - \textit{Minimum Goalpost}}$$

The minimum and maximum goalposts are numbers set outside the actual data set to allow for measurement of growth over several years.

In the original HDI, each of the three components received equal, or one-third weight (see equation 1).

(1): HDI = 1/3(Income Index) + 1/3(Health Index) +1/3(Education Index)

In 2010, the UNDP published a New Human Development Index (NHDI), to address some criticisms of the HDI. There were several notable changes, including changing from GDP per capita to GNI per capita, education measurements were changed to average education attainment and expected attainment of today's children, and most notably it changed it so that HDI is calculated with a geometric mean, instead of arithmetic mean (see equation 2).

(2): NHDI = (Income Index)$^{1/3}$(Health Index)$^{1/3}$(Education Index)$^{1/3}$

HDI is by no means perfect, and in her working paper, *The Human Development Index: A History*, Elizabeth A. Stanton articulates many of these critiques by sorting them into five main categories: poor data, incorrect choice of indicators, various problems with the HDI's formula in general, incorrect specification of income in particular, and redundancy. Another important criticism is that HDI does not reflect important issues like inequality, environmental sustainability, or gender disparity. Without going into too much detail about methodology, it is important to note that the UNDP has continuously evolved the HDI and how it is calculated to answer its critics, for example the dramatic change in 2010 to the NHDI. While HDI may oversimplify the problems it attempts to define, it does so with the intent of presenting several indicators in a clear, interconnected way, which is close to how people actually experience them. Despite its criticisms, HDI is used by the UNDP and is well-respected by most development economists.

c. Measure of America

Measure of America is an initiative of the Social Science Research Council that is working to turn a mirror back onto the United States using the Human Development Index. They have further developed the HDI to be more relevant to an American context, and they call it the American Human Development Index. It serves the same role as the UNDP's HDI and is made up of indicators of health, education, and income. The health indicator is measured with life expectancy at birth. Education is measured using net school enrollment for the population age 3 to 24 and degree attainment for the population 25 years and older (proportion of adult population that has earned a high school diploma, bachelor's degree,

and graduate or professional degree). Income is measured using the median personal earnings of workers ages 16 and older. They use the original HDI calculation, meaning they calculate by equally weighting each individual index (see equation 1).

Measure of America has produced state and congressional district level HDI data, which is publically available on their website. They have also produced "State Profiles" for a few individual states with the use of grant money. They have only done profiles for a select few states, however these profiles calculate HDI on a county-level within the state and provide analysis based on these calculations. In this paper, I take their formula for HDI and apply it to every county across America, providing a holistic picture that their analyses had lacked.

Poverty alleviation policy is typically directed to low-income areas. As mentioned earlier, HUD provides Community Development Block Grants (CDBG) to cities and counties based in large part by city or county-level income poverty levels. Additionally, other federal, state, and private grants provide funding towards communities and areas based on income and poverty levels. Programs and funding like these are important; they allow families in need an opportunity to boost themselves out of poverty.

However, they may drastically miss certain areas because those areas may experience economic growth, but not true development. On the international level, a great example is the oil producing countries in the Middle East. Countries like Saudi Arabia have very high GDP per capita, because of the wealth in their natural resources. However, they have developed very poorly, and by looking solely at their income we miss these countries where individuals may on average have more money but have poor well-being. My data reveals similar counties, where very poor development or well-being is hidden by higher

incomes. It also reveals the opposite end of the spectrum: counties where lower incomes do not necessarily mean lower development.

In my analysis, I have calculated the HDI, provided graphical representations, identified counties and regions that fall into certain categories of interest to policymakers, and discussed some shared characteristics of those counties and areas. It is beyond the scope of this paper to make any policy recommendations or responses to the interpretation, although further research into this is a naturally important next step.

III. Data & Methodology

In order to calculate HDI, I needed to obtain county-level data for each of the indicators. Except for life expectancy, I was able to obtain most from the American Community Survey (ACS), an annual survey conducted by the U.S. Census Bureau. I obtained the life expectancy at birth data from The Institute for Health Metrics and Evaluation (IHME), which is an independent global health research center at the University of Washington. Their data was published and released in Population Health Metrics in 2011. All of the data I use is from 2010, as that is the most current ACS data with all the indicators present.

- **Health Index** – This is measured using life expectancy at birth. This is calculated using life tables using mortality data and population estimates. Their data provided life expectancy for males and females in every county. In order to calculate a county-wide life expectancy (LE), I collected the ratio of males to females in every county

from the ACS. My county-wide life expectancy was calculated using the following formula:

LE = (Male Life Expectancy*Proportion Male) + (Female Life Expectancy*Proportion Female)

- **Education Index** – This is measured using two indicators: net school enrollment for the population age 3 to 24 and degree attainment for the population 25 years and older (based on the proportion of the adult population that has earned a high school diploma, a bachelor's degree, and a graduate or professional degree). For the degree attainment, each category represents the percentage of the adult population who have achieved at least that level of attainment. Recall from earlier that UNDP calculates education as a weighted average of adult literacy (two-thirds) and gross school enrollment ratio (one-third). The United States no longer consistently measures adult literacy because the numbers are always near 100%. Measure of America changed the makeup of the education index to better fit an American context, and I use this superior education index.
- **Income Index** – This is measured using the median personal earnings of all workers with earnings ages 16 and older.

In order calculate HDI, I needed to create sub-indexes for each of the three dimensions. To calculate each index, minimum and maximum values (goalposts) had to be identified for each underlying indicator. In my calculations, I simply used the range of the indicator observed as minimums and maximums. When UNDP measures HDI, they choose goalposts from outside the data to take into account possible increases and decreases in

years to come. However, it is the beyond the scope of this paper to identify or calculate responsible goalposts outside of the range of my data. See table 1 in the Appendix for the four sets of goalposts for my data. Additionally, Measure of America's final index is a score out ten, as opposed to UNDP's score between zero and one, and I follow their lead to make each county's score more accessible.

In order to calculate the individual indices, I used the following general formulas:

- **Health Index$_i$ =** $\frac{Actual\ LE - minimum\ LE}{maximum\ LE - minimum\ LE}$ **x10**

  (Where LE stands for Life Expectancy)

- **Educational Attainment Index =** $\frac{Actual\ EA - minimum\ EA}{maximum\ EA - minimum\ EA}$ **x10**

  (Where EA stands for Educational Attainment)

- **Enrollment Index =** $\frac{Actual\ NER - minimum\ NER}{maximum\ NER - minimum\ NER}$ **x10**

  (Where NER stands for Net Enrollment Ratio)

- **Education Index** = (1/3) *Enrollment Index + (2/3) *Educational Attainment Index

- **Income Index =** $\frac{log(y) - log(min\ y)}{log(max\ y) - log(min\ y)}$ **x10**

  (Where y stands for median personal earnings)

I then calculated HDI using the following formula (as proposed by Measure of America):

HDI = 1/3(Income Index) + 1/3(Health Index) +1/3(Education Index)

This measurement equally weights all three dimensions and expresses HDI as value between 0 and 10. I created a map of the United States graphically depicting my HDI results (see Figure 1 in Appendix). This map groups counties into one of several colors.

Each color or "bin" has an equal range, so that not every bin has the same number of counties in it. The alternative would have been to make colors distributed so that each bin has the same number of counties. By doing it the former way, we avoid falsely equivocating two counties with very different HDI's. The latter way makes a county's color dependent on the rest of the counties and that might harm our perception of the results.

The UNDP groups countries into categories of Low Development, Medium Development, High Development, and Very High Development. They do this so that they can track how countries move from one category to another and look at shared characteristics between countries in the same groups. In Figure 1 in the Appendix, I have done something similar. Each bin corresponds to a level of development. In my results section, I look closely at each of some of these groupings.

In order to calculate the disparity between HDI and pure income measures, I created another variable called difference. In order to do this, I ranked all counties from high to low in HDI (meaning the number 1 was assigned to the county with the highest HDI). I did the same thing for median personal earnings (meaning the number 1 was assigned to the county with the highest median personal earnings). I create the difference variable using the following formula: **Difference = Median Earnings Rank – HDI Rank**.

A positive number shows by how much a county's relative ranking rises when HDI is used instead of median earnings, and a negative number shows the opposite. This illuminates an important purpose of HDI: if county rankings did not change much by using HDI instead of median earnings (if difference=0), then median earnings is a good proxy for human well-being and there is no reason for health or education indicators. The interpretation of this is that a positive difference means high earnings hide an underlying

poor development, and negative differences show that low earnings do not necessarily mean poor development. I have also created a map plotting these county-level differences, which is Figure 2 in the Appendix. Similar to figure 1, I have grouped certain levels of difference together for the potential purpose of analysis.

IV. Results

Table 2 in the Appendix depicts the top 25 counties as ranked by HDI. You will note that many of these counties are coastal counties that incorporate or are near major metropolitan areas. It shows a collective grouping of developed counties in certain states, the 25 highest HDI counties are from just eleven different states. However, this grouping does not manifest itself into a single region of the United States, which is clear to see by examining the map in Figure 1. They also share consistently high median earnings ranks, which corresponds with pretty small difference scores. These small difference scores tell us that for high earnings counties, median personal earnings is likely a good proxy for social well-being.

Table 3 in the Appendix depicts the bottom 25 counties as ranked by HDI. It is clear that most of these counties are in the south eastern United States. Strikingly, counties in Mississippi occupy 11 of the bottom 25 in the country. This is very evident when examining the map in Figure 1. While all 25 of these counties have negative difference scores, they all fall close to -200 with little variability. This tells us that we can expect very poorly developed counties to have low earnings. However, this also tells that us the worst HDI counties have a factor outside just earnings that leads to their poor development. This bottom 25 list identifies counties that are pretty low on the earnings scale, but not

necessarily the poorest. This list provides us with counties that may be overlooked by policies that target strictly earnings.

Table 4 in the Appendix shows the biggest positive 25 counties by difference, which is Median Earning rank minus HDI rank. This list shows us counties who perform in the top ¼ of the rank in HDI but have very low earnings. Not surprisingly, these are almost entirely states with moderate sized cities within rural states. States like Iowa, Nebraska, and Washington are well represented in this table. We could expect this because low cost-of-living could be keep earnings lower and cities could provide the collective strength to provide for services to maintain good education and health. In general, these types of counties do not control a single region, as Figure 2 in the Appendix shows.

Table 5 in the Appendix shows the biggest negative 25 counties by difference, which is Median Earning rank minus HDI rank. This list shows us counties with earnings in the top 1/3 of the country but who have very low HDI. These are the counties that policy targeted towards earnings alone will miss. They have experienced economic growth but not development. The appear to come mostly from the south eastern United States, as Mississippi and Georgia make up nine of these 25 counties. This is backed up by Figure 2 in the appendix, which shows a concentration of these kinds of cities in that region. One uniting factor here is that the south eastern region is in most need of investment in health and education, as the entire region has poor HDI, but even the counties with decent earnings still experience very big negative difference scores.

V. Conclusion

The Human Development Index (HDI) attempts to replace GDP per capita as a measure of development by more closely measuring human well-being and capability. While this measurement has become a gold standard in international development economics, it has not yet been applied to the United States for internal assessment. An initiative called Measure of America has adapted HDI to better fit an American context and has begun to do state and congressional level analysis.

I calculated county-level HDI to descriptively explore the human well-being and capability inside the United States to a degree not yet measured. Federal, state, and local policymakers make decisions informed by indicators such as unemployment, poverty, and income, among others. In contrast, county-level HDI provides policymakers with a measure of well-being and access to opportunity of people that simplifies and prioritizes the information available to them. This data can illuminate the shortcomings in evaluating people's status by single indicators like income.

While much more analysis is yet to be done, my initial calculation provides a strong base. I have categorized counties to identify potential groups or regions that policies or investment targeted by traditional income measures may have missed, and I have begun to explore what those groups and regions can tell us. Future research can be done to develop targeted policies to help these counties that have been overlooked.

Appendix:

Table 1: The goalposts for each indicator in my Human Development Index

	Maximum Value	Minimum Value
Life expectancy at birth (years)	70.30	83.38

Educational attainment score	.605	2.073
Combined net enrollment ratio (%)	0	100
Median Personal Earnings (2010 dollars)	5559	59672

Table 2: Top 25 counties as ranked by HDI

County	healthindex	educationi~x	incomeindex	hdi	hdirank	earningrank	difference~e
Falls Church city, Virginia	8.879773	9.576667	10	9.48548	1	1	0
Los Alamos County, New Mexico	9.064261	9.296358	9.45752	9.272713	2	5	3
Arlington County, Virginia	8.838678	8.503361	9.743529	9.028522	3	2	-1
Fairfax County, Virginia	9.496638	8.054269	9.296096	8.949001	4	8	4
Montgomery County, Maryland	9.922059	8.043351	8.85386	8.939756	5	16	11
Marin County, California	10	7.69584	8.753125	8.816321	6	21	15
Douglas County, Colorado	9.342944	7.789755	9.232787	8.788496	7	11	4
Howard County, Maryland	8.514734	8.256258	9.508528	8.75984	8	4	-4
Loudoun County, Virginia	8.694345	7.920536	9.614379	8.743087	9	3	-6
Alexandria city, Virginia	8.750863	7.661716	9.329012	8.58053	10	6	-4
Somerset County, New Jersey	8.635982	7.563897	9.229568	8.476482	11	12	1
Morris County, New Jersey	8.819753	7.411326	9.107434	8.446171	12	13	1
Hunterdon County, New Jersey	8.493977	7.414033	9.283728	8.397245	13	9	-4
Pitkin County, Colorado	9.235638	7.899283	7.916819	8.35058	14	112.5	98.5
New York County, New York	8.761402	7.378256	8.910659	8.350105	15	15	0
Bergen County, New Jersey	9.117682	6.979855	8.794028	8.297188	16	19	3
Santa Clara County, California	9.400011	6.842316	8.60592	8.282749	17	27	10
San Mateo County, California	9.475723	6.75178	8.590064	8.272522	18	29	11
Hamilton County, Indiana	8.252725	7.726176	8.487391	8.155431	19	40	21
Collin County, Texas	8.810416	7.120254	8.535043	8.155237	20	36	16
Westchester County, New York	8.81764	7.039473	8.580877	8.145997	21	31	10
Nassau County, New York	8.888106	6.866658	8.656145	8.13697	22	23	1
Middlesex County, Massachusetts	8.455164	7.484188	8.388265	8.109205	23	55	32
Norfolk County, Massachusetts	8.218247	7.395531	8.628175	8.080651	24	25	1
Johnson County, Kansas	8.29292	7.464187	8.204626	7.987245	25	73	48

Table 3: Bottom 25 counties as ranked by HDI

county	County	healthindex	educationi~x	incomeindex	hdi	hdirank	earningrank	difference~e
54047	McDowell County, West Virginia	0	2.492725	5.976953	2.823226	3141	2140	-1001
28119	Quitman County, Mississippi	.2236871	3.272316	5.171557	2.889187	3140	2985	-155
21129	Lee County, Kentucky	1.215553	3.081153	4.500254	2.93232	3139	3097	-42
21189	Owsley County, Kentucky	1.645846	2.829146	4.374949	2.94998	3138	3107	-31
28133	Sunflower County, Mississippi	.2177406	3.738329	5.170447	3.042172	3137	2986	-151
28051	Holmes County, Mississippi	.5903365	3.667884	4.921997	3.060072	3136	3041	-95
22035	East Carroll Parish, Louisiana	2.149272	2.844623	4.310053	3.101316	3135	3112	-23
13037	Calhoun County, Georgia	1.226909	3.209228	4.898839	3.111659	3134	3048	-86
28053	Humphreys County, Mississippi	.8142862	3.547148	5.048739	3.136724	3133	3014	-119
13239	Quitman County, Georgia	2.118792	2.632452	4.704134	3.151793	3132	3071	-61
28125	Sharkey County, Mississippi	.7721118	4.11376	4.594013	3.159961	3131	3089	-42
21051	Clay County, Kentucky	1.766586	2.994133	4.78232	3.181013	3130	3063	-67
21237	Wolfe County, Kentucky	1.507068	2.726975	5.40842	3.214154	3129	2891	-238
45061	Lee County, South Carolina	1.292473	3.077103	5.277274	3.215616	3128	2943	-185
28143	Tunica County, Mississippi	.2115256	3.844814	5.610315	3.222218	3127	2721	-406
47095	Lake County, Tennessee	2.820345	2.70525	4.339921	3.288505	3126	3110	-16
13141	Hancock County, Georgia	1.362308	3.285268	5.220358	3.289311	3125	2966	-159
51081	Greensville County, Virginia	1.66951	2.732362	5.483541	3.295138	3124	2841	-283
21147	McCreary County, Kentucky	2.135383	3.127439	4.623458	3.295427	3123	3083	-40
5107	Phillips County, Arkansas	.7022647	3.729827	5.490754	3.307615	3122	2836	-286
45069	Marlboro County, South Carolina	1.233106	3.23198	5.473217	3.312768	3121	2849	-272
28157	Wilkinson County, Mississippi	1.486141	3.018556	5.44063	3.315109	3120	2867	-253
21025	Breathitt County, Kentucky	1.513703	3.086812	5.367277	3.322597	3119	2909	-210
28055	Issaquena County, Mississippi	2.436147	2.633442	4.950415	3.340002	3118	3036	-82
28027	Coahoma County, Mississippi	.799592	4.064142	5.194372	3.352702	3117	2974	-143

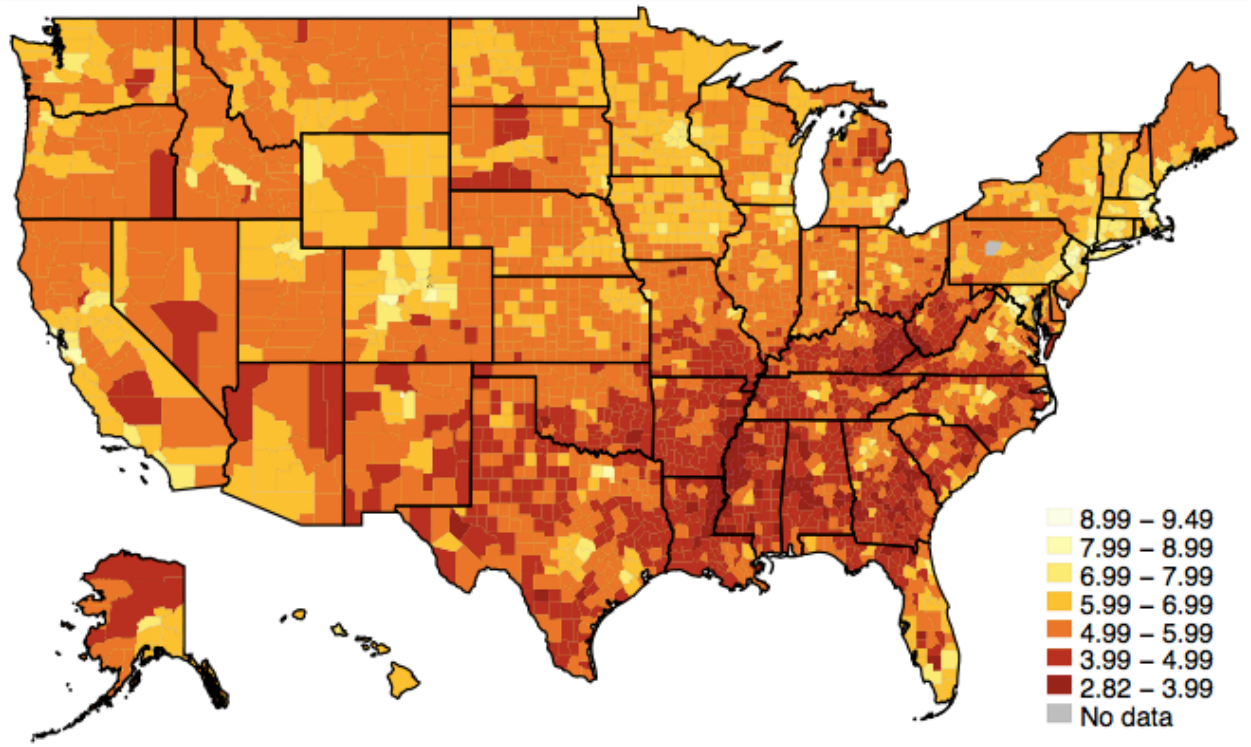
Table 4: Biggest Positive 25 counties by Difference (Median Earning Rank – HDI Rank)

County	healthindex	educationi~x	incomeindex	hdi	hdirank	earningrank	difference~e
Story County, Iowa	8.085066	7.443696	5.009915	6.846226	196	3020	2824
Benton County, Oregon	7.988082	7.554187	5.355599	6.965956	157	2913	2756
Latah County, Idaho	7.604276	7.093097	4.622952	6.440109	361	3084	2723
Douglas County, Kansas	7.800851	7.572979	5.469079	6.947637	160	2853	2693
Albany County, Wyoming	7.116402	7.33495	4.946668	6.466007	348	3038	2690
Riley County, Kansas	7.548224	6.94851	4.659728	6.385488	390	3079	2689
Centre County, Pennsylvania	7.253873	6.969564	5.007144	6.410194	378	3022	2644
Cache County, Utah	8.194146	6.170063	5.313291	6.559167	306	2930	2624
Gunnison County, Colorado	9.183619	6.716276	5.644401	7.181432	111	2682	2571
Brookings County, South Dakota	7.243526	6.575386	4.967234	6.262049	478	3032	2554
Tompkins County, New York	7.816274	7.966667	5.664404	7.149115	116	2659.5	2543.5
Monroe County, Indiana	6.740357	7.169137	4.464944	6.124813	639	3101	2462
Whitman County, Washington	7.127286	7.775395	3.344056	6.082245	688	3130	2442
Utah County, Utah	8.068411	6.210063	5.618114	6.632196	271	2711	2440
Charlottesville city, Virginia	6.724502	7.134505	5.588041	6.482349	338	2746	2408
Wayne County, Nebraska	7.452438	6.07327	4.741932	6.089213	680	3068	2388
Champaign County, Illinois	6.958927	7.098556	5.640826	6.566103	301	2686	2385
Kittitas County, Washington	7.062516	6.075168	4.914921	6.017535	759	3042	2283
Jefferson County, Washington	7.972157	6.24684	5.758965	6.659321	258	2536	2278
Blue Earth County, Minnesota	7.495038	5.900963	5.680378	6.358793	406	2642	2236
Tippecanoe County, Indiana	6.272932	6.508429	5.249457	6.010273	772	2955	2183
Winneshiek County, Iowa	7.821165	5.874524	5.776702	6.490797	332	2499.5	2167.5
Stevens County, Minnesota	7.646153	5.411417	4.620928	5.892833	930	3085	2155
Missoula County, Montana	6.839179	6.371962	5.721122	6.310754	438	2587	2149
Brazos County, Texas	6.675862	6.375476	4.606222	5.885853	944	3087	2143

Table 5: Biggest Negative 25 counties by Difference (Median Earning Rank – HDI Rank)

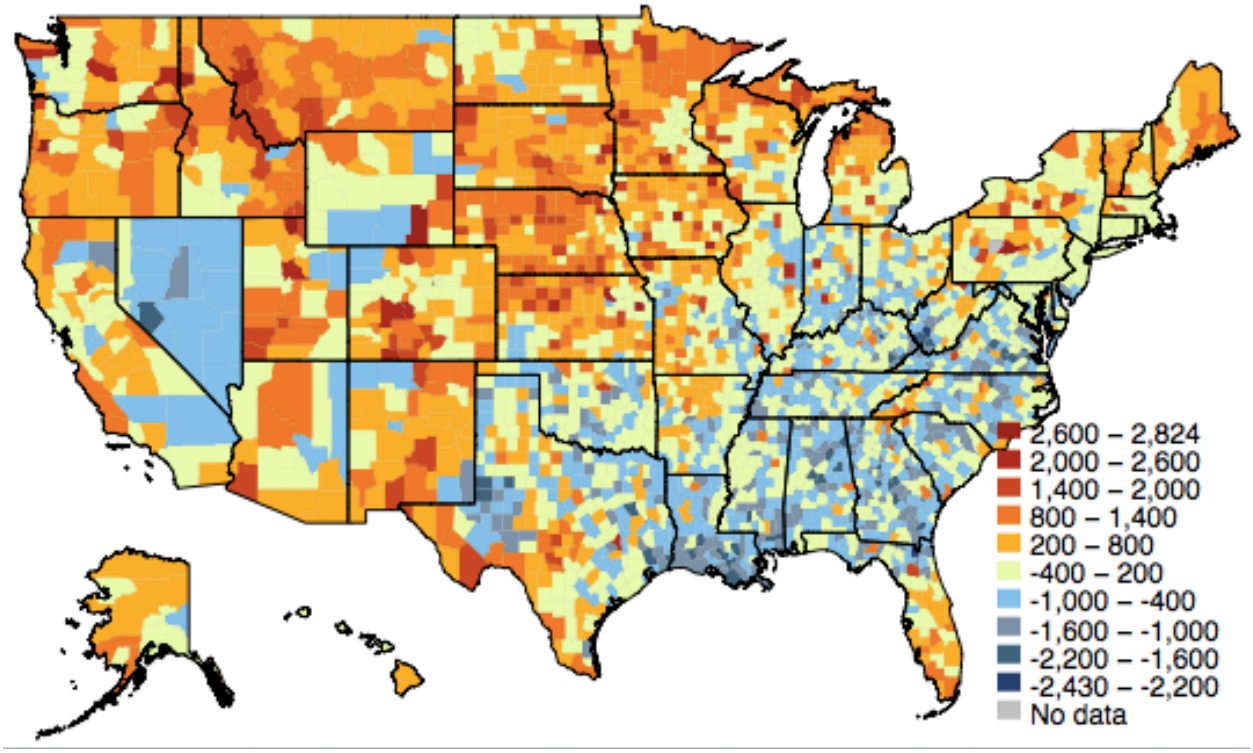
County	healthindex	educationi~x	incomeindex	hdi	hdirank	earningrank	difference~e
Boone County, West Virginia	2.158177	3.385132	7.175626	4.239645	2844	414	-2430
Baker County, Florida	1.679996	3.394369	6.833445	3.96927	2981	681	-2300
Mingo County, West Virginia	1.319177	3.340009	6.705774	3.78832	3045	837	-2208
Buckingham County, Virginia	2.388458	2.587193	6.693256	3.889636	3012	855	-2157
Leslie County, Kentucky	1.969008	2.948719	6.652665	3.856797	3022	919	-2103
George County, Mississippi	2.628415	4.126621	7.167889	4.640975	2510	417	-2093
Dodge County, Georgia	2.515863	3.676131	6.799625	4.33054	2778	711.5	-2066.5
Brantley County, Georgia	2.665087	3.447257	6.754105	4.288816	2815	762	-2053
Baltimore city, Maryland	1.616603	4.874442	6.909849	4.466965	2667	615	-2052
Bibb County, Alabama	1.867181	3.381326	6.643435	3.963981	2983	937	-2046
Assumption Parish, Louisiana	3.116324	3.314641	6.841074	4.424013	2703	675	-2028
Stone County, Mississippi	2.757944	3.800917	6.817095	4.458652	2675	698	-1977
Butts County, Georgia	3.192556	3.586984	6.867293	4.548944	2595	651	-1944
Crawford County, Georgia	3.062338	3.980091	6.974625	4.672351	2478	565	-1913
Anderson County, Texas	2.382372	3.514278	6.616725	4.171125	2880	984	-1896
Chilton County, Alabama	2.743822	3.77139	6.679614	4.398275	2721	876	-1845
Dinwiddie County, Virginia	3.966488	3.792888	7.391276	5.050218	2112	268	-1844
Lawrence County, Mississippi	2.576396	4.146712	6.713329	4.478812	2658	819	-1839
Charles City County, Virginia	3.635921	3.803315	7.063727	4.834321	2329	509	-1820
Gallatin County, Kentucky	4.021209	3.409964	7.0121	4.814424	2347	542	-1805
Liberty County, Texas	3.174739	3.466585	6.656882	4.432735	2693	911	-1782
St. Clair County, Alabama	3.516616	4.162371	7.113329	4.930772	2240	470	-1770
Glascock County, Georgia	1.62419	3.523497	6.466066	3.871251	3018	1255	-1763
Murray County, Georgia	3.078748	3.103905	6.556083	4.246245	2840	1080	-1760
Twiggs County, Georgia	2.731981	2.749637	6.480416	3.987345	2974	1222	-1752

Figure 1: Map of county-level HDI, grouped into bins of set ranges.



The red counties are considered Low Development (HDI below 5). The orange counties are Medium Development (HDI between 5 and 6). The yellow counties are High Development (HDI between 6 and 9). The beige counties are Very High Development (HDI above 9).

Figure 2: Map of county-level difference in HDI v. Median Earnings.



Yellow counties have little to no difference value. Orange counties are Medium Positive Difference Counties. Red counties are High Positive Difference Counties. Light blue counties are Medium Negative Difference Counties. Dark Blue counties are High Negative Difference Counties.

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