Public utility taxation in Illinois

Diane F. Siegel and William A. Testa

Taxation of natural gas, electricity, and telephone utility revenues has become an important source of state and local government revenue in Illinois. Rising costs of fossil fuels and electric power plant construction have caused utility tax revenues to grow more rapidly than such other revenue sources as general sales and property taxes. The increase in utility taxes has been especially dramatic in those municipalities, such as the City of Chicago, that have raised tax rates on the expanding utility tax base. The rapid growth of state and local utility taxes in Illinois is of special concern because the state has one of the highest utility tax levels in the nation.

This paper analyzes the Illinois utility taxes in terms of their likely impact on economic growth, their fairness to taxpayers, and their contribution to state and local fiscal stability. Our findings indicate that the Illinois utility taxes add to the state's relatively high energy utility prices. Another drawback of the state's utility tax system is that its burden falls most heavily on low-income taxpayers. However, the utility taxes do provide a stable source of revenue for state and local governments, and their costs of administration and taxpayer compliance are quite low.

Growth of utility taxation in Illinois

Both state and municipal governments in Illinois tax the gross receipts of utility sales under selective excise taxes. The state tax applies to sales of natural gas, electricity, and intrastate messages. Local governments are allowed to tax these three utilities as well as water services. Together, state and local utility tax revenue amounted to $959 million in fiscal 1983, two-thirds collected by the state government and one-third by municipal governments (Table 1). While one out of five Illinois cities taxes one or more utility services, the City of Chicago accounts for over three-fourths of all local utility tax revenues.

The Illinois state utility tax has been levied at a five percent rate since 1967. In fiscal 1984, the state government collected $652 million from the utility tax. Electricity receipts contributed 47 percent of that amount, while gas and telephone utilities contributed 33 percent and 20 percent respectively.

Since the late 1960s, state utility tax revenues have consistently grown faster than the rate of inflation. This is demonstrated by the increase in the index of constant dollar utility tax revenue relative to the 1968 level (Figure 1). Real state utility tax revenues increased by roughly five percent per year, on average, from 1968 to 1974, with gas, electricity and message revenues all growing at approximately the same rate. Total utility tax revenues continued this real growth rate from 1974 to 1983, but the growth of the individual components diverged. The constant dollar revenues from intrastate telephone services remained fairly stagnant, but the growth of real gas and electricity revenues accelerated following the dramatic increase in world energy prices.

The rapid growth in public utility tax revenues has increased the tax's importance to the state's revenue system. Utility tax revenues as a share of total state taxes grew from 5.0 percent in fiscal 1970 to 7.5 percent in fiscal 1984. Growth in the utility tax revenues exceeded the growth in the general sales tax, the other selective excise taxes, and the state income tax. The corporate income tax was the only major state tax to increase faster than the public utility tax since 1970, and its growth was partly attributable to the addition of the personal property tax replacement surcharge in 1979.

Local utility taxes in Illinois. Public utility taxes have also been an expanding source of revenue for local governments in Illinois since the early 1970s, generally outpacing local property and sales taxes. All municipalities, except Chicago, are limited to a maximum public utility tax rate of five percent on gross receipts from the sale of electric, natural gas,

Diane F. Siegel is an associate economist and William A. Testa is an economist at the Federal Reserve Bank of Chicago. The authors thank Georgia Stefanski for valuable assistance and Gary Koppenhaver and Donna Vandenbrink for useful comments.

Table 1
Illinois state and local public utility tax revenues
fiscal years 1970-1984

Fiscal year	State revenue		Total local revenue		City of Chicago revenue	
	Million dollars	Percent of taxes	Million dollars	Percent of taxes	Million dollars	Percent of taxes
1970	144	5.0	n.a.	n.a.	55	14.5
1971	158	5.0	74	2.8	60	13.3
1972	175	5.2	82	2.7	66	13.6
1973	189	5.1	89	2.8	71	12.6
1974	209	5.1	95	2.5	75	13.5
1975	248	5.6	118	3.2	95	16.0
1976	277	5.8	143	3.7	111	17.9
1977	329	6.2	162	3.7	123	18.9
1978	372	6.4	183	4.0	141	21.1
1979	429	6.8	207	4.2	158	22.0
1980	470	6.6	229	4.3	175	23.8
1981	526	7.2	255	4.3	192	24.2
1982	595	8.0	295	4.7	222	25.4
1983	607	8.2	352	5.0	267	26.2
1984	652	7.5	n.a.	n.a.	285	24.1

SOURCES: City of Chicago, Illinois Department of Revenue, and U.S. Bureau of the Census.

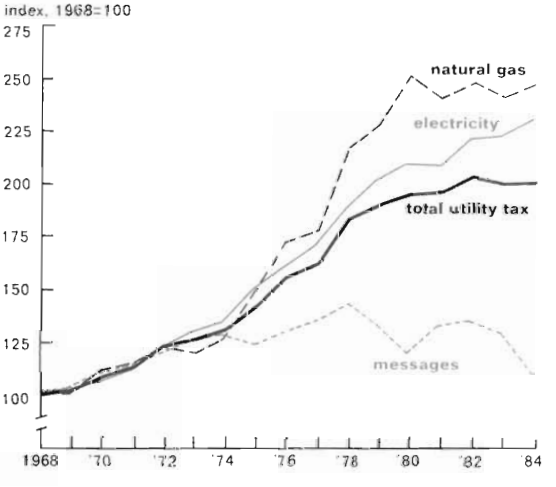
water, and message services. Not all municipalities tax all utility services at the maximum rate. Many impose the tax at a lower rate, many do not tax all types of utility services, and some Illinois communities do not tax utility receipts at all.

The City of Chicago effectively taxes electric, natural gas, and telephone receipts at an eight percent rate, although for electric and telephone services this rate is achieved through the combination of two separate taxes. One is a public utility tax that is similar to the state and other local utility taxes in that it is collected by the utilities from the customers. The other tax is a franchise tax on gross receipts that the utility pays directly to the city. Unlike the utility tax, the franchise tax does not appear on customer billings. There is no franchise tax on natural gas sales, but the city's utility tax covers natural gas receipts at an eight percent rate. This was increased from five percent in July 1981.

In fiscal 1983, Illinois municipalities raised a total of $352 million from public utility taxes with the great bulk collected by the City of Chicago (Table 1). Local utility taxes grew from 2.8 percent of total local taxes in fiscal 1971 to 5.0 percent in fiscal 1983. As with the state utility tax, the growth in local public utility tax revenues was spurred by the energy price increases in the 1970s and 1980s, though statutory tax rate increases also contributed.

In Chicago the importance of utility taxes to the city budget has grown tremendously. From fiscal 1970 to 1984, the utility tax share of total city tax revenues increased from 14.5 to 24.1 percent. Over the same period, the contribution of the city sales tax grew much

Figure 1
Constant dollar index of state utility tax revenue in Illinois



more slowly, from 13.5 to 17.2 percent, and the contribution of the property tax fell from 59.0 to 34.5 percent.

Interstate comparison of utility tax levels

Public utility taxes in Illinois have been controversial not only because of their rapid growth, but also because many contend that the Illinois utility taxes are very high relative to those in other states. Concern about the level of utility taxes in Illinois increased as utility prices rose, stimulating some support for proposals to lower the state's utility tax.[1] This section of the paper conducts a comprehensive comparison of utility receipts taxation across states and finds that Illinois does have one of the highest utility tax levels in the country.

Interstate comparison of public utility taxation is complicated because utility receipts are covered under different types of taxes across states. Many states levy a separate tax on public utilities as Illinois does, while others tax utility receipts under their general sales taxes. There are twenty-two states which cover utility receipts under both a sales tax and a separate utility excise tax. Furthermore, in many states public utility receipts are taxed at the local level under general sales taxes or selective utility excise taxes. The economic effects of these different forms of utility taxation should be very similar. For this reason, our utility tax comparison includes all taxes which apply to public utility receipts or sales at the state and local levels.

There is also substantial variation across states in the type of utility service covered and the basis of taxation. Most often, utility taxes are imposed on utilities' gross receipts, but in a few states they apply to units of service sold, miles of line for transportation utilities, or miles of poles for telephone companies. To simplify our comparison of utility tax levels, we focus on the total revenues collected by such taxes in each state.[2]

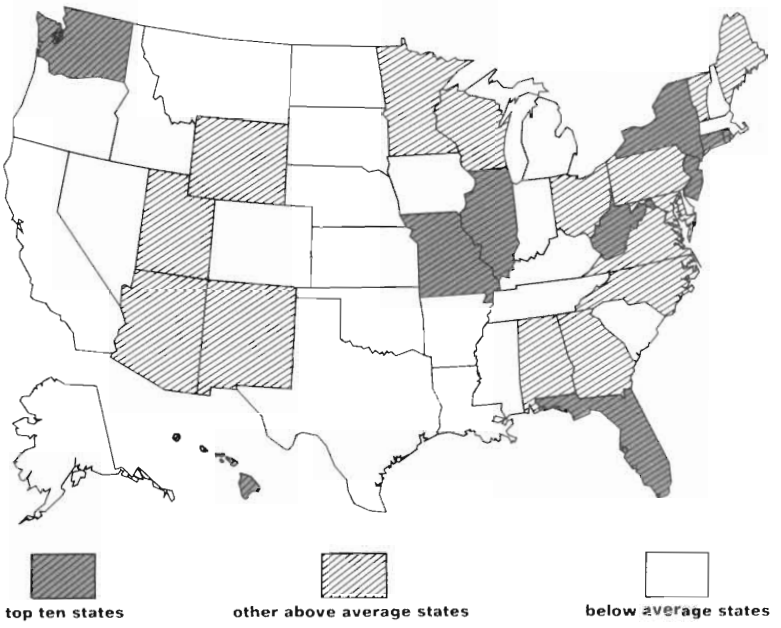
It is not enough to compare utility tax collections across states, however. The relative level of utility taxation in each state is best indicated by revenue measures that correct for differences in state size and taxable resources. Our interstate comparison is based on four such measures: the ratios of utility tax revenues to state general revenues, population, income, and total utility sales. The top ten states according to each measure in fiscal 1982 are shown in Table 2. Illinois ranks very high by each of these criteria.

Table 2
Ten states with highest levels of public utility taxation according to four measures, fiscal year 1982

Revenues as a percent of state & local own source general revenue		Revenues per capita		Revenues per $1,000 personal income		Revenues as a percent of standard base	
Florida	5.3%	New York	$103.79	New York	$9.05	New York	12.7%
New Jersey	5.2	New Jersey	89.51	West Virginia	7.82	New Jersey	9.2
Illinois	5.1	**Illinois**	77.77	New Jersey	7.40	Hawaii	8.3
West Virginia	5.0	Hawaii	75.85	Hawaii	6.87	West Virginia	8.18
Missouri	4.7	Florida	69.76	Florida	6.84	Florida	8.18
New York	4.6	Connecticut	69.51	**Illinois**	6.70	Washington	8.17
Alabama	4.3	West Virginia	65.71	Arizona	6.33	Connecticut	8.1
Connecticut	4.3	Arizona	61.77	Alabama	6.27	**Illinois**	7.6[1]
Arizona	4.1	Rhode Island	56.46[1]	Missouri	5.63[1]	Rhode Island	7.5[1]
Hawaii	4.0	Pennsylvania	55.53	Rhode Island	5.57[1]	Missouri	6.9
50-state mean	2.5	50-state mean	38.57	50-state mean	3.82	50-state mean	4.5
std. dev.	1.5	std. dev.	22.99	std. dev.	2.12	std. dev.	2.7

[1] Rhode Island's tax revenues are understated because information on revenues from taxation of public utility receipts under the state sales tax was not available. This understatement is probably small because Rhode Island's state sales tax does not apply to residential or manufacturing purchases of public utility services.

Figure 2
State and local utility tax effort by state -1982



The first measure indicates the importance of utility taxes to state and local governments by their contribution to state and local own source general revenue (column 1).[3] Illinois is third among states with 5.1 percent of all state and local tax revenues contributed by utility taxation. The two states which lead the list outrank Illinois only slightly. Utility tax revenues contributed 5.3 percent of state and local own source general revenue in Florida and 5.2 percent in New Jersey.

Measures of utility tax revenue per capita and per $1000 of personal income (columns 2 and 3) are used to estimate the burden of utility taxation on state residents. Illinois utility taxes rank third in the country on a per capita basis and, because of high personal incomes in the state, sixth in utility tax revenue per $1000 of personal income. These ratios suggest that utility tax burdens on Illinois taxpayers are higher than in most states, assuming the taxes are borne fully by state residents.

Finally, we measure tax collections relative to the expenditure on utility services in the state (column 4).[4] This measure reflects the degree to which each state employs the taxable base, utility consumption, as a tax source. Comparisons using this "tax effort" or effective rate correct for the fact that utility consumption varies across states due to industry mix, climate, and proximity to energy sources. If utility taxes are largely passed forward to final customers, this measure estimates the extent to which the taxes raise utility prices.

Illinois ranks eighth in the nation according to this measure, with an effective tax rate of 7.6 percent compared to a 4.5 percent 50-state average. The fact that Illinois ranks a little lower according to the tax effort index suggests that its taxable base of utility sales slightly exceeds that of the other high utility tax states.

Figure 2 compares the utility tax effort levels of all 50 states. High utility taxes appear much more prevalent in the eastern half of the country. Of all the midwestern states, Illinois has the highest utility tax effort, though it is closely followed by Missouri.

The four tax level measures all indicate that the Illinois utility taxes are among the highest in the nation. Such high utility taxes might have adverse effects on business expansion and income distribution in the state. A further concern is whether the tax is a reliable

source of financing for government services through economic upturns and downturns. The following sections consider the implications of the Illinois public utility taxes for economic development, utility consumers, and state-local governments.

Implications for economic development

The relatively high utility tax levels in Illinois may adversely affect economic growth in two ways. First, the tax may raise utility prices relative to other production inputs so that businesses will substitute other inputs for the taxed utilities. This use of resources will be less efficient because it is not based on prices that reflect the true scarcity of inputs. Second, if the tax raises industrial utility prices in Illinois relative to those in other states, it may discourage energy-intensive industries from locating or expanding in Illinois.

Utility taxation and resource use. The Illinois sales tax does not cover sales of intermediate goods used in production, including utility services.[5] However, the Illinois utility excise taxes cover both commercial and industrial sales. As a result, firm decisions concerning choice of input mix and production method are affected by the uneven tax coverage of inputs. To the extent that utility taxes raise the price of utilities relative to substitutes, production choices are based on prices that do not reflect the scarcity value of alternative inputs. The use of utility services is discouraged in favor of substitute inputs to production.

This effect may be partly offset by Illinois sales taxation of the closest substitutes to gas and electricity, such as fuel oil and coal. Illinois levies a sales tax on these products at an identical five percent rate so that production choices between alternative fuels are not necessarily distorted because taxes raise fuel prices proportionately. Local tax treatment of alternative fuels, however, is often more diverse because local sales taxes in Illinois seldom exceed one percent while municipal utility taxes are often higher.

The taxation of utility inputs to production also results in inordinate tax burdens on those goods, both final consumer and intermediate producer goods, that use utility services intensively in their production process. This leads to multiple taxation and the upward skewing of prices of certain final goods. These goods are taxed once under the utility tax because final prices reflect embodied taxed utility services, and they are taxed once again by the retail sales tax. In the case of final consumer goods, utility-intensive product prices and the attendant consumer choices are thus distorted. Similarly, prices of utility-intensive intermediate goods in production reflect utility taxation so that firm choices among production methods are also affected.

Utility taxes and investment. An additional concern is that utility taxes may discourage industry from locating or expanding in Illinois by ultimately raising utility prices and total production costs in comparison to neighboring regions. Because utility costs account for a small share of production cost for most industries, wide utility price disparities across locations are necessary to generate significant regional differences in profitability and hence to affect location or investment decisions.

Total gas plus electric cost per dollar of value added in manufacturing provides one measure of the importance of utility costs to Illinois industry. As Table 3 shows, utility costs are not a large cost component for most Illinois manufacturers. In 1980, total manufacturing outlays on utility services amounted to only four percent of value added. Only one major Illinois industry, primary metals, consumed gas and electricity at far above the average for all manufacturers. Other industries reported outlays on utilities in the one to six percent range.

The extent to which Illinois utility taxes increase utility prices can be estimated by utility revenues as a percent of utility sales for all end uses (Table 2, column 4). This measure yields an average potential tax-induced price hike assuming that taxes are largely passed forward in utility prices. Here we find that, on average, state and local tax policies in Illinois tend to raise utility prices three percent above the 50-state mean and approximately seven to eight percent in relation to low tax states.[6]

For industrial prices specifically, these estimated price add-ons understate the potential price markup because many states exempt natural gas and electricity, along with other fuels, that are used directly in industrial production (Figure 3). Thirty states, including Illinois, tax industrial gas or electricity sales under a selective utility tax. Thirty states levy a sales tax

Table 3
Energy utility costs (natural gas plus electric) as a share of value-added in manufacturing for Illinois and U.S.–1980

	Utility cost/ value added	
	U.S.	Illinois
	(percent)	
SIC 20 - Food and kindred products	3.9	4.4
SIC 21 - Tobacco manufacturers	1.1	—
SIC 22 - Textile mill products	5.9	—
SIC 23 - Apparel and other textile	1.4	1.5
SIC 24 - Lumber and wood prods.	3.5	—
SIC 25 - Furniture and fixtures	1.9	2.2
SIC 26 - Paper and allied prods.	9.0	4.7
SIC 27 - Printing and publishing	1.2	1.4
SIC 28 - Chemicals and allied prods.	9.5	5.2
SIC 29 - Petroleum and coal prods.	14.4	—
SIC 30 - Rubber, misc. plastics	4.8	5.8
SIC 31 - Leather and leather prods.	1.7	—
SIC 32 - Stone, clay, glass prods.	10.5	—
SIC 33 - Primary metals	14.4	15.5
SIC 34 - Fabricated metal prods.	2.8	3.2
SIC 35 - Machinery, except elec.	1.7	2.0
SIC 36 - Electric, Electronic equip.	1.9	2.0
SIC 37 - Transportation equip.	2.1	1.8
SIC 38 - Instruments, related prod.	1.2	1.8
SIC 39 - Misc. manu. prods.	1.7	1.9
All manufacturers	4.7	4.0

SOURCE: U.S. Department of Commerce, *Annual Survey of Manufacturers*, May 1984.

on gas or electricity sales; however, 19 of those either exempt or partially exempt industrial fuel use. Due to this widespread exemption practice, the U.S. average utility tax on industrial utility sales likely falls short of the 4.5 percent mean measured over all end uses reported in Table 2. Accordingly, the Illinois 7.6 percent markup from gross utility receipts taxation looms somewhat larger in comparison.

Industrial utility tax differences are particularly notable in relation to neighboring states. The state sales taxes in the nearby states of Iowa, Michigan, and Indiana cover utility sales but exempt gas and electricity used in industrial production. The Kentucky and Missouri sales taxes offer partial exemptions to one or more utility services (Figure 3). Utility price differences among neighboring states are expected to be important to business location choices because other factor costs, such as labor and transportation, often diverge less within the same general region.

These findings notwithstanding, utility taxes alone probably cannot cause price disparities large enough to significantly affect investment decisions in Illinois because utility costs remain a lesser cost consideration in production. However, utility tax reform can contribute to a broader set of policies intended to maintain competitive utility prices in Illinois. Such policies could improve the state's business climate if utility prices greatly were to exceed those in neighboring states and regions.

Industrial gas and electricity prices in Illinois exceeded the national average and those in most neighboring states in 1981 (Table 4). Illinois natural gas prices compared more favorably than electricity prices to prices in neighboring states and the national average. Gas prices in some parts of Illinois, such as the Chicago area, benefit from regulated contract prices on older vintage natural gas wells under the Natural Gas Policy Act of 1978. However, as these particular reserves of natural gas are exhausted over time, Illinois natural gas prices may rise relative to prices in other states.

Electricity prices in Illinois were much greater than those in most neighboring states and the nation in 1981. This electricity price differential did not change significantly in the period from 1974 to 1981. However, the ambitious nuclear program in Illinois may widen these price differences further in the near future as the costs of completed nuclear power plants are passed along in customer billings. As of March, 1985, four nuclear power plants in Illinois remain under construction.

In summary, although utility prices in Illinois are not now critically out of line with other regions, utility prices, especially electricity, are higher than those in neighboring states, and they could increase further in coming years. Retrenchment of utility taxation on industrial and commercial use cannot, by itself, lower comparative utility prices to a degree that would significantly encourage economic development. However, if Illinois utility prices become uncompetitive in coming years, utility tax reform may grow increasingly attractive when packaged with other price containment policies.

Implications for residential consumers

In addition to its potential impact on business development, the Illinois public utility tax may also influence the consumption patterns and welfare of residential utility customers. We find little indication that the utility tax does alter consumer behavior, but there is sub-

Utility taxation in Seventh District states*

	Gross receipts tax		Sales and use tax			
	State	Local	State	Local	Major sales tax exemptions	Effective tax rate
Illinois	5%	0-5%**	X	X	no sales tax coverage of utilities	7.6
Indiana	X	X	5%	X	gas and electricity used in industrial processing	2.3
Iowa	X	X	4%	X	gas and electricity used in industrial processing	2.4
Michigan	X	5%	4%	X	gas and electricity used in industrial processing	2.7
Wisconsin	rate varies	X	5%	X	gas and electricity for both residential and agricultural use from November to April.	5.7

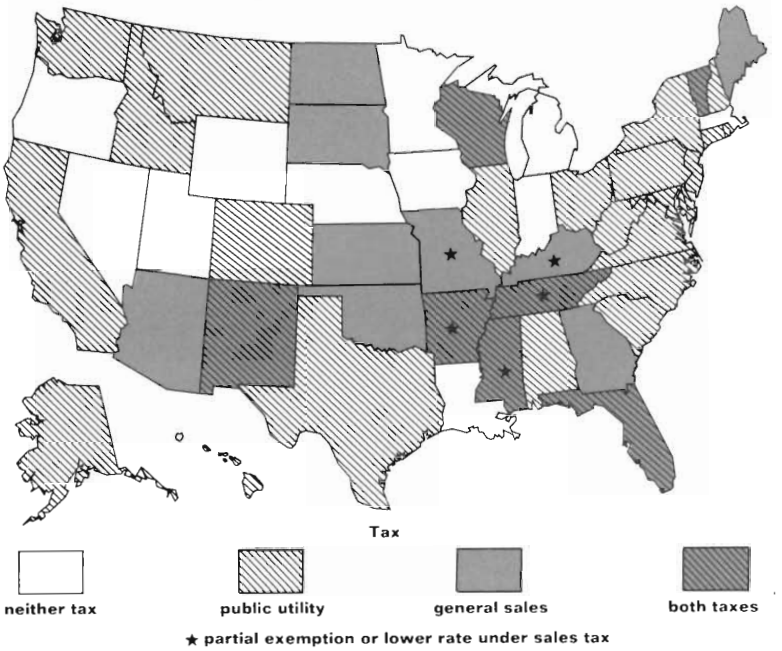
*Utilities taxes in all the Seventh District States cover natural gas, electricity, and intrastate message receipts. Some also include sales by water, steam, and car line companies.
**The City of Chicago effectively taxes gross receipts at 8 percent.
X—means the tax does not apply to utility receipts.

Utility taxation practices vary widely among Seventh District states. In Illinois, utility receipts are taxed at both the state and local levels. Taken together, these taxes cover the estimated utility tax base at a 7.6 percent rate, which exceeds the 4.5 percent for all states. In addition to the five percent state tax on gas, electricity, and intrastate messages, approximately 230 Illinois municipalities (18 percent) tax one or more utility services at rates up to five percent. The City of Chicago taxes utility receipts at an eight percent rate through a combination of business franchise and gross receipts taxes.

Wisconsin also taxes utility sales at an effective rate greater than the national average. This is accomplished through a combination of utility gross receipts taxation and state sales tax coverage of utility services. Wisconsin is the only Seventh District state to target tax relief to residential consumers by exempting home utility sales from taxation during the cold weather season.

The states of Iowa, Indiana, and Michigan share similar utility tax levels and administrative practices. Their state-local tax effort, at approximately two and one-half percent of utility sales, falls below the national average. In practice, these states include utility services in their state sales taxes but exempt fuel used in industrial processing. At the local government level, the city of Detroit alone imposes a sales-type tax on utility services. This is achieved by a five percent levy on gross receipts which is earmarked for wage and salary disbursements to Detroit policemen.

Figure 3
State government taxation of utility services (gas or electric) used by industrial customers - 1983



stantial evidence that the tax alters the distribution of income in the state by falling more heavily on low income households.

Utility taxes and consumer prices. Utility taxation can influence consumption behavior if it changes the relative prices of consumer goods and services. Therefore, the utility tax must be compared with other consumer taxes, particularly state and local sales taxes, which affect the prices of non-utility goods and services.

The State of Illinois imposes a sales tax of five percent on the purchase and use of tangible property. This sales tax base is narrower than in many other states because it excludes services and utility sales. The Illinois state public utility tax effectively broadens the base of consumer taxation at the state level by taxing *residential* utility sales at a five percent rate. Since the utility tax increases the number of consumer purchases taxed at five percent, it generally enhances the consumer price neutrality of the state tax system.

The neutrality of utility taxation at the state level is not always achieved at the local level in Illinois. Many municipalities impose utility tax rates that exceed or fall below the local sales tax rate. The City of Chicago is an extreme example for it imposes an eight percent tax on utilities and a two percent tax on general retail sales. In the absence of other offsetting government policies, this can be expected to raise Chicago utility prices relative to other consumption goods.

The equity of utility taxation. A more serious concern about the Illinois utility taxes is that their burden may fall inordinately on low-income households. If low-income people spend a greater share of their income on utilities, the utility tax will take up a greater share of their income. Such a tax is called a regressive tax and is often considered inequitable because it redistributes income away from low-income people.

The Illinois state public utility tax does appear to be highly regressive. Because the utility tax is proportional to total utility expenditure, the equity of the tax can be inferred from the schedule of utility expenditure by income level. Figure 4 shows that in Illinois spending on natural gas and electricity as a share of household income declines dramatically as income rises. Households with the

Table 4
Average cost of natural gas and electricity delivered to manufacturers 1974 to 1981

			Ratio of Illinois price to other regions	
	1974	1981	1974	1981
Natural gas ($/mcf)				
Illinois	.80	3.47	1.00	1.00
U.S.	.68	3.20	1.17	1.08
Neighboring states				
Indiana	.72	3.05	1.11	1.14
Iowa	.64	3.01	1.25	1.15
Kentucky	.70	3.26	1.14	1.06
Michigan	.92	3.62	.87	.96
Missouri	.65	3.32	1.23	1.05
Wisconsin	.80	3.84	1.00	.90
Electricity (¢/kwh)				
Illinois	1.6	4.6	1.00	1.00
U.S.	1.4	3.8	1.18	1.19
Neighboring states				
Indiana	1.2	3.5	1.36	1.30
Iowa	1.6	3.8	1.05	1.21
Kentucky	.9	3.2	1.77	1.42
Michigan	1.8	4.8	.91	.95
Missouri	1.4	3.5	1.13	1.31
Wisconsin	1.7	3.9	.96	1.18

SOURCE: U.S. Department of Commerce, Bureau of the Census, *Annual Survey of Manufacturers 1974* and *1982 Census of Manufacturers.*

highest ten percent of income had a ratio of utility expenditure to income that was less than one-tenth the ratio for households with the lowest ten percent of income.

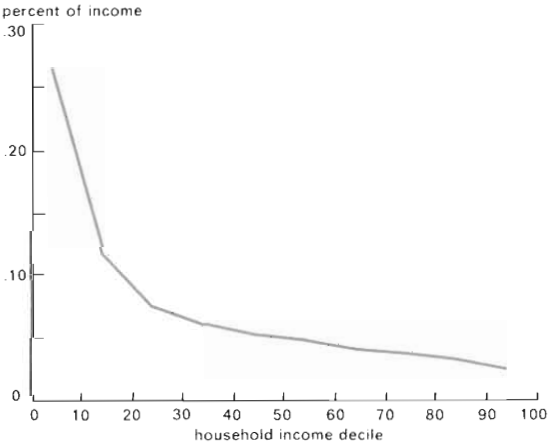
The utility expenditure rate declines very steeply at the beginning of the schedule, particularly over the first three income deciles. Over 25 percent of money income was spent on gas and electricity in those households in the lowest decile in 1979. The second income decile paid slightly less than 12 percent and the third decile paid less than eight percent of income on utilities.

In addition, there is evidence that utility taxation has become more regressive since the early 1970s. This trend can be most easily demonstrated by the change in income elasticity of utility expenditures over time. The elasticity measure summarizes tax regressivity by computing the ratio of the percentage change in utility expenditure to the percentage change in income level. Since the utility tax is directly proportional to utility expenditures, the income elasticity of the tax is identical to the elasticity measure for total utility expenditures. An elasticity estimate less than one indicates that the tax is regressive because the tax burden does not rise proportionately with income. An elasticity estimate greater than one suggests that the tax is progressive because it rises more rapidly than income.

We estimate the income elasticity of utility expenditure from data on consumer spending in the Central Census Region for 1972-73 to be 0.39.[7] This low elasticity measure reinforces our conclusion that the Illinois tax is highly regressive. By 1980-81, the region's income elasticity estimate had fallen to 0.17, indicating that utility taxation had grown even more regressive.

This increase in the regressivity of utility taxation appears to be due to the slower adjustment by low income households to the real increase in energy prices that occurred in the 1970s. The quadrupling of world oil prices, accompanied by rising prices of associated fuels, sparked a significant investment in weatherization improvements in the household sector. Construction methods were also modified to increase the efficiency of residential energy use. However, low-income households apparently did not keep up with the pace of improvement in energy efficiency. There is evidence that housing occupied by low-income families was weatherized less often during the

Figure 4
Percent of household income spent on gas and electricity in Illinois by income class - 1979



1970s than the housing of high-income people.[8] As a result, utility consumption, and utility tax payments, as a percent of income, grew more rapidly for low-income households across the nation as energy prices rose. Thus, there is strong evidence that the portion of the Illinois utility tax that falls directly on residential customers is highly regressive and that its regressivity increased during the recent period of rapidly rising energy prices.

The equity of the utility tax that is levied directly on commercial and industrial utility customers is much more difficult to measure because it is not clear who actually pays the tax. The incidence of nonresidential utility taxes will depend on the income levels of the customers who ultimately pay the taxes through the prices of final goods and services. While the actual tax incidence is very difficult to measure, the nonresidential component of the utility tax is most likely less regressive than the residential component because household utility services are more concentrated in low income budgets than are general household expenditures.[9]

Residential exemptions. Since the late 1970s, many state governments have sought to reduce the regressivity of utility taxation by specifically exempting household consumption from the tax base. In the vast majority of cases, these exemptions have applied to sales taxes rather than selective utility excise taxes such as the Illinois utility tax. In a few states, residential utility sales are still taxed at the local level even though they have been exempted under the state sales tax.

Of the 47 states which have sales taxes 31 cover some or all utilities and 30 of these cover gas or electricity. Seventeen of these 30 states provide some type of exemption for utility services, primarily gas or electricity purchased by residential users (Figure 5). Delaware is the only state that exempts residential utility sales under a selective utility excise tax.

The exemption of residential utility sales has clearly accelerated during the past decade of rising fuel prices. Virtually all of these exemptions have been enacted since 1974, many within the past five years, in attempts to soften the consumer burden of rising energy prices.

Illinois has not participated in the recent movement toward residential exemption, and as a result low income households in the state clearly bear an inordinate share of the rising utility tax burden. Relatively high utility taxes in Illinois, and particularly in Chicago, intensify concerns over the fairness of this tax. As most economic analysts believe that income redistribution programs are best handled at the federal level, it is questionable whether state-local tax structure design should be dominated by equity concerns. However, if state legislators perceive that the federal government is not accounting for the detrimental effect of rising energy prices on the poor, state-local utility tax reform is an alternative policy course.

Implications for government

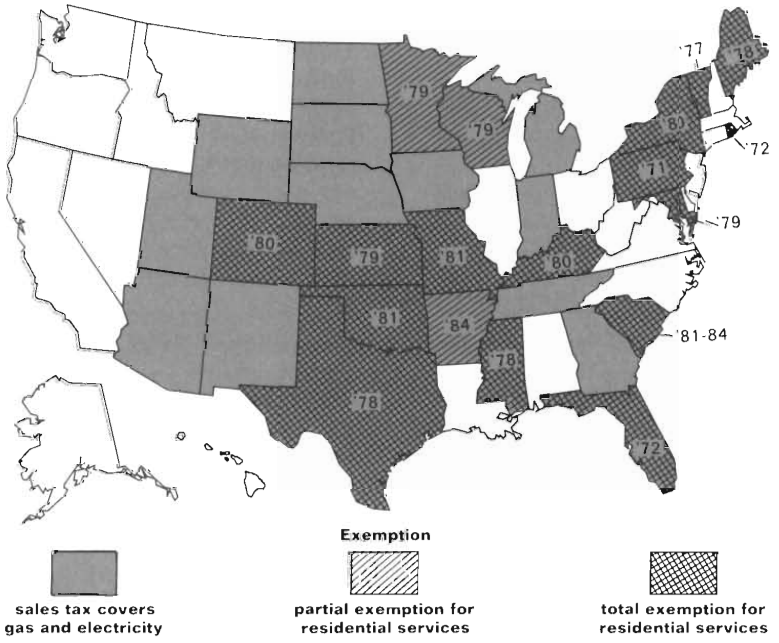
Finally, the advantages and disadvantages of the rapidly growing Illinois utility tax should be considered from the point of view of state and local government administration. From this perspective the tax scores fairly well. The cost to governments of administering the tax and the cost to taxpayers of complying with it are low. In addition, utility taxes are a reasonably reliable revenue source, for they display only a moderate level of sensitivity to the business cycle.

Administration and compliance costs. The cost of collecting the utility tax is low because the number of collection points, the public utility companies in the state, is very small. Moreover, the extensive recordkeeping required of regulated utilities facilitates the auditing of revenues for tax purposes. There are no extra costs of tax compliance on the taxpayers' side because utility customers usually pay the taxes along with their utility bills.

Local sales taxes on utility services are usually administered and collected by the state along with the state sales tax where the local sales tax base includes utilities. This practice lowers the cost of tax administration because it requires little duplication of facilities.

Utility taxes and fiscal stability. Another major consideration for state and local governments is the stability of tax revenues with respect to changing economic conditions, particularly swings in national economic activity. Extreme tax revenue volatility can be costly. Many state governments borrow to finance long-run capital expenditures and to meet very short-term deficits. Borrowing to

Figure 5
State sales tax exemption of residential gas and electricity by year of enactment



meet unexpected shortfalls in revenues from cyclically sensitive taxes raises costs to state governments, especially during periods of high interest rates. And insofar as most state governments are prohibited from running operating deficits beyond their fiscal years, revenue shortfalls during periods of recession often prompt legislatures to enact new taxes or program cutbacks in a haphazard manner. Tax and spending changes designed in haste may include poorly conceived features that are not always revised during the subsequent economic recoveries.

Assuming that interactions between the stability of various taxes are negligible, the Illinois utility tax's contribution to the cyclical sensitivity of the tax system can be assessed by comparing the stability of the utility tax to that of other major taxes. Our analysis focuses on the state utility tax, but we expect the behavior of local utility taxes in Illinois to be very similar. We find that the three components of the Illinois state utility tax contribute very different amounts of business cycle sensitivity to state tax revenues. However, the cyclical behavior of combined total utility tax revenues does not sharply differ from that of other major state taxes so that broad-based utility tax abatement would not radically change the stability of the Illinois tax system.

In order to estimate the cyclical sensitivity of the utility tax, we must hold the influence of many noncyclical factors constant. The weather is the strongest noncyclical influence on utility tax revenues. Changes in the tax rate or base can produce dramatic shifts in tax revenues. Movements in relative utility prices also have a powerful independent effect on the growth in real utility tax revenues.

We estimate the stability of the utility tax by regressing quarterly real tax receipts on quarterly real income in Illinois and on the aforementioned noncyclical factors which are thought to affect tax revenue variation.[10] The stability of the tax, or its elasticity, is indicated by the coefficient on the real income variable. Since the regressions are specified in logarithmic form, the income coefficient measures the percent change in real tax revenues in response to a one percent change in economic activity.

Separate equations for electricity, natural gas, and message tax revenues are specified to provide an understanding of the behavior of the three components of the utility tax. These

equations are first estimated using quarterly data from the third quarter of 1962 through the second quarter of 1983. The results are compared to the estimates of a similar equation for the state sales tax. The four equations are re-estimated over a shorter sample beginning in the fourth quarter of 1969 so as to allow comparison with the state individual income tax which was enacted in 1969.

Stability estimates from the full sample indicate that the elasticity of real tax revenues with respect to real income is very different for the three components of the utility tax (Table 5). Real electricity revenues have a high real income elasticity of 2.38. Message revenues appear to be very stable with a real income elasticity of 0.65. The natural gas elasticity of 1.22 indicates that revenues from this portion of the public utility tax are moderately sensitive to economic conditions. The sales tax revenues also display a moderately sensitive elasticity estimate of 1.30.

The cyclical sensitivity of the total public utility tax is estimated by averaging the real income elasticities of the three components weighted by each component's average share of total utility tax revenue. This weighted average utility tax elasticity is 1.59, which exceeds the estimated sales tax elasticity. However, the difference is not large enough to suggest that the overall utility tax is much less stable than the sales tax. The fact that both elasticities are greater than one suggests that the public utility tax and the sales tax are fairly sensitive to cyclical changes in the state's economy.

The regressions estimated over the shorter sample period have fairly similar results. The major difference is that the real income elasticity estimated for gas tax revenues is very low (0.48) and statistically insignificant. This may be because the period of natural gas shortage in the 1970s makes up a substantial portion of the shorter sample. When gas consumption is limited by supply, the effect of income on consumption is not likely to be very strong. Therefore, it is not surprising that the income elasticity estimate for gas is low and insignificant in the shorter period.

The other income elasticity estimates differ somewhat from the estimates in the full sample, although their ranking remains the same. The low income elasticity for natural gas pulls the weighted average elasticity for the total public utility tax down to 1.14 in the shorter sample. This is lower than the estimated real income elasticities of 1.53 and 1.68 for the sales and individual income taxes. However, because the weighted average elasticity for the total utility tax may be unusually low over this period, we do not reverse our conclusion from the full sample that the cyclical sensitivity of the utility tax is fairly similar to that of the sales tax. The fact that the income elasticities of the income tax and the sales tax are close suggests that, under normal market conditions, the stability levels of the utility tax and the income tax may also be similar.

The public utility, sales, and individual income taxes each contribute a moderate

Table 5
Cyclical stability of Illinois state tax revenues[1]

	1962 Q3 -1983 Q2		1969 Q4 - 1983 Q2	
	Real income elasticity	95% confidence interval	Real income elasticity	95% confidence interval
Public Utility Tax				
Electricity	2.38	1.95 to 2.81	1.92	1.53 to 2.31
Natural Gas	1.22	.19 to 2.25	.48	−.96 to 1.92
Messages	.65	.36 to .94	.53	.14 to .92
Sales Tax	1.30	1.16 to 1.44	1.53	1.24 to 1.82
Individual Income Tax			1.68	.95 to 2.41

[1] Cyclical stability is estimated by the partial elasticity of real tax revenues with respect to real income. For complete regression estimates see Diane F. Siegel and William A. Testa, "Taxation of Public Utility Sales in Illinois" (Regional Working Paper, Federal Reserve Bank, Chicago, 1985).

amount of instability to the Illinois state tax system. Their behavior is not different enough to suggest that altering the relative levels of the three taxes would radically change the overall sensitivity of the state's real tax receipts. However, the three components of the utility tax do react very differently to cyclical changes in the state's economy. Thus, any restructuring of the utility tax could alter the stability of total utility tax revenues.

Conclusion

Given the offsetting advantages and disadvantages of the Illinois utility taxes, outright elimination or comprehensive reduction of utility tax rates is an undesirable path of reform. Utility taxes are an attractive revenue source for state and local governments because the costs of administration and taxpayer compliance are very low. Furthermore, the cyclical sensitivity of state utility tax revenues is not substantially different from that of revenues from other major state taxes. High utility taxes in Illinois may be detrimental to the state's business climate because of their contribution to the relatively high utility costs in the state. However, as yet, utility prices do not appear to be critically higher than other regions and utility taxes contribute only a modest amount to total utility price. The case for lowering the utility tax on industrial and commercial use is thus not overwhelming, although such a policy is an option for state lawmakers if the utility price disadvantage in Illinois grows larger.

The policy trade-offs concerning the utility tax on residential sales are much sharper. The tax is very burdensome to low-income households, and it has grown more so over the past decade of rising energy prices. Yet, the tax is distributed more in proportion to income for middle and upper income consumers and it has a fairly neutral influence on overall consumer purchase decisions. For this reason, policymakers should consider those reforms that target tax relief to the lower end of the income distribution where utility taxes are the most regressive.

[1] In 1984, several bills were introduced into the Illinois General Assembly which would lower the state public utility tax in some way. The two that attracted the most support were a proposal to cut the state utility tax rate in half (an amendment to H.B. 1736) and another proposal, sponsored by Rep. Tom Homer (D., Canton), to levy the tax on units of utility consumption rather than gross utility receipts (H.B. 2442). An advisory referendum in support of the bill to halve the tax rate passed in 75 communities in the March 1984 primary. That bill was later changed to support a consumption-based tax at slightly lower rates than proposed by H.B. 2442. Neither bill made it out of committee during the 1984 legislative session.

In 1985, the Homer bill was introduced as H.B. 18 in the House and S.B. 334 in the Senate. The House Revenue Committee passed an amended version of the bill. The amendments raised the rate slightly; removed payments for services rendered, including minimum service charges, from the definition of gross receipts; and required that each customer be taxed at the lower of the consumption-based rate and the five percent rate. An amendment to S.B. 334 replaced the Homer proposal with a requirement that utility receipts be taxed at a rate set each year to insure that projected tax receipts equal the revenue collected in fiscal 1985. At the time this article went to press, H.B. 18 had passed in the House and S.B. 334 had passed in the Senate.

[2] State and local public utility tax revenue data were obtained from the Bureau of the Census. State sales tax revenues from public utilities were collected directly from the state revenue departments. Data on local sales tax revenues from public utilities are not available from the Bureau of the Census or from state revenue departments, so they were estimated from information on state sales taxes.

[3] Own source general revenue is the revenue raised directly by the government through taxes and user fees.

[4] The standard base measure used is the sum of total revenues from sales of electricity, natural gas, and telephone services. The telephone revenues are estimates of sales of *local* telephone services in each state. This method understates the telephone tax base for those states that tax intrastate long distance calls or interstate messages.

[5] Along with most other states, Illinois exempts sales for resale along with tangible personal property that becomes a constituent part of another product under its state sales tax. In recent years, the sales tax has become more consumption-oriented by exempting manufacturing machinery and equipment along with farm machinery and equipment exceeding $1000 in value.

[6] Public utilities and other firms pay a wide range of state-local taxes including property, corporate income, unemployment insurance, and other taxes.

While favorable tax administration on these tax bases may tend to offset high gross receipts taxation in Illinois, evidence to date suggests that public utilities in Illinois pay above-average taxes in other guises as well. See Donald J. Reeb and Eliot T. Howe, "State Taxation of the Public Utilities Industry: The Need For A Theory", *Proceedings*, National Tax Association—Tax Institute of America, 1983, pps. 72-75.

[7] This analysis is based on summary data from the Bureau of Labor Statistics, Consumer Expenditure Survey, which precluded state-specific estimation. The relation generally holds true for other Census regions. For a complete description see Diane F. Siegel and William A. Testa, "Taxation of Public Utility Sales in Illinois" (Regional Working Paper, Federal Reserve Bank of Chicago, 1985).

[8] Raymond J. Struyk, "Home Energy Cost and the Housing of the Poor and the Elderly," in Anthony Downs and Katherine L. Bradbury, eds., *Energy Costs, Urban Development and Housing* (The Brookings Institution, 1984).

[9] Some studies have indicated that high income households consume a greater share of those items that embody high energy usage in their production process. These findings imply that a tax on household utility fuels alone falls more heavily on low-income households than broad-based energy taxes. For example see R.A. Herendeen, "Affluence and Energy Demand", *Mechanical Engineering*, October, 1974, pps. 18-22.

[10] A complete description of the tax revenue regression equations is given in Diane F. Siegel and William A. Testa, ibid.