

Indiana Property Tax Equalization Study

Allen County Equalization Report



December 24, 2004

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County Report for Allen County

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This document summarizes the data, the equalization statistics, and the results of the Ratio Study performed on Allen County. The first section of this document entails specific results for Allen County, while the Appendices provide a general overview of the Indiana Property Tax Equalization Study and the processes used to complete the task.

County Overview

Allen County is the third most populated county in Indiana, located in the northeastern part of the state. It is bordered by Adams, Dekalb, Huntington, Noble, Wells, and Whitley Counties and by the state of Ohio. Ft. Wayne is the largest city and the county seat. Allen County's population is 340,153 (2003).¹ There are 20 townships in Allen County: Aboite, Adams, Cedar Creek, Eel River, Jackson, Jefferson, Lafayette, Lake, Madison, Marion, Maumee, Milan, Monroe, Perry, Pleasant, Scipio, Springfield, St. Joseph, Washington, and Wayne.

Allen County completed its March 1, 2002 Reassessment on December 24, 2003. The tax base for real property, including assessed value and number of parcels, by property class, is presented in Table 1 below.

Table 1

Real Property Assessed Values and Number of Parcels, Allen County

Real Property in Allen County	Residential	Commercial & Industrial	Agricultural	Utility & Other	Total
Number of Parcels	123,499	10,415	8,984	4,583	147,481
Assessed Value	\$10,217,825,030	\$4,238,590,860	\$721,111,700	\$501,278,900	15,678,806,490

Ratio Study Data

Beginning in 2001 with the enactment of HEA 1499, IC 6-1.1-4-25 (b), Indiana Code stated:

“the township assessor in a county having a consolidated city, or the county assessor in every other county, shall:

(1) maintain an electronic data file of the parcel characteristics and parcel assessments of all parcels for each township in the county as of each assessment date that is in the form required by:

- (A) the legislative services agency (LSA); and
- (B) the department of local government finance; and

¹ Stats Indiana <http://stats.indiana.edu/profiles/pr18001.html>

(2) transmit the data with respect to the assessment date of each year before October 1 of the year to:

- (A) the legislative services agency; and
- (B) the department of local government finance.”²

In addition, the Act required, in I.C. 6-1.1-4-19.5, the Department of Local Government Finance (DLGF) to develop a standard contract or standard provisions for contracts to be used in securing professional appraisal services that include provisions stipulating

- “...the contractor will generate complete parcel characteristics and parcel assessment data in a manner and format acceptable to the legislative services agency and the department of local government finance; and
- ...the legislative services agency and the department of local government finance have unrestricted access to the contractor's work product under the contract.”³

Simply stated, the Indiana General Assembly required local assessing officials to submit assessment data in a standard electronic file structure and format (“standardized format”) developed by the DLGF, which met the requirements of the DLGF and the LSA.

In addition, 50 IAC 12-16-28 sets forth the electronic record layout for sales disclosure information administration under authority of IC 6-1.1-31.5, which required the DLGF to promulgate computer specification standards, including those for assessment and sales disclosure data.

The primary data required to perform an equalization analysis are parcel-by-parcel new and prior year assessments and market value information, specifically, the sales prices and property characteristics of recently sold properties. The collection and transmission of the assessment and sales data in accordance with statute and rule discussed above provide the means by which the Indiana Fiscal Policy Institute (IFPI) can perform the equalization study.

Because local officials and their software vendors, in some cases, did not comply with the data transmission requirements, the IFPI found it necessary to obtain sales disclosure data directly from the paper sales disclosure form (State Form 46201). The IFPI had the paper forms “digitized,” that is, electronically scanned and the information on them converted to an electronic format which allowed them to be used in the equalization analysis. In addition, the IFPI obtained Multiple Listing Service (MLS) sales data from Boards of Realtors across the state with the assistance of the Indiana Association of Realtors in order to supplement the sales disclosure form data.

For Allen County, the IFPI evaluated the accuracy of the assessment of 142,898 parcels of residential, commercial and industrial, and agricultural property (see Table 1). This was done by making a ratio study of the categories of property listed in 50 IAC 14 and by

² HEA 1499 - 2001, Section 16.

³ HEA 1499 - 2001, Section 15.

testing for “sales chasing” (the practice of assessing recently sold properties in a manner different from unsold properties).

The ratio study was based on sales data for Allen County provided in the standardized format, digitized sales disclosure forms, and from the MLS database from Metropolitan Indianapolis Board of Realtors (MIBOR). From all sources, the IFPI received 147,337 records of sales. Allen County provided parcel data via County Assessor records in the standardized format, including 135,389 sales. However, only 16,306 of the Allen County sales records submitted by the Assessor were usable. Records were excluded because:

- There was no sales price, as was the case in over 54% of the 135,589 sales received in the standardized format;
- The sales occurred outside the date range, some from as early as 1900;
- There was other needed information missing from the record;
- There were duplicate records;
- There were new construction records; and
- There were some extremes (or outliers).

This left 12.0% of the sales records to use in the equalization analysis, or a total of 18,145 sales records. The 18,145 sales represent 12.7% of the total number of parcels. Of the 18,145 sales, 17,628 are improved residential sales and 323 are improved commercial and 37 are improved industrial sales.

Ratio Study Methodology

The main methodological steps taken to perform the ratio study in Allen County were:

- (1) assemble the data,
- (2) determine the study groups (“strata”),
- (3) make statistical analyses.

The Legislative Services Agency and Almy, Jacobs, Gloude-mans, and Denne (“the consultant”) cleaned the data, meaning that records with incomplete information or with data in an unusable format were eliminated from analysis unless the problems could be rectified. In addition, both the parcel and sales disclosure data were screened to determine whether a specific sale should be used in the ratio study. Reasons that a sale would be excluded include non-arm’s length sales, new construction, and extremes and outliers.⁴

Computerized statistical programming was used to match the sale with an assessment. Since sales from 1998 through 2003 were included, adjustments to reported sales prices were made to account for the difference between the sale’s date and the assessment date.

⁴ See the IFPI’s “Background Tool Kit” July, 2004 for a more complete discussion of sales screening at <http://www.indianafiscal.org/docs/BackgroundToolKit.pdf>.

In accordance with 50 IAC 14-5-1, the Department of Local Government Finance’s equalization standards require equalization be performed for each of the following classes of property in each Township:

- Improved Residential
- Unimproved Residential
- Improved Commercial
- Unimproved Commercial
- Improved Industrial
- Unimproved Industrial
- Agricultural Land (use value basis)

When a sample of sales is small, when it does not represent the makeup of the total assessment roll well, and when the variation in sales ratios is great, ratio study statistics may not reliably portray the quality of appraisals.

In Allen County, sales sample sizes were small in some townships and for some classes of property. Therefore, the consultant “re-stratified,” or combined, first, some of the classes of property and, then collapsed all classes in all townships to the county-wide level. When considered necessary, the first level of re-stratification was to combine (1) improved commercial and improved industrial property into a broader commercial and industrial property stratum and (2) unimproved commercial, industrial, and residential property into a broader vacant land stratum. Then, all townships were re-stratified to the county-wide level to produce statistics with higher sample sizes for the county.

As previously noted, the IFPI used 18,145 sales to evaluate the assessments of 142,898 residential, commercial and industrial, and agricultural properties. We calculated standard ratio study statistics and used performance standards promulgated by the International Association of Assessing Officers (IAAO) to evaluate the results.⁵ The following statistics were calculated:

- The *median ratio* was selected as the measure of central tendency used to describe the *level of assessment*—how close assessments are, overall, to 100 percent of market value. The IAAO standard is that assessments should be within 10% of market value. That means the median ratio should be between 90% and 110% (0.9 and 1.1).
- The *95% confidence interval* around the median. The confidence interval provides an indication of the reliability of the calculated median. It measures the probability that a range of values is likely to include the median value. The width of the confidence interval at a given level of confidence (e.g., 95%) is a statement regarding the certainty of the estimate based on both the amount and variability of the sample data. Said another way, since we use a sample to estimate the median,

⁵ Each of these standards, and their statistical procedures, are discussed in more detail in the “Indiana Property Tax Equalization Study Background Tool Kit.” It may be obtained at <http://www.indianafiscal.org/docs/BackgroundToolKit.pdf>. A full discussion of the IAAO standards may be obtained in the “Standard on Ratio Studies,” 1999, International Association of Assessing Officers.

we are uncertain of the actual median value of the population. A 95% confidence interval says that while we are uncertain of the true value of the median, that true median will fall within the range of values calculated as the confidence interval 95 times out of 100. The IAAO standard for medians states that the 95% confidence interval should encompass at least some part of the standard for the median (from 0.9 to 1.1).

- The *coefficient of dispersion* (COD) is a statistic that describes the uniformity or consistency of assessments by measuring the variability of the sales ratios. The higher the COD, the less uniform or consistent the assessments. The IAAO standard is that the COD should be no more than 15.0 for improved residential property and no more than 20.0 for other classes of property.
- The *price related differential* (PRD) examines the uniformity of assessments between high-value and low-value properties. In other words, the PRD is a measure of the “vertical equity” of assessments. A PRD below 1.0 indicates that lower valued properties are assessed at a lower percentage of market value than higher value properties. In other words, lower value properties have lower sales/assessment ratios. A PRD above 1.0 indicates that higher value properties are assessed at a lower percentage of market value than lower value properties. The IAAO standard is that the PRD should be between 0.98 and 1.03.

The IAAO standards include guidance on sample sizes needed to allow confidence in the statistical measures. Small sample sizes preclude definitive interpretation of some results in some classes of property within some townships and counties. However, re-stratification of related property classes (vacant land classified as commercial, industrial, and residential; or improved commercial and industrial properties, for example) has been done in most cases, which allow more general results.

The IAAO standards state that assessment level should be uniform across property use strata and township assessment jurisdictions. The IAAO standard is that the level of assessment (the median) should not vary across townships by more than 5% from the county-wide measure. Again, sample size affects the ability to make judgments on this standard in some cases.

Finally, the IFPI analyzed whether there were differences in changes of assessment (as percentages) between properties that were part of the ratio study, on the one hand, and properties that did not sell recently, on the other that might suggest “sales chasing.” The comparison was strictly between unsold properties and those in the ratio calculations. Percentage changes of assessments were computed for each property, in total and with respect to both land and improvements. The differences between the two groups were analyzed by reviewing the distributions of the changes for the two groups at the township level. Summary statistics were calculated, and statistical tests were used to determine the likelihood that the observed differences would have been likely to arise by chance alone in contrast to reflecting a probable real difference in the treatment of the two groups of properties.

Disproportionate increases of sold properties were taken as potential evidence of sales chasing. When observed, such differentials were then tested for statistical significance using the Mann Whitney test.

Ratio Study Results for Allen County

Table 2					
Standards Compliance Matrix for Allen County					
Class: Residential Improved Sample Size: 17,628					
Measures	IAAO Standard	County Wide Value	95% CI Overlaps Standard	Meets Standard	Does Not Meet Standard
Median Sales Ratio	.9 to 1.1	0.981		x	
Coefficient of Dispersion	< 15.0	14.0		x	
Class: Commercial & Industrial Improved Sample Size: 360					
Measures	IAAO Standard	County Wide Value	95% CI Overlaps Standard	Meets Standard	Does Not Meet Standard
Median Sales Ratio	.9 to 1.1	0.961		x	
Coefficient of Dispersion	< 20.0	29.98			x

Standards and Compliance – County-Wide

Allen County met the standards for the Median Sales Ratio for the classes Residential Improved property, Commercial Improved, and Industrial Improved property. The County also met the standard for uniformity of assessment embodied in the COD metric as shown in Table 2 for Residential Improved, but did not meet the COD standard for Commercial Improved or Industrial Improved.

The IFPI has found that many, if not most, of the counties reviewed have not met the COD standards. The reasons are several but may be summarized to: a) this is the first ever statewide reassessment under market value standards for the state of Indiana, and b) the sample sizes are so small that it makes deriving an acceptable COD difficult.

Standards and Compliance – Townships

The sample sizes were large enough in the improved residential class in every township, except Jackson and Scipio, to have confidence in the township level statistics. Table 3 presents ratio study statistics for improved residential property in 18 townships and for the improved commercial class in five townships for which the sample size was adequate to have some level of confidence in the statistics.

Table 3						
Standards Compliance Matrix: Townships						
Class: Residential Improved						
Township	Sample Size	Median	Median Meets Standard?	Within +/- 5% of County?	Coefficient of Dispersion	COD Meets Standard?
Aboite	2,605	1.000	x	x	9.37	x
Adams	1,747	0.948	x	x	16.31	
Cedar Creek	154	0.965	x	x	11.29	x
Eel River	66	1.038	x		21.72	
Jefferson	73	1.008	x	x	12.66	x
Lafayette	54	0.961	x	x	15.45	
Lake	29	1.013	x	x	26.29	
Madison	37	1.034	x		18.23	
Marion	62	0.918	x		16.21	
Maumee	66	0.96	x	x	13.17	x
Milan	50	0.991	x	x	13.51	x
Monroe	39	0.981	x	x	18.70	
Perry	1,117	0.998	x	x	9.45	x
Pleasant	107	0.977	x	x	10.93	x
Springfield	62	0.968	x	x	19.09	
St. Joseph	5,194	0.975	x	x	8.53	x
Washington	1,348	0.976	x	x	10.22	x
Wayne	4,803	0.988	x	x	23.17	
Class: Commercial & Industrial Improved						
Township	Sample Size	Median	Median Meets Standard?	Within +/- 5% of County?	Coefficient of Dispersion	COD Meets Standard?
Aboite	22	0.965	x	x	22.55	
Adams	55	0.989	x	x	27.38	
St. Joseph	59	0.996	x	x	26.33	
Washington	79	0.983	x	x	26.02	
Wayne	126	0.908	x		37.53	

The detailed results of the analysis are presented in Appendix A. Appendix A contains the summary statistics for the re-stratified sample that combined similar property classes across the entire county to increase the sample size, as well as the township by township results.

In addition to the statistical tests performed relating to the metrics relating to the level and uniformity of assessment, the IFPI performed the tests required to determine if sales chasing was evidenced in Allen County. Sales chasing is indicated when the distribution of percentage changes in assessed value for properties that sold is significantly different than the distribution of percentage changes in assessed value of properties that did not sell recently.

Table 4			
Sales Chasing Analysis Results for			
Allen County			
("x" indicates statistical evidence of systematic difference between sold and unsold parcels)			
Percent Change in Assessments of Land, Improvements, and Total			
Township	Land	Improvements	Total
Aboite			
Adams	x		
Cedar Creek		x	x
Eel River			
Jackson			x
Jefferson	x		
Lafayette	x		
Lake	x		
Madison	x		
Marion	x		
Maumee			
Milan		x	x
Monroe	x		
Perry	x	x	x
Pleasant	x		x
Scipio			
Springfield	x		
St. Joseph			
Washington		x	x
Wayne.			

Evidence of sales chasing was found in Adams, Cedar Creek, Jackson, Jefferson, Lafayette, Lake, Madison, Marion, Milan, Monroe, Perry, Pleasant, Springfield, and Washington Townships. Perry Township’s results exhibit the most comprehensive evidence.

Summary Quality Evaluation of Allen County’s Reassessment Results

Small sample sizes preclude definitive evaluation of the reassessment quality for all classes of property in all townships. For those townships with adequate sample sizes in improved residential property and improved commercial property, we find them to meet acceptable standards of assessment quality.

However, four townships did not meet the standard for uniformity across jurisdictions. In the Residential Improved class, Eel River, Madison, and Marion townships’ median ratios varied from the county-wide median ratio by more than 5%. In the Commercial Improved class, Wayne Township’s median ratio varied from the county-wide median ratio by more than 5%.

For the county as a whole, we find improved residential assessment quality with respect to the median sales ratio and the coefficient of dispersion to meet acceptable standards.

For improved commercial and industrial property, we find the median sales ratio and the coefficient of dispersion within acceptable standards.

For several townships, we found evidence of sales chasing and, for Perry Township, we found extensive evidence of sales chasing. For Perry Township, we cannot rely upon the ratio statistics as evidence that the township met the IAAO standards for assessment quality.

Overall, we find Allen County meeting an acceptable standard of quality of assessment with respect to the level of assessment, with the exception of the cross-jurisdictional standard in Eel River, Madison, Marion, and Wayne Townships.

Appendix A

County Data

**Allen County Property Tax Reassessment Equalization Analysis
Indiana Property Tax Equalization Project**

Standard Equalization Via Median

	MajrClas	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio
1	Agri-Vac	1,888	56,714,900	1	0.05	0.32	.	1.00	0.961	.	.	58,997,603
2	Agri-Imp	7,096	664,396,800	81	1.14	2.06	25.48	1.09	0.863	0.81	0.91	769,550,270
3	Ind-Vac	410	15,334,900	1	0.24	0.12	.	1.00	0.718	.	.	21,346,181
4	Ind-Imp	1,558	947,394,530	37	2.37	2.79	29.73	1.21	1.058	0.83	1.20	895,138,798
5	Coml-Vac	1,245	82,075,000	.	.	.	.	.	.	.	.	.
6	Coml-Imp	7,202	3,193,786,430	323	4.48	4.97	29.68	1.15	0.953	0.91	1.00	3,352,790,835
7	Res-Vac	17,306	203,899,600	74	0.43	3.85	20.74	1.03	1.022	0.97	1.10	199,435,106
8	Res-Imp	106,193	10,013,925,430	17,628	16.60	17.69	14.00	1.02	0.981	0.98	0.98	10,209,225,604
Total		142,898	15,177,527,590	18,145								

Restratified Equalization Via Median

	MjrCls2	ParclCnt	Asmt Total, New	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio
1	Agri-Vac	1,888	56,714,900	1	0.05	0.32	.	1.00	0.961	.	.	58,997,603
2	Agri-Imp	7,096	664,396,800	81	1.14	2.06	25.48	1.09	0.863	0.81	0.91	769,550,270
3	Ind-Imp	1,558	947,394,530	37	2.37	2.79	29.73	1.21	1.058	0.83	1.20	895,138,798
4	C+I-Vac	1,655	97,409,900	1	0.06	0.02	.	1.00	0.718	.	.	135,594,581
5	Coml-Imp	7,202	3,193,786,430	323	4.48	4.97	29.68	1.15	0.953	0.91	1.00	3,352,790,835
6	Res-Vac	17,306	203,899,600	74	0.43	3.85	20.74	1.03	1.022	0.97	1.10	199,435,106
7	Res-Imp	106,193	10,013,925,430	17,628	16.60	17.69	14.00	1.02	0.981	0.98	0.98	10,209,225,604
Total		142,898	15,177,527,590	18,145								

Restratified (2) Equalization Via Median

	MjrCls3	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio
1	Agri-Vac	1,888	56,714,900	1	0.05	0.32	.	1.00	0.961	.	.	58,997,603
2	Agri-Imp	7,096	664,396,800	81	1.14	2.06	25.48	1.09	0.863	0.81	0.91	769,550,270
3	C+I-Imp	8,760	4,141,180,960	360	4.11	4.47	29.98	1.16	0.961	0.92	1.01	4,311,060,243
4	C+I+R Vac	18,961	301,309,500	75	0.40	2.61	21.20	1.03	1.005	0.95	1.10	299,884,568
5	Res-Imp	106,193	10,013,925,430	17,628	16.60	17.69	14.00	1.02	0.981	0.98	0.98	10,209,225,604
Total		142,898	15,177,527,590	18,145								

**Allen County Property Tax Reassessment Equalization Analysis
Indiana Property Tax Equalization Project**

Standard Equalization Via Median

CntyXtpw	MajrClas	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio
1 Aboite Twp	Agri-Vac	67	3,163,900	.	.	.	.	.	.	.	.	.
2 Aboite Twp	Agri-Imp	94	9,568,100	.	.	.	.	.	.	.	.	.
3 Aboite Twp	Ind-Vac	7	787,200	.	.	.	.	.	.	.	.	.
4 Aboite Twp	Ind-Imp	23	41,657,700	1	4.35	3.92	.	1.00	1.202	.	.	34,662,875
5 Aboite Twp	Coml-Vac	60	12,664,000	.	.	.	.	.	.	.	.	.
6 Aboite Twp	Coml-Imp	578	302,604,580	21	3.63	7.17	22.56	0.99	0.959	0.83	1.08	315,688,203
7 Aboite Twp	Res-Vac	1,633	18,563,900	.	.	.	.	.	.	.	.	.
8 Aboite Twp	Res-Imp	10,495	1,861,769,080	2,605	24.82	23.64	9.37	1.00	1.000	1.00	1.00	1,862,173,305
9 Adams Twp	Agri-Vac	217	5,136,400	.	.	.	.	.	.	.	.	.
10 Adams Twp	Agri-Imp	94	12,584,000	4	4.26	4.90	5.26	0.99	1.077	0.89	1.09	11,688,860
11 Adams Twp	Ind-Vac	60	2,285,100	.	.	.	.	.	.	.	.	.
12 Adams Twp	Ind-Imp	227	124,390,200	5	2.20	2.06	24.00	0.96	0.831	0.53	1.18	149,731,986
13 Adams Twp	Coml-Vac	107	3,607,100	.	.	.	.	.	.	.	.	.
14 Adams Twp	Coml-Imp	783	213,022,900	50	6.39	7.30	27.36	1.00	1.005	0.88	1.16	212,047,700
15 Adams Twp	Res-Vac	1,734	20,984,200	33	1.90	13.10	23.58	1.01	1.055	0.98	1.35	19,894,376
16 Adams Twp	Res-Imp	9,052	635,574,600	1,747	19.30	20.05	16.31	1.02	0.948	0.94	0.95	670,791,135
17 Cedar Creek Twp	Agri-Vac	157	3,354,700	.	.	.	.	.	.	.	.	.
18 Cedar Creek Twp	Agri-Imp	500	71,068,600	2	0.40	0.39	11.15	1.05	0.629	0.56	0.70	112,966,778
19 Cedar Creek Twp	Ind-Vac	2	89,500	.	.	.	.	.	.	.	.	.
20 Cedar Creek Twp	Ind-Imp	40	16,697,700	1	2.50	0.71	.	1.00	1.847	.	.	9,040,648
21 Cedar Creek Twp	Coml-Vac	15	485,600	.	.	.	.	.	.	.	.	.
22 Cedar Creek Twp	Coml-Imp	145	22,424,000	4	2.76	3.76	18.12	1.14	0.884	0.69	1.14	25,358,388
23 Cedar Creek Twp	Res-Vac	1,018	30,806,100	5	0.49	2.24	12.12	1.00	0.867	0.79	1.22	35,544,859
24 Cedar Creek Twp	Res-Imp	3,139	419,570,000	154	4.91	4.73	11.29	1.00	0.965	0.95	0.98	434,588,354
25 Eel River Twp	Agri-Vac	68	2,334,400	.	.	.	.	.	.	.	.	.
26 Eel River Twp	Agri-Imp	704	72,670,700	16	2.27	4.10	23.57	1.09	0.915	0.79	1.14	79,390,249
27 Eel River Twp	Ind-Imp	3	1,397,000	.	.	.	.	.	.	.	.	.
28 Eel River Twp	Coml-Vac	4	37,800	.	.	.	.	.	.	.	.	.
29 Eel River Twp	Coml-Imp	4	553,700	.	.	.	.	.	.	.	.	.
30 Eel River Twp	Res-Vac	172	3,394,700	1	0.58	3.90	.	1.00	0.922	.	.	3,680,143
31 Eel River Twp	Res-Imp	803	99,152,600	66	8.22	8.32	21.72	1.07	1.038	0.92	1.16	95,541,204
32 Jackson Twp	Agri-Vac	177	7,810,800	.	.	.	.	.	.	.	.	.
33 Jackson Twp	Agri-Imp	148	14,955,100	1	0.68	0.69	.	1.00	1.136	.	.	13,166,098
34 Jackson Twp	Ind-Vac	1	3,300	.	.	.	.	.	.	.	.	.
35 Jackson Twp	Ind-Imp	4	2,253,300	.	.	.	.	.	.	.	.	.
36 Jackson Twp	Coml-Vac	2	15,400	.	.	.	.	.	.	.	.	.

**Allen County Property Tax Reassessment Equalization Analysis
Indiana Property Tax Equalization Project**

CntyXtwp	MajrClas	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio
37 Jackson Twp	Coml-Imp	5	258,100	1	20.00	18.25	.	1.00	1.025	.	.	251,741
38 Jackson Twp	Res-Vac	69	627,300	1	1.45	17.18	.	1.00	0.923	.	.	679,617
39 Jackson Twp	Res-Imp	133	12,362,700	13	9.77	9.90	27.96	1.03	0.791	0.56	1.01	15,631,595
40 Jefferson Twp	Agri-Vac	60	1,857,700	.	.	.	.	.	.	.	.	.
41 Jefferson Twp	Agri-Imp	538	36,503,800	3	0.56	1.23	11.30	1.01	0.825	0.60	0.88	44,261,339
42 Jefferson Twp	Ind-Vac	1	62,200	.	.	.	.	.	.	.	.	.
43 Jefferson Twp	Ind-Imp	26	24,958,000	.	.	.	.	.	.	.	.	.
44 Jefferson Twp	Coml-Vac	12	733,600	.	.	.	.	.	.	.	.	.
45 Jefferson Twp	Coml-Imp	36	12,648,600	2	5.56	0.86	34.45	1.15	0.756	0.50	1.02	16,738,157
46 Jefferson Twp	Res-Vac	103	1,817,600	.	.	.	.	.	.	.	.	.
47 Jefferson Twp	Res-Imp	592	55,259,900	73	12.33	12.45	12.66	1.03	1.008	0.97	1.02	54,839,239
48 Lafayette Twp	Agri-Vac	126	4,336,500	.	.	.	.	.	.	.	.	.
49 Lafayette Twp	Agri-Imp	443	42,604,900	16	3.61	6.41	26.31	1.09	0.740	0.63	0.91	57,566,577
50 Lafayette Twp	Ind-Imp	4	87,372,100	.	.	.	.	.	.	.	.	.
51 Lafayette Twp	Coml-Vac	9	31,500	.	.	.	.	.	.	.	.	.
52 Lafayette Twp	Coml-Imp	21	7,888,300	.	.	.	.	.	.	.	.	.
53 Lafayette Twp	Res-Vac	231	10,458,100	9	3.90	13.58	20.73	0.98	0.967	0.69	1.25	10,819,964
54 Lafayette Twp	Res-Imp	590	68,633,300	54	9.15	9.55	15.45	1.01	0.961	0.89	1.01	71,408,673
55 Lake Twp	Agri-Vac	44	1,246,100	.	.	.	.	.	.	.	.	.
56 Lake Twp	Agri-Imp	514	48,437,300	4	0.78	1.22	13.50	0.95	0.814	0.81	1.25	59,474,491
57 Lake Twp	Ind-Imp	5	432,600	.	.	.	.	.	.	.	.	.
58 Lake Twp	Coml-Vac	5	57,700	.	.	.	.	.	.	.	.	.
59 Lake Twp	Coml-Imp	11	1,643,100	.	.	.	.	.	.	.	.	.
60 Lake Twp	Res-Vac	284	4,532,400	2	0.70	4.87	24.71	1.25	1.035	0.78	1.29	4,377,313
61 Lake Twp	Res-Imp	548	46,304,000	29	5.29	4.74	26.29	1.12	1.013	0.91	1.15	45,699,689
62 Madison Twp	Agri-Vac	60	2,151,800	.	.	.	.	.	.	.	.	.
63 Madison Twp	Agri-Imp	520	42,559,300	5	0.96	1.07	37.43	1.04	1.018	0.82	2.08	41,804,318
64 Madison Twp	Ind-Imp	13	905,800	.	.	.	.	.	.	.	.	.
65 Madison Twp	Coml-Vac	1	7,800	.	.	.	.	.	.	.	.	.
66 Madison Twp	Coml-Imp	17	1,434,500	2	11.76	17.16	28.38	0.95	0.842	0.60	1.08	1,704,336
67 Madison Twp	Res-Vac	67	1,767,900	1	1.49	4.21	.	1.00	1.522	.	.	1,161,225
68 Madison Twp	Res-Imp	440	44,374,000	37	8.41	8.25	18.23	1.04	1.034	0.92	1.07	42,904,326
69 Marion Twp	Agri-Vac	143	3,579,400	.	.	.	.	.	.	.	.	.
70 Marion Twp	Agri-Imp	511	45,553,700	4	0.78	1.48	11.56	0.99	0.789	0.70	0.99	57,718,974
71 Marion Twp	Ind-Imp	5	550,400	.	.	.	.	.	.	.	.	.
72 Marion Twp	Coml-Imp	19	2,458,800	.	.	.	.	.	.	.	.	.
73 Marion Twp	Res-Vac	218	2,821,600	.	.	.	.	.	.	.	.	.

**Allen County Property Tax Reassessment Equalization Analysis
Indiana Property Tax Equalization Project**

CntyXtpw	MajrClas	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio
74 Marion Twp	Res-Imp	907	92,891,400	62	6.84	6.68	16.21	1.03	0.918	0.88	0.98	101,183,321
75 Maumee Twp	Agri-Vac	28	994,400	.	.	.	.	.	.	.	.	.
76 Maumee Twp	Agri-Imp	362	27,594,800	2	0.55	0.97	50.60	1.08	1.171	0.58	1.76	23,565,418
77 Maumee Twp	Ind-Imp	14	3,238,700	.	.	.	.	.	.	.	.	.
78 Maumee Twp	Coml-Vac	4	27,200	.	.	.	.	.	.	.	.	.
79 Maumee Twp	Coml-Imp	53	5,845,300	.	.	.	.	.	.	.	.	.
80 Maumee Twp	Res-Vac	207	3,023,800	.	.	.	.	.	.	.	.	.
81 Maumee Twp	Res-Imp	733	62,661,400	66	9.00	8.07	13.17	1.01	0.960	0.93	0.99	65,278,283
82 Milan Twp	Agri-Vac	76	2,400,500	1	1.32	7.67	.	1.00	0.961	.	.	2,497,117
83 Milan Twp	Agri-Imp	688	65,858,200	2	0.29	0.66	23.20	1.06	0.662	0.51	0.82	99,542,900
84 Milan Twp	Ind-Vac	1	300	.	.	.	.	.	.	.	.	.
85 Milan Twp	Ind-Imp	10	19,578,600	.	.	.	.	.	.	.	.	.
86 Milan Twp	Coml-Vac	1	1,300	.	.	.	.	.	.	.	.	.
87 Milan Twp	Coml-Imp	17	3,652,700	2	11.76	4.96	5.60	1.00	0.552	0.52	0.58	6,622,345
88 Milan Twp	Res-Vac	160	3,843,900	1	0.63	2.44	.	1.00	1.082	.	.	3,553,155
89 Milan Twp	Res-Imp	732	80,619,300	50	6.83	6.64	13.51	1.03	0.991	0.93	1.02	81,354,513
90 Monroe Twp	Agri-Vac	43	1,681,100	.	.	.	.	.	.	.	.	.
91 Monroe Twp	Agri-Imp	320	22,813,200	3	0.94	1.73	19.79	0.97	0.813	0.80	1.28	28,045,089
92 Monroe Twp	Ind-Vac	1	2,200	.	.	.	.	.	.	.	.	.
93 Monroe Twp	Ind-Imp	11	6,769,900	1	9.09	0.56	.	1.00	1.154	.	.	5,868,287
94 Monroe Twp	Coml-Vac	15	79,700	.	.	.	.	.	.	.	.	.
95 Monroe Twp	Coml-Imp	65	3,312,400	1	1.54	1.66	.	1.00	0.938	.	.	3,530,493
96 Monroe Twp	Res-Vac	230	2,466,500	1	0.43	2.79	.	1.00	0.515	.	.	4,791,197
97 Monroe Twp	Res-Imp	627	46,372,400	39	6.22	5.59	18.70	1.05	0.981	0.93	1.03	47,287,994
98 Perry Twp	Agri-Vac	177	5,023,400	.	.	.	.	.	.	.	.	.
99 Perry Twp	Agri-Imp	186	19,511,900	1	0.54	0.28	.	1.00	1.161	.	.	16,799,246
100 Perry Twp	Ind-Vac	4	198,500	.	.	.	.	.	.	.	.	.
101 Perry Twp	Ind-Imp	21	9,171,000	.	.	.	.	.	.	.	.	.
102 Perry Twp	Coml-Vac	47	7,037,600	.	.	.	.	.	.	.	.	.
103 Perry Twp	Coml-Imp	142	68,774,700	2	1.41	0.14	4.96	1.02	1.140	1.08	1.20	60,333,808
104 Perry Twp	Res-Vac	2,584	34,398,500	5	0.19	2.75	11.41	1.01	0.947	0.75	1.10	36,320,381
105 Perry Twp	Res-Imp	7,200	1,130,584,100	1,117	15.51	14.67	9.45	1.01	0.998	0.99	1.01	1,132,843,043
106 Pleasant Twp	Agri-Vac	60	1,934,300	.	.	.	.	.	.	.	.	.
107 Pleasant Twp	Agri-Imp	395	31,089,100	2	0.51	0.81	14.12	1.04	0.801	0.69	0.91	38,816,539
108 Pleasant Twp	Ind-Vac	21	1,354,700	.	.	.	.	.	.	.	.	.
109 Pleasant Twp	Ind-Imp	72	83,502,100	2	2.78	1.89	17.90	1.12	1.325	1.09	1.56	63,010,280
110 Pleasant Twp	Coml-Vac	14	471,100	.	.	.	.	.	.	.	.	.

**Allen County Property Tax Reassessment Equalization Analysis
Indiana Property Tax Equalization Project**

CntyXtpw	MajrClas	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio
111 Pleasant Twp	Coml-Imp	29	8,893,200	.	.	.	.	.	.	.	.	.
112 Pleasant Twp	Res-Vac	232	7,656,400	6	2.59	6.67	16.33	0.93	0.962	0.72	1.20	7,962,555
113 Pleasant Twp	Res-Imp	1,016	89,558,500	107	10.53	10.02	10.93	1.01	0.977	0.96	1.02	91,670,289
114 Scipio Twp	Agri-Vac	25	901,500	.	.	.	.	.	.	.	.	.
115 Scipio Twp	Agri-Imp	206	13,281,900	.	.	.	.	.	.	.	.	.
116 Scipio Twp	Coml-Imp	1	52,300	.	.	.	.	.	.	.	.	.
117 Scipio Twp	Res-Vac	22	1,209,900	.	.	.	.	.	.	.	.	.
118 Scipio Twp	Res-Imp	93	9,444,300	2	2.15	2.17	2.88	1.00	1.041	1.01	1.07	9,069,986
119 Springfield Twp	Agri-Vac	74	2,261,000	.	.	.	.	.	.	.	.	.
120 Springfield Twp	Agri-Imp	664	63,702,300	9	1.36	2.85	21.09	1.14	0.876	0.65	1.02	72,716,332
121 Springfield Twp	Ind-Imp	14	3,932,800	.	.	.	.	.	.	.	.	.
122 Springfield Twp	Coml-Vac	3	21,600	.	.	.	.	.	.	.	.	.
123 Springfield Twp	Coml-Imp	44	5,330,100	1	2.27	1.05	.	1.00	0.941	.	.	5,666,525
124 Springfield Twp	Res-Vac	234	7,839,400	3	1.28	4.47	9.77	1.04	1.109	1.00	1.33	7,067,418
125 Springfield Twp	Res-Imp	756	79,023,600	62	8.20	7.12	19.09	1.02	0.968	0.92	1.02	81,638,484
126 St. Joseph Twp	Agri-Vac	104	2,230,500	.	.	.	.	.	.	.	.	.
127 St. Joseph Twp	Agri-Imp	71	10,190,200	2	2.82	6.98	10.54	1.00	0.671	0.60	0.74	15,178,313
128 St. Joseph Twp	Ind-Imp	19	5,146,000	.	.	.	.	.	.	.	.	.
129 St. Joseph Twp	Coml-Vac	139	23,052,700	.	.	.	.	.	.	.	.	.
130 St. Joseph Twp	Coml-Imp	628	540,416,130	59	9.39	7.78	26.33	1.35	0.996	0.88	1.09	542,629,623
131 St. Joseph Twp	Res-Vac	1,447	11,723,900	1	0.07	1.08	.	1.00	0.826	.	.	14,191,982
132 St. Joseph Twp	Res-Imp	21,252	2,186,241,600	5,194	24.44	24.39	8.53	1.00	0.975	0.97	0.98	2,242,900,795
133 Washington Twp	Agri-Vac	89	2,423,800	.	.	.	.	.	.	.	.	.
134 Washington Twp	Agri-Imp	86	9,656,300	4	4.65	8.78	22.65	1.16	0.971	0.60	1.27	9,944,612
135 Washington Twp	Ind-Vac	78	8,369,700	1	1.28	0.22	.	1.00	0.718	.	.	11,650,622
136 Washington Twp	Ind-Imp	436	327,592,130	13	2.98	2.42	22.14	0.98	0.999	0.75	1.20	327,951,595
137 Washington Twp	Coml-Vac	176	19,812,800	.	.	.	.	.	.	.	.	.
138 Washington Twp	Coml-Imp	1,387	975,121,150	66	4.76	5.08	26.69	1.17	0.983	0.82	1.07	992,310,561
139 Washington Twp	Res-Vac	1,400	15,273,300	.	.	.	.	.	.	.	.	.
140 Washington Twp	Res-Imp	9,340	896,852,000	1,348	14.43	15.49	10.22	1.00	0.976	0.97	0.98	919,183,098
141 Wayne Twp	Agri-Vac	93	1,892,700	.	.	.	.	.	.	.	.	.
142 Wayne Twp	Agri-Imp	52	4,193,400	1	1.92	1.60	.	1.00	1.018	.	.	4,120,248
143 Wayne Twp	Ind-Vac	234	2,182,200	.	.	.	.	.	.	.	.	.
144 Wayne Twp	Ind-Imp	611	187,848,500	14	2.29	6.70	34.98	1.57	1.167	0.60	1.46	160,966,570
145 Wayne Twp	Coml-Vac	631	13,930,500	.	.	.	.	.	.	.	.	.
146 Wayne Twp	Coml-Imp	3,217	1,017,451,870	112	3.48	2.77	36.55	1.13	0.892	0.81	0.97	1,140,309,976

**Allen County Property Tax Reassessment Equalization Analysis
Indiana Property Tax Equalization Project**

CntyXtpw	MajrClas	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio	
147	Wayne Twp	Res-Vac	5,260	20,690,200	5	0.10	1.77	5.12	0.99	1.149	1.06	1.27	18,011,399
148	Wayne Twp	Res-Imp	37,745	2,096,676,650	4,803	12.72	13.49	23.17	1.06	0.988	0.98	1.00	2,121,132,063
Total			142,897	15,177,527,590	18,145								

Restratified (2) Equalization Via Median

CntyXtpw	MjrcIs3	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio	
1	Aboite Twp	Agri-Vac	67	3,163,900	.	.	.	.	.	.	.	.
2	Aboite Twp	Agri-Imp	94	9,568,100	.	.	.	.	.	.	.	.
3	Aboite Twp	C+I-Imp	601	344,262,280	22	3.66	6.77	22.55	0.98	0.965	0.83	1.17	356,899,820
4	Aboite Twp	C+I+R Vac	1,700	32,015,100	.	.	.	.	.	.	.	.	.
5	Aboite Twp	Res-Imp	10,495	1,861,769,080	2,605	24.82	23.64	9.37	1.00	1.000	1.00	1.00	1,862,173,305
6	Adams Twp	Agri-Vac	217	5,136,400	.	.	.	.	.	.	.	.	.
7	Adams Twp	Agri-Imp	94	12,584,000	4	4.26	4.90	5.26	0.99	1.077	0.89	1.09	11,688,860
8	Adams Twp	C+I-Imp	1,010	337,413,100	55	5.45	5.37	27.38	1.00	0.989	0.88	1.13	341,002,378
9	Adams Twp	C+I+R Vac	1,901	26,876,400	33	1.74	10.23	23.58	1.01	1.055	0.98	1.35	25,480,561
10	Adams Twp	Res-Imp	9,052	635,574,600	1,747	19.30	20.05	16.31	1.02	0.948	0.94	0.95	670,791,135
11	Cedar Creek Twp	Agri-Vac	157	3,354,700	.	.	.	.	.	.	.	.	.
12	Cedar Creek Twp	Agri-Imp	500	71,068,600	2	0.40	0.39	11.15	1.05	0.629	0.56	0.70	112,966,778
13	Cedar Creek Twp	C+I-Imp	185	39,121,700	5	2.70	2.46	30.66	1.18	0.982	0.69	1.85	39,835,534
14	Cedar Creek Twp	C+I+R Vac	1,035	31,381,200	5	0.48	2.19	12.12	1.00	0.867	0.79	1.22	36,208,423
15	Cedar Creek Twp	Res-Imp	3,139	419,570,000	154	4.91	4.73	11.29	1.00	0.965	0.95	0.98	434,588,354
16	Eel River Twp	Agri-Vac	68	2,334,400	.	.	.	.	.	.	.	.	.
17	Eel River Twp	Agri-Imp	704	72,670,700	16	2.27	4.10	23.57	1.09	0.915	0.79	1.14	79,390,249
18	Eel River Twp	C+I-Imp	7	1,950,700	.	.	.	.	.	.	.	.	.
19	Eel River Twp	C+I+R Vac	176	3,432,500	1	0.57	3.85	.	1.00	0.922	.	.	3,721,121
20	Eel River Twp	Res-Imp	803	99,152,600	66	8.22	8.32	21.72	1.07	1.038	0.92	1.16	95,541,204
21	Jackson Twp	Agri-Vac	177	7,810,800	.	.	.	.	.	.	.	.	.
22	Jackson Twp	Agri-Imp	148	14,955,100	1	0.68	0.69	.	1.00	1.136	.	.	13,166,098
23	Jackson Twp	C+I-Imp	9	2,511,400	1	11.11	1.88	.	1.00	1.025	.	.	2,449,525
24	Jackson Twp	C+I+R Vac	72	646,000	1	1.39	16.69	.	1.00	0.923	.	.	699,877
25	Jackson Twp	Res-Imp	133	12,362,700	13	9.77	9.90	27.96	1.03	0.791	0.56	1.01	15,631,595
26	Jefferson Twp	Agri-Vac	60	1,857,700	.	.	.	.	.	.	.	.	.
27	Jefferson Twp	Agri-Imp	538	36,503,800	3	0.56	1.23	11.30	1.01	0.825	0.60	0.88	44,261,339

**Allen County Property Tax Reassessment Equalization Analysis
Indiana Property Tax Equalization Project**

CntyXtpw	MjrCls3	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound of 95% confidence interval for Median	Upper bound of 95% confidence interval for Median	Imputed Market Value per Median Ratio	
28	Jefferson Twp	C+I-Imp	62	37,606,600	2	3.23	0.29	34.45	1.15	0.756	0.50	1.02	49,765,602
29	Jefferson Twp	C+I+R Vac	116	2,613,400	.	.	.	.	.	.	.	.	.
30	Jefferson Twp	Res-Imp	592	55,259,900	73	12.33	12.45	12.66	1.03	1.008	0.97	1.02	54,839,239
31	Lafayette Twp	Agri-Vac	126	4,336,500	.	.	.	.	.	.	.	.	.
32	Lafayette Twp	Agri-Imp	443	42,604,900	16	3.61	6.41	26.31	1.09	0.740	0.63	0.91	57,566,577
33	Lafayette Twp	C+I-Imp	25	95,260,400	.	.	.	.	.	.	.	.	.
34	Lafayette Twp	C+I+R Vac	240	10,489,600	9	3.75	13.53	20.73	0.98	0.967	0.69	1.25	10,852,554
35	Lafayette Twp	Res-Imp	590	68,633,300	54	9.15	9.55	15.45	1.01	0.961	0.89	1.01	71,408,673
36	Lake Twp	Agri-Vac	44	1,246,100	.	.	.	.	.	.	.	.	.
37	Lake Twp	Agri-Imp	514	48,437,300	4	0.78	1.22	13.50	0.95	0.814	0.81	1.25	59,474,491
38	Lake Twp	C+I-Imp	16	2,075,700	.	.	.	.	.	.	.	.	.
39	Lake Twp	C+I+R Vac	289	4,590,100	2	0.69	4.81	24.71	1.25	1.035	0.78	1.29	4,433,039
40	Lake Twp	Res-Imp	548	46,304,000	29	5.29	4.74	26.29	1.12	1.013	0.91	1.15	45,699,689
41	Madison Twp	Agri-Vac	60	2,151,800	.	.	.	.	.	.	.	.	.
42	Madison Twp	Agri-Imp	520	42,559,300	5	0.96	1.07	37.43	1.04	1.018	0.82	2.08	41,804,318
43	Madison Twp	C+I-Imp	30	2,340,300	2	6.67	10.52	28.38	0.95	0.842	0.60	1.08	2,780,521
44	Madison Twp	C+I+R Vac	68	1,775,700	1	1.47	4.19	.	1.00	1.522	.	.	1,166,348
45	Madison Twp	Res-Imp	440	44,374,000	37	8.41	8.25	18.23	1.04	1.034	0.92	1.07	42,904,326
46	Marion Twp	Agri-Vac	143	3,579,400	.	.	.	.	.	.	.	.	.
47	Marion Twp	Agri-Imp	511	45,553,700	4	0.78	1.48	11.56	0.99	0.789	0.70	0.99	57,718,974
48	Marion Twp	C+I-Imp	24	3,009,200	.	.	.	.	.	.	.	.	.
49	Marion Twp	C+I+R Vac	218	2,821,600	.	.	.	.	.	.	.	.	.
50	Marion Twp	Res-Imp	907	92,891,400	62	6.84	6.68	16.21	1.03	0.918	0.88	0.98	101,183,321
51	Maumee Twp	Agri-Vac	28	994,400	.	.	.	.	.	.	.	.	.
52	Maumee Twp	Agri-Imp	362	27,594,800	2	0.55	0.97	50.60	1.08	1.171	0.58	1.76	23,565,418
53	Maumee Twp	C+I-Imp	67	9,084,000	.	.	.	.	.	.	.	.	.
54	Maumee Twp	C+I+R Vac	211	3,051,000	.	.	.	.	.	.	.	.	.
55	Maumee Twp	Res-Imp	733	62,661,400	66	9.00	8.07	13.17	1.01	0.960	0.93	0.99	65,278,283
56	Milan Twp	Agri-Vac	76	2,400,500	1	1.32	7.67	.	1.00	0.961	.	.	2,497,117
57	Milan Twp	Agri-Imp	688	65,858,200	2	0.29	0.66	23.20	1.06	0.662	0.51	0.82	99,542,900
58	Milan Twp	C+I-Imp	27	23,231,300	2	7.41	0.78	5.60	1.00	0.552	0.52	0.58	42,118,347
59	Milan Twp	C+I+R Vac	162	3,845,500	1	0.62	2.44	.	1.00	1.082	.	.	3,554,634
60	Milan Twp	Res-Imp	732	80,619,300	50	6.83	6.64	13.51	1.03	0.991	0.93	1.02	81,354,513
61	Monroe Twp	Agri-Vac	43	1,681,100	.	.	.	.	.	.	.	.	.
62	Monroe Twp	Agri-Imp	320	22,813,200	3	0.94	1.73	19.79	0.97	0.813	0.80	1.28	28,045,089
63	Monroe Twp	C+I-Imp	76	10,082,300	2	2.63	0.92	10.30	1.02	1.046	0.94	1.15	9,639,520
64	Monroe Twp	C+I+R Vac	246	2,548,400	1	0.41	2.70	.	1.00	0.515	.	.	4,950,289

**Allen County Property Tax Reassessment Equalization Analysis
Indiana Property Tax Equalization Project**

CntyXtwp	MjrCls3	ParclCnt	AV - Total Land & Improvements	Sample Size	Sample Parcels Pct of Popln	Sample Assessed Value Pct	Coefficient of Dispersion	Price Related Differential	Median	Lower bound	Upper bound	Imputed Market Value per Median Ratio
										of 95% confidence interval for Median	of 95% confidence interval for Median	
65 Monroe Twp	Res-Imp	627	46,372,400	39	6.22	5.59	18.70	1.05	0.981	0.93	1.03	47,287,994
66 Perry Twp	Agri-Vac	177	5,023,400	.	.	.	.	.	.	.	.	.
67 Perry Twp	Agri-Imp	186	19,511,900	1	0.54	0.28	.	1.00	1.161	.	.	16,799,246
68 Perry Twp	C+I-Imp	163	77,945,700	2	1.23	0.12	4.96	1.02	1.140	1.08	1.20	68,379,228
69 Perry Twp	C+I+R Vac	2,635	41,634,600	5	0.19	2.27	11.41	1.01	0.947	0.75	1.10	43,960,769
70 Perry Twp	Res-Imp	7,200	1,130,584,100	1,117	15.51	14.67	9.45	1.01	0.998	0.99	1.01	1,132,843,043
71 Pleasant Twp	Agri-Vac	60	1,934,300	.	.	.	.	.	.	.	.	.
72 Pleasant Twp	Agri-Imp	395	31,089,100	2	0.51	0.81	14.12	1.04	0.801	0.69	0.91	38,816,539
73 Pleasant Twp	C+I-Imp	101	92,395,300	2	1.98	1.71	17.90	1.12	1.325	1.09	1.56	69,721,045
74 Pleasant Twp	C+I+R Vac	267	9,482,200	6	2.25	5.39	16.33	0.93	0.962	0.72	1.20	9,861,363
75 Pleasant Twp	Res-Imp	1,016	89,558,500	107	10.53	10.02	10.93	1.01	0.977	0.96	1.02	91,670,289
76 Scipio Twp	Agri-Vac	25	901,500	.	.	.	.	.	.	.	.	.
77 Scipio Twp	Agri-Imp	206	13,281,900	.	.	.	.	.	.	.	.	.
78 Scipio Twp	C+I-Imp	1	52,300	.	.	.	.	.	.	.	.	.
79 Scipio Twp	C+I+R Vac	22	1,209,900	.	.	.	.	.	.	.	.	.
80 Scipio Twp	Res-Imp	93	9,444,300	2	2.15	2.17	2.88	1.00	1.041	1.01	1.07	9,069,986
81 Springfield Twp	Agri-Vac	74	2,261,000	.	.	.	.	.	.	.	.	.
82 Springfield Twp	Agri-Imp	664	63,702,300	9	1.36	2.85	21.09	1.14	0.876	0.65	1.02	72,716,332
83 Springfield Twp	C+I-Imp	58	9,262,900	1	1.72	0.60	.	1.00	0.941	.	.	9,847,555
84 Springfield Twp	C+I+R Vac	237	7,861,000	3	1.27	4.46	9.77	1.04	1.109	1.00	1.33	7,086,891
85 Springfield Twp	Res-Imp	756	79,023,600	62	8.20	7.12	19.09	1.02	0.968	0.92	1.02	81,638,484
86 St. Joseph Twp	Agri-Vac	104	2,230,500	.	.	.	.	.	.	.	.	.
87 St. Joseph Twp	Agri-Imp	71	10,190,200	2	2.82	6.98	10.54	1.00	0.671	0.60	0.74	15,178,313
88 St. Joseph Twp	C+I-Imp	647	545,562,130	59	9.12	7.71	26.33	1.35	0.996	0.88	1.09	547,796,700
89 St. Joseph Twp	C+I+R Vac	1,586	34,776,600	1	0.06	0.36	.	1.00	0.826	.	.	42,097,671
90 St. Joseph Twp	Res-Imp	21,252	2,186,241,600	5,194	24.44	24.39	8.53	1.00	0.975	0.97	0.98	2,242,900,795
91 Washington Twp	Agri-Vac	89	2,423,800	.	.	.	.	.	.	.	.	.
92 Washington Twp	Agri-Imp	86	9,656,300	4	4.65	8.78	22.65	1.16	0.971	0.60	1.27	9,944,612
93 Washington Twp	C+I-Imp	1,823	1,302,713,280	79	4.33	4.41	26.02	1.14	0.983	0.83	1.06	1,325,461,965
94 Washington Twp	C+I+R Vac	1,654	43,455,800	1	0.06	0.04	.	1.00	0.718	.	.	60,490,474
95 Washington Twp	Res-Imp	9,340	896,852,000	1,348	14.43	15.49	10.22	1.00	0.976	0.97	0.98	919,183,098
96 Wayne Twp	Agri-Vac	93	1,892,700	.	.	.	.	.	.	.	.	.
97 Wayne Twp	Agri-Imp	52	4,193,400	1	1.92	1.60	.	1.00	1.018	.	.	4,120,248
98 Wayne Twp	C+I-Imp	3,828	1,205,300,370	126	3.29	3.38	37.53	1.21	0.908	0.81	1.02	1,327,162,931
99 Wayne Twp	C+I+R Vac	6,125	36,802,900	5	0.08	0.99	5.12	0.99	1.149	1.06	1.27	32,037,956
100 Wayne Twp	Res-Imp	37,745	2,096,676,650	4,803	12.72	13.49	23.17	1.06	0.988	0.98	1.00	2,121,132,063
Total		142,897	15,177,527,590	18,145								

Indiana Property Tax Equalization Study

Appendix B:

Background Tool Kit

Introduction

The State of Indiana is completing a mass reassessment of all real property in accordance with the requirements of the Indiana Supreme Court set forth in the decision in State Board of Tax Commissioners v. Town of St. John and subsequent order of the Indiana Tax Court.

The Indiana Department of Local Government Finance (DLGF) laid out the reassessment rules and procedures in Indiana Administrative Code 50 IAC. The regulations require the reassessment to produce assessments that comply with the Supreme Court Decision and the Tax Court order; specifically, that they be “objectively verifiable.” Market value is the objectively verifiable standard which the reassessment must meet.

In addition, Indiana statute (I.C. 6-1.1-34) requires a School Assessment Ratio Study and the DLGF regulations require a state-wide, county-by-county report on both the processes used for and the results of the reassessment. Finally, the State needs a dynamic, accurate, consistent database for effective, ongoing property tax administration.

Therefore, the DLGF and the State Budget Agency have asked the Indiana Fiscal Policy Institute (IFPI) to perform a Property Tax Equalization Study that will provide the State with a determination of the strengths, weaknesses, and accuracy of the reassessment process and its results. The key features of the study are:

- A county-by-county analysis of the property tax equalization performed by the counties,
- A school assessment sales ratio study,
- An analysis, by jurisdiction, of the tax burden shift between classes of property,
- An analysis, by jurisdiction, of tax bill changes and property class,
- A study of the assessment methodology and process, with recommendations for improvements in future years,

- An analysis, by jurisdiction, of the effects on tax bills of levy increases, and
- An analysis of the data requirements for future property tax reassessments.

This Toolkit provides background material for local government officials, members of the media, and taxpayers to assist in their understanding of the objectives of the study and the process the IFPI used to conduct it. It includes an explanation of the need for the study, discussion of property tax administration and analysis concepts, and definitions of terms.

Why is an independent ratio study needed?

First, the Indiana Constitution requires that property tax “assessment and taxation” be “uniform and equal.” It is the State’s constitutional responsibility to administer the property tax system such that local governments perform the ministerial duties of assessment and tax collection in accordance with state law. In State Board of Tax Commissioners v. Town of St. John, the Supreme Court mandated a market value based assessment standard.

Therefore, the State’s responsibility is to ensure compliance, by the local assessors, of the DLGF’s reassessment rule. Since the Supreme Court mandated that assessments be objectively verifiable, an independent study that measures the relationship between assessments and market value is required to determine compliance by the local assessors. The best method to make that determination is an independent ratio study.

Second, a ratio study essentially is an audit of the quality of an assessment. A cursory review of county equalization studies revealed several things that called into question their general reliability. The following problems were noted:

- There were variations in study methods, and some studies used non-standard statistics.ⁱ
- There seemingly are discrepancies in the numbers of properties in the various mandated strata.ⁱⁱ
- There were discrepancies in the numbers of sales considered usable in the studies.

- At least as furnished by the state, most studies were poorly documented.
- Most important, the reported statistics too often were incredibly good, which lowered confidence in the county studies.

Background, Definitions, and Explanation of Concepts

Taxation is integral to civil society, and public finance experts usually recommend property taxes to bring diversity to, and help balance, a state and local revenue system. When public revenues come from several types of taxes and other sources of revenue, it is easier to find a balance among competing policy objectives, weather economic difficulties, and compete effectively in the global economy. A tax on the current market value of real property is an important part of such a system, because a market value-based property tax has a comparatively stable and reliable base, which is attractive during troubled economic times (see the box on the next page for a discussion of market value in the Indiana property tax system).

Property value can be a measure of a taxpayer's wealth or ability to pay. A real property tax is an especially suitable source of revenue for local governments. The immovability of the tax base makes clear which government is entitled to the tax revenue. If the property is security for the tax, it cannot be evaded. In addition, many local government services are provided to properties or to their owners and occupants. The tax captures for local government some of the increases in the value of land that are partially created by public expenditures, such as streets and highways, water and sewer, public safety, etc. Further, a dedicated source of revenue promotes local autonomy. Finally, the visibility of property taxes focuses attention on the overall quality of governance and promotes accountability.

What is market value?

There are many legal and textbook definitions of market value. In valuation theory however, *market value* essentially is an *expected price*—the price for a property that the seller and an unrelated buyer would most likely agree to in an open market. The definition of market value also carries the assumption that both parties were reasonably well informed about how the property could be used in the future and about prices for similar properties.

Furthermore, it would be assumed that neither was under any unusual pressure to buy or sell.

How is market value for property tax purposes determined?

Valuation or *appraisal* is the activity of *estimating* what property values are. In essence, part of the job of an appraiser is to look at properties the way typical buyers and sellers would. Although many methods may be used to estimate market values, professional appraisers have agreed to standard procedures and methods (discussed below), which require them to work systematically, document their work, and communicate their opinions of value clearly. *Assessment* is the act of officially determining the value estimate to be used as the basis for taxation; the specialist appraiser who has the responsibility for making these determinations is an *assessor*.

Real estate markets reflect the ways people who want to buy or sell real estate think and act. Tracts of land may be used for such purposes as quiet enjoyment, agriculture, exploitation of mineral resources, and development either immediately or eventually. Developed land (land with buildings and other structures) may be used for housing or for carrying out economic activities. A person may want to own real estate to use it for such purposes directly or to rent it to others. One reason for owning real estate is to receive the rental income it can generate. Another reason to own real estate is the hope that it will appreciate in value. Of course, real estate may be held for more than one purpose. The important point is that the real estate market naturally is segmented, and an important valuation activity is deciding how to best estimate its market value.

Indiana’s property tax assessment standard: True tax value

The meaning of “true tax value” seems subject to interpretation. A common interpretation is that it is “market value in use.” For properties whose future use would be the same as the current use, market value and true tax value is the same thing. When the future use would be different from the current use, true tax value can be inferred from the market value of similar properties whose use is unlikely to change or that are not subject to the same economic pressures, whether positive or negative. Indiana courts have ruled that true tax values must be “objectively verifiable”—hence the need for the tax equalization study.

In appraisal practice, there are three basic “approaches” to estimating market values. These reflect market participants’ behaviors and the resulting evidence of market values.

- The *sales comparison approach*: Gathers information on recent open-market sales prices of similar propertiesⁱⁱⁱ, analyzes why their prices differ, and uses that information to estimate the value of each appraisal property^{iv}. It provides the best way to appraise residences and vacant land plots.
- The *income approach*: Uses the estimated future income stream over the remaining economic life of a property and uses a rate-of-return on investments of comparable risk to “capitalize” the income stream into a present value as of the appraisal date. It provides an excellent way to appraise properties that commonly are rented.
- The *cost approach*: Combines three components: the replacement cost of improvements *minus* accrued depreciation *plus* land value, which are separately estimated. Replacement cost is what it would cost to replace the existing structures and other improvements with new construction. Accrued depreciation is the loss in value due to physical depreciation, functional obsolescence, and economic obsolescence. Land value is what vacant land with the same characteristics and allowable uses would sell for in the open market^v.

Appraisal standards recommend using as many of the approaches as is practical. Theoretically, all three approaches would yield the same estimate of value. However, market imperfections, data limitations, differences in appraisal skills, and other factors conspire to produce differing value estimates in practice. Consequently, appraisers must evaluate the strengths and weaknesses of the above approaches and chose the figure that is most appropriate in the circumstances. This process is known as “reconciliation”.

Although the summary above has not provided the details, all three approaches to value require analysis of available sales of comparable properties. This requires assessors to collect information on sales of real estate in their jurisdictions (and desirably to consider comparable sales from other areas as well). Each sale should be evaluated (or screened) to determine whether it is usable in appraisal (that is, meets the criteria of an open-market, arm’s-length sale) and whether it is usable in ratio studies (discussed below). To help with this process, Indiana law requires buyers and sellers to complete a sales disclosure form.

The *purpose* of an appraisal greatly affects how the appraisal should be conducted. Two factors especially affect appraisals for property tax purposes: (1) the need for efficiency in the appraisal process and (2) the need to treat taxpayers consistently.

Mass appraisal in Indiana

The 2002 Real Property Assessment Manual, which Indiana township and county assessors are required to use, lays out a framework for a mass appraisal system. System specifications reinforce it. The cost approach is the default valuation approach.

Efficiency is warranted because the costs of administering a tax should be kept to a minimum.^{vi} Relative to most other purposes for commissioning an appraisal (such as determining the price of a property or whether the property provides sufficient collateral for a mortgage), the amounts at stake in a property tax appraisal (the taxes in question) are low. Consistency is warranted for the intended goal of equity and for quality assurance. So-called “mass appraisal” methods serve both goals. As defined by the International Association of Assessing Officers, mass appraisal is “the process of valuing a group of properties as of a given date, using standard methods, employing common data, and allowing for statistical testing.” Modern mass appraisal relies considerably on computer support.

What does “equalization” mean and why is it needed?

“Equalization” is a loosely used term in property tax administration. Formally, equalization is used to describe processes by which an agency with authority over two or more assessment districts (like the Indiana Department of Local Government Finance) makes adjustments to total assessments in the districts so that the assessments within the agency’s jurisdiction all bear the same relationship to total market value.

Informally, property tax officials may use “equalization” as a synonym for reassessment, review of assessments, or deciding assessment appeals. Equalization, as defined above, also is known as *inter-jurisdictional* equalization. Sometimes equalization agencies have authority to adjust total assessments of classes of property within an assessment district; this is known as *intra-jurisdictional* equalization.

Equalization programs sometimes are classified as “direct” or “indirect,” although the distinction may be blurred in certain instances. In direct equalization, by application of an equalization factor or reassessment order,

the equalization agency causes local assessments to be changed. In indirect equalization, neither local assessments nor local taxes are affected; the equalized value estimates merely figure in aid distribution formulas and the like.

States “equalize” property tax assessments for three main reasons:

- To ensure that local governments comply with the law – that is, to ensure equitable treatment of taxpayers under the law.
- To ensure that taxpayers benefit equally from state-mandated exemptions.
- To improve the allocation of state aid.

In order to have a rational basis for equalization, measurement of the quality of property tax assessments must be performed. Ratio studies provide that rational measurement by analyzing property tax assessments.

What is a “ratio study”?

Here we consider only basic concepts; later we consider some of the issues involved. A “ratio study” is an investigation of how closely the *appraisals* that underlie property tax assessments approach *market values* and how consistent those appraisals are across all property. As will be illustrated through an example later, there are two principal concerns:

1. Level – Do the assessments meet the State’s standard? In other words: on average, how close are the assessments to market value?
2. Uniformity or Consistency – How close are individual assessment ratios to assessment ratios across all property?

A ratio study is a form of applied statistical analysis. This means that conclusions are drawn about the overall *quality of assessments* on the basis of data about a sample of properties—those that happen to have sold on the open market. For those

Two views of statistics

“There are three kinds of lies: Lies, damned lies, and statistics.”

Benjamin Disraeli (1804-1881)

“Statistics is a body of methods for making wise decisions in the face of uncertainty.”

W. Allen Roberts and Harry V. Roberts,
Statistics: A New Approach, 1956

conclusions to be valid, certain conditions need to be met. This also means that uncertainty cannot be completely dispelled. Judgment always is needed in interpreting the results of a ratio study.

What are the steps in completing a ratio study?

The main steps in a ratio study are: (1) assemble the data, (2) determine the study groups (“strata”), (3) make statistical analyses, (4) evaluate results, and (5) report the results.

Data assembly - the most labor-intensive phase of a ratio study - requires:

1. Collecting raw sales data—in Indiana the primary source of sales data is the sales disclosure form that buyers must file. Other sources may be used.
 - Key data are computerized; quality checks are made.
 - Screening the sales to determine whether a particular sale should be used in the ratio study—recall that only open-market, arm’s-length sales provide reliable evidence of market values. Family sales, foreclosure sales, and the like often do not. In addition, sales that would produce extremely high or low sales ratios are excluded. These are called “outliers.”
 - Matching the sale price with an assessment. In doing this, it is important to determine whether the property that was sold essentially is the same as the property that was assessed. A sale can take place any day of the year, while assessments are as of a single date. If significant physical changes to a property took place between the two dates, the sale cannot be used to evaluate the quality of the assessor’s appraisal.
 - Making necessary adjustments to reported sales prices. Sometimes adjustments to actual sales prices are warranted to make the evaluation of assessments fairer. For example: If a sale included significant personal property that was not considered in the real property assessment, the estimated value of the personal property inflates the price above market value. Such distortions should be removed. After these steps have been completed, the sales file is ready for analysis.

2. *Stratification.* Recalling that the real estate market is naturally segmented and that different methods may be used to appraise different types of property, a better picture of assessment performance can be obtained if different subsets of property are studied separately. This is called “stratification.” Common subsets (“strata”) are the main types of property—residential, commercial, industrial, agricultural, and vacant land. In equalization, different taxing districts may be studied separately.
3. *Data analysis.* After data assembly and stratification, analysis can begin. The next section discusses and illustrates the main statistical computations using a fictitious data set.
4. *Evaluation of results.* When a sample of sales is small, when it does not represent the total makeup of the total assessment roll well, and when the variation in sales ratios is great, ratio study statistics may not reliably portray the quality of appraisals. The same is true if appraisals of parcels in the ratio study sample are adjusted so that they approximate sales prices (so-called “sales chasing”), with the result being ratio study statistics that imply quality appraisals. Another method of misrepresenting the quality of appraisals is to select for inclusion in the sample only sales with “good” ratios (“cherry picking”). Analysts should consider such possibilities before drawing conclusions based on ratio study statistics about the quality of appraisals.
5. *Reporting.* The final step in a ratio study is to report the results. What is reported will depend on the purpose of the study and the audience. More detail is required when the audience includes non-specialists. It often is helpful to compare observed performance with standards of performance, such as those promulgated by the International Association of Assessing Officers.

How are ratio-study statistics calculated and what do they mean?

When actual sales are used as evidence of market values, the investigation is known as a “sales ratio study.” A sales ratio (R) is formed by dividing the appraised value (A) by the sales price (S). For example, if a property was appraised for \$148,000 and it was sold for \$154,000, the sales ratio would be:

$$R = A / S = 148,000 / 154,000 = 0.961.$$

That is, the appraisal is 96 percent of the sale price. In a ratio study, sales ratios would be calculated for all the sales that were deemed usable and patterns in the ratios would be examined.

Table 1: Data used to illustrate calculation of basic ratio study statistics

<i>Sample sales data to illustrate the calculation of ratio study statistics</i>	ID			
	No.	Assessment	Sale Price	Ratio
	(1)	(2)	(3)	(4)
The adjoining nine sales will be used to show how ratio study statistics are calculated. They have been randomly selected from a data set of 75 sales that has been concocted to illustrate both calculations and points.	61	99,200	772,000	0.128
	3	28,000	59,250	0.473
	16	54,110	99,000	0.547
	20	36,320	63,300	0.574
	27	50,560	70,500	0.717
	29	61,360	78,000	0.787
	33	58,080	69,000	0.842
	68	182,000	153,000	1.190
	57	160,000	129,600	1.235
	Total	729,630	1,493,650	6.493

The statistics calculated in ratio studies mainly deal with the *level* of value (assessment) and the *uniformity* of values as previously noted. Another area of statistical inquiry is whether the primary statistics described below may be considered *reliable*. Level of value is measured by a *measure of central tendency*, such as the *median*, the common *arithmetic mean*, and the *weighted mean*. There are several aspects to uniformity. If the question is whether two or more groups of property are valued uniformly, measures of central tendency are compared. If the question is whether all the properties in a group are valued uniformly, a *measure of variability* is calculated. The *coefficient of dispersion* is the chief measure used. Sometimes, the concern is whether high-value properties and low-value properties are valued uniformly. The *price-related differential* is used here.

- *Median*—the median ratio is the *middle* sales ratio when the ratios are arrayed in order of magnitude. When the total number of sales is even, the median is the arithmetic mean of the two middle-most ratios. In table 1, the sales ratios in column 4 have already been arrayed from lowest (0.128) to highest (1.235). The middle ratio (the median) is that of the fifth sale (ID no. 27), which is 0.717. If the sale with ID

- no. 57 were not in the sample, the median would be the average of the ratios of sales 20 and 27, which would be 0.646 ($[0.574+0.717]/2$). The value of the median is unaffected by the values of the ends of the array. For this reason, the median generally is the preferred measure of central tendency when evaluating the quality of a reassessment.
- *Arithmetic mean*—the arithmetic mean is the sum of the individual ratios divided by the number of ratios. If the nine ratios in table 1 were added, they would total 6.493, the average of which would be 0.721. Although not evident from this small sample of nine sales, the value of the mean is strongly affected by the values of the extreme ratios. Hence, it is not relied upon in sales ratio studies.
 - *Weighted mean*—the weighted mean ratio is the sum of the appraisals (assessments) divided by the sum of the sales prices. In table 1, the sum of appraised values (column 2) is 729,630, and the sum of the sales prices (column 3) is 1,493,650. Dividing 729,630 by 1,493,650 results in a ratio of 0.488. As inspection of table 1 would reveal, this ratio is heavily influenced by sale 61, which sold for \$772,000. This dollar-weighting feature makes the weighted mean the preferred measure of central tendency when the objective is to estimate to total market value of a district (as in indirect equalization).
 - *Coefficient of dispersion*—the coefficient of dispersion (COD) measures the average percentage deviation of individual ratios from the median ratio. The lower the COD, the more uniform the appraisals. Table 2 (below), which is derived from table 1, illustrates the calculations.
 1. subtracting the median from each ratio (result in column 3),
 2. taking the absolute value (negative signs are ignored) of the differences (result in column 4),
 3. summing these values (result = 2.332),
 4. dividing by the number of ratios to obtain the “average absolute deviation” ($2.332 / 9 = 0.259$),

5. dividing by the median ($0.259 / 0.717 = 0.361$, and
6. multiplying by 100 to express the results in percentage terms (result = 36.1%).

Table 2: Calculation of the coefficient of dispersion (COD)

ID No. (1)	Ratio (2)	Ratio-Median (3)	Absolute Value (4)
61	0.128	-0.589	0.589
3	0.473	-0.245	0.245
16	0.547	-0.171	0.171
20	0.574	-0.143	0.143
27	0.717	0.000	0.000
29	0.787	0.070	0.070
33	0.842	0.125	0.125
68	1.190	0.472	0.472
57	1.235	0.517	.0517
		Sum =	2.332
Average Absolute Deviation:		$2.332 / 9$	= 0.259
Coefficient of Dispersion:		$0.259 / 0.717$	= 0.361
COD expressed as percentage:		$0.361 * 100$	= 36.1%

- *Price-related differential*—the price-related differential (PRD) is the mean ratio divided by the weighted mean ratio. The PRD of the nine ratios in table 1 is 1.477 ($0.721/0.488$). PRDs close to 1.0 signify uniform appraisals. If the PRD is much above 1.0 (as is the case here), high-value properties tend to be valued at a lower percentage of value than low-value properties. This is known as “assessment regressivity.” PRDs much below 1.0 signify “progressivity.”

Endnotes

- ⁱ Computational errors also were noted.
- ⁱⁱ Some studies provided no information on the numbers of properties in each stratum making it impossible to determine whether omitted strata should have been studied.
- ⁱⁱⁱ Referred to as “comparables.”
- ^{iv} also known as the “subject property.”
- ^v Although it is the least direct approach, the cost approach often is the default valuation approach because it was the first mass appraisal approach to be developed and because data on replacement costs are inexpensively available from specialist publishers.
- ^{vi} Adam Smith’s fourth canon of taxation states “Every tax ought to be so contrived as both to take out and keep out of the pockets of the people as little as possible, over and above what it brings into the public treasury of the state” (*Wealth of Nations*, 1776).

For more information, contact the Indiana Fiscal Policy Institute:

**Indiana Fiscal Policy Institute
One N. Pennsylvania St., Ste 1000
Indianapolis, Indiana 46204
(317) 237-2890
FAX (317) 237-2893
ifpi@indianafiscal.org
www.indianafiscal.org**