# A Rigorous Estimate of the Economic Importance of Indiana's Counties

B. H. SCHOCKEL, Valparaiso University

The objective of this project is measurement and portrayal of the economic importance of the counties of the United States—an experiment in areal differentiation, by which the counties are comparable percentage-wise. The intent is to test a technique for such measurement and portrayal. This article is limited to the counties of Indiana, as a sample, see Fig. 1.

In procedure the areal differentiation is achieved by portraying each county in terms of its percentage of a mythical Representative County of the United States used as a standard. Thereby the estimated relative importance of any counties of the United States can be noted, and in addition significant groupings of counties can be detected, in areal differentiation.

The area of the mythical Representative County is 675 square miles, the same being the average size of the counties of the states east of the Rocky Mountains. By mathematical proportion the values of the mythical county were deduced in the following items, total and per square mile: (1) population, (2) value of products sold from the farm, (3) value added by manufacturing, (4) wholesale sales, (5) retail sales, (6) persons employed in mining and quarrying, and (7) employed persons not involved in the items 2-6.

With these 14 norms of the Representative County used as a basis, each Indiana county's percentage of the Representative County was calculated for each of the 14 norms, and then 14 maps were drawn. Since the rating of the counties is in terms of percentage of the representative, the 14 ratings for each county were then integrated into one composite rating, namely its rating in economic importance. The final result therefore is one map of Indiana portraying the economic importance of its 92 counties, as of 1950, each comparable to all 3,072 counties.

The core of the formula is — $\frac{\text{county x 100}}{\text{Representative County}}$

## Why 675 Square Miles?

A mythical county of 675 square miles as "representative" county advantages the use of the average county of the United States, and the median county thereof. Examination of a county map of the United States reveals huge counties in the Mountain States and the Pacific States whereas the counties of the states east of the Rocky Mountains are much smaller and, in addition, approach gross homogeneity in size. Areally these "eastern" counties represent the United States better than do the "westerns." Moreover the "easterns" far outweigh the

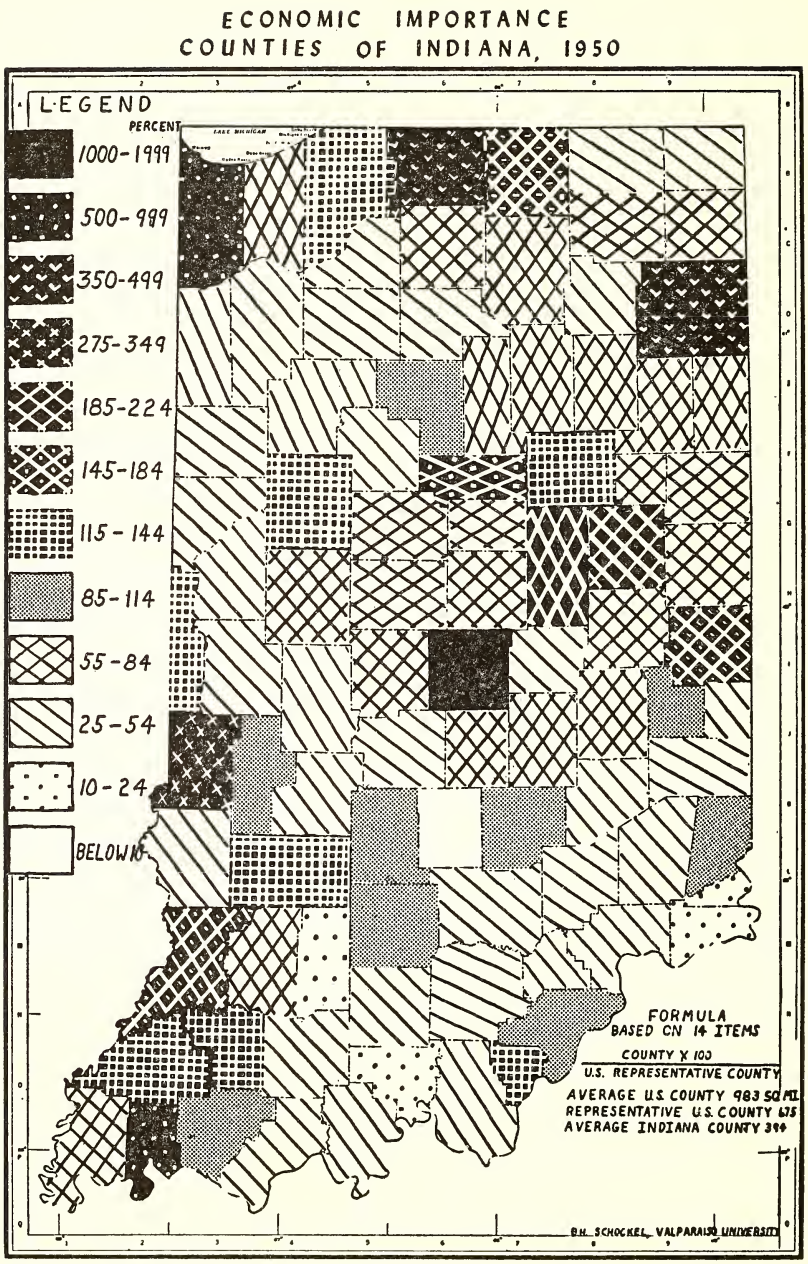


Figure 1. The percentages are per cent of the Representative County of the United States, the area of which is 675 square miles. Gray, stippled counties approximate the Representative County in economic importance. The black counties, and white-on-black, denote superiority. The white counties, and black-on-white denote inferiority.

"westerns" in overall economic activity, and population. Hence the average area of the "easterns," some 675 square miles, is assumed to be representative, and thereby establishes the mythical Representative County.

The area of the average county of the United States, some 983 square miles, is too large to be representative. A portrayal based upon a county of 983 tends to depress the estimated overall economic importance of each county, although the importance of the counties to each other is substantially correct. (The average area of the counties of Indiana is only 394 square miles.) The area of the median county of our country is less than 675 square miles; it ranks about 175 counties below the Representative County. A portrayal based upon the median county tends to exaggerate the estimated overall economic importance of each county, although not the relative importance.

The area of the Representative County lies between that of the average and the median, somewhat larger than the latter and sharply smaller than the former. Finally, the Representative County is attuned to the specific uniqueness of the United States; it is not a conventional mean or median; probably it, as herein defined, could not be used for any other county. Admittedly this Representative County is not perfection; but it is an improvement.

## Areal Importance

The basic items employed, namely 1-7, constitute a totality, a unity for areal treatment. The project is a study of areal importance only. For example, addition of the item, economic importance per person, would ruin the areal unity, by stressing competence per person instead of performance of area. Incidently item number 7, all other employed persons, constitutes about one-quarter of the total of the employed persons in Indiana, and therefore is too important to be ignored. For the sake of brevity the item has not been broken down into its components—into construction, transportation, business service, professional callings, etc.

## Breakdown of Integrated Map

It will be helpful to break down the integrated map of Indiana, Fig. 1, into the items which have been integrated into it. This map of the estimated overall economic importance of the counties is an integration of 14 maps, each representing a component or norm. To save space, two token tables are presented instead of the 14 maps. (Tables 1, 2.)

An important item is agriculture, in the form of products sold from the farm, and measured in terms of percentage of the Representative County: (a) products of the total county sold from its farms; (b) products sold from the county's farms per square mile of the county; and (c) the integration, $\frac{\text{a plus b}}{2}$, shown in Table 1.

TABLE I

Agricultural Importance of Indiana Counties 1950[1,2]

| | Per Cent[3] | | Per Cent[3] | | Per Cent[3] |
|---|---|---|---|---|---|
| 1. Clinton | 250 | 32. Adams | 170 | 63. Washington | 114 |
| 2. Rush | 243 | 33. Henry | 170 | 64. Porter | 111 |
| 3. Benton | 238 | 34. Hancock | 167 | 65. Franklin | 110 |
| 4. Kosciusko | 231 | 35. Newton | 165 | 66. Dubois | 109 |
| 5. Boone | 230 | 36. Whitley | 163 | 67. Sullivan | 108 |
| 6. Carroll | 223 | 37. Fulton | 162 | 68. Daviess | 106 |
| 7. Elkhart | 223 | 38. Noble | 162 | 69. Clay | 97 |
| 8. Montgomery | 221 | 39. La Porte | 160 | 70. Spencer | 95 |
| 9. Howard | 218 | 40. Marion | 157 | 71. Jackson | 94 |
| 10. Tipton | 217 | 41. Starke | 156 | 72. Ripley | 92 |
| 11. Hendricks | 216 | 42. Warren | 155 | 73. Greene | 88 |
| 12. White | 215 | 43. Putnam | 154 | 74. Harrison | 87 |
| 13. Tippecanoe | 210 | 44. Pulaski | 154 | 75. Ohio | 83 |
| 14. Hamilton | 209 | 45. La Grange | 151 | 76. Clark | 83 |
| 15. Wayne | 205 | 46. Saint Joseph | 151 | 77. Jefferson | 82 |
| 16. Jasper | 204 | 47. Union | 148 | 78. Switzerland | 80 |
| 17. Madison | 200 | 48. Fountain | 146 | 79. Dearborn | 77 |
| 18. Wabash | 200 | 49. Lake | 145 | 80. Floyd | 75 |
| 19. Allen | 199 | 50. Bartholomew | 144 | 81. Warrick | 70 |
| 20. Marshall | 194 | 51. De Kalb | 144 | 82. Pike | 65 |
| 21. Cass | 194 | 52. Fayette | 135 | 83. Orange | 63 |
| 22. Grant | 192 | 53. Posey | 132 | 84. Crawford | 62 |
| 23. Decatur | 187 | 54. Gibson | 131 | 85. Jennings | 59 |
| 24. Knox | 185 | 55. Vermillion | 130 | 86. Scott | 56 |
| 25. Johnson | 184 | 56. Parke | 130 | 87. Lawrence | 55 |
| 26. Shelby | 183 | 57. Jay | 130 | 88. Owen | 51 |
| 27. Randolph | 182 | 58. Steuben | 127 | 89. Monroe | 39 |
| 28. Delaware | 178 | 59. Vanderburgh | 119 | 90. Perry | 36 |
| 29. Wells | 176 | 60. Blackford | 119 | 91. Martin | 29 |
| 30. Huntington | 174 | 61. Vigo | 117 | 92. Brown | 16 |
| 31. Miami | 174 | 62. Morgan | 116 | | |

[1] Calculated from data from the Bureau of the Census.

[2] Based on integration of products sold from the farm: total and per square mile.

[3] Percent of the Representative County of the U. S.

In category b, which is per square mile, the counties of Indiana make their best showing: some 14 counties approximate the importance of the Representative County; while eight counties rank lower, the lowest one rating 21 per cent; whereas the remaining 70 counties rank higher, the highest one rating 313 per cent. In category a, which is total county, the counties of Indiana make a poorer showing in agriculture because they are small in area (394 square miles): some

TABLE II

Economic Importance of Indiana Counties 1950[1,2]

| Per Cent[3] | | Per Cent[3] | | Per Cent[3] | |
|---|---|---|---|---|---|
| 1. Marion | 1550 | 32. Huntington | 77 | 63. Benton | 50 |
| 2. Lake | 801 | 33. Posey | 76 | 64. Fountain | 49 |
| 3. Vanderburgh | 549 | 34. Wabash | 75 | 65. Jasper | 46 |
| 4. Saint Joseph | 444 | 35. Miami | 73 | 66. Fulton | 45 |
| 5. Allen | 358 | 36. Kosciusko | 73 | 67. Steuben | 45 |
| 6. Vigo | 332 | 37. Montgomery | 72 | 68. Morgan | 45 |
| 7. Madison | 218 | 38. Blackford | 69 | 69. Parke | 44 |
| 8. Delaware | 212 | 40. Porter | 68 | 70. Newton | 44 |
| 9. Elkhart | 178 | 41. Hamilton | 67 | 71. Starke | 42 |
| 10. Wayne | 170 | 42. Marshall | 67 | 72. Spencer | 41 |
| 11. Howard | 155 | 43. Adams | 66 | 73. Jefferson | 40 |
| 12. Knox | 153 | 44. Boone | 66 | 74. Pulaski | 38 |
| 13. Grant | 139 | 45. Johnson | 65 | 75. Sullivan | 38 |
| 14. Floyd | 139 | 46. Rush | 65 | 76. La Grange | 37 |
| 15. La Porte | 134 | 47. Randolph | 65 | 77. Perry | 37 |
| 16. Tippecanoe | 130 | 48. Daviess | 63 | 78. Ripley | 37 |
| 17. Pike | 129 | 49. De Kalb | 60 | 79. Orange | 34 |
| 18. Vermillion | 127 | 50. Noble | 58 | 80. Union | 34 |
| 19. Gibson | 120 | 51. Tipton | 57 | 81. Washington | 32 |
| 20. Greene | 116 | 52. Wells | 55 | 82. Warren | 32 |
| 21. Dearborn | 114 | 53. Jay | 55 | 83. Scott | 31 |
| 22. Monroe | 114 | 54. Hendricks | 54 | 84. Owen | 30 |
| 23. Clay | 109 | 55. Carroll | 54 | 85. Harrison | 29 |
| 24. Fayette | 102 | 56. White | 54 | 86. Franklin | 29 |
| 25. Clarke | 101 | 57. Decatur | 53 | 87. Ohio | 27 |
| 26. Cass | 93 | 58. Dubois | 53 | 88. Jennings | 25 |
| 27. Warrick | 93 | 59. Whitley | 51 | 89. Crawford | 24 |
| 28. Bartholomew | 86 | 60. Hancock | 51 | 90. Switzerland | 23 |
| 29. Lawrence | 86 | 61. Putnam | 50 | 91. Martin | 19 |
| 30. Henry | 81 | 62. Jackson | 49 | 92. Brown | 8 |
| 31. Clinton | 78 | | | | |

[1] Calculated from data from the Bureau of the Census.
[2] Based upon the integration of 14 economic items.
[3] Percent of the Representative County of the U. S.

20 counties approximate the representative; while 30 rank lower, the lowest being 10 per cent; whereas 42 rank higher, the highest one rating 205. Finally in category c, which is integrated agricultural importance, the counties make a fairly good showing, as shown in Table 1, the highest one rating 250 and the lowest one 16.

In each of the other integrated items, the counties of Indiana make a poorer showing than in agriculture, as is indicated in Tables 1, 2. Space herein does not permit a token breakdown like the preceding

one presented for agriculture. Suffice to say that above 100 per cent of the Representative County are 68 counties in agriculture; 20 in manufacturing and in population; 19 in retail sales; 13 in the item, "all other" employment, and in the item, mining and quarrying; and 6 in wholesale sales. As of 1950, Lake County leads in manufactural importance (although Indianapolis outrates Gary); and Vigo in mining importance; but Marion County leads in all other items.

In summary, it is these 7 items, per county totals and per square mile of the county, which are integrated as 14 norms to produce the map, Figure 1.

### Consider the Map and Table II

The map and Table II depict the overall economic importance of Indiana's counties areally and statistically. According to Table II, some 25 counties rate higher than 100 per cent of the Representative County. Marion County heads with 1,550 per cent and Brown tails with 8.

On the map, the 92 counties are classified into 12 classes. The gray stippling denotes the class, 85-114 per cent, of which class there are 9 counties. They approximate the Representative County and could be assigned a grade of C. The devices, black, and white-on-black, indicate the classes above 114 per cent, of which classes there are 20 counties. (So ultra great is the economic importance of New York, Cook, and Los Angeles counties, etc., that there are no A counties in Indiana.) The devices, white, and black-on-white, designate the classes below 85 per cent, of which there are 63 counties. They comprise the D and the E counties. The highest county is about two hundred times the lowest county in overall economic importance.

The patterns portrayed by the map are significant and warrant brief description as follows:

Aside from the tremendous and embarrassing contrast between Marion and Brown, is the fact that six scattered spots spearhead the state. The nucleus of each spot is a large city, which dominates its service-area, affects a wider zone, and penetrates even farther through ribbons of conveyance-contact.

Areally approximately two-thirds of the state appears to be sub-par. There is a discontinuous lens of high importance, mostly B land, with an axis from Vanderburgh to Allen, via Marion; and there is a northwestern rich fringe. Also there is an axis of sub-par, D and E, land (much of it hilly) trending from Union to Spencer. And a crescent D area with tips at Fulton and Brown, widest in the sandy and erstwhile marshy land associated with the Kankakee River—a land which impeded north-south conveyance and thereby imprinted overall mediocracy to this day.

The Chicago-Lake Michigan fringe, axial with Fort Wayne, New York, Montreal and Detroit, is more flourishing than the Ohio River fringe.

There is a central core, dominated by Marion, Madison and Delaware, of rich glacial plains, supplemented historically by natural gas. This core is in effect surrounded by a sub-par ring. Incidently Marion,

favored politically and now economically powerful, towers above a smaller ring with natural resources comparing favorably with those of the giant. (This quasi-restrictive dominance highlights the retail and wholesale maps.)

Coal, beverages, and longtime Ohio River bridgements pinpoint certain spots of affluence.

A geologist would note a pattern associated with the mineralized flanks of the axial anticline trending northwest from Cincinnati.

The circumstances of the economic patterns, and the patternal implications are too formidable for treatment herein.

## Remarks

Indiana's counties do not fare as well by this measurement as by less rigorous estimates. It may be argued that the 675 square mile area of the Representative County acts as a depressent. It could be argued in rebuttal that the orthodox estimates have been too liberal, influenced by the high standing of the counties in agriculture, and by unconscious overlooking of the stupendous economic importance of the leading dozen counties of our country, which cannot be ignored in calculating the Representative County whatsoever its area. Moreover, even if the 92 counties have been rated rather low herein (?), the rated importance relative to one another and to the 3,072 counties is true since the measurement is uniform. Completion of the measurement of the 3,072 will prove to be illuminating.

By way of precaution it is stated that Indiana's economic importance is not 1/92nd of the sum of the percentages exhibited by the 92, i.e., it is not 107 per cent. As a state, Indiana should be rated in terms of the United States or in terms of a calculated Representative State. Nor does the map portray level of living of inhabitants.

The favorable rating of a group of counties in southwestern Indiana herein is a bit of a surprise. It is true that many Hoosier writers have been prone to depress the real importance of this southwestern area, known as the "pocket." Regardless, is the area as important as it is rated herein? Is the rating as of 1950 true in the light of the fact that since 1950 the net migration has been outward? The item, mining and quarrying, must be considered. This portion of the state leads in that item. Inclusion of the item tends to lower a bit the rating of many of the 92 counties. In rebuttal it is stated that multiplicity of developed natural resources is in fact important in the overall economic importance of a county. Incidently the problem of weighting the seven basic items in this measurement has not been solved.

A serious defect in the measurement for the map is as follows: The item, manufacturing, is in terms of value added in the process of manufacturing (manufacturing increment). But the item, retailing, is in terms of gross sales (not retailing increment); and likewise the item, wholesaling. The item, products sold from the farm, is not wholly satisfactory for use in the measurement.

It is assumed that the rating herein of the 92 counties will be useful. (Newspapers already have taken note because any serious rating is "news" to American readers.) An example in planning will suffice: Indiana and Uncle Sam contemplate spending billions on Indiana's highways. Recommendations as to location of such improvements have super-stressed the item, traffic flow. In effect this means that to those portions of the state which have should be given, with all Hoosiers participating in the cost. Which causes the geographer-planner to pause and to mull in the light of the patterns exhibited by the map. Is not the incidence of general welfare vital?