A Cost of Community Services Study
For Indiana Counties and School Corporations

Larry DeBoer
Department of Agricultural Economics
Purdue University

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Abstract
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Cost of community services (COCS) studies compare local government service costs to the revenues collected to pay for those costs. Costs and revenues are divided into three sectors: residential, agricultural and business. Costs and revenues are attributed to each sector, and a cost-revenue ratio is calculated for each. A COCS ratio greater than one implies that the sector is imposing costs in excess of the revenue it pays. A ratio less than one implies that the sector is paying revenues in excess of the costs it imposes. Dozens of past COCS studies have found the residential ratio to be greater than one, and the agricultural and business ratios to be less than one.

Care should be taken in the interpretation of COCS ratios. All sources agree that the ratios *cannot* be used to evaluate individual development projects. The fact that the residential ratio is greater than one does not mean that the next housing development will impose more added costs than it generates in revenue. The COCS ratios are averages, not measures of marginal impact; they are aggregates of many kinds of development which may have differing cost and revenue impacts; they do not take account of the "multiplier" effects of one kind of development on other sectors of the local economy.

This project does COCS studies for county governments and school corporations in 91 Indiana counties. When counties and school corporations are combined, the residential sector imposes more costs on counties and school corporations combined than it pays in revenues, for all counties under all assumptions about the allocation of costs and revenue among sectors. The agricultural and business sectors impose fewer costs on counties and school corporations combined than they pay in revenues, for almost all counties and allocation assumptions.

This is the usual COCS result, and it is a necessary result of the assumptions used in COCS analysis. COCS analysis assumes that all school costs are imposed by the residential category. Since property taxes fund a part of school costs, and property taxes are paid by business and agriculture as well as households, the residential ratio for schools is greater than one. The agricultural and business ratios for schools are zero. Since school corporations spend five times what counties spend, the school results dominate the COCS ratios.

This points out that the assumptions used to allocate costs to the residential, agricultural and business sectors are crucial to the COCS ratio results. This study tests the effects of differing assumptions for allocating county government costs. Under the traditional assumptions about allocating costs and revenues, this study finds the traditional results. Ratios for the residential sector are greater than one; other ratios are less than one.

This study looks at two alternate assumptions about property values. Some costs are allocated based on property values. In Indiana's assessment system, all property except farmland is assessed at market value. Farmland is assessed at its use value in agriculture, which appears to be less than one-third its market value, on average. If costs are allocated with use value, the agricultural COCS ratios tend to be less than one. If costs are allocated with estimated market value, the ratios tend to be greater than one. It is not clear which assumption is more appropriate.

This study also looks at alternate assumptions about road construction and maintenance costs. County road costs are allocated based on vehicle use. Highway engineers find that heavy trucks produce most of the wear on roads. Passenger cars produce very little. The business and agricultural sectors own most of the trucks, and so impose most of the wear on roads. Allocating road costs to business and agriculture

can reverse the traditional COCS results for county governments, depending on assumptions about how many miles trucks drive on county roads. Business and agriculture *may* impose more costs on counties than the revenues they pay. The data are not sufficient to reach a firm conclusion.

This study uses COCS results for policy analysis. Since the early 1970s, Indiana has introduced several local income taxes, lessening the importance of the property tax. In 2009 Indiana eliminated the property tax for the school general fund, replacing it with added state aid. Both of these changes shift revenues from business and agriculture to the residential sector. Indiana provides substantial property tax deductions to homeowners. These deductions reduce the share of the property tax paid by the residential sector, shifting these taxes to agriculture and business.

All three policy changes combined have decreased the residential ratios and increased the agricultural and business ratios. The residential ratio is greater than one for counties and schools combined, and the agricultural and business ratios are less than one. These policy changes have moved all three ratios closer to one.

How are changes in the COCS ratios to be interpreted? The American Farmland Trust says that COCS ratios are *not* an indication of who should pay for local government services. Under the benefit view of taxation, however, the costs of services should be paid by their beneficiaries. Economists Oakland and Testa point out that under the benefit view, the cost-revenue ratios should equal one. Indiana's policy changes have moved its tax system somewhat closer to the benefit view ideal. Whether this is an appropriate change in tax policy depends on whether the benefit view is accepted.

Introduction

Cost of community services (COCS) studies compare local government service costs, or expenditures, or appropriations, to the revenues collected to pay for those costs. The comparisons are usually done for three sectors: residential or household, agricultural or open space, and business, meaning commercial, industrial and utility. Costs and revenues are attributed to each sector, and a cost-revenue ratio is calculated.

A COCS ratio greater than one implies that the sector is imposing costs or receiving services in excess of the revenue it pays. A ratio less than one implies that the sector is paying revenues in excess of the costs it imposes or services it receives.

Kotchen and Schulte (2009) report the results of 125 COCS studies. They show the ratio results for the three sectors in bar charts, reproduced here as Figure 1. The ratio results almost always show a residential ratio greater than one, and agricultural and business ratios less than one. The residential sector receives more in services, or imposes more in costs, than the revenue it pays. The agricultural and business sectors pay more in revenues than the costs they impose or the services they receive.

This huge number of studies, and the close agreement of the results among almost all of them, leads to a question. Why do *another* cost of community services study? This study offers several answers.

- It calculates COCS ratios for county and school corporation governments in 91 counties, all at once. Past studies have studied one or a few localities. This may represent a sacrifice of local detail (though Kotchen and Schulte show that doing interviews with local officials has no measureable effects on COCS results). It offers the chance to compare COCS results for 91 different communities under a consistent set of local government institutions, data definitions, and methods. It uses regression analysis to measure the reasons for variations in the 91 county ratios.

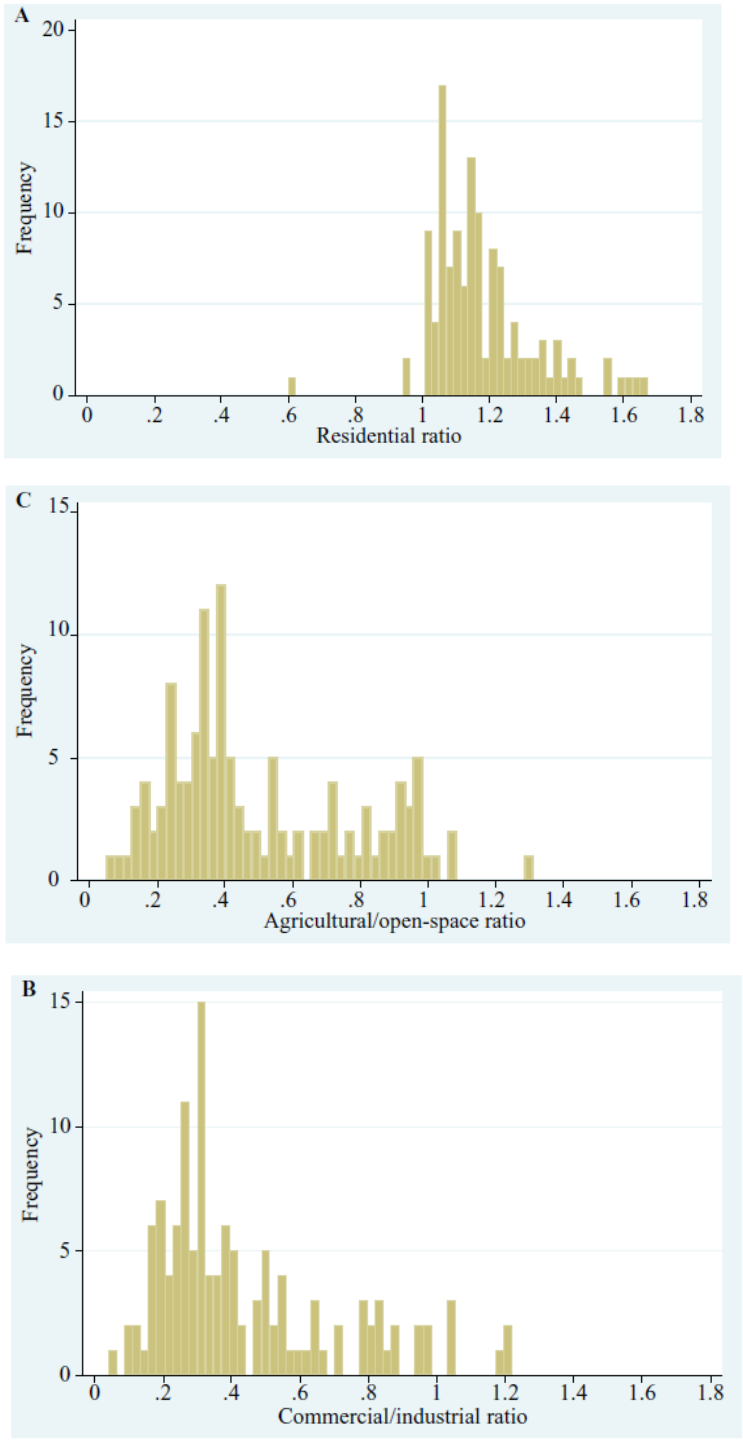
- It tests the sensitivity of the ratio results to differing cost share assumptions. One of the most important parts of a COCS analysis is allocating local government expenditures among the three sectors. Most studies use a single set of cost shares, but this study finds that there are sometimes reasonable alternatives for allocating costs. This study applies them, and examines how the ratios change.

- Many COCS studies are not as transparent as they could be about the cost shares and how they are determined. This study attempts to be explicit about the cost shares and their effects. It provides a method of showing how each assumption affects the ratios.

- This study uses the COCS method to examine the effects of policy changes. Indiana local government finance has changed in the past forty years, with lessened dependence on property taxes, more on local income taxes and state aid. Homeowners have been offered large deductions from their assessments. This study looks at how these changes have altered the COCS ratios.

Figure 1.

Frequency Distributions of Cost of Community Service Study Ratios for Residential, Commercial/Industrial, and Agricultural/Open-Space Land Uses



Source: Kotchen and Schulte (2009)

Interpreting Cost of Community Service Study Results

The cost of community services method produces cost-revenue ratios. What these ratios mean has been the subject of much argument. What can be said if the residential ratio is greater than one? Perhaps the fiscal impact of residential development is negative. New houses generate more costs than revenues. What are the implications for policy of an agricultural ratio less than one? Perhaps such ratios mean that business and agriculture are overtaxed. They pay more for services than they receive. Somewhat surprisingly, the practitioners of COCS reject both of these interpretations.

Kotchen and Schulte (2009) list the main arguments about the interpretation of COCS results. COCS reports average results from past data. Making development decisions requires an analysis of the marginal impacts of new property uses. For example, current residential school costs may exceed residential school revenues. The COCS residential ratio of costs to revenues for schools may be greater than one. This does not necessarily mean that the next housing development will have a negative fiscal impact—that the development's added costs will exceed the added revenues. It may be that current costs exceed revenues because of a new school building which has empty classroom space. The next housing development would then impose no added building costs, so its fiscal impact could be positive.

Using only three categories of property (residential, agricultural and business) hides variations within the categories. For example, an expensive home with no children will have a different impact on school budgets than will a mobile home with five children. A high-tech factory paying high wages, with a large amount of equipment to tax, will have a different effect than low-tech factory with low wages and little equipment. A grain farm may have a different impact from a livestock operation.

The method attempts to measure costs directly imposed by land uses, rather than measuring the benefits of public goods to the community. Schools benefit businesses by providing an educated workforce, but COCS allocates all education costs to the residential category. Economic development expenditures benefit households by providing jobs and private goods and services, but COCS allocates all economic development costs to the business category.

Guides for conducting COCS studies are aware of these criticisms. Penn State's (1998) guide addresses the average versus marginal issue. The authors write,

> despite a popular misconception about their purpose, COCS studies do not provide a measure of the costs of development. Instead, they compare the outlay and influx of money to and from several general types of already-developed (or undeveloped) land. Other approaches must be used to estimate development costs, and they must consider the specific development itself (Penn State 1998, p. 2).

The Penn State guide also warns that the results for each land-use are averages, and that "the mix of local services required by different populations within a certain land type varies greatly" (Penn State 1998, p. 3).

The American Farmland Trust responds to the community benefits issue in their "How to" guide. They write,

> Even though society as a whole benefits from a healthy and educated voting public, citizens directly demand these services. COCS studies measure this demand, not the public good to be derived from it. While they provide practical data on land use requirements for services, these studies do not answer broad, philosophical questions about who in society should pay for what (AFT 1993, p.15).

According to advocates of COCS, the studies do not "provide a measure of the costs of development" and do not answer questions "about who in society should pay for what." One suspects that these are exactly the uses to which COCS results often are put, however. If these are not the appropriate interpretations for COCS, what interpretations *are* appropriate?

Oakland and Testa (1996) use a method similar to that of COCS studies, to divide revenues and costs for both state and local governments between businesses and households. They state directly that "general business taxation should be structured so as to recover the costs of public services rendered to the business community" (p. 2). This is a statement of the benefit view of taxation. Those who receive government services should pay for them. They argue that this view is not only fair, it is efficient, because people and businesses will make their government service decisions based on the full costs of providing these services, without subsidies from other taxpayers.

Oakland and Testa present tax to expenditure ratios for state and local business taxes (the inverse of the COCS cost-revenue ratios). For every region of the county, business taxes substantially exceed business expenditures, with ratios that vary from 1.45 to 2.08. Business pay 45% to 108% more in revenues than the costs they impose. (These ratios are the equivalent to COCS ratios of 0.69 and 0.48, well within the ratios found in COCS studies, as shown in Figure 1.)

Oakland and Testa have no problem drawing a conclusion about "who should pay for what." They write, "business taxes exceed business expenditures by healthy proportions," and "this indicates that, taking the benefits principle approach, discussions of tax reform should be directed toward bringing business taxation and business expenditures into closer alignment" (p.10).

Perhaps the practitioners of COCS studies should not give up so easily. A case can be made for benefits taxation of business and agriculture. The costs imposed on local governments by business and agriculture would equal the taxes paid. Benefits taxation implies that the COCS ratios should equal one.

Perhaps COCS ratios could be interpreted from the property owner's point of view. Lower taxes and higher quality government services are attractive to both households and businesses. For example, Payton (2004) analyzed the determinants of home prices in Indianapolis in 1999. He found that property characteristics such as square footage, number of bathrooms, and number of rooms had a positive effect on price, and characteristics such as age had negative effects. He also found that higher property tax rates reduced home prices, and higher quality schools (as measured by test scores) increased prices.

This must be because people are more likely to demand houses in areas where property taxes are low, and school quality is high, all else equal. The added demand raises home prices. If higher expenditures on public services raise their quality (a topic for research as well), then the most attractive location for a home buyer would be one with large spending and low taxes in the residential category.

Such a location would have a residential COCS ratio greater than one. Could it be that residential ratios greater than one lead to higher demand for homes, and higher home prices? Likewise, businesses in communities with business ratios less than one pay high taxes but receive few services. Could it be that business ratios less than one deter business investment, leading to declining employment and population? If it deters population growth, though, perhaps a low business ratio will eventually inhibit the demand for housing, and *reduce* home prices.

This leads to the issue of indirect or secondary effects. If a high residential ratio attracts more buyers, the households will pay higher prices for homes. The residential category benefits from low taxes, but pays for services indirectly through higher home prices.

Oakland and Testa use a similar argument for business benefits from education and other social service expenditures. They write, "to the extent that these services raise labor productivity, businesses will pay for higher productivity through wages paid to the household sector" (p. 9). That is, a local government expenditure that improves the productivity of labor will attract businesses to the community. The added demand for labor will increase the wages businesses must pay. Businesses benefit indirectly from education expenditures, but they also pay indirectly for education expenditures.

Business taxation has indirect effects as well. It is estimated that portions of business taxes are passed on to customers in higher prices, and employees in lower wages and benefits. The lower is the business ratio, the less attractive is the community for firm location. Fewer jobs are available, so wages are lower. Fewer products are for sale, so prices are higher. If the employees and customers live within the community, then the residential sector pays part of the business tax share, indirectly, though higher prices and lower wages.

Lower residential taxes which attract homebuyers may increase housing costs. Increased education expenditures increase business labor costs. Increased business taxes increase product prices and reduce employee wages. The indirect effects may play a balancing role. If the COCS ratios are too distant from one, perhaps indirect economic effects will make the community pay.

How should COCS ratios be interpreted? They are not useful for analyzing the fiscal impact of a particular new development. The ratios are too aggregated, so they do not account for the tax and cost effects of differing developments within the three broad categories. An analyst cannot use COCS ratios to evaluate the fiscal impacts of a factory compared to a strip mall. Further, the ratios show average results, not marginal fiscal impacts. The capacity of local government facilities at the time of the proposed development may result in added costs that differ from past averages. The distance of the new development from local government infrastructure may also affect costs.

The American Farmland Trust says that COCS results do not indicate who should pay for local services. Oakland and Testa disagree. If the benefit view of taxation is accepted as fair and efficient, then COCS ratios should equal one. A residential ratio greater than one means households are paying too little. An agricultural or business ratio less than one means these taxpayers are paying too much.

What of the indirect effects? COCS ignores them. This does not mean the studies are without value, however. Direct costs and taxes are the *starting point* for the indirect analysis. We cannot know what the indirect effects could be, until we know what the direct effects are.

Cost Allocations

Revenue allocations by property type are relatively straightforward. In particular, property taxes can be divided clearly among property types, and property tax revenue is the major revenue source in most counties.

Cost allocations often are not so straightforward. Many services are used by all property types. The sheriff protects residential, agricultural and business property. Vehicles from all property types use the roads. Data are often hard to come by, or do not divide neatly into property categories. Court cases, for example, are divided into felonies and misdemeanors, not into residential, agricultural and business offenses.

The quantities and values of public services themselves are hard to measure. How much public safety does the sheriff provide? How much health does the county health department provide? Many local government services are at least partly "public goods," which means they are consumed by all county residents and property owners at once, and paid for collectively. Private goods have quantities that people and property owners purchase, and prices that they pay. Public goods do not.

These difficulties mean that COCS results are dependent on the assumptions and methods used to allocate local government costs. This section provides a detailed account of the cost allocations used in this study.

There are three basic cost allocation assumptions used here. Costs may be allocated based on the shares of each property type in total property value. The costs of the property tax assessor's office might be allocated based on property shares, for example. Costs may be allocated based on the shares of each property type in daytime and nighttime population. County residents and people temporarily in the county for employment in business or agriculture may be the beneficiaries of county health expenditures, for example. And, costs may be allocated based on road use by vehicles owned by residential, agricultural and business drivers. These shares are used to allocate road and bridge construction and maintenance costs. Other cost allocations are combinations of the property value and population cost shares. The sheriff protects both property and people, for example.

Property Value. Some county government services provide benefits to property. The county surveyor establishes property lines and works on flood control. The recorder keeps property deeds. The assessor measures property values for taxation. The sheriff protects property from theft and vandalism. The costs of such services may be allocated to residential, agriculture and business using shares in the value of property.

In 2002-03 Indiana began assessing most land, buildings and business equipment based on market values. Assessments are attempts to predict the selling prices of property. Assessed values are available for homesteads, rental housing, agricultural property and commercial/industrial land, buildings and equipment for counties and school corporations.

Agricultural land is not assessed based on its potential selling price, but based on its value in use as farm land. The use-value formula starts with a base rate of farmland, which in 2008-09 was $1,200 per acre. This is well below the average value of farmland in Indiana. The average value of an acre of farmland with average productivity was $4,240 in June 2008, according to a survey by the Purdue Agricultural Economics Department (Dobbins and Cook, 2008).

This means that cost shares based on the assessed values of property imply that farmland imposes less in county costs than do other forms of property. This may be justified. Part of the selling price of farm land includes its speculative value for use in residential or business development. Perhaps that part of the land's value should be allocated to residential and business users. The actual costs imposed on the county by the use of land in agriculture might well be measured by its agricultural use value. *Speculative* uses may not impose *actual* costs.

On the other hand, the value of land to its owner is ultimately measured by its selling price. The value of the services of the surveyor who marks the boundaries of land, and of the recorder who records to deed, may well be measured by the potential selling price of the land. The county legal system that protects an owner's rights to the land is defending the full value of his or her property. Perhaps farmland should be treated like all other property.

In addition, it seems possible that the base rate of farm land used in Indiana underestimates the value of land used in agriculture. The survey value of $4,240 was the average price of farmland sold for use as farmland. "Transition land", farmland sold for residential or business use, had an average value of $9,415 per acre. The survey method makes an effort to exclude the effects of current transition sales.

The survey data do not provide county-by-county information. So, farmland assessments may be adjusted to approximate market value by multiplying each county's farmland assessment total by the ratio of the average market value to the base rate per acre, which is 3.53.

Whether or not it is appropriate to measure farmland at its use value or approximate market value is open to question, so we have two sets of property value shares. One assumes that all property, including farmland, uses county services and imposes costs proportional to market value. Another assumes that farmland uses services and imposes costs based on its value in use in agriculture, and that Indiana's use value calculation is the appropriate measure of value in use.

Service Population. Some county government services primarily benefit people, rather than property. But which people? In some cases, the people who benefit are the residents of the county. Such expenditures should be allocated entirely to the residential category.

In other cases non-residents benefit from county services. For example, sheriff's officers protect residents, but also non-residents who are in the county for a time. In addition, some county residents spend part of their time outside the county where they live. Then they are under the protection of officers from a different county.

Work is the primary reason that people spend time outside their resident county. Non-resident in-commuters spend a fraction of their week in the county at work. Since they are in the county for jobs with business or agricultural firms, their expenditure shares should be allocated to the business or agricultural categories.

Employed residents spend a fraction of their week in their county at work, too. Were it not for the firms providing jobs in the county, these residents would have to commute elsewhere. They are in the county during working hours because of the presence of their employers. The expenditure share representing residents working at their in-county jobs should also be allocated to the business or agricultural categories.

The primary reason that residents spend time out of a county is also for work. Out-commuters spend a fraction of their week outside their county of residence. They do not consume county services while they are outside the county, so should not be counted in an allocation of county expenditures.

There are 168 hours in a week. A typical 40-hour workweek is 23.8% of total hours. We assume that in-commuters spend 23.8% of their time in the county where they work. Residents who work in the county spend 23.8% of their time at work. And, residents who are out-commuters spend only 76.2% of their time in the county where they live.

Define the "service population" as the average number of people, resident and working, served by the county. It is calculated as total resident population less 23.8% of out-commuters, plus 23.8% of in-commuters, or

Service population = resident population + 0.238 x (net-commuters)

where net-commuters are in-commuters less out-commuters. Service population exceeds resident population in counties where there are more in-commuters than out-commuters. These include most of the larger urban counties. Counties with more out-commuters than in-commuters have service populations that are less than their resident populations.

This idea is related to somewhat more familiar concepts of "daytime" and "nighttime" population. Daytime population includes everyone living and working in the county, less those working elsewhere. Nightime population includes only those who live in the county. "Service population" is an average of the two, accounting for the share of the week spent at work. Essentially, service population is 23.8% of daytime population plus 76.2% of nighttime population.

In-commuters are present in a county, consuming county services, because their employers are located in the county. Residents who are employed in-county are also present during working hours because their employers are located in the county. So, the business and agricultural share of the service population is the share present in the county during working hours because of business or agricultural employers in the county.

In-commuters counted as employees spend 23.8% of their time at work in the county. Resident-employees spend 23.8% of their time at work in the county too. Business and agricultural shares are calculated based on shares of each in total county employment. In a formula,

Business service population = 0.238 x business employment
Agricultural service population = 0.238 x agricultural employment.

The residential share of the service population starts with residential population. Out-commuters spend their working time outside the county, so 23.8% of out-commuters are subtracted. The working day of employed residents is allocated to business and agriculture, so the non-working day is allocated to residential. Subtract 23.8% of resident employment, which is calculated as total employment less in-commuters. In a formula,

Residential service population = Residential population – 0.238 x (out-commuters)
– 0.238 x (resident employment).

Business, agricultural and residential service population sum to total service population. The business and agricultural service population is 0.238 times total employment. Residential service population subtracts 0.238 times total employment, leaving residential population plus 0.238 times in-commuters, less 0.238 times out-commuters. That's total service population.

An Example for Adams County. The U.S. Census estimated the population of Adams County for 2007 at 33,644. The Indiana Department of Workforce Development derives commuting data for Indiana counties based on income tax returns. Indiana's tax form requires filers to state their county of residence and county of work for local income tax purposes. The data for 2007 show that 24,709 Adams County residents are employed (either in or out of the county), 20,923 people live and work in Adams County, and 24,646 people work in Adams County (including residents and commuters).

This implies that 24,709 minus 20,923 people must live in Adams County and work elsewhere. There are 3,786 out-commuters. And it implies that there are 24,646 minus 20,923 people who work in Adams County but live elsewhere. There are 3,723 in-commuters. Net in-commuters are -63 people.

Total service population is Census population, 33,644, plus 0.238 times -63, or 33,629. The employer share of service population is 0.238 times total employment in Adams County, 24,646, times, or 5,868.

The income tax data do not differentiate between business and agricultural employment. U.S. Department of Commerce, Bureau of Economic Analysis data are used to make this allocation. According to the BEA, in 2007 there were 22,712 employees in Adams County, of which 1,349 or 7.0% were farm employees. (The BEA count and the income tax data result in different figures primarily because of differing treatment of full-time and part-time employees.) It is assumed that 7.0% of the employer share is agricultural employment, or 412. The remaining 5,456 people are business employees.

The residential share is population, 33,644, less 23.8% of the 3,786 out-commuters, which is 901 people, less 23.8% of the 20,923 people who are resident employees, which is 4,982. The result is 27,761. The residential service population plus the agricultural and business service populations is 27,761 + 412 + 5,456 = 33,629, equal to total service population.

The shares of each cost category are 82.6% residential, 1.2% agricultural, and 16.2% business.

Vehicle Road Use. Roads are made for vehicles. Vehicles wear out roads. Spending on road maintenance and construction creates benefits for the owners of vehicles, in proportion to the wear that each vehicle puts on the roads.

Ideally a COCS study would find a measure of the cost of road wear from each vehicle, and then allocate highway maintenance and construction costs to residential, agricultural and business owners. Such a measure would include the miles traveled by each vehicle on county roads, and the relative wear each vehicle-mile puts on the road (which is a function of vehicle weight). Shares of each vehicle type in the total vehicle-mile-wear index would allocate total road spending by owner-type.

Roads are used by local residents and businesses, but also by vehicles from outside the county. Some of the vehicles from outside travel to the county as customers of or suppliers to county businesses or farms. Costs for such vehicles could be allocated to business or agriculture. Some of the vehicles from outside travel to the county to visit local residents. Costs for such vehicles could be allocated to the residential category. Some of the outside vehicles are just passing through. These are services delivered to non-residents, but the wear on the roads affects local residents, farms and businesses. This road spending could be allocated using the proportions from local vehicles.

Perhaps this ideal can be approximated with available data. Vehicle registration data are available for each county. The data include passenger cars, trucks of various weights owned by farms and other businesses, and other vehicles (buses, for example).

Highway engineers estimate the road wear caused by a vehicle of particular weight using an index called "equivalent single axle load" (ESAL). ESAL measures the road wear created by a vehicle relative to an 18,000 pound truck. ESAL indexes can be approximated by the "fourth power rule," which divides a vehicle's weight by 18,000, and raises the result to the fourth power. This implies that road wear rises exponentially with weight. Heavier vehicles put more than proportional wear on roads.

The Federal Highway Administration (FHWA, 2008) provides ESAL ranges for thirteen categories of vehicles, ranging from motorcycles to seven-or-more axle multi-trailer trucks. Passenger cars list an ESAL range of 0.0004 to 0.0008, which means that an 18,000 pound truck with an index of one creates as much wear in a single pass over a road as 1,250 to 2,500 cars. The maximum ESAL for the multi-trailer trucks is listed as 3+.

Three methods for allocating road costs are suggested by available data. Vehicle registrations can be classified by FHWA category and multiplied by their ESAL indexes. The share of residential, agricultural and business vehicle ESAL indexes in the total would be the shares of road spending allocated to each category. This method takes no explicit account of vehicles that travel county roads but are not registered in the county. In effect the method assumes that wear from these outside vehicles is in proportion to wear from county vehicles. That was the assumption in the ideal method described above.

A more serious problem with this method is the implied assumption that each vehicle drives the same number of miles on county roads. This seems unlikely. Federal Highway Administration data for 2008 show that the average semi-tractor-trailer drove more than five times as many miles as the average automobile. These data include roads of all kinds—federal, state, municipal and county. The data include mileage for "other rural" roads, which are most likely to be maintained by counties. The average semi travels more than four times as many miles on other rural roads as the average automobile.

Farm trucks pose a further problem. Trucks owned by grain farms are likely to be used intensively at harvest time, less so at other times. Trucks owned by livestock farms may be used more. A 1999 survey for the U.S. Department of Transportation (Tolliver, et. al., 2001), covering farms in the northern plains, found that the average grain farm semi-tractor-trailer drove only 8,035 miles, compared to an overall average of 64,764 miles for all semis. Farm trucks may be used much less than business trucks.

However, it is possible that farm trucks are more likely to travel county roads than other business trucks. Certainly, the entry to the farm itself is more likely to be from a county road than are the entries to other businesses. The average semi traveled 6,237 miles on "other rural" roads. If all farm semi travel is on rural roads, it is possible that farm semis drove *more* miles on roads maintained by the county compared to business semis.

The data will take us no further. What is available suggests three approaches: (1) assume all vehicles travel the same number of miles on county roads; (2) assume that vehicles travel on county roads in proportion to average miles traveled on all roads, with farm trucks assumed to travel fewer miles; (3) assume that vehicles travel on county roads in proportion to average miles traveled on "other rural" roads, with farm vehicle mileage assumed to be entirely on "other rural" roads.

An example for Adams County. Adams County recorded 34,149 vehicle registrations in 2009. Indiana registrations data show 17 vehicle categories. These are classified as residential, agricultural and business vehicles, and matched to FHWA categories so ESALs can be applied. Of the total (not counting the N/A category), 65.9% of Adams registrations are residential, 1.9% are agricultural, and 32.2% are business.

The first calculation assmes that all vehicles travel the same number of miles on county roads. The registration categories house car, motorcycle and passenger car are classified as residential. FHWA lists no ESAL for motorcycles, presumably because they impose almost no wear on roads. FHWA has a range of 0.0004 to 0.0008 for passenger cars. The midpoint value of 0.0006 is used in the calculation.

Four registration categories are listed as agricultural. Tractors and trailers are given an ESAL of 2.15. FHWA lists "4-Axle or Less, Single Trailer Trucks" at 1.5 to 2.0, and "6 or More Axle Single Trailer Trucks" at 2.0 to 2.3. Smaller ESALs apply to single-unit trucks, and larger ESALs apply to multi-trailer trucks. Since trailers are registered individually, multi-trailer ESALs did not seem appropriate. The middle value between 1.5 and 2.3 is 1.9, which is used for the tractors and the trailers. However, these

ESALs apply to a tractor and trailer combined. The indexes for separate tractor and trailer registrations are divided by 2 to account for this.

Table 1.

Adams County, Road Allocation by Registrations

Vehicle Type	Registrations, 2009	Owner category	ESAL (FHWA)	Registrations x ESAL		
Farm Semi Tractor	99	Agriculture	1.9	94.1	*	
Farm Semi Trailer	133	Agriculture	1.9	126.4	*	
Farm Trailer	85	Agriculture	0.02	1.7		
Farm Truck	317	Agriculture	0.0625	19.8		
House Car	397	Residential	0.0006	0.2		
Motorcycle	1,192	Residential	0	-		
N/A	536	n/a	n/a			
Other Bus	22	Business	1.25	27.5		
Passenger Car	18,693	Residential	0.0006	11.2		
Recovery Vehicle	28	Business	1	28.0		
School Bus	2	Business	1.25	2.5		
Semi Tractor	18	Business	1.9	17.1	*	
Semi Trailer	490	Business	1.9	465.5	*	
Special Machinery	11	Business	1	11.0		
Trailer	3,746	Business/Residential	0.02	74.9		
Truck >11	242	Business	0.5	121.0		
Truck 7-11	8,138	Business	0.0625	508.6		
Total	34,149			1,509.5		
	65.9%	Residential		48.91		**3.2%**
	1.9%	Agricultural		241.9		**16.0%**
	32.2%	Business		1,218.7		**80.7%**

* Registrations multiplied by 1/2, because tractors and trailers are used jointly.

Farm trailers are assumed to be lightweight trailers (horse trailers, for example), and are given a relatively low ESAL of 0.02, greater than the heaviest SUV, but less than the lightest truck. Farm trucks are assumed to be equivalent to the trucks weighing 7,000 to 11,000 pounds, which is by far the non-farm truck registration category with the largest number of registrations. Since this registration category has a specific weight, the fourth power rule is used to calculate its ESAL. The middle value of 9,000 pounds, divided by the index value of 18,000, raised to the fourth power, yields 0.0625.

Eight registration categories are classified as business. Semi-tractors, semi-trailers, and trucks 7,000 to 11,000 pounds are classified as described above. Trucks greater than 11,000 are assumed to average 15,000 pounds, so the fourth power rule gives an ESAL of 0.5. The few recovery vehicle and special

machinery registrations are given an ESAL of one, arbitrarily. FHWA gives bus ESALs of 0.75 to 1.75. The middle value of 1.25 is used here.

The registration category "trailer" is assumed to be half business, half residential. Business trailers could include, for example, rental hauling trailers, while residential trailers could include boat trailers. As with farm trailers, an ESAL of 0.02 is chosen.

A final registration category, "N/A", is ignored in the calculation. These are vehicles of unknown type. Ignoring them allocates their road wear in proportion to the known vehicles.

The results in Table 1 show that road wear is dominated by business semi-trailers and business trucks 7,000 to 11,000 pounds. Farm semi-tractors and trucks above 11,000 pounds are also large contributors to road wear. In total, business accounts for 80.7% of road wear costs, agriculture 16.0%, and residential a mere 3.2%.

The second and third calculations apply weights based on the average miles traveled by vehicle type, plus the results for farm trucks from the USDOT study. Table 2 summarizes these weights. Weights are calculated relative to passenger car mileage. Data for the first six lines are from the annual Federal Highway Administration's highway statistics. Data for the last two lines are from the U.S. Department of Transportation study of farm vehicle use in the upper Great Plains. The "all roads" columns use all miles traveled by each vehicle type. The "other rural roads" columns use only those miles traveled on "other rural" roads, which exclude all urban roads, rural interstates and rural arterial roads. Other rural roads are those most likely to be maintained by county governments.

Table 2.

	Average Miles/Vehicle		Ratio to Cars	
	All Roads	"Other Rural" Roads	All Roads	"Other Rural" Roads
Passenger Cars	11,788	1,428	1.0	1.0
Motorcycles	1,868	249	0.2	0.2
Buses	8,436	2,101	0.7	1.5
Other 2-axle vehicles	10,951	1,424	0.9	1.0
Single unit trucks	12,362	2,279	1.0	1.6
Combination trucks	64,764	6,237	5.5	4.4
Farm Trucks				
Single unit trucks	2,588	2,588	0.2	1.8
Combination (Semi) trucks	8,035	8,035	0.7	5.6

Combination trucks refer to semi-tractor-trailers. Such vehicles are driven far more miles, on average, than any other vehicle type, on all roads and other rural roads. The major differences between the all

roads and other rural road factors are for farm trucks. In terms of total miles, farm trucks appear to be driven only about one-eighth the miles compared to business trucks generally. If it is assumed that all farm truck miles are on rural roads, however, farm trucks are driven slightly more than business trucks on the rural roads most likely maintained by counties.

Tables 3 and 4 show that the assumptions about miles traveled make an enormous difference in the cost allocations for road construction and maintenance. Using the all roads factors, Table 3 shows that business vehicles account for more than 94% of the road wear. The agricultural share is only 4.4%, and the residential share is 1.4%.

Table 3.

Adams County, Road Allocation by Registrations and Mileage on All Roads

Vehicle Type	Registrations, 2009	Owner category	ESAL (FHWA)	Mileage Weights (all roads)	Registrations x ESAL x Mileage Weights	
Farm Semi Tractor	99	Agriculture	1.9	0.7	65.8	*
Farm Semi Trailer	133	Agriculture	1.9	0.7	88.4	*
Farm Trailer	85	Agriculture	0.02	0.2	0.3	
Farm Truck	317	Agriculture	0.0625	0.2	4.0	
House Car	397	Residential	0.0006	1.0	0.2	
Motorcycle	1,192	Residential	0	0.2	0.0	
N/A	536	n/a	n/a	1.0		
Other Bus	22	Business	1.25	0.7	19.3	
Passenger Car	18,693	Residential	0.0006	1.0	11.2	
Recovery Vehicle	28	Business	1	1.0	28.0	
School Bus	2	Business	1.25	0.7	1.8	
Semi Tractor	18	Business	1.9	5.5	94.1	*
Semi Trailer	490	Business	1.9	5.5	2560.3	*
Special Machinery	11	Business	1	1.0	11.0	
Trailer	3,746	Business/Residential	0.02	1.0	74.9	
Truck >11	242	Business	0.5	1.0	121.0	
Truck 7-11	8,138	Business	0.0625	1.0	508.6	
Total	34,149				3,588.9	
	65.9%	Residential			48.91	**1.4%**
	1.9%	Agricultural			158.6	**4.4%**
	32.2%	Business			3,381.4	**94.2%**

* Registrations multiplied by 1/2, because tractors and trailers are used jointly.

Table 4 shows the cost allocations using the rural road mileage weights. Agricultural vehicles now account for almost 28% of wear on county roads, while the business share is 71%. The residential share is still very small.

One conclusion is clear: residential vehicles put very little wear on county roads. Business and agricultural vehicles account for almost all road costs. The division between the agricultural and business

costs, however, is unclear. Assuming that farm trucks are driven much less than business trucks, agriculture puts little wear on roads. Assuming that farm trucks are driven on county roads more than business trucks, agriculture accounts for more than a quarter of road costs. Assuming that all vehicles are driven equal miles on county roads splits the difference.

Table 4.

Adams County, Road Allocation by Registrations

Vehicle Type	Registrations, 2009	Owner category	ESAL (FHWA)	Mileage Weights (rural roads)	Registrations x ESAL x Mileage Weights	
Farm Semi Tractor	99	Agriculture	1.9	5.6	526.7	*
Farm Semi Trailer	133	Agriculture	1.9	5.6	707.6	*
Farm Trailer	85	Agriculture	0.02	1.8	3.1	
Farm Truck	317	Agriculture	0.0625	1.8	35.7	
House Car	397	Residential	0.0006	1.0	0.2	
Motorcycle	1,192	Residential	0	0.2	0.0	
N/A	536	n/a	n/a	1.0		
Other Bus	22	Business	1.25	1.5	41.3	
Passenger Car	18,693	Residential	0.0006	1.0	11.2	
Recovery Vehicle	28	Business	1	1.6	44.8	
School Bus	2	Business	1.25	1.5	3.8	
Semi Tractor	18	Business	1.9	4.4	75.2	*
Semi Trailer	490	Business	1.9	4.4	2048.2	*
Special Machinery	11	Business	1	1.0	11.0	
Trailer	3,746	Business/Residential	0.02	1.6	119.9	
Truck >11	242	Business	0.5	1.6	193.6	
Truck 7-11	8,138	Business	0.0625	1.6	813.8	
Total	34,149				4,635.9	
	65.9%	Residential			71.39	**1.5%**
	1.9%	Agricultural			1,273.0	**27.5%**
	32.2%	Business			3,291.6	**71.0%**

* Registrations multiplied by 1/2, because tractors and trailers are used jointly.

Protection from Crime. The county government provides police protection through the sheriff's department, prosecution of crimes through the courts, and incarceration through the county jails. The county criminal justice system protects property from crimes such as theft and vandalism, and protects the lives of the public from crimes such as rape and murder. Criminal justice service costs, then, should be attributed partly to property, and partly to population.

Property can be measured by its market value, and the costs of protection divided up by the shares of residential, agricultural and business property in total value. This implies that more valuable property is more costly to protect, which may be a reasonable assumption. High valued property may be more likely to attract thieves, and so would require more protection, such as more frequent patrolling.

Population can be measured by service population. The county criminal justice system protects people within the county's boundaries, whether they are residents or not. The sheriff *does* respond to in-commuters who are threatened with personal crime. Service population is divided among residential, agricultural and business categories based on place of residence and place of employment.

The question, then, is how to divide criminal justice costs between the property value and service population cost shares.

The FBI collects and publishes crime data for many Indiana counties, showing the numbers of crimes of different types in the course of a year. Not all counties report crime data, and some crimes such as murder are rare (fortunately). Two years of statewide data are used to assure a large enough sample of crimes. Table 5 shows the numbers of crimes reported, by type of crime. The table is divided between personal crimes and property crimes. Almost 96% of total crimes are crimes against property.

Table 5.
Calculation of Personal and Property Crime Cost Shares

	Number, 2007 and 2008	Share of Total	Weights	Product	Share of Total
Personal crime					
Murder and nonnegligent manslaughter	34	0.1%	11,000,000	374,000,000	17.9%
Forcible rape	309	0.6%	313,000	96,717,000	4.6%
Robbery	342	0.7%	314,000	107,388,000	5.1%
Aggravated assault	1,378	2.9%	86,000	118,508,000	5.7%
Total Personal Crime	2,063	4.3%		696,613,000	33.3%
Property crime					
Burglary	11,994	24.8%	30,000	359,820,000	17.2%
Larceny-theft	31,139	64.4%	30,000	934,170,000	44.7%
Motor vehicle theft	3,140	6.5%	30,000	94,200,000	4.5%
Arson	221	0.5%	30,000	6,630,000	0.3%
Total Property Crime	46,273	95.7%		1,394,820,000	66.7%
Total, All Crime	48,336	100.0%		2,091,433,000	100.0%

Some crimes are more costly to prevent, or to investigate and prosecute after they are committed. A murder usually calls for more criminal justice resources than a burglary. Personal crimes are comparatively rare, but they may be more costly to prevent and are likely more costly to investigate and prosecute, and are more likely to involve extended jail-time.

Cohen et. al. (2004) surveyed 1,300 people nationwide to estimate the "cost of crime." The survey asked about people's willingness to pay to reduce the numbers of particular crimes. The sum of these figures over the population is the aggregate willingness to pay for a reduction in crime. The authors report the dollar amount the public is willing to pay, on average, to prevent a crime of a particular type.

Table 5 shows the cost of crime results in the column labeled "weights." The U.S. population would be willing, in the aggregate, to pay $11 million to prevent a single murder. The population would be willing

to pay $30,000 to prevent any of the different property crimes. The levels of these figures are less important than their relative values for our purposes. The public regards murder as 367 times more costly than burglary.

The products of the numbers of crimes and weights imply that people would have been willing to pay $374 million to prevent the 34 murders over two years, and $360 million to prevent the 11,994 burglaries. By these estimates, in total the public would have been willing to pay almost $2.1 billion to prevent the 48,336 crimes in 2007 and 2008. One-third of this amount would have been to prevent personal crimes, and two-thirds would have been to prevent property crimes.

For criminal justice costs, then, one-third will be allocated based on service population, and two-thirds will be allocated based on property value.

Revenue Allocations

Revenue allocations are more straightforward than cost allocations. Data are available to divide revenues among the residential, agricultural and business categories for the larger part of county and school corporation revenues. Here are the revenue allocation assumptions used in this study.

Property Tax. The property tax is the primary revenue source for most Indiana counties. It is the second most important revenue source for most Indiana school corporations, after state aid.

Indiana property tax data are divided into categories that easily can be classified into residential, agricultural and business categories. Residential includes property tax payments by homesteads, which are owner-occupied primary residences; non-homestead residential property, which are mostly small rentals and second homes; and commercial apartments, which are larger rental units. Farm homesteads are included within the *residential* category.

Agricultural includes tax payments on farmland and agricultural non-residential buildings. Business includes non-apartment commercial property, industrial property, utility property, and personal property, which is almost entirely business equipment. Unfortunately, agricultural equipment cannot be split from business equipment in total personal property. Tax payments on all personal property are classified in the business category. This slightly understates agricultural property taxes.

The shares of property tax payments in total property tax payments to the county governments, and to the school corporations, are used for the property tax revenue shares.

Local Income Taxes. Local income taxes are the second largest tax source for Indiana counties. School corporations receive a small fraction of their revenue from local income taxes.

Data on local income tax payments are not sufficient to divide revenues among residential, agricultural and business sources. Instead, county income data from the U.S. Department of Commerce, Bureau of Economic Analysis are used. This source provides county data on wage and salary disbursements, farm proprietors' income, and non-farm proprietor's income, which together make up the bulk of the tax base for the local income tax. The first category represents residential income, the second agricultural income, and the third business income.

The shares of these three income sources in the total are used to allocate the local income tax revenue shares.

Motor Vehicle Count. The state distribution for road construction and maintenance is a major revenue source for counties. School corporations, of course, do not share in this distribution.

State revenue for this distribution derives primarily from motor fuel taxes. However, it is distributed to counties through a set of formulas. The Motor Vehicle Highway (MVH) formula divides state revenues among counties based on the share of the county's road mileage in total road mileage, and the share of the county's vehicle registrations in total registrations. It is unclear how road mileage might be divided among residential, agricultural and business sources (though *road maintenance costs* can be divided among them, as described above). Vehicle registrations, on the other hand, are classified by residential, agricultural and business uses. Since the formula depends on the vehicle count, the number of vehicles in the residential, agricultural and business categories determine the amount of state aid the county receives. The shares of vehicle registrations in the three categories in each county are used to classify MVH formula revenue.

Business Vehicle Count. Counties can adopt local option vehicle taxes, called the motor vehicle excise surtax and the county wheel tax. The surtax is a tax on automobiles, motorcycles and light trucks, and so is classified as 100% residential. The wheel tax is a tax on heavier vehicles, so it is paid by agricultural and business vehicle owners. Wheel tax revenue is divided among the agricultural and business categories based on shares of each in total non-residential vehicle registrations.

Service Population. Charges and fees are paid by people who reside in the county, or who are in the county for their employment. For example, hospital receipts may be paid by residents, but an employee injured on the job may be treated at the hospital in the county where he or she works. Copy machine charges may relate to copies of records for residents or businesses. Golf course fees may be paid by residents, or by business people employed in the county who are not residents. Airport revenues may represent fees by aircraft owners who are residents, or fees for business-owned aircraft.

Such charges and fees are divided among the three categories based on service population shares, which are defined in the cost section.

Property Value. Some charges and fees are paid for services to property. Sanitation fees, trash collection fees, sewer fees, weed cutting fees and building permit fees are examples. Revenue from such charges and fees may be divided among residential, agricultural and business payers based on property values. Owners of bigger, more valuable properties probably pay more in such fees.

As described in the cost section, this study uses two tabulations of property value shares. One approximates farmland market value; the other uses farmland use-value, as defined by the Indiana assessment system. Both assumptions will be used for revenue allocations.

State and Federal Aid. Aid from higher levels of government is an important revenue source for counties, and the largest revenue source for school corporations. Aid is distributed by formula, so the elements of the formula provide the measures that ought to be used for revenue allocations. Most Federal aid formulas are based on resident population. Places with more people receive more aid. This implies that all of the revenue ought to be allocated to the residential category.

Indiana's MVH distribution is based on road miles and vehicle registrations, so the vehicle registration count is used to allocate revenues among the three categories (see above). Indiana's local road and street (LRS) distribution also provides revenue to counties for road maintenance and construction. Its formula is based on population, so the LRS revenue is allocated entirely to the residential category.

School corporations now receive almost all of their general fund revenue (for operating costs) from state aid. The aid formula is complex, but at its core is a per-pupil distribution. Pupils are residents of the county, so state school aid is distributed entirely to the residential category.

The school aid formula illustrates a difficulty with the COCS method in treating aid from higher levels of government. In 2009 Indiana eliminated the property tax for the school general fund, and replaced it with added state aid. The state sales tax was increased to provide extra revenue for this purpose. Sales taxes are paid by residential, agricultural and business people. It would be possible to allocate sales tax payments among these three groups. But the amount of sales tax paid by the three taxpayer categories in the school corporation *is not related* to the amount of aid the school corporations receive. All groups pay the taxes that fund state aid to schools, but the aid itself is distributed based on the numbers of people in the residential category.

Cost and Revenue Shares Compared

Table 6 shows a comparison of all the cost shares that are used in this study to allocate county and school corporation expenditures. The figures are the unweighted averages of 91 Indiana county shares for each property type. Note that the table adds two categories not described above: residential and business. Some costs, such as education, are allocated entirely to residential users. Some, such as industrial park costs, are allocated entirely to business. There are no costs allocated entirely to agriculture.

Table 6.
Cost Allocation Shares, Indiana Average

	Residential	Agricultural	Business
Property Values			
Farmland Market Value	50.7%	25.8%	23.5%
Farmland Use Value	60.0%	12.3%	27.7%
Service Population	85.7%	0.9%	13.4%
Prop Value/Svc Pop Average			
Farmland Market Value	68.2%	13.4%	18.4%
Farmland Use Value	72.8%	6.6%	20.6%
Vehicles			
Equal Mileage	3.5%	14.6%	81.9%
All Roads Mileage	1.9%	4.9%	93.2%
County Roads Mileage	1.9%	25.8%	72.3%
Public Safety			
Farmland Market Value	62.3%	17.5%	20.1%
Farmland Use Value	68.5%	8.5%	23.0%
Residential	100%	0%	0%
Business	0%	0%	100%

The residential share dominates the property value cost shares. The two property value shares differ based on how farmland is treated. If farmland market values are approximated, the agricultural share is 25.8%, more than double its share if the use value calculation used by Indiana assessors is accepted.

When market value is used, there are 16 (of 91) counties where the agricultural share is larger than the residential or business shares. When use values are used, there is only one county (Benton) where the agricultural share is largest. (Note that these are *unweighted* averages of property shares. Heavily industrial counties such as Elkhart, Marion or Vanderburgh are counted equally with the many rural counties, even though their total assessed value is much higher. Agriculture's share in total statewide assessed value is smaller than the unweighted average shows.)

The residential share is even more dominant in the service population cost shares. This is because the agricultural and business shares reflect employment. Employees are 64% of total population statewide, but only 23.8% of people's time is assumed to be devoted to employment. In most counties in-commuters are a small share of daytime population. The residential share accounts for all of people's time for 36% of the population, and the three-quarters of the time of everyone else. Agricultural employment is a tiny share of total employment, so the agricultural share of service population is very small. The residential share is largest, and the agricultural share smallest, in all 91 counties.

Many county services benefit people and property. For a number of services, then, costs will be allocated based on the average of the property value and service population shares. Since there are two ways to measure property value, there are two property value-service population averages. Both have similar shares for residential and business property, but the farmland market value share is double the farmland use value share.

The average of property values and service population is the "fall-back" allocation. Both the AFT and Penn State COCS guides recommend a general cost and revenue allocation assumption for categories which lack data to allocate in any other way. The property value-service population average is chosen because services are delivered partly to people and partly to property. Revenues are paid partly by people and partly by property owners.

Road maintenance and construction costs are allocated based on vehicle registrations, vehicle weights, and vehicle miles traveled. The data are open to interpretation, so three sets of assumptions are used. Under each of these assumptions the residential share is very small. Cars are lightweight and are not driven as much as commercial trucks, so they place little wear on roads. Business vehicles place the most wear on roads, because they are heavy and are driven many miles.

Differences in the three assumptions have the greatest effect on the agricultural cost shares. Data are not available to narrow down this wide range of agricultural cost share estimates. Vehicle registrations include heavy farm trucks. If all vehicles are driven the same number of miles on county roads, these heavy trucks create enough road wear to put the agricultural share of costs at 14.6%. Farm trucks appear to drive many fewer miles than business trucks. If non-farm trucks are driven on county roads in proportion to their miles traveled on all roads, the agricultural share is much smaller, at 4.9%. But if non-farm trucks are driven on county roads in proportion to their miles traveled on rural roads only (the roads most likely to be maintained by the county), and all farm truck miles are assumed to be on county roads, the agricultural share is much larger, at 25.8%. Under the equal miles and all road miles assumptions, business has the largest cost share in all 91 counties. Under the county miles assumption, agriculture has the largest share in 5 rural counties, business the largest share in the other 86.

The public safety cost shares are a combination of the property value and service population shares. There are many more crimes committed against property than people, but the public places a much higher value on preventing crimes against people than property. Based on the number of crimes and the public valuation, one-third of public safety costs are allocated based on service population, and two-thirds are allocated based on property value.

Again, because there are two cost allocations for property value, there are two public safety cost allocations. If farmland is valued based on its approximate market value, the agricultural share averages 17.5%. If farmland is valued based on its Indiana assessment use value, the agricultural share averages 8.5%.

Table 7 shows a comparison of all the revenue shares that are used in this study to allocate county and school corporation revenues.

Residential and business taxpayers pay the bulk of property taxes. The agricultural share is less. This is due mainly to the shares in urban and suburban counties, where the assessed value of homes and businesses is far more than the assessed value of farmland and farm buildings. In 43 of 91 counties, residential property owners pay the largest share of property taxes. In 43 other counties, business owners pay the most. And in 5 rural counties, agricultural taxpayers pay the largest share of property taxes.

Table 7.
Revenue Allocation Shares, Indiana Average

	Residential	Agricultural	Business
Property Tax	43.3%	16.4%	40.4%
Income Tax	84.9%	2.8%	12.2%
Motor Vehicle Count	65.3%	2.1%	32.6%
Business Vehicle Count	0.0%	15.1%	84.9%
Service Population	85.7%	0.9%	13.4%
Property Value			
Farmland Market Value	50.7%	25.8%	23.5%
Farmland Use Value	60.0%	12.3%	27.7%
Prop Value/Svc Pop Average			
Farmland Market Value	68.2%	13.4%	18.4%
Farmland Use Value	72.8%	6.6%	20.6%
Residential	100%	0%	0%
Agricultural	0%	100%	0%
Business	0%	0%	100%
Residential-Business	50%	0%	50%

It is interesting to compare the property tax shares to the property value-farmland use value shares. The former are the shares of the property tax actually paid by the owners of each property type. The latter are the assessed values of property. Residential property makes up 60.0% of assessed value, but pays only 43.3% of property taxes. Indiana offers homeowners large deductions from taxable assessed value. Agriculture and business pay tax bill shares well in excess of their assessments.

Income tax shares are dominated by the residential category, because wage and salary income is much greater than business and farm proprietor's income. Indiana's state and local revenue system has shifted

away from property taxes, towards income taxes over the past several decades. Clearly this is a shift in tax payments towards residential taxpayers, away from agricultural and business taxpayers.

The motor vehicle count is also dominated by residential vehicles. More passenger cars are registered than any other kind of vehicle. These shares are used for the MVH road funding formula allocation, which depends on total registered vehicles of any type, so factors such as vehicle weight or miles traveled are not considered. The same is true for the business vehicle count, which merely excludes passenger vehicles from the total. These shares are used to allocate the wheel tax on heavy vehicles.

Service population is used to allocate most charges and fees, and it too is dominated by the residential category. Most charges and fees are paid by county residents. Some fees are paid by property owners for services to property. These are allocated based on the two property value share assumptions. Residential is the largest category, but agriculture and business owners pay substantial amounts.

The property value-service population average is the "fall-back" allocation assumption for revenues, as well as costs.

Allocating County Funds and Revenues

The next part of the COCS process is to allocate local government costs and revenues to the residential, agricultural and business categories, based on the appropriate cost and revenue allocation shares.

The budget data are derived from the Indiana's budget form 4-B, known as the "16-line form." This form is filed by every local government for every separate fund, showing planned appropriations, the fund's property tax levy, non-property tax revenues and balances. The data are compiled for every local government by the state's Department of Local Government Finance, and made available in the local government data base.

In total there are 146 different revenues and 457 funds used in at least one county (excluding "generic" and "dummy" funds). Each revenue and fund is allocated to residential, agricultural and business categories based on one of the above allocation assumptions. Fortunately, 12 funds make up 95% of total county appropriations, and 20 revenue sources make up 93% of total revenues. These funds and revenues will be discussed here.

Tables 8 and 9 show the allocation decisions made for costs (that is, appropriations) for the major county funds, and the major county revenue sources. The percentages show the shares of each fund or revenue category in the total for the 91 counties for which data were available. Shown are funds with more than one percent of total costs or half a percent of total revenues.

General fund costs comprise more than 70% of the county total (Table 8). These are primarily wages and salaries of county employees, and include county administration (auditor, treasurer, commissioners, etc.), the sheriff, courts and jail, and many other functions. Unfortunately, data are not available to divide this fund into more detailed categories. The "fall-back" cost shares—the service population-property value average—are used to allocate general fund costs.

Table 8.
Cost Allocation of Major County Funds

Fund Code	Fund Name	Share of Appropriations	Basis for Cost Allocation
0101	GENERAL	70.0%	Svc/Prop
0702	HIGHWAY	10.5%	Vehicles
0790	CUMULATIVE BRIDGE	3.5%	Vehicles
0801	HEALTH	2.4%	SvcPop
0706	LOCAL ROAD & STREET	1.9%	Vehicles
2391	CUMULATIVE CAPITAL DEVELOPMENT	1.9%	Svc/Prop
0123	REASSESSMENT	1.5%	Property
1301	PARK & RECREATION	0.9%	Residential
1185	JAIL LEASE RENTAL	0.8%	PublicSafety
0180	DEBT SERVICE	0.7%	Svc/Prop
0188	DEBT SERVICE EXEMPT FROM CIRCUIT BREAKERS	0.7%	Svc/Prop
0792	COUNTY MAJOR BRIDGE	0.6%	Vehicles
		95.3%	

Four of these twelve funds are related to roads, and combined they comprise 16.5% of costs. They are allocated based on the three different versions of the vehicle cost shares. The cumulative capital development fund is a kind of savings account for large capital projects. This infrastructure is likely to provide services to both people and property, so its costs are allocated based on the service population-property value "fall-back" cost shares. Parks and recreation spending are intended for county residents, and are allocated entirely to the residential category. The jail lease rental fund effectively pays debt service on jail construction bonds. It is allocated using the public safety cost shares. The two debt service categories are treated differently by one of Indiana's property tax relief programs. Both pay for general infrastructure, and since details about the nature of these facilities are unavailable, the service population-property value cost shares are used.

Table 9 shows twenty major revenue sources for counties, comprising 93% of total county revenues. Of these, the property tax is by far the largest. It is allocated based on the property tax revenue shares, of course.

The COIT, CAGIT and CEDIT income taxes are the three income taxes collected by counties. They all tax the same income, and are allocated based on income shares. The MVH distribution is allocated using the vehicle count, and the LRS distribution is allocated to residential, as described above. The auto and aircraft excise tax is the motor vehicle excise tax, a tax mainly on light motor vehicles. Since this excludes most business vehicles (which are taxed by the commercial vehicle excise tax, CVET), the tax is allocated entirely to the residential category.

Interest is earned on county investments, which are county fund balances. Balances are derived from an excess of revenue over expenditures, and so are a combination of all revenue sources. It is allocated using the broad "fall-back" cost shares, service population-property value.

Table 9.
Revenue Allocation of Major County Revenues

Revenue Code	Revenue Source	Share of Misc. Revenues	Basis for Revenue Allocation
0100	PROPERTY TAX	51.4%	PropertyTax
1416	MOTOR VEHICLE HIGHWAY/COUNTY HIGHWAY DIST.	8.3%	Vehicles
0212	COUNTY OPTION INCOME TAX (COIT)	8.1%	Income
0203	COUNTY ADJUSTED GROSS INCOME TAX (CAGIT)	7.4%	Income
0202	AUTO AND AIRCRAFT EXCISE TAX	4.0%	Residential
6100	INTEREST ON INVESTMENTS	3.6%	Svc/Prop
1417	LOCAL ROAD AND STREET DISTRIBUTION	1.5%	Residential
4103	CLERK OF CIRCUIT COURT	1.1%	Svc/Prop
6500	NON-IDENTIFIED REVENUE	1.0%	Svc/Prop
2711	REIMBURSEMENTS	0.8%	Svc/Prop
2109	COUNTY SHERIFF	0.7%	Svc/Prop
2108	COUNTY RECORDER	0.6%	Svc/Prop
4100	FINES AND FEES	0.6%	Svc/Prop
1701	RIVERBOAT	0.6%	Res/Bsns
1120	4-D PROGRAM	0.6%	Residential
2504	EMERGENCY MEDICAL SERVICES	0.6%	SvcPop
0213	COUNTY ECONOMIC DEVELOPMENT INCOME TAX (CEDIT)	0.6%	Income
1122	CARE OF FEDERAL PRISONERS	0.5%	Residential
2505	HEALTH DEPARTMENT	0.5%	Residential
0207	COUNTY WHEEL TAX	0.5%	BsnsVehicles
		93.0%	

Several fines, charges, fees and other collections are allocated using the service population-property value shares. Some charges are paid for services to people, some for services to property. These are fines, charges and fees to the circuit court, the county sheriff, the county recorder, and the category simply labeled "fines and fees." In addition, two miscellaneous categories, non-identified revenue and reimbursements, are also allocated based on the "fall-back" shares.

Some counties receive revenues from riverboat casinos. Some of these revenues are paid out of casino profits, some out of charges to patrons. Some of the patrons are local residents, some are tourists. Agriculture does not play a role. Half the riverboat revenues are allocated to residential, half to business.

The 4-D program is federal aid for child support enforcement. It is allocated entirely to residential. Emergency medical services are available to the daytime and nighttime population of the county, so the fees paid for such services are allocated using service population shares.

The Federal government pays counties for the care of federal prisoners. Most federal aid formulas are based on population, and more populous counties probably house more federal prisoners. This aid is allocated entirely to residential. People pay fees to the health department for services such as flu shots. Counties make these services available for their own residents, so all health department fees are allocated to the residential category. Finally, the county wheel tax is a tax on heavy vehicles, so it is allocated to the agricultural and business categories based on the vehicle registration count.

Allocating School Corporation Funds and Revenues

The school corporation budget data also are derived from the Indiana's budget form 4-B. The fund or cost allocation for school corporations is quite simple. There are only 17 school funds (as opposed to 457 county funds), and *all are allocated to the residential category*. COCS analysis assumes that the costs of school services depend on the number of students who reside in the school corporation. As the American Farmland Trust guide says, "citizens directly demand these services," and COCS studies "measure this demand, not the public good to be derived from it" (AFT 1993, p.15).

Revenues of school corporations are simple as well. Of the total, 66% is state aid, and 28% is property tax revenue. Another 2% is motor vehicle excise tax revenue. These three sources comprise 96% of school corporation revenue. The state aid formula is based on numbers of students, so it is allocated entirely to the residential category. Property tax revenue is allocated based on property tax shares. The motor vehicle excise tax is paid by owners of light vehicles, so it is allocated entirely to residential.

Calculating the Cost of Community Service Ratios

Once the cost and revenue shares are determined, and shares are assigned to the various funds and revenue sources, the calculation of the ratios is mechanical. Shares are multiplied by appropriations in each fund, to allocate costs among residential, agricultural and business. Shares are multiplied by revenues in each revenue category, to allocate revenues among residential, agricultural and business.

Table 10 shows the importance of each method in allocating total county costs and revenues. On the cost side, the average of service population and property values (defined either way) is by far the most important. This is because it is used to allocate appropriations for the general fund, which is the largest fund for county governments. The vehicle method (defined several ways) is second most important, because it is used to allocate road maintenance appropriations. These are usually the next biggest funds in county government. Together, these two methods allocated more than 90% of county costs.

The revenue side is not quite so concentrated. Property tax payments are the most important allocation method, because property taxes are the largest county revenue source. Income is second, because the various local income taxes are the next most important revenue source for counties. Vehicles enter as the allocation method for the major state aid distribution for road maintenance. The service population-property value average is used to allocate the many charges, fees and fines, which together add up to significant revenue. Almost ten percent of revenues are allocated entirely to the residential category. This represents several state and federal aid programs, which are distributed based on population. These five allocation methods comprise more than 95% of revenues.

School corporation costs are entirely allocated to the residential category. School corporation revenues are allocated 68% to residential, because of the very large share of total revenue that is state aid. The formula is based on enrollment. Property tax payments allocate another 26% of school corporation revenues. These two methods serve to allocate 94% of the total.

Table 10.
Costs and Revenue Allocations by Method, for Indiana Counties

Allocation Method	Costs	Revenues
Property Value	1.6%	0.3%
Service Population	3.3%	0.9%
Vehicles	16.8%	8.3%
Business Vehicles		0.5%
Public Safety	1.5%	
Service Pop./ Property Value	75.2%	10.8%
Property Tax Payments		51.4%
Income		16.4%
Residential 100%	1.5%	9.8%
Business 100%	0.04%	0.8%
Residential 50% Bsns. 50%		0.8%
Total	100.0%	100.0%

There were 293 school corporations and 92 counties in Indiana in 2009. School corporation costs and revenues must be combined into county units to produce combined ratios for county government and school corporations by county. This is obvious for the school corporations that are entirely within a single county. However, 43 school corporations are in more than one county. Costs and revenues for these cross-county school corporations must be divided among the counties in which they are located.

This is easily done for the property tax, because data are available for tax payments in each county. Other revenue sources, and appropriations, are not divided by county. As a solution, the share of residential gross assessed value in each county is used to allocate all cross-county school corporation non-property tax costs and revenues among counties. This part of assessed value is used because both costs and most non-property school revenues are allocated entirely to the residential category.

Data are available for all counties but LaPorte, and all school corporations but those in LaPorte. Data for LaPorte have not been available since 2006, due to administrative problems with assessment.

Local governments must balance their budgets. In 2009 appropriations exceeded revenues in most counties and school corporations. The difference was covered by drawing down balances. The amount of balances used is treated as a revenue source in this study, and allocated based on the residential, agricultural and business shares of all other revenues combined. This allocation is used because balances were accumulated when revenues exceeded appropriations in the past. Balances are thus the sum of past revenue sources, and current combined revenue allocations are the best indicator of the sources of those revenues.

Likewise, in some local units revenues exceeded appropriations in 2009. The difference was added to balances. The addition to balances is counted as an added appropriation or cost in this study. Eventually this revenue will be spent, so it is allocated based on the residential, agricultural and business share of all other costs combined.

As a result of this treatment of balances, the school corporation and county government revenue and cost totals by county are identical. The overall ratio of costs to revenues will be one.

Ratios are calculated by dividing the allocated costs by the allocated revenues for the residential, agricultural and business categories, for each county. Ratios greater than one indicate that the category imposes more in costs, or receives more in services, than the revenues it pays. Ratios less than one indicate that the category pays more in revenues than the costs it imposes.

Results for Counties

With two property value and three vehicle share allocations, there are six cost of community service ratios to calculate. In addition, we add a "standard" calculation, based on use value assessment of farmland, and using the vehicle count (unadjusted for vehicle weight or mileage). These share allocations seem closest to what is usually done in COCS studies. There is only one set of school share allocations, so the school calculations do not add to the number of ratios. County by county results are shown in the appendix tables.

Table 11 shows the results for counties. These are weighted statewide averages of 91 counties. That is, the revenues and costs were summed for the state, and ratios calculated for the sums. This means larger counties have greater weight in the totals than smaller counties do.

The first set of ratios is labeled "standard." This is an attempt to use allocation shares that are most like those used by past COCS studies. In particular, farm land property values are measured by the assessment system's use value assessment, and road costs are allocated using the vehicle count, without considering vehicle weight or miles driven. The residential ratio is greater than one, meaning that the costs assigned to the residential category are greater than revenues derived from residential category. The agricultural and business ratios are less than one, meaning revenues exceed costs from these categories.

Table 11.

COCS Ratios for County Governments, Indiana Averages (91 Counties)

Allocation Share Assumptions	Residential	Agriculture	Business	Total
Standard: Use Value; Vehicle Count	1.171	0.618	0.723	1.000
1: Use Value; Vehicle Weights, No Mileage	0.996	1.023	1.004	1.000
2: Market Value; Vehicle Weights, No Mileage	0.969	1.523	0.979	1.000
3: Use Value; Vehicle Weights, All Mileage	0.992	0.723	1.055	1.000
4: Use Value; Vehicle Weights, County Mileage	0.992	1.396	0.960	1.000
5: Market Value; Vehicle Weights, All Mileage	0.965	1.247	1.031	1.000
6: Market Value; Vehicle Weights, County Mileage	0.965	1.865	0.935	1.000

These results are similar to those of past studies. The 125 studies that Kotchen and Schulte reviewed had an average residential ratio of 1.18, and average agricultural ratio of 0.50, and an average business ratio of 0.44. The residential ratio here is quite close; the agricultural and business ratios are somewhat higher. Both non-residential ratios are well within the distribution of ratios from past studies (see the frequency charts in Figure 1 above). Most important, the residential ratio is greater than one, and both the agricultural and business ratios are less than one. This is the usual result.

Allocation 1 uses the use value of farm land, the same as the standard allocation. But it uses the road cost allocation using vehicle weights, assuming all vehicles travel the same miles. All the ratios move very close to one. The reason for this change is clear from Tables 6, 7 and 10. Table 7 shows the allocation shares for vehicle count (used in the standard allocation), and table 6 shows the shares for the "equal mileage" version of the vehicle weight and mileage allocation share. There are many more passenger cars than there are agricultural or business trucks, so 65.3% of road costs are assigned to the residential category using the motor vehicle count. But heavy trucks put much more wear on roads than do passenger cars, so the agricultural and business shares of road costs increase substantially when vehicle weights are considered. Only 3.5% of road costs are assigned to residential.

Table 10 shows why the treatment of vehicles matters so much for the COCS ratios. In total, 16.8% of costs are allocated using the vehicle shares. It is the second most important set of allocation shares. Its importance is due to the large share of county appropriations that are road construction and maintenance. This is shown in table 8, the cost allocation by major county funds. The funds labeled highway, cumulative bridge, local road and street, and county major bridge sum to 16.5% of state appropriations.

The cost shares are both very different in their allocations to the three categories, and are very important in allocating total costs. The allocation share assumption for road costs makes a major difference in COCS results. (Note that the combination of Tables 6, 7 and 10 provides transparency for the COCS results. If we know the category shares for each allocation method, and we know the importance of each method in allocating costs, we can calculate the overall cost shares.)

Allocation 2 makes an additional change, measuring property values with the estimated market value of farm land, rather than the use value assessment. The residential and business ratios drop marginally from allocation 1, but the agricultural ratio jumps to 1.523. This ratio implies that agriculture costs counties almost half again as much as it pays in revenues.

Again, the differences in the cost shares and their importance in allocating appropriations show the reasons for this ratio. The farmland market value share for agriculture is more than double the use value share (Table 6). The residential and business shares are smaller using farmland market value, but not by such a large factor. Property values make up half of the most important set of allocation shares, the service population-property value average. In total 75.2% of total county appropriations are allocated using this set of shares (Table 10), including the county general fund. In addition, 1.6% of costs are allocated by property value alone. A much smaller share of revenues are allocated using property values (only 11% of revenues, in total).

The results from the standard allocation, and allocations 1 and 2, show that the treatment of vehicle weight makes a large difference in the ratios for all three categories, and the treatment of farmland property value makes a large difference for the agricultural ratio, but not the residential and business ratios.

Allocations 3 through 6 explore the effects of two assumptions about vehicle mileage. Allocations 3 and 4 use the farmland use value shares. Allocation 3 assumes vehicles drive on county roads in proportion to their travel on all roads. As shown in Table 6, this assumption assigns a very high share of road costs to business vehicles, and a very small share to agriculture. Allocation 4 assumes vehicles drive on county roads in proportion to their travel on all rural roads, with farm vehicles assumed to travel only on county roads. This allocation assigns a much larger share to agriculture.

In effect, these two assumptions bracket the real situation. Survey results show that farm trucks travel many fewer miles than business trucks. Allocation 3 assumes that the proportion of these miles traveled

on county roads is the same for business and farm trucks. But it seems likely that farm trucks spend more miles on county roads. Allocation 4 assumes that farm trucks spend all their miles on county roads. But, of course, farm trucks travel on state roads and interstates as well. The actual farm truck mileage on county roads must be between these two assumptions.

The ratio results under these two assumptions are not so different for the residential and business categories. There is a small difference for the residential ratio, beyond the third decimal place. But under either assumption residential vehicles put almost no wear on county roads. The business category costs more than the revenue it pays under the all mileage assumption; less than the revenue it pays under the county mileage assumption. In each case, those, the business ratios are near one.

The mileage assumption makes a huge difference for the agricultural ratio. The all mileage assumption with use value assessment produces a ratio of 0.723. Agriculture costs less than the revenue it generates. The county mileage assumption with use value assessment produces a ratio of 1.396. Agriculture costs more than the revenue it generates. Actual mileage must be between these two, so the actual ratio (assuming use value farmland assessment) must be between these two. But the range is so wide that little can be said about agriculture's relative costs and revenues for counties.

Allocations 5 and 6 make a similar comparison of the two vehicle mileage assumptions, using the estimated farmland market value assumption. Again, the assumption makes no real difference for the residential ratio. Business costs a bit more than it pays under the all mileage assumption, and costs less than it pays under the county mileage assumption.

Again, the assumption makes the biggest difference for the agricultural ratio. Under the all mileage assumption, using the estimated farmland market value, the agricultural category costs 24.7% more than it pays in revenue. Under the county mileage assumption, agriculture costs 86.5% more than it pays in revenue. The range is wide, but this time the question is whether agriculture costs more, or much more, than it pays in revenue.

Under cost allocation assumptions 1 through 6, the business ratio ranges from 0.935 to 1.055. Business costs are always within 6.5% of business revenues. Under assumptions 1 through 6, residential costs slightly less than its revenues.

We might be justified in assigning costs based on the use value of farmland. Market value includes the speculative value of the land's transition to other uses, which may not impose costs on county government. Or, we might be justified in assigning costs based on the market value of farmland. All other property is treated this way, and some services, such as sheriff's protection, might be valued partly by the value of property that is protected. In Indiana, use values are much less than market values. *It is unclear which assumption is best.* How the value of farmland is treated makes a big difference in the COCS results for agriculture.

We might be justified in assigning road costs based on vehicle counts. There are more passenger cars on the roads than there are trucks, so the residential category benefits from roads more than the business and agricultural categories. We might be justified in assigning road costs based on the wear vehicles put on the roads, which then must take account of vehicle weights. And in that case, we need to know how much the heavy vehicles drive on county roads, since it's the heavy vehicles that create almost all road wear. *We don't know how much farm vehicles use county roads, relative to business vehicles.* Two assumptions that bracket the possibilities produce a wide range of COCS ratios for agriculture, from 0.723 to 1.865.

Results for Schools and Counties

The results for school corporations are comparatively simple. All costs are allocated to the residential category. There are only two main revenue sources, state aid, which is allocated to residential, and property taxes, which are allocated based on actual payments by property type.

Because all costs are allocated to residential, the ratios for the agricultural and business categories are zero. Zero costs divided by the property tax shares (and some minor revenue sources) is zero. The residential ratio must then be greater than one. School budgets are balanced, meaning costs equal revenues. Agriculture and business pay some school revenues, but account for no school costs. Dividing the full cost of schools by only part of school revenues produces a ratio greater than one. (These zero ratios are sometimes cited as a disadvantage of COCS studies. Business and agriculture pays school revenues but the ratios give no information about how much or how little.)

The 91-county average school corporation cost of community services ratio for the residential category is 1.172. The residential category costs school corporations 17.2% more than the revenues it pays.

Table 12 shows the 91-county average COCS ratio results for the sum of counties and school corporations. These results are much like those of the many studies reviewed by Kotchin and Schulte. Again, in these 125 studies, the average residential ratio was 1.18, the average agricultural ratio was 0.50, and the average business ratio was 0.44. Under the seven sets of assumptions, the residential ratios are slightly lower than that average, but the agricultural and business ratios are both above and below the average from past studies. Again, most important, the residential ratio is greater than one, while the agricultural and business ratios are less than one. Combined county and school costs exceed revenues for the residential category, while revenues exceed costs for the agricultural and business categories.

Table 12.

COCS Ratios for County Governments and School Corporations, Indiana Averages (91 Counties)

	Residential	Agriculture	Business	Total
Standard: Use Value; Vehicle Count	1.172	0.208	0.268	1.000
1: Use Value; Vehicle Weights, No Mileage	1.147	0.344	0.372	1.000
2: Market Value; Vehicle Weights, No Mileage	1.143	0.542	0.362	1.000
3: Use Value; Vehicle Weights, All Mileage	1.146	0.243	0.391	1.000
4: Use Value; Vehicle Weights, County Mileage	1.146	0.469	0.356	1.000
5: Market Value; Vehicle Weights, All Mileage	1.142	0.444	0.381	1.000
6: Market Value; Vehicle Weights, County Mileage	1.142	0.663	0.346	1.000

These results are so different from the county results because school corporation appropriations and revenues are far larger than county appropriations and revenues. For the 91 counties in 2009, county appropriations totaled $2.3 billion, and school corporation budgets totaled $10.0 billion. The combined results are dominated by the fact that the residential ratio for schools is greater than one, and the agricultural and business ratios for schools are both zero.

The residential ratio is highest, and the agricultural and business ratios lowest, using the standard assumptions of use value assessment of farmland and the vehicle count to allocate road costs. The various assumptions in allocations 1 through 6 have almost no effect on the residential ratio, and little effect on the business ratio. The agricultural ratio is affected, but in no case does it approach one.

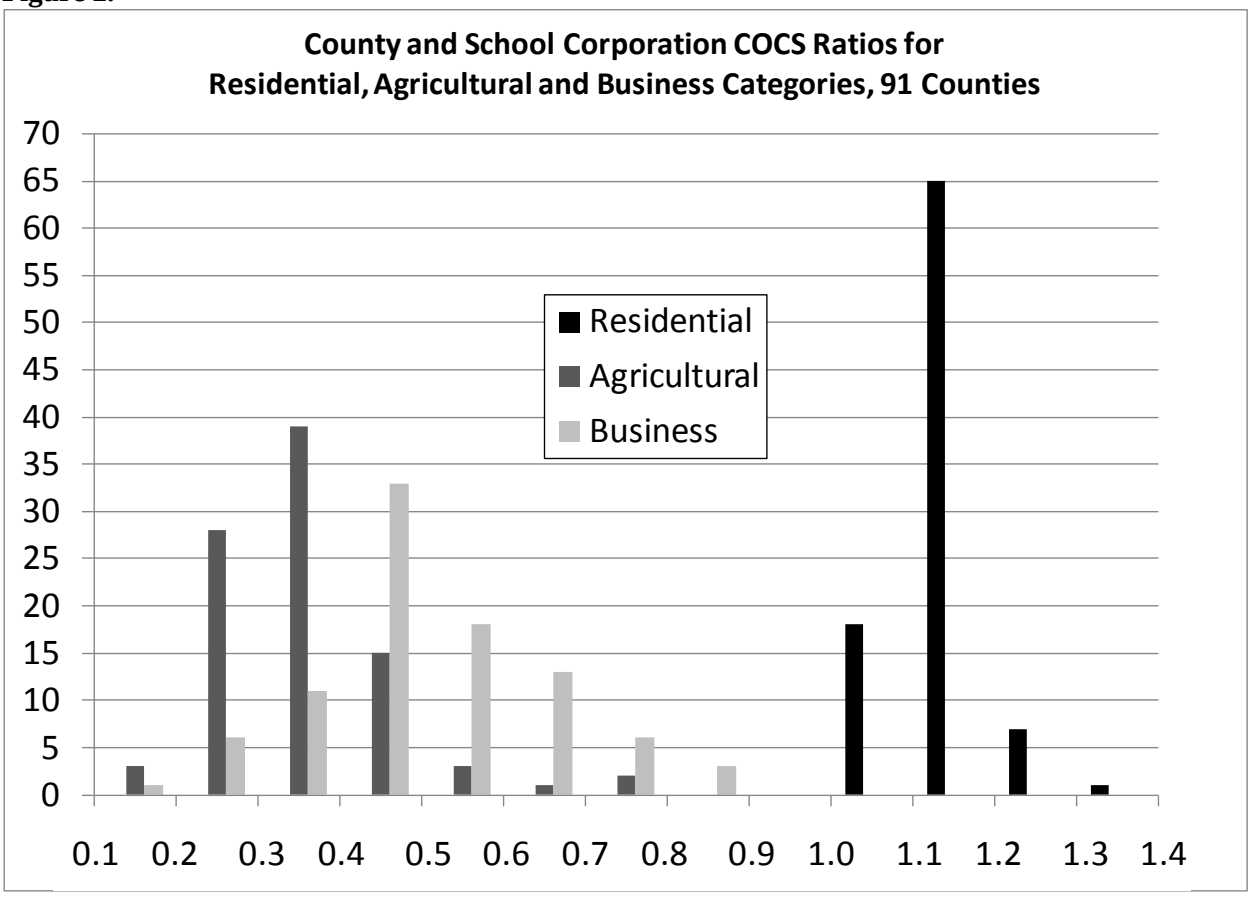
No matter what assumptions are made about county costs, when counties and school corporations are considered together, the residential category has costs greater than revenues, and the agricultural and business categories have revenues greater than costs.

Results by County

An advantage of calculating cost of community service ratios for 91 counties at once is the ability to compare results among counties. The appendix reports the county results under seven allocations. Figure 2 shows the results for Allocation 1, which assumes use value assessment for farmland, takes account of vehicle weights but assumes equal mileage for all vehicles. This allocation is chosen because it has ratio values towards the middle of the range of results shown in Table 11.

Figure 2 shows that the residential results are most concentrated. In 65 of 91 counties the residential ratio is between 1.1 and 1.2. Most of the remaining counties are in the 1.0 to 1.1 range. Agricultural ratios are the next most concentrated, with 67 of 91 counties in the 0.2 to 0.4 range. Most of the other counties are in the 0.4 to 0.5 range. Business ratios are least concentrated. The 0.4 to 0.7 range contains 64 counties, but there are 18 counties with lower ratios and 9 with higher ratios. Kotchen and Schulte found a similar pattern among their 125 studies (Figure 1). Residential results are more concentrated than agricultural or business ratios.

Figure 2.



The reasons for this range of values for all three ratio categories can be investigated using regression analysis. Recall that ratios greater than one mean that costs exceed revenues; ratios less than one mean that revenues exceed costs. The 91 ratios for each category are regressed on several county measures.

The first measure is *county population* for 2009, which serves as an urban-rural measure. Counties with bigger populations tend to be more urban. We have no expectations about the direction of the effect of population on the ratios. Urban and rural counties may well be different; this variable will test for that difference.

The second measure is the *share of school appropriations in total school and county appropriations*. Since school appropriations are allocated entirely to the residential category, counties with more school appropriations should have a higher residential ratio, and lower agricultural and business ratios.

The third measure is the *share of property tax revenue in total school and county revenue*. The main alternatives to the property tax are the local income taxes and state school aid. Both alternatives are allocated substantially to the residential category, so a greater reliance on the property tax will increase revenues received from agriculture and business. Revenues are in the denominator of the ratios, so greater reliance on the property tax should reduce the business and agricultural ratio, and increase the residential ratio.

The fourth measure is the *ratio of service population to resident population*, which will be greater in counties with more in-commuters. This is another urban measure, since cities tend to be employment centers. If there are more in-commuters, more of the costs of county services are allocated to the business category. Costs are in the numerator of the ratios, so this should increase the business ratios.

The fifth and sixth measures are the *shares of agriculture and business in the market value of property*. Given the county's use of the property tax, the greater are these shares, the greater should be the revenues collected from agriculture and business, so the *smaller* should be their ratios. However, property shares are also used to allocate costs. If agriculture or business has a larger share, more costs will be allocated to agriculture or business. This would *increase* their ratios. The effect of these measures will indicate whether the cost or revenue effects are more important.

The seventh measure is the *share of county road and bridge appropriations* in total county and school appropriations. Ratios from Allocation 1 use vehicle weights, so road and bridge costs are allocated primarily to business property. Counties with more road and bridge appropriations should see larger business ratios.

Regression results are shown in Table 13. Levels of significance are marked with asterisks. Measures without asterisks have no apparent influence on the ratios. The R-squared and F-statistics indicate the explanatory power of the regressions on each set of ratios. The seven measures explain more than 80% of the variation in the residential and business ratios, and about half of the variation in the agricultural ratios. The F-statistics indicate that the measures are jointly significant, meaning that together they do have measurable effects on the ratios.

Perhaps the biggest surprise in these results is that the population and in-commuter measures do not have significant effects on the size of the ratios. These are the two main measures that distinguish urban from rural counties. County population does not matter for any of the COCS ratios. And, apparently the effect of the number of in-commuters on costs, through the service population measure, is too small to be measured. High or low ratios for residential, agricultural and business categories are not an urban-rural phenomenon, at least according to these measures.

Table 13.
Regression Results, 91 County COCS Ratios

Measure	Residential	Agriculture	Business
Population (millions)	-0.002	0.029	0.090
School Share of Appropriations	0.281 ***	-1.549 ***	-2.006 ***
Property Tax Share of Revenues	0.617 ***	-0.396 **	-1.116 ***
In-Commuter Ratio	-0.132	0.407	0.201
Agriculture Share of Market Value	0.309 ***	-0.173 **	-0.178 ***
Business Share of Market Value	0.425 ***	0.092	-0.549 ***
Road/Bridge Share of Appropriations	-0.124 ***	0.531 ***	0.836 ***
Constant	0.715 ***	1.184 **	2.196 ***
R-squared	0.830	0.483	0.858
F-statistic	57.83 ***	11.07 ***	71.64 ***

***Significant at the 1% level
** Significant at the 5% level
* Significant at the 10% level

The school share of appropriations is significant with the expected signs in all three regressions. Where school appropriations are large, the share of costs allocated to the residential category is larger, and the share allocated to the other two categories is smaller. This makes the residential ratio larger (shown by the positive sign on the coefficient), and makes the agricultural and business ratios smaller (shown by the negative signs).

The property tax share of revenues is also significant with the expected signs in all three regressions. The property tax is paid more by agriculture and business, and less by residential, than other major revenue sources. A greater reliance on property taxes means that the residential category pays less in revenue relative to costs, so its ratio is higher. With more property taxes, the agricultural and business categories pay more, making their ratios smaller.

The agricultural and business shares of market value have positive effects on the residential ratio. Higher non-residential property shares mean that more of the property tax is paid by non-residential taxpayers, which makes the residential ratio lower. Higher non-residential shares could also mean that non-residential costs are greater and residential costs lower. Because the signs are positive, the revenue side dominates.

The negative effect of the business share of market value on the business ratio, and of the agricultural share of market value on the agricultural ratio, also shows that the revenue side dominates. The insignificant coefficient of the business share on the agricultural ratio may mean that the cost and revenue sides offset. The negative effect of the agricultural share on the business ratios is curious. If the agricultural share is higher, the business share may be lower. Business costs or revenues could be lower

as a result. Since the sign is negative, a higher agricultural share makes the business ratio smaller. The higher agricultural share apparently reduces business costs more than business revenues.

The road and bridge share of appropriations has the biggest effect on the business ratio. The analysis allocates more costs to business in counties that spend more on roads. More business costs mean higher business ratios. The effects on the agricultural ratios is smaller, but still positive and significant. The effect on residential is negative. Little in road costs are allocated to the residential category, so a greater share of road appropriations reduces the residential ratio.

We can ask the urban-rural question again with these results. Population is closely correlated with the agricultural share of market value, and with the road and bridge share of appropriations. Rural counties with smaller populations have a larger agricultural share. Rural counties also have a smaller share of road and bridge appropriations, because are larger share of road mileage is maintained by cities and towns. (Note that the fact that population is closely correlated with these two variables may explain why population is not significant in any of the regressions. Its effects of population are covered by the other two measures.)

A rural county, then, is one with a lot of farm property and less road spending. In the residential equation, the agricultural share has a positive sign, while road appropriations have a negative sign. The coefficient on the agricultural share is larger and more significant, so it probably dominates. This implies that, in rural counties, the residential ratio is likely to be larger.

Likewise, these two measures have differing signs in the business equation. In this case, though, the road measure has the larger coefficient. In rural counties, the business ratio may tend to be larger. The same analysis applies to agriculture.

In summary, the residential ratio tends to be larger where schools are a more important part of the local government mix, where property taxes are a more important revenue source, and where non-residential property is more important in the tax base. Rural counties may have somewhat higher residential ratios.

The business ratio tends to be smaller where schools are a more important part of spending, and where the property tax is a larger share of revenues. Increases in both the agricultural and business shares of property value reduce the business ratio. The business ratio is larger where counties spend more on roads. Rural counties may have somewhat higher business ratios.

The agricultural ratio also tends to be smaller where schools are a more important part of spending, and where the property tax is a larger share of revenues. A agricultural ratio is larger where counties spend more on roads, so rural counties may have higher agricultural ratios.

Policy Analysis

The cost of community services ratios can be used to analyze changes in state policy. Three policy changes are examined here. Indiana has shifted its local government funding away from property taxes, towards local income taxes. Indiana has increased the property tax deductions provided to homeowners. Indiana has shifted the funding of the school corporation general fund from property taxes to state aid.

Local Income Taxes. The first local income tax was introduced in Indiana in 1973, as part of the Bowen administration's efforts to reduce reliance on property taxes. Since then several additional local income taxes have been made available. As of 2009, Indiana local governments collected about $1.5 billion in local income taxes, and about $6 billion in property taxes. A few counties collected more in income taxes than in property taxes, which has only recently become possible.

What has been the effect of this move towards income taxes on the COCS ratios? Clearly there *will* be an effect. Table 7 shows that income tax revenue is allocated mostly to the residential category, while property tax revenue is allocated mostly to the two non-residential categories. So, replacing property tax revenues with income tax revenues has increased the revenue share paid by the residential category, and decreased the non-residential share. The residential ratio has decreased (revenues will cover more costs), while the agricultural and business ratios have increased (revenues will cover less costs).

The analysis is easily done. The local income tax revenues are reallocated using the property tax allocation shares, so they are assigned to the residential, agricultural and business categories as if they were property tax revenues. Again, Allocation 1 is chosen as the starting point.

Table 14 shows the results. These are ratios for the 91 Indiana counties. The "property tax only" lines show what the ratios would be if there were no local income taxes. The "property taxes and income taxes" lines are the ratios from Allocation 1 in Tables 11 and 12, which are the actual values for 2009.

Table 14.
Policy Analysis: Allocate Income Taxes as Property Taxes

	Residential	Agriculture	Business
Counties			
Property Taxes Only	1.104	0.795	0.874
Property Taxes and Income Taxes	0.996	1.023	1.004
School Corporations			
Property Taxes Only	1.176	0	0
Property Taxes and Income Taxes	1.171	0	0
Counties and Schools			
Property Taxes Only	1.166	0.307	0.350
Property Taxes and Income Taxes	1.147	0.344	0.372

As expected, the residential ratios decline with the introduction of income taxes, and the agricultural and business ratios increase. The changes are especially noticeable for the county-only ratios. This is because counties, cities and towns have been the main recipients of local income tax revenue. Without income taxes, the county residential ratio is greater than one. Costs exceed revenues. The introduction of income taxes pushes the ratio below one, so revenues exceed costs. Likewise, without income taxes both the agricultural and business ratios are less than one. Revenues exceed costs. The introduction of local income taxes pushes both ratios slightly above one.

School corporations have received only a small share of income tax revenue. The county and school corporation totals show relatively small changes, but all are moves towards ratios of one.

Few states use local income taxes as much as Indiana does. These results suggest the possibility that Indiana county COCS ratios may differ from past studies because Indiana local governments use local income taxes more than most.

Homestead Deductions. Indiana has enacted substantial homestead property tax deductions to provide property tax relief for homeowners. By far the largest share of deductions provided by the Indiana property tax system goes to homeowners. Indiana also provides property tax credits, but these have been much diminished since 2009.

What has been the impact of these deductions on the COCS ratios? The analysis again is straightforward. Property taxes can be allocated based on gross assessed value, rather than based on the actual payment of property taxes. Gross assessed value is assessed value prior to deductions. Since the property tax is a flat rate tax, the distribution of tax payments will be in proportion to shares in gross assessed value, if there are no deductions or credits.

Table 7 shows the actual property tax distribution in the "property tax" line, and the gross assessed value in the "farmland use value" line. We use farmland use value because Allocation 1 starts with use value assessment, and because these are the actual gross assessed value shares in Indiana. Because of the large deductions provided to homeowners, the actual property tax share for residential property is less than the gross assessed value share, and the shares for agriculture and business are greater. Homeowner deductions shift property taxes to other property types.

Table 15.
Policy Analysis: Allocate Property Taxes with Gross Assessed Value

	Residential	Agriculture	Business
Counties			
Gross Assessed Value	0.881	1.267	1.299
With Deductions and Credits	0.996	1.023	1.004
School Corporations			
Gross Assessed Value	1.124	0	0
With Deductions and Credits	1.171	0	0
Counties and Schools			
Gross Assessed Value	1.087	0.458	0.486
With Deductions and Credits	1.147	0.344	0.372

Moving from a property tax system with no deductions, to one with deductions, will reduce residential revenue and increase the residential ratio. It will increase agricultural and business revenue, and decrease the ratios of these property types.

Table 15 shows the ratio results. Without deductions (but with income taxes), revenues exceed costs for residential property, and costs exceed revenues for agriculture and business. As a result of deductions, the county-only ratios all move towards one.

The county and school corporation results tell a different story. The ratios move in the same direction, but further from one. Revenues cover less of residential costs as a result of deductions. The agricultural and business categories pay even more in revenues than the costs they impose, as a result of deductions.

School General Fund. In 2009 Indiana replaced the property taxes used for the school corporation general fund with increased state aid. This was part of the property tax reform passed in March 2008.

Property taxes are paid by all three property types. State aid is allocated entirely to the residential category. The state takeover caused the residential share of revenues to increase, so the residential ratio fell. The agricultural and business shares of revenues decreased, so those ratios increased.

The analysis is done by measuring the share of general fund appropriations that were funded by property taxes in 2008, then applying that share to data for 2009. Total 2009 general fund appropriations remain the same, but the share paid by property taxes equals the share paid in 2008. State aid is smaller.

Table 16 shows the results. There is no change in the county ratios, since this policy applied only to schools. The school corporation residential ratio declines substantially with the state takeover of the school general funds, moving towards one. All ratios move towards one when counties and school corporations are combined.

Table 16.
Policy Analysis: Substitute Property Taxes for School Aid Using 2008 Formula

	Residential	Agriculture	Business
Counties			
2008 School GF Property Taxes	0.996	1.023	1.004
2009 No School GF Property Taxes	0.996	1.023	1.004
School Corporations			
2008 School GF Property Taxes	1.349	0	0
2009 No School GF Property Taxes	1.171	0	0
Counties and Schools			
2008 School GF Property Taxes	1.282	0.225	0.258
2009 No School GF Property Taxes	1.147	0.344	0.372

All Three: Forty Years of Policy Change. Since the early 1970's three major policy changes have affected the way county and school government is financed in Indiana. Two of these policy changes have decreased the residential ratio. One has increased the residential ratio. What has been the net effect of all three?

Note that there is some "overlap" between the local income tax and deduction policy changes. Here, to eliminate the effects of the local income taxes we replace the income allocation shares with gross assessed values, not the actual property tax payments. The result is the combined effect of eliminating the income taxes and eliminating the deductions for the property tax.

Table 17 shows the result of making all three changes. The lines labeled "Local Finance 1970" assume no local income taxes, no deductions or credits, and no state takeover of the school general fund. The lines labeled "Local Finance 2010" are the current results.

The two policies that affect counties have offsetting effects. The changes in the ratios are small. The state takeover of the school general fund reduces the residential ratio, because state aid depends on enrollment. The combination shows that these three policy changes enacted since 1970 have shifted all ratios towards one.

Table 17.
Policy Analysis: Three Policy Changes Since 1970

	Residential	Agriculture	Business
Counties			
Local Finance 1970	0.962	0.941	1.093
Local Finance 2010	0.996	1.023	1.004
School Corporations			
Local Finance 1970	1.349	0	0
Local Finance 2010	1.171	0	0
Counties and Schools			
Local Finance 1970	1.275	0.220	0.264
Local Finance 2010	1.147	0.344	0.372

In 2010, the residential category imposes costs that exceed the revenues it pays by 14.7%. However, without the three policy changes over the past decades, costs would have exceeded revenues by 27.5%. The use of local income taxes to replace property taxes, and the state takeover of the school general fund, have lessened the importance of the property tax in Indiana local finance. The additional property tax deductions and credits that benefit residential property have not offset this trend.

The agricultural and business categories still pay substantially more in revenues than the costs they impose. This is due almost entirely to the fact that these categories impose no school costs, while they pay school taxes. The property tax is diminished in Indiana local finance, but it is still the largest local revenue source, and school corporations still collect the largest share of property taxes. Since 1970, however, the share of revenues paid by agriculture and business has declined, and this has increased their COCS ratios.

Conclusions and Policy Implications

This project does cost of community services studies for county governments and school corporations in 91 Indiana counties. The COCS ratios divide the costs by the revenues attributed to the residential, agricultural and business sectors. Ratios greater than one imply that costs exceed revenues for that sector. Ratios less than one imply that revenues exceed costs. Almost all past COCS studies show the residential sector with ratios greater than one, and the agricultural and business sectors with ratios less than one.

When counties and school corporations are combined, this study agrees with past results. The residential sector imposes more costs on counties and school corporations combined than it pays in revenues, for all counties under all assumptions about the allocation of costs and revenue among sectors. The agricultural and business sectors impose fewer costs on counties and school corporations combined than they pay in revenues, for almost all counties and allocation assumptions.

These results are dominated by school corporations, which are units of government which spend five times as much as counties. COCS analysis assumes that all school costs are imposed by the residential category. Since property taxes fund a part of school costs, and property taxes are paid more by business and agriculture, and less by residential, the residential ratio for schools is greater than one. The agricultural and business ratios for schools are zero.

Statistical analyses for the 91 counties add support to this result. Regression results show that the residential ratios are higher where school appropriations are a larger share of the school-county total, and ratios are higher where property taxes are a larger share of total school-county revenues. Educating students is the primary cost that the residential sector imposes on local government. Where that function is relatively large, residential costs are relatively large, and the residential ratios are higher. The property tax is paid primarily by non-residential property owners. Where that tax is more important (and where state aid and income taxes are less important), the residential sector pays less in revenues, and residential ratios are higher.

The ratio results for county governments are not so clear. Under traditional assumptions about allocating costs and revenues, this study finds the traditional results. Ratios for the residential sector are greater than one, other ratios are less than one. But this study explores alternate assumptions about allocating costs.

Some costs are allocated based on property values. Property values are determined by county assessors as part of the property tax process. In Indiana all property except farmland is assessed at market value, its predicted selling price. Farmland is assessed at its use value, which appears to be less than one-third its market value, on average. Agriculture is assigned a much greater share of county costs when those costs are allocated based on the estimated market value of farmland. Under the use value allocation, the agricultural ratio for county governments tends to be less than one. Under the market value assumption, the county government ratio is greater than one.

It is unclear which assumption is appropriate. All other property is measured at its market value. The value of sheriff's protection, for example, might be measured by the value of property preserved from crime. But the selling prices of farmland include a speculative premium based on potential residential or business development. Speculative value may not impose county costs. This would imply that use value is the better measure. But use value, as measured in Indiana, implies that *most* of the value of farmland is speculative. That seems excessive.

County road construction and maintenance costs are allocated based on vehicle use. Highway engineers find that heavy trucks produce most of the wear on roads. Passenger cars produce very little. This implies that road costs should be allocated to the business and agricultural sectors, which own the heavy

trucks. Road expenditures are an important share of total county costs. When vehicle weights are included, the county government residential sector ratios are between 0.95 and one. Residential imposes costs that are slightly less than the revenues it pays. When vehicle weights are included, the county government business sector ratios are between 0.93 and 1.06. Business may impose costs slightly more or slightly less than the revenues it pays, depending on the particular road cost assumption. Taking account of the road costs imposed by heavy vehicles muddles the traditional residential and business results for county governments.

The results for agriculture turn on how many miles agricultural vehicles drive on county roads, compared to business vehicles. *We don't know.* One mileage assumption puts the agricultural ratio at less than one; several others have it greater than one. If we accept that vehicle weights should be considered in allocating costs, we cannot say whether agriculture imposes costs on county governments greater than or less than the revenues it pays.

Regression results support the importance of road costs in determining the business ratio. Where county road and bridge appropriations are a larger share of the total budget, the business and agricultural ratios are higher, and the residential ratios are lower. Business and agriculture account for the largest part of road costs. Where road spending is most important, more costs are allocated to these sectors, and their ratios are higher.

This study uses COCS results for policy analysis. Since the early 1970s, Indiana has introduced several local income taxes, lessening the importance of the property tax. Income taxes are paid primarily out of the residential sector's wages and salaries. Greater use of local income taxes has reduced the residential ratio, by raising revenues relative to costs. It has reduced the agricultural and business ratios, reducing revenues relative to costs.

Indiana provides substantial property tax deductions to homeowners. These deductions reduce the share of the property tax paid by the residential sector, shifting these taxes to agriculture and business. They increase the residential ratios, and decrease the agricultural and business ratios.

In 2009 Indiana eliminated the property tax for the school general fund, replacing it with added state aid. The state aid formula allocates funds on a per-pupil basis, so its revenues are attributed to the residential sector. Reducing the property tax, which is largely paid by business and agriculture, and increasing state aid, entirely attributed to residential, adds to residential revenues and reduces the residential ratio. It increases the agricultural and business ratios.

All three policy changes combined have decreased the residential ratios and increased the agricultural and business ratios. The residential ratio is greater than one for counties and schools combined, and the agricultural and business ratios are less than one. These policy changes have moved all three ratios closer to one.

Two main interpretations are offered for cost of community services ratios. Sometimes they are taken to be measures of the fiscal impact of residential, business and agricultural development. *All sources agree that this is not appropriate.* The ratios do not take account of government capacity and the location of the new development. They are too aggregated, taking no account of the differing revenue and spending effects of different kinds of residential, agricultural and business development.

Another interpretation is controversial. Despite the fact that they originated COCS analysis, the American Farmland Trust says that COCS ratios are not an indication of who should pay for local government services. Economists Oakland and Testa point out, however, that under the benefit view of

taxation, the ratios should equal one. The benefit view argues that the costs of services should be paid by their beneficiaries. Whether this is fair is a subjective judgment. It may well be efficient, however, because benefit recipients would then take account of the full costs of the services they demand.

Under the benefit view, what do these COCS ratios imply about tax policy?

- Under the benefit view, the COCS ratios imply that agriculture and business pay too much for the local government services they receive, and residential pays too little. Agricultural and business taxes should be reduced, and residential taxes increased.

- Under the benefit view, the COCS ratios imply that the residential sector pays too little for schools. Agriculture and business pay too much.

- Under the benefit view, the COCS ratios imply that the residential, agricultural and business payments for county government services may be close to the benefits received, overall. There is considerable doubt about this conclusion, however, partly because data is lacking on how much heavy vehicles use county roads.

- Under the benefit view, the COCS ratios imply that business and agriculture may pay too little for road maintenance. The road funding formula does not take account of the wear placed on roads by heavy vehicles. This result depends on particular road cost assumptions, however.

- Under the benefit view, the COCS ratios imply that it is appropriate to move state policy towards greater reliance on local income taxes and state aid to schools. They have increased the share of costs that the residential sector pays, and decreased the subsidy that agriculture and business pays.

- Under the benefit view, the COCS ratios imply that counties should adopt local income taxes to reduce their reliance on the property tax. This would cause the residential sector to pay for more of the services it receives.

- Under the benefit view, the COCS ratios imply that school corporations should have more non-property tax revenue options. Local income taxes are mainly collected by counties, cities and towns, but the gap between residential revenues and costs derives from education. Adopting local income taxes could skew the county government ratios further from one, in order to bring the overall school-county ratios closer to one.

Each of these paragraphs begins with "under the benefit view, the COCS ratios imply" for a reason. If a different view of tax fairness is used—the ability to pay view, for example—none of these policy results may apply. If the COCS methodology or its cost assumptions are not accepted, likewise none of these policy results may apply. *This study does not recommend any of these policies.* But, under the benefit view, using the COCS method, these are policy implications of the results of this study.

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Appendix

The following seven tables show the county-by-county results for the standard allocation and the six alternate allocations. The statewide (91 county) results are compiled in Table 12. Allocation 1 is used for the regressions and the policy analysis. These are the county results shown in Figure 2.

The county by county results indicate another potential problem with COCS analysis. Tippecanoe County, for example, has agricultural ratios substantially higher than one for allocations 4 and 6. In 2009 Tippecanoe used a large amount of funds from its cumulative bridge fund, money that had been accumulating for many years. In 2009, then, roads were a very large share of Tippecanoe County appropriations. In allocations 4 and 6, a large share of road costs are allocated to agriculture, and since road costs are so important in the county's budget, agricultural costs appear high.

COCS usually uses costs, spending or appropriations from a single year. Sometimes, the data for that year are exceptional, and the ratios will be affected.

Standard Allocation

Cost of Community Services, Indiana County Governments and School Corporations

Ratios, Costs to Revenues: Vehicle Count; Farmland Use Value

	Residential	Agriculture	Business		Residential	Agriculture	Business
91 Counties	1.172	0.208	0.268				
01 Adams	1.232	0.230	0.329	46 LaPorte			
02 Allen	1.152	0.200	0.279	47 Lawrence	1.175	0.200	0.288
03 Bartholomew	1.181	0.217	0.294	48 Madison	1.163	0.192	0.245
04 Benton	1.337	0.239	0.572	49 Marion	1.188	0.131	0.193
05 Blackford	1.177	0.305	0.387	50 Marshall	1.151	0.197	0.319
06 Boone	1.144	0.155	0.220	51 Martin	1.131	0.253	0.503
07 Brown	1.107	0.223	0.362	52 Miami	1.163	0.196	0.327
08 Carroll	1.164	0.258	0.375	53 Monroe	1.112	0.281	0.382
09 Cass	1.198	0.231	0.333	54 Montgome	1.337	0.180	0.259
10 Clark	1.131	0.230	0.248	55 Morgan	1.091	0.173	0.283
11 Clay	1.132	0.235	0.405	56 Newton	1.227	0.242	0.440
12 Clinton	1.179	0.248	0.358	57 Noble	1.197	0.186	0.254
13 Crawford	1.184	0.233	0.392	58 Ohio	1.074	0.454	0.494
14 Daviess	1.222	0.241	0.410	59 Orange	1.125	0.284	0.392
15 Dearborn	1.152	0.185	0.343	60 Owen	1.141	0.142	0.407
16 Decatur	1.160	0.232	0.405	61 Parke	1.167	0.245	0.543
17 DeKalb	1.214	0.235	0.280	62 Perry	1.153	0.174	0.393
18 Delaware	1.156	0.201	0.314	63 Pike	1.355	0.234	0.347
19 Dubois	1.203	0.168	0.266	64 Porter	1.157	0.131	0.179
20 Elkhart	1.202	0.149	0.212	65 Posey	1.300	0.189	0.313
21 Fayette	1.173	0.259	0.323	66 Pulaski	1.207	0.379	0.557
22 Floyd	1.126	0.160	0.209	67 Putnam	1.174	0.151	0.307
23 Fountain	1.174	0.263	0.460	68 Randolph	1.172	0.300	0.388
24 Franklin	1.126	0.235	0.345	69 Ripley	1.119	0.182	0.444
25 Fulton	1.177	0.223	0.407	70 Rush	1.235	0.293	0.428
26 Gibson	1.251	0.214	0.397	71 St. Joseph	1.156	0.228	0.265
27 Grant	1.161	0.190	0.355	72 Scott	1.119	0.232	0.370
28 Greene	1.132	0.235	0.444	73 Shelby	1.196	0.206	0.298
29 Hamilton	1.144	0.148	0.222	74 Spencer	1.321	0.159	0.278
30 Hancock	1.134	0.156	0.283	75 Starke	1.124	0.174	0.331
31 Harrison	1.129	0.194	0.373	76 Steuben	1.123	0.229	0.351
32 Hendricks	1.184	0.127	0.194	77 Sullivan	1.281	0.196	0.322
33 Henry	1.153	0.184	0.304	78 Switzerlan	1.157	0.345	0.439
34 Howard	1.204	0.170	0.313	79 Tippecanoe	1.217	0.119	0.249
35 Huntington	1.190	0.220	0.306	80 Tipton	1.185	0.215	0.417
36 Jackson	1.190	0.233	0.320	81 Union	1.226	0.169	0.319
37 Jasper	1.232	0.191	0.328	82 Vanderbur	1.153	0.371	0.408
38 Jay	1.294	0.192	0.318	83 Vermillion	1.278	0.222	0.325
39 Jefferson	1.180	0.175	0.294	84 Vigo	1.151	0.303	0.359
40 Jennings	1.135	0.226	0.333	85 Wabash	1.196	0.201	0.314
41 Johnson	1.140	0.135	0.181	86 Warren	1.259	0.271	0.638
42 Knox	1.230	0.157	0.318	87 Warrick	1.150	0.193	0.290
43 Kosciusko	1.147	0.151	0.284	88 Washingto	1.148	0.187	0.355
44 LaGrange	1.168	0.214	0.323	89 Wayne	1.132	0.200	0.393
45 Lake	1.192	0.140	0.178	90 Wells	1.180	0.216	0.321
				91 White	1.164	0.262	0.477
				92 Whitley	1.133	0.197	0.421

Allocation 1 (Used for Regressions and Policy Analysis)

Cost of Community Services, Indiana County Governments and School Corporations

Ratios, Costs to Revenues: Vehicles Travel Equal Miles; Farmland Use Value

	Residential	Agriculture	Business		Residential	Agriculture	Business
91 Counties	1.147	0.344	0.372				
01 Adams	1.188	0.331	0.472	46 LaPorte			
02 Allen	1.124	0.291	0.412	47 Lawrence	1.141	0.244	0.447
03 Bartholomew	1.152	0.421	0.399	48 Madison	1.152	0.240	0.298
04 Benton	1.239	0.391	0.830	49 Marion	1.188	0.131	0.193
05 Blackford	1.129	0.446	0.570	50 Marshall	1.111	0.360	0.511
06 Boone	1.122	0.295	0.341	51 Martin	1.086	0.348	0.763
07 Brown	1.060	0.338	0.669	52 Miami	1.133	0.298	0.484
08 Carroll	1.118	0.552	0.489	53 Monroe	1.084	0.330	0.544
09 Cass	1.154	0.378	0.490	54 Montgome	1.287	0.352	0.354
10 Clark	1.099	0.324	0.437	55 Morgan	1.072	0.264	0.448
11 Clay	1.091	0.407	0.633	56 Newton	1.183	0.326	0.614
12 Clinton	1.146	0.394	0.474	57 Noble	1.166	0.267	0.381
13 Crawford	1.144	0.238	0.618	58 Ohio	1.036	0.629	0.772
14 Daviess	1.174	0.357	0.564	59 Orange	1.095	0.350	0.565
15 Dearborn	1.122	0.219	0.492	60 Owen	1.095	0.200	0.770
16 Decatur	1.120	0.384	0.570	61 Parke	1.101	0.427	0.850
17 DeKalb	1.180	0.327	0.400	62 Perry	1.101	0.235	0.664
18 Delaware	1.131	0.333	0.424	63 Pike	1.300	0.323	0.458
19 Dubois	1.172	0.258	0.385	64 Porter	1.144	0.265	0.249
20 Elkhart	1.186	0.180	0.277	65 Posey	1.243	0.417	0.426
21 Fayette	1.133	0.427	0.480	66 Pulaski	1.147	0.539	0.709
22 Floyd	1.102	0.211	0.360	67 Putnam	1.143	0.271	0.446
23 Fountain	1.122	0.453	0.651	68 Randolph	1.138	0.392	0.547
24 Franklin	1.092	0.289	0.612	69 Ripley	1.085	0.271	0.701
25 Fulton	1.132	0.362	0.597	70 Rush	1.164	0.440	0.656
26 Gibson	1.195	0.482	0.510	71 St. Joseph	1.139	0.342	0.341
27 Grant	1.129	0.365	0.479	72 Scott	1.092	0.322	0.531
28 Greene	1.089	0.332	0.719	73 Shelby	1.156	0.393	0.435
29 Hamilton	1.125	0.289	0.328	74 Spencer	1.271	0.295	0.388
30 Hancock	1.095	0.432	0.486	75 Starke	1.094	0.301	0.531
31 Harrison	1.093	0.310	0.590	76 Steuben	1.086	0.411	0.557
32 Hendricks	1.161	0.238	0.295	77 Sullivan	1.233	0.313	0.450
33 Henry	1.134	0.255	0.408	78 Switzerlan	1.116	0.421	0.632
34 Howard	1.180	0.323	0.388	79 Tippecanoe	1.117	0.710	0.618
35 Huntington	1.143	0.388	0.484	80 Tipton	1.123	0.475	0.617
36 Jackson	1.168	0.328	0.397	81 Union	1.192	0.245	0.479
37 Jasper	1.194	0.295	0.445	82 Vanderbur	1.127	0.703	0.505
38 Jay	1.227	0.365	0.480	83 Vermillion	1.240	0.380	0.402
39 Jefferson	1.140	0.354	0.453	84 Vigo	1.129	0.440	0.452
40 Jennings	1.111	0.302	0.473	85 Wabash	1.147	0.339	0.512
41 Johnson	1.125	0.253	0.265	86 Warren	1.178	0.427	0.893
42 Knox	1.195	0.286	0.420	87 Warrick	1.124	0.339	0.416
43 Kosciusko	1.111	0.299	0.471	88 Washingto	1.121	0.253	0.550
44 LaGrange	1.128	0.311	0.518	89 Wayne	1.109	0.270	0.517
45 Lake	1.182	0.191	0.221	90 Wells	1.146	0.360	0.449
				91 White	1.107	0.508	0.671
				92 Whitley	1.086	0.372	0.668

Allocation 2

Cost of Community Services, Indiana County Governments and School Corporations
Ratios, Costs to Revenues: Vehicles Travel Equal Miles; Farmland Market Value

	Residential	Agriculture	Business		Residential	Agriculture	Business
91 Counties	1.143	0.542	0.362				
01 Adams	1.174	0.548	0.445	46 LaPorte			
02 Allen	1.123	0.539	0.407	47 Lawrence	1.136	0.437	0.435
03 Bartholomew	1.148	0.671	0.389	48 Madison	1.146	0.483	0.285
04 Benton	1.217	0.497	0.770	49 Marion	1.188	0.356	0.192
05 Blackford	1.117	0.702	0.543	50 Marshall	1.105	0.558	0.494
06 Boone	1.118	0.460	0.333	51 Martin	1.077	0.539	0.730
07 Brown	1.058	0.471	0.667	52 Miami	1.120	0.492	0.457
08 Carroll	1.103	0.762	0.455	53 Monroe	1.083	0.527	0.541
09 Cass	1.141	0.619	0.456	54 Montgome	1.278	0.544	0.326
10 Clark	1.098	0.471	0.434	55 Morgan	1.069	0.447	0.440
11 Clay	1.078	0.632	0.602	56 Newton	1.159	0.526	0.554
12 Clinton	1.134	0.636	0.429	57 Noble	1.161	0.450	0.367
13 Crawford	1.131	0.431	0.590	58 Ohio	1.031	0.968	0.755
14 Daviess	1.160	0.537	0.532	59 Orange	1.090	0.601	0.535
15 Dearborn	1.120	0.351	0.487	60 Owen	1.089	0.293	0.759
16 Decatur	1.113	0.579	0.537	61 Parke	1.084	0.597	0.813
17 DeKalb	1.175	0.589	0.383	62 Perry	1.096	0.391	0.649
18 Delaware	1.126	0.607	0.412	63 Pike	1.287	0.571	0.416
19 Dubois	1.168	0.410	0.375	64 Porter	1.143	0.446	0.247
20 Elkhart	1.185	0.301	0.273	65 Posey	1.234	0.642	0.399
21 Fayette	1.122	0.691	0.456	66 Pulaski	1.118	0.771	0.628
22 Floyd	1.102	0.300	0.359	67 Putnam	1.136	0.427	0.423
23 Fountain	1.104	0.653	0.603	68 Randolph	1.121	0.617	0.494
24 Franklin	1.083	0.462	0.595	69 Ripley	1.078	0.422	0.676
25 Fulton	1.116	0.572	0.560	70 Rush	1.142	0.632	0.610
26 Gibson	1.187	0.736	0.477	71 St. Joseph	1.137	0.639	0.337
27 Grant	1.124	0.581	0.460	72 Scott	1.087	0.557	0.516
28 Greene	1.077	0.542	0.688	73 Shelby	1.148	0.606	0.414
29 Hamilton	1.124	0.485	0.326	74 Spencer	1.265	0.445	0.363
30 Hancock	1.090	0.631	0.476	75 Starke	1.086	0.471	0.513
31 Harrison	1.089	0.443	0.575	76 Steuben	1.081	0.637	0.548
32 Hendricks	1.159	0.399	0.291	77 Sullivan	1.220	0.495	0.405
33 Henry	1.124	0.462	0.382	78 Switzerlan	1.108	0.594	0.602
34 Howard	1.176	0.577	0.375	79 Tippecanoe	1.115	0.811	0.614
35 Huntington	1.135	0.643	0.462	80 Tipton	1.109	0.658	0.581
36 Jackson	1.163	0.526	0.378	81 Union	1.179	0.370	0.450
37 Jasper	1.188	0.461	0.421	82 Vanderbur	1.126	1.127	0.502
38 Jay	1.215	0.517	0.449	83 Vermillion	1.229	0.656	0.361
39 Jefferson	1.136	0.505	0.441	84 Vigo	1.125	0.865	0.439
40 Jennings	1.103	0.540	0.448	85 Wabash	1.137	0.537	0.490
41 Johnson	1.124	0.422	0.261	86 Warren	1.146	0.580	0.827
42 Knox	1.186	0.462	0.381	87 Warrick	1.120	0.606	0.407
43 Kosciusko	1.108	0.447	0.463	88 Washingto	1.110	0.413	0.522
44 LaGrange	1.123	0.448	0.506	89 Wayne	1.105	0.448	0.503
45 Lake	1.181	0.392	0.220	90 Wells	1.135	0.596	0.417
				91 White	1.092	0.709	0.635
				92 Whitley	1.079	0.565	0.645

Allocation 3

Cost of Community Services, Indiana County Governments and School Corporations

Ratios, Costs to Revenues: Vehicle Mileage Proportional to All Miles; Farmland Use Value

	Residential	Agriculture	Business		Residential	Agriculture	Business
91 Counties	1.146	0.243	0.391				
01 Adams	1.187	0.250	0.512	46 LaPorte			
02 Allen	1.124	0.221	0.421	47 Lawrence	1.140	0.198	0.461
03 Bartholomew	1.151	0.272	0.418	48 Madison	1.151	0.208	0.306
04 Benton	1.237	0.265	1.085	49 Marion	1.188	0.131	0.193
05 Blackford	1.128	0.328	0.618	50 Marshall	1.110	0.235	0.555
06 Boone	1.121	0.194	0.366	51 Martin	1.085	0.262	0.820
07 Brown	1.059	0.246	0.689	52 Miami	1.132	0.232	0.533
08 Carroll	1.118	0.368	0.623	53 Monroe	1.083	0.280	0.550
09 Cass	1.153	0.264	0.543	54 Montgome	1.286	0.242	0.389
10 Clark	1.098	0.184	0.451	55 Morgan	1.072	0.202	0.468
11 Clay	1.090	0.283	0.716	56 Newton	1.182	0.262	0.688
12 Clinton	1.145	0.292	0.528	57 Noble	1.165	0.203	0.402
13 Crawford	1.143	0.222	0.632	58 Ohio	1.035	0.495	0.801
14 Daviess	1.173	0.264	0.619	59 Orange	1.095	0.278	0.591
15 Dearborn	1.121	0.188	0.502	60 Owen	1.093	0.150	0.821
16 Decatur	1.119	0.259	0.628	61 Parke	1.100	0.303	0.998
17 DeKalb	1.179	0.239	0.418	62 Perry	1.099	0.171	0.692
18 Delaware	1.130	0.254	0.438	63 Pike	1.299	0.249	0.486
19 Dubois	1.172	0.173	0.406	64 Porter	1.143	0.159	0.256
20 Elkhart	1.185	0.153	0.281	65 Posey	1.241	0.231	0.476
21 Fayette	1.132	0.310	0.521	66 Pulaski	1.146	0.412	0.851
22 Floyd	1.102	0.144	0.369	67 Putnam	1.143	0.197	0.485
23 Fountain	1.121	0.330	0.768	68 Randolph	1.137	0.316	0.610
24 Franklin	1.091	0.235	0.652	69 Ripley	1.084	0.189	0.762
25 Fulton	1.131	0.256	0.675	70 Rush	1.163	0.307	0.777
26 Gibson	1.194	0.306	0.553	71 St. Joseph	1.139	0.259	0.347
27 Grant	1.128	0.243	0.507	72 Scott	1.091	0.253	0.551
28 Greene	1.088	0.267	0.766	73 Shelby	1.155	0.270	0.473
29 Hamilton	1.124	0.200	0.335	74 Spencer	1.270	0.181	0.427
30 Hancock	1.094	0.258	0.529	75 Starke	1.093	0.212	0.590
31 Harrison	1.092	0.220	0.631	76 Steuben	1.084	0.271	0.592
32 Hendricks	1.160	0.156	0.305	77 Sullivan	1.232	0.224	0.504
33 Henry	1.133	0.207	0.434	78 Switzerlan	1.115	0.348	0.674
34 Howard	1.180	0.233	0.400	79 Tippecanoe	1.114	0.306	0.666
35 Huntington	1.142	0.257	0.525	80 Tipton	1.122	0.326	0.728
36 Jackson	1.168	0.245	0.420	81 Union	1.191	0.186	0.551
37 Jasper	1.194	0.200	0.479	82 Vanderbur	1.127	0.440	0.511
38 Jay	1.226	0.254	0.546	83 Vermillion	1.239	0.272	0.436
39 Jefferson	1.139	0.220	0.488	84 Vigo	1.128	0.342	0.461
40 Jennings	1.111	0.246	0.497	85 Wabash	1.145	0.222	0.563
41 Johnson	1.125	0.175	0.273	86 Warren	1.176	0.325	1.108
42 Knox	1.195	0.175	0.477	87 Warrick	1.123	0.222	0.433
43 Kosciusko	1.110	0.184	0.504	88 Washingto	1.120	0.200	0.602
44 LaGrange	1.127	0.242	0.555	89 Wayne	1.108	0.212	0.532
45 Lake	1.182	0.147	0.223	90 Wells	1.145	0.249	0.502
				91 White	1.105	0.323	0.811
				92 Whitley	1.084	0.246	0.730

Allocation 4

Cost of Community Services, Indiana County Governments and School Corporations

Ratios, Costs to Revenues: Vehicle Mileage Proportional to County Miles; Farmland Use Value

	Residential	Agriculture	Business		Residential	Agriculture	Business
91 Counties	1.146	0.469	0.356				
01 Adams	1.187	0.410	0.444	46 LaPorte			
02 Allen	1.124	0.394	0.410	47 Lawrence	1.140	0.296	0.441
03 Bartholomew	1.151	0.632	0.379	48 Madison	1.151	0.299	0.289
04 Benton	1.237	0.458	0.710	49 Marion	1.188	0.131	0.193
05 Blackford	1.128	0.548	0.540	50 Marshall	1.110	0.511	0.475
06 Boone	1.121	0.432	0.315	51 Martin	1.085	0.431	0.723
07 Brown	1.059	0.514	0.654	52 Miami	1.132	0.400	0.424
08 Carroll	1.117	0.712	0.387	53 Monroe	1.083	0.379	0.545
09 Cass	1.153	0.489	0.448	54 Montgome	1.286	0.510	0.309
10 Clark	1.099	0.355	0.439	55 Morgan	1.072	0.390	0.422
11 Clay	1.090	0.559	0.551	56 Newton	1.182	0.386	0.558
12 Clinton	1.145	0.501	0.426	57 Noble	1.165	0.355	0.365
13 Crawford	1.143	0.237	0.622	58 Ohio	1.035	0.878	0.736
14 Daviess	1.173	0.450	0.519	59 Orange	1.095	0.405	0.553
15 Dearborn	1.122	0.259	0.490	60 Owen	1.094	0.272	0.727
16 Decatur	1.119	0.513	0.520	61 Parke	1.100	0.585	0.691
17 DeKalb	1.179	0.394	0.394	62 Perry	1.099	0.303	0.651
18 Delaware	1.130	0.515	0.402	63 Pike	1.299	0.405	0.434
19 Dubois	1.172	0.342	0.371	64 Porter	1.143	0.409	0.245
20 Elkhart	1.185	0.210	0.276	65 Posey	1.242	0.563	0.395
21 Fayette	1.132	0.604	0.429	66 Pulaski	1.146	0.617	0.633
22 Floyd	1.102	0.228	0.363	67 Putnam	1.142	0.407	0.388
23 Fountain	1.120	0.594	0.535	68 Randolph	1.137	0.458	0.501
24 Franklin	1.092	0.353	0.579	69 Ripley	1.084	0.346	0.661
25 Fulton	1.131	0.471	0.532	70 Rush	1.163	0.524	0.592
26 Gibson	1.193	0.731	0.459	71 St. Joseph	1.139	0.481	0.337
27 Grant	1.128	0.533	0.450	72 Scott	1.091	0.438	0.510
28 Greene	1.088	0.463	0.646	73 Shelby	1.155	0.585	0.386
29 Hamilton	1.124	0.501	0.322	74 Spencer	1.270	0.410	0.357
30 Hancock	1.094	0.737	0.428	75 Starke	1.093	0.422	0.469
31 Harrison	1.092	0.447	0.544	76 Steuben	1.084	0.601	0.532
32 Hendricks	1.160	0.372	0.286	77 Sullivan	1.232	0.404	0.405
33 Henry	1.133	0.328	0.376	78 Switzerlan	1.115	0.505	0.598
34 Howard	1.180	0.513	0.369	79 Tippecanoe	1.114	1.401	0.564
35 Huntington	1.142	0.536	0.452	80 Tipton	1.121	0.681	0.482
36 Jackson	1.168	0.401	0.382	81 Union	1.191	0.311	0.413
37 Jasper	1.194	0.352	0.430	82 Vanderbur	1.127	1.063	0.502
38 Jay	1.225	0.518	0.404	83 Vermillion	1.239	0.508	0.369
39 Jefferson	1.139	0.552	0.415	84 Vigo	1.128	0.609	0.443
40 Jennings	1.111	0.403	0.439	85 Wabash	1.145	0.447	0.478
41 Johnson	1.125	0.410	0.254	86 Warren	1.175	0.533	0.700
42 Knox	1.195	0.357	0.389	87 Warrick	1.123	0.489	0.403
43 Kosciusko	1.110	0.447	0.447	88 Washingto	1.120	0.320	0.499
44 LaGrange	1.127	0.429	0.481	89 Wayne	1.108	0.342	0.506
45 Lake	1.182	0.240	0.221	90 Wells	1.145	0.458	0.412
				91 White	1.105	0.645	0.581
				92 Whitley	1.084	0.552	0.607

Allocation 5

Cost of Community Services, Indiana County Governments and School Corporations

Ratios, Costs to Revenues: Vehicle Mileage Proportional to All Miles; Farmland Market Value

	Residential	Agriculture	Business		Residential	Agriculture	Business
91 Counties	1.142	0.444	0.381				
01 Adams	1.173	0.469	0.485	46 LaPorte			
02 Allen	1.122	0.473	0.416	47 Lawrence	1.135	0.393	0.449
03 Bartholomew	1.148	0.528	0.408	48 Madison	1.146	0.453	0.293
04 Benton	1.215	0.373	1.028	49 Marion	1.188	0.356	0.192
05 Blackford	1.116	0.590	0.591	50 Marshall	1.104	0.435	0.538
06 Boone	1.117	0.362	0.358	51 Martin	1.076	0.456	0.787
07 Brown	1.057	0.381	0.687	52 Miami	1.120	0.427	0.506
08 Carroll	1.102	0.582	0.589	53 Monroe	1.082	0.478	0.547
09 Cass	1.140	0.508	0.510	54 Montgome	1.277	0.439	0.362
10 Clark	1.098	0.338	0.448	55 Morgan	1.068	0.386	0.459
11 Clay	1.077	0.511	0.685	56 Newton	1.158	0.464	0.629
12 Clinton	1.133	0.538	0.484	57 Noble	1.160	0.389	0.388
13 Crawford	1.130	0.416	0.604	58 Ohio	1.030	0.840	0.785
14 Daviess	1.158	0.445	0.587	59 Orange	1.089	0.533	0.561
15 Dearborn	1.119	0.322	0.497	60 Owen	1.087	0.243	0.809
16 Decatur	1.112	0.460	0.596	61 Parke	1.083	0.477	0.961
17 DeKalb	1.174	0.504	0.401	62 Perry	1.094	0.328	0.677
18 Delaware	1.126	0.531	0.425	63 Pike	1.285	0.500	0.444
19 Dubois	1.167	0.327	0.395	64 Porter	1.142	0.342	0.254
20 Elkhart	1.184	0.275	0.277	65 Posey	1.232	0.458	0.448
21 Fayette	1.121	0.578	0.497	66 Pulaski	1.116	0.649	0.772
22 Floyd	1.101	0.234	0.368	67 Putnam	1.135	0.355	0.462
23 Fountain	1.103	0.534	0.721	68 Randolph	1.120	0.543	0.558
24 Franklin	1.083	0.409	0.635	69 Ripley	1.077	0.342	0.738
25 Fulton	1.115	0.468	0.639	70 Rush	1.140	0.501	0.731
26 Gibson	1.186	0.564	0.520	71 St. Joseph	1.137	0.561	0.343
27 Grant	1.124	0.463	0.489	72 Scott	1.086	0.490	0.536
28 Greene	1.076	0.478	0.736	73 Shelby	1.147	0.487	0.452
29 Hamilton	1.123	0.398	0.333	74 Spencer	1.264	0.334	0.402
30 Hancock	1.090	0.462	0.520	75 Starke	1.085	0.384	0.572
31 Harrison	1.088	0.356	0.617	76 Steuben	1.080	0.505	0.584
32 Hendricks	1.158	0.319	0.301	77 Sullivan	1.219	0.408	0.459
33 Henry	1.123	0.415	0.408	78 Switzerlan	1.107	0.524	0.644
34 Howard	1.176	0.489	0.387	79 Tippecano	1.113	0.423	0.663
35 Huntington	1.133	0.517	0.502	80 Tipton	1.108	0.512	0.693
36 Jackson	1.162	0.449	0.401	81 Union	1.178	0.311	0.523
37 Jasper	1.187	0.369	0.454	82 Vanderbur	1.126	0.881	0.509
38 Jay	1.213	0.407	0.514	83 Vermillion	1.228	0.550	0.394
39 Jefferson	1.135	0.376	0.475	84 Vigo	1.124	0.771	0.449
40 Jennings	1.102	0.486	0.472	85 Wabash	1.136	0.424	0.541
41 Johnson	1.123	0.346	0.270	86 Warren	1.144	0.479	1.043
42 Knox	1.185	0.353	0.438	87 Warrick	1.119	0.496	0.424
43 Kosciusko	1.106	0.335	0.496	88 Washingto	1.109	0.361	0.574
44 LaGrange	1.121	0.382	0.543	89 Wayne	1.104	0.390	0.519
45 Lake	1.181	0.348	0.222	90 Wells	1.134	0.489	0.470
				91 White	1.091	0.537	0.777
				92 Whitley	1.077	0.443	0.708

Allocation 6

Cost of Community Services, Indiana County Governments and School Corporations

Ratios, Costs to Revenues: Vehicle Mileage Proportional to County Miles; Farmland Market Value

	Residential	Agriculture	Business		Residential	Agriculture	Business
91 Counties	1.142	0.663	0.346				
01 Adams	1.173	0.625	0.416	46 LaPorte			
02 Allen	1.122	0.637	0.405	47 Lawrence	1.136	0.487	0.429
03 Bartholomew	1.148	0.874	0.369	48 Madison	1.146	0.541	0.276
04 Benton	1.215	0.563	0.649	49 Marion	1.188	0.356	0.192
05 Blackford	1.116	0.800	0.512	50 Marshall	1.104	0.706	0.458
06 Boone	1.117	0.595	0.307	51 Martin	1.076	0.619	0.689
07 Brown	1.057	0.646	0.653	52 Miami	1.119	0.590	0.396
08 Carroll	1.101	0.919	0.352	53 Monroe	1.082	0.575	0.542
09 Cass	1.140	0.726	0.414	54 Montgome	1.277	0.695	0.281
10 Clark	1.098	0.500	0.436	55 Morgan	1.068	0.572	0.414
11 Clay	1.077	0.780	0.520	56 Newton	1.158	0.585	0.498
12 Clinton	1.133	0.738	0.380	57 Noble	1.160	0.536	0.351
13 Crawford	1.130	0.431	0.594	58 Ohio	1.030	1.204	0.719
14 Daviess	1.158	0.630	0.487	59 Orange	1.089	0.653	0.524
15 Dearborn	1.119	0.391	0.484	60 Owen	1.087	0.364	0.716
16 Decatur	1.112	0.701	0.487	61 Parke	1.082	0.749	0.652
17 DeKalb	1.174	0.654	0.377	62 Perry	1.094	0.458	0.636
18 Delaware	1.126	0.783	0.390	63 Pike	1.285	0.651	0.392
19 Dubois	1.168	0.492	0.360	64 Porter	1.142	0.587	0.243
20 Elkhart	1.184	0.331	0.273	65 Posey	1.233	0.786	0.368
21 Fayette	1.121	0.862	0.405	66 Pulaski	1.116	0.845	0.550
22 Floyd	1.101	0.317	0.362	67 Putnam	1.135	0.559	0.364
23 Fountain	1.103	0.790	0.486	68 Randolph	1.120	0.681	0.448
24 Franklin	1.083	0.524	0.562	69 Ripley	1.077	0.495	0.635
25 Fulton	1.115	0.679	0.495	70 Rush	1.141	0.714	0.545
26 Gibson	1.186	0.977	0.425	71 St. Joseph	1.137	0.773	0.333
27 Grant	1.124	0.744	0.432	72 Scott	1.086	0.671	0.495
28 Greene	1.076	0.670	0.615	73 Shelby	1.147	0.791	0.365
29 Hamilton	1.123	0.691	0.320	74 Spencer	1.264	0.559	0.332
30 Hancock	1.089	0.926	0.419	75 Starke	1.085	0.589	0.451
31 Harrison	1.088	0.574	0.529	76 Steuben	1.080	0.817	0.524
32 Hendricks	1.158	0.530	0.282	77 Sullivan	1.219	0.585	0.360
33 Henry	1.123	0.535	0.350	78 Switzerlan	1.107	0.673	0.568
34 Howard	1.176	0.761	0.356	79 Tippecanoe	1.113	1.478	0.560
35 Huntington	1.133	0.786	0.429	80 Tipton	1.107	0.859	0.446
36 Jackson	1.163	0.595	0.363	81 Union	1.178	0.434	0.384
37 Jasper	1.188	0.516	0.405	82 Vanderbur	1.126	1.462	0.499
38 Jay	1.213	0.668	0.371	83 Vermillion	1.228	0.782	0.327
39 Jefferson	1.135	0.697	0.402	84 Vigo	1.124	1.028	0.430
40 Jennings	1.102	0.639	0.414	85 Wabash	1.136	0.640	0.456
41 Johnson	1.123	0.574	0.250	86 Warren	1.143	0.685	0.632
42 Knox	1.185	0.532	0.350	87 Warrick	1.119	0.748	0.394
43 Kosciusko	1.106	0.593	0.439	88 Washingto	1.109	0.480	0.471
44 LaGrange	1.121	0.561	0.469	89 Wayne	1.105	0.518	0.492
45 Lake	1.181	0.440	0.220	90 Wells	1.134	0.691	0.380
				91 White	1.091	0.837	0.544
				92 Whitley	1.077	0.739	0.584