

# *Ratio Study Practices in the United States and Canada: Results of 2011 Survey*

**BY THE TECHNICAL STANDARDS COMMITTEE,  
INTERNATIONAL ASSOCIATION OF ASSESSING OFFICERS**

*This paper explores current practices and issues in ratio studies by comparing states, provinces, and a few local jurisdictions not subject to review by a state/provincial oversight agency in terms of frequency of studies, standards used to evaluate results, and final use of results. The report includes an introduction and narrative discussion of responses and some trends since 1989, but focuses on the most recent changes and includes tables and appendixes showing key findings, tabulated responses, and the individual responses from each jurisdiction.*

*In comparing responses to IAAO standards, the 2010 version of the Standard on Ratio Studies was used.*

## **Introduction**

The intent of this analysis is to continue to search for clarification of technical issues by exploring and reviewing state and provincial level ratio study practices throughout the United States and Canada. When possible, responses are compared to those from previous surveys.

This section explores the history of ratio study surveys, provides historical perspective on the availability of standardized ratio study guidance, and describes the development of the 2011 survey and its comparison with survey responses over time.

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*The International Association of Assessing Officers (IAAO) Technical Standards Committee develops and maintains technical standards of professional practice in assessment administration, tax policy, and mass appraisal. The committee also provides input into technical assistance programs and projects regarding property tax administration, policy, and valuation of property.*

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## History of Ratio Study Surveys

Although the direct involvement of the IAAO Technical Standards Committee in ratio study surveys dates only to 2008, attempts to systematically survey national or international ratio study practices date back to at least 1975, when Dennis Deegear, then with the Texas Legislative Property Tax Committee, conducted the first known comprehensive survey with wide participation from U.S. states. The next comprehensive survey was conducted in 1984 by Bob Gloudemans, then with the Arizona Department of Revenue, with responses from 44 states. Periodically, beginning in 1983 and including Canadian provinces and territories from 1989 through 2003, Alan Dornfest, with the Idaho State Tax Commission, conducted comprehensive surveys. Although IAAO staff provided assistance with the 1997 and 2003 surveys, the product was not adopted as a formal IAAO-sponsored task until 2008, when the survey was assigned to the Technical Standards Committee.

## Availability of Standardized Ratio Study Guidance

Historically, little written material was available to provide a basis for standardization of ratio studies. The early literature includes a 1924 Bulletin of the Kansas State Agricultural College titled, "Assessment and Equalization of Farm and City Real Estate in Kansas" (Agricultural Experiment Station 1924); a more systematic 1954 Federation of Tax Administrators publication titled, "Guide for Assessment-Sales Ratio Studies" (Committee on Sales Ratio Data 1954); and a U.S. Census Bureau series of publications begun in 1957 and continued each five years through 1982 titled, "Taxable Property Values and Assessment/Sales Price Ratios" (U.S. Department of Commerce 1985). By the late 1970s, IAAO was providing guidance through materials including the *Improving Real Property Assessment* textbook (Almy 1978). This soon was followed by the first IAAO

*Standard on Ratio Studies*, published in 1980 (IAAO 1980). By 1990, the IAAO *Property Appraisal and Assessment Administration* textbook (Eckert et al. 1990) and an updated *Standard on Ratio Studies* (IAAO 1990) were available and were soon in wide circulation. Recently, these materials have been updated: there is now a 2010 version of the *Standard on Ratio Studies* (IAAO 2010), and the 2011 *Fundamentals of Mass Appraisal* (Gloudemans and Almy 2011) has replaced the 1999 *Mass Appraisal of Real Property* (Gloudemans 1999).

Although these materials present many unified themes for ratio study practices, disparities in use and terminology still exist and make interpretation of survey responses somewhat subjective. The committee attempted to address this problem by personal follow-up contacts with many of the participants in the survey.

## Survey Development

The 2011 Ratio Study Survey is the second conducted by the IAAO Technical Standards Committee. Although many of the prior questions were retained to permit longitudinal comparisons, a few areas needed clarification or are of greater importance today and therefore were updated or expanded. New questions were developed in response to emerging issues, such as the use of foreclosure-related sales in ratio studies. Some questions were eliminated as unnecessary or moved to a property tax policy survey where they are more appropriate.

In addition, the current survey was conducted as an online survey over the Web by using the Zoomerang® survey tool. Although this greatly facilitated completion, shortened turnaround time, and broadened participation, design limitations in some instances restricted the answers, which then required additional follow-up for clarification.

Requests to respond to the survey were sent via e-mail with an embedded link

to the IAAO Web page. Responses were received from every Canadian Province except Manitoba; all states; the District of Columbia; the County of Honolulu in Hawaii, and Kent County in Delaware. A text version of the online survey, showing the original questions in their entirety, is provided in Appendix A.

### Comparison with Previous Surveys

Because of the continuing nature of this survey, it is possible to report not only on U.S. state and Canadian provincial practices but also on the incorporation of professionally accepted best practices. This latest 2011 survey shows, with a few notable exceptions, a continuation of trends noted in 2008, especially with regard to horizontal and vertical uniformity standards used by states and provinces. States and provinces have continued to move closer to IAAO uniformity standards in general, but most have not adopted IAAO guidance regarding technical issues, such as use of tests of statistical significance for level or uniformity measures.

### Survey Limitations

In reports on results of previous ratio study surveys (Dornfest 1993, 1995, 1997; Dornfest and Thompson 2004; Technical Standards Committee 2009), a great deal of confusion regarding ratio study terminology, techniques, standards, and use was noted. A certain amount of confusion is probably unavoidable, resulting from long-standing practices and local statutory guidelines, both of which are difficult to change.

After reviewing responses and clarifying feedback, the committee noted the following limitations because they may affect interpretation of trends among surveys:

- Hawaii and Delaware are unique in that they do not provide state oversight for local assessments. Responses for these states were from local jurisdictions and

reflect local, rather than state, practices.

- One less Canadian province and no Canadian territories responded in 2011. This alters the numbers for Canada and may give the appearance of diminishing use, a conclusion that is not necessarily warranted.
- In addition to questions that were deleted or added (see table 1), some questions were reworded substantially so that comparison with prior years' results is not meaningful. For example, measures of price-related bias are delineated in question 41. Although roughly comparable to question 56 in 2008, this year's question asked for more detail about how measures other than the price-related differential were used and distinguished between calculating the measure and using it to test compliance or make compliance-related decisions.

**Table 1.** Questions from the 2008 survey deleted and questions added to the 2011 survey

<b>2008 Questions Deleted</b>
17. When does disclosure occur?
63–79. Statutory requirements for assessment, use of base years, and fractional ratios
100,101. Taxable status of intangibles and types of intangibles exempt from property tax
47. If the COD is poor, does this alter compliance decisions regarding assessment level?
<b>2011 Questions Added</b>
10. Most recent date tested?
11. Time period from which sales derived
30. Time adjustment method used
44. Are statewide ratio study statistics computed?
63. Have there been fewer ratio study-related actions in recent years?
73. Which categories of real property are subject to performance audits?
77. What software is used for ratio studies?
79. Are foreclosure-related sales used?

- Despite an attempt by the committee to reword questions to eliminate confusion, some questions remained difficult for respondents to correctly interpret the committee's intent. This situation led to inadvertent mistakes in tallies of responses. In particular, the following concerns should be noted:
  - *Reliability* means use of confidence intervals and similar statistics for testing appraisal level or uniformity and compliance with standards. States and provinces indicating that they judge reliability by using the coefficient of dispersion (COD) and similar statistics were not included as using reliability statistics.
  - The question (question 3) designed to establish the frequency of ratio studies was reworded using the word *required*. This added to the confusion, with some places indicating that the studies were not required but they did them once a year. When caught, such answers were changed to reflect common practice.
  - Some questions were too open-ended, leading to reports of 17 types of disclosure documents, with very little if any substantive difference between them.
  - In questions 48 and 49, the term *adjustment* was used in relation to an equalization order to distinguish between *factors* and reappraisal. This was not clear to the respondents and may have resulted in some misstatements.
- Responses have been categorized to distinguish between state-mandated and statewide-implemented procedures to the extent possible. In some cases it is possible to make a

distinction between these two possibilities. For example, if a state's laws permit the ordering of adjustments to locally determined assessments but the state has not used this provision, that can be discerned from the answers.

- The survey questions were reordered again in 2011 to better group them by category. This reordering seemed to improve response rates for questions relating to performance or procedure audits.
- As in 2008, questions about reliability and confidence intervals were not divided into direct and indirect equalization uses. This diminishes the accuracy of responses to this set of questions when states or provinces use point estimates for one type of equalization but not for another.
- Questions about methods used to detect sales chasing were reworded. The 2008 survey asked respondents to rank the different methods according to "first choice, second choice, and so on." This was not very meaningful, and this year's survey asked only which methods were used.

## Responses from U.S. States and Canadian Provinces

Table 2 shows the response rate of ratio study surveys since 1989. Table 3 is a summary of key findings regarding U.S. and Canadian responses to major survey issues. Major ratio study practices and trends in states since 1989 are summarized in this table. Trends in Canadian provinces are discernable beginning in 1994. Because of the larger number of Canadian respondents since 1997 and the smaller number of provinces responding in 2011, comparisons with previous provincial surveys may be misleading. Table 4 lists new and emerging issues first examined in 2011.

Appendix B presents a detailed tabulation of U.S. and Canadian responses; this allows

**Table 2.** Response rate for Surveys on Ratio Study Practices in the United States and Canada, 1989–2011

Survey Year	U. S. States		Canadian Provinces	
	Number	Percentage	Number	Percentage
1989	48/51	94%	—	—
1992	47/51	92%	—	—
1994	46/51	90%	7/12	58%
1997a	51/51	100%	11/12	92%
2003b	51/51	100%	12/13	92%
2008a	51/51	100%	11/13	85%
2011c	51/51	100%	9/13	69%

<sup>a</sup> Including Washington, D.C. and a composite of two of four Hawaiian counties.

<sup>b</sup> Including Washington, D.C. and all four Hawaiian counties.

<sup>c</sup> Including Washington, D.C. and one Hawaiian county.

comparison among responses from the 1994, 1997, 2003, and 2008 surveys.

Based on these data, it appears that the *typical* ratio study program includes the following features:

- An annual ratio study of real property is conducted by the state or, in Canada, by the province.
- Sales or a mix of sales and appraisals of real property is used to develop the ratio study.
- There is statutory authority to require disclosure of sale prices to administrative jurisdictions by means of mandatory disclosure and transfer fees, especially in Canada, where each province has mandatory disclosure.
- Adjustments to sale prices are made primarily for personal property included in the sale price, time, and less frequently financing.
- U.S. results are used primarily to equalize funding, advise local officials of assessment conditions, and determine the need for reappraisal:
  - Secondary uses of significant frequency are adjusting locally

determined values, equalizing assessments of centrally assessed properties, and approving tax rolls

- The pattern of uses was similar in 2008 and 2011, with one exception—the number of states reporting that they use ratio studies to equalize centrally assessed properties dropped sharply from 17 to 8.
- Canadian results are used primarily to monitor valuation accuracy. Note that a number of Canadian provinces are the assessing authority.
- Level and uniformity standards are used for gauging performance or compliance with ratio study standards; these are often similar to IAAO ratio study standards.
- Results are calculated on the basis of samples for which there is generally no predetermined minimum size.

Despite strong recommendations in the *Standard on Ratio Studies* (IAAO 2010) to use confidence intervals in ratio studies designed to test compliance with appraisal level standards, this practice has not caught on widely in either the United States or Canada, and the number of jurisdictions reporting use of confidence intervals decreased from 2008 to 2011.

Detailed responses from each state and province are presented in Appendix C for the United States and Appendix D for Canada. These tabulations provide a complete rendition of responses, except in instances in which it became evident from the responses that the wording of a few questions may have caused confusion. In these few instances, the responses are judged as not meaningful and are not reported in the tables.

Several of the questions presented respondents an opportunity to elaborate on procedures or circumstances; see table 5. Many of these more elaborate answers have been included in the tables in this report. Raw data from the survey is available on the IAAO Website [www.iaao.org/sitePages.cfm?Page=178](http://www.iaao.org/sitePages.cfm?Page=178). Of-

**Table 3.** Key findings from the 2011 Survey of Ratio Study Practices in the United States and Canada

				UNITED STATES						CANADA					
				Numbers of Responses						Numbers of Responses					
2003	2008	2011	Survey Year >	1989	1992	1994	1997	2003	2008	2011	1994	1997	2003	2008	2011
Q#	Q#	Q#	Topic	Total Responses >											
2	3	3	Annual ratio study <sup>a</sup>	35	37	35	41	41	43	43	1	6	8	8	7
3	4	4	Conducted by state/province/territory <sup>b</sup>	29	24	26	29	38	44	44	6	3	7	10	9
4	5	8	Only sales used in ratio studies	19	15	20	23	25	31	30	5	8	8	10	8
5a	94	69	Personal property ratio study	6	10	9	8	7	6	6	0	0	0	0	0
6a	100		Intangible personal property exemption		32	25	32	38	40	NA	3	4	6	3	NA
7	12	74	Procedural audits in lieu of ratio study		11	19	17	22	2	2	2	3	3	1	0
NA	11	72	Procedural audits used						32	25				6	8
8a	16	20	Full disclosure of sales prices <sup>c</sup>	24	33	30	35	37	36	37	6	9	11	11	9
<i>Sales Price Adjustments (used):</i>															
9	26	29	Time	11	13	14	15	18	21	23	4	9	4	6	7
9	26	29	Financing	13	10	16	16	15	11	12	3	8	5	4	4
9	26	29	Personal property	28	26	31	32	26	30	27	6	9	4	7	5
<i>Equalization Adjustments (Authority):</i>															
11c	30	51	Order reappraisal	12	20	22	31	31	28	30	2	1	1	0	2
12	34	49	Trend by category	18	16	11	14	13	16	18	1	2	1	0	1
12c	34	49	Give local officials a grace period to comply			2	12	3	12	25	0	2	1	0	1
12d	34	49	Other			11	4	10	12	16	6	3	0	0	0
13a	48	57	<i>Uniformity Standards for COD/COV:</i>	24	26	32	34	38	40	34	2	8	9	8	7
13a	48		More stringent than IAAO	3	1	6	1	5	6	3	1	1	4	2	0
13a	48		Less stringent than IAAO	18	9	21	23	21	11	5	3	6	3	0	0
13a	48		No standard	23	20	18	17	13	12	17	2	3	3	3	0
13a	48		IAAO standard for one or more types					23	23	26			5	6	7
13b	55		<i>Vertical Equity Standards for PRD:</i>			11	18	22	27	28	2	4	6	5	6
13b	57	58	IAAO standard: PRD = 0.98 to 1.03		2	8	12	17	23	25	2	2	5	5	6
13b	57	58	PRD standard of ranges different from IAAO			3	4	5	4	3	1	1	1	1	0
13b	57	58	No standard			35	34	28	25	23	4	7	6	5	3
14a	35		<i>Testing Assessment Level:</i>												
14a	35	53	Statutory ±10%	17	10	11	15	16	16	19	1	4	1	3	3
14a	35	53	Statutory ± 5%	6	5	5	6	6	4	5	2	2	2	2	3
<i>Assessment Level:</i>															
16	70	53	Required Residential Level of 100% of MV	14	27	17	22	23	26	NA	6	6	8	9	NA
		53	Statutorily Set Assessment Level							43					5

**Notes**

<sup>a</sup> In 2008 two Hawaiian respondents counted once in this table, but counted twice in Appendix B where applicable.

<sup>b</sup> Includes Montana, which contracts out study.

<sup>c</sup> The 2008 total reflects new addition of Delaware, loss of disclosure in South Carolina, and proper classification of Nevada. The 2011 total reflects the correct reporting of South Carolina as a disclosure state.

NA indicates not asked.

**Table 4.** New and emerging issues in ratio studies in the United States and Canada

Issue	U.S. States	Canadian Provinces
Sales time period		
Mostly before assessment date	23	7*
Overlapping	9	0
Mostly after assessment date	11	4*
Statewide ratio study statistics	29	6
Fewer ratio study oversight actions	12	0
Foreclosure-related sales used	17	1
Type of software		
Custom written in house	23	4
CAMA vendor application	6	1
Spreadsheet (e.g., Excel®)	25	6
Statistical software (e.g., SPSS®)	19	7
Database software	14	4

\* Ontario and Quebec indicated two different studies and were counted in both groups

ten, these questions were discretionary or not applicable in certain jurisdictions, so answers only for certain states and provinces are included.

### Recent Trends in the United States

Within the limitations noted, the questions in the current survey and the number of responding jurisdictions were similar to those in previous ratio study surveys. While respecting the constraints and other concerns noted, the committee was often able to compare changes in U.S. ratio study practices over time.

### General Trends

The number of states performing annual ratio studies decreased from 44 in 2008 to 43 in 2011. Many states combine sales and appraisals, although most use sales only. There was little change in this area. Only California still bases its ratio study exclusively on appraisals. In this state, the close ties between sale price and assessed value reduce the applicability of traditional sales-based studies.

The number of states performing personal property ratio studies increased from six to ten between 1989 and 1992. However, this indicator has been steadily

**Table 5.** Questions from the 2011 survey with additional response information

Question Number	Description of Topic
5/6	How ratio study is used
9	Comments on use of sales and appraisals in ratio study
12	Comments on time period for ratio study sales
14	Procedures for testing representativeness
19	Description of sales validation audit policy
25	Description of confidentiality provisions regarding disclosed sale prices
30	Methods used for time adjustment
32/33	Comments on sample size goals
40	Comments on use of confidence intervals to test appraisal level
46	Comments on outlier trimming procedures
49	Methods used to order adjustments to locally determined values
54	Specific standards for appraisal level
55	Methods or authority for setting appraisal level standards
57	Specific standards for uniformity based on the COD
58	Specific standards for vertical equity based on the PRD
60	Description of actions resulting from failure to meet uniformity standards
67	Comments on tests used to detect sales chasing
68	Comments on lower limit for COD as indicator of sales chasing
70/71	Uses of personal property ratio studies
73	Types of property subject to procedural audits
74/75	Uses of procedural audits
78	Comments on software used for ratio studies

decreasing since then; only six states continued to perform ratio studies on personal property in 2008 and 2011. Personal property ratio studies conducted are based solely on appraisals.

The number of states conducting procedural audits decreased from 32 in 2008 to 25 in 2011. Only two states, New York and California, indicated that they conduct such audits instead of ratio studies.

Such studies typically are conducted to provide information about selected property categories for which there is little market activity or when use value and other constraints not directly related to the market are in place. The results of procedural audits may be used to determine compliance.

### **Disclosure of Sale Price**

There are three elements of disclosure: full mandatory sales price disclosure, transfer fees, and mandatory recordation of any transfer instrument. There are five states without these elements as statewide policy: Alaska, Idaho, Missouri, Texas, and Utah. However, the limitation is not as severe in Missouri because several major local jurisdictions have full disclosure; thus only parts of the state are without sale price disclosure requirements.

Many states have transfer taxes based on sale price. Some of these states also have full disclosure. This year, South Carolina was returned to the list of states with disclosure and may have been wrongly removed from the list in 2008.

Disclosure typically occurs via a sale price statement filed with the recorder when deeds are processed. Fewer states indicated that disclosed sale prices are confidential; this number declined from nine in 2008 to seven in 2011.

### **Adjustments to Sale Prices**

The number of states reporting use of adjustments to sale prices was similar in 2008 and 2011.

As in 1997, 2003, and 2008, three states still indicated use of overall adjustments. Of these, only two, Florida and Arizona, make significant overall adjustments and the substance of these has not changed for many years. Washington makes a nominal 1 percent adjustment for personal property presumed to be included in each sale price.

### **Use of Ratio Studies**

The ratio study has traditionally been used in an *advise and assist* role. There was little change in the number of states reporting this use from 2008 to 2011.

Although 29 states indicated they have the authority to order adjustments to locally determined values, only 20 reported that they may use ratio studies for this purpose. Included in the states that order adjustments are some that order reappraisal. There was some confusion about the type of and basis for adjustments. However, 15 states indicated they may trend by class or category, while 3 trend by jurisdiction. Nevertheless, only 14 states have taken action to order adjustments and 10 states to order reappraisals in the past 3 years. This contrasts with 20 states ordering reappraisal during the 3-year period preceding 2008. As a whole, the number of adjustment orders is down, quite possibly because appraised values tend to lag the market less given current economic conditions. Previous surveys showed the number of states that would apply trends to individual categories of property has varied considerably over time.

As mentioned earlier, the number of states reporting that they use ratio studies to equalize centrally assessed properties decreased significantly, from 17 in 2008 to 8 in 2011.

### **Uniformity Standards**

The number of states reporting no horizontal uniformity standards increased from 12 in 2008 to 16 in 2011, the highest reported since 1997. Despite this alarming trend, the number of states with standards for horizontal uniformity that are similar to those recommended in the IAAO *Standard on Ratio Studies* has not changed appreciably since 2003. Of 35 states reporting use of some standards, 26 have standards similar to those recommended by IAAO. Michigan indicated it has uniformity standards that vary by region. General uniformity standards are based predominantly on the coef-



ficient of dispersion (COD). One state, Utah, indicated that it uses uniformity standards based on the coefficient of variation (COV).

The number of states that have developed price-related differential (PRD) standards has continued to increase, from 27 in 2008 to 28 in 2011. Twenty-five of these states use the specific guidelines in the IAAO *Standard on Ratio Studies*. This number has continued to increase, with 23 states indicating use of this standard in 2008. This represents the most widely used guidance found in the IAAO standard. Note that Michigan reported standards based on the PRD, but indicated that the standards vary by region.

Thirty-two states indicated they can initiate action on the basis of poor uniformity. The most typical action is ordering reappraisal, which can be done in 21 of these states.

Twenty states indicated that they test the reliability of the COD, while 9 test the reliability of the PRD. Although the decrease was less significant with regard to the COD, for which 21 states tested reliability in 2008, 5 fewer states indicated testing the reliability of the PRD in 2011. Six states take reliability into account when making decisions or determining compliance with uniformity standards. In 2008, a total of 11 states reported that they base compliance with uniformity standards on reliability measures. There certainly is no evidence of movement toward the guidance in the IAAO *Standard on Ratio Studies* in this area.

### **Level Standards**

A level standard is defined as some range of acceptability around the statutorily required assessment ratio. Such ranges may be provided by statute but, more frequently, are established by administrative or oversight agency authority. Many states have established ranges of this type, but the number of states with *no allowable variance* standard for assessment level could not be determined from the

responses to the 2011 survey because the question was reworded and seven states left it blank, while three reported statutory requirements but no range. In 2008, there were 15 states that reported no allowable variance. The IAAO *Standard on Ratio Studies* recommends a range of -10 to +10 percent for direct equalization of locally determined values and a range of -5 to +5 percent for indirect equalization of funding distributions. The number of states using the  $\pm 10$  percent parameter grew from 16 in 2008 to 19 in 2011, while the number using the  $\pm 5$  percent parameter increased from 4 in 2008 to 5 in 2011.

### **Reliability of Level Statistics**

When the principles of statistical sampling error are used, ratio studies tend to be more reliable for large, uniform samples and less reliable when these conditions are not met. The number of states indicating they test reliability and use this information for compliance purposes appears to have decreased in both 2008 and 2011. Because questions were reworded and there continues to be confusion about this concept, it is not clear that long-term comparisons are valid.

Nevertheless, only 14 of the states that use ratio studies to test compliance with level standards do so on the basis of reliability statistics rather than point estimates. In 2008, a total of 17 states indicated they use reliability statistics. Of the 40 states that use ratio studies for equalization or to order reappraisal, 13 use confidence intervals in helping to make this determination. Of the 43 states that use their ratio studies to make some adjustment to value or to order reappraisal, 30 use point estimates for this purpose.

Beginning in 2008, the survey examines a special situation in which lower levels of confidence or point estimates might be appropriate, as described in the IAAO *Standard on Ratio Studies*. To

do this, the survey asks whether a decision based on reliability statistics could be based on point estimates or lower levels of confidence given long-standing noncomplying point estimates. In 2008, three states indicated they would use lower levels of confidence given this situation. This number dropped to two states in 2011. However, whereas in 2008 no state using confidence intervals would substitute point estimates, in 2011 two indicated they would do so. There has been no change in the number of states (six) indicating that they would continue to find the results in compliance. Since 1999, the IAAO *Standard on Ratio Studies* has recommended lowering the degree of confidence when point estimates indicate long term appraisal inequity.

### Measures of Assessment Level

States typically compute three measures of level: the mean, the median, and the weighted mean. Although similar numbers of states compute these statistics, either the median or weighted mean predominates for equalization purposes. Both the 2008 and 2011 surveys further distinguished between statistics used for direct and indirect equalization.

Usage of all measures of level for direct equalization decreased between 2008 and 2011. This decline may reflect that fewer states are equalizing centrally assessed property (17 in 2008, but only 8 in 2011). The median remains the dominant statistic used for direct equalization, despite the number of states indicating use of this measure decreasing from 25 in 2008 to 18 in 2011. The number of states using the weighted mean for direct equalization decreased from 10 to 5, and those using the arithmetic mean for this purpose decreased from 9 in 2008 to 3 in 2011.

In contrast to trends regarding direct equalization, overall numbers of states reporting the use of various measures of level for indirect equalization remained relatively unchanged between 2008 and 2011. The most significant change was the increase in the number of states us-

ing the median for this purpose. While 12 states used the median this way in 2008, 17 indicated doing so in 2011. The IAAO *Standard on Ratio Studies* differentiates between direct (change property values) and indirect (alter funding) equalization, suggesting that the median is more appropriate for the former and the weighted mean conceptually is more appropriate for the latter.

### Outliers

The number of states identifying outliers was similar in 2003, 2008, and 2011. Since 2008, the survey has been expanded to explore methods of outlier identification and trimming. Despite considerable treatment of this subject in the *Standard on Ratio Studies*, no particular method prevails in practice. However, use of fixed asymmetric points to remove observations decreased from 6 states in 2008 to 1 state in 2011.

### Sales Chasing

The number of states with statutory requirements for testing for sales chasing increased from three in 2008 to five in 2011. However, the number of states with nonstatutory requirements decreased from 12 to 9.

The number of states testing samples for sales chasing increased from 27 in 2008 to 31 in 2011. This question was revised in 2011 to enable states to list methods employed for detecting sales chasing; the question no longer requests ranking the various methods, so the 2011 results are not comparable with those from 2008. The most commonly used technique is comparison of average percentage appraised value changes on sold and unsold parcels; 24 states reported use of this method. While in 2008 only Nebraska indicated establishing a lower limit on the COD as a possible indicator of sales chasing, in 2011 six states indicated such limits and four of these follow the IAAO guidance and use a 5 percent lower limit on the COD.

### **Sample Size and Representativeness**

Uncertainty continues regarding any minimum sample size standard that should be used for evaluating assessment performance based on a ratio study. There is considerable variance between jurisdictions and no significant change for 2003, 2008, and 2011.

The number of states indicating that they may test samples for representativeness decreased from 32 in 2003 to 21 in 2008, but then increased to 26 in 2011.

### **Legal Action**

Continuing a pattern noted in the 2008 survey results, fewer states indicated that ratio studies can result in outside legal action. Although in 2003 there were 37 states indicating that this could occur, in 2008 only 27 states and in 2011 only 20 states indicated that this is a possibility. For the 2011 survey, the question on legal action in the form of appeals was divided into those by taxpayers and those by taxing jurisdictions. A total of 12 states indicated the possibility of the former, while 18 states indicated the possibility of the latter. Some states indicated that both could occur.

### **Recent Trends in Canada**

Responses to this year's survey were received from 9 of the 10 Canadian provinces but no territories. This reflects one less province (Manitoba) and one less territory (Northwest Territories) than in 2008 (see table 2). In some cases, where change was highly unlikely (e.g., disclosure laws), the 2008 responses for Manitoba were included. In a few cases, significant trends are apparent and are stated. In other cases, the general nature of Canadian ratio studies is discussed, and some comparison with U.S. practices is offered.

### **General Trends**

Among the respondents, the number of provinces performing annual ratio studies decreased slightly, from 8 in both

2003 and 2008 to 7 in 2011. (Manitoba performed ratio studies annually as of 2008, but was not counted in 2011.)

All respondents indicated that the ratio study is performed at the provincial level, rather than by local jurisdictions.

As in 2003 and 2008, only one province, Alberta, adds appraisals to sales samples.

Personal property is known to be exempt in most provinces. None of the provinces conduct personal property ratio studies.

All reporting provinces, except Quebec, indicated that they use procedural audits. This response reflects an increase from 6 provinces reporting this use in 2008 to 8 provinces in 2011.

### **Disclosure of Sale Price**

All nine of the responding jurisdictions have full disclosure as well as transfer fees. Presumably, this did not change in Manitoba as well and reflects long-term patterns throughout Canadian provinces. In 2003, all but the Yukon Territory, which did not respond in 2008 or 2011, had full disclosure.

### **Adjustments to Sale Prices**

Adjustments for time and personal property are the most common and occur at about the same relative frequency as in the United States. No Canadian jurisdictions make overall adjustments at this time, and none reported having done so since 1997.

### **Use of Ratio Studies**

Ratio studies are predominantly used as a tool to advise local jurisdictions or to assist mass appraisal programs. Only one province (Saskatchewan) uses its ratio study to adjust locally determined values, and two may use it to equalize funding. Two provinces indicated that they can use the study to order reappraisal, although none indicated this use in 2008. As has been the case since 1997, none use ratio studies to adjust utility (centrally

assessed) values. Regardless of authority, no province has actually ordered adjustments to locally determined values or reappraisal in the past six years.

### **Level and Uniformity Standards**

Use of uniformity standards in 2011 was slightly lower than that reported in 2008, with six provinces now indicating they use such standards, while eight did so in 2008. The reporting provinces use standards similar to those in the IAAO *Standard on Ratio Studies*.

Six provinces continued to report use of PRD standards, and all six cited the range in the IAAO *Standard on Ratio Studies*.

Four provinces indicated that they can initiate reappraisal action based on uniformity. Although in 2008 five provinces indicated that they could take some action on this basis, only three indicated that such action could include reappraisal.

The number of provinces reporting use of specified allowable variance ranges for assessment level was seven in both 2008 and 2011. Three of these provinces use a range of -10 to +10 percent for this purpose. Three provinces use a tighter range of -5 to +5 percent. Nova Scotia tightened its allowable range from  $\pm 10$  to  $\pm 5$  percent, while Saskatchewan continues to report use of a  $\pm 2$  percent range. Ontario indicated that allowable variance is based on market type and property type.

### **Reliability**

Although in 2008 five provinces indicated that confidence intervals are computed and could influence a determination of compliance with assessment level standards, in 2011 only three provinces reported using confidence intervals to determine compliance. Of these, only Quebec uses ratio studies in other than an advise and assist function. British Columbia indicated that it lowers the level of confidence needed to find noncompliance after the calculated (point estimate) measure of level has been out of the desired range for sev-

eral years. Most provinces (six) do not use confidence intervals to determine compliance; however, noncompliance only results in adjustments to values or funding in three provinces. In only one of these provinces, Quebec, is the confidence interval used to make decisions of this nature (in this case to adjust funding provided to local jurisdictions).

The number of provinces testing the reliability of the COD and PRD increased from four and two in 2003 to five and four, respectively, in 2008. The number of provinces testing the reliability of the COD increased to six in 2011, with four provinces testing the reliability of the PRD. Of these, the number of provinces using uniformity reliability measures to take reappraisal and similar action increased from one in 2008 to four in 2011.

### **Measures of Assessment Level**

Canadian use of the various measures of assessment level is similar to that in the United States, with the median the predominant measure computed. However, assessment functions tend to be more concentrated at the provincial level or done through quasi-governmental corporations that function within the province. This has led to less use of ratio studies for equalization than in the United States. Therefore, compilations of statistics regarding measures of level used for various types of equalization are not very meaningful.

### **Normality**

As in 2008, five provinces reported testing normality of the data distribution.

### **Outliers**

The number of provinces testing for outliers increased from seven in 2008 to eight in 2011. Only Nova Scotia limits the percentage of outliers that may be trimmed (no more than 10 percent).

### **Sales Chasing**

Although no province indicated statutory requirements for testing for sales

chasing, British Columbia has non-statutory requirements. Five provinces indicated that they test for sales chasing, with the predominant methods being the comparison of average value change technique and the comparison of average unit values of sold and unsold properties (a technique rarely used in the United States).

Two provinces, Alberta and British Columbia, reported having established lower limits on the COD as indicators of probable sales chasing. Alberta uses a COD of 5 percent for this purpose. In addition, Ontario reported informal use of a COD of 5 percent for use in this way.

### **Sample Size and Representativeness**

Two provinces, British Columbia and Ontario, set minimum sample size quotas at 25 and 30 sales, respectively. Minimum sample size requirements generally are similar to those in the United States.

Four provinces indicated they test samples for representativeness.

### **Legal Action**

Legal action as a result of ratio studies was indicated only in Alberta and could be taken only by taxing jurisdictions.

### **Conclusions**

Ratio studies remain critical for measuring, evaluating, and working toward the improvement of assessment practices in most places. The IAAO *Standard on Ratio Studies* provides detailed guidance on ratio studies. However, aside from isolated instances and especially uniformity standards and statistics, there does not appear to be any clear continuing trend for states and provinces to adopt more features of this IAAO standard.

The report on the 2003 ratio study survey (Dornfest and Thompson 2004) indicated that a growing number of states and provinces base assessment level compliance on confidence intervals and suggested that a major change in practice related to this issue might be emerging.

However, such a trend is not supported by the results of either the 2008 or 2011 studies, which show similar or diminishing numbers of jurisdictions using reliability tests in such decision making. Even more troubling, despite efforts to reword questions to enable better understanding, inconsistencies among answers to multiple questions on this subject led the committee to conclude that the degree of understanding of statistical reliability measures remains deficient. As reported in 2008, the committee continues to believe that previous conclusions about trends in the use of such statistics may have been based on incorrect interpretation of survey questions or responses. As a corollary in support of this conclusion, few states and provinces appear to have responded to the recommendation first found in the 1999 *Standard on Ratio Studies* to lower the level of confidence when long-term inequities are apparent. The lack of response in this area suggests lack of understanding of the underlying statistical measures.

On a more positive note, many states and some provinces are using the methods outlined in the IAAO standard for identifying outliers and for detecting sales chasing. In future surveys, follow-up questions could explore issues of resolution once sales chasing is identified.

Although the 2010 version of the IAAO *Standard on Ratio Studies* was available at the time, most respondents to this survey relied on the 2007 version for guidance. The IAAO *Standard on Ratio Studies* continues the tradition of providing valuable guidance and assistance and is widely cited and used. It is hoped that this survey will provide focus for U. S. states and Canadian provinces and territories that are attempting to evaluate their ratio study systems and work toward internationally recognized guidelines. It is also hoped that states will use survey results as an impetus to become more knowledgeable about the technical aspects of ratio studies that have not yet been incorporated into their practices.

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*Appendix A. 2011 questionnaire for survey of ratio study practices in the United States and Canada*

**Background & General Questions**

**Q1: Enter your full contact information. (contact information will not be distributed or used except in relation to this survey)**

Name (first last):

Title:

Jurisdiction:

E-mail address:

Phone:

**Q2: What is your jurisdiction type?**

- State agency
- Provincial agency
- Territory
- Local

Other, describe (50 char limit):

**Q3: How often is your jurisdiction REQUIRED to conduct ratio studies? Indicate if annual or explain other variations.**

- Annual
- Not required
- Other, describe (50 char limit):

**Q4: Who conducts your ratio study? (check all that apply)**

- State/province/territory officials
- Local officials
- Contracted service provider (university or private company)
- Other, specify (50 char limit):

**Q5: How is your ratio study used? (check all that apply)**

- To order adjustments to locally determined assessed values if necessary
- To equalize state or provincial funding of local jurisdictions
- To order local jurisdictions to reappraise
- To advise assessment officials of assessment conditions
- To assist mass appraisal programs
- To approve tax assessment roll
- To adjust or equalize centrally determined assessed values (such as utilities)
- Other (see next question)

**Q6: How is your ratio study used?**

Other, please explain:

**Q7: Have you incorporated portions of the IAAO *Standard on Ratio Studies* in your statutes or rules and regulations?**

- Yes
- No

## Ratio Study Design

**Q8: Which of the following does your real property ratio study include?**

- Sales only
- Appraisals conducted by or contracted by your agency only
- Both sales and appraisals conducted by or contracted by your agency

**Q9: If you use both sales and appraisals, can they be combined in order to study one type or category of property?**

- No
- Not applicable
- Yes, comments (50 char limit):

**Q10: What was the assessment date tested with your most recent ratio study?**

**Q11: Which of the following describes the time period from which sales are used in your ratio study? (check all that apply)**

- One year
- Multiple Years
- Flexible time period (varies by jurisdiction or category)
- Sale period mostly before assessment date
- Sale period mostly after assessment date
- Sales period equally before and after the assessment date
- Additional comments (see next question)

**Q12: Which of the following describes the time period from which sales are used in your ratio study?**

Additional comments:

**Q13: Do you attempt to determine the representativeness of sales used in the ratio study?**

- Yes
- No

**Q14: If you attempt to determine sample representativeness, what is your procedure? Describe:**

## Data Acquisition & Screening

**Q15: If sales are used in the ratio study, which jurisdiction performs the sample selection?**

- State/province
- Local
- Contracted service provider
- Both state/province and local
- Not applicable
- Other, specify (50 char limit):

**Q16: Which jurisdiction conducts the sales validation (screening)?**

- State/provincial agency
- Local
- Contracted service provider
- Both state/province and local
- Not applicable
- Other (see next question)



**Q17: Which jurisdiction conducts the sales validation (screening)?**

Other, please describe:

**Q18: If the state/provincial agency does NOT conduct the sales validation, does the agency perform an audit of the sales validation process?**

- Yes
- No
- Not applicable

**Q19: If an audit of sales is performed by the oversight agency, briefly summarize your audit policy.**

**Q20: Regarding sales price disclosure: Does your jurisdiction have a law requiring disclosure of real estate sales prices to assessment officials?**

- Yes, disclosure made to state/province/territory officials
- Yes, disclosure made to local assessors
- Yes, disclosure made to both
- No

**Q21: What type of disclosure document is used?**

- Sale price statement
- Comprehensive sale questionnaire
- Both
- Not applicable
- Other, describe (50 char limit):

**Q22: What office is responsible for initially accepting the disclosure document?**

- Recorder/registrar
- Local assessor
- State office
- Not applicable
- Other, describe (50 char limit):

**Q23: Does your jurisdiction employ a unique identification system to track sale disclosure documents?**

- Yes
- No
- Not applicable

**Q24: Are disclosed sale prices public records?**

- Yes
- No
- Not applicable

**Q25: If you answered No to the previous question, please explain:**

**Q26: Is a value-related fee charged (e.g., transfer tax, deed stamp) for real property transfers?**

- Yes
- No

**Q27: Does your jurisdiction have a law making recordation/registration mandatory for real property transfers?**

- Yes
- No

### Sale Price Adjustments

**Q28: Regarding sales price adjustments—Which of the following adjustments to sale price do you have authority to implement in your ratio studies? (check all that apply)**

- No authority to implement adjustments
- Time
- Financing
- Personal property
- Closing costs
- Brokerage fees
- Intangible personal property
- Delinquent taxes
- Other, describe (50 char limit):

**Q29: Which of the following adjustments to sale price do you actually use in your ratio studies? (check all that apply)**

- Time
- Financing
- Personal property
- Closing costs
- Brokerage fees
- Intangible personal property
- Delinquent taxes
- Other, describe (50 char limit):

**Q30: If you make time adjustments for sales used in ratio studies, which methods are used? (check all that apply)**

- Tracking trends in sales ratios over time
- Tracking changes in value per unit over time
- Analysis of repeat sales
- Not applicable
- Other, describe (50 char limit):

**Q31: Are blanket or global adjustments made to sales prices prior to computing ratios? (For example, some jurisdictions adjust all prices down by one percent in an attempt to adjust for personal property that is difficult to isolate sale by sale; others might adjust all sales by ten percent for financing considerations.)**

- Yes
- No

If yes, describe:

### Ratio Study Statistics & Procedures

**Q32: Regarding sample size, what is the smallest sample you will use to evaluate any category of property?**

- Less than 5 observations
- 5 to 9 observations
- 10 to 19 observations
- 20 to 30 observations
- More than 30 observations
- Other, describe (50 char limit):

**Q33: Do you establish sample size quotas or goals (e.g., 3 percent of parcels in category or a number based on a statistical sample size formula)?**

- Yes
- No

If yes, please explain:

**Q34: Check each measure of level that you calculate and indicate if it is used for direct and/or indirect (funding) equalization.**

- ARITHMETIC MEAN - calculate
- ARITHMETIC MEAN - use for direct equalization
- ARITHMETIC MEAN - use for indirect equalization
- MEDIAN - calculate
- MEDIAN - use for direct equalization
- MEDIAN - use for indirect equalization
- WEIGHTED MEAN - calculate
- WEIGHTED MEAN - use for direct equalization
- WEIGHTED MEAN - use for indirect equalization
- GEOMETRIC MEAN - calculate
- GEOMETRIC MEAN - use for direct equalization
- Use GEOMETRIC MEAN - use for indirect equalization
- OTHER - calculate
- OTHER - use for direct equalization
- OTHER - use for indirect equalization

If other measure of level, specify (50 char limit):

**Q35: Do you test the distribution of ratios to see if it is statistically normal?**

- Yes
- No

**Q36: Do you use confidence intervals to determine statistical compliance with standards for appraisal level?**

- Yes
- No
- Not applicable

**Q37: If you use confidence intervals (CIs) to test compliance with appraisal level standards, and the calculated level of assessment is 86% with a confidence interval ranging from 76% to 95% for a particular group of properties, would you consider the level to be in compliance?**

- Yes (the CI overlaps the required minimum level)
- No (the CI does not overlap 100%)
- Not applicable (CI not used to determine compliance)
- Additional comments (see next question)

**Q38: If you use confidence intervals (CIs) to test compliance with appraisal level standards, and the calculated level of assessment is 86% with a confidence interval ranging from 76% to 95% for a particular group of properties, would you consider the level to be in compliance?**

Additional comments:

**Q39: If you use CIs to test compliance with appraisal level standards, and the calculated level of assessment is out of compliance except for the confidence interval for a particular group of properties, and the calculated level of assessment remains below the required minimum level for several years, which action would your agency take? (check all that apply)**

- Lower the level of confidence and reevaluate
- Base the compliance decision on point estimates
- Continue to find the jurisdiction in compliance
- Other
- Not applicable (CI not used to determine compliance)
- Additional comments? (see next question)

**Q40: If you use CIs to test compliance with appraisal level standards, and the calculated level of assessment is out of compliance except for the confidence interval for a particular group of properties, and the calculated level of assessment remains below the required minimum level for several years, which action would your agency take?**

Additional comments:

**Q41: Which measures or tests of price-related bias do you use? (check all that apply)**

- Price related differential (PRD) calculated
- PRD used to test for compliance
- Spearman-Rank calculated
- Spearman-Rank used to test for compliance
- Mann-Whitney Test calculated
- Mann-Whitney Test used to test for compliance
- T-test calculated
- T-test used to test for compliance
- Other, describe (50 char limit):

**Q42: Are actions taken to correct price-related noncompliance?**

- Yes
- No

If yes, please describe:

**Q43: Do you calculate confidence intervals or related tests of statistical significance around any of the following?**

- Coefficient of Dispersion (COD)
- Price-related Differential (PRD)
- COD and PRD
- Neither

**Q44: Do you compute statewide ratio study statistical results?**

- Yes
- No

### Outlier Trimming

**Q45: Do you trim outlier ratios?**

- Yes
- No

**Q46: If outliers are trimmed, what procedure do you use? (check all that apply)**

- 1.5 × interquartile range
- 3.0 × interquartile range
- Beyond 2 standard deviations
- Fixed symmetric points (e.g., remove ratios 1.50)
- Fixed asymmetric points (e.g., remove ratios 2.00)
- Good judgment
- Look for logical break points
- Other, describe (50 char limit):

**Q47: Is there a limit on the maximum percentage of sales that can be trimmed out of a sample? (e.g., 20%)**

- No
- Yes-indicate percentage (50 char limit):

### Ratio Study Standards & Enforcement

**Q48: Do you or another oversight agency have authority to order adjustments to locally determined values?**

- Yes
- No

**Q49: If you order adjustments to locally determined assessed or appraised values, which of the following procedures are used? (check all that apply)**

- Order local officials to apply trending factors to individual classes or categories of property
- Trend all types of property equally, based on a jurisdiction-wide adjustment factor
- Give local officials a compliance grace period to apply indicated factors
- Other, describe (50 char limit):

**Q50: How many local jurisdictions have been issued orders to ADJUST values in the past three (3) years?**

**Q51: Do you or another oversight agency have authority to order reappraisal of locally determined values?**

- Yes
- No

**Q52: How many local jurisdictions have been issued orders to REAPPRAISE values in the past three (3) years?**

**Q53: Do you have a statutorily defined level(s) of assessment? (for example, 100% for all property or percentages that vary by property type)**

- Yes
- No

**Q54: What are your ratio study standards for acceptable level of appraisal?**

- 0.95-1.05
- 0.90-1.10
- Other, indicate range (50 char limit):

**Q55: If you have appraisal level standards, how are they set?**

- Statute
- Administrative rule or regulation
- Other, describe (50 char limit):

**Q56: Which of the following uniformity measures are calculated or used to make compliance determinations? (check all that apply)**

- Coefficient of dispersion (COD) calculated
- COD used to test for compliance
- Coefficient of variation (COV) calculated
- COV used to test for compliance

**Q57: If you have specific standards or requirements based on the COD, what is the highest acceptable COD for each of the following categories. (50-char. limit per field, enter "NA" for categories that do not apply)**

- Residential
- Commercial/Industrial
- Farmland
- Timberland
- Vacant Land
- Other, specify

**Q58: If you have a standard for price-related bias (vertical inequity) based on the PRD, what is the standard?**

- PRD 0.98 to 1.03
- Other, describe (50 char limit):

**Q59: What actions can your agency initiate as a result of assessment uniformity conditions? (check all that apply)**

- None
- Order a reappraisal
- Withhold funding (e.g., revenue sharing)
- Other
- Additional comments (see next question)

**Q60: What actions can your agency initiate as a result of assessment uniformity conditions?**

Additional comments:

**Q61: If you initiate action as a result of assessment uniformity conditions, is the action dependent upon confidence intervals or related tests of statistical significance?**

- Yes
- No
- Not Applicable

**Q62: If your agency can order a reappraisal or withhold funding as a result of assessment uniformity conditions, how many times has it been done in the past three years?**

**Q63: Have you taken fewer ratio study-related actions in the past three years?**

- Yes
- No
- Not Applicable

## Sales Chasing

**Q64: Do you have statutory requirements to check for sales chasing?**

- Yes
- No
- Nonstatutory requirement

**Q65: Do you test for sales chasing?**

- Yes
- No

**Q66: If you test for sales chasing, what techniques do you use? (check all that apply)**

- Comparison of average percentage changes in appraised values of sold and unsold properties
- Comparison of average unit values of sold and unsold properties
- Split sample technique (using sales before and after the appraisal date)
- Comparison of observed vs. expected distribution of ratios
- Mass appraisal techniques
- Additional comments (see next question)

**Q67: If you test for sales chasing, what techniques do you use?**

Additional comments:

**Q68: Has a lower limit on the COD been established as an indicator of possible sales chasing?**

- Yes
- No
- Additional Comment

## Personal Property Ratio Studies

**Q69: Is a ratio study conducted for personal property?**

- Yes
- No

**Q70: How are the results of your personal property ratio study used?**

- To order adjustments to locally determined assessed values
- To equalize state or provincial funding of local jurisdictions
- To order local jurisdictions to reappraise
- To advise provincial, state, or local jurisdictions of assessment conditions
- To assist mass appraisal programs
- To approve tax assessment roll
- To adjust or equalize centrally determined assessed values (such as utilities)
- Other (please describe in next question)

**Q71: How are the results of your personal property ratio study used?**

Other, please describe:

### Procedural Audits

**Q72: Does your agency perform procedural audits of local assessment procedures/practices?**

- Yes
- No

**Q73: If your agency performs a procedural audit of local assessment procedures/practices—which categories of real property are audited? (check all that apply)**

- Residential
- Commercial/industrial
- Agricultural
- Timberland
- Not applicable
- Other, explain:

**Q74: If your agency performs a procedural audit of local assessment procedures/practices—Is the audit used INSTEAD OF a ratio study?**

- Yes
- No
- Not applicable

Additional comment:

**Q75: If your agency performs a procedural audit how is it used?**

- To order adjustments to locally determined assessed values
- To order local jurisdictions to reappraise
- To advise provincial, state, or local jurisdictions of deficiencies or to recommend improvements in assessment procedures.
- To approve tax assessment roll
- Not applicable
- Other, describe (50 chars):

### Miscellaneous/New & Emerging Issues

**Q76: Can any of the following initiate legal action as a result of your ratio study?**

- Taxing jurisdiction (e.g., school district)
- Taxpayers
- Not Applicable

**Q77: What software does your agency use for ratio studies? (check all that apply)**

- Custom software written in house
- CAMA vendor application
- Spreadsheet software (e.g., Excel)
- Statistical software (e.g. SPSS, NCSS, SAS)
- Database software (e.g., Access)
- Not applicable
- Additional comments (please enter in next question)

**Q78: What software does your agency use for ratio studies?**

Additional comments:

**Q79: Do you currently use any foreclosure-related sales in your ratio studies?**

- Yes
- No
- Not applicable



**Q80: Please provide comments about new issues or recent changes related to your ratio study practices:**

**Q81: Please share any comments you may have about this survey:**

**Q82: Your time and expertise in completing this survey are greatly appreciated. The IAAO Technical Standards Committee thanks you. The final report will be posted on the IAAO Web site. Do you want a notification sent to your e-mail address when results are available?**

Yes

No

Enter alternate e-mail address here if preferred:

*Appendix B. Tabulation of comparable responses from the surveys of ratio study practices in the United States and Canada, 1989–2011*

1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note
							Numbers of Responses					Numbers of Responses					
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011	
<b>General</b>																	
2	2	2	3	3	Frequency of ratio studies	Annual	35	41	41	44	43	1	6	8	8	7	(a)
						1 per 2 years	5	4	2	2	3	0	0	0	0	0	
						1 per 3 years	1	0	0	1	2	1	1	1	1	1	
						1 per 4 years	5	7	1	1	1	5	4	2	2	1	
						Other	5	7	7	3	2	0	1	1	0	0	
3	3	3	4	4	Who does study?	State or Province/ Territory	26	29	38	44	43	6	3	7	10	9	
						Local only	4	7	7	7	6	0	3	1	0	0	(b)
						Contracted to others	14	14	4	2	1	1	4	2	1	0	(c)
						Both state and local	NA	NA	NA	11	6	NA	NA	NA	0	0	
						Other	2	2	2	0	1	0	1	3	0	0	
4	4	4	5	8	What does study include?	Sales only	20	23	25	31	30	5	8	8	10	8	
						Appraisals only	5	4	2	1	1	0	0	1	0	0	
						Both sales and appraisals	21	25	24	19	19	2	3	1	1	1	
4a	4a	4a	6	9	If both, combined?	Yes	NA	NA	24	17	18	NA	NA	0	1	1	
NA	NA	NA	NA	79	Foreclosure sales included?	Yes	NA	NA	NA	NA	17	NA	NA	NA	NA	1	new
4b	4b	4b	7	15	Who selects samples?	State or Province/ Territory	NA	NA	35	23	28	NA	NA	6	7	6	
						Local	NA	NA	14	12	11	NA	NA	5	2	3	
						Both	NA	NA	NA	16	10	NA	NA	NA	0	0	
						Private contractor	NA	NA	NA	1	0	NA	NA	NA	1	0	
4c	4c	4c	8	16	Who validates sales?	State or Province/ Territory	NA	NA	23	26	13	NA	NA	3	6	5	
						Local	NA	NA	24	26	18	NA	NA	3	4	4	
						Both	NA	NA	NA	8	17	NA	NA	1	1	0	
						Contracted and other	NA	NA	NA	1	1	NA	NA	1	2	0	
NA	NA	NA	9	18	Audit of sales validation?	Yes	NA	NA	NA	23	18	NA	NA	NA	3	2	
NA	NA	NA	NA	11a	Time period sales are used?	One Year	NA	NA	NA	NA	29	NA	NA	NA	NA	3	new
						Multiple Years	NA	NA	NA	NA	17	NA	NA	NA	NA	5	
						Varies by Jurisdiction or Class	NA	NA	NA	NA	10	NA	NA	NA	NA	0	
NA	NA	NA	NA	11b	Time period described in relation to assessment date.	Before	NA	NA	NA	NA	23	NA	NA	NA	NA	7	
						After	NA	NA	NA	NA	11	NA	NA	NA	NA	0	
						Overlapping	NA	NA	NA	NA	9	NA	NA	NA	NA	4	
<b>Personal Property</b>																	
5	5	5	93	NA	Personal property (PP) taxable?	Yes	37	40	40	39	NA	3	6	3	2	NA	deleted
5a	5a	5a	94	69	PP ratio study conducted?	Yes	9	8	7	6	6	0	0	0	0	0	

Key to cell shading is located on page 39.

1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note
							Numbers of Responses					Numbers of Responses					
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011	
5b	5b	5b	95	NA	For PP ratio study, do you use sales, appraisals, or both?	Sales only			0	0	NA	0	0	0	0	NA	deleted
						Appraisals only	7	8	7	6	NA	0	0	0	0	NA	
						Both sales and appraisals	1	0	0	0	NA	0	0	0	0	NA	
5c	5c	5d	99	71	How is PP ratio study used?	Order adjustments	NA	NA	3	2	2	NA	NA	NA	NA	NA	
						Equalize funding	NA	NA	0	3	3	NA	NA	NA	NA	NA	
						Order reappraisal	NA	NA	0	1	2	NA	NA	NA	NA	NA	
						Advise local jurisdictions	NA	NA	0	3	3	NA	NA	NA	NA	NA	
						Assist mass appraisal	NA	NA	0	1	1	NA	NA	NA	NA	NA	
						Adjust or equalize CAP	NA	NA	2	1	1	NA	NA	NA	NA	NA	
						Approve tax roll	NA	NA	0	0	0	NA	NA	NA	NA	NA	
NA	NA	5e	97	NA	PP appraisal techniques	Depreciation or economic life tables	NA	NA	7	4	NA	NA	NA	NA	NA	deleted	
						lowa curves	NA	NA	2	1	NA	NA	NA	NA	NA		
						Other	NA	NA	1	1	NA						
8	6	6a	100	NA	Statutory exemption for intangible personal property?	Yes	25	32	37	40	NA	3	4	6	3	NA	
						No	17	15	9	12	NA	4	4	6	8	NA	
0	0	6b	101	NA	Exemptions for types of intangible personal property	Capital stock	NA	NA	32	33	NA	NA	NA	3	1	NA	
						Bonds	NA	NA	33	31	NA	NA	NA	3	1	NA	
						Deposits	NA	NA	33	30	NA	NA	NA	3	1	NA	
						Contracts and contract rights	NA	NA	34	30	NA	NA	NA	3	1	NA	
						Copyrights	NA	NA	35	31	NA	NA	NA	3	1	NA	
						Custom computer programs	NA	NA	29	30	NA	NA	NA	3	1	NA	
						Customer lists	NA	NA	34	29	NA	NA	NA	3	1	NA	
						Goodwill	NA	NA	30	28	NA	NA	NA	3	1	NA	
						Licenses	NA	NA	34	30	NA	NA	NA	3	1	NA	
						Patents	NA	NA	35	31	NA	NA	NA	3	1	NA	
						Rights-of-way	NA	NA	22	20	NA	NA	NA	2	1	NA	
						Trademarks	NA	NA	35	31	NA	NA	NA	3	1	NA	
						Trade secrets	NA	NA	35	29	NA	NA	NA	3	1	NA	
Other	NA	NA	6	2	NA	NA	NA	1	0	NA							
<b>Procedural Audits</b>																	
6	7	7	12	74	Procedural audit in lieu of ratio study?	Yes	19	17	22	2	2	2	3	3	1	0	
						No	NA	NA	NA	30	25	NA	NA	NA	5	9	
	7a	NA	11	72	Procedural audit on any category?	Yes	NA	NA	NA	32	25	NA	NA	NA	6	8	
						No	NA	NA	NA	19	26	NA	NA	NA	5	1	

Appendix B. Tabulation of comparable responses (continued)

1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note	
							Numbers of Responses					Numbers of Responses						
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011		
NA	NA	NA	NA	73	Residential	Yes	NA	NA	NA	NA	26	NA	NA	NA	NA	7	new	
					Commercial Industrial	Yes	NA	NA	NA	NA	25	NA	NA	NA	NA	8		
					Agricultural	Yes	NA	NA	NA	NA	21	NA	NA	NA	NA	5		
					Timber	Yes	NA	NA	NA	NA	9	NA	NA	NA	NA	2		
NA		NA	14	75	Is procedural audit advisory?	Yes	NA	NA	NA	14	26	NA	NA	NA	4	5		
						No	NA	NA	NA	17	25	NA	NA	NA	1	4		
NA	7c	7b	13	NA	Is procedural audit in addition to ratio studies?	Yes	NA	25	26	26	NA	NA	4	5	4	NA	deleted	
						No	NA	NA	NA	5	NA	NA	NA	NA	2	NA		
NA	7b	7c	15	75	Can equalization or reappraisal be ordered from audits?	Yes	11	14	15	12	11	2	5	4	4	1		
						No	NA	NA	NA	16	14	NA	NA	NA	2	8		
<b>Disclosure</b>																		
7	8a	8a	16	20	Legal requirement?	Yes	30	35	37	36	37	6	9	11	11	10	(d)	
7a	8a	8a	16	20	Disclosure made to:	State or Province/ Territory only	NA	NA	2	6	6	NA	NA	11	7	8		
						Local assessors only	NA	NA	8	8	8	NA	NA	2	2	0		
						Both	NA	NA	20	22	23	NA	NA	5	2	1		
0	0	8b	17	NA	Disclosure occurs when?	At deed recording	NA	NA	35	33	NA	NA	NA	11	11	NA	deleted	
						Within statutory time period	NA	NA	4	1	NA	NA	NA	0	0	NA		
						Other	NA	NA	3	2	NA	NA	NA	0	0	NA		
0	0	8c	18	23	Are documents tracked?	Yes	NA	NA	31	29	24	NA	NA	8	11	9		
0	0	8d	20	21	Type of disclosure document?	Sale price statement	NA	NA	17	10	9	NA	NA	10	5	3		
						Comprehensive questionnaire	NA	NA	7	10	7	NA	NA	0	0	0		
						Both	NA	NA	7	9	7	NA	NA	1	3	1		
						Other	NA	NA	8	7	15	NA	NA	0	3	5		
7a	8a	8e	22	24	Is disclosure confidential?	Yes	9	6	5	9	7	3	4	4	2	1		
						No	NA	NA	39	29	35	4	7	8	9	8		
7b	8b	8f	23	26	Value-related fee?	Yes	NA	NA	34	35	36	5	10	10	11	9		
7c	8c	8g	24	27	Mandatory recordation?	Yes	28	25	26	27	28	5	8	10	10	9		
NA	NA	8g	24	22	If yes, recordation occurs at what jurisdictional level?	State or Province/ Territory	NA	NA	10	NA	1	NA	NA	6	NA	0		
						Local	NA	NA	14	NA	35	NA	NA	1	NA	9		
						Both	NA	NA	3	NA	1	NA	NA	0	NA	0		
NA	NA	8h	NA	NA	Legal penalties for falsifying?	Yes	NA	NA	35	NA	NA	NA	NA	9	NA	NA		
						No	NA	NA	8	NA	NA	NA	NA	2	NA	NA		
					No element of disclosure?		3	4	2	7	5	0	0	0	0	0		

Key to cell shading is located on page 39.

1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note
							Numbers of Responses					Numbers of Responses					
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011	
<b>Sales Price Adjustments</b>																	
9	9	9	26	29	Verified sales prices adjusted?	Yes	33	34	32	40	39	6	9	9	8	7	
					Adjust for:	Time	14	15	18	21	23	4	9	4	6	5	
						Financing	16	16	15	11	12	3	8	5	4	2	
						Personal property (chattels)	31	32	26	30	27	6	9	4	7	5	
						Closing costs	0	5	2	6	8	0	1	1	1	1	
						Brokerage fees	1	4	0	2	4	0	0	1	1	0	
						Intangibles	5	11	11	16	14	3	1	3	3	3	
						Other	7	4	4	4	3	0	2	3	0	1	
10	10	10	27	31	Blanket or global adjustments?	Yes	8	3	3	3	3	1	0	0	0	0	
						No	36	45	47	49	48	6	10	12	11	9	
NA	NA	NA	NA	30	Method of calculating time adjustments.	Tracking trends-ratios over time	NA	NA	NA	NA	15	NA	NA	NA	NA	5	new
						Tranking changes-value per unit	NA	NA	NA	NA	8	NA	NA	NA	NA	1	
						Analysis of repeat sales	NA	NA	NA	NA	15	NA	NA	NA	NA	2	
						MRA	NA	NA	NA	NA	2	NA	NA	NA	NA	1	
10b	10b	10b	29	NA	Court cases re: adjustments?	Yes	NA	NA	1	1	NA	NA	NA	0	0	NA	deleted
<b>Purposes of Ratio Study</b>																	
11	11	11	30	5, 6	Purposes of ratio study?	Order adjustments	22	27	26	20	20	3	4	2	1	1	
						Equalize funding	30	31	31	28	29	1	3	2	2	2	
						Order reappraisal	22	31	30	28	20	2	1	1	0	2	
						Advise local jurisdictions	35	35	43	39	40	7	9	5	7	6	
						Assist mass appraisal	NA	NA	31	22	20	NA	NA	9	4	6	
						Adjust or equalize centrally assessed property	13	18	19	17	8	0	0	0	0	0	
						Approve tax roll	0	0	5	13	13	0	0	3	3	2	
NA	NA	NA	32	50	How many states issued orders to adjust?	Orders to adjust	NA	NA	NA	16	14	NA	NA	NA	0	0	
NA	NA	NA	33	52	How many states issued orders to reappraise?	Orders to reappraise	NA	NA	NA	20	10	NA	NA	NA	0	0	
NA	NA	NA	NA	63	Fewer ratio study related actions taken in the past three years?	Yes	NA	NA	NA	NA	12	NA	NA	NA	NA	0	new

Appendix B. Tabulation of comparable responses (continued)

1994 Q.No.	1997 Q.No.	2003 Q.No.	2008 Q.No.	2011 Q.No.	Topic	Response	UNITED STATES					CANADA					Note	
							Numbers of Responses					Numbers of Responses						
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011		
12	12	12	34	49	Adjustment procedures?	Order trend by class/ category	11	14	13	16	15	1	2	1	0	1		
						Trend jurisdiction-wide	5	3	3	7	3	1	1	0	0	0		
						Grace period	2	12	3	12	25	0	2	1	0	0		
						Other	11	4	10	12	16	6	3	0	0	0		
<b>Testing Uniformity</b>																		
13a	13a	13a	48	57	Statute/standard for COD/ COV?	Yes	32	34	38	40	35	2	8	9	8	6		
						No	18	17	13	12	16	2	3	3	3	3		
NA	NA	13a	48	57	Comparison to IAAO standard	IAAO standard	NA	NA	23	23	26	NA	NA	5	6	6		
						More stringent	6	1	5	6	5	1	1	4	2	0		
						Less stringent	21	23	21	11	3	3	6	3	0	0		
						Unknown	0	0	0	0	1	0	0	0	0	0		
13b	13b	13b	55, 57	58	Price-related bias/PRD standard?	Yes	11	18	22	27	28	2	4	6	6	6		
						No	35	34	28	25	23	4	7	6	5	3		
						IAAO standard 0.98–1.03	8	12	17	23	25	2	2	5	5	6		
13c	13c	13c	58, 59, 60	56, 59	Initiate action re: uniformity?	Yes	30	34	34	30	32	4	7	7	5	5		
						If so, which actions?	Order reappraisal	NA	NA	23	23	21	NA	NA	4	3	4	
							Withhold funding	NA	NA	9	5	7	NA	NA	0	0	0	
							Other action	NA	NA	10	11	13	NA	NA	3	1	1	
NA	NA	13d	61	56, 41	If yes, uniformity measures?	COD	NA	NA	24	21	22	NA	NA	4	5	6		
						PRD	NA	NA	12	14	14	NA	NA	2	4	4		
						Both (combined into above totals)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
		13e	62	43, 61	Action dependent upon:	Point estimates	NA	NA	17	12	11	NA	NA	4	2	1		
						Confidence intervals	NA	NA	8	11	6	NA	NA	0	1	4		
<b>Testing Assessment Level</b>																		
14a	14a	14a	35	54	Allowable variance?	Yes	33	34	34	37	41	5	7	5	8	8		
						No or unknown	13	18	17	15	10	2	4	7	3	1	(e)	
						Variance permitted:	± 10%	11	15	16	16	19	1	4	1	3	3	
							± 5%	5	6	6	4	5	2	2	2	2	3	
14b	14b	14b	36	55	If yes, variance set by statute?	Yes	15	18	19	18	22	0	1	3	2	4		
						No	17	15	18	18	21	3	3	2	6	5		
						If no, legal authority?	Administrative rule	NA	NA	8	7	19	NA	NA	1	0	3	
							Other	NA	NA	7	11	0	NA	NA	0	5	2	

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1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note
							Numbers of Responses					Numbers of Responses					
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011	
14e	14d	14d	39	34	Do you calculate these measures of assessment level?	Arithmetic mean	32	39	36	32	35	5	8	8	5	4	
						Median	38	43	38	39	38	6	10	9	8	8	
						Weighted (aggregate) mean	35	40	39	32	24	4	6	7	3	4	
						Geometric mean	4	2	5	6	4	0	2	1	0	1	
						Other	4	1	2	6	6	0	0	0	1	0	
					Do you use these measures for both indirect and direct equalization?	Arithmetic mean	5	11	7	18	10	0	2	1	1	0	
						Median	19	33	30	37	35	0	4	2	2	1	
						Weighted (aggregate) mean	19	21	19	25	20	1	3	2	0	0	
						Geometric mean	NA	NA	1	3	0	NA	NA	1	0	0	
						Other	NA	NA	0	2	2	NA	NA	0	1	0	
					Do you use these measures for direct equalization?	Arithmetic mean	NA	NA	NA	9	3	NA	NA	NA	1	0	
						Median	NA	NA	NA	25	18	NA	NA	NA	0	1	
						Weighted (aggregate) mean	NA	NA	NA	10	5	NA	NA	NA	0	0	
						Geometric mean	NA	NA	NA	1	0	NA	NA	NA	0	0	
						Other	NA	NA	NA	1	1	NA	NA	NA	0	0	
14e	14d	14d	39	34	Do you use these measures for indirect equalization?	Arithmetic mean	NA	NA	NA	9	7	NA	NA	NA	1	0	
						Median	NA	NA	NA	12	17	NA	NA	NA	1	0	
						Weighted (aggregate) mean	NA	NA	NA	15	15	NA	NA	NA	0	0	
						Geometric mean	NA	NA	NA	2	0	NA	NA	NA	0	0	
						Other	NA	NA	NA	1	1	NA	NA	NA	0	0	
NA	14e	14e	40	35	Test for statistical normality?	Yes	NA	13	13	16	22	NA	4	4	5	5	
15	16	16	63	NA	Residential property appraised annually at 100% of current fair market value?	Yes	17	22	23	32	NA	6	6	8	4	NA	deleted
15a	16a	16a	64 / 65	NA	Property appraised as of a constant base year?	Yes	5	13	13	10	NA	2	5	5	6	NA	
	16b			NA	Are property values updated during an interim year?	Yes	NA	18	14	6	NA	NA	5	5	3	NA	
0	0	0	0	53	Statutorily set level of assessment?	Yes	NA	NA	NA	NA	43	NA	NA	NA	NA	5	new
0	0	16b	68	NA	Can local jurisdictions establish different assessment ratios?	Yes	NA	NA	10	16	NA	NA	NA	0	0	NA	deleted

Appendix B. Tabulation of comparable responses (continued)

1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note
							Numbers of Responses					Numbers of Responses					
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011	
15b	16c	16c	70 - 76	NA	Statutorily set ratios at 100%?	Residential @ 100% of FMV	NA	NA	23	27	NA	NA	NA	8	9	NA	deleted
						Farmland @ 100% of FMV	NA	NA	12	4	NA	NA	NA	7	4	NA	
						Commercial @ 100% of FMV	NA	NA	30	28	NA	NA	NA	10	9	NA	
						Industrial @ 100% of FMV	NA	NA	30	28	NA	NA	NA	10	9	NA	
						Utilities @ 100% of FMV	NA	NA	29	30	NA	NA	NA	5	9	NA	
						Personal Prop. @ 100% of FMV	NA	NA	18	20	NA	NA	NA	0	1	NA	
						Railroads @ 100% of FMV	NA	NA	23	28	NA	NA	NA	3	2	NA	
<b>Testing Reliability</b>																	
						Yes			19	15	14			4	5	3	
						No	NA	NA	27	32	33	NA	NA	6	3	6	
						Not applicable—level compliance not tested				5	NA				3	NA	
						Point estimates only	NA	26	19	27	30	NA	5	3	2	2	
							13	18	20	6	14	NA	1	6	3	3	
						Both	NA	NA	NA	11	NA	NA	NA	NA	2	NA	
		15b	NA		If yes, which test?	95% confidence level	NA	NA	17	NA	NA	NA	NA	4	NA	NA	deleted
						90% confidence level	NA	NA	5	NA	NA	NA	NA	2	NA	NA	
						Other confidence level	NA	NA	0	NA	NA	NA	NA	0	NA	NA	
14d	15b	15c	44		Is a sample mean ratio of 85%, with a 95% confidence interval (CI) between 75 and 94%, in compliance?	Yes, confidence interval overlaps	NA	11	13	11	12	NA	NA	2	4	3	
						No, only point estimates used	NA	NA	28	30	NA	NA	1	5	2	0	
						No, CI fails to overlap 100%	NA	NA	NA	5	2	NA	NA	NA	1	0	
			45		If CI overlaps, but the median continues to be out of compliance for several years, what actions?	Lower confidence level and reevaluate	NA	NA	NA	3	2	NA	NA	NA	2	1	
						Base compliance decision on point estimates	NA	NA	NA	0	2	NA	NA	NA			
						Continue to find in compliance	NA	NA	NA	6	6	NA	NA	NA	2	1	
						Other	NA	NA	NA	6	4	NA	NA	NA	2	0	

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1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note
							Numbers of Responses					Numbers of Responses					
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011	
	15c	15d	47	NA	Revise if COD showed poor uniformity?	No change		33	16	7	NA		1	0	2	NA	deleted
						May lower level of confidence	NA	NA	2	3	NA	NA	NA	0	1	NA	
						May use point estimate only	NA	NA	3	20	NA	NA	NA	0	1	NA	
						May review level measures	NA	NA	7	10	NA	NA	NA	0	5	NA	
						May use additional information	NA	NA	16	17	NA	NA	NA	0	5	NA	
NA	NA	NA	NA	43	Compute confidence intervals for?	COD	NA	NA	NA	NA	20	NA	NA	NA	NA	6	
						PRD	NA	NA	NA	NA	9	NA	NA	NA	NA	4	
NA	NA	NA	NA	61	Compliance actions dependent on?	Confidence intervals	NA	NA	NA	NA	6	NA	NA	NA	NA	4	
<b>Ratio Study Samples</b>																	
NA	17a	17a	NA	NA	Stratification	Range of values	NA	11	18	NA	NA	NA	NA	4	NA	NA	deleted
						Geographic neighborhood	NA	20	16	NA	NA	NA	NA	9	NA	NA	
						School district	NA	4	8	NA	NA	NA	NA	1	NA	NA	
						City (Municipality)	NA	1	12	NA	NA	NA	NA	4	NA	NA	
						County	NA	NA	25	NA	NA	NA	NA	2	NA	NA	
						Other factors	NA	NA	12	NA	NA	NA	NA	4	NA	NA	
16a	17b	17b	80	32	Smallest sample	Less than 5	4	8	7	10	13	1	2	3	1	1	
						5 to 9	7	8	10	10	11	2	1	1	2	2	
						10 to 19	3	4	10	6	4	2	1	3	2	2	
						20 to 30	9	13	5	7	8	0	3	1	2	2	
						Greater than 30	4	3	10	5	4	0	1	2	0	0	
						Other	19	16	9	10	10	2	3	1	2	2	
NA	17c	17c	81	33	Sample size quotas or goals?	Yes	12	11	20	13	16	0	2	1	1	2	
NA	17d	17d	83	45	Do you identify outlier ratios?	Yes	NA	26	35	34	35	NA	6	9	7	8	
NA	NA	NA	84	46	Method of outlier identification?	1.5 * interquartile range	NA	NA	NA	5	7	NA	NA	NA	2	2	
						3.0 * interquartile range	NA	NA	NA	4	8	NA	NA	NA	1	2	
						Beyond 2 standard deviations	NA	NA	NA	6	3	NA	NA	NA	2	2	
						Fixed symmetric pts. <.5 or >1.5	NA	NA	NA	4	8	NA	NA	NA	1	3	
						Fixed symmetric pts. <.3 or >2.0	NA	NA	NA	6	1	NA	NA	NA	1	0	
						Good judgment	NA	NA	NA	10	8	NA	NA	NA	5	3	
	17f	17f	86	13	Determine representativeness?	Yes	NA	21	32	21	26	NA	4	5	4	4	

1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note
							Numbers of Responses					Numbers of Responses					
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011	
NA	17a	NA	NA	NA	If yes, which apply?	Stratify by geographic area	NA	21	21	NA	NA	NA	7	4	NA	NA	deleted
						Stratify by property class	NA	Most	29	NA	NA	NA	5	4	NA	NA	
						Stratify by value range	NA	11	16	NA	NA	NA	5	3	NA	NA	
						Other	NA	NA	6	NA	NA	NA	NA	2	NA	NA	
		17g	87	NA	Fixed trim points remove outliers?	Yes	NA	NA	16	9	NA	NA	NA	3	2	NA	
		17h	85	47	Limit on trimmed sales?	Yes	NA	NA	10	5	6	NA	NA	3	0	1	
<b>Sales Chasing</b>																	
NA	NA	18	88	64	Statutes for sales chasing?	No, but nonstatutory requirement	NA	NA	NA	12	9	NA	NA	NA	0	1	
						Yes	NA	NA	10	3	5	NA	NA	1	0	0	
NA	NA	NA	54	68	Lower limit on COD established	Yes	NA	NA	NA	1	6	NA	NA	NA	0	2	
NA	NA	NA	89	69	Test for sales chasing?	Yes	NA	NA	NA	27	31	NA	NA	NA	5	5	
NA	NA	NA	90	66	Procedure for sales chasing?	Compare average changes-sold vs. unsold	NA	NA	NA	20	24	NA	NA	NA	3	5	
						Compare average unit values	NA	NA	NA	6	3	NA	NA	NA	3	5	
						Split sample technique	NA	NA	NA	5	8	NA	NA	NA	3	1	
						Compare observed vs. expected distributions	NA	NA	NA	14	7	NA	NA	NA	4	1	
						Mass appraisal techniques	NA	NA	NA	17	7	NA	NA	NA	3	1	
<b>Miscellaneous</b>																	
NA	NA	NA	NA	44	Compute statewide ratio study statistics?	Yes	NA	NA	NA	NA	29	NA	NA	NA	NA	6	new
NA	NA	NA	NA	77	Software used for ratio studies?	Custom written in house	NA	NA	NA	NA	23	NA	NA	NA	NA	4	
						CAMA vendor application	NA	NA	NA	NA	6	NA	NA	NA	NA	1	
						Spreadsheet (e.g. Excel)	NA	NA	NA	NA	25	NA	NA	NA	NA	6	
						Statistical (e.g. SPSS)	NA	NA	NA	NA	19	NA	NA	NA	NA	7	
						Database (e.g. Access)	NA	NA	NA	NA	14	NA	NA	NA	NA	4	
NA	NA	NA	42	7	Incorporate IAAO standards in statutes or rules?	Yes	NA	NA	NA	33	36	NA	NA	NA	5	5	
						No	NA	NA	NA	16	15	NA	NA	NA	6	4	
17	19	19	92	76	Legal action re: ratio study?	Yes	30	32	37	27	20	1	4	3	1	1	
NA	NA	NA	NA	76	Legal action by taxpayer?	Yes	NA	NA	NA	NA	12	NA	NA	NA	NA	0	new

Key to cell shading is located on page 39.

1994 QNo.	1997 QNo.	2003 QNo.	2008 QNo.	2011 QNo.	Topic	Response	UNITED STATES					CANADA					Note
							Numbers of Responses					Numbers of Responses					
							1994	1997	2003	2008	2011	1994	1997	2003	2008	2011	
NA	NA	NA	NA	76	Legal action by taxing jurisdiction?	Yes	NA	NA	NA	NA	18	NA	NA	NA	NA	1	new
<b>Legend</b>																	
NA	= not asked or compiled																
	= These questions are new to this 2011 survey																
	= These questions were not asked in the 2011 survey																

Notes

- (a) In 2008 two Hawaiian respondents were included in this Table 2 where applicable, however only counted once in Table 1.
- (b) 2008 includes District of Columbia and the two Hawaiian counties; 2011 includes District of Columbia and one Hawaiian county; Neither survey includes Delaware, which does not conduct ratio studies.
- (c) Only Montana contracts entire study and is reflected in 2011 count; two other states indicated they contract certain tasks; these are reported in local only count
- (d) The 2008 total reflects addition of Delaware and presumed loss of disclosure in South Carolina and the corrected classification for Nevada.  
The U.S. total for 1997 was revised to reflect an error in tabulating Oregon's response, which should have been counted as a "Yes."  
The U.S. total for 2003 includes the addition of Pennsylvania and, effective July 2003, New Mexico. It also includes Manitoba.
- (e) Allowable variance: Not shown are responses to the 1992 survey, which total 19 "No" U.S. answers to this portion of the question.

## Appendix C. Results of 2011 Survey of Ratio Study Practices in the United States

Question No. >		Q3	Q4	Q5				
State	Abbreviation	How often is your jurisdiction REQUIRED to conduct ratio studies?	Who conducts your ratio study?	How is your ratio study used?				
				To order adjustments to locally determined assessed values if necessary	To equalize state or provincial funding of local jurisdictions	To order local jurisdictions to reappraise	To advise assessment officials of assessment conditions	To assist mass appraisal programs
Alabama	AL	Annually	state				X	X
Alaska	AK	Annually-not required	local only		X		X	
Arizona	AZ	Annually	state	X		X	X	
Arkansas	AR	3 or 5 yrs; pers. prop. = annually	state	X			X	
California	CA	Periodically	state					
Colorado	CO	Annually, assessors & auditor	state/con		X		X	X
Connecticut	CT	Annually	state		X		X	
Delaware-Kent County	DE	Not required	NA					
District of Columbia	DC	Annually	local only				X	X
Florida	FL	Annually	state		X		X	X
Georgia	GA	Annually	state		X	X	X	
Hawaii-Honolulu County	HN	Annually	local only				X	X
Idaho	ID	Annually	state	X			X	
Illinois	IL	Annually	state	X	X		X	
Indiana	IN	Annually	state/local	X	X	X	X	
Iowa	IA	Annually	state	X	X	X	X	
Kansas	KS	Annually	state			X	X	X
Kentucky	KY	Annually	state				X	
Louisiana	LA	Annually	state			X	X	
Maine	ME	Annually	state		X	X	X	
Maryland	MD	Annually	state				X	
Massachusetts	MA	Every 3 yrs.	local/con		X			
Michigan	MI	Annually	local only	X				
Minnesota	MN	Annually	state/local	X	X	X	X	X
Mississippi	MS	Every 4 yrs.	state/local					X
Missouri	MO	Every 2 yrs.	state	X		X	X	X
Montana	MT	Every 2 yrs.	contracted				X	X
Nebraska	NE	Annually	state	X	X	X	X	X
Nevada	NV	Annually	state	X		X	X	
New Hampshire	NH	Annually	state		X		X	
New Jersey	NJ	Annually	state	X	X	X	X	X
New Mexico	NM	Annually	state				X	X
New York	NY	Annually	state		X			
North Carolina	NC	Annually	state		X			
North Dakota	ND	Annually	state/local	X			X	
Ohio	OH	Every 3 yrs.	state	X		X	X	X
Oklahoma	OK	Annually	state	X	X	X	X	X
Oregon	OR	Annually	state				X	
Pennsylvania	PA	Annually and court ordered	state		X		X	
Rhode Island	RI	Annually	state		X		X	X
South Carolina	SC	Annually	state		X		X	
South Dakota	SD	Annually	state	X	X	X		
Tennessee	TN	Every 2 yrs.	state	X	X	X	X	X
Texas	TX	Annually	state		X			
Utah	UT	Annually	both	X	X	X	X	X
Vermont	VT	Annually	state		X	X		
Virginia	VA	Annually	state/local		X			
Washington	WA	Annually	state	X	X		X	
West Virginia	WV	Annually	state				X	X
Wisconsin	WI	Annually	state		X	X	X	
Wyoming	WY	Annually	state/local	X	X	X	X	X

Question No. >	Q5 (continued)		Q6	Q7	Q8
	How is your ratio study used?				
State	To approve x assessment roll	To adjust or equalize centrally determined assessed values (such as utilities)	How is your ratio study used? Other	Have you incorporated portions of the IAAO <i>Standard on Ratio Studies</i> in your statutes or rules and regulations?	Which of the following does your real property ratio study include? Sales only; Appraisals only; Both sales and appraisals conducted by or contracted by your agency
AL	X	X	<p><b>Alaska:</b> We use it for school funding and as a check for equalization.</p> <p><b>Arkansas:</b> To determine accuracy of assessed values and order corrective action if needed.</p> <p><b>California:</b> We do not conduct ratio studies per se. Instead, we periodically measure counties' overall assessment levels to determine their level of compliance with state law.</p> <p><b>Connecticut:</b> To equalize net assessment for each local municipality.</p> <p><b>Delaware-Kent County:</b> No study is conducted.</p> <p><b>Georgia:</b> The primary role is to equalize the tax digest for inclusion into the QBE funding formula. Another state agency uses the ratio study to approve tax digests or require corrective measures.</p> <p><b>Indiana:</b> The local assessing officials are responsible for completing/ conducting annual adjustments, including a recommended ratio study. The DLGF uses the local information in the review and approval of the annual adjustment process.</p> <p><b>Michigan:</b> For determination of assessments at the local level, county equalization and state equalization.</p> <p><b>Minnesota:</b> Minnesota Tax Court uses in valuation cases to give petitioner additional relief if median ratios are below 90%.</p> <p><b>Montana:</b> We report to the legislature to demonstrate how well our statewide reappraisal met equity considerations.</p> <p><b>New Jersey:</b> Ratios are used for tax appeals.</p>	Yes	Sales only
AK				Yes	Sales only
AZ	X			No	Sales only
AR				Yes	Both sales and appraisals
CA				No	Appraisals only
CO	X			Yes	Both sales and appraisals
CT				Yes	Sales only
DE				No	Not applicable
DC				No	Sales only
FL	X			No	Both sales and appraisals
GA	X			Yes	Both sales and appraisals
HN				No	Sales only
ID				Yes	Sales only
IL				Yes	Sales only
IN				Yes	Sales only
IA				Yes	Both sales and appraisals
KS				Yes	Sales only
KY	X			Yes	Both sales and appraisals
LA	X			No	Both sales and appraisals
ME				No	Both sales and appraisals
MD				Yes	Sales only
MA	X			Yes	Both sales and appraisals
MI				No	Both sales and appraisals
MN	X	X		Yes	Sales only
MS				Yes	Sales only
MO				No	Both sales and appraisals
MT				Yes	Sales only
NE		X		Yes	Sales only
NV				Yes	Both sales and appraisals
NH				Yes	Sales only
NJ				Yes	Sales only
NM	X			No	Sales only
NY		X	Yes	Both sales and appraisals	
NC		X	No	Sales only	
ND			Yes	Both sales and appraisals	
OH	X		Yes	Sales only	
OK			Yes	Sales only	
OR			Yes	Both sales and appraisals	
PA			Yes	Sales only	
RI			No	Sales only	
SC			No	Sales only	
SD			Yes	Sales only	
TN		X	Yes	Sales only	
TX			Yes	Both sales and appraisals	
UT	X		Yes	Sales only	
VT			Yes	Both sales and appraisals	
VA		X	Yes	Sales only	
WA		X	No	Both sales and appraisals	
WV			Yes	Sales only	
WI			Yes	Both sales and appraisals	
WY	X		Yes	Sales only	

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q9	Q9	Q10	Q11			
	If you use both sales and appraisals, can they be combined in order to study one type or category of property?	Comments	What was the assessment date tested with your most recent ratio study?	Which of the following describes the time period from which sales are used in your ratio study?			
State				One year	Multiple years	Flexible time period (varies by jurisdiction or category)	Sale period mostly before assessment date
AL	Not applicable	<b>Arkansas:</b> Can be combined for commercial/industrial.	10/1/2010	X			X
AK	Not applicable		1/1/2010		X		X
AZ	Not applicable		1/1/2011				X
AR	Yes	<b>Idaho:</b> Rarely, appraisals are added to small samples.	1/1/2010		X		
CA	Not applicable		Not applicable.				
CO	Yes		assmt 1/1/2011/appraisal 6/30/2010		X		X
CT	Not applicable	<b>Iowa:</b> Commercial realty.	10/01/2009 in process	X			
DE	Not applicable		Not applicable				
DC	Not applicable	<b>Kentucky:</b> If a county has less than 20 valid residential sales then we supplement with appraisals.	1/1/2010	X			
FL	Yes		1/1/2010	X	X	X	X
GA	Yes		1/1/2009 completed; 1/1/2010 in progress	X			
HN	Not applicable		10/1/2010	X	X		
ID	Yes		2009	X		X	
IL	Not applicable	<b>Massachusetts:</b> For C&I properties where sales are limited.	2009 Assessment values for 2010 sales	X			
IN	Not applicable		3/1/2010	X			
IA	Yes		2009	X			
KS	Not applicable	<b>Missouri:</b> Applies to residential property only.	2010	X	X		
KY	Yes		1/1/2010				
LA	No		1/1/2007			X	
ME	Yes	<b>North Dakota:</b> Appraisals used if too few sales.	4/1/2010		X		
MD	Not applicable		2010	X			
MA	Yes		1/1/2010	X	X		X
MI	Yes only		12/31/2010		X		X
MN	Not applicable		1/1/2010				
MS	Not applicable		1/1/2011			X	X
MO	Yes		2009	X			
MT	Not applicable		7/1/2008		X		
NE	Not applicable		1/1/2011		X	X	X
NV	Yes		7/1/2010	X	X	X	X
NH	Not applicable		4/1/2010	X			
NJ	Not applicable		7/1/2009 - 6/30/2010	X			
NM	Not applicable		1/1/2010	X			X
NY	Yes		7/1/2010			X	X
NC	Not applicable		1/1/2011	X			
ND	Yes		2/1/2009	X	X		X
OH	Not applicable		1/1/2010	X			X
OK	Not applicable		1/1/2010		X		X
OR	Yes		1/1/2010			X	
PA	Not applicable		7/1/2010				
RI	Not applicable		12/31/2009	X			
SC	Not applicable		12/31	X			X
SD	Not applicable		11/1/2008 thru 10/31/2010		X		X
TN	Not applicable		1/1/2010	X			
TX	Yes		1/1/2010				
UT	Not applicable		1/1/2010	X	X	X	X
VT	Yes		2010		X		
VA			1/1/2009	X			
WA	Yes		1/1/2010				X
WV	Not applicable		Tax Year 2011	X			
WI	Yes		1/1/2010	X			X
WY	Not applicable		1/1/2011	X			X

Question No. >	Q11 (continued)		Q12
	Which of the following describes the time period from which sales are used in your ratio study?		Which of the following describes the time period from which sales are used in your ratio study? Additional comments:
State	Sale period mostly after assessment date	Sales period equally before and after the assessment date	
AL			<b>Alabama:</b> The appraisal date in Alabama is October 1 each year. The sales used in the ratio study are for the period October 1 through September 30 just preceding this appraisal date.
AK			
AZ			<b>Arizona:</b> Sale period is before the assessment date.
AR			<b>Arkansas:</b> Depends on property type and size of county.
CA			<b>California:</b> Not applicable.
CO			<b>Colorado:</b> 18 months ending on June 30 of year prior to revaluation year. The period can be extended by adding 6 month increments up to a total of 5 years.
CT	X		
DE			<b>Delaware-Kent County:</b> Not applicable.
DC			
FL			<b>Georgia:</b> One year prior to Jan. 1 assessment date. Example: For 1/1/2009 study, 2008 sales were used.
GA			<b>Hawaii-Honolulu:</b> One year of sales: for overall ratio study of property class/jurisdiction. Multiple years of sales: for ratio study by property class/neighborhoods.
HN		X	
ID	X		<b>Idaho:</b> One year is used unless insufficient sales data is available; then up to two years may be used.
IL	X		<b>Indiana:</b> For the March 1, 2010, assessment date, sales from calendar year 2009, and Jan. and Feb. 2010 were used. If needed, assessors may use sales outside that time frame, as long as they are time adjusted.
IN			
IA			<b>Kansas:</b> In some small counties supplemental sales from previous 4 years may be required.
KS	X		<b>Kentucky:</b> We use the last six months of the year for our ratio studies.
KY	X		<b>Louisiana:</b> Typically, we use sales occurring 6 months before and after the reassessment date. However, in rural areas the time frame may be extended to 12 months before and after.
LA		X	
ME		X	<b>Maine:</b> 7/1 to 6/30
MD		X	
MA			<b>Massachusetts:</b> The total 3 of arm's length sales should be at least 2% of the class(1 or 2 yrs used). If 2% less than 10 sales then 24 months of sales for that class should be analyzed.
MI			<b>Michigan:</b> Sales Study dates are October 1, 2009 thru September 30, 2010 for the Residential Class and October 1, 2008 through Sept 30, 2010 for all other classes or Res Class with exception granted.
MN	X		<b>Minnesota:</b> October 1 through September 30 compared with Jan. assessment date.
MS			
MO		X	<b>Mississippi:</b> Sales dated the year of the update are first searched for, if inadequate sales are available for the current year, then prior year's sales are accepted.
MT	X		
NE			<b>Missouri:</b> We collect two years worth of sales for analysis (1 year before and after value date) however only use one year's worth (6 months before and after value date) for the actual study.
NV			
NH		X	<b>Montana:</b> 2007 – 2008 to check the accuracy of valuations. Since then we have done ratio studies to track market changes.
NJ	X		
NM			<b>Nebraska:</b> Agricultural and commercial property study period is three-year period ending June 30 prior to assessment date.; Residential property study period is two-year period ending June 30 prior to assessment date.
NY			
NC			<b>New Jersey:</b> Fiscal year.
ND			<b>New Mexico:</b> Multiple years will be used to achieve a usable sample size.
OH			<b>New York:</b> Time period depends on latest year jurisdiction revalued all properties.
OK			<b>North Dakota:</b> Up to 4 years may be used if insufficient sales in one year. If insufficient sales in 4 years appraisals are added.
OR			
PA			
RI		X	<b>Ohio:</b> In the current market we've been using some supplemental ratio studies using sales that take place after the lien date.
SC			<b>Oklahoma:</b> When adequate sample size available, one year used. When more samples are needed, additional year added instead of conducting appraisals.
SD			
TN	X		<b>Oregon:</b> Counties are required to compile data for the full year, but may also use other periods they believe are most representative of current market conditions.
TX		X	
UT			<b>South Dakota:</b> 2 years.
VT	X		<b>Texas:</b> Beginning July 1 before the assessment date until June 30 after the assessment date.
VA	X		<b>Utah:</b> We have never used sales beyond the lien date of Jan. 1.
WA		X	<b>Vermont:</b> Three (3) years prior to assessment date.
WV			
WI			<b>Washington:</b> 8 month period, August 1 of the previous year through March 31 of the current year, straddling Jan. 1 assessment date.
WY			

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q13	Q14	Q15
	Do you attempt to determine the representativeness of sales used in the ratio study?	If you attempt to determine sample representativeness, what is your procedure? Describe:	If sales are used in the ratio study, which jurisdiction performs the sample selection?
State			
AL	Yes	<b>Alabama:</b> All valid sales are required to be submitted in the sales ratio study. Analysis is done on each property type and property use in addition to market areas.	Both state/province and local
AK	No		Local
AZ	No	<b>Colorado:</b> COD, PRD, median sales ratio. Also the treatment of solds vs. unsolds is analyzed.	Both state/province and local
AR	No	<b>Delaware-Kent County:</b> Not applicable.	State/province
CA	No		Not applicable
CO	Yes	<b>Florida:</b> Compare percent change in value for sample versus population; calculate frequency distribution for sample and population and compare line charts for sample versus population.	Local
CT	No		State/province
DE	No	<b>Georgia:</b> Office statistical comparison of tax digest vs. sales/appraisals. Confirmed with field review by field appraisers if nonrepresentativeness is suspected or discovered.	Not applicable
DC	No		Local
FL	Yes	<b>Idaho:</b> Sales are reviewed for disproportional concentration in certain geographic areas.	State/province
GA	Yes	<b>Illinois:</b> COD, COC, PRD 95% Confidence Interval.	State/province
HN	No		Local
ID	Yes	<b>Kansas:</b> In the 21 largest counties a representative sample of residential sales are selected. The sample attempts to closely match the population profile of property characteristics.	Both state/province and local
IL	Yes	<b>Kentucky:</b> Revenue field representatives will review sales. They read deeds and review the sale codes used.	State/province
IN	No		Local
IA	No	<b>Louisiana:</b> Sales within similar geographic areas/neighborhoods are correlated to determine sample representativeness.	State/province
KS	Yes		State/province
KY	Yes	<b>Maine:</b> Field review of municipal records for type and applicability.	Both state/province and local
LA	Yes	<b>Michigan:</b> Local units use different procedures depending on the area.	State/province
ME	Yes		State/province
MD	No	<b>Mississippi:</b> Look for good data that fits our requirements, has been verified with the grantor and grantee, and is a good arm's-length transaction.	State/province
MA	No		Both state/province and local
MI	Yes	<b>Missouri:</b> Comparison of stratification by assessed value, location, and year built; this applies to residential sales studies only.	local
MN	No		State/province
MS	Yes	<b>Montana:</b> We used all verified sales across the state. Presumably, this is representative of all residential property.	Local
MO	Yes		Both state/province and local
MT	No	<b>Nebraska:</b> Balance sample by factors that affect value in the agricultural class of real property.	State/province
NE	Yes	<b>Nevada:</b> Random sample, minimum determined by category and county.	State/province
NV	Yes	<b>New Jersey:</b> Review sales by deed reviews, calls to attorneys, assessors.	State/province
NH	No		State/province
NJ	Yes	<b>Pennsylvania:</b> Not applicable.	State/province
NM	No	<b>Tennessee:</b> By area or subdivision, if an inordinate number of sales are recorded relative to the percentage of parcels that area contributes to the overall jurisdiction's population of parcels. Appropriate representative number of sales is calculated and those sales used are then selected at random.	Local
NY	No		State/province
NC	Yes		State/province
ND	No	<b>Texas:</b> Appraisers review each sale to ensure each is an arm's-length transaction representing market value	Both state/province and local
OH	No		State/province
OK	No	<b>Utah:</b> We stratify the sales, which helps to determine what areas the sales represent.	State/province
OR	No	<b>Virginia:</b> We attempt to limit the percentage of total sales from any specific neighborhood to the same percentage of parcels that the neighborhood bears to the entire jurisdiction.	Local
PA	No		State/province
RI	No	<b>Washington:</b> Review validated and invalidated sales; Review selling vs. non-selling properties.	Both state/province and local
SC	No		Local
SD	No	<b>Wisconsin:</b> The state employs various procedures of review that include % of base, % on/off water, % high-dollar, property type, and vacant/nonvacant.	State/province
TN	Yes		State/province
TX	Yes	<b>Wyoming:</b> Using a 95% confidence interval, COD, COV, PRD, etc.	State/province
UT	Yes		Both state/province and local
VT	Yes		State/province
VA	Yes		Both state/province and local
WA	Yes		State/province
WV	Yes		State/province
WI	Yes		State/province
WY	Yes		Local



Question No. >	Q16	Q17	Q18
State	Which jurisdiction conducts the sales validation (screening)?	Which jurisdiction conducts the sales validation (screening)? Other, please describe:	If the state/provincial agency does NOT conduct the sales validation, does the agency perform an audit of the sales validation process?
AL	Both state/province and local	<b>Alabama:</b> State analysts and local county appraisers work together.	Not applicable
AK	Local	<b>Alaska:</b> Not applicable.	Yes
AZ	Both state/province and local	<b>Arkansas:</b> Local if in-house reappraisal, otherwise contractor.	Not applicable
AR	local/contractor	<b>Delaware-Kent County:</b> Not applicable.	Yes
CA	Not applicable	<b>Georgia:</b> Not applicable.	Not applicable
CO	Local	<b>Hawaii-Honolulu:</b> County real property appraisers conduct sales validation.	Not applicable
CT	Both state/province and local	<b>Indiana:</b> The local officials conduct the sales validation; however, the state (DLGF) approves the sales file (verifying that critical data like name, address, parcel number, etc. are included).	Not applicable
DE	Not applicable	<b>Iowa:</b> Local also.	Yes
DC	Local	<b>Maine:</b> Municipal with state review.	Not applicable
FL	Local	<b>Massachusetts:</b> Not applicable.	No
GA	State/provincial agency	<b>Michigan:</b> County, local unit and state.	Not applicable
HN	Local	<b>Mississippi:</b> Sales are collected from questionnaires sent to the grantor and grantee. From these sales the state screens the sales for validation.	Yes
ID	Local	<b>Nebraska:</b> Local.	Not applicable
IL	State/provincial agency	<b>North Dakota:</b> A local jurisdiction may challenge a sale but the state has to approve the challenge.	Not applicable
IN	Both state/province and local		Not applicable
IA	State/provincial agency		Yes
KS	State/provincial agency		Not applicable
KY	State/provincial agency		Yes
LA	State/provincial agency		Not applicable
ME	Both state/province and local		Yes
MD	State/provincial agency		Not applicable
MA	Local		Yes
MI	Both state/province and local		Not applicable
MN	Both state/province and local		Yes
MS	State/provincial agency		Yes
MO	Local		Not applicable
MT	State/provincial agency		Yes
NE	Both state/province and local		Not applicable
NV	Local		Yes
NH	State/provincial agency		Not applicable
NJ	Both state/province and local		Not applicable
NM	Local		Yes
NY	Both state/province and local		No
NC	Local		Yes
ND	Local		No
OH	State/provincial agency		Not applicable
OK	Both state/province and local		Not applicable
OR	Local		No
PA	Both state/province and local		No
RI	State/provincial agency		Not applicable
SC	Local		No
SD	Both state/province and local		Not applicable
TN	Both state/province and local		Not applicable
TX	State/provincial agency		Not applicable
UT	Both state/province and local		Yes
VT	Both state/province and local		Not applicable
VA	Local		No
WA	Local		Yes
WV	Local		Yes
WI	Both state/province and local		Yes
WY	Local		No

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q19	Q20
State	If an audit of sales is performed by the oversight agency, briefly summarize your audit policy.	Regarding sales price disclosure: Does your jurisdiction have a law requiring disclosure of real estate sales prices to assessment officials?
AL	<b>Alaska:</b> An assessment office audit also reviews sales and ratios for accuracy and compliance with IAAO Standards	No
AK		No
AZ	<b>Arkansas:</b> We select samples and determine if proper codes were assigned, by checking with confirmation sources	Yes, disclosure made to both.
AR		No
CA	<b>Colorado:</b> An independent company (auditor) is contracted to test the statistical compliance of values established by each county assessor's office.	Yes, disclosure made to state/province/territory officials.
CO		Yes, disclosure made to local assessors.
CT	<b>Florida:</b> State agency conducts annual sale qualification studies (random sample) to evaluate reliability of sale qualification decisions of local jurisdictions.	Yes, disclosure made to local assessors.
DE		Yes, disclosure made to both.
DC	<b>Georgia:</b> Sales clearly non-qualifying are removed by office staff (ie. \$0 transfers). Questionable sales are marked for field review to be sure field appraisers have a second set of eyes looking at sale conditions.	Yes, disclosure made to local assessors.
FL		Yes, disclosure made to both.
GA	All sales not removed as non-qualifying are reviewed by field appraisers. This includes reading deeds, security deeds or any other recorded instrument pertinent to the transfer (such as UCC personal property transfers). This list is ultimately submitted to the jurisdiction being audited for any local knowledge about the sale that may be pertinent. Information given from the local jurisdiction must be confirmed by the field appraiser.	Yes, disclosure made to both.
HN		Yes, disclosure made to state/province/territory officials.
ID		No
IL		Yes, disclosure made to both.
IN		Yes, disclosure made to local assessors.
IA	<b>Hawaii-Honolulu</b> 1) Audit all sales that occurred to check for sales that were not validated by county appraisers; 2) Check appropriateness of validity codes, whether sales coded 'valid' are 'valid' or not; 3) Check if sales coded 'invalid' are 'valid'; 4) Check percent change in assessed value from prior year; 5) Check outliers.	Yes, disclosure made to both.
KS		Yes, disclosure made to both.
KY		Yes, disclosure made to local assessors.
LA	<b>Indiana:</b> The DLGF reviews the sales file for accuracy of data (see question #17), as well as ensuring the number of sales submitted (an approximation) is correct based on revenue reported for sales filing fees.	No
ME		Yes, disclosure made to both.
MD	<b>Iowa:</b> Call to buyer or seller on most commercial sales	Yes, disclosure made to state/province/territory officials.
MA	<b>Massachusetts:</b> Certification process includes on site review	Yes, disclosure made to both.
MI	<b>Michigan:</b> Spot review, random selection of units, entire counties are chosen where problems are suspected.	Yes, disclosure made to both.
MN		Yes, disclosure made to both.
MS	<b>Mississippi:</b> Sales are collected from the jurisdiction, analyzed, and sorted based on the guidelines for an arm's-length transaction.	No
MO		No
MT	<b>Missouri:</b> Review forms, policies, and procedures of each jurisdiction for proper compliance with state regulations and IAAO standards	Yes, disclosure made to state/province/territory officials.
NE		Yes, disclosure made to both.
NV	<b>Nebraska:</b> Review arm's-length transactions	No
NH		Yes, disclosure made to both.
NJ	<b>Nevada:</b> Random sample of sales, follow procedures from recorder through final sale file.	Yes, disclosure made to both.
NM	<b>New Jersey:</b> State reviews sales by public records check, calls to assessors and attorneys	Yes, disclosure made to local assessors.
NY	<b>New Mexico</b> Annual evaluations are conducted in all counties on an annual basis. Sales verification procedures are investigated during these evaluations.	Yes, disclosure made to both.
NC		No
ND	<b>North Carolina:</b> The local counties select deeds based off of a random sample supplied the our state office. The county then submits the sale selected along with the appraised value. We (the state) perform an audit where we will review a certain % of what was submitted. We confirm that the correct deed was selected and that the correct value was given. If we are satisfied with the results, then the county's work is accepted. There have been times where we (the state) have gone back and conducted the study completely on our own, as we were not satisfied with the deed selection, or the values given.	Yes, disclosure made to both.
OH		Yes, disclosure made to both.
OK		No
OR		Yes, disclosure made to state/province/territory officials.
PA		Yes, disclosure made to both.
RI	<b>Utah:</b> Areas we review	No
SC	1. Are all available sales being considered	Yes, disclosure made to local assessors.
SD	2. How many are being rejected, and for what reasons	Yes, disclosure made to state/province/territory officials.
TN	3. Are the reasons for rejection of a sale reasonable	No
TX	4. Random detailed review of sales being verified by the counties	No
UT		No
VT	<b>Washington:</b> Review invalidated sales for reasonableness and appropriate use of invalidation codes. Audit some invalidated sales. Sometimes talk with buyers/sellers.	Yes, disclosure made to both.
VA	<b>West Virginia:</b> Random sales are selected for review.	Yes, disclosure made to local assessors.
WA	<b>Wisconsin:</b> The state reviews the validations of the local assessors and verifies any inconsistencies, abnormalities, etc.	Yes, disclosure made to both.
WV		Yes, disclosure made to both.
WI	<b>Wyoming:</b> We are currently looking into a process to audit this procedure.	Yes, disclosure made to both.
WY		Yes, disclosure made to both.

Question No. >	Q21	Q22	Q23	Q24
State	What type of disclosure document is used?	What office is responsible for initially accepting the disclosure document?	Does your jurisdiction employ a unique identification system to track sale disclosure documents?	Are disclosed sale prices public records?
AL	Not applicable	Not applicable	Not applicable	Not applicable
AK	Not applicable	Not applicable	Not applicable	Not applicable
AZ	Comprehensive sale questionnaire	Recorder/registrar	Yes	Yes
AR	Not applicable	Not applicable	Not applicable	Not applicable
CA	Both	Recorder/registrar	Not applicable	No
CO	Both	Recorder/registrar	Yes	Yes
CT	Real estate conveyance tax form	Recorder/registrar	Yes	Yes
DE	Deed, affidavit of consideration	Recorder/registrar	No	Yes
DC	Sale price statement	Recorder/registrar	Yes	Yes
FL	Amount of documentary tax paid, from which sale price is calculated	Recorder/registrar	No	Yes
GA	State PT61 form electronically recorded at state clerk's authority	Local assessor, County Clerk of Superior Court	Yes	Yes
HN	Sale price statement	Recorder/registrar	Yes	Yes
ID	Not applicable	Not applicable	Not applicable	Yes
IL	Real state transfer declaration	Not applicable	Not applicable	Yes
IN	Comprehensive sale questionnaire	Local assessor	Yes	Yes
IA	Sale price statement	Recorder/registrar	Yes	Yes
KS	Sale price statement	Recorder/registrar	Yes	No
KY	Deeds recorded in the clerk's office	Local assessor, County Clerk records the deeds.	Not applicable	Yes
LA	Not applicable	Not applicable	Not applicable	Yes
ME	Real estate transfer tax	State office	Yes	Yes
MD	Sale price statement	Recorder/registrar	Yes	Yes
MA	Deed	Recorder/registrar	Yes	Yes
MI	Deeds, PTA (transfer affidavits), real property statements	Registrar of Deeds, state and local assessor	No	Yes
MN	Comprehensive sale questionnaire	Local assessor, County Auditor	Yes	Yes
MS	Not applicable	Not applicable	Not applicable	No
MO	Not applicable	Not applicable	Not applicable	Not applicable
MT	Comprehensive sale questionnaire	Recorder/registrar	Yes	No
NE	Both	Recorder/registrar	Yes	Yes
NV	Not applicable	Not applicable	Not applicable	Not applicable
NH	Both	Recorder/registrar	Not applicable	Yes
NJ	Recorded deeds	Not applicable	Yes	Yes
NM	Statute requires the filing of sale price affidavits	Local assessor	No	No
NY	Comprehensive sale questionnaire	Recorder/registrar	Yes	Yes
NC	Deed stamps	Recorder/registrar	No	Yes
ND	Both	Recorder/registrar	No	No
OH	Questionnaire as part of conveyance form	Local assessor	Yes	Yes
OK	Not applicable	Not applicable	Not applicable	Not applicable
OR	Compensation is required to be stated on deeds	Recorder/registrar	No	Yes
PA	Comprehensive sale questionnaire	Recorder/registrar	Yes	Yes
RI	Tax stamp based on sale price.	Local assessor	Not applicable	Yes
SC	Deeds or affidavit shows true consideration	Recorder/registrar	Yes	Yes
SD	Comprehensive sale questionnaire	Recorder/registrar	Not applicable	Yes
TN	Not applicable	Not applicable	Not applicable	Not applicable
TX	Not applicable	Not applicable	Not applicable	Not applicable
UT	Not applicable	Not applicable	Not applicable	Not applicable
VT	Both	Recorder/registrar	Yes	Yes
VA	Sale price statement	Recorder/registrar	Yes	Yes
WA	Sale price statement	Recorder/registrar	Yes	Yes
WV	Both	Recorder/registrar	Yes	Yes
WI	Real estate transfer return	Recorder/registrar	Yes	Yes
WY	Sale price statement	Recorder/registrar	No	No

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q25	Q26	Q27	Q28				
State	If you answered No to the previous question, please explain:	Is a value-related fee charged (e.g., transfer tax, deed stamp) for real property transfers?	Does your jurisdiction have a law making recordation/registration mandatory for real property transfers?	Regarding sales price adjustments--Which of the following adjustments to sale price do you have authority to implement in your ratio studies?	No authority to implement adjustments	Time	Financing	Personal property
AL	<b>California:</b> If a sale price is known by the assessor through a statement filed by the assessee, the sale price must be kept confidential. However, if the sale price is known from other publicly available sources (e.g., transfer tax amounts) the assessor may show the sale price on his or her public listing of transferred properties.	Yes	No		X	X	X	
AK		No	No		X	X	X	
AZ		No	Yes	X				
AR		Yes	Yes		X	X	X	
CA		Yes	No					
CO		Yes	No		X	X	X	
CT		Yes	Yes	X				
DE		Yes	Yes					
DC		<b>Kansas:</b> Not an open public record but many exceptions that allow access to taxpayers, appraisers and real estate brokers/agents.	Yes	Yes	X			
FL		Yes	No		X	X	X	
GA		Yes	No		X	X	X	
HN		<b>Mississippi:</b> Mississippi is a nondisclosure state, sales letters are sent to the grantor and grantee on each qualifying deed. These sale prices are kept confidential and used only for maintaining property values in the jurisdiction in which they were collected.	Yes	Yes	X	X	X	
ID		No	No		X		X	
IL		Yes	Yes		X			
IN		No	No		X			
IA		Yes	Yes				X	
KS		<b>Montana:</b> The realty transfer certificate is used to report the sale price and some of the details about the sale transaction. This information is confidential. The Department has it, but the public does not.	No	No		X	X	X
KY		Yes	No	X				
LA		No	Yes		X			
ME		Yes	No	X				
MD		Yes	Yes					
MA		<b>New Mexico:</b> The State of New Mexico is a nondisclosure state. Sale price affidavits may be used only for statistical and analytical purposes.	Yes	Yes		X		
MI		Yes	Yes		X	X	X	
MN		Yes	Yes		X	X	X	
MS		<b>North Dakota:</b> Sale prices reported on statements of full consideration are confidential but may be shared with assessors. Sale prices reported on the fact of the deed are public records.	No	Yes		X	X	X
MO		No	No		X	X	X	
MT		No	Yes		X			
NE		Yes	Yes				X	
NV		Yes	Yes		X	X	X	
NH		<b>Wyoming:</b> A taxpayer may only see the sales used to value his/her property during the protest period.	Yes	No	X			X
NJ		Yes	No	X				
NM		No	Yes	X				
NY	Yes	Yes		X				
NC	Yes	Yes						
ND	No	No				X		
OH	Yes	Yes	X					
OK	Yes	No				X		
OR	No	Yes						
PA	Yes	Yes	X					
RI	Yes	Yes						
SC	Yes	No			X	X		
SD	Yes	No		X	X			
TN	Yes	No	X					
TX	No	No		X	X	X		
UT	No	No		X	X	X		
VT	Yes	Yes				X		
VA	Yes	No	X					
WA	Yes	Yes				X		
WV	Yes	No	X					
WI	Yes	Yes				X		
WY	No	Yes		X	X	X		

Question No. >	Q28 (continued)				
	Regarding sales price adjustments--Which of the following adjustments to sale price do you have authority to implement in your ratio studies?				
State	Closing costs	Brokerage fees	Intangible personal property	Delinquent taxes	Other, describe:
AL	X	X	X		<b>Colorado:</b> Fees that are atypical may warrant an adjustment. <b>Georgia:</b> No restrictions for our study. <b>Hawaii-Honolulu:</b> Demolition cost <b>Indiana:</b> Done at the local level. <b>Kansas:</b> Special assessments, long term leases. <b>Missouri:</b> No limitation on authority to implement adjustments. <b>North Carolina:</b> There is no law stating that we can or can't make changes. We typically don't make any changes to be consistent. <b>Oregon:</b> Counties make all appropriate adjustments. <b>Rhode Island:</b> Historically have not made adjustments to sales for ratio calculation. <b>Texas:</b> Any other factor affecting market value.
AK	X		X		
AZ					
AR					
CA					
CO	X	X	X	X	
CT					
DE					
DC					
FL	X	X	X		
GA	X	X	X	X	
HN	X	X			
ID					
IL					
IN					
IA					
KS	X	X	X	X	
KY					
LA	X				
ME					
MD					
MA					
MI			X		
MN			X		
MS	X	X	X		
MO	X	X	X	X	
MT			X		
NE			X		
NV			X		
NH					
NJ					
NM					
NY					
NC					
ND					
OH					
OK					
OR					
PA					
RI					
SC					
SD					
TN					
TX	X	X	X	X	
UT	X				
VT			X		
VA					
WA					
WV					
WI			X		
WY			X		

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q29							
	Which of the following adjustments to sale price do you actually use in your ratio studies?							
State	Time	Financing	Personal property	Closing costs	Brokerage fees	Intangible personal property	Delinquent taxes	Other, describe:
AL	X		X					
AK	X	X	X			X		
AZ								
AR	X		X					
CA								Not applicable.
CO								See answer to question 28.
CT								
DE								Not applicable.
DC								
FL	X	X	X	X	X	X		
GA	X		X			X		Timber value.
HN								
ID	X		X					
IL	X							
IN	X							Done at the local level.
IA	X		X					Sale to tenant.
KS	X	X	X	X	X	X	X	The county appraiser must request & document.
KY								None.
LA	X			X				
ME								
MD								
MA	X							
MI	X	X	X			X		
MN	X	X	X			X		
MS			X	X	X	X		
MO	X	X	X	X		X		
MT	X							
NE			X			X		
NV	X		X					
NH	X		X					
NJ								Not applicable.
NM								Not applicable.
NY	X		X			X		
NC								
ND			X					Add special assessment balances assumed.
OH								
OK			X					
OR	X	X	X	X		X	X	
PA								
RI								None.
SC		X	X					
SD		X	X					
TN								
TX	X	X	X	X	X	X	X	Any other factor affecting market value.
UT	X	X	X	X				
VT			X					
VA								
WA			X					
WV								
WI			X			X		
WY	X	X	X			X		

Question No. >	Q30				Q31	Q31
State	If you make time adjustments for sales used in ratio studies, which methods are used?				Are blanket or global adjustments made to sales prices prior to computing ratios?	If yes, describe:
	Tracking trends in sales ratios over time	Tracking changes in value per unit over time	Analysis of repeat sales	Not applicable		
AL			X		No	<b>Colorado:</b> In some cases the answer may be yes. There are likely to be isolated examples of this in some counties. <b>Florida:</b> Across the board adjustments are made by local assessors; state generally uses same adjustments. <b>Pennsylvania:</b> 15% <b>Washington:</b> 1% blanket adjustment on all real property sales to account for personal property.
AK	X		X		No	
AZ				X	No	
AR	X	X	X	Any method based on sound methodology and the market.	No	
CA				X	No	
CO	X		X		No	
CT				X	No	
DE					No	
DC				X	No	
FL				Multiple regression analysis.	Yes	
GA		X	X		No	
HN				X	No	
ID	X				No	
IL		X			No	
IN	X	X	X	Done at the local level.	No	
IA	X				No	
KS	X	X	X	MRA date of sale coefficient.	No	
KY				X	No	
LA		X			No	
ME					No	
MD				X	No	
MA	X		X		No	
MI			X		No	
MN	X				No	
MS			X		No	
MO	X		X		No	
MT		X			No	
NE				X	No	
NV			X		No	
NH	X				No	
NJ				X	No	
NM				X	No	
NY	X				No	
NC					No	
ND				X	No	
OH				X	No	
OK				X	No	
OR	X		X		No	
PA					Yes	
RI				X	No	
SC				X	No	
SD				X	No	
TN					No	
TX				X	No	
UT	X		X		No	
VT				X	No	
VA					No	
WA					Yes	
WV					No	
WI				X	No	
WY	X	X	X		No	

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q32	Q32	Q33
State	Regarding sample size, what is the smallest sample you will use to evaluate any category of property?	Regarding sample size, what is the smallest sample you will use to evaluate any category of property? Other, describe:	Do you establish sample size quotas or goals (e.g., 3 percent of parcels in category or a number based on a statistical sample size formula)?
AL	Other	<p><b>Alabama:</b> Due to the economic downturn, we have no standards regarding minimum sample size.</p> <p><b>Georgia:</b> A strata can stand with 12, but sales chasing tests require 30.</p> <p><b>Iowa:</b> 2% or 10 observations.</p> <p><b>Michigan:</b> Depends on the size of the local unit.</p> <p><b>Nebraska:</b> Based upon quality statistic from sample.</p> <p><b>North Dakota:</b> 30 sales or 10% of # of parcels in the class.</p> <p><b>Oklahoma:</b> 15 CM min., 36 RES min., 1 AG sample per TWP.</p> <p><b>South Carolina:</b> We use all sales in a one year period, no size limit.</p> <p><b>Utah:</b> If the sample represents 10% or more of property category it could be less than 10 observations.</p>	No
AK	5 to 9 observations		No
AZ	10 to 19 observations		No
AR	Less than 5 observations		Yes
CA			
CO	More than 30 observations		Yes
CT	Less than 5 observations		No
DE	Other		No
DC	20 to 30 observations		No
FL	20 to 30 observations		Yes
GA	Other		Yes
HN	Less than 5 observations		No
ID	5 to 9 observations		No
IL	20 to 30 observations		No
IN	5 to 9 observations		No
IA	Other		Yes
KS	5 to 9 observations		No
KY	20 to 30 observations		Yes
LA	20 to 30 observations		Yes
ME	10 to 19 observations		No
MD	10 to 19 observations		Yes
MA	5 to 9 observations		Yes
MI	Other		No
MN	5 to 9 observations		No
MS	Less than 5 observations		No
MO	20 to 30 observations		Yes
MT	20 to 30 observations		No
NE	Other		No
NV	5 to 9 observations		Yes
NH	5 to 9 observations		Yes
NJ	Less than 5 observations		No
NM	More than 30 observations		No
NY	Less than 5 observations		No
NC	More than 30 observations		No
ND	Other		Yes
OH	More than 30 observations		Yes
OK	Other		No
OR	Less than 5 observations		No
PA	Less than 5 observations		No
RI	Less than 5 observations		No
SC	Other		No
SD	10 to 19 observations		No
TN	Less than 5 observations		No
TX	5 to 9 observations		Yes
UT	Other		Yes
VT	Less than 5 observations		No
VA	20 to 30 observations		No
WA	5 to 9 observations		No
WV	Less than 5 observations		No
WI	Less than 5 observations		No
WY	5 to 9 observations	No	



Question No. >	Q33 (continued)	Q34				
		Check each measure of level that you calculate and indicate if it is used for direct and/or indirect (funding) equalization.				
State	If yes, describe:	ARITHMETIC MEAN - calculate	ARITHMETIC MEAN - use for direct equalization	ARITHMETIC MEAN - use for indirect equalization	MEDIAN - calculate	MEDIAN - use for direct equalization
AL	<b>Arkansas:</b> Real except agri - all valid sales less edits;				X	X
AK	Agri - 100 samples; Personal - depends on population of county.	X			X	
AZ					X	X
AR	<b>Colorado:</b> 30 or more	X			X	X
CA	<b>Florida:</b> COV formula					
CO						
CT	<b>Georgia:</b> Use the IAAO sample size formula in order to achieve desired COD (ultimately an acceptable C.I.)	X			X	
DE	<b>Iowa:</b> 2% or 10 observations.					
DC		X			X	
FL	<b>Kentucky:</b> If a county does not have 20 valid residential sales then we will supplement with appraisals. We do not do this for farm or commercial properties.	X			X	
GA		X				
HN		X			X	
ID	<b>Louisiana:</b> Sample size goals depend on the population of the parish.	X			X	X
IL					X	X
IN	<b>Maryland:</b> Fewer than 10 commercial sales - ratio NOT used for real property stat. by class.	X		X	X	
IA		X	X		X	X
KS		X			X	
KY					X	
LA	<b>Missouri:</b> We use the same # of samples in each jurisdiction when utilizing only appraisal studies based on sample size estimator and study of historical data. For residential sales studies we have benchmarks at 1% of residential parcel population as a minimum threshold for sample size.	X			X	
ME		X		X		
MD		X			X	
MA	<b>Nevada:</b> Statistical sample size formula by category and county.	X			X	
MI						
MN		X			X	X
MS	<b>New Hampshire:</b> Minimum of 20 sales. If there are less than 20 sales, supplemental sales are added.				X	X
MO		X			X	X
MT	<b>North Dakota:</b> 30 sales or 10% of # of parcels in the class.	X			X	
NE		X			X	X
NV	<b>Ohio:</b> 100 sales is ideal, but not available for all jurisdictions.					
NH		X			X	
NJ	<b>Texas:</b> A maximum 5 percent margin of error is targeted for each school district study.	X		X		
NM		X			X	
NY	<b>Utah:</b> 10% or more of a property category (e.g. commercial).					
NC						X
ND		X			X	X
OH		X	X		X	X
OK		X			X	X
OR		X			X	
PA		X		X		
RI		X			X	
SC		X			X	
SD		X			X	X
TN		X			X	X
TX					X	
UT		X	X	X		
VT		X			X	
VA					X	X
WA						
WV					X	
WI		X		X	X	
WY		X		X	X	X

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q34 (continued)							
	Check each measure of level that you calculate and indicate if it is used for direct and/or indirect (funding) equalization.							
State	MEDIAN - use for indirect equalization	WEIGHTED MEAN - calculate	WEIGHTED MEAN - use for direct equalization	WEIGHTED MEAN - use for indirect equalization	GEOMETRIC MEAN - calculate	GEOMETRIC MEAN - use for direct equalization	GEOMETRIC MEAN - use for indirect equalization	OTHER - calculate
AL						None	None	
AK				X				
AZ	X							
AR		X						
CA								
CO	X			X				
CT	X	X						X
DE								
DC		X						
FL		X		X				
GA	X			X				
HN								
ID		X		X	X			
IL	X							X
IN	X							
IA	X	X						
KS		X			X			X
KY								
LA								
ME								
MD		X						
MA		X		X				
MI		X	X	X				
MN	X	X						
MS		X	X					
MO		X						
MT		X						
NE		X		X				X
NV	X							
NH				X	X			
NJ								
NM		X						X
NY		X	X	X				
NC	X							
ND		X						
OH		X	X					
OK	X	X						
OR		X			X			
PA								
RI				X				
SC	X							
SD	X							
TN	X	X						
TX				X				
UT	X			X				
VT				X				
VA	X							
WA			X	X				
WV		X						X
WI	X	X		X				
WY								

Question No. >	<b>Q34 (continued)</b>		<b>Q35</b>	<b>Q36</b>
	Check each measure of level that you calculate and indicate if it is used for direct and/or indirect (funding) equalization.		Do you test the distribution of ratios to see if it is statistically normal?	Do you use confidence intervals to determine statistical compliance with standards for appraisal
State	OTHER - use for direct equalization	OTHER - use for indirect equalization		
		If other measure of level, specify		
AL			Yes	No
AK			No	No
AZ			No	Yes
AR			Yes	Yes
CA			No	
CO			No	No
CT			No	No
DE			No	Not applicable
DC			Yes	No
FL			Yes	No
GA		X	Yes	Yes
HN			No	No
ID			Yes	Yes
IL			Yes	Not applicable
IN			No	Yes
IA			No	No
KS			Yes	Yes
KY			Yes	No
LA			No	No
ME			No	Not applicable
MD			Yes	No
MA			No	No
MI			Yes	No
MN			No	No
MS			Yes	No
MO			No	Yes
MT			Yes	Yes
NE			No	No
NV			No	No
NH			Yes	Yes
NJ	X		No	No
NM			Yes	No
NY			No	No
NC			Yes	No
ND			No	No
OH			No	No
OK			No	No
OR			Yes	No
PA			No	No
RI			No	No
SC			No	No
SD			No	No
TN			No	No
TX			No	Yes
UT			Yes	Yes
VT			Yes	Yes
VA			No	No
WA			No	No
WV			Yes	No
WI			Yes	Yes
WY			Yes	Yes

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q37	Q38
State	If you use confidence intervals (CIs) to test compliance with appraisal level standards, and the calculated level of assessment is 86% with a confidence interval ranging from 76% to 95% for a particular group of properties, would you consider the level to be in compliance?	If you use confidence intervals (CIs) to test compliance with appraisal level standards, and the calculated level of assessment is 86% with a confidence interval ranging from 76% to 95% for a particular group of properties, would you consider the level to be in compliance? Additional comments:
AL	Not applicable (CI not used to determine compliance.)	<b>Alaska:</b> Not applicable.
AK	Not applicable (CI not used to determine compliance.)	<b>Arkansas:</b> In compliance if that is the 90% confidence interval.
AZ	Yes (The CI overlaps the required minimum level.)	<b>Delaware-Kent County:</b> Not applicable.
AR	Yes (The CI overlaps the required minimum level.)	<b>Georgia:</b> Not applicable.
CA		<b>Indiana:</b> The level of confidence used by the DLGF is 95% (two-tailed).
CO	Not applicable (CI not used to determine compliance.)	<b>Massachusetts:</b> Not applicable.
CT	Not applicable (CI not used to determine compliance.)	<b>Montana:</b> Yes. We would test to insure that the CI for assessment levels overlap for the particular groups. If the CI for another group were 88% to 102% then we would say the groups are equalized.
DE	Not applicable (CI not used to determine compliance.)	<b>New Jersey:</b> Not applicable.
DC	Not applicable (CI not used to determine compliance.)	<b>Oregon:</b> Confidence levels are considered in reviews but many counties don't appear to consider factors in their reporting.
FL	Not applicable (CI not used to determine compliance.)	
GA	Yes (The CI overlaps the required minimum level.)	
HN	Not applicable (CI not used to determine compliance.)	
ID	Yes (The CI overlaps the required minimum level.)	
IL		
IN	Yes (The CI overlaps the required minimum level.)	
IA	Not applicable (CI not used to determine compliance.)	
KS	Yes (The CI overlaps the required minimum level.)	
KY	Not applicable (CI not used to determine compliance.)	
LA	Not applicable (CI not used to determine compliance.)	
ME	Not applicable (CI not used to determine compliance.)	
MD		
MA	Not applicable (CI not used to determine compliance.)	
MI		
MN	Not applicable (CI not used to determine compliance.)	
MS	Not applicable (CI not used to determine compliance.)	
MO	Yes (The CI overlaps the required minimum level.)	
MT	Yes (The CI overlaps the required minimum level.)	
NE	Not applicable (CI not used to determine compliance.)	
NV	Not applicable (CI not used to determine compliance.)	
NH	Yes (The CI overlaps the required minimum level.)	
NJ	Not applicable (CI not used to determine compliance.)	
NM	Not applicable (CI not used to determine compliance.)	
NY	Not applicable (CI not used to determine compliance.)	
NC	Not applicable (CI not used to determine compliance.)	
ND	Not applicable (CI not used to determine compliance.)	
OH	Not applicable (CI not used to determine compliance.)	
OK	Not applicable (CI not used to determine compliance.)	
OR	Not applicable (CI not used to determine compliance.)	
PA		
RI	Not applicable (CI not used to determine compliance.)	
SC	Not applicable (CI not used to determine compliance.)	
SD	Not applicable (CI not used to determine compliance.)	
TN	Not applicable (CI not used to determine compliance.)	
TX	Yes (The CI overlaps the required minimum level.)	
UT	No (the CI does not overlap 100%.)	
VT	Yes (The CI overlaps the required minimum level.)	
VA		
WA		
WV		
WI	Yes (The CI overlaps the required minimum level.)	
WY	No (the CI does not overlap 100%.)	

Question No. >	Q39				
	If you use CIs to test compliance with appraisal level standards, and the calculated level of assessment is out of compliance except for the confidence interval for a particular group of properties, and the calculated level of assessment remains below the required minimum level for several years, which action would your agency take?				
State	Lower the level of confidence and reevaluate	Base the compliance decision on point estimates	Continue to find the jurisdiction in compliance	Other	Not applicable (CI not used to determine compliance)
AL					X
AK					X
AZ			X		
AR			X		
CA					
CO					X
CT					X
DE					X
DC					X
FL					X
GA			X		
HN					X
ID	X				
IL					
IN					
IA					X
KS	X	X	X		
KY					X
LA					X
ME					
MD					
MA					X
MI					
MN					X
MS					X
MO			X		
MT					
NE					
NV					X
NH				X	
NJ					X
NM					X
NY				X	
NC					X
ND					X
OH					
OK					X
OR					X
PA					
RI					X
SC					X
SD					X
TN					X
TX					X
UT			X	X	
VT					X
VA					
WA					
WV					
WI		X			
WY				X	

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q40	Q41					
	If you use CIs to test compliance with appraisal level standards, and the calculated level of assessment is out of compliance except for the confidence interval for a particular group of properties, and the calculated level of assessment remains below the required minimum level for several years, which action would your agency take?	Which measures or tests of price-related bias do you use?					
State		Price related differential (PRD) calculated	PRD used to test for compliance	Spearman-Rank calculated	Spearman-Rank used to test for compliance	Mann-Whitney Test calculated	Mann-Whitney Test used to test for compliance
AL	<b>Alaska:</b> Not applicable.	X					
AK	<b>Arkansas:</b> None.	X	X				
AZ	<b>Delaware-Kent County:</b> Not applicable.						
AR		X				X	
CA	<b>Georgia:</b> If the confidence interval continues to be too wide, additional appraisals will be performed in order to increase the sample size and hopefully improve the confidence levels.						
CO			X				
CT		X					
DE	<b>Indiana:</b> Confidence interval, rather than the median ratio itself, is used to determine compliance with the level of assessment benchmark. Local officials would be advised to consider using more sales in their stratum.	X					
DC		X					
FL	<b>Kansas:</b> The Director has broad discretion.	X	X				
GA			X	X	X	X	X
HN	<b>Massachusetts:</b> Not applicable.	X	X				
ID	<b>Montana:</b> Not sure. The state values the property so in theory there are not equalization issues. In the one case that the assessment levels CI was outside of the standards, it overlapped with other areas so we could not statistically determine they were assessed differently.	X	X			X	
IL		X					
IN		X	X	X	X		
IA		X					
KS	<b>New Jersey:</b> Not applicable.	X	X				
KY	<b>New York:</b> Would consider other additional information.						
LA	<b>Oregon:</b> In recent years, Oregon Dept. of Revenue ratio study reviews have been limited. The trend is currently toward a low level of oversight of county A&T programs.	X					
ME		X					
MD		X					
MA	<b>Utah:</b> If there was a pattern of passing based on the confidence interval we would most likely issue an order of some type.	X	X				
MI		X	X				
MN	<b>Wyoming:</b> A work plan would be developed and state staff would be sent out to the local jurisdiction to assist in rectifying the problem.	X	X			X	X
MS		X					
MO		X					
MT		X					
NE		X	X				
NV		X					
NH		X	X				
NJ							
NM		X					
NY		X					
NC		X					
ND		X					
OH		X					
OK		X					
OR		X					
PA							
RI		X					
SC							
SD		X					
TN		X					
TX		X					
UT		X					
VT		X		X		X	
VA		X					
WA							
WV							
WI		X	X				
WY		X	X				

Question No. >	Q41 (continued)		Q42	Q42	Q43		
	Which measures or tests of price-related bias do you use?		Are actions taken to correct price-related noncompliance?	If yes, please describe:	Do you calculate confidence intervals or related tests of statistical significance around any of the following?		
State	T-test calculated	T-test used to test for compliance				Other, describe:	
AL		None		Yes	<b>Alabama:</b> Advise counties to consider adjustments in future reappraisals.	Neither	
AK					No	Neither	
AZ					No	<b>Colorado:</b> Consider modifications to coefficients.	Coefficient of Dispersion (COD)
AR	X				No		Coefficient of Dispersion (COD)
CA						<b>Florida:</b> Communicate with local jurisdictions to identify and address any issues.	
CO					Yes		Neither
CT					No		Neither
DE				Not applicable.	No	<b>Georgia:</b> Use aggregate instead of median.	Neither
DC					No		Neither
FL					Yes	<b>Indiana:</b> Local officials are advised to review sales.	Neither
GA				Chi-squared and Fisher Exact if necessary.	Yes		Neither
HN					No	<b>Iowa:</b> Order a reappraisal.	Coefficient of Dispersion (COD)
ID					No	<b>Michigan:</b> Investigation which can lead to assessor discipline.	Coefficient of Dispersion (COD)
IL					No		COD and PRD
IN					Yes	<b>Minnesota:</b> County assessor is advised to watch and improve uniformity.	Neither
IA				Between 90% and 110%	Yes	Corrective action may be ordered for following year if noncompliance continues.	Neither
KS					No		COD and PRD
KY					No		Coefficient of Dispersion (COD)
LA					No		Neither
ME					No	<b>Mississippi:</b> Should a jurisdiction fail the ratio study, that jurisdiction is considered to be noncompliant and given 2 years to correct the assessments.	Neither
MD					No		COD and PRD
MA				Not applicable.	No		Neither
MI					Yes	<b>Nebraska:</b> Further investigate local jurisdiction assessment practices.	COD and PRD
MN	X				Yes		COD and PRD
MS					Yes		
MO					No	<b>Wyoming:</b> The actions to correct this would be up to the State Board of Equalization.	Coefficient of Dispersion (COD)
MT					No		Neither
NE					Yes		Neither
NV					No		COD and PRD
NH					No		COD and PRD
NJ				Not applicable.	No		Coefficient of Dispersion (COD)
NM					No		Neither
NY				No		Neither	
NC				No		Neither	
ND				No		Neither	
OH				No		Coefficient of Dispersion (COD)	
OK				No		Neither	
OR				No		Coefficient of Dispersion (COD)	
PA						Neither	
RI				No		COD and PRD	
SC				No		Neither	
SD				No		Coefficient of Dispersion (COD)	
TN				No		Neither	
TX				No		Neither	
UT				No		Neither	
VT	X			No		Coefficient of Dispersion (COD)	
VA				No		Neither	
WA				No		Neither	
WV				Yes		Neither	
WI				No		COD and PRD	
WY				Yes		Neither	

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q44	Q45	Q46								
State	Do you compute statewide ratio study statistical results?	Do you trim outlier ratios?	If outliers are trimmed, what procedure do you use?								
			1.5 X interquartile range	3.0 X interquartile range	Beyond 2 standard deviations	Fixed symmetric points (e.g., remove ratios 1.50)	Fixed asymmetric points (e.g., remove ratios 2.00)	Good judgment	Look for logical break points	Other, describe:	
AL	Yes	Yes						X		<b>Arkansas:</b> In general, lowest 10% of assessed values and up to 5% of atypical ratios.	
AK	Yes	No									
AZ	No	Yes	X								
AR	Yes	Yes									
CA											<b>Illinois:</b> Based on 1st and 3rd quartile.
CO	No	Yes				X		X			
CT	No	No									<b>Indiana:</b> Local officials are advised to use the 2007 IAAO standard, Appendix B.
DE	No										
DC	No	Yes				X					
FL	Yes	Yes				X					
GA	No	Yes		X						<b>New York:</b> Subtract from 1st quartile; added to 3rd quartile.	
HN	No	No									
ID	Yes	Yes	X	X	X				X		
IL	Yes	Yes								<b>Oklahoma:</b> Only extreme ratios, indiv. case by case.	
IN	No	Yes	X	X							
IA	Yes	No								<b>Oregon:</b> Counties may use any of the above.	
KS	Yes	Yes	X								
KY	No	No								<b>South Carolina:</b> Bottom 25% and top 25%.	
LA	No	Yes		X							
ME	No	Yes								<b>Washington:</b> Trim ratios <25% or >175%.	
MD	Yes	Yes				X	X				
MA	No	No									
MI	Yes	Yes						X			
MN	Yes	Yes	X			X					
MS	No	Yes						X			
MO	No	Yes		X							
MT	Yes	Yes	X	X					X		
NE	Yes	No									
NV	Yes	No									
NH	Yes	Yes		X							
NJ	Yes	No									
NM	Yes	Yes						X	X		
NY	No	Yes	X								
NC	No	No									
ND	Yes	No									
OH	Yes	Yes				X					
OK	Yes	Yes									
OR	No	Yes									
PA		Yes									
RI	Yes	Yes						X			
SC	Yes	Yes									
SD	Yes	No									
TN	No	Yes				X					
TX	Yes	No									
UT	No	No									
VT	No	Yes		X							
VA	Yes	Yes						X	X		
WA	Yes	Yes									
WV	Yes	Yes			X						
WI	Yes	Yes			X			X			
WY	Yes	Yes				X					



Question No. >	Q47	Q48	Q49		
State	Is there a limit on the maximum percentage of sales that can be trimmed out of a sample? (e.g., 20%)	Do you or another oversight agency have authority to order adjustments to locally determined values?	If you order adjustments to locally determined assessed or appraised values, which of the following procedures are used?		
			Order local officials to apply trending factors to individual classes or categories	Trend all types of property equally, based on a jurisdiction-wide adjustment	Give local officials a compliance grace period to apply indicated factors
AL	No	Yes			X
AK	Yes-5%	No			X
AZ	No	Yes	X		X
AR	No	Yes			X
CA		No			
CO	Yes-5% according to auditor	Yes			X
CT		No			
DE		No			X
DC	No	No			
FL	No	Yes			X
GA	No	No			
HN	No	No			
ID	No	Yes	X		X
IL	No	Yes		X	X
IN	No	Yes			X
IA		Yes	X		
KS	Yes-max 20% on small samples	Yes	X		X
KY	No	Yes			X
LA	No	No			
ME	No-15 % high 15% low	No			
MD	No	No			
MA	No	Yes			X
MI	No	Yes			X
MN	Yes-	Yes	X		X
MS	No	Yes			X
MO	No	Yes	X		
MT	No	No			X
NE		Yes	X		
NV	No	No	X		
NH	No	Yes			X
NJ	Yes-Not applicable	Yes			X
NM	No	Yes	X		X
NY	No	No			
NC		No			
ND	No	Yes	X		
OH	No	Yes	X		X
OK	No	Yes	X		X
OR	No	No			
PA	No	No			
RI	No	No			
SC	No	No			
SD	No	Yes		X	
TN	No	Yes	X		
TX	No	No			
UT		Yes	X		
VT		No			
VA	No	Yes			X
WA	Yes-No greater than 5% of total valid sales.	No			
WV	No	No			
WI	No	Yes			X
WY	No	Yes	X	X	X

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q49 (continued)	Q50	Q51	Q52
State	If you order adjustments to locally determined assessed or appraised values, which of the following procedures are used? Other, describe:	How many local jurisdictions have been issued orders to ADJUST values in the past three (3) years?	Do you or another oversight agency have authority to order reappraisal of locally determined values?	How many local jurisdictions have been issued orders to REAPPRAISE values in the past three (3) years?
AL	<b>Alabama:</b> Analysis is done on each market area and property type.	<b>Alabama:</b> Each Alabama County is under an order to adjust all properties annually to market value	Yes	Counties required to reset "Base" (cost index & base land values) every 4 years.
AK			No	Not applicable
AZ			Yes	
AR	<b>Arkansas:</b> Corrective action is based on our findings.	<b>Alaska:</b> Not applicable.	Yes	0
CA			No	
CO	<b>Colorado:</b> State Board of Equalization may order reappraisal.	<b>Arkansas:</b> 6.	Yes	One
CT		<b>Colorado:</b> 0.	No	
DE		<b>Delaware-Kent County:</b> Not applicable.	No	Not applicable
DC	<b>Delaware-Kent County:</b> Not applicable.		No	
FL		<b>Florida:</b> None.	Yes	None
GA	<b>Florida:</b> Adjustment ordered as necessary to facilitate compliance.	<b>Georgia:</b> Not applicable.	No	Not applicable
HN			No	
ID		<b>Idaho:</b> 1.	Yes	None
IL	<b>Illinois:</b> Order reassessment of property.	<b>Illinois:</b> None.	No	
IN		<b>Indiana:</b> Numerous - varying levels of adjustment needed. 0.	Yes	Three (3) 0
IA	<b>Massachusetts:</b> Require support for values.		Yes	0
KS		<b>Iowa:</b> 48.	Yes	One (limited to one market area).
KY	<b>Michigan:</b> Equalization is a 3-part process at the local, county and state level.	<b>Kansas:</b> None.	Yes	Two
LA		<b>Kentucky:</b> 2.	Yes	Six
ME		<b>Massachusetts:</b> 0.	Yes	0
MD	<b>Missouri:</b> Analyze ratio study to target specific appraisal concerns.	<b>Michigan:</b> At county level, unknown. At state level - 0.	No	
MA			Yes	0
MI		<b>Minnesota:</b> 154.	Yes	Over 50
MN	<b>Montana:</b> The state is responsible for valuation. It is not clear what would happen if the assessment ratio showed we were out of compliance.	<b>Mississippi:</b> 4.	Yes	None
MS		<b>Missouri:</b> 4.	Yes	4
MO		<b>Montana:</b> 0.	Yes	28
MT	Probably require the legislature to order a new appraisal.	<b>Nebraska:</b> 18.	No	0
NE		<b>Nevada:</b> 0.	Yes	1
NV		<b>New Jersey:</b> 240.	Yes	0
NH		<b>New Mexico:</b> 10.		240
NJ	<b>Nebraska:</b> Orders from the Tax Equalization and Review Commission.	<b>North Dakota:</b> 25.	Yes	None
NM		<b>Ohio:</b> We usually obtain compliance short of an order.	No	0
NY		<b>Oklahoma:</b> 3.	Yes	1 (the answer to #51 is correct - no authority).
NC	<b>New Hampshire:</b> The New Hampshire Board of Tax and Land Appeals can order a municipality to be reappraised in whole or in part. They are not limited to any specific methodology for ordering compliance.	<b>Oregon:</b> None.	Yes	All (88) have been ordered to reappraise or update 0-zero.
ND		<b>Rhode Island:</b> Not applicable.	Yes	4
OH		<b>South Dakota:</b> 0.	No	Department policy does not order reappraisals.
OK		<b>Tennessee:</b> 7.	No	Not applicable
OR		<b>Utah:</b> 5.	No	
PA		<b>Virginia:</b> None per se. State disagreed with one locality. State determined which sales were to be used.	Yes	0
RI		<b>West Virginia:</b> 0.	Yes	0
SC	<b>New Jersey:</b> Revaluation/reassessment ordered by county.	<b>Wisconsin:</b> 0.	No	None. State makes the determination based on data provided by localities.
SD		<b>Wyoming:</b> 0.	No	
TN	<b>Oklahoma:</b> Order review, adj. of values for class of property.		No	0
TX			No	0
UT			Yes	0
VT	<b>Virginia:</b> We have authority to accept or reject any sales from the locality and to select sales as appropriate.		No	
VA			No	0
WA			No	0
WV	<b>Wisconsin:</b> Complete revaluation of the jurisdiction.		Yes	0
WI			Yes	0
WY			Yes	0

Question No. >	Q53	Q54	Q55
State	Do you have a statutorily defined level(s) of assessment? (for example, 100% for all property or percentages that vary by property type)	What are your ratio study standards for acceptable level of appraisal?	If you have appraisal level standards, how are they set?
AL	Yes	Median ratio; 0.98 -1.02	Administrative rule or regulation
AK	Yes	0.90-1.10	Statute
AZ	Yes	.74-.9 for residential and vacant, .73-.89 for commercial	Statute
AR	Yes	0.90-1.10	Statute
CA			
CO	Yes	0.95-1.05	Administrative rule or regulation
CT	Yes		
DE	No	Not applicable	
DC	Yes	0.90-1.10	Administrative rule or regulation
FL	No	A 90 percent minimum standard is used, with point estimate.	Administrative rule or regulation
GA	Yes	0.90-1.10	Statute
HN	Yes	0.90-1.10	Statute
ID	Yes	0.90-1.10	Administrative rule or regulation
IL	Yes		
IN	Yes	0.90-1.10	Administrative rule or regulation
IA	Yes	0.95-1.05	Statute
KS	Yes	0.90-1.10	Administrative rule or regulation
KY	Yes	0.90-1.10	Administrative rule or regulation
LA	Yes	0.90-1.10	Statute
ME	Yes	0.70 .10	Statute
MD	Yes	0.90-1.10	Administrative rule or regulation
MA	Yes	0.90-1.10	Administrative rule or regulation
MI	Yes	Ratio must be between 49.5 and 50.	Both statute and rule
MN	Yes	0.90-1.05	Statute
MS	Yes	.92-1.08 Class I and .75-1.25 for Class II	Admin. rule or regulation ,The Dept. of Revenue
MO	Yes	0.90-1.10	Admin. rule or reg. set by vote of State Tax Commission as policy
MT	Yes	0.90-1.10	Administrative rule or regulation
NE	Yes	Residential and Commercial - 0.92 - 1.00; Ag land - 0.69 - 0.75	Statute
NV	Yes	0.32 - 0.36	Statute
NH			
NJ	Yes	±15% of average ratio	Statute
NM	Yes	0.90-1.10	Statute
NY	No	Must assess at uniform level throughout jurisdiction.	
NC	No		
ND	Yes	.95-1.00	Max 1.00 statutory, min. .95 administrative
OH	Yes	0.90-1.10	Admin. rule or reg. at discretion of the agency
OK	Yes	AV/SP ratios between 11-13.5%, Dev. bet. classes < 1.5%	Admin. rule or reg. Const., State Board of Equal., legal precedent
OR	Yes	0.95-1.05	Statute
PA	No		
RI	Yes	Uniform % not exceeding 100 %	Statute
SC	Yes	.80 to 1.05	Administrative rule or regulation
SD	Yes	85-100	Statute
TN	Yes	Above .90 in the 3rd year of a jurisdiction on a 6-year cycle	Statute
TX	Yes	0.95-1.05	Statute
UT	Yes	0.90-1.10	Administrative rule or regulation
VT	Yes	> .80	Statute
VA	Yes	0.7	Statute
WA	Yes		Statute
WV	No	0.90-1.10	Administrative rule or regulation
WI	Yes	0.90-1.10	Statute
WY	Yes	0.95-1.05	Administrative rule or regulation

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q56				Q57	
State	Which of the following uniformity measures are calculated or used to make compliance determinations?				If you have specific standards or requirements based on the COD, what is the highest acceptable COD for each of the following categories.	
	Coefficient of dispersion (COD) calculated	COD used to test for compliance	Coefficient of variation (COV) calculated	COV used to test for compliance	Residential	Commercial/Industrial
AL	X	X				
AK	X				IAAO standards	IAAO standards
AZ	X	X			.15 or .20 depending on population of county	0.25
AR	X	X			≤15 in newer market areas; otherwise 20 or less	≤ 20 in larger counties; otherwise ≤ 25
CA						
CO	X	X			15.99%	20.99%
CT	X		X			
DE						
DC	X				Less than 15	less than 15
FL	X	X			0.15	0.2
GA	X	X			≤ .15	≤ .20
HN	X	X			15	20
ID	X	X	X		15	20
IL	X	X				
IN	X	X			Improved ≤15.0	≤ 20.0
IA	X				20	20
KS	X	X			20	20
KY	X				20	20
LA	X	X			<20	<20
ME						
MD	X					
MA	X	X	X		20	20
MI	X	X			Varies by region	Varies by region
MN	X	X	X		10 to 15 or less	15 to 20 or less
MS	X				<20%	
MO	X	X			20 for sales studies; 25 for appraisal studies	30
MT	X					
NE	X					
NV	X		X			
NH						
NJ	X	X			≤ 15% COD	> 15% COD
NM	X		X		15-20; Higher COD's allowable in rural jurisdictions	Not applicable
NY	X					
NC						
ND	X				Not applicable	Not applicable
OH	X				15	20
OK	X	X			20	20
OR	X	X			15	20
PA	X					
RI	X		X		Not applicable	Not applicable
SC						
SD					20	20
TN	X		X			
TX						
UT	X	X	X	X	20	25
VT	X					
VA	X					
WA						
WV	X	X			15	20
WI	X				Not applicable	Not applicable
WY	X	X	X		≤ 15	≤ 20

Question No. >	<b>Q57 (continued)</b>				<b>Q58</b>
	If you have specific standards or requirements based on the COD, what is the highest acceptable COD for each of the following categories.				If you have a standard for price-related bias (vertical inequity) based on the PRD, what is the standard?
State	Farmland	Timberland	Vacant Land	Other, specify	
AL				20 or Less County Wide	PRD 0.98 to 1.03
AK	IAAO standards	Not applicable	IAAO standards		PRD 0.98 to 1.03
AZ	Not applicable	Not applicable	0.25	Not applicable	
AR	Not applicable	Not applicable	≤ 25	Not applicable	PRD 0.98 to 1.03
CA					
CO	Not applicable	Not applicable	20.99%		PRD 0.98 to 1.03
CT					
DE				Not applicable	Other
DC	Not applicable	Not applicable	Not applicable		PRD 0.98 to 1.03
FL	0.25	0.25	0.2		PRD 0.98 to 1.03
GA	≤ .20	≤ .20	Res. ≤ .15; Non-res. ≤ .20		PRD 0.98 to 1.03
HN			20		PRD 0.98 to 1.03
ID	Not applicable	Not applicable	20	Manufactured housing 20	PRD 0.98 to 1.03
IL					PRD 0.98 to 1.03
IN	Not applicable	Not applicable	≤ 20.0	Not applicable	PRD 0.98 to 1.03
IA					Other
KS	Not applicable	Not applicable	20		PRD 0.98 to 1.03
KY	20	Not applicable	Not applicable		Other
LA			<20		
ME					
MD					
MA	20	20	20		Other
MI	Varies by region	Varies by region	Not applicable		Other
MN	≤ 20	≤ 20	≤ 20	20 or less	PRD 0.98 to 1.03
MS					
MO	30	30	30		PRD 0.98 to 1.03
MT					PRD 0.98 to 1.03
NE					PRD 0.98 to 1.03
NV					
NH					
NJ	Not applicable	Not applicable	≤ 15% COD	APTS ≤ 15% COD	
NM	Not applicable	Not applicable	Not applicable	Not applicable	PRD 0.98 to 1.03
NY				15 highpopdensity; 17 mediumdensity; 20 lowdensity	PRD 0.98 to 1.03
NC					
ND	Not applicable	Not applicable	Not applicable		Other
OH	Not applicable	Not applicable	Not applicable	Not applicable	PRD 0.98 to 1.03
OK	20	Not applicable	Not applicable		
OR	20	20	20	Manufactured Structures: 25	PRD 0.98 to 1.03
PA					
RI	Not applicable	Not applicable	Not applicable	Not applicable	PRD 0.98 to 1.03
SC					
SD	20	Not applicable	20		Other
TN					
TX					
UT	25	25	25		PRD 0.98 to 1.03
VT				< 20 for all combined	PRD 0.98 to 1.03
VA					
WA					
WV			20	20	
WI	Not applicable	Not applicable	Not applicable	Not applicable	PRD 0.98 to 1.03
WY	Not applicable	Not applicable	≤ 20		PRD 0.98 to 1.03

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q58 (continued)	Q59-Q60			
State	If you have a standard for price-related bias (vertical inequity) based on the PRD, what is the standard? Other, describe:	What actions can your agency initiate as a result of assessment uniformity conditions?			
		None	Order a reappraisal	Withhold funding (e.g., revenue sharing)	Other
AL			X		
AK		X			
AZ			X		
AR				X	X
CA					
CO			X		
CT		X			
DE	Not applicable	X			
DC		X			
FL			X		X
GA	outside .98 - 1.03 is tested with Mann-Whitney				X
HN		X			
ID		X			
IL			X		X
IN			X		
IA	between 90% and 110%		X		
KS			X	X	X
KY	NONE		X		
LA			X		
ME			X	X	
MD			X		
MA	Not applicable		X		
MI	Varies by region		X		X
MN			X		X
MS		X			
MO		X			
MT		X			
NE					X
NV			X		
NH		X			
NJ			X		
NM		X			
NY		X			
NC		X			
ND	Not applicable				X
OH					X
OK					X
OR				X	
PA		X			
RI		X			
SC				X	
SD			X		
TN		X			
TX					X
UT			X	X	
VT			X	X	
VA		X			
WA		X			
WV					X
WI		X			
WY			X		

**Arkansas:** Require corrective action.

**California:** If a county's overall assessment level is found to be outside of statutorily prescribed limits, the assessor's office is ineligible for county reimbursement for certain administrative costs.

**Colorado:** This agency may recommend a reappraisal order, but that function is more applicable to the auditor. The State Board of Equalization issues the reappraisal order.

**Delaware-Kent County:** Not applicable.

**Florida:** Provide aid and assistance to local jurisdictions.

**Georgia:** The Dept. of Revenue can levy penalties and/or refuse to authorize counties to send out tax bills. The Dept. of Audits and Accounts Sales Ratio Division conducts the study and provides it to other agencies, but does not have enforcement capabilities.

**Illinois:** Withhold multiplier (factor).

**Indiana:** Generally, local officials will be instructed to review and adjust assessments to achieve conformity; however, if needed, a reappraisal could be ordered.

**Kansas:** Remove appraiser from office.

**Michigan:** Assume jurisdiction of the roll, cause a reappraisal, discipline the assessor, charge the local unit, prefer criminal charges.

**Minnesota:** The department works with local assessors to identify the specific problem area and work to improve the assessments in the area.

**Montana:** Montana is a unique system where the state is responsible for valuing all property.

**Nebraska:** Investigate local jurisdiction assessment practices.

**North Dakota:** Raise or lower values of a class of property in a jurisdiction.

**Ohio:** Used to gauge overall quality of the appraisal and to make assessors aware of potential problems in the assessment.

**Oklahoma:** Order review and adjustments of values for a particular class of property.

**Oregon:** Little enforcement is undertaken. We have a grant fund that can be withheld but has not been in the history of the program. The threat does provide a lever.

**Texas:** Coefficients of dispersion outside statutory limits may trigger a performance audit of an appraisal district.

Question No. >	Q61	Q62	Q63	Q64	Q65
State	If you initiate action as a result of assessment uniformity conditions, is the action dependent upon confidence intervals or related tests of statistical significance?	If your agency can order a reappraisal or withhold funding as a result of assessment uniformity conditions, how many times has it been done in the past three years?	Have you taken fewer ratio study-related actions in the past three years?	Do you have statutory requirements to check for sales chasing?	Do you test for sales chasing?
AL	No	Not applicable	Yes	No	Yes
AK	Not applicable	Not applicable	Not applicable	No	Yes
AZ	Yes		No	No	Yes
AR	Yes	5	No	Nonstatutory requirement	Yes
CA	Not applicable		Not applicable		
CO	No	Not applicable to this agency	Not applicable	No	Yes
CT	Not applicable		Not applicable	No	No
DE	Not applicable	Not applicable	Not applicable	No	No
DC	Not applicable		Not applicable	No	No
FL	No	None	Not applicable	No	Yes
GA	Not applicable	Not applicable	Not applicable	No	Yes
HN	Not applicable		No	No	No
ID	Not applicable	Not applicable	No	Nonstatutory requirement	Yes
IL	No	None	Not applicable	No	No
IN	No	None	Yes	Nonstatutory requirement	Yes
IA	No	0	Yes	No	No
KS	Yes	None	Yes	No	Yes
KY	No	Two	Yes	No	No
LA	No	Three	No	No	No
ME		Funding 30+	Not applicable	No	Yes
MD	Not applicable	None	Not applicable	No	Yes
MA	No	Unavailable	Yes	No	No
MI	No	More than 30	No	Yes	Yes
MN	Yes	None	Yes	Yes	Yes
MS				No	Yes
MO	Not applicable	Not applicable	No	No	Yes
MT	Not applicable	0	Not applicable	No	Yes
NE	Not applicable	1	No	No	Yes
NV	No	0	No	No	Yes
NH				No	No
NJ	Yes		No	Nonstatutory requirement	No
NM	Not applicable		Not applicable	No	No
NY	Not applicable		Not applicable	No	Yes
NC	Not applicable		Not applicable	No	Yes
ND	No	NA (ordered once without authority)	No	No	No
OH	Not applicable		No	No	Yes
OK	No	0	No	Nonstatutory requirement	Yes
OR	Yes	None	No	Nonstatutory requirement	No
PA	No			No	No
RI	Not applicable		Not applicable	No	No
SC	No	0	Not applicable	No	No
SD	Not applicable	0	Yes	No	Yes
TN	Not applicable		Not applicable	Nonstatutory requirement	Yes
TX	No		Yes	Yes	Yes
UT	No	Never done - came close once	Yes	Yes	Yes
VT	No	71	Yes	Nonstatutory requirement	Yes
VA			Not applicable	No	No
WA				No	
WV	No		Not applicable	Nonstatutory requirement	Yes
WI	No	Not applicable	Not applicable	No	Yes
WY	No	0	Yes	Yes	Yes

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q66					Q67
	If you test for sales chasing, what techniques do you use?					
State	Comparison of average percentage changes in appraised values of sold and unsold	Comparison of average unit values of sold and unsold properties	Split sample technique (using sales before and after the appraisal date)	Comparison of observed vs. expected distribution of ratios	Mass appraisal techniques	If you test for sales chasing, what techniques do you use?
AL	X					<b>Alaska:</b> As stated in 66.
AK	X					<b>Colorado:</b> The auditor, not this agency, tests for sales chasing according to standards established by the State Board.
AZ				X		<b>Delaware-Kent County:</b> Not applicable.
AR	X				X	<b>Florida:</b> Calculate alternate ratio.
CA						<b>Georgia:</b> Distribution comparison, then Chi-squared test, then Mann-Whitney Test.
CO	X	X	X		X	<b>Indiana:</b> Methods listed in Appendix D of the 2007 IAAO <i>Standard on Ratio Studies</i> . The Mann-Whitney test is the most commonly employed method.
CT						<b>Kansas:</b> Additional tests are performed if the sample is suspect.
DE						<b>Massachusetts:</b> Not applicable.
DC						<b>Mississippi:</b> By observation of the sales questionnaires, and why or why not a particular sale was culled.
FL	X					<b>Missouri:</b> Also look at COD when testing for sales chasing .
GA				X		<b>Montana:</b> The department values the property and we review the process within the department. The values are used to model, and then the model is applied.
HN						<b>Nebraska:</b> Review of sold and unsold properties
ID	X					<b>New York:</b> Evaluate coefficient of a binary variable for sold properties used to regress on natural log of sale prices. Then compare weighted mean estimate produced by study using current assessments with weighted mean estimate produced by study using assessments established prior to the earliest sale, and adjusted for change in level of assessment to the current year.
IL						<b>North Carolina:</b> We sometimes ask for the prior year values to see if the value has been changed due to the sale.
IN	X					<b>Oregon:</b> We have made plans to do audits but the plans remain on hold at this time.
IA			X	X		<b>Washington:</b> Randomly select sales from previous year's ratio study and compare percentage changes of sold and unsold properties.
KS	X		X	X		
KY						
LA						
ME	X		X			
MD					X	
MA						
MI	X					
MN	X		X	X		
MS					X	
MO	X		X			
MT					X	
NE	X				X	
NV	X	X				
NH						
NJ						
NM						
NY	X					
NC						
ND						
OH	X					
OK	X					
OR						
PA						
RI						
SC						
SD			X			
TN			X			
TX	X			X		
UT	X					
VT	X	X				
VA						
WA	X					
WV	X					
WI	X			X	X	
WY	X					



Question No. >	Q68		Q69	Q70			
State	Has a lower limit on the COD been established as an indicator of possible sales chasing?	Additional Comment:	Is a ratio study conducted for personal property?	How are the results of your personal property ratio study used?			
				To order adjustments to locally determined assessed values	To equalize state or provincial funding of local jurisdictions	To order local jurisdictions to reappraise	To advise provincial, state, or local jurisdictions of assessment conditions
AL	Yes	<b>Alabama:</b> A comparison of multi-year value percentage change is conducted if sales ratio results indicate a COD less than 5. <b>Arkansas:</b> No exact limit is established. <b>Colorado:</b> An overly low COD may be a red flag that would result in closer scrutiny. <b>Florida:</b> 0.05. <b>Idaho:</b> If the COD is <5% we review the sample and population more thoroughly for possible sales chasing. <b>Minnesota:</b> We are studying the IAAO recommendations and will be implementing them. <b>Missouri:</b> 5% in large jurisdictions; 10% in small jurisdictions without disclosure. <b>Nebraska:</b> 0.05. <b>Ohio:</b> No, but it helps confirm the practice. <b>Oklahoma:</b> No specified lower limit. <b>Oregon:</b> We recognize the symptoms but no action has been taken. <b>Utah:</b> It is not a part of our documented process, but if it gets too low I have requested additional review.	No				
AK	No		No				
AZ	No		No				
AR	Yes		Yes				X
CA			Yes				
CO			Yes	X	X	X	
CT	No		No				
DE	No		No				
DC	No		No				
FL	Yes		No				
GA	No		No				
HN	No		No				
ID	Yes		No				
IL	No		No				
IN	No		No				
IA	No		No				
KS	No		No				
KY	No		No				
LA	No		No				
ME	No		No				
MD	No		No				
MA	No		No				
MI	No		No				
MN			No				
MS	No		No				
MO	Yes		No				
MT	No		No				
NE	Yes		No				
NV	No		Yes	X		X	X
NH	No		No				
NJ	No	No					
NM	No	No					
NY	No	No					
NC	No	No					
ND	No	No					
OH	No	No					
OK	No	No					
OR	No	No					
PA		No					
RI		No					
SC	No	No					
SD	No	No					
TN	No	No					
TX	No	Yes			X		
UT	No	No					
VT	No	No					
VA	No	No					
WA	No	Yes			X	X	
WV	No	No					
WI	No	No					
WY	No	No					

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q70-71 (continued)				Q72
State	How are the results of your personal property ratio study used?				Does your agency perform procedural audits of local assessment procedures/practices?
	To assist mass appraisal programs	To approve tax assessment roll	To adjust or equalize centrally determined assessed values (such as utilities)	How are the results of your personal property ratio study used? Other, please describe:	
AL		None		<b>Alaska:</b> Not applicable.	No
AK				<b>Arkansas:</b> To require corrective action if necessary.	Yes
AZ				<b>Colorado:</b> See previous.	No
AR				<b>Delaware-Kent County:</b> Not applicable.	Yes
CA				<b>Georgia:</b> We have the authority to either conduct personal property ratio studies or incorporate the personal property in our equalized digests at the same level as other calculated real property ratios.	Yes
CO	X				No
CT					No
DE					No
DC					Yes
FL					Yes
GA					Yes
HN					No
ID					Yes
IL					No
IN					Yes
IA					No
KS					Yes
KY					Yes
LA					No
ME					No
MD					No
MA					Yes
MI					Yes
MN					Yes
MS					No
MO					Yes
MT					No
NE					Yes
NV					Yes
NH					Yes
NJ					No
NM					Yes
NY					Yes
NC					No
ND				No	
OH				No	
OK				Yes	
OR				No	
PA				No	
RI				No	
SC				Yes	
SD				Yes	
TN				Yes	
TX				Yes	
UT				No	
VT				No	
VA				No	
WA			X	No	
WV				Yes	
WI				No	
WY				Yes	

Question No. >	Q73					Q74
	If your agency performs a procedural audit of local assessment procedures/practices--which categories of real property are audited?					If your agency performs a procedural audit of local assessment procedures/practices--Is the audit used INSTEAD OF a ratio study?
State	Residential	Commercial/ industrial	Agricultural	Timberland	Not applicable	
AL	X	X	X	X		No
AK	X	X	X			Additional comment:
AZ						
AR	X	X	X	X		No
CA	X	X	X	X		Yes
CO	X	X	X			No
CT					X	Not applicable
DE						Not applicable
DC	X	X				No
FL	X	X				No
GA						No
HN	X	X	X			No
ID					X	Not applicable
IL					X	No
IN						Not applicable
IA	X	X	X			No
KS	X	X	X			
KY	X	X	X			
LA						No
ME						
MD					X	Not applicable
MA	X	X	X	X		No
MI	X	X	X	X		No
MN	X	X	X	X		No
MS					X	Not applicable
MO	X	X				No
MT						No
NE	X	X	X			
NV	X	X	X			No
NH	X	X	X	X		No
NJ					X	Not applicable
NM	X	X	X			No
NY						Yes
NC						Not applicable
ND					X	Not applicable
OH						
OK	X	X	X			No
OR					X	Not applicable
PA						Not applicable
RI						Not applicable
SC	X					No
SD	X	X	X			No
TN	X	X	X	X		No
TX	X	X	X	X		No
UT						
VT						
VA						Not applicable
WA						
WV	X	X				No
WI					X	Not applicable
WY	X	X	X			No

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q74 (continued)	Q75				
State	If your agency performs a procedural audit of local assessment procedures/practices--Is the audit used INSTEAD OF a ratio study? Additional comment:	If your agency performs a procedural audit how is it used?				
		To order adjustments to locally determined assessed values	To order local jurisdictions to reappraise	To advise provincial, state, or local jurisdictions of deficiencies or to recommend	To approve tax assessment roll	Not applicable
AL	<b>Alaska:</b> Audit is used in conjunction with ratio study.			X		
AK	<b>Nebraska:</b> Generally the ratio study is relied upon but			X		
AZ	if the audit of the local assessment indicates the ratio					
AR	study is unreliable, the results of the local assessment					
CA	audit will be relied upon.			X		
CO						X
CT						X
DE						X
DC				X		
FL				X		
GA				X		
HN				X		
ID						X
IL						X
IN						X
IA			X	X	X	
KS			X	X		
KY				X		
LA						
ME						
MD						X
MA		X	X	X		
MI			X	X		
MN				X		
MS						X
MO				X		
MT				X		
NE			X	X		
NV		X	X	X		
NH				X		
NJ						X
NM		X		X	X	
NY						
NC						X
ND						X
OH						
OK		X	X	X		
OR						X
PA						
RI						X
SC				X		
SD				X		
TN				X		
TX				X		
UT						
VT						
VA						
WA						
WV				X		
WI						
WY				X		

Question No. >	Q75 (continued)	Q76			Q77-78			
State	If your agency performs a procedural audit how is it used? Other, describe:	Can any of the following initiate legal action as a result of your ratio study?			What software does your agency use for ratio studies?			
		Taxing jurisdiction (e.g., school district)	Taxpayers	Not Applicable	Custom software written in house	CAMA vendor application	Spreadsheet software (e.g., Excel)	
AL	<b>Arkansas:</b> To require corrective action if necessary. <b>New York:</b> To examine local reassessment projects. <b>Wisconsin:</b> Petitions for reassessment and assessor compliants.			X		X	X	
AK				X			X	
AZ					X	X		
AR			X	X				
CA								
CO					X	X	X	X
CT					X	X		
DE					X			
DC					X			
FL			X			X		X
GA					X			
HN					X		X	X
ID					X	X		X
IL					X	X		
IN					X			X
IA			X					X
KS			X	X		X		X
KY					X			X
LA			X	X				X
ME					X	X		X
MD					X	X		
MA					X	X		X
MI			X				X	X
MN			X			X		X
MS					X			X
MO				X		X		X
MT				X				
NE			X	X		X		X
NV					X	X		X
NH			X			X		
NJ		X	X					
NM				X			X	
NY		X						
NC		X	X					
ND				X			X	
OH					X			
OK				X			X	
OR				X				
PA		X						
RI				X	X			
SC				X	X			
SD		X	X		X			
TN		X	X		X			
TX		X	X		X		X	
UT				X				
VT				X				
VA				X			X	
WA		X	X		X			
WV				X		X		
WI		X			X			
WY						X	X	

Appendix C. United States 2011 Survey Results (continued)

Question No. >	Q77-78 (continued)			Q79
State	What software does your agency use for ratio studies?			Do you currently use any foreclosure-related sales in your ratio studies?
	Statistical software (e.g. SPSS, NCSS, SAS)	Database software (e.g., Access)	Not applicable	
AL	X	X		No
AK				No
AZ	X			Yes
AR	X			No
CA				
CO	X	X		Yes
CT		X		No
DE			X	Not applicable
DC	X			No
FL	X			No
GA				Yes
HN				No
ID				Yes
IL			X	Yes
IN	X			Yes
IA	X			No
KS				No
KY	X			No
LA				No
ME				No
MD				No
MA				Yes
MI		X		Yes
MN	X	X		Yes
MS				No
MO	X	X		Yes
MT	X			No
NE				Yes
NV		X		Yes
NH				No
NJ		X		No
NM				Not applicable
NY	X			No
NC		X		No
ND		X		Not applicable
OH				No
OK	X	X		No
OR			X	Yes
PA				
RI		X		No
SC				No
SD				Yes
TN				No
TX	X	X		No
UT	X	X		Yes
VT	X			No
VA				No
WA	X			Yes
WV				No
WI				Yes
WY	X			No

Question No. >	Q80	Q81
State	Please provide comments about new issues or recent changes related to your ratio study practices:	Please share any comments you may have about this survey:
AL	<b>Alaska:</b> None.	<b>Alaska:</b> Question 76 should have a “No” answer.
AK	<b>Delaware-Kent County:</b> Not applicable.	<b>Colorado:</b> Our responses are primarily intended to explain what happens in Colorado, but the answers to many of your questions apply primarily to local assessors and the auditor, not this office.
AZ	<b>Georgia:</b> We will use bank REO sales and other distressed or short sales if they meet our statutory arm’s-length and FMV criteria, but not the foreclosure sale	<b>Delaware-Kent County:</b> None.
AR	where the bank takes the property back at the loan amount.	<b>Florida:</b> The substantial change in wording of some questions make comparison to past answers quite challenging.
CA	<b>Indiana:</b> When foreclosure-related sales constitute the preponderance of sales in an area, or research shows little difference between them and conventional sales, then validated foreclosure-related sales can be used without adjustment. Reference is given to the 2009 “IAAO Guide to Foreclosure-Related Sales and Verification Procedures.”	<b>Georgia:</b> There are apparently a wide range of uses and designs for ratio studies. In Georgia where we conduct the study, but others have the enforcement responsibilities it is clumsy to answer a few of these survey questions. Having said that, this is a great thing. If you happen to have any data about the number of U.S. States that use property taxes as a component of the QBE formula, I would appreciate that number.
CO	<b>Kansas:</b> Guidelines on foreclosure sales developed	<b>Hawaii-Honolulu:</b> Thank you for making it simple to complete your survey.
CT	<b>Michigan:</b> The STC has over the past 3 years ordered single year studies in the residential class to reflect the declining market. They also change the dates of the study period to get closer to tax day.	<b>Indiana:</b> None. Thank you for your time and efforts.
DE	<b>Minnesota:</b> If they have been verified. We are implementing the procedures described in the IAAO <i>Standard on Verification and Adjustment of Sales</i> .	<b>Michigan:</b> Because of differences in terms, even simple ones like local unit, it makes it difficult to answer with a check or yes/no for some questions.
DC	<b>Mississippi:</b> In 2006 new rules were adopted. The standard for passing the assessment level test was tightened to 85%-115%, COD was changed to 20% and the regressivity was changed to .92 to 1.08.	<b>Minnesota:</b> This is a good survey. I appreciate the efforts that have gone into the standards.
FL	<b>Missouri:</b> We slightly reduced sample size requirements for appraisal studies; from 35 to 25 on residential and from 35 to 30 on commercial.	<b>North Carolina:</b> I thought the survey was well prepared and should provide excellent results. I would like to see more boxes to add additional information.
GA	<b>Montana:</b> In the past we have only done ratio studies at the end of each reappraisal cycle (once every 6 years). We concluded a reappraisal in 2008 and since then have used them extensively to quantify our results.	<b>Oklahoma:</b> Useful comparative tool- Thanks to the committee for your efforts in producing and updating the survey!
HN	<b>Nebraska:</b> Correlation of expanded samples	
ID	<b>Oregon:</b> Responsibility for sale verification and analysis of useable sales is left to the discretion of the counties.	
IL	<b>South Carolina:</b> We now have capped values during reassessment and reappraisals after a property sells so classes of property are no longer factored with ratio results for distribution of school money.	
IN	<b>South Dakota:</b> Previously prevented by statute from using sales that were	
IA	1) Any property that sold for more than 150% of assessed value	
KS	2) Any ag property that sold for more than 150% of ag income value	
KY	3) Any ag property that sold in increments of 70 acres or less.	
LA	We have now gone to a productivity valuation on agricultural land. The 150% of ag income and 70 acre statutes have been repealed. The 150% of assessed value sales are being phased in over the next 4 years.	
ME	<b>Texas:</b> Texas has changed its annual school district ratio studies to every other year.	
MD	<b>Washington:</b> Began allowing bank-owned resales to be considered valid in 2009. Currently 26 out of 39 counties are on an annual revaluation cycle. Legislation passed in 2009 requiring all counties to revalue property on an annual basis by 2014.	
MA	<b>West Virginia:</b> Trim outliers using $\pm 2SD$ .	
MI		
MN		
MS		
MO		
MT		
NE		
NV		
NH		
NJ		
NM		
NY		
NC		
ND		
OH		
OK		
OR		
PA		
RI		
SC		
SD		
TN		
TX		
UT		
VT		
VA		
WA		
WV		
WI		
WY		





## Appendix D. Results of 2011 Survey of Ratio Study Practices in Canada

Question No. >		Q3	Q4	Q5-6	
Province/Territory*	Abbreviation	How often is your jurisdiction REQUIRED to conduct ratio studies?	Who conducts your ratio study?	How is your ratio study used?	
				To order adjustments to locally determined assessed values if necessary	To equalize state or provincial funding of local jurisdictions
Alberta	AB	Annually	State/province		X
British Columbia	BC	Annually	State/province		
New Brunswick	NB	Annually	State/province		
Newfoundland	NL	Every three (3) years	State/province		
Nova Scotia	NS	Annually	Internal		
Ontario	ON	Ratio studies every 4 years as part of reassessment	Self MPAC conducts own studies		
Prince Edward Island	PEI	Annually	State/province		
Quebec	QC	Annually	State/province		X
Saskatchewan	SK	Annually	State/province	X	

\* Manitoba and Northwest Territories did not participate in the 2011 survey

Question No. >	Q5-6 (continued)						Q7
Province/ Territory	How is your ratio study used?						Have you incorporated portions of the IAAO <i>Standard on Ratio Studies</i> in your statutes or rules and regulations?
	To order local jurisdictions to reappraise	To advise assessment officials of assessment conditions	To assist mass appraisal programs	To approve tax assessment roll	To adjust or equalize centrally determined assessed values (such as utilities)	Other, please explain:	
AB	X	X	X	X	None	<b>Nova Scotia:</b> To complete annual reassessment activities and filed roll statistics. <b>Quebec:</b> To trace a picture of whole rolls of all local jurisdictions	Yes
BC		X	X				Yes
NB		X	X				Yes
NL		X	X				Yes
NS							No
ON			X				Yes
PEI		X	X				No
QC		X					No
SK	X			X			No

Question No. >	Q8	Q9	Q10
Province/ Territory	Which of the following does your real property ratio study include?	If you use both sales and appraisals, can they be combined in order to study one type or category of property?	What was the assessment date tested with your most recent ratio study?
AB	Both sales and appraisals conducted or contracted by agency	Yes, To increase sample size	1-Jul-10
BC	Sales only	Not applicable	
NB	Sales only	Not applicable	2009, currently working on 2010
NL	Sales only	Not applicable	1-Jan-08
NS	Sales only	Not applicable	2011 reassess - estimate market value at Jan. 1, 2009
ON	Sales only	Not applicable	1-Jan-08
PEI	Sales only		Jan. 2009 - September 2010
QC	Sales only	Not applicable	01-07-2009 for the applicable roll in 01-2011-2013
SK	Sales only	Not applicable	June 30, 2006. SK has a 4 year reval. cycle.

Appendix D. Canadian 2011 Survey Results (continued)

Question No. >	Q11-12						
Province/ Territory	Which of the following describes the time period from which sales are used in your ratio study?						
	One year	Multiple Years	Flexible time period (varies by jurisdiction or category)	Sale period mostly before assessment date	Sale period mostly after assessment date	Sales period equally before and after the assessment date	
AB		X	None	X	None		
BC	X						X
NB	X					X	
NL		X				X	
NS	X						X
ON		X				X	X
PEI		X				X	
QC						X	X
SK		X				X	

Question No. >	Q11-12 (continued)	
Province/ Territory	Which of the following describes the time period from which sales are used in your ratio study?	
	Additional comments:	
AB	3 years of sales up to July 1 of assessment year.	
BC	3 months either side of July 1st for residential (Apr - Sep); 6 months either side of July 1st for nonresidential (Jan - Dec).	
NB		
NL	3 years Jan 1, 2005 to Dec 31, 2007.	
NS	Sale dates for 2011 reassessment: July 1, 2008 - June 30, 2009.	
ON	Mass appraisal ratio studies include sales 3-5 years before valuation date. Roll quality studies & appeals consider sales from Jan. 2007 to Dec. 2008 typically.	
PEI	Use 2 to 3 year time period.	
QC		
SK	Base date June 30, 2006. Sales are allowed up to Dec. 31, 2006.	

Question No. >	Q13	Q14	Q15	Q16-17		
Province/ Territory	Do you attempt to determine the representativeness of sales used in the ratio study?	If you attempt to determine sample representativeness, what is your procedure? Describe:	If sales are used in the ratio study, which jurisdiction performs the sample selection?	Which jurisdiction conducts the sales validation (screening)?	Other, please describe	
AB	Yes	<b>Alberta:</b> Minimum of 15 indicators of value. <b>Prince Edward Island:</b> Use all VALID sales due to small sample size. <b>Quebec:</b> We determine the maximum of vacant lots, according the number of vacant lots there is in the roll (we keep the same proportion of vacant lots there is in the roll). <b>Saskatchewan:</b> Not applicable.	Local	State/provincial agency	<b>Nova Scotia:</b> Internally. <b>Ontario:</b> Local field offices validate sales. Ratio studies completed by mass appraisal staff and quality services staff. <b>Saskatchewan:</b> Not applicable.	
BC	Yes		State/province	State/provincial agency		
NB	Yes		State/province	State/provincial agency		
NL	No		State/province	State/provincial agency		
NS	No		Local, internally	Local		
ON	No		State/province, self	State/provincial agency		
PEI	No		State/province	State/provincial agency		
QC	Yes		State/province	Local		
SK	No		Local	Local		

Question No. >	Q18	Q19	Q20
Province/ Territory	If the state/provincial agency does NOT conduct the sales validation, does the agency perform an audit of the sales validation process?	If an audit of sales is performed by the oversight agency, briefly summarize your audit policy.	Regarding sales price disclosure: Does your jurisdiction have a law requiring disclosure of real estate sales prices to assessment officials?
AB	Not applicable	<b>Nova Scotia:</b> Annual external compliance audit measures level of compliance with IAAO sales validation procedures. <b>Prince Edward Island:</b> Province is responsible for all real property transfers. <b>Saskatchewan:</b> Not applicable.	Yes, disclosure made to state/province/territory officials.
BC	Not applicable		Yes, disclosure made to state/province/territory officials.
NB	Yes		Yes, disclosure made to state/province/territory officials.
NL	Not applicable		Yes, disclosure made to state/province/territory officials.
NS	Yes		Yes, disclosure made to both.
ON	Not applicable		Yes, disclosure made to state/province/territory officials.
PEI	Not applicable		Yes, disclosure made to state/province/territory officials.
QC	No		Yes, disclosure made to state/province/territory officials.
SK	No		Yes, disclosure made to state/province/territory officials.

Question No. >	Q21	Q22	Q23	Q24	Q25
Province/ Territory	What type of disclosure document is used?	What office is responsible for initially accepting the disclosure document?	Does your jurisdiction employ a unique identification system to track sale disclosure documents?	Are disclosed sale prices public records?	If you answered No to the previous question, please explain:
AB	Sale price statement	Recorder/registrar	Yes	Yes	<b>Nova Scotia:</b> Legislation does not exist to allow the release of sales prices for purposes other than the purpose for which it is collected.
BC	Both	Recorder/registrar	Yes	Yes	
NB	Sale price statement	Recorder/registrar	Yes	Yes	
NL	Registry of Deeds legal document, (transfer)	Recorder/registrar	Yes	Yes	
NS	Deed Transfer Tax Affidavit	Recorder/registrar	Yes	No	
ON	Sale price statement	Recorder/registrar	Yes	Yes	
PEI	Affidavit of Sale is Registered	Recorder/registrar	Yes	Yes	
QC	The contract	Recorder/registrar	Yes	Yes	
SK	Transfer documents & statutory provisions for disclosure	Local assessor	Yes	Yes	

Question No. >	Q26	Q27	Q28					
Province/ Territory	Is a value-related fee charged (e.g., transfer tax, deed stamp) for real property transfers?	Does your jurisdiction have a law making recordation/ registration mandatory for real property transfers?	Regarding sales price adjustments--Which of the following adjustments to sale price do you have authority to implement in your ratio studies? (check all that apply)					
			No authority to implement adjustments	Time	Financing	Personal property	Closing costs	Brokerage fees
AB	Yes	Yes		X	X	X		
BC	Yes	Yes		X	X	X	X	
NB	Yes	Yes	X					
NL	Yes	Yes		X	X	X		
NS	Yes	Yes		X	X	X	X	X
ON	Yes	Yes		X				
PEI	Yes	Yes		X				
QC	Yes	Yes		X		X		
SK	Yes	Yes	X					

Appendix D. Canadian 2011 Survey Results (continued)

Question No. >	Q28			Q29			
	Regarding sales price adjustments--Which of the following adjustments to sale price do you have authority to implement in your ratio studies? (check all that apply)			Which of the following adjustments to sale price do you actually use in your ratio studies?			
Province/ Territory	Intangible personal property	Delinquent taxes	Other, describe:	Time	Financing	Personal Property	Closing Costs
AB	X			X		X	
BC	X	X		X	X	X	X
NB							
NL			HST harmonized sales tax.	X		X	
NS	X	X	Sales tax on new construction (if not incl. in recorded price).		X	X	
ON				X			
PEI							
QC	X			X		X	
SK							

Question No. >	Q29 (continued)			
	Which of the following adjustments to sale price do you actually use in your ratio studies?			
Province/ Territory	Brokerage fees	Intangible personal property	Delinquent taxes	Other, describe:
AB	None	X		
BC		X	X	
NB				
NL				HST harmonized sales tax.
NS				Sales tax on new construction (if not incl. in recorded price).
ON				
PEI				Not applicable.
QC		X		
SK				Adjustments are applied by the local assessor prior to ASR study .

Question No. >	Q30					Q31
	If you make time adjustments for sales used in ratio studies, which methods are used?					Are blanket or global adjustments made to sales prices prior to computing ratios? (For example, some jurisdictions adjust all prices down by one percent in an attempt to adjust for personal property that is difficult to isolate sale by sale; others might adjust all sales by ten percent for financing considerations.)
Province/ Territory	Tracking trends in sales ratios over time	Tracking changes in value per unit over time	Analysis of repeat sales	Not applicable	Other, describe:	
AB	X	X	X		<b>Ontario:</b> Include as a variable in the mass appraisal process. <b>Prince Edward Island:</b> Not applicable. <b>Saskatchewan:</b> Any adjustment is made by local assessor prior to ASR study.	
BC	X					
NB				X		
NL	X		X			
NS				X		
ON	X					
PEI						
QC	X					
SK						

Question No. >	Q32			Q33	
Province/ Territory	Regarding sample size, what is the smallest sample you will use to evaluate any category of property?	Other, describe:		Do you establish sample size quotas or goals (e.g., 3 percent of parcels in category or a number based on a statistical sample size formula)?	If yes, please explain
AB	10 to 19 observations	<b>Prince Edward Island:</b> If sample size is small increase sample area. <b>Saskatchewan:</b> All sales used submitted by local appraisers used for primary audit only.		No	<b>British Columbia:</b> Minimum 25 sales per sample size. <b>Ontario:</b> For equity studies for appeals we have established a goal of at least 30 sales.
BC	20 to 30 observations			Yes	
NB	Less than 5 observations			No	
NL	10 to 19 observations			No	
NS	5 to 9 observations			No	
ON	5 to 9 observations			Yes	
PEI	Other			No	
QC	20 to 30 observations			No	
SK	Other			No	

Question No. >	Q34									
Province/ Territory	Check each measure of level that you calculate and indicate if it is used for direct and/or indirect (funding) equalization.									
	ARITHMETIC MEAN - calculate	ARITHMETIC MEAN - use for direct equalization	ARITHMETIC MEAN - use for indirect equalization	MEDIAN - calculate	MEDIAN - use for direct equalization	MEDIAN - use for indirect equalization	WEIGHTED MEAN - calculate	WEIGHTED MEAN - use for direct equalization		
AB		None	None	X		None		None		
BC				X						
NB										
NL	X				X				X	
NS	X				X				X	
ON	X				X				X	
PEI	X				X				X	
QC									X	
SK							X			

Question No. >	Q34 (continued)							Q35
Province/ Territory	Check each measure of level that you calculate and indicate if it is used for direct and/or indirect (funding) equalization.							Do you test the distribution of ratios to see if it is statistically normal?
	WEIGHTED MEAN - use for indirect equalization	GEOMETRIC MEAN - calculate	GEOMETRIC MEAN - use for direct equalization	Use GEOMETRIC MEAN - use for indirect equalization	OTHER - calculate	OTHER - use for direct equalization	OTHER - use for indirect equalization	
AB	None		None	None	None	None	None	No
BC								Yes
NB								Yes
NL		X						No
NS								No
ON								Yes
PEI								Yes
QC								Yes
SK								No

Appendix D. Canadian 2011 Survey Results (continued)

Question No. >	Q36	Q37	Q38
Province/ Territory	Do you use confidence intervals to determine statistical compliance with standards for appraisal level?	If you use confidence intervals (CIs) to test compliance with appraisal level standards, and the calculated level of assessment is 86% with a confidence interval ranging from 76% to 95% for a particular group of properties, would you consider the level to be in compliance?	Additional comments:
AB	No	Not applicable (CI not used to determine compliance).	<b>Ontario:</b> Yes. The example noted complies with IAAO <i>Standard on Ratio Studies</i> examples on the use of confidence intervals.
BC	Yes	Yes (the CI overlaps the required minimum level).	
NB	No	Not applicable (CI not used to determine compliance).	
NL	No	Not applicable (CI not used to determine compliance).	
NS	No	Not applicable (CI not used to determine compliance).	
ON	Yes	Yes (the CI overlaps the required minimum level).	
PEI	No		
QC	Yes	Yes (the CI overlaps the required minimum level).	
SK	No	Not applicable (CI not used to determine compliance).	

Question No. >	Q39-40			
Province/ Territory	If you use CIs to test compliance with appraisal level standards, and the calculated level of assessment is out of compliance except for the confidence interval for a particular group of properties, and the calculated level of assessment remains below the required minimum level for several years, which action would your agency take?			
	Lower the level of confidence and reevaluate	Base the compliance decision on point estimates	Continue to find the jurisdiction in compliance	Not applicable (CI not used to determine compliance)
AB		None		X
BC	X			
NB				X
NL				
NS				X
ON				X
PEI				X
QC				
SK				

Question No. >	Q40 (continued)	Q41					
Province/ Territory	Additional comments:	Which measures or tests of price-related bias do you use?					
		Price related differential (PRD) calculated	PRD used to test for compliance	Spearman-Rank calculated	Spearman-Rank used to test for compliance	Mann-Whitney Test calculated	Mann-Whitney Test used to test for compliance
AB		X		None	None	None	None
BC		X					
NB		X	X				
NL			X				
NS		X	X				
ON		X					
PEI		X					
QC	We advise the local jurisdiction.		X				
SK							

Question No. >	Q41 (continued)			Q42	
Province/ Territory	Which measures or tests of price-related bias do you use?			Are actions taken to correct price-related noncompliance?	If yes, please describe:
	T-test calculated	T-test used to test for compliance	Other, describe		
AB	None	None	<b>Ontario:</b> Ratio studies across cross sections of property data. <b>Prince Edward Island:</b> PDRs used as quality control measure. <b>Saskatchewan:</b> None.	Yes	<b>Newfoundland:</b> Sale info review and data review and reinspection where required. <b>Nova Scotia:</b> In context of noncompliance - if during the reassessment process, ratio analysis indicated preliminary assessments outside acceptable PRD criteria, analysis would be revisited and revisions required. Additionally, the following year's ratio analysis may be required to address the situation.
BC				No	
NB				No	
NL				Yes	
NS				Yes	
ON				No	
PEI				No	
QC				Yes	
SK				No	

Question No. >	Q43	Q44	Q45	Q46				
Province/ Territory	Do you calculate confidence intervals or related tests of statistical significance around any of the following?	Do you compute province-wide ratio study statistical results?	Do you trim outlier ratios?	If outliers are trimmed, what procedure do you use?				
				1.5 X interquartile range	3.0 X interquartile range	Beyond 2 standard deviations	Fixed symmetric points (e.g., remove ratios 1.50)	Fixed asymmetric points (e.g., remove ratios 2.00)
AB	COD and PRD	Yes	Yes			X		
BC	COD and PRD	Yes	Yes					
NB	COD and PRD	No	Yes				X	
NL	COD and PRD	Yes	Yes	X	X			
NS	Neither	No	Yes				X	
ON	Coefficient of Dispersion (COD)	Yes	Yes	X	X			
PEI	Coefficient of Dispersion (COD)	Yes	Yes				X	
QC	Neither	No	Yes			X		
SK	Neither	Yes	No					

Question No. >	Q46 (continued)			Q47	Q48
Province/ Territory	If outliers are trimmed, what procedure do you use?			Is there a limit on the maximum percentage of sales that can be trimmed out of a sample? (e.g., 20%)	Do you or another oversight agency have authority to order adjustments to locally determined values?
	Good judgment	Look for logical break points	Other, describe		
AB	X	X		No	No
BC	X			No	No
NB				No	No
NL				No	Yes
NS				Yes-10%	No
ON				No	No
PEI	X	X		No	Yes
QC				No	No
SK			NA		No

Appendix D. Canadian 2011 Survey Results (continued)

Question No. >	Q49			
	If you order adjustments to locally determined assessed or appraised values, which of the following procedures are used?			
Province/ Territory	Order local officials to apply trending factors to individual classes or categories of property	Trend all types of property equally, based on a jurisdiction-wide adjustment factor	Give local officials a compliance grace period to apply indicated factors	Other, describe:
AB		None	X	<b>Newfoundland:</b> Order agency officials to apply trend factor at category level. <b>Prince Edward Island:</b> Province is responsible for assessment values. <b>Saskatchewan:</b> Corrective action required per statutory primary audit.
BC				
NB				
NL	X			
NS				
ON				
PEI				
QC				
SK				

Question No. >	Q50	Q51	Q52	Q53
Province/ Territory	How many local jurisdictions have been issued orders to ADJUST values in the past three (3) years?	Do you or another oversight agency have authority to order reappraisal of locally determined values?	How many local jurisdictions have been issued orders to REAPPRAISE values in the past three (3) years?	Do you have a statutorily defined level(s) of assessment? (for example, 100% for all property or percentages that vary by property type)
AB		Yes		Yes
BC		No		No
NB		No		No
NL	None	Yes	None	Yes
NS		No		No
ON		No		Yes
PEI	Not applicable	Yes	None	No
QC	0	No	0	Yes
SK	None	Yes	None	Yes

Question No. >	Q54	Q55	Q56	
Province/ Territory	What are your ratio study standards for acceptable level of appraisal?	If you have appraisal level standards, how are they set?	Which of the following uniformity measures are calculated or used to make compliance determinations?	
			Coefficient of dispersion (COD) calculated	COD used to test for compliance
AB	0.95-1.05	Statute	X	
BC	0.90-1.10	Administrative rule or regulation		X
NB	0.90-1.10	Administrative rule or regulation	X	
NL	0.90-1.10	Administrative rule or regulation		X
NS	0.95-1.05	Internal standards	X	X
ON	Standards vary based on market type & property type	Statute	X	X
PEI		CUSPAP	X	
QC	0.95-1.05	Statute		
SK	0.98 - 1.02	Statute		



Question No. >	Q56 (continued)		Q57	
	Which of the following uniformity measures are calculated or used to make compliance determinations?		If you have specific standards or requirements based on the COD, what is the highest acceptable COD for each of the following categories.	
Province/ Territory	Coefficient of variation (COV) calculated	COV used to test for compliance	Residential	Commercial/Industrial
AB		None	15	20
BC			15	20
NB				
NL	X		New homo ≤ 10, older hetero ≤ 15, Rural ≤ 20	Larger Urban ≤ 15, Smaller rural ≤ 20
NS			Up to 19.9%	Up to 19.9%
ON	X		15	20
PEI			<20	Not applicable
QC				
SK			Not applicable	Not applicable

Question No. >	Q57 (continued)				Q58
	If you have specific standards or requirements based on the COD, what is the highest acceptable COD for each of the following categories.				If you have a standard for price-related bias (vertical inequity) based on the PRD, what is the standard?
Province/ Territory	Farmland	Timberland	Vacant Land	Other, specify:	
AB	Not applicable	Not applicable	20		PRD 0.98 to 1.03
BC	Not applicable	Not applicable	Not applicable		PRD 0.98 to 1.03
NB					PRD 0.98 to 1.03
NL			≤ 20	Other real varies with local conditions	PRD 0.98 to 1.03
NS	up to 19.9%	up to 19.9%	up to 19.9%	up to 19.9%	PRD 0.98 to 1.03
ON	20	Not applicable	25		PRD 0.98 to 1.03
PEI	Not applicable	Not applicable	<20	Not applicable	
QC					
SK	Not applicable	Not applicable	Not applicable	Not applicable	None

Question No. >	Q59				Q60
	What actions can your agency initiate as a result of assessment uniformity conditions?				Additional comments:
Province/ Territory	None	Order a reappraisal	Withhold funding (e.g., revenue sharing)	Other	
AB		X			<b>British Columbia:</b> Regional managers are required to investigate. <b>Nova Scotia:</b> Agency has authority to conduct reassessment of a current year. <b>Ontario:</b> MPAC is the assessment authority of the Province of Ontario. There is no oversight agency to review ratio studies or order reappraisals. <b>Prince Edward Island:</b> Reappraise work unit areas or selected property types. <b>Saskatchewan:</b> There are no statutory uniformity requirements.
BC				X	
NB	X				
NL		X			
NS		X			
ON	X				
PEI		X			
QC	X				
SK	X				

Appendix D. Canadian 2011 Survey Results (continued)

Question No. >	Q61	Q62	Q63	Q64
Province/ Territory	If you initiate action as a result of assessment uniformity conditions, is the action dependent upon confidence intervals or related tests of statistical significance?	If your agency can order a reappraisal or withhold funding as a result of assessment uniformity conditions, how many times has it been done in the past three years?	Have you taken fewer ratio study-related actions in the past three years?	Do you have statutory requirements to check for sales chasing?
AB	Yes		No	No
BC	Yes		Not applicable	Nonstatutory requirement
NB	Not applicable		Not applicable	No
NL	Yes	None	Not applicable	No
NS	No	0	Not applicable	No
ON	Not applicable		Not applicable	No
PEI	Yes	Not applicable	No	No
QC	Not applicable		No	No
SK	Not applicable	None	Not applicable	No

Question No. >	Q65	Q66–67					
Province/ Territory	Do you test for sales chasing?	If you test for sales chasing, what techniques do you use?					
		Comparison of average percentage changes in appraised values of sold and unsold	Comparison of average unit values of sold & unsold properties	Split sample technique (using sales before & after the appraisal date)	Comparison of observed vs. expected distribution of ratios	Mass appraisal techniques	Additional comments
AB	Yes	X	X				None
BC	Yes	X	X	X	X		
NB	No						
NL	Yes	X	X				
NS	Yes	X	X				
ON	Yes	X	X			X	
PEI	No						
QC	No						
SK	No						

Question No. >	Q68	Q68	Q69	Q70–71		
Province/ Territory	Has a lower limit on the COD been established as an indicator of possible sales chasing?	Additional comment: <b>Alberta:</b> COD below 5. <b>Ontario:</b> Informal review if COD falls below 5. <b>Prince Edward Island:</b> Assessment rates are determined using sales analysis and mass appraisal techniques.	Is a ratio study conducted for personal property?	How are the results of your personal property ratio study used?		
				To order adjustments to locally determined assessed values	To equalize state or provincial funding of local jurisdictions	To order local jurisdictions to reappraise
AB	Yes		No	Not applicable	Not applicable	Not applicable
BC	Yes		No			
NB	No		No			
NL	No		No			
NS	No		No			
ON	No		No			
PEI	No		No			
QC	No	No				
SK	No	No				

Question No. >	Q70–71 (continued)					Q72
	How are the results of your personal property ratio study used?					Does your agency perform procedural audits of local assessment procedures/practices?
Province/ Territory	To advise provincial, state, or local jurisdictions of assessment conditions	To assist mass appraisal programs	To approve tax assessment roll	To adjust or equalize centrally determined assessed values (such as utilities)	Other	
AB	Not applicable	Not applicable	Not applicable	Not applicable	NA	Yes
BC						Yes
NB						Yes
NL						Yes
NS						Yes
ON						Yes
PEI						Yes
QC						No
SK						Yes

Question No. >	Q73						Q74
	If your agency performs a procedural audit of local assessment procedures/practices—which categories of real property are audited?						If your agency performs a procedural audit of local assessment procedures/practices—Is the audit used INSTEAD OF a ratio study?
Province/ Territory	Residential	Commercial/ industrial	Agricultural	Timberland	Not Applicable	Other	
AB		X			None	Saskatchewan: All SK tax classes (per regulations) for the confirmation audit.	No
BC	X	X	X	X			No
NB	X	X	X				No
NL	X	X					No
NS	X	X					No
ON	X	X	X				No
PEI	X	X	X	X			No
QC							Not applicable
SK	X	X	X				Both confirmation & ASR (primary audit) required.

Question No. >	Q75					
	If your agency performs a procedural audit how is it used?					
Province/ Territory	To order adjustments to locally determined assessed values	To order local jurisdictions to reappraise	To advise provincial, state, or local jurisdictions of deficiencies or to recommend improvements in assessment procedures.	To approve tax assessment roll	Not applicable	Other, describe:
AB		None			None	<b>Alberta:</b> To review complex petrochemical facilities. <b>Saskatchewan:</b> To approve assessment roll (tax and assessment rolls are separate).
BC			X			
NB			X			
NL			X			
NS			X			
ON				X		
PEI	X			X		
QC						
SK						

Appendix D. Canadian 2011 Survey Results (continued)

Question No. >	Q76			Q77					
	Can any of the following initiate legal action as a result of your ratio study?			What software does your agency use for ratio studies?					
Province/ Territory	Taxing jurisdiction (e.g., school district)	Taxpayers	NA	Custom software written in house	CAMA vendor application	Spreadsheet software (e.g., Excel)	Statistical software (e.g. SPSS, NCSS, SAS)	Database software (e.g., Access)	NA
AB	X	None				X	X	X	None
BC			X	X		X	X		
NB			X	X					
NL			X		X	X	X		
NS			X			X	X	X	
ON			X				X		
PEI			X			X	X	X	
QC			x	X				X	
SK			X	X			X	X	

Question No. >	Q78	Q79	Q80	Q81
Province/ Territory	What software does your agency use for ratio studies? Additional comments:	Do you currently use any foreclosure-related sales in your ratio studies?	Please provide comments about new issues or recent changes related to your ratio study practices:	Please share any comments you may have about this survey:
AB		Yes	<p><b>Nova Scotia:</b> Recent change (for 2011 reassessment) to use the median for reporting the general level of assessment.</p> <p><b>Ontario:</b> Introduced more residual based measures to review values at the lower end of the market</p> <p><b>Saskatchewan:</b> Currently only improved sales used in ratio study for residential and non residential property class for the statutory primary audit. Plans were to include vacant land sales for the purposes of obtaining a more representative overall municipal ASR.</p>	None
BC	COGNOS BI	No		
NB		No		
NL		No		
NS		No		
ON		No		
PEI		No		
QC		No		
SK		No		