"TO TAX AND TO PLEASE, NO MORE THAN TO LOVE AND TO BE WISE, IS NOT GIVEN TO MEN." - Edmund Burke, _Speech on American Taxation_

OPEC Price Increase

On Sunday, December 17, 1978, the Organization of Petroleum Exporting Countries announced that, as of January 1, 1979, the price of Saudi Arabian light crude was going to go up, in a series of steps, by 14.5%. In terms of gasoline prices, the OPEC action translates into an increase of approximately five or six cents per gallon. Heating oil prices will rise by about four cents per gallon. The OPEC increase will add to inflationary pressures in our domestic economy, and in addition to higher prices for petroleum and petroleum products, the move will cause a round of slight price increases throughout the economy.

A five percent refinery tax would be cumulative in its effect, and would have some effect on prices (see appendix C). However, the OPEC increase affects approximately 50% of the crude oil refined in this country, and a Texas refinery tax approximately 26% of the oil refined in the United States. The effective OPEC increase is 7.5%, and the effective Texas tax rate would be 1.3% when spread out nationwide. The magnitude of the Texas tax is less than one-fifth of the OPEC increase - less than one cent per gallon. This assumes that all the price increases would be passed along equally, and distributed equally among all consumers. These assumptions are not realistic, but they do illustrate that the Texas tax is relatively insignificant when viewed from the perspective of the national economy.

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INTRODUCTION

The Senate Study to Replace Ad Valorem Taxes was created by the Senate during the 65th Legislature's Regular Session. The Study's main purpose was to examine the possibility of using a five percent tax on crude oil inputs to refiners as a replacement for property taxes levied and collected by school districts. In addition, the Study was charged with investigating other possible sources of tax revenues that might be used, instead of a refinery tax, to replace property taxes.

This Final Report is divided into two main parts. First is the section on taxes, second is the section on the problems of local control and replacing property taxes with other dollars. Each of the major divisions has a brief introduction and discussion, and further remarks will be deferred until those pages. One final note here, however, is that this Study was conducted in the context of trying to find a source of revenue which will raise between one the two billion dollars each year. This is because school districts raise that amount to pay their share of the public education system, and to make a sizeable dent in the property tax load borne by taxpayers, at least one billion dollars each year - and probably closer to two billion - will be needed.

PROPOSITION 13

After Proposition 13 passed in California, a wave of
"tax revolt" sentiment swept the country. Yet, what was
a flood elsewhere was little more than a trickle here. The
reason séems to be that Texans do not feel that their taxes
are excessive, nor do they feel any deep discontent with their
governments. Personal tax burdens are among the lowest in
the nation, and although the level of government services
is not as high as in some states, Texas residents are generally
well served by their governments at most levels.

As nearly as can be determined, what most Texans want
is more responsible behavior at the federal level; from the
state and local governments they want assurances that spending
will not increase rapidly (which would call for higher taxes)
and that any new programs be well thought out and be jus-
tified by some need. As some legislators discovered during
the Second Called Session of the 65th Legislature, there
is not a great deal of political hay to be made in Texas
by leaping on the Proposition 13 bandwagon. What people
want is responsible, responsive government, and they want
taxes to be as low and as fair as possible. The 66th
Legislature will have an opportunity to make great strides
in reforming the tax structure in Texas. The state still
has a solid revenue base in its sales and natural resource
taxes, so the Legislature will not be faced with any finan-
cial crunch which demands reform. The mood of the people
is still likely to be favorable for movement toward increasing
tax fairness and (as a result) lower taxes. The "Tax Relief
Amendment" passed by the Special Session does not provide
real tax relief or reform. In short, the time is ripe
for changes to be made in the Texas tax system, but the
Proposition 13-type of change is both unnecessary and wrong.
Tax burdens could be reduced by replacing the property tax
(or the school district M&O portion of it) by a low rate
personal income tax and a low rate business tax. More people

would be paying less taxes per person, so government spending need not be cut. A refinery tax could also be used; though not as broad-based as the other two, it would raise the necessary revenue without serious problems. If the citizens of Texas want government spending or programs cut back, there are other ways to do it than by crippling a government's ability to raise money. Proposition 13 did not make the property tax system any more fair or equitable, it just made it hurt less. Texas has an opportunity to change its tax system so it can achieve both goals - less pain and more fairness - and the time is coming when changes will be <u>forced</u> on the legislature. It is better to take the opportunity now, in a time of relative peace, than when faced with more severe problems.

PART   I

Taxes

SUMMARY - TAXES

The danger with trying to summarize a problem as complex as this (making changes to the tax structure), is that all too often people read only the summary, then try to understand the whole problem, and solve it, on the bases of these few tidbits of information. The issues are complicated further because of the emotions involved when the subject of taxes is raised. With these two points in mind, the summary that follows should be taken only for what it is: a brief digest, incomplete and oversimplified, of the examination into the possibility of replacing a large chunk of the property taxes collected in Texas.

Recall that this Study is trying to find a tax (or taxes) that will bring in approximately one to two billion dollars each year. It would be possible to raise this amount by raising the rates of one or more present taxes. For instance, by doubling the state sales tax from four to eight per cent, or by increasing the natural gas or oil severance tax rates fourfold (from 7½% to 30% on gas, and from 4.6% to 18.4% on oil), the necessary revenues could be raised. More realistically, some combination of rate increases would produce the same result with less pain. (See table 7). There is a further problem that the money from some types of taxes is dedicated by law to certain funds, and might not be available for property tax relief. This would not be a problem with a new tax, the proceeds from which could be dedicated by law to a special "Property Tax Relief Fund."

While there are no doubt many ways to raise tax money
that are not used in Texas, this Study has been interested
mainly in three. First and foremost is the five percent
refinery tax, a tax on the value of crude oil going into
refineries in Texas. Second is a broad-based business tax
of some type, especially a value-added tax. Finally, the
Study has considered a personal income tax. Other taxes that
were considered were new severance taxes on lignite, uranium,
and timber; a corporate income tax; and a land or site
value tax (a tax on land alone, rather than on any improvements
to the land). The study concentrated on the first three
because each one, if used by itself, would generate approxi-
mately one to one and a half billion dollars each year - very
close to the amount need to reduce property taxes around the
state substantially. A five per cent refinery tax, it is
estimated, would generate approximately 1-1.5 billion dollars
per year. A value-added tax on all business, at a rate of
two and a half per cent (2.5%) would produce approximately
one billion dollars a year. A personal income tax, whether
levied at a flat 2% rate or in a progressive, graduated form,
would raise between one and one and a half billion dollars
annually. The refinery tax can be levied at a low rate because
the value of the taxed good is very high (and is rising).
The business tax and the personal income tax can be applied
at low rates because the tax base would be very broad -
everybody pays a little. Each of these three has its own

special problems, none is perfect or perfectly acceptable.
Each has something to recommend it as well, as this Report
indicates.

CONCLUSIONS - TAXES

   I. Nobody likes taxes

  II. Most taxes, whatever they are called and however they
      are figured, are actually paid out of current income.

 III. If the Legislature decides to use state revenue to replace
      local property taxes, the fairest taxes to rely upon to
      generate the money would be broad-based personal income
      and business (value-added) taxes.

  IV. The five percent refinery tax, though a little less equi-
      table than the broader-based taxes, would serve the purpose
      just as well.

   V. A refinery tax of five percent will not by itself lead to
      the slow erosion and decay of either the refinery industry
      or the petrochemical industry in Texas.

  VI. A refinery tax, especially if it includes a small-refiner
      exemption, would most probably be passed through to con-
      sumers of refined products.

 VII. In the long run, Texas consumers of gasoline might be
      required to pay more than their proportionate share of
      a refinery tax.

VIII. A refinery tax would have other price - increasing effects
      in Texas.

  IX. The refining and petrochemical industries in Texas may
      be entering a period of slower growth, or relative stag-

nation, even without the refinery tax.

X. It may not be desirable to replace the property tax as a source of revenue for local government entities, such as school districts, without also replacing local control with state control and direction, though it is <u>possible</u> to do so.

XI. Even if it is possible to replace property taxes with some other tax or taxes, it may not be necessary. The property tax system can be made more fair and more efficient (though perhaps only a little less burdensome for most property owners/taxpayers).

TAXES - INTRODUCTION

In the first part of this Report, the discussion will cover the possible sources of tax revenues that might be used to reduce property taxes. Some of the taxes are likely, for one reason or another, to be of little use in financing property tax replacement. Consequently, they will be dealt with only briefly. The three major taxes which might be used as substitutes for property taxes will be discussed at much greater length. The refinery tax, as the primary subject of this study, will be the focal point.

Generally, nobody likes to pay taxes. No matter what kind of tax is levied, and no matter how the tax is classified or labeled, most tax dollars are paid out of current income. In the face of rising prices and increasing costs of government, and in view of the popular notion that most taxes are unfair, it should come as no surprise that many taxpayers in many places are angry and frustrated. The time has come for responsible people to consider, in an objective and dispassionate way, the problems and concerns the people of Texas have with taxes, and some of the opportunities that exist for making Texas the state with the best and most equitable tax system.

For the last several years, and again in this year's gubernatorial race, Texans have been given a slogan - "No new taxes" - instead of any real or meaningful tax relief or tax reform. Without some very real and very substantial decrease in government spending at all levels, the only thing the "No new taxes" slogan means is that the same old taxes must go up another notch. There are better ways to finance state and local governments than the present system. "No new taxes" is not the answer for the future, no matter how correct it seems now. It is merely expediency, and not good government. The Legislature, as the body representing

and protecting the best interest of the people, must lead
the way - and it will require leadership and courage - to
a more equitable tax system. Although the tax system in
Texas, overall, is considerably better than the tax systems
in other states, it could be made better. Furthermore,
now is the time to seize the opportunity to reform the tax
structure. Now, while the state still has a good tax base
in its oil and gas wealth. Now, while state and local
taxes on business and individuals are still relatively
low. Now, before the crunch in government finance comes and
changes MUST be made under pressure.

This Study was charged primarily with studying the five
percent tax on crude oil inputs to Texas refineries. When
it became apparent that there might be some serious problems
with the refinery tax, it was decided to do two things.
First, the questions surrounding the refinery tax were
referred to a team of experts at Texas A & M University.
The second step the Study took was to expand its investigation
to include several other types of taxes and tax schemes.

There are, in the public's eye, two kinds of taxes.
The first are the "painful" types, that the individual sees
and feels right away. These taxes are the personal income
tax, property taxes, some types of sales taxes, some excise
taxes, and most user fees (assessed for trash collection,
library use and similar municipal services), and sales taxes
on such things as cigarettes, liquor, and gasoline. Tra-
ditional tax theories talk about direct or indirect taxes,
personal or business taxes, and regressive, proportional
or progressive taxes. While these concepts are important
for studying taxes, and for analyzing tax impacts and tax
burdens, they are of minimal importance to most taxpayers.
When the money is leaving his pocket, the average taxpayer's
concern is directly proportional to the size of the tax

bill he is paying and to his awareness of the existence of
the tax. For instance, most smokers know that they pay
some taxes on their cigarettes. It is unlikely, however,
that they know that between one-third and one-half of the
price of their cigarettes is tax. Further, this hidden tax
is collected a little at a time instead of all at once.
A heavy smoker (two packs a day) ends up paying the state
$135.05 over a year's time. If he received a bill at the
end of the year for that amount, he would be much less likely
to pay the tax. Similarly, the state gasoline tax of five
cents a gallon is largely hidden; while the average gasoline
purchaser doesn't think of the one dollar in taxes he pays
each time he buys twenty gallons of gasoline, he would
certainly be more aware of it if he received a tax bill for
$100 at the end of the year. Corporate profits taxes (and
other business taxes) - to the extent these taxes are passed
on the the consumer - and general sales taxes are also
largely unnoticed and are not thought of as being painful.
On the other hand, property taxes, utility taxes (when the
utility is owned by the municipality), special sales or
excise taxes (such as "luxury taxes"), some user fees,
and most personal income taxes are viewed with considerably
more hostility because they are paid in one lump sum at a
specified time, and the taxpayer is aware of both the neces-
sity for payment NOW and the size of the pinch. (Income
taxes may be different, as we will consider below.)

Any person who advocates changing the tax system must,
of necessity, deal with the psychology of paying taxes as
well as econometric theory. This is not to say that taxpayers
can be easily convinced that a change is necessary or will
be beneficial. At the moment, however, many taxpayers
are unhappy with the present system, and they want some
type of change. Since most people are willing to pay their

share of taxes as long as they perceive the tax system to
be fair, it is essential that any change in the system must
be toward greater equity. Greater equity is achieved
when the system requires the largest number of taxpayers
to pay the smallest possible number of dollars, and when
people in similar circumstances pay similar taxes (this is
called "horizontal equity"). Texas has relied on some broad-
based taxes (the sales tax and the local property taxes)
and on some narrow-based taxes (the oil and gas severance
taxes). Although there are some types of taxes, such as the
refinery tax, which are selective and narrow-based but which
also generate substantial amounts of money, heavy reliance
on these sources may have negative long term economic
effects. Taxes like the refinery tax can be levied without
severe dislocations, but they should be used judiciously
and sparingly.

The personal income tax, as suggested above, would appear
to be the type of tax which most people would find "painful."
Some studies indicate, however, that state income taxes are
not so widely despised as might be thought. The 1978
survey by ACIR, "Changing Public Attitudes on Governments
and Taxes", shows that only about eleven per cent of the
people believe state income taxes are the "least fair",
or "worst" taxes. In contrast, roughly one-third of the
people are of the opinion that local property taxes are the
"worst" taxes (three times as many people as the state
income tax). The reasons are that most state income taxes
are fairly low and not progressive (or only mildly so).
People are able to distinguish between state income taxes,
which are thought to be fair, and the federal income tax,
which is percieved as unfair. Further, even though the tax-
payer receives a bill for a lump sum amount due on a certain
date, he almost always has had money withheld, and has paid
all or most of the tax already. It is this withholding
procedure which makes a personal income tax more like a
sales or excise tax. The funds are taken a little at a time,

and the tax bite is not felt all at once.

The other taxes used by Texas as sources of revenue - sales and use taxes, franchise taxes, special sales taxes, severance taxes - are generally unfelt or unseen by the ultimate taxpayer, the consumer. (An exception to this may be franchise taxes, which may be "absorbed" or paid by the corporation in some way other than raising the price of the goods or services.) However, should any of these taxes be raised substantially (and they would have to be raised substantially to generate two billion dollars per year), taxpayers would be likely to complain.

What should be drawn from all this is that any change in the status quo is likely to make taxpayers upset. The more unfair the changes appear to be, the more they will be likely to resent any changes. If the tax system, as a whole, is seen to be "fair", governments at all levels will have far less trouble funding programs they consider necessary. Any tax system, then, should not be discriminatory or oppressive. It should not focus on one single source of revenue when many are available, nor should it depend on a narrow tax base when a broad base is available. With these principles in mind, there follows a more detailed discussion of some of the major types of taxes which are or could be used to support state programs, including property tax relief. Any single tax or type of tax may be narrowly based, and it may seem discriminatory to those who pay it. When, however, that tax is put into the whole state and local scheme of taxes, and when the final resting place of its burden is described (e.g., a refinery tax, though paid by refiners, has most of its impact on gasoline and fuel purchasers, who actually bear the tax burden), that tax seems (and is) less narrow and discriminatory.

INCREASED SEVERANCE TAXES

The State of Texas currently imposes the lowest tax
(4.6% of market value) on oil production and one of the lowest
taxes (7½% market value at well head) on natural gas of any
producing state. Suggestions are made frequently that these
tax rates can and should be increased. The reason that is
usually given is that the State should receive a fair share
of the value of its mineral resources. But exactly what
or how much a "fair share" is, is one of those very subjective
questions. Better arguments can be made for the extreme
positions - that the state should either receive everything
from its mineral wealth or that it should receive nothing -
than can be made for most of the intermediate positions.

Given that the Legislature has imposed severance
taxes, it must decide upon a reasonable level. As with any
question of taxation, the issue is complex and frought with
unknowns. We can start with two facts. First, we are talk-
ing about replacing the school districts' share of the
property tax - roughly two billion dollars per year - with
some other tax or taxes. Secondly, the total amount collected
last year for both taxes was only $900 million. In order
to raise an additional two billion dollars, the tax rates
on oil and gas would have to be tripled - to 13.8% for crude
oil and to 22.5% for natural gas. Such rates would certainly
make Texas a leader, in one respect, among producing states.

The economic effects of such high tax rates would be

Increased Severance Taxes

to increase prices, reduce consumption, hasten the already-
declining rate of production, and perhaps, in the longer
run, to reduce the amount of tax revenues these taxes would
provide. Clearly, raising the severance tax rates is not
the "quick fix" or easy answer many people suggest.

More responsible people argue that increased severance
taxes need not substitute for the entire two billion dollars,
and that they replace only some of that revenue. They
envision tax rate increases in several areas - the sales tax,
severance taxes, franchise fees, gasoline taxes - to make
up the two billion dollars. This is an answer, but it is
not necessarily the best Texas could do. Instead of raising
lots of little taxes so we would have lots of bigger taxes,
the Legislature should consider simplifying the tax structure
so that it accomplishes two purposes:

(1)   It must provide adequate revenue to
      fund all the programs the State is to
      be responsible for, and

(2)   It should be fair. The largest number
      of taxpayers each should be paying the
      smallest tax possible. Both individuals
      and businesses should pay their "fair
      shares", but neither segment should
      pay more, (of course, it is the duty

of the Legislature to say what a "fair
share" is.)

There are better ways to accomplish these two goals
than doubling or tripling the severance tax rates. (Texas
also imposes a severance tax on sulphur; the rate on sulphur
production is $1.03 per long ton or fraction thereof. In
1977, collections amounted to $4.48 million, hardly a major
tax source. The sulphur industry in Texas is weak, and
doubling or tripling the tax rate would likely reduce pro-
duction even further. Obviously this is not a good source
of long-term revenue.)

INCREASED SEVERANCE TAXES - NOTE

There is some feeling that while the long-term effect of a refinery tax may be to accentuate the slight tendency of the oil refining industry to shift to the East, an increase in the oil and gas severance taxes (4.6% and 7.5% of market value, respectively) would have no such effect. Furthermore, since it appears that President Carter's Energy Bill will (a) increase the price for natural gas, and (b) allow some regulation of intrastate natural gas sales, it has been suggested that increased severance taxes, especially on natural gas, be used to capture some of the "economic rents" that would normally go to the producer and (perhaps) be passed on to out-of-state purchasers. It is thought that such a severance tax increase would put a "floor" under the new higher price of gas. This is possible because Texas still has many wells producing very cheap gas and the difference between this very low production cost and the new higher price for gas may become substantial. The argument is that part of that difference should go to the people of Texas rather than the people of the Northeast.

This argument is probably valid, at least in some measure, but the table (next page) shows, even a jump from 7.5% to 10.0% in the natural gas tax will not produce any more than $272.30 million in additional revenue by 1984. If the oil severance tax is increased to 9.5% (more than twice its current rate) at the same time, the combined increase will still be less

Table 1:   INCREASED SEVERANCE TAXES

(in $ million by fiscal year)

TAX	1979	1980	1981	1982	1983	1984
Oil Production at 4.6%	443.90	457.60	470.80	484.90	501.10	578.10
at 9.5%	916.75	944.90	972.30	1001.50	1034.88	1070.00
Net increase	472.85	487.30	501.50	516.60	533.78	551.90
Natural Gas at 7.5%	585.00	642.60	694.10	740.10	780.80	816.60
at 10.0%	780.00	856.80	925.50	986.80	1041.10	1088.90
Net increase	195.00	214.20	231.40	246.70	260.30	272.30
Total net increase	667.85	701.50	732.90	763.30	794.08	824.20

NOTE: Even if both taxes were levied at the higher rates, the net increase (the new money which could be used to replace present property taxes) would remain at approximately one-third the level needed to fund the portion of puplic education expenditures we are talking about - the M/O portion.

than one billion dollars. Although the severance tax increase
could fund a portion of the property tax relief, it could not
pay the full amount. Other taxes could replace the property
tax, and at low rates, better than increase in severance taxes.

NEW SEVERANCE TAXES

The accompanying table shows how much money might be raised if the State imposed severance taxes on uranium, timber and lignite. The justification for any such taxes would be to raise more money without finding a different type of tax base, and the justification for these new severance taxes is philosophically the same as that for the existing severance taxes.

The problems associated with severance taxes in general also apply to these new taxes, and are perhaps even more serious in these stagnant industries than in the healthier oil, gas and sulphur industries. It can be argued - and perhaps rightly so - that uranium and lignite production are both due to increase greatly in the future; it certainly makes little sense, economically or politically, to levy a tax on these industries now. Taxes would make them less competitive, would raise prices to consumers, and would retard growth and development. Such risks would be more worth taking if these industries would be a major source of tax revenue. Since they are not likely to be that in the near future, severance taxes now would be more harmful than helpful to our state economy.

Table 2

NEW SEVERANCE TAXES   (in $ million by Fiscal Year)

Proposed Tax at 5% level	1979	1980	1981	1982	1983	1984
Lignite	20.20	23.30	27.10	35.20	40.60	52.00
Timber	9.00	9.50	10.20	11.20	11.90	12.60
Uranium	9.30	11.55	12.60	14.63	13.20	12.00
Total at 5%	38.50	44.35	49.60	61.03	65.70	76.60
Proposed Tax at 8% level						
Lignite	32.30	37.30	43.30	56.40	64.90	83.10
Timber	14.40	15.20	16.40	18.00	19.00	20.10
Uranium	14.88	18.40	20.16	23.41	21.12	19.20
Total at 8%	61.58	70.98	79.86	97.81	105.02	122.40

Based on information supplied by the State Comptroller's Office, Sept. 1978

SALES TAXES

The limited sales and use tax used by Texas is the largest single source of tax revenue for the state, and is nearly four times as large as the next closest revenue sources (oil and gas severance taxes). Currently, the state imposes a limited sales tax of four percent on each retail sale. There are exceptions to this levy, but in general most retail sales are covered. The sales tax provided Texas with $1.681 billion in 1977, and will likely generate about $2 billion this year.

The sales tax is a broad-based tax, and, as used in Texas, is probably a proportional tax, or a slightly regressive tax at worst. Generally a sales tax is regressive (it takes a larger portion of a lower income than it does higher income), but because of the exemptions and exceptions - especially those for food and medicines - the Texas sales tax is probably not terribly regressive.

There are ways to make a sales tax progressive or at least proportional, but for Texas to change the form of its sales levy would be more trouble and more expense than any benefits that might be gained. The main reason the sales tax is being considered here is to determine whether it could be used as a means of replacing some portion of school property taxes. The magnitude of the problem immediately becomes apparent. The property tax for which this Study is seeking a replacement amounts to almost two billion dollars per year. If the State relies entirely on the sales tax to supplant the property tax

raised by school districts, taxpayers would have to pay twice as much on each retail sale as they do now. The sales tax rate would have to be raised from 4% to 8%. At that rate, Texas would have the highest sales tax in the nation (at the state level). Even though the sales tax is often ignored by the taxpayer (who considers it a part of the purchase price), an increase of 100% in the tax would certainly be quite noticeable.

At present, the sales tax rate in Texas is five per cent; of that amount, four per cent is raised at the state level, as mentioned above. The remaining one per cent is a local option tax that cities and towns may impose. All five percent are collected by businesses making retail sales, and the money is sent to the Comptroller of Public Accounts. Based upon the location of each sale, or the amount of sales in each city or town exercising its option to levy the sales tax, the Comptroller returns one-fifth of the money collected. The same system could, for a relatively small expenditure, be set up to allow school districts the same option. Every school district in the state would be allowed to impose a sales tax of one or two percent. Each business collecting the tax would include in its report the name not only of the city or town, but also the proper school district. The Comptroller's office would match sales to school districts and send the proper amount of money to each district. School districts choosing to levy a sales tax could only do so if they reduced property taxes by an amount equal to their sales tax receipts.

Of course, no system is ideal, and this one has its problems, too. First, the sales tax is generally considered to be regressive. That is, it takes a larger bite out of lower incomes than it does out of higher incomes. In Texas, this problem has been mitigated somewhat by the exclusion of food and medicines from the tax base. Nevertheless, the tax is probably neutral at best, taking about the same percentage from all income levels. (This is still a heavier burden on the lower income levels. If we assume that the sales tax takes about two percent a year from everybody, regardless of income, then a family with an income of $10,000 pays $200 annually in sales taxes, and has $9800 left to spend on other things. A family with an income of $50,000 pays the same two percent, or $1000, annually, but it has $49,000 left over to spend elsewhere. This same problem will come up again in the discussion of the personal income tax.) There are ways to make the sales tax fairer, but the exemptions and the administrative complexity involved would be very expensive. To the extent that the Texas version of the sales tax is not regressive, it should probably be left alone.

More severe is the problem that would face many school districts where the volume of sales that take place within each district would not produce enough tax revenue to pay for the schools. In particular, most rural districts would require even more state aid, since they do not have a large sales base to generate tax revenues. In fact, there would be a shift of money from the rural districts to urban and suburban districts, since more people from the country go to the city to shop than

the other way around. Any system of local option sales taxes supplemented by state funds would benefit the cities at the expense of the rural districts.

Lastly, economic theory suggests that an increase in the sales tax might have a slight negative effect on economic activity. To the extent that consumers "feel" the sales tax increase as a price increase, they may make fewer or less expensive purchases. It would be difficult to predict the effect or the size of the impact. This theoretical problem should not be considered a barrier to raising the sales tax rate, but it should be noted.

In the final analysis, there are some problems with using an increase in the sales tax to replace part of the property tax. If the tax is levied at the state level, distribution of the funds would have to be by some formula system, with a reduction in property taxes part of the formula. If the tax is raised at the local level, some districts will lose local money and will have to rely even more heavily on the state for help. School districts in cities will benefit (in general), and rural districts may lose. The sales tax is useful as a source of revenue at the state level, and, to a more limited extent, is a source of money for cities and towns. At the school district level, however, the sales tax may create more problems than it solves.

"ALL TAXES MUST, AT LAST, FALL UPON AGRICULTURE."
            -Edward Gibbon, _Decline and Fall of the Roman Empire_

"THE THING GENERALLY RAISED ON CITY LAND IS TAXES."
            -Charles Dudley Warner, _My Summer in a Garden_

PROPERTY TAX

The property tax is two taxes, really. The first is a
tax on the land itself; the second is a tax on the improvements
(if any) on the land. Both of these taxes have economic effects
on land use and on improvements, and both have an impact on
land owners. It is not necessary for present purposes to be
too detailed about the econometrics; it is sufficient to note
that, basically, a high tax on land encourages the landowner
to use his property to its highest and best use, and a high tax
on improvements discourages building or repairing existing
structures. The usual combination is to have a relatively
low tax on land and a relatively higher tax on improvements.
This leads to an inefficient (economically speaking) use of
the land. There are, of course, very important non-economic
reasons (social or political considerations, for example)
for using a particular level of land or improvements tax.
The "agricultural use" valuation is but one instance, and a
common one, of an attempt to achieve a socially important goal
in a manner which is economically inefficient.

The usual argument against the property tax is that it
is a regressive tax, taking more from the poor than from the
rich. It is also attacked on the ground that it discourages
formation of housing and encourages the growth of shopping
centers. Currently there is a continuing debate over these
issues, one that is not likely to be finished in time for
this report. What can be said at this time is that if the

patchwork system of crazy-quilt taxing jurisdictions existing
in Texas was eliminated, and some modern and effective adminis-
trative system (one tax assessor's office for each county and
all the taxing entities therein) was used instead, and if the
property tax was fairly administered within each jurisdiction,
there would be very little complaining about property taxes.

The other source of complaints is from "rising property
values mean rising taxes". There may be two issues here that
need to be separated. The first is that of rising values
and taxes. Nobody wants to pay higher taxes, but nobody minds
if his property doubles in value. In fact, people probably do
not mind paying higher taxes as long as they feel they are
receiving a fair return (from the various levels of government)
for their tax money. This is the second issue, that of govern-
ment services and spending. In general, people feel pretty
good about their state, county and local governments. But
they are watching more closely than they have in the past,
and political leaders at all levels must be aware of the people's
concern.

The property tax, as used by the school districts and other
government entities in Texas, is probably inequitable - or at
least inequitably administered - in many areas. The reasons
for this unfairness are several. A few jurisdictions that levy
property taxes have poorly trained assessors, or assessors with no
training at all. Many authorities rely entirely on another
entity's assessments (purchasing them through a contract

arrangement). There is no requirement that there be any sort of uniformity among the taxing bodies. A house valued at $65,000 by a school district for its tax purposes, may be valued at $50,000 by the water district, and at $72,000 by the hospital district, in which it sits. Furthermore, that $65,000 may be identical to one the next block over, but the second house is liable to be valued by each of the taxing bodies at a completely different level than the first. And, while the disparity between valuations may be relatively small within a neighborhood, traditionally the assessed value of similar houses has varied significantly from neighborhood to neighborhood. The $65,000 in our example might be valued at $65,000 (fair market value), but assessed at only $40,000 (assessed value) - an assessment ratio of 61.5% - if it sits in a nice, wealthy suburban neighborhood. A similar house in an older, more run-down, or city-core neighborhood might have a market value of $65,000, but it would be assessed at $55,000 - an assessment ratio of 85%. (In fact, what usually happens is that the assessment ratio is set first, perhaps neighborhood by neighborhood by some conscious design, more often by tradition and politics. Then all the houses in area A are assessed at 65% of market value, while all the houses in area B are assessed at 85% of market value. This is one of the great injustices of the property tax system.) When people learn that others in the same circumstances as their own are getting "preferential" treatment (either lower valuations or lower assessment ratios), they get angry.

Property Tax

The property tax falls on others besides owners of residential property. Renters also pay property taxes as part of their rent. Studies indicate that the tax is slightly regressive to renters as well as to property owners. Businessmen who either own or lease property can, under most circumstances, shift the tax forward to consumers. The tax is a cost of doing business common to all the businessmen in an area, and will be passed on to purchasers of the products as part of the price. Only in a case where a business in city A, which pays a property tax, is faced with competition from city B, where there is no property tax (or a tax at a net lower rate, after transportation costs are added) will businessman A absorb the tax (or a portion of it). In Texas, manufacturing and other business entities pay more than sixty per cent of all the property taxes collected by the state and local governments. They pay the taxes, but they do not bear the tax burden, which is largely shifted forward to purchasers in the form of higher prices. A significant reduction in property taxes might have the effect of lowering some prices and rents, or at least keep them from increasing as rapidly as they have been.

Although the property tax has been the source of much discontent in some areas (especially California), the problems associated with it here in Texas are not as severe or threatening. Property tax rates in Texas generally quite low, and local governments here are not over-taxing property. However, the

problems associated with property taxes are of some concern,
and there is little doubt that the system could be improved.
In fact, one of the main complaints about the property tax
system is that like properties are not treated alike for tax
purposes. This disparity is not inherent in the property tax
system, but in the administration of the system. Texas has
perhaps the worst collection of property tax assessment juris-
dictions in the nation. It isn't that the assessors and the
administrators are corrupt, inept, or stupid (most of them are
none of those). The problem is that there are nearly ten times
as many separate taxing jurisdictions as there are counties
in Texas. There is a great deal of overlap and confusion.
There is no excuse for allowing some of these problems to con-
tinue; Texas has the resources and the opportunity to correct
them. What needs to be done, if the property tax system is
going to be made more equitable and more efficient, is that
the state needs to set professional standards for assessors,
and to enforce those standards. At the state level, valuation
techniques and standards should be set, required, and enforced.
Each assessing office at the local level should be required
to have at least one certified assessor for each $ X million
worth of property (or for each X hundred or thousand pieces
of property). There should be only one assessing office in
each county, and all the other taxing authorities in that county
should be allowed (or required) to contract with that one office.
The state should, from time to time, conduct audits or sample
valuations, in order to see that the local assessors are doing

their job properly. With real property tax reform, many people
would get real property tax relief. (Other people would find
that their taxes might be raised. These would be the folks
whose property has been systematically undervalued, and who
relative to other taxpayers, have not been paying their fair
share. Some rural school districts, and many wealthy urban or
suburban neighborhoods, would face this problem.)

In spite of all the negative things that have been written
or said about the property tax, there are at least two good
reasons for keeping it (albeit in some sort of reformed version).
First, is is a tax that people know and are aware of. It is
a traditional tax, and home-buyers, businessmen, and even some
renters, make it a point to find out about property taxes when
they are deciding what to do. In the last year or so, the
property tax has become more visible still, with the result
that more people want more information about the tax and its
effects. The second reason for retaining the property tax is
that it is perhaps the only tax that can be used effectively
and efficiently at a local level. This facet of the problem
has been mentioned before, but it should be recalled in this
context. Most other types of taxes, when levied by a school
district or city or town, are either complex and expensive
to administer, or will have some negative economic effects.
An income tax (on individual incomes) or an inventory tax (on
business inventories) can be avoided simply by moving outside
the taxing jurisdiction. Some sales or excise taxes could be
avoided the same way. The beauty of the tax on real property

(if it is beautiful in any way) is that real property is, for all intents and purposes, immobile. It has to stay in the tax-ing jurisdiction. This makes the property tax very useful to local governments.

Finally, there is a strong political problem involved in this discussion of replacing the property tax with other taxes. The issue of "local control", which has been raised before and which is the subject of another part of this Report, will have to be dealt with at some point. Local governments, and especially school districts, are not eager to relinquish control over local funds, which gives them control over policies and pro-grams. They are afraid that state funds would mean state con-trols; they are probably correct, for there are few Legislators who would agree to spend state money without some control over how it is spent. The problem is not insoluble, even in the context of public school finance. Distribution formulas, tax reduction incentives or requirements, local spending or taxing caps - all these are parts of a scheme for reducing property taxes by raising money elsewhere. But they all reduce the parts played by local officials, and those officials may strongly oppose any attempts to change their roles.

In sum, property taxes are probably at least a little regressive (and perhaps are quite regressive). Everybody pays some property tax, either directly (home or property owners) or indirectly (renters, or consumers of products in which part of the price is the property tax cost to the businessman).

Property Tax

The property tax system in Texas can be reduced in importance by raising revenue from other tax sources, but any attempt to do so will face opposition by those who do not wish to relinquish or reduce local control. Real reform of the property tax system would give relief to some, higher taxes to others. Texas is not faced with a California - type tax revolt, but Texas taxpayers do want fairer taxes. "Fairer taxes" means either new taxes to replace part of the property tax burden, or a reformation of that system.

THE VALUE-ADDED TAX

The State of Texas prides itself on being one of the
very few states with neither a corporate profits ("corporate
income") tax nor a personal income tax. At least one, and
most often both, of these broad-based taxes is used in nearly
every other state. Just as Texas should be pleased with
this scheme, it should also be ashamed of the unfair and
inefficient property tax system upon which so much govern-
ment relies in this state. (The property tax is a local
tax, but if local governments did not depend heavily on it,
they would have to rely on state funds.)

If the Legislature and the Governor wish to respond to
the wants of the people, they must find a fair and efficient
way to replace some portion of the property tax burden. A
broad-based personal income tax is one replacement (it is
discussed elsewhere in this Report), and a broad-based
business tax is another. Most states use a corporate-profits
tax as their business tax; this Study considered a CPT,
but decided instead to examine another business tax - the
value-added tax. This would be a tax levied against all
entities doing business in Texas. The tax base, therefore,
is broader than the corporate tax, and the tax rate can be
quite low. It is not an income tax, nor a profits tax,
but a tax on the privilege of doing business in the state.
It is not a tax on gross receipts; indeed, the tax base
is limited to 50% of receipts. So, while the rate is ex-
pressed as 2.5%, it is effectively a tax of 1.25% on gross

receipts. For many corporations and other businesses, deductions and credits under the federal tax code will reduce the effective tax rate to them even further. The VAT, as a percentage of gross receipts, is a very small tax.

The VAT that is proposed here has other features which make it attractive as a business tax: (a) a capital investment write-off for new investment, (b) royalty deductions, (c) small business exemptions and deductions, (d) a labor-intensity circuit breaker (to limit the burden on labor-intensive businesses and keep the VAT from being a tax on labor), and (e) provisions to protect specific industries, such as small farmers and pipeline companies.

The procedure by which a business determines its tax base can be found following the end of this section. Clearly, the VAT is neither an income tax nor a glorified sales tax. It is a tax on the business activities and resource-additions which increase the value of certain inputs as they are transformed into saleable goods and services. Because the VAT rate applies to payroll and capital alike, it is neutral in its impact on business decision-making. (A corporate profits tax is a tax largely on capital, so it discriminates against capital and in favor of labor. A payroll tax, being a tax on labor, has the opposite impact.)

One feature of the VAT which evokes both praise and criticism is that it applies to all businesses, and not just to corporations. The justification is that all businesses,

and not just corporations, consume resources and services.
Furthermore, by taxing all businesses, the potential tax base
is broadened considerably and the tax rates may be kept low.
With the proper safeguards against double taxation of partner-
ship income and with the small business exemption, unincorpora-
ted businesses are protected from an excessive burden, as
are all businesses under a certain size regardless of form.

In the context of this study (replacing property taxes),
the value-added tax appears to be one type of tax to recommend.
Although it has been difficult to get a solid estimate of the
revenues that tax would produce, based on the experience
of Michigan (the only other state using this tax) and on some
attempts to estimate receipts and incomes to businesses in
Texas, it seems likely that a VAT of 2.5% would raise approxi-
mately $1.5 billion to $2.0 billion each year. In the tables
of revenue estimates which follow the first part of this Report,
the figures used are those provided by the Comptroller's
Office. (Caution is urged since the figures are preliminary
estimates only; despite repeated attempts, the Study was
unable to get any final figures.)

The VAT, because of its broad base and its low rate, is
the type of tax which could be used alone to replace a sub-
stantial portion of the property tax. However, it is a bit
unfair to tax only businesses, so the VAT could be combined
with a personal income tax, so that virtually all potential
taxpayers would be paying some taxes. Because the bases of
these taxes would be broad, the rates could be very low.

The Value-Added Tax

There would be enough money raised to replace most school
district taxes if, for example, the VAT rate was 1.25% and the
personal income tax was a flat 1%. (Discussion of the personal
income tax can be found elsewhere in this part of the Report).
Most businesses and individuals pay property taxes at rates
higher than those; the substitution would benefit almost every-
one who pays property taxes.

A word of warning should be included here. Like any tax
the VAT can be designed to hurt certain groups and give benefits
to others. One of the beauties of the VAT is that it applies
to all businesses, which keeps the rate down quite low. If
the tax base is narrowed by giving some businesses or indus-
tries special treatment, the rates must necessarily rise
if the same goal (substantial property tax relief) is to be
achieved. The Legislature should realize that a good tax is
one that touches everyone equally; if the Legislature chooses
to levy a VAT, they must guard against attempts to make the
VAT a special interest bill.

VALUE-ADDED TAX OUTLINE

Basis of Tax: Privilege of doing business in Texas as an in-
                dividual, firm, partnership, corporation,
                trust, or other person.

Measure of Tax; Tax Base

A. Business Income (by definition is federal table income).

B. Add:

  1. Compensation paid including fringe benefits

  2. Also add, to the extent deducted or excluded in arriving
     at federal taxable income:

     a) Depreciation, and other tangible asset write-offs

     b) Taxes imposed on or measured by income (mostly other
        states' taxes, but includes city or foreign income
        taxes).

     c) Value-added Tax

     d) Dividends, interest and royalties

     e) Capital loss carryover/carryback

     f) Excluded capital gains (individuals only)

     g) Gross interest and dividend income from bonds and
        similar obligations issued by states other than
        Texas and political subdivisions thereof.

     h) Losses from partnerships

     i) Exclusions or deductions taken due to classification
        as one of certain types of corporations (e.g., DISC).

C. Deduct (to the extent included in arriving at federal tax-
   able income):

  1. Dividends, royalty and interest income included in
     business income.

2. Capital losses not deducted in arriving at business income.

3. Income from partnerships included in business income.

Financial institutions are to include interest recovered in the tax base and exclude interest paid.

Tax base is apportioned by a three-factor formula: Property, payroll, sales.

D. After allocation or apportionment, the tax base is further adjusted by deductions (such as the capital acquisition deduction), reductions, exemptions, and credits for those who qualify.

Tax Rate: 2.5% of adjusted tax base

Projected Yield: $1.5 - 2.0 billion per year. (This is only a rough estimate, and should be used with caution.)

THE PERSONAL INCOME TAX

Recently there have been some attempts by a few Legislators
to propose and get passed an amendment to the Texas Constitu-
tion which would forever prohibit the imposition of a tax on
personal income. This effort, besides being demagoguery, is
short-sighted and foolish. First, it would hamstring future
legislatures by preventing them from relying on what can be
the fairest tax of all. Second, it would force future legisla-
tures to rely on ever-higher sales, property, severance, ex-
cise (such as cigarette or gasoline), and business taxes. This
would have a two-fold effect: on the one hand, such higher taxes
on businesses would severely damage Texas' image as a business-
oriented state; on the other hand these taxes would cause
prices to rise to consumers, who would end up paying more anyway.
Third, these demagogues are being misleading; since most
taxes are paid out of current income, it is more honest and
efficient just to tax income openly. Finally, there is a great
inequity in levying ever-heavier taxes on businesses and natural
resources (even if they are later largely passed through to
consumers) and not requiring individuals to pay their fair share.
If the actual costs of government products, goods, and services
are not reflected in the prices paid for them, people will
tend to overconsume those artificially cheap government goods
and services, which distorts resource allocation and raises
the price to those sectors which are required to pay for the
products. By any standard of good government, by any
measure of proper public service, any attempt to prohibit

for all times the use of a personal income tax should be re-soundingly defeated.

This is not to say that the tax on individual incomes is the perfect, or even the most acceptable, tax that can be levied or used to replace property taxes collected by school districts. What is being said is that there are many good reasons to think about levying a personal income tax. Some of those reasons are:

1) to the extent that the ad valorem property tax has a negative effect on residential or business construction, replacing a large portion of that tax may encourage new construction.

2) the personal income tax may be easier and less-costly - in overall terms - to administer than the property tax, especially since its collection (through withholding) can be piggy-backed on the federal tax system.

3) the number of taxpayers is increased; that is, people who do not pay property taxes will be paying income taxes. The tax burden will be spread out over a larger number of people.

4) perhaps most importantly, the income tax will replace some property taxes paid by businesses. To the extent that business taxes are reduced, the cost of doing business in Texas will decline, making Texas more attractive for industry. This will spur new development and expansion, keeping employment in Texas high.

5)   to the extent that businesses now meet their tax lia-
     bility by shifting the tax burden to their employees
     in the form of lower wages and salaries (than could be
     offered if there were no taxes to pay), replacing in-
     dustry's share of the property tax for schools with a
     personal income tax may result in higher wages and
     salaries.

6)   more easily than most other taxes, the personal income
     tax can be indexed to inflation. Only if a person's
     income increases faster than inflation (or the cost of
     living, which would be just as good a standard), would
     that person be required to pay more taxes.

7)   the personal income tax can be structured so as to be
     very fair, and to provide both horizontal and vertical
     equity.

8)   a personal income tax would reduce the number of dollars
     going to the federal government, because payment of the
     state tax is deducted from income for federal tax
     purposes.   More money would stay - and be spent - in
     Texas.

A personal income tax can either be a proportional (a flat-
rate) or graduated (a progressive rate) tax. Either type of
structure would, at very low rates, serve to replace completely
the property taxes raised in the school districts. The table at
the end of this part (Taxes) of the Report shows the amounts
that could be raised by three sets of graduated steps. While

the two higher structures would provide substantial property
tax relief by themselves, the first and lowest set of rates
would be used in conjunction with another tax, such as a refinery
tax at 3%, the VAT at 1.25%, or a 1% increase in the sales tax
(dedicated specifically to property tax relief). The second
chart on income taxes shows how a combination of taxes could
be used to finance property tax reductions.

Both structures have been figured against adjusted gross
income, and they do not allow any exemptions, deductions, or
credits at the state level. All income would be taxed, but
at low rates. The only exceptions to this structure are people
with incomes under $6000 per year, who would be required to pay
no taxes on their income. Both types of tax would provide
revenues for property tax relief, and both are of about equal
difficulty to administer. The choice, then, is largely philo-
sophical. The graduated or progressive tax is often justified
by the "ability to pay" argument; that is, those whose incomes
are higher have a better ability to pay, and so should be taxed
at a higher rate. It might also be said that their "fair share"
is a little larger, since their part of the pie is larger also.
The porportional tax is also often urged on the grounds of equity -
every person should pay the same percentage as every other person.
There is no way to draw a fair distinction between an income of
$29,999 and one of $30,000 such that the latter pays $300.00
more in taxes each year. A flat rate should be applied to all,
the argument concludes. That sounds fair, but the reality of

it is different. If a family of four has an income of $15,000
a year, their income tax at 4% would be $600, and they would
have $14,400 left to spend. A family of four at $10,000 would
pay $400 and would have $9600 left over. A family of four with
$50,000 would pay $2000 - the same 4% - but they would have
$48,000 left to spend. The 4% taken from the last family is the
same proportion taken from the others, but that family started
at a much higher level and has much more spending freedom than
the family at $10,000, which was already limited. A proportional
tax does hurt lower-income taxpayers more than taxpayers in
higher brackets because it further reduces their ability to
spend. This Report does not suggest that one structure is nec-
essairly better than the other; both have advantages and dis-
advantages, and attention is called to the differences only to
alert the Legislature to their existence. The rates proposed
are low enough so that no serious economic dislocations should
occur in either instance; by combining the personal income tax
with a business tax, the rates can be reduced still further.

The two suggested taxes, as mentioned, allow no exemptions
or exceptions. This not to say that some deductions, credits
or exemptions may not be good. They can be used to serve social
and political purposes, but they have been left out of this Report
for two reasons. First, it is much easier to make revenue
projections with a simple tax, especially since current data
is hard to find for Texas. The Comptroller's Office does not
collect much information on personal incomes, so simplicity

The Personal Income Tax

is important for accuracy. Secondly, exemptions and deductions
narrow the tax base by favoring certain groups (and reducing
their share of taxes). Often the reductions are less beneficial
than supposed; that is, they often do not provide the relief
they are designed to provide. (Exemptions to property taxes
have the same problem. Most of them could be eliminated with-
out severe problems. Tax rates would decrease as more people
paid taxes.) It is the Legislature's job to determine how they
wish to manipulate such a tax, so this Report has considered
only a "plain vanilla" tax. It is simply impossible to know
which groups would receive favorable treatment and which would
not; again, simplicity is essential to accuracy.

This Study recognizes that in Texas, the issue of personal
income taxes is one highly charged with emotions. Nevertheless,
the time has come to clear away the fog of rhetoric and to dis-
cuss income taxes in a sober, rational way. When Texas' natural
resources run out, another tax base will have to be used. The
more prepared the state is to make the change, the less dis-
ruption the change will cause.

Notes on Table III

Graduated Income Tax

Revenue Projection

1. The adjusted gross income data is for 1975 tax returns.
   This was the latest information available from IRS.

2. The figures for tax revenues and the average tax payment are
   the result of simple arithmetic manipulations. No attempt
   has been made to weight each class of taxpayers toward
   the largest number of incomes within each class.

3. These figures are not to be considered an official es-
   timate, but are used to indicate in a very simple and
   very rough way the "ballpark" amounts of money that might
   be raised from this type of tax.

4. Any attempt to use these figures for anything other than
   what they are – a "ballpark" estimate based on unrefined
   and extremely simplistic techniques – will likely subject
   the user to great criticism.

TABLE 3   Graduated Income Tax

Income Level	Adjusted Gross Income	Tax Rate	Tax Revenues	Tax Rate	Tax Revenues	Tax Rate	Tax Revenues	Average Tax Payment/taxpayer (for highest rates
0 - $5999	$4,376,118,000	0	0	0	0	0	0	0
$6000 - $7999	$3,422,392,000	$\frac{1}{4}$%	$8,555,980	$\frac{1}{2}$%	$17,111,960	1%	$34,223,920	$69.54
$8000 - $9999	$3,691,818,000	$\frac{1}{2}$%	$18,459,090	1%	$36,918,180	2%	$73,836,360	$180.40
$10,000 $14,999	$9,920,603,000	3/4%	$74,404,523	$1\frac{1}{2}$%	$148,809,045	3%	$297,618,090	$372.75
$15,000 $19,999	$9,379,218,000	1%	$93,792,180	2%	$187,584,360	4%	$375,168,720	$693.43
$20,000 $29,999	$10,137,677,000	$1\frac{1}{4}$%	$126,720,963	$2\frac{1}{2}$%	$253,441,925	5%	$506,883,850	$1189.49
$30,000 $49,999	$5,513,268,000	$1\frac{1}{2}$%	$82,699,020	3%	$165,398,040	6%	$330,796,080	$2187.50
$50,000 $99,999	$3,048,748,000	13/4%	$53,353,090	$3\frac{1}{2}$%	$106,706,180	7%	$213,412,360	$4681.84
$100,000 up	$2,711,238,000	2%	$54,244,760	4%	$108,449,520	8%	$216,899,040	$15,509.41
TOTAL			$512,209,605		$1,024,419,210		$2,048,838,420	

The Refinery Tax

By far the greater part of the energy expended by this Study has been spent investigating the suggested "refinery tax" - a tax at the rate of five per cent levied against the market value of crude oil inputs to Texas refineries. This tax, as do all others, has its supporters and its opponents. Those who favor a refinery tax do so generally because they believe that it is an exportable tax, a tax that can be shifted forward to purchasers of the refined products. Most of the refined products from Texas refineries are sold to out-of-state buyers; hence, if the tax can be shifted forward in the form of higher prices, much of the tax is exported to those out-of-state buyers. Further, say the supporters, this tax would raise substantial amounts of money which could be used (through the creation of a Property Tax Reduction Fund, for instance) to provide property tax relief. Many people who favor the tax do so for another reason: they do not believe the refiners are paying a fair share of the tax burden, and that refiners should pay more.

Opposition to the tax comes from refiners, naturally, and from other segments of the oil and petrochemical industries. Their arguments against the tax fall into two major categories: the equity or fairness argument, and the economic impact argument. The equity argument is quite simple: it says that the state would be unfair to rely upon a very narrow-based tax

The Refinery Tax

(on refiners) to provide such a large amount of revenue (a
billion dollars or more per year). No other tax, they say,
falls on so small a group, and is called upon to raise so much
money. This last statement is probably true; it will be con-
sidered in more detail a little further on when the entire
equity argument is examined. The second argument - economic
impact - is by far the more important; it is to this problem
the Study directed most of its attention, and to which this
report now turns.

The Comptroller's Office has estimated that a tax on
the value of crude oil would produce roughly one billion dollars
for property tax relief in its first year, and that that amount
would increase by nine to ten percent each year for the next
five years. Since the object of the tax is to provide money
that can be used to change and to reduce the property tax
burden, we know where the money is supposed to go. What we do
not know, and what is crucial to the whole debate, is where the
money will come from. Who will actually pay the taxes? The
quick and easy answer is, of course, "The refiners will pay the
taxes on their crude inputs." But "the refiners" won't. It
isn't that simple. Refining companies will, it is true, total
up their crude inputs for the month (or the quarter); will
multiply the number of barrels by the appropriate market value
figures (established, probably, by the Comptroller); and will
multiply that total crude oil value by five per cent to find
out how much they owe the state for that time period. The

refiners will then sit down and write a check to the state,
and will thereby discharge their obligation to the state. But
the money has to come from somewhere, and there are but three
sources: purchasers of the products, investors, or employees.

The tax on crude oil must be seen as an increase in the
cost of doing business. Although a five per cent tax on crude
is not the same as a five per cent increase in total cost, it
will still be a sizeable increase. The refiners will try to
pass the increased cost along to consumers in the form of an
increase in prices. This is the most likely method of recover-
ing the cost increase. If, however, the market conditions are
such that the price to purchasers cannot be increased, the
refiners must recover the money from either investors or em-
ployees.

Both the refining industry and the petrochemicals industry
(which is heavily dependent on the refining industry, since
refined products are feedstocks for petrochemical products)
have painted bleak pictures of low wages, unemployment, and over-
all industrial decay if labor is forced to bear the brunt
of the tax burden. Both industries claim that tens of thousands
- perhaps hundreds of thousands - of jobs would be affected
over the next generation or so (15 to 20 years). Employment
would fall (or at least not increase as rapidly as it otherwise
might) and wages would therefore be depressed in these two
industries. There would be a ripple effect which might spread

throughout the Texas economy and have at least a slight depressing effect overall. This scenario is based on the following assumptions:

(a) that labor will bear the entire burden of the refinery tax,

(b) that no federal tax deduction is taken for the amount of the state tax,

(c) that the demand for refineries and their products slackens, and

(d) that Texas becomes an unattractive place for new refineries or expansion of current plants (because of the tax).

Clearly, the refining and petrochemical industries have overstated their cases. First, under existing federal tax laws, almost half (48%) of the tax burden is shifted to the federal government. Secondly, demand for refined products will not decrease in the next generation. It may not grow as rapidly as it has in the past, but demand for gasoline, jet fuels, and petrochemical feedstocks (and probably for all products) will continue to grow. Finally, if labor can be forced to bear the burden of the tax, Texas might become a more attractive place for industrial growth and expansion, since labor costs would be less than in other places. While refinery growth may not be as rapid as otherwise, other industries (such as petrochemicals) would grow. It is not likely, however, that labor will bear the tax burden, especially in the Gulf Coast area.

The Refinery Tax

Because of the pressures of economic growth in general and the
powers exerted by labor unions, the refinery and petrochemical
industries will be unable to shift any significant portion
of the tax burden to labor.

Another source of funds to pay the refinery tax would be
the stockholders, the investors in the refining company - the
owners of the capital. They could bear the burden by accepting
a smaller return on their investment, or by accepting a lower
value for their investment. In either case, refining would be-
come a less attractive industry in which to invest, despite
a growing demand for its products, and investors would shift
funds to other, more rewarding, businesses. At present, return
on investment for the refining industry is just about equal to
the average return for all industries. The huge capital in-
vestment a new refinery requires must be attracted by at least
an average return; the same is true of the investment required
to expand existing facilities. Anything which would substantially
reduce after-tax profits would also reduce the attractiveness
of these types of investments. An unrecovered refinery tax
would cut into net profits, even with the shifting allowed
by the federal tax system. However, Texas has an advantage
over other parts of the country in terms of capital acquisi-
tion costs - capital costs are lower along the Gulf Coast
- and it is unlikely that the refinery tax will be sub-
stantial enough to eliminate that advantage. Only the

refiners know for certain what their capital costs are, and what their capital/labor mix is. They have been reluctant to share specifics with most investigators. This Study has had to rely on incomplete and biased information, when it was available at all, and this Report does not reach any conclusion regarding the effects of the refinery tax on investment and capital-cost decisions. All that can be said is that there may be some adverse impact, though there is nothing (other than the industry's official position) to indicate that the impact would be severe, long-term, or inevitable. The Study assumes, however, that any decision by refiners to shift the tax to their investors and capital owners would be a last resort; a move taken after all else had been tried and had not recovered the taxes. It is unlikely, in any realistic sense, that the shift would be toward stockholders and other investors; nevertheless even that very remote possibility must be considered.

More probable than either of the two precedings shifts - onto labor or onto the owners of the capital - is the shift forward to the purchasers of refined products. This shift would be accomplished by raising prices of all the products. Although this sounds like a relatively simple and most reasonable solution, in fact it is an extremely complex problem. Partly because even tax-incidence-theory experts are not in agreement about what portion of business taxes is shifted forward, partly because the refining industry closely guards much of the information necessary for making an estimate, and partly because

of the nature of the refining process itself, any statements -
ours or the industry's - must be taken with a measure of caution.
Nevertheless, there are some things that can be said with rela-
tive certainty. First, the demand for gasoline is increasing,
and will continue to grow until at least 1985. Despite the fed-
eral mileage requirements, gasoline consumption is increasing. A
combination of reasons - more people driving vans and pickup
trucks, more families with two or more cars, more people driving
farther to work - accounts for this continued growth. Secondly,
the price elasticity of demand for gasoline (and for some other
refined products) is very small. Some observers have suggested
that gasoline prices would have to go far above a dollar per
gallon - closer to a dollar and a half - before there would be
any significant drop in gasoline demand. Similar conditions exist
for some other refined products. Third, the public is familiar
with inflation; increasing the price of gasoline by two to four
cents a gallon is not going to have any impact on people's at-
titudes or their driving habits. Of course, while gasoline is the
most likely vehicle for recovering most of a cost increase, it
is not likely that gasoline would have to bear the entire burden.
(It may be, because of the increase required, that a gasoline
price boost could not recover the entire amount.) More prob-
ably, a wide variety of products would have their prices
raised. Because some products face great competition, or
have a high elasticity of demand, their increases would be

small. Other products, such as gasoline, which have different demand curves, would bear price hikes that would be greater than their proportional share of the costs.

It is important, at this point., to say a few words about the refining process itself. The flow chart of a typical refinery is confusing enough to someone who sees it for the first time: if one tries to follow and understand all the physical and chemical processes that are part of the flow chart, he could easily throw up his hands in despair. The most important things to remember about the refining process are:

1. "Crude Oil" is not a homogeneous commodity. Some crude has a high sulphur content ("sour crude"), while other crude contains little sulphur ("sweet crude"). Sour crude is more expensive to refine; it is also more corrosive to the pipes and equipment at the refinery.

2. At the other end of the process, approximately fifty per cent of each barrel of crude input comes out as gasoline. Two-thirds of each barrel of crude comes out as either gasoline or distillate fuels (jet fuels, kerosines, diesel fuel, heating oils). These products are the ones with high demands and relatively little price elasticity. These are the products that would carry most of any cost-increase pass-through.

3. There is no way to accurately allocate costs to any one particular product. That is, it is impossible

to say exactly how much it costs to produce one gallon
of high-octane unleaded gasoline, or one barrel of
residual oil, or one unit of any other product.
Refiners can use any one of several cost allocation
methods, but they all involve some arbitrariness.
They serve more as production guidelines than as
price-setting devices. What this means is that the
price of gasoline may far exceed its actual production
cost, while the price of residual oil may be less
than its cost.

Most new refinery capacity under construction in this
country is designed to maximize the yield of high-octane
gasolines, jet fuels, and petrochemical feedstocks. This means
that some products, like residual fuel oil, must be imported,
because the lower-end products of distillation are cracked
and/or reformed to become ingredients for high-octane gasoline.
This new capacity is expensive; and not only are the processes
expensive, but also the refineries must be built to handle
sour crudes (the quantity of sweet crude is declining) and they
must meet federal environmental standards. These are expenses
that must be incurred anywhere - and everywhere - domestic
capacity is added; they are not unique to Texas. We can,
therefore, discount the industry's argument that new refinery
capacity in Texas will be more expensive. New capacity will
cost more, but no more - and probably less - than anywhere
else. In a report prepared especially for this Study, "A

Consensus Analysis of Proposed Refinery Tax", a team of experts

at the Texas A & M Unversity Center for Energy and Mineral

Resources, state that having to make these investments "would

not change the relative attractiveness of Texas location

versus other states." The refining industry argues, however,

that a five per cent refinery tax (on top of the expensive

investments) would make Texas a less attractive site for new

or expanded facilities.

One of the most frustrating aspects of this entire Study

is that it has been unable to pin down, with any degree of

certainty, factors which influence a refiner to build or not

build in a certain region, or at a specific location within a

region. Location decision-making is a poorly studied area of

business behavior. The American Petroleum Institute has pub-

lished criteria for refinery siting (see Table 4), and taxes

are not listed anywhere among them. Yet, refiners would have

us believe that the five per cent tax is one of the most impor-

tant items on the list. In fact, of those criteria listed,

there is not a single one which Texas does not possess in more

than satisfactory amounts. With the exception of Louisiana,

there is probably no other area in the country as well suited

(by these standards) for refinery construction as the Texas

Gulf Coast. This, of course, leaves open the argument that if

Texas and Louisiana are equally well suited for refinery sites,

a five per cent tax in Texas will be enough to tip the balance

in favor of Louisiana. As evidence to the contrary, a Report

by the Fantus Company (a subsidiary of Dun and Bradstreet)

Table 4

Criteria for Refinery Siting

o Close to market/population centers (or good access to them)

o Close to major pipeline networks – products line
                                      crude line

o Close to/on port or navigable river or superport

o Large tracts – 500+ acres + Buffer Zone

o Industrial zoning

o Non-sensitive environmental location (or minimally sensitive)

o Road network capable of sustaining truck and construction traffic

o Skilled labor force area

o Nice housing/good community atmosphere/good schools

o Related industries – machine shops, valve manufacturing, warehousing,
   etc., for contract maintenance

Source: American Petroleum Institute

ranks Texas as the state (among the contiguous 48 states) with the best business climate. (Table 5). A five percent refinery tax would change only one of those fifteen items. It would reduce significantly the item called "per capita property tax." (The first item mentions only corporate income taxes, not total corporate taxes. If total corporate taxes were the measure, the first factor would increase. Since other business taxes are used in other states, their omission as a measure may be because they are not significant overall, or because they can be recovered by raising prices.) Louisiana, Texas' nearest competitor for refineries, did not even make the top twelve states. To be fair, a tax on a single industry may, under some conditions, make that industry behave differently than businesses in general. This returns us to the point where we were discussing just how much a refinery tax would affect refiners.

This discussion has already covered the three ways a refiner could shift the tax burden. It has also mentioned that a large portion of the burden will be shifted to the federal government (under corporate income tax laws). Since that shift involves 48% of the tax, refiners would be faced, not with a 5% tax, but a tax of only 2.6%. Since the refinery tax is to be used as a substitute for a large portion of the property tax, refiners would find their property taxes reduced greatly. The net effective refinery tax rate would probably be in the neighborhood of only 2%. If crude oil costs ap-

Table 5

The Fantus Report

The Fantus Company based its business climate ranking on 15 factors deemed important to firms considering alternative states as a possible location:

1. corporate income taxes as a percent of total state taxes
2. per capita property tax
3. per capita welfare expenditures
4. per capita personal income tax
5. total state taxes per capita
6. total state and local taxes per capita
7. labor legislation favorable to management
8. legal coverage relative to strikes,picketing,and boycotts
9. regulation of labor unions
10. unemployment compensation tax rate
11. average workmen's compensation payment
12. governmental units per 1,000 of population
13. state and local payroll per capita
14. per capita state debt
15. per capita state and local debt

All 48 contiguous states were ranked in each category relative to one another. If a state ranked 1-12 relative to other states in a particular category it was rated excellent; 13-24 good; 25-36 fair; and 37-48 poor. The criteria for excellence included low taxes, low levels of public assistance, restrictive labor legislation, and a low level of government spending and debt.

Each state's ranking in each category was summed to arrive at a composite score. The lower the composite, the higher the overall business climate ranking. The 12 best and 12 worst states for business climate, along with their composite scores, were as follows:

The Best		The Worst	
Texas	192	New York	628
Alabama	210	California	581
Virginia	214	Massachusetts	547
South Dakota	230	Michigan	532
South Carolina	236	Delaware	520
North Carolina	239.5	Connecticut	516.5
Florida	244	Pennsylvania	506
Arkansas	248	Minnesota	505.5
Indiana	261	Oregon	499
Utah	279	Washington	495
North Dakota	286	Vermont	489
Mississippi	287	New Jersey	483

It is interesting to note that among the top 12 states, all but Indiana have right-to-work laws.

proximately $13.00 per barrel, this is an increase of only
twenty-six cents per barrel, or less than one cent per gallon
(.00619¢/gallon). A price increase of two cents per gallon of
gasoline (since gasoline is about one half the product mix)·
would more than recover the tax. If the cost increase is
spread over several products, the price of gasoline would rise
by a penny a gallon or so. This is hardly a drastic price
increase, and would be accepted by gasoline buyers with little
trouble. Refiners argue that they are faced with such com-
petition in the marketplace that gasoline prices could not be
raised without a resulting loss of business. There is no evi-
dence that this is the case. Most major refiners sell to
dealers who retail that major's brand; the refiners also sell
to wholesalers and jobbers who sell, in turn, to dealers of
other brands. The market arrangements from refiner to retailer
are, as is everything else in the oil industry, complex and
confusing. Nevertheless, given the complicated web of whole-
sale and retail arrangements, a one to three cent increase in
the cost of Texas products would be passed along as a smaller
increase in nationwide product prices. At the very worst,
Texas consumers of refined products might have to bear a dis-
proportionate share of the price increase, if the out-of-state
portion could not all be passed along. Gasoline prices would
go up four or five cents per gallon, and prices in general
would rise a little. (See Appendix C for an estimate of the
effect on prices a refinery tax would have in Texas.) In this

case, it would be true that exporting the tax is not entirely
possible, but Texas consumers would be paying for Texas'
public education system, the way Texas property owners do
now. It would not be unfair to ask them to do so. This is a
"worst case" scenario, since the far more likely pattern would
be a smaller price increase for most petroleum products around
the country. It is reasonable to believe, that is, that the
tax burden can be exported.

Before returning to the equity argument, there are a
couple of issues that should be mentioned. First, one of the
threats (or promises) that refiners have made is that if a tax
is imposed in Texas as planned, their initial response would
be to shift crude runs to other states where it is cheaper to
refine and where there is excess capacity. This is, at the
moment, a hollow threat. There is no excess capacity, at the
time this Report is being prepared, in the United States. Re-
fineries are running at record levels, and in the first week
of December, gasoline output reached a record level of 2.2
billion gallons. It is simply not realistic to think that
any significant shift of crude runs would occur because of a
five per cent refinery tax (the effective rate of which, recall,
is closer to two per cent); there is no spare capacity, and
there are no significantly cheaper places to refine the pro-
ducts in demand. A related issue, or a corollary issue, is
that, over time, new capacity could be built elsewhere which
would allow crude runs to be shifted. This is true. However,
in the October 2, 1978 issue of the Oil and Gas Journal (a

weekly trade publication of high reliability), a list (see
Appendix E) of all the new and planned refinery projects in
the United States shows Texas with 28%. This is an even larger
share of the domestic total than the 26% of current capacity
nationwide that Texas already has. Contrary to some assertions,
Texas is not losing ground, but gaining it, in the size of the
share of the domestic refining capacity it has.

The second - and last - issue is that of small refineries.
There are some small plants which refine a limited number of
products for a limited market or group of customers. Some of
these small refiners exist largely (or solely) because the
federal entitlements program makes it possible and profitable
for them to be and stay in business. There are moves afoot
in Washington to cut the entitlements program in half, or to
make other significant changes in it. These proposed changes
might force some small or marginal refiners out of business.
The state of Texas has no wish to do that to anyone engaged
in a legitimate business endeavor; however, it is not the
state's place to subsidize inefficient or marginal businesses.
As a compromise position, this Study recommends that all re-
finers, regardless of size, be allowed to exempt (if they wish)
the first 30,000 barrels per day of crude oil they run through
their plants. This would have the effect of still further
reducing the effective tax rate per barrel, and would be
enough to protect many small or marginal refiners.

Finally, let us consider the allegation that a tax on

crude oil inputs is unfair because it discriminates against one
group or one industry. It is true that the tax will fall on
only one group of taxpayers - those who refine crude oil. But
that does not make the tax unfair. The real property ad valorem
tax falls on only one group of taxpayers - real property
owners. The gasoline tax falls on only one group of taxpayers -
gasoline purchasers. The franchise tax falls on only one group
of taxpayers - domestic and foreign corporations chartered to
do business in Texas. A refinery tax is no different, and is
thus no less fair, than any other tax. The fact that the
group which would pay the tax is small in numbers should not
be confused with the fact that they are huge in assets, and
that the commodity which is being taxed is both relatively
high in value and present in this state in great quantities.
That a value-added tax at a very small rate, or a personal
income tax at a low rate, or a combination of the two, might
be more equitable because they would tax everyone instead of
one group, is no argument against a refinery tax, but rather
an argument in favor of the others.

In sum, a five per cent tax on the value of crude oil
inputs to refineries would be an acceptable tax to use to
replace property taxes levied by school districts. While it
might not be the best tax to use, it would produce the desired
result (one to two billion dollars per year) without any
severe economic dislocations. This is not to say that there
would be no problems, only that they would be relatively small
and probably over a long period of time (fifteen to twenty

years). The refinery industry has been in a period of slow

growth in the United States; even so, Texas is the location

for a larger proportion of new projects (28%) than its current

industry share (26%). A five per cent tax ends up being an

effective rate of about 2%, and a large portion of that is likely

to be shifted out of state. The advantage Texas has, both

in its complex system of refineries and transportation facili-

ties and pipelines, and in its general business climate, more

than offset a small tax such as this. If Texas builds a

deepwater port facility, the State's competitive position

would be enhanced further. Texas has been the leader in re-

fining in this country for years. It is now, and even with a

five per cent refinery tax, it will continue to lead the nation

in supplying the refined products upon which our society de-

pends so heavily.

Table 6

GENERAL BAYTOWN FLOW SEQUENCE

Exxon Refinery, Baytown, Texas:
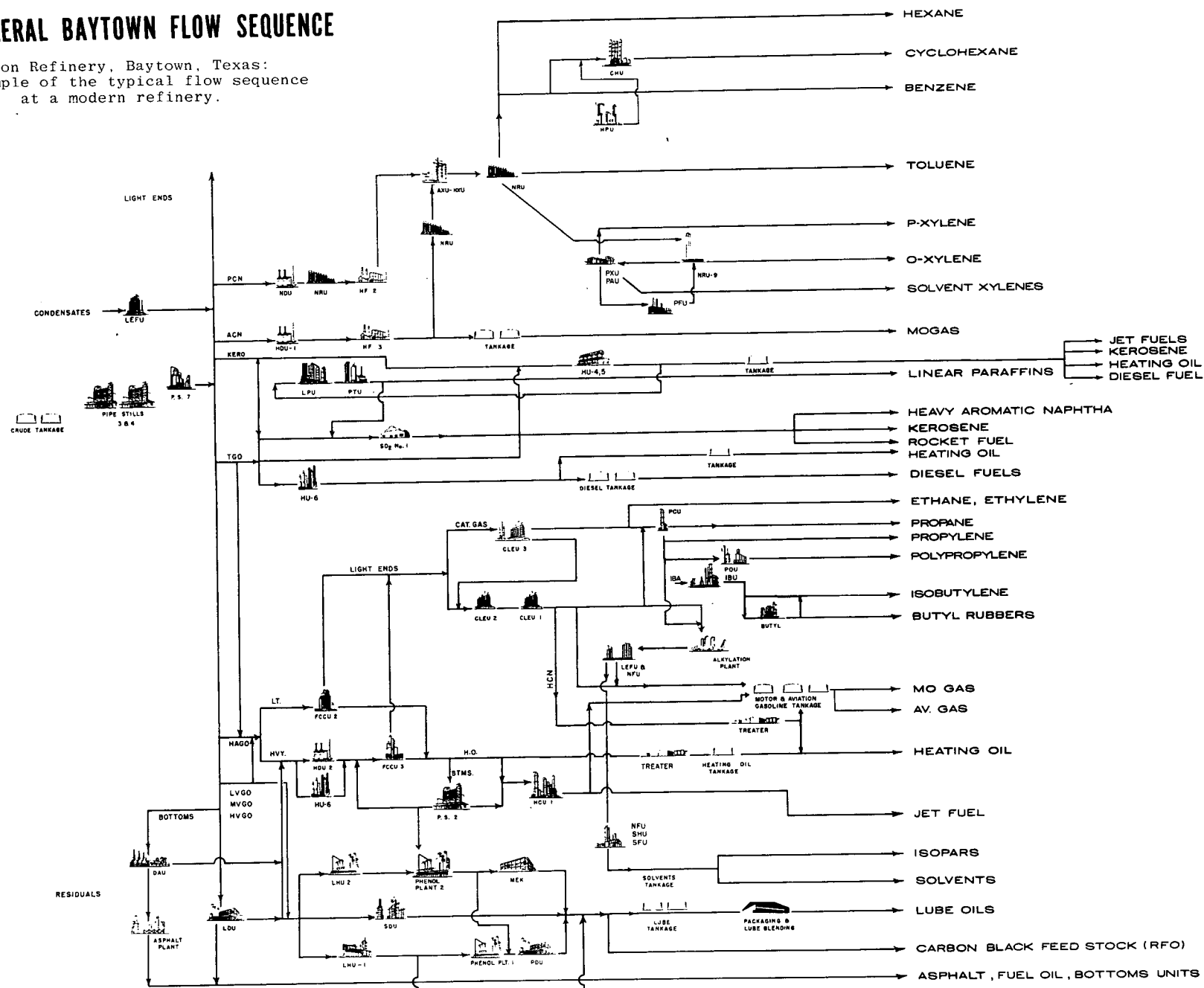an example of the typical flow sequence
at a modern refinery.

HEXANE

CYCLOHEXANE

BENZENE

TOLUENE

P-XYLENE

O-XYLENE

SOLVENT XYLENES

MOGAS

JET FUELS
KEROSENE
HEATING OIL
DIESEL FUEL

LINEAR PARAFFINS

HEAVY AROMATIC NAPHTHA
KEROSENE
ROCKET FUEL
HEATING OIL

DIESEL FUELS

ETHANE, ETHYLENE

PROPANE
PROPYLENE

POLYPROPYLENE

ISOBUTYLENE

BUTYL RUBBERS

MO GAS

AV. GAS

HEATING OIL

JET FUEL

ISOPARS

SOLVENTS

LUBE OILS

CARBON BLACK FEED STOCK (RFO)

ASPHALT, FUEL OIL, BOTTOMS UNITS

LIGHT ENDS

CONDENSATES

LEFU

PCN

NDU   NRU   HF 2

ACN

HDU-1   HF 3   TANKAGE

KERO

LPU   PTU

HU-4,5   TANKAGE

P.S. 7

PIPE STILLS 3 & 4

CRUDE TANKAGE

SO₂ No. 1

TANKAGE

TGO

HU-6

DIESEL TANKAGE

CAT. GAS   CLEU 3

PCU

LIGHT ENDS

CLEU 2   CLEU 1

POU IBU

IBA

BUTYL

ALKYLATION PLANT

HCN

LEFU & NFU

MOTOR & AVIATION GASOLINE TANKAGE

TREATER

LT.

FCCU 2

HAGO

HVY.

HDU 2   FCCU 3   BTMS.

HCU 1

TREATER   HEATING OIL TANKAGE

HU-6

P.S. 2

NFU SHU SFU

LVGO MVGO HVGO

BOTTOMS

DAU

LHU 2   PHENOL PLANT 2   MEK

SOLVENTS TANKAGE

RESIDUALS

ASPHALT PLANT

LDU

SDU

LHU-1   PHENOL PLT. 1   PDU

LUBE TANKAGE   PACKAGING & LUBE BLENDING

AXU-NRU   NRU

NRU

PXU PAU   NRU-9

PFU

HPU

CHU

Courtesy of Exxon, U.S.A.   JUNE, 1975

TABLE 7: Revenue Estimates for the Expansion of Taxes
Presently in Use (In Million $ by fiscal year)

PROPOSED INCREASE						
1. Franchise Tax						
@ $4.25	284.92	317.41	351.82	388.14	431.04	484.58
@ $6.50	435.76	485.45	538.07	593.63	659.24	741.09
Net increase	150.84	168.04	186.25	205.49	228.20	256.53
2. Cigarette Tax						
@ $ 9.25, $11.35	338.30	359.03	378.04	396.89	419.13	445.64
@ $11.50, $13.50	420.05	445.83	469.45	492.62	520.51	553.47
Net increase	81.75	86.80	91.41	95.93	101.38	107.83
3. Gasoline Tax						
@ 5¢ gal.	422.64	437.96	451.69	464.91	480.45	498.39
@ 10¢ gal.	845.28	875.92	903.38	929.82	960.90	996.78
Net increase	422.64	437.96	451.69	464.91	480.45	498.39
4. Natural Gas						
@ 7.5%	585.00	642.60	694.10	740.10	780.80	816.60
@ 10%	780.00	856.80	925.50	986.80	1041.10	1088.90
Net increase	195.00	214.20	231.40	246.70	260.30	272.30
5. Oil Production						
@ 4.6%	443.90	457.60	470.80	484.90	501.10	578.10
@ 9.5%	916.75	944.90	972.30	1001.50	1034.88	1070.00
Net increase	472.85	487.30	501.50	516.60	533.78	551.90
6. Sales Tax						
@ 4%	2224.82	2539.53	2879.21	3259.09	3689.74	4176.85
@ 6%	3337.23	3809.30	4318.82	4888.64	5534.61	6266.28
Net increase	1112.41	1269.77	1439.61	1629.55	1844.87	2089.43
@ 8%	4449.64	5079.06	5758.42	6518.18	7379.48	8353.70
Net increase	2224.92	2539.53	2879.21	3259.09	3689.74	4176.85

Table based on data supplied by Comptroller's Office, September 18, 1978

TABLE 8 : New Sources of Revenue
(In $ Million by Fiscal Year)

	1979	1980	1981	1982	1983	1984
Proposed Tax:						
Refinery tax @ 5%	978.9	1075.5	1180.7	1295.7	1427.3	1574.0
Lignite @ 5%	20.20	23.30	27.10	35.20	40.60	52.00
Timber @ 5%	9.00	9.50	10.20	11.20	11.90	12.60
Uranium @ 5%	9.30	11.55	12.60	14.63	13.20	12.00
Total @ 5%	38.50	44.35	49.90	61.03	65.70	76.60
Lignite @ 8%	32.30	37.30	43.30	56.40	64.90	83.10
Timber @ 8%	14.40	15.20	16.40	18.00	19.00	20.10
Uranium @ 8%	14.88	18.48	20.16	23.41	21.12	19.20
Total @ 8%	61.58	70.98	79.86	97.81	105.02	122.40
Personal Income @ 2% rate	2030.8	2241.4	2459.8	2693.8	2974.6	3297.8
Value Added @ 2.5%	1903.87	2101.31	2306.06	2525.44	2788.28	3091.68

Table based on data supplied by Comptroller's Office, September 18, 1978

Table 9 :   Revenue Estimates

For Combinations of Taxes

(In $ Million by Fiscal Year)

Type of Tax Combination	1979	1980	1981	1982	1983	1984
1. Personal Income @ 1% - plus - Value Added @ 1.25%	1967.34	2171.34	2382.93	2609.62	2880.94	3194.74
2. Refinery Tax @ 3% plus Personal Income @ 1%	1602.74	1766.00	1938.32	2124.32	2343.18	2593.3
3. State Sales Tax @ 5%, with 1% specifically dedicated to property tax relief - plus - Personal Income @ 1%	1571.61	1755.59	1949.71	2161.68	2409.24	2693.62
4. State Sales Tax @ 5% with 1% specifically dedicated to property tax relief - plus - Value Added @ 1.25%	1508.15	1685.55	1872.84	2077.50	2316.58	2590.66
5. Refinery @ 3% - plus - Sales at 5%, with 1% specifically dedicated to property tax relief.	1143.55	1280.19	1428.23	1592.20	1778.82	1989.12

Table based on data supplied by Comptroller's Office, September 18, 1978.

Table 10 : Revenue Estimates
Graduated Personal Income Tax
combined with
other types of taxes

Note: The figures for the graduated personal income tax are
based on 1975 adjusted gross income data, and should be
considered only as a very rough approximation.

Estimated Revenue From A Graduated Personal Income Tax
Tax Rates - ¼% to 2%, as shown in Table   :
$550 million per year.

Graduated Income Tax combined with	Revenue from Second tax	Revenue from Income tax	Total - FY 1979 only
VAT @ 1.25%	951.94	550.0	1501.94
Refinery tax @ 5%	587.34	550.0	1137.34
State Sales Tax @ 5%, with the additional 1% dedicated to property tax relief	556.21	550.0	1106.21

(All figures in millions of dollars)

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PART   2

Local Control

SUMMARY - LOCAL CONTROL

Every school district in the state levies and collects
a property tax. Within certain limits, the school district
administration is free to determine how and for what those
locally-raised funds are to be spent. This spending power
is what the issue of "local control" is all about. If
you remove all discretionary spending ability from the local
level, and transfer it to the state level, by replacing the
property tax with some other tax, what has effectively been
done is to make the state the administrative power for
every school district in the state. Even though property
tax reform, and real tax relief, is something that most
people see as necessary and desireable, there are many people
who do not believe that tax relief is as important as retain-
ing local control of the schools. They therefore oppose
any type of tax, refinery, business or income, which would
reduce or eliminate local control of the schools.

The actual amount of "local control" that exists is
difficult to measure. If the ideal is total state control,
it can be argued that there is considerable local discretion.
On the other hand, if the ideal is no state control at all
(with all decision-making power resting in the local district),
it is clear that local districts are considerably restrained
by the structure of the present system. By replacing most
local property taxes with state revenues (regardless of their
source), whatever "local control" that does exist may be

nearly eliminated. Although it is possible to distribute
state money with no strings attached, it is unlikely that
that would be the case. Much more probable is that more
state money would mean more state control, and the thought
of more state control upsets those who now wield the local
power. This issue, like the refinery tax issue, has no
easy answer or "quick fix". The Legislature must be made
aware of the consequences of its acts, regardless which
path it chooses to follow.

CONCLUSIONS - LOCAL CONTROL

I.   Some level of "local control" does exist in the school districts.

II. Increasing the portion of public education that is funded by the state, and simultaneously reducing the local share, will not necessarily increase state control and reduce local power.

III. The property tax is probably the only tax available to local governments which, on the one hand, can produce the revenues they need and, on the other, is within their abilities to administer efficiently. The alternative taxes that might be used at the local level are either being used at other governmental levels or are too expensive or complex to be used by local governments.

LOCAL CONTROL

The passage of proposition 13 has raised a great deal of concern about the traditional means of financing local government in this country. It was out of this concern that the Texas Senate Study to Replace Ad Valorem Taxes was created. Hopefully, by addressing the problems of local finance while Texas still has a healthy tax base, we can avoid the type of short-sighted action that took place in California.

Proposition 13 is a perfect example of how in the area of governmental finance, invention is, as often times as not, the bastard son of necessity. This study recognizes that there is much to be gained by acting before the crunch. Looking at various taxing alternatives while we still have the leisure of time provides us with a golden opportunity to develop a system of local government finance which will remain healthy and strong for years to come.

The basic goal of the Senate Study to Replace Ad Valorem Taxes is to provide local property tax relief by replacing some local property tax with some type of state tax. The study has concentrated its attention on replacing the local property tax used to finance the operating and maintenance costs of local school districts in the state.

Education is a function which is placing ever-increasing demands on the local property tax base. Increasing school taxes in many states threaten to crowd local units of general government - cities and counties - off of the local property tax preserve. While this condition may not currently exist

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in rural Texas, the urban areas of the state are already feeling the pinch.

The study has focused on the replacement of local school taxes for several reasons. As previously mentioned, school taxes are gradually commanding a larger and larger portion of the total property tax dollar. But more importantly, the benefits of education are decidely more statewide in nature than the more local benefits from services provided by local units of general government (water and sewer). A persuasive argument can be made that the more local functions should have first claim on the local property tax base. If the state is to provide local property tax relief it would seem reasonable for it to finance the area of local concern which affords the most statewide benefits.

Arguments against substantial or full state funding of education focus on the loss of local control, which presumably will accompany such a system of school finance. The proponents of the status quo, chiefly the property-rich school districts, contend that the state will take control of taxation and expenditures. In accordance with the old adage that "He who pays the piper calls the tune," the state, in an effort to assure accountability for its dollars, will become heavily involved in all education decision-making. It is argued that as the state becomes more immersed in the day-to-day operations of schools the local district will lose all it its influence. Whether or not this is an accurate description of what whould follow state financing of substantially all the cost of education is the

subject of this section

It is the basic contention of this section that centralized financing and local decision-making can exist side by side in the same education system, "He who pays the piper," calls the tune only if he choses to.

The study is divided into three sections. The first section is concern with developing an operational definition of local control; the second attempts to point out the current restrictions on local control; and the last section will hopefully provide some insight as to how large a threat state financing of education actually presents to local control.

A Definition of Local Control

School districts, like all units of local government, are creatures of the state and subject to direct state control. What separates school districts from other local jurisdictions is the absence of an explict "home rule" doctrine. In Texas, as in most states education is constitutionally a state responsibility. However, a substantial amount of responsibility for delivering education services has been delegated to local districts.

The demand for local control and the accompanying rhetoric have evolved into a confirmed belief in its advantages. It has received constant lip service and substantial legislative backing, which is understandable considering its wide public support. Most Texans accept the desirability of local control of public education almost as an article of faith.

The doctrine of local control, however, is so ill-defined that it is difficult to conceptualize for the sake of analysis.

At one time or another it has meant control by voters, parents, teachers, school districts officials, and school boards.

Local control has sometimes been defined as a district's discretion to spend more if it desires. The major problem with this definition is that a district's desire to spend more is often overruled by its ability to spend more. Further, the definition is too simplistic to facilitate analysis.

To infer that the more dollars a district has to spend on education the more options it has in providing education, is, at least to this writer, stating the obvious. Property rich-school districts, with their greater fiscal capacity, necessarily have more education options than property-poor districts.

Using this definition we could sum up the effects of substantial State funding on local control very quickly - any restructuring of the system of financing education which restricts or eliminates a district's revenue-raising authority will restrict or eliminate local control. Since any meaningful property tax relief will require that limits be placed on local taxation, such legislation will necessarily limit local control.

However, there is much more to the doctrine of local control than the authority to levy and collect taxes - paramount though that may be. For the purposes of this paper, local control will be defined as the power to make a wide variety of decisions at a local level. It will focus primarly on the effects of substantial state funding on local education decision-making power.

In reviewing the existing restrictions on local decision making, little attention will be given to the constraints related to local district property wealth. It is, however, assumed that

there is a direct relationship between district wealth and district options. This assumption seems to be supported by the fact that the most staunch opponents of any cap that might accompany a larger state role in school financing are the residents of middle and higher-income areas, particularly the suburbs.

It is also assumed that a larger state role in financing education will result in an increase in the total amount of funds devoted to education statewide. Since it will not be politically possible to force districts to reduce the amount they are currently spending, state financing must inevitably be one of leveling up rather than down.

Accepting the fact that dollars are directly related to options and that state financing must be one of leveling up, it is possible that state financing might have the net effect of increasing local options statewide. This, of course, is conjecture since there is no empirical evidence to support it.

Restrictions on Local Control

In attempting to determine the effect of state financing on local decision making, it is useful to point out that under the present system of financing, local districts are restricted in their autonomy both fiscally and non-fiscally. An examination of these restrictions will provide a better understanding of how much decision-making power local districts have and what is really at stake in restructuring the system of school finance.

Following the democratic principle of local control of public institutions, early schools were organized at the community level and placed under the direction of popularly elected school boards; over the years, this true local control has gradually been weakened.

During the twentieth century, great emphasis has been put on professionalism and efficiency in public education. In the period following World War II many school districts were consolidated and subject to increasing central control from state and federal agencies.

Control at the state level has increased for many reasons. Rising school costs, intensified efforts to achieve greater equality of educational opportunity, and more efficient use of resources are major contributors.

Some observers claim that local control is presently so restricted by the state that it has very little meaning. Justice Marshall in his dissenting opinion in San Antonio vs Rodriguez Supreme Court decision remarked,

> In Texas, statewide laws regulate in fact the most minute details of local public education. For example, the State prescribes required courses. All textbooks must be submitted for state approval, and only approved textbooks may be used. The State established the qualifications necessary for teaching in Texas public schools and the procedures for obtaining certification. The State has even legislated on the length of the school day. Texas' own courts have said:

>> As a result of the acts of the Legislature our school system is not of mere local concern but it is statewide. While a school district is local in territorial limits, it is an integral part of the vast school system which is co-extensive with the confines of the State of Texas.

The remainder of this section will focus on the various existing restrictions on local education decision-making. This

will be done, in part, by looking at the following dimensions of possible state control over local autonomy:

Curricular Requirements

    1. Textbook Control

    2. Course Requirement

Budgetary and Taxing Restrictions

    1. Budget Controls

    2. Taxing Limitations

    3. Bonded Indebtedness

State Regulation of Federal Programs

    1. Title I

Regulation of Personnel Administration

    1. Teacher Certification

    2. Employment Contracts

    3. Salary Regulations

    4. Collective Bargaining

Jurisdictional Boundaries

    1. District Formulation, Annexation, and Consolidation

Curricular Requirements:

1. Textbook Controls

School districts are prohibited from using any textbooks not adopted by the State Board of Education. Textbooks are adopted on recommendation by the State Textbook Committee which consists of fifteen persons appointed by the State Board for the period of one year. Districts are allowed to select their textbooks from multiple lists approved by the board, e.g. there may be as many as five or as few as three American history books to choose from. Once selected, textbooks are purchased by the State and furnished at no expense to the local school district. When a school district selects a textbook, it is required to continue using that text for at least five years.

2. Course Requirements

The Texas Education Code mandates that each school provide instruction in certain specified areas. The State also gives the Commissioner of Education authority to specify additional curriculum requirements. These additional requirements are found in the principles, standards, and procedures necessary for school district accreditation.

The statutory curriculum requirements are listed in Table I.

TABLE 11

Curriculum Elements Prescribed By State Law

The statutes mandating these areas are contained in the following table. (Numbers in parentheses refer to Texas Education Code.)

English Language Usage	Mathematics	Citizenship	Health & Physical Development
Mastery of English (21.109, 21.451, 21.455) Comprehending English (21.454) Speaking English (21.454) English Grammer (21.101) Reading in English (21.101, 21.454) Composition (21.101, 21.454) Penmanship (21.101) Orthography (spelling) (21.101)	Arithmetic (21.101) Mental Arithmetic (21.101)	Citizenship (2.01) U.S. & Texas Constitution (21.106) Civil Government (21.101) U.S. History (21.101, 21.454) Texas History (4.15, 21.101, 21.103) Intelligent Patriotism (4.16, 21.102) Essentials & Benefits of Free Enterprise (21.101) History & Culture Associated with Student's First Language (21.454) Modern Geography (21.101) Kindness to Animals, Protection of Birds and Their Nests and Eggs (21.105) Dangers of Crime (& Narcotics) (21.113)	Physiology & Hygiene (21.101, 21.104) Physical Education (21.101, 21.117) Effects of Alcohol & Narcotics (21.101, 21.113)

In addition to these requirements, the Texas Education Agency requires that students in elementary and secondary schools receive instruction in science.

The State sets minimum requirements on the length of the school year and school day. Each district must provide at least 18Q days of instruction. The school day must be at least seven hours long with a minimim of six hours of instruction, excluding recesses and lunch periods.

The State requires that each elementary school maintain a balanced curriculum. A balanced curriculum includes a daily schedule of instruction in the areas of English language arts, science, mathematics social studies, and physical education; and a weekly schedule in the areas of art, music, drama, and health. Career education, drug education, and safety education as well as citizenship, conservation of natural resources, and an understanding of the free enterprise system are expected to be integrated into the curriculum.

The Texas Education Agency provides a list of approved courses that may be offered in grades 7-12 and the amount of credit that can be awarded for each course. School districts wanting to offer a course not on TEA's approved list must submit a written proposal describing the course and the amount credit they wish to give it to the TEA. If the TEA approves the course and it passes the required first year evaluation, it may be added to the list of approved courses.

Each accredited secondary school must make available to

each student:

Six years of

English

Mathematics - including one year of Algebra and Geometry

Science - including Biology, Chemistry and Physics.

Social Studies - including one year of Texas History and

Geography in Grade 7; two years of American History, includ-

ing one year of American History and Citizenship in Grade 8,

and 3 quarters of American History in any grade, 9-12; three

quarters of either World History Studies or World Geography

Studies in any grade, 9-12; two quarters of American Govern-

ment which includes study of the Texas and United States

Constitutions. Instruction on the essentials and benefits

of the free enterprise system is incorporated within the

required courses of American History, World History Studies

or World Geography Studies, and American Government.

Physical Education

Accredited secondary schools must also provide health educa-

tion and foreign language and vocational programs according

to local needs.

The Texas Education Agency also establishes minimum require-

ments for high school graduation. All students must complete

at least 55 quarter units of credit to receive a high school

diploma. (The TEA defines a unit of credit to be 160 clock

hours of instruction.) The required 55 quarters must include

the following specified subjects:

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English (9 quarter units)

World History or World Geography (3 quarter units)

American History (3 quarter units)

American Government (2 quarter units)

Mathematics (6 quarter units)

Science (6 quarter units)

Physical Education (5 quarter units)

Health Education (2 quarter units)

Electives from TEA list of approved subjects
(19 quarter units)

The TEA further requires that all teachers hold valid Texas teacher certificates and that teachers be assigned to subjects for which they have completed an approved program of teacher education.

Budgetary and Taxing Restrictions

1. Budget Controls

State law requires that local school budgets be prepared no later than August 20th of each year. The budget must be itemized in detail in accordance with the TEA's "Financial Accounting Manual". After the local budget is prepared, the president of the local school board, who is by statute the budget officer for the district, must call a meeting of the trustees to consider it's adoption. Copies of the adopted budget must be filed with the local county clerk's office and the TEA, no later than November of the budgeted year.

2. Tax Limitations

School districts are authorized to levy and collect annual ad valorem taxes. Districts may adopt their own assessment ratio. State law prohibits districts from levying a total tax rate of $1.50 per $100 of the full market value of taxable property in the districts. While few districts come close to levying the state limit there are many other considerations which limit a district's ability to tax itself. Districts are aware that residents pay municipal, county, and other special district taxes as well as school taxes. Boards consider the total tax burden when they propose school tax increases.

3. Bonded Indebtedness

The State places a statutory limit on the bonded indebtedness of school districts at 10% of the district's assessed property value. In order to sell bonds, a district must hold a bond election. State law requires that the bond issue be passed by a simple majority of the voters voting in the election. As in the case of tax levies, the political climate and financial condition of the district often places more restrictions on the bonded indebtedness of local districts than state statutes.

State Regulation of Federal Programs

1. Title I

The state of Texas has no state laws that augment the federal regulations of Title I projects. Federal regulations themselves are only imposed on districts which accept federal funds and have no direct bearing or state regulations. For this reason, and because restructuring the state system of finance is likely to have little impact on the flow of federal funds or changes in federal regulations, restrictions on local autonomy by the federal government will not be addressed in detail. However, it is important to point out that 90% of the school districts in the state accept some type of federal funds. Since federal funds are primarily categorical in nature and are targeted at specific populations and purposes, the use of these funds is constrained by detailed regulations. So, at least in those areas where federal funds are used, there is little discretion left to the district.

Regulations of Personnel Administration

1. Teacher Certification

School districts may hire only state certified teachers or persons holding emergency teaching permits. Teacher certification is essentially controlled by those colleges and universities with teacher education programs approved by the State Board of Education. Teaching certificates designate one or more specialized areas in which the teacher may teach.

2. Employment Contracts

There are statutory limitations on the length of super-

intendent, principal, and teacher employment contracts. The maximum length of contracts vary with district pupil populations. Districts with less than 5,000 students may not enter into employment contracts for longer than three years. Those districts with more than 5,000 students are allowed to make employment contracts up to five years in length. Teachers employed by a district for the first time must be employed under a probationary contract or contracts for a period of three years. Under the probationary contract, a teacher may be fired at the end of such a contract. Once a teacher has served three years in a district under probationary contract he is elevated to continued contract status. Under continued contract status, he is allowed to continue in this position until retirement or resignation. There are statutory regulations on the removal of a teacher employed under continued contract status.

3. Salary Regulations

The State establishes minimum monthly base salaries for all professional school empolyees. Minimum monthly salaries are based on position classification found in the "Texas Public Education Compensation Plan". Salary adjustments are made within each position classification for different levels of education and teaching experience. All salaries must be paid on at least a 10 month basis.

Although nearly all districts pay their professional employees more than the state minimum, local autonomy over salary questions is at least to some degree limited by the statutory

requirement that each district maintain a 1 to 25 teacher-student ratio.

4. Collective Bargaining

·The State prohibits collective bargaining between school district officials and employees through a labor organization for the purpose of formulating a contract regarding wages, hours, or conditions of employment.

District employees, however, may express their grievances concerning wages, hours of work, or working conditions through a representative that does not claim the right to strike.

Jurisdictional Boundaries

1. District Formulation, Annexation, and Consolidation

The State has abolished the State Board of Education's power to create independent school districts. Existing statutes seem to encourage district consolidation. Procedures for annexation are generally the same. The State requires that a petition be presented to the county judge asking for an election on the proposed change. The proposed change must win a simple majority of the vote in each of the two or more districts. In the creation of a county wide district, a simple majority of the county vote is enough to pass the issue.

While there is little state law restricting district reorganization, the federal courts have made the procedure a bit more involved.

In addition to the state laws and regulations, federal courts have made many individual district desegregation rulings. Typically the outcome of these rulings are court ordered desegregation plans which the district must comply with. Currently the entire state of Texas is subject to the regulations of Civil Action No. 5281 issued by the U.S. District Court for the Eastern District of Texas. In general, Civil Action 5281 requires the Texas Education Agency to enforce district compliance with Title VI of the Civil Rights Act of 1964. More specifically, it requires that all student transfers and any changes in school district boundaries must be approved by the TEA pursuant to the provisions of Title IV. Student transfers and district boundary changes cannot be approved if they change the racial balance in any of the affected districts by more than one percent.

School district transportation systems must be reexamined annually by the TEA. Approved bus routes must not encourage or maintain segregation.

Each district must file with the TEA a list of objective, non-racial and non-ethnic criteria by which the district will measure its faculty and staff for assignment, promotion, demotion, reassignment or dismissal.

School districts desiring to sell or lease real property must notify the TEA of their intentions.

The remaining requirements of Civil Action 5281 have been for the most part, incorporated into the TEA's accreditation requirements. Under these requirements, the administration

of personnel, the assignment of students, and the extra-curricular activities of all school districts must be reviewed by the TEA for possible discriminatory practices.

The purpose of this discourse of restrictions on local decision making has not been to discredit the state statutes or court decisions. Rather it is to point out that much of what is considered to be in the realm of local decision-making has actually been shifted to the state or at least conditional upon state restrictions or approval. What remains of local discretion is a very limited and, in many cases, a shrinking area of decision making. If substantial state funding of education poses a threat to local control - and this paper's position is that it does not - then the system threatened is not a system of independent boards making and implementing policy solely in accordance with the wishes of the community. The local school board and the community are just two actors in a much larger set of factors and constraints which influence school policy.

The Effect of Substantial State Funding on Local Control

Little empirical research has been done on the relationship between state funding of education and state control. Only one multistate study has specifically addressed the issue. An Urban Institute team studied state laws and regulations in ten states with different levels of state funding. The areas of statutory and regulatory law which were addressed by the Urban Institute are essentially the same as those covered

in the Restriction section, above. Several of the Study's findings are worth noting.

"1. State statutes and regulations sharply limit the degree of local board autonomy - although this varies widely between states and within the ...dimensions surveyed... in the majority of the states examined.

2. There is little direct relationship between the percentage of state aid provided and the degree of state restrictions on the operation of local school boards.

3. While state restrictions in some dimensions such as budgetary controls, may increase as the state percentage of funding for local education increases, there is not a uniform pattern which can be identified across the dimensions studied."

These findings clearly challenge the belief that increased state funding neccessarily brings increased state control.

The Urban Institute study also looked at the relationship between local innovation and state funding. It found that innovations are, "not stifled by higher percentages of state funding and may indeed be increased by it."

It may be that the political culture of a state - its history, political traditions, and beliefs are more important factors in determining the locus of power between the state and the district than the level of state funding. It is possible that Texas with its history of localism can retain

its system of local control even with the advent of full state funding. While restructuring school finance, the State Legislators would be hard pressed to write laws restricting local autonomy if it goes against the desires of their constituencies

Because the nature of this study is property tax relief, it is assumed that local districts will necessarily lose at least some of their "right of taxation." While some leeway should be allowed districts in determining the total expenditure level for pupils in their schools, limits on local enrichment are necessary to ensure tax relief. Studies by the Texas Research League indicate that previous attempts by the legislature to provided local school tax relief by simply increasing state aid to schools has not been effective. The Texas Legislature increased state aid to districts in school year 1977-78 by $446 million, or 28.4 percent. It also reduced the Local Fund assignment which is the share of the Foundation School Program funded by local school districts from local property taxes. The 1,080 local school districts responded by increasing school budgets by $836 million, of which $470 million went for higher current operating expenses. Proposed spending for capital outlay was up by $325 million. Debt service expenses were up $40 million.

About $130 million of the $446 million of additional state aid was intended (but not required) for local property tax relief. Despite a letter from the speaker of the Texas House of Representatives to each school board president urging re-

ductions in local school taxes, the total levy was increased by $148 million. Only 158 of the 1,080 districts actually reduced their levies. (see Table 12)

TABLE 12

NUMBER OF SCHOOL DISTRICTS DECREASING OR INCREASING
SCHOOL PROPERTY TAX LEVIES 1977-78
COMPARED TO PREVIOUS YEAR

	Number Districts	% of State-wide ADA	% of State-wide Taxable Property
Decrease	158	11.9%	10.5%
No Change	5	0.1	0.1
Increases			
Under 5% Increase	300	27.6	25.4
5% - 9.9%	224	25.2	21.0
10 - 14.9	109	17.7	19.2
15 - 19.9	68	4.6	6.6
20 - 29.9	96	9.1	10.8
30 - 39.9	41	1.8	2.7
40 - 49.9	24	0.9	1.8
50 - 99.9	36	1.0	1.7
100% & Over	10	0.1	0.2
	1,079	100.0%	100.0%

Since 1969 the Advisory Commission on Intergovernmental Relations has recommended that states assume substantially all responsibility for financing education. This recommendation has been made for essentially two reasons: 1) to reduce the pressures on the local property tax base and, 2) to reduce the financial disparities between school districts. In conjunction with this recommendation the Commission has also advocated statutory provisions allowing local districts to use the local

property tax to raise a limited amount of revenue (10% of the funds provided by the state) to meet unusual financial situations. With statewide adoption of "truth in taxation", limits on local taxation might be necessary for only a temporary period of time.

Tax assessors, beginning this year, will have to calculate a certified tax rate that will produce the same revenue levied the previous year. To adopt a higher rate, the school board will have to publicize their intention and hold a public hearing at a separate meeting at which taxpayers can be heard. This will make the school board politically responsible for any increase in property taxes, eliminating the past practice of increased taxes through higher assessments.

After a few years of taxing limits to allow district residents to adjust to the lower rates, the limits could be removed. The higher visibility of tax increases would act as a deterrent to future increases.

Whatever particular add-on scheme the state legislature chooses (e.g., power equalizing), the final determination of the level of total expenditures is left to the school district.

Even full state funding does not threaten all aspects of fiscal control. Clearly, revenue control would be lost but the district could maintain control over the use of expenditures.

Local decision-making in non-fiscal areas could be left intact. Districts would still be able to fill teacher slots

with the type of teachers they choose, develop their own cur-
riculum, and experiment with new programs and innovations within
the present state regulations.

Conclusion:

There is no reason why a state education system of cen-
tralized financing and local decision making cannot exist.
Nor is there any reason to expect that the essential elements
of local control would be any more restricted under such a
system than they are under the existing system. Further,
once school superintendents and local board members are libera-
ted from the necessity of "selling" local bond issues and
tax rate increases, they can concentrate their efforts on the
true interests of local control - namely, the nature and quality
of education provided the children of their district.

APPENDIX   A
EXCERPTS FROM
CONSENSUS REPORT ON PROPOSED REFINERY TAX
TEXAS A&M UNIVERSITY CENTER
FOR ENERGY & MINERAL RESOURCES

A CONSENSUS ANALYSIS

of Reports Entitled:

"THE ECONOMIC EFFECTS OF A TEXAS TAX
ON THE PROCESSING OF PETROLEUM PRODUCTS,"
February 4, 1975
by
Charles E. McLure, Jr.

"AN APPRAISAL OF THE ABILITY OF THE STATE OF TEXAS TO EXPORT A STATE TAX
ON THE REFINING OF CRUDE OIL AND PETROLEUM DISTILLATE IN THE STATE,"
March 18, 1977
by
Henry Steele

WITH COMMENT

on

GOVERNOR'S ENERGY ADVISORY COUNCIL, REPORT NUMBER: 77-03-03, "SELECTED
TEXAS AND U.S. REFINERY DATA: TAXES, OPERATING COSTS, CAPACITY,
PROSPECTS FOR GROWTH AND OTHER INFORMATION RELEVANT TO
REFINERY TAX CONSIDERATION,"
March 23, 1977

TEXAS A&M UNIVERSITY
College Station, Texas 77843
October, 1978

INTRODUCTION

As stated in Appendix D, the "design of tax structures for state and local revenue is a complex matter not only involving technical and legal questions but questions of stability of tax sources, economic effects of the distribution of tax loads among industries and among consumer groups, questions of equity and many other."

Questions relating to a possible refinery tax as replacement, or partial replacement, for current state ad valorem tax revenues are not trivial since the potential effects could have serious adverse results on the economy of the State and the well-being of its industries and its people. Or, the possibility exists for no material adverse effects to occur.

Answers to questions of the "real world," actual effects of such a tax basically hinge on economics and the final effects on the competitive position of industries affected. And, the competitive position of Texas industries is affected not only by actions of the State of Texas but also by national and international moves by governments and industries. There are in today's business world a wide selection of choices that motivate business decisions.

This report attempts to analyze some of these factors and possible actions by petroleum companies that could, or might result from a state refinery tax of 5% of the value, or costs, of crude processed by Texas refineries.

Considering the time available for this analysis (Appendix A), the approach taken was to constitute a faculty team which reviewed the reports at Appendix B, C and D and then met as a group to discuss individual analyses. This report is a "consensus" of these discussions.

1

ORGANIZATION OF REVIEW TEAM

Dr. Spencer R. Baen, Director, Center for Energy and Mineral
    Resources - Chairman

Dr. S. Charles Maurice, Professor and Head, Economics Department

Dr. Peter S. Rose, Professor, Finance Department

Dr. W. Frank McFarland, Research Economist, Texas Transportation Institute

Dr. Robert R. Hill, Assistant Professor, Department of Business Analysis
    and Research

Daniel M. Bragg, Associate Research Engineer, Industrial Economics
    Research Division

Comments on Impact of a Texas Tax

on Petroleum Refining - A Review

of Reports by Charles E. McLure, Jr. and Henry Steele

The fundamental question raised by the request for this analysis is:
are the McLure and Steele studies basically sound? The answer appears to be
two-fold: (1) theoretical portions of the studies appear to be correct;
however, (2) empirical estimates of the effects of the proposed tax are
subject to question.

Tax Exporting

Professors McLure and Steele are basically correct in arguing that the tax
can be fully exported, or passed on, only if: (1) a substantial share of
refinery output is concentrated within Texas; (2) the cost of refinery pro-
duction does not vary with the rate of production and sale; and (3) product
demand is perfectly price-inelastic.

With regard to (1) above, Texas' share of U.S. production of refinery
output has remained (since 1966) about 26%, followed by California with 13%
and Louisiana with 9.2%. It can be argued on this basis that Texas indeed
does dominate U.S. refining. (For example, the Department of Justice uses
approximately a 5% share of a market as a guideline in antitrust prosecution.)

Texas does not have to dominate the national market to be able to pass
on the tax. If refiners raise their product prices by the full amount of the
tax, the new price is cheaper than prices from refineries located in other
states, and other factors (such as convenience, transportation costs, etc.)
continue to be favorable, consumers will continue to buy Texas-refined products,
thus paying all of the tax and, hence, there would be no significant reduction
in sales from Texas refineries.

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As regards to (2) and (3) above, the mood of industry today is that inflation is expected and all costs are passed to consumers where price changes, of course, permit the company to remain competitive. It is not expected that companies would absorb payments out of profits; it is expected that the tax would be passed on as a price increase to the fullest extent possible. It should be recognized that the tax would result in a reduction in corporate federal taxes; hence, it is not possible to predict the actual effect of the tax on product cost, or sale price.

The analysis of marginal cost data enclosed from the "Hypothetical Oil Company" here in Texas (enclosure to letter at Appendix A) is pessimistic as to the cost-effect of the tax for these reasons:

a. It is assumed that the entire tax burden is added to the cost of gasoline alone. In the "real world" all products would be expected to bear a part of cost increases. Residual fuel oils (RSFO) would probably share a price shift proportionate to production.

b. Calculations do not include profit, capital investment costs (overhead), or federal tax relief which would result from the state tax.

c. If the refinery tax is a replacement for existing ad valorem and possibly some franchise taxes (estimated as 8 to 9 cents per barrel, page 17, Appendix D), elimination of these taxes may effectively reduce the tax burden to 4% per barrel, or a 20% reduction in the tax.

Consideration of a refinery tax by itself without consideration of the overall tax structure in Texas relative to other states is a mistake. For example, a certain benefit to the Texas companies is that state corporate income taxes do not exist. Thus, trade-offs between the proposed refinery tax, corporate profit, ad valorem, franchise, and other taxes should be compared with similar factors in other states and estimates made as to relative overall costs of business operations in those states.

Transportation costs

The argument that the tax would drive refineries from Texas because the availability of pipelines will permit companies to shift both crude and refined products at low cost, is considered an overstatement.

Where transportation costs are low and where pipelines for transport are available to a company and where the company owns refinery capacities outside the state, a company will of course consider shifting some production. However, business decisions are complex and this is but one factor among a multitude of considerations.

A factor which is perhaps more important to production decisions is the investment in plant and production facilities. In the short run, refiners may decide to shift some of their production to another state. But it is logical to operate whereever production costs are cheaper. According to the report in Appendix D, page 14, operating costs per barrel of crude (excluding the price of input crude) are 45 cents more in Louisiana than in Texas.

Transportation costs are of course a consideration, and Mexican crude could be shipped by tanker to Louisiana or Texas probably for about the same cost. The same is true for OPEC oil. But, it is not expected that long distance transport of Mexican crude to foreign refineries would be undertaken because of a Texas tax of the proposed magnitude.

Construction of a "Seadock" crude petroleum transhipment facility off the Texas coast could provide a further incentive to continued use of Texas refineries and possible future construction of additional refineries and petrochemical plants. That is, provided a use-tax, or use-cost, make its use economical. At present, ocean transport using the Very Large Crude Carriers (VLCCs) is cost-beneficial compared with cost of transport by smaller tankers. Use of part of refinery tax income toward establishment of the offshore terminal could be viewed by petroleum companies as a direct benefit and an overall improved basis for

continuing Texas refining operations.

Transportation of refined products from either Mexico, OPEC or other countries is a possibility (see Appendix E). Decisions of these oil exporters to build refineries, or processing plants, will of course depend on the cost of construction, existance of plants, and world demand for products. Future decisions of these types could affect production in Texas and could affect construction of planned new plants in our state. At present, the investment in refineries and petrochemical plants in Texas is sizable and it is doubtful that decisions to close any production would be made hastily.

Current discussions regarding refining of Alaskan crude include the possible building of a crude oil pipeline from California to Texas. This pipeline would bring in crude which is considered high in sulfur, but which is refinable in existing Texas-based refineries. Many factors are being considered in these discussions; the economic benefits of using existing refinery facilities is certainly important. (Note: Atlantic Richfield purchased a pipeline about two years ago and is reported to be now transporting Alaskan crude oil to Texas using this facility.)

The availability of pipelines in the coastal region of Texas is well known and, as stated earlier, could result in some shifting of production where the company in question has duplicate facilities and where the shift provides economic benefit. It is, of course, not clear from data available which, if any, companies this might involve.

The close proximity of refineries to chemical companies, which buy their operating feedstocks from refineries, is also well known in the coastal region. This close proximity has developed because of advantages in logistics, reduced investment requirements, lower operating costs, and other factors. The existance of these relationships should tend to encourage continued refinery operations using existing plants.

Specific Comments

(The following page numbers refer to the report by Professor McLure. Inasmuch as Professor Steele's report essentially repeats the conclusions of Professor McLure, reference is not made to the Steele report).

Pages 11 and 12: Article states that it might be possible for the subject tax to be shifted forward if the Federal Energy Administration allowed pass-through of such a tax in its setting of ceiling prices for petroleum products. Author states that this is a necessary condition but it is generally not sufficient for forward-shifting.

Comment: The general situation is such that prevailing prices are presently below ceiling prices, which would indicate that "free market" forces are in operation and a competitive market exists. The question of whether the tax would be allowed is beyond the purview of this evaluation. Presumably this is a cost-of-business tax and would be similar to a severance tax and/or a corporation tax and would be allowed. The tax, of course, could be tested in the courts and could have already been so tested.

Page 17: Presumes that Texas producers would sell their crude to out-of-state refineries if Texas refiners attempted to pass the processing tax backward **in the form of lower posted-prices.**

Comment: Texas producers would of course sell their products wherever they would get the highest prices. It is not possible to draw the conclusion of the article.

Page 18 (note 12): States in general that, since Texas is surrounded by refineries in New Mexico, Oklahoma, and Louisiana which would not be subject to tax and with the existance of transportation of crude and products at minimal costs, Texas refineries would come out last in the "fantastic scramble for the markets of Texas." Also, that "there is no chance that the tax would be

recouped by raising the prices of petroleum products sold to Texans or by reducing prices of Texas crude oil."

Comment: See general comments concerning effect of availability of transportation of crude and products, availability of refineries and proximity to chemical company customers. Statements are considered over-statements and do not consider individual companies or their complex business situations.

Page 7: (Regarding Independent or marginal refineries). Report states that margins of some refineries might be so reduced that, to the extent this occurred, refineries would be abandoned or independents might simply go out of business.

Comment: Some independent, or marginal, refinery might go out of business; but this refinery might go out of business with or without the proposed tax.

If the larger petroleum refineries elect to pass on the proposed tax as an added cost, and this would be expected, then small refiners' costs would likewise increase in direct proportion to their production and their products would end up in the same relative position.

As regards the competitive position of Texas relative to neighboring states, the prices of motor transport fuels "at the pumps" continue to be less in Texas. Thus, the relative "pump prices" would appear essentially the same, whether the refinery tax or an additional one cent per gallon state gasoline tax were added.

An alternative to the tax which could provide some relief to Texas producers would be to exempt the first "so-many" (say 30,000) barrels of crude oil input per day for all refiners.

Page 28: Report states that because substantial investments will be required just to continue operation of some existing plants, the tax may have a more adverse effect on continued operations than if such investments were not necessary.

Comment: These investments are needed for (1) high sulfur crude, (2) EPA regulations and (3) octane requirements and will have to be made on all refineries throughout the county and would not change the relative attractiveness of Texas locations versus other states. There may well be advantages to current Texas refinery capabilities. (See discussion regarding transport of Alaskan crude by pipeline from California to Texas and also possible alternatives to tax to give allowances for plant improvements and expansion.)

Page 29: Includes statement that "pressures for efficient product mixes would work themselves through the pricing system to encourage the relocation of petrochemical plants nearer the refineries outside of Texas."

Comment: This follows from the assumption that Texas refiners would produce exempt items with motor fuels being produced in other states. Since the largest concentration of petrochemical plants in the world is in Texas and feedstocks are available to these plants, it would be economically unsound to relocate the petrochemical industry elsewhwere. Even if all the refineries were to leave the state (which is also probably economically unsound), the transportation network would be completely at the disposal of the petrochemical industry.

Page 30: Claims "a conservative estimate is that some 50,000 to 60,000 workers might eventually be affected by refining cutbacks resulting from the tax."

Comment: It is doubtful that a refinery exodus from the state would result. The loss of potential jobs from increased production could be a possibility. As discussed in the article in Appendix E, a potential loss could also occur from a shift of refineries to OPEC countries or to Mexico for that matter. Basic economics, perhaps international politics, can affect these possibilities.

Page 32: Overall Fiscall Effects section is of course based on the conclusion there would be an exodus of Texas refineries, which is not accepted by this analysis.

Page 34: The Policy Options section also is based on the exodus conclusion.

Page 38: The Export-Tax Import-Subsidy Aspect of the Tax discussions are basically correct and should be addressed or corrected by a possible alternative. See discussion.

Page 43: Prior Analysis of Tax Effects on Industrial Location appears to be well constructed. An exception is taken, however, with the "footloose" characterization of the Texas refinery industry based on the capital invested and replacement cost aspects of today's construction market.

Page 47: Earlier Analysis of Tax Exporting in Texas Refining-Prof. McLure attributes his earlier endorsement of a similar tax to his classification of "Texas as dominating the national market for petroleum refining and manufacture of petrochemicals." This current analysis tends toward Professor McLure's earlier conclusion.

COMMENTS ON

GOVERNOR'S ENERGY ADVISORY COUNCIL

Report Number: 77-03-03

The subject report provides a sound analysis of factors which influence
business decisions to locate petroleum refineries, or, at least have influenced
decisions in the past.   As stated, the purpose of the report was to provide
selected background information relevant to the refinery tax question.

The following are general comments:

Page 16:   Claim is that "transportation costs...make little difference
in refinery location decisions although adequacy of transportation capacity is
a high priority.   ...costs are small...since a well-developed pipeline, barge
and tanker system is in place."

Comment: The general intent is understood but the statements are mis-
leading since supply and price are not independent.   Adequate facilities
will give a lower transportation cost than inadequate facilities; therefore,
transportation costs are implicitly important factors in location.

Page 19:   It should be noted that the "business climate" ranking in the
Fantus Report, ranks Texas best (192).   Other Gulf Coast states are Alabama
(210), Florida (244), and Mississippi (287).

Page 20:   Claims "Since the tax is a variable tax (a fixed percentage of
the value of processed crude oil) some downward adjustment in the portion of the
national market supplied by Texas would be expected, other regions would in-
crease production somewhat and overall production would decrease.   Some of the
costs would be borne by producers in Texas, some increase in profits would accrue
to other refineries in the U.S. and consumers would reduce consumption."

Comment: The reaction of consumers to a producer's attempt to pass on the entire tax will depend on the prices of products from other regions. If Texas products are cheapest, consumers will continue to buy but with possibly some reduced consumption--depending on elasticity of demand. If there is reduced consumption, then there would be a corresponding decrease in Texas' share of the national market. If another region is cheaper than Texas, it will increase production but we cannot tell if overall U.S. production will go up or down, for, if this region captured all of the Texas losses, there would be no change in U.S. consumption.

Page 22: Statement is made that "out-of-state consumers would pay approximately 70% of the tax since 70% of Texas refinery products are exported." However, earlier (on page 20, top) the paper mentioned that the refinery would bear only 48% of the tax since that amount would fall on the Federal government through lost revenues.

Comment: It would be more clear to state that "of the consumer's burden, 70% would fall on out-of-state consumers."

Note: It is possible that the Texas Energy Advisory Council's current study of the Project Independence Evaluation System (PIES) could provide some explicit answers to the effects of the proposed tax on refinery costs in Texas by use of a "refinery model" which is part of the national modeling effort. The status of the evaluation of the "refinery model" is not known at this time.

COMMENTS ON PROBLEMS AND ISSUES

This section addresses specific problems and issues included on page 2 of Appendix A.

1. The effect on small refiners, etc.

Comment: As stated earlier, if the larger petroleum refiners elect to pass-on the proposed tax as an added cost, and this would be expected, then smaller refiners' costs would likewise increase in direct proportion to their production and their products could end up in the same relative positions (Assuming same initial costs). In some cases, where a small refiner elected to produce higher percentages of motor fuel over the larger refiners, the tax could be spread over increased production with a less increase per gallon for the smaller producers.

If the competitive positions with neighboring states' refinery production were adversely affected, marginal producers would be damaged. However, "pump prices" continue to be less in Texas and this could permit Texas refiners to increase price and still retain "pump price" competition on the borders. This would of course depend on ownership of outlets and allowed imports of out-of-state production for sale in Texas.

An alternative to the tax which could provide some relief to Texas producers would be to exempt the first 30,000 barrels per day of crude oil input for all refineries.

II. The effect of huge oil finds in Mexico.

Comment: Presumably transportation costs to all Gulf Coast states would be essentially the same and there would be no particular advantage to Texas refineries. Costs to individual refiners could vary depending on contractural

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negotiations, owned transport carriers, pipelines, storage and their facilities, and other factors.

As stated earlier, the availability of a "Seadock" could provide an advantage to Texas refineries.

III. The relative attractiveness of Texas as a place to build or expand refining or petrochemical plants.

Comments: It is believed that the Fantus report still is valid and that Texas still ranks highest in the nation.

For example, consider recent discussions to build a California-to-Texas pipeline for Alaskan crude.

IV. The effect that the world refining capacity excess might have.

Comment: If world refining excess results in lower-priced gasoline (that meets U.S. E.P.A. requirements) than can be produced in Texas, then it is expected that East Coast areas might well purchase foreign products.

V. The effect available offshore refining capacity has on decisions made by refiners.

Comment: See paragraph IV above.

The utilization of offshore facilities would, of course, depend on their availability to individual companies and relative production, transportation, handling and distribution costs. If the economics favored construction of offshore refineries, a company would certainly evaluate costs for construction and attendant capital costs for building a facility.

VI, The effect a 5% tax might have on the competitive positions of Texas refiners. That is, will a 5% tax lead gradually to the decline of the Texas refinery and petrochemical industries, or can this tax be passed through without any deleterious effect?

Comment: This of course is the basic question and the answer depends largely on the attitudes of the industry and the relative economics which result.

The belief is expressed that the current attitude of business is that inflation is inevitable and it would be expected that the tax would be passed on to its consumers. However, hard data are not available and may be considered privileged, or proprietary, by companies. Therefore, the problem is largely empirical. That is, the consequences of the tax might not be known until a tax is levied.

Business could take a retaliatory position and deliberately cut production and rely on already produced reserves or other stocks available world-wide. It is doubtful that business would take this attitude, however, because the economic effects over a relatively long period could be devastating to a company. A more likely approach would be to analyze in detail the other advantages offered in Texas, including reduced other taxes, labor, environment, market growth, and others.

It is also pointed out that a tax, regardless of its type, is not irrevocable.

As stated in the introduction to this study, the questions relating to this possible tax are not trivial since the potential effects could have serious adverse consequences on the economy of the state and the well-being of its industries and its people. This seriousness has been foremost in the minds of the reviewers of these questions and an attempt has been made to be truly objective and realistic in the analysis.

VII. What, if any, difference would a deep water port facility, a "Seadock" facility, make?

Comment: As stated earlier, it is belived that a "Seadock" would be beneficial to the industries of Texas provided reasonable costs for its use are formulated. It was also stated that a portion of any refinery tax probably should be reserved for construction of a "Seadock," and possibly also to improve intercoastal transportation and other port facilities that serve Texas petroleum and petrochemical industries.

DISCUSSION

This "consensus" analysis was made in a short time using the method described in the introduction. Reviewers added this task to their already existing responsibilities and met as a group to discuss their individual analysis. The time available for study of the documents requested to be reviewed varied with the individual faculty member.

General

Clearly a tax on the refining of petroleum products could and probably would reduce the rate of return to this industry unless a full pass-through occurs. In the long run, it could result in a decrease in refinery investment in the state. But, this is a decrease below what it would have been in the absence of the tax. It does not at all imply a decrease in investment from what it has been in the past. Many other factors enter into the investment decision. This is ignored in both papers.

The issue is basically an empirical question. It follows that the relevant issues must be: (1) the magnitude and (2) time horizon of this effect. These are clearly empirical questions for which satisfactory answers would require a substantial econometric study. It would require consideration of such data as:

1. The relative importance of taxes in a firm's location decision.

2. The extent to which the burden of the tax will indeed fall on the firm and on each firm operating in Texas.

3. The other major determinants in the firm's location decision. (A very ad hoc examination of existing refinery locations would indicate that they tend to locate either at the source of the crude

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petroleum or at the market and tend to locate near water transportation. It would be very interesting to find the percent of all new refineries which were built in Texas--not simply growth rates.) The growth rates in Texas vis-a-vis other states are meaningless since these other states frequently started from so low a base.

4. The tax burden which exists in those states which are potential receiving areas for the refineries. (It would appear that these are the East Coast states.)

5. The lifetime of a refinery and construction time for new facilities. (In particular, it would be interesting to consider these in relation to estimates of existing petroleum reserves in Texas.)

6. Transportation cost differences for crude and refined petroleum. (This is really a question of weight, or volume, loss in the processing stage.)

SUMMARY

Some of the issues in the foregoing discussion have been considered in the existing studies. We will attempt to summarize the conclusions. (Since it appears that Professor Steele's report essentially follows the same reasoning as Professor McLure's, our review was essentially limited to the latter study.)

1. The paper is basically sound but the empirical estimates are subject to question and some basic exceptions to reasoning exist. For example, the author basically appears to confuse reductions in investment from what could be, or would have been, to reductions in investment.

2. The author argues that Texas can not export the tax in higher prices for refined products since Texas has only 26% of the U.S. refining and 7% of the world's capacity. This is basically where this analysis and Professor McLure's analysis diverges. This analysis considers that Texas' capacity is substantial and that the tax can be passed on depending essentially upon the attitudes of the industry and the actual "real world" effects of all taxes and pricing factors on the final competitive position of Texas refiners. This latter would require data which are not available for analysis, and because of the complexities of the economics, the problem is largely empirical.

3. Decisions to shift production to another state will depend on whether an individual company has excess capacity in other states, its investment situation and numberous other factors, not on overall U.S. statistics. A thorough econometric study would require studies of individual companies rather than industry-wide statistics.

4. The following are specific observations with regard to Professor McLure's report with which some exceptions are taken:

a. His estimates indicate that the time horizon for the effects
to be realized are 15-20 years. Exception: with prevailing inflation rates
the value of existing plants should multiply during this period.

b. Growth rates in refinery capacity in Texas (2.7%) is noted as less
than in the rest of the Gulf Coast and lower Atlantic (6.6%) but notes that Texas
growth is approximately equal to the total U.S. (3%) for 1960-74). These growth
rates fail to consider the base on which the growth rates are calculated. It
would appear to be more relevant to ask: Where did the new refineries locate
(in percentage)?

c. It is stressed that transportation costs are insignificant, but
the author's one cent per gallon transportation cost is approximately the same
as the proposed tax.

d. In calculations of the reduction in the net rate of return from
imposition of the tax (pages 21-25), it appears that no consideration is given
to any pass-through of the tax and its effect on federal corporation income
tax.

5. The major conclusions of this analysis is that Professor McLure
employs basically sound principles but his calculations are upper bound, or
"worst case" effects in essentially all examples.

6. As stated earlier the potential effects of the proposed refinery tax
are not trivial. While McLure and Steele do present the "worst case," their
arguments are theoretically sound and the tax effects could turn out roughly
as they prescribe. This means that _in_ _the_ _short_ _run_: (a) refinery earnings
and production could decline (depending upon price elasticities, economies
of scale in the industry, and competitive conditions in the market); (b) marginal
amounts of refinery production could be shifted to out-of-state facilities,
especially nearer major East Coast consumption centers; (c) unemployment in the
Gulf Coast area could rise if production is cut back; and (d) the _net_ effect

on state tax revenues could actually be negative due to declining refinery activity. In the long run, capital investment in Texas refinery operations could decline, while increasing in other states or in foreign countries. The state's petroleum sector, therefore, probably would, or could, grow more slowly than in the absence of the tax. On the other hand, Texas refinery and petro-chemical industries could continue to grow and prosper.

ALTERNATIVES

Because of some basic impacts which are apparent from this review, the following alternatives (to the tax) are offered for consideration.

1. Smaller, or marginal, refineries could be adversely affected, particularly if refined products are permitted to be imported from neighboring states without tax.

Consider: Exempting the first given number of barrels of crude oil input per day (say 30,000) for all refineries. This would also permit large refineries to adjust production to their advantage in the event of surpluses.

2. A Texas tax on all production regardless of the disposition of refined products could act as a subsidy to foreign imports, or similar products on the world market.

Consider: Exempting refined products which enter the world competitive market as exports and tax refined products imported to the extent locally produced products are taxed.

3. Tax could discourage future building of refineries or modernization of existing plants.

Consider: Permitting an exemption for five years for production from new refineries and for expanded capacity.

4. If the tax considered is the only replacement for ad valorem tax, industry could rebel.

Consider: Funding from this tax for construction of facilities and improvements which can benefit the Texas industries. For example, build "Seadock" and improve intercoastal waterways and Texas ports.

APPENDIX B

Excerpts from Rand Corporation

Report

The Effect of Taxes on Business Location

Decision - Making

and

Excerpts from Radian Corporation

Report

A Program to Investigate Various

Factors in Refinery Siting

THE URBAN IMPACTS OF
FEDERAL POLICIES:
VOL. 2, ECONOMIC DEVELOPMENT

ROGER J. VAUGHAN

IV. THE DETERMINANTS OF INDUSTRIAL LOCATION AND DEVELOPMENT: EMPIRICAL RESULTS

This section reviews some of the empirical evidence that has been collected concerning the multitude of factors that affect the path of local economic development through the wide variety of analytic techniques documented in Sec. III. Some studies have analyzed employment change in states and some in cities, and some have examined the behavior of individual firms. The interpretations of the results have also varied considerably.

For organizational simplicity, factors that influence growth and development are separated into three types: those that affect the demand for output; those that affect the cost of production at a particular location; and a less tangible group of amenities that may affect the attractiveness of a particular location as a place to live and do business, such as air quality, recreation facilities, and crime rate. These last may affect the local market and local costs, but they do so less directly than the other factors. A list of the factors included under each heading is shown in Table 4.1. Some factors fall into more than one category. For example, transportation costs enter into the determination of both the cost of factors of production (through the cost of bringing inputs to the plant) and the level of consumer demand (through the cost of carrying the output to the purchasers).

Table 4.1

FACTORS AFFECTING INDUSTRIAL GROWTH AND DEVELOPMENT

DEMAND
  Consumer Market—population and income
  Intermediate Market—interindustry linkages

INPUT COSTS AND AVAILABILITY
  Transportation
  Labor—size of force, skill level, wages, productivity, unionization
  Land
  Raw materials
  Energy
  Finance
  Taxes and municipal services
  External economies—scale and agglomeration

LOCAL CHARACTERISTICS
  Amenities
  Leadership

LIMITATIONS

It is extremely difficult to separate the effects of different factors and to weigh the factors according to the relative strengths of their effects upon changing patterns of economic activity. For example, it seems probable that one factor in the rapid expansion of manufacturing activity in the South was the extension of the federal highway system into areas of declining agricultural employment where there was a ready pool of surplus labor. Should the rapid growth in that region be attributed to reduced transportation costs or to low-cost labor? The introduction of air conditioning for manufacturing plants may also have stimulated economic development in the South. How should the growth rate be attributed among these three factors?

Second, there are probably interactions among factors of production. For example, the amenities—climate, recreation facilities. low crime rate—may exert an independent influence on the path of development, as does the availability of labor. However, when a location offers both plentiful labor and a high level of amenities, the joint effects of these factors may exceed their sum. Traditional production functions often assume a multiplicative relationship between factors of production and the level of output,[1] yet almost all the studies of industrial location estimate the relationship between output or employment and productive inputs in a simple linear model. Few attempts have been made to identify interaction effects.[2]

A third problem is that factor prices may not accurately reflect the costs and quality of those factors available to local businesses. For example, an index of labor wages does not measure the skill of the labor force or the hiring costs and training costs that the firm must incur. This problem is discussed more fully below.

Fourth, many factors are omitted altogether from research on industrial growth and location, perhaps the most important being the cost of capital. Data from which to estimate the cost or availability of capital are limited.[3] Other omissions include measures of the availability of public services, including fire and police protection, garbage disposal, and water treatment facilities. Detailed estimates of the tax burden by industry are included only rarely.

Finally, information concerning the inputs and outputs of industries is not complete. Through the *Censuses of Manufactures, Wholesale and Retail,* and *Selected Services,* input data are only available for manufacturing industries; therefore, most research has examined manufacturing employment and location. The quality of the data is uneven. Other major sectors—transportation, wholesale and retail, finance, insurance and real estate, and personal business services—have received less attention, although they account for more than 70 percent of nonagricultural employment. The appendix contains a discussion of data problems.

Interpretation of the considerable volume of empirical results and reconciliation of apparent conflicts require the use of judgment and intuition as well as more rigorous analytical tools. The primary empirical results are discussed below. The order in which the following factors are treated does not necessarily reflect their relative importance.

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[1] For a summary of such models, see Hahn and Matthews (1966).

[2] One exception in this regard is the work of Wheat (1973), discussed below.

[3] There have been some attempts at approximation. The cost of construction has been used as a measure of the local cost of capital equipment. Harris and Hopkins (1972) and Segal (1976) use the value of capital equipment in place as an independent variable.

CONSUMER MARKET

The local consumer market for a commodity is defined by a wide variety of local population characteristics:

- The costs of transporting the commodity to consumers,
- The number of consumers,
- The level of real income,
- The distribution of income,[4]
- The costs of other goods and services.[5]

A number of other factors are also relevant but are more difficult to quantify. State and local taxes affect disposable income, as do the level of transfer payments (welfare, social security, and other transfers that do not enter directly into income data). Climate may affect the demand for some goods; more umbrellas per capita are sold in Portland, Oregon, than in Phoenix, Arizona; more air conditioners are sold in Phoenix. Differences in taste among regions will also account for some of the variations in demand.

Separating the influence of the level of demand on employment in an area presents considerable problems. The size of the local population, often used as a measure of demand, also measures the availability of labor. Demand, output, and employment interact in a complex way as shown in Fig. 4.1. A growth in local population leads to an increase in labor supply and in the demand for output, leading to an increase in demand for labor. The growth in labor demand stimulates the increase in population as migrants arrive seeking jobs. As employment increases, so does local income, which stimulates a further increase in demand (the multiplier effect). Within this dynamic system it is difficult to determine the extent to which the growth in market demand stimulates the growth in employment or whether the growth in employment opportunities attracts people.[6] Undoubtedly, the relative strength of the two effects differs from place to place. Retired persons seeking the sun in Phoenix or Miami are little interested in jobs, although their purchasing power has attracted businesses to these cities. Many of the autoworkers in Detroit were attracted by the job opportunities.

Market Growth and Employment Growth[7]

There is considerable evidence that growth in employment follows rather than leads growth in population. Of 22 industries examined by Burrows, Metcalf, and Kaler (1971), previous population growth was significantly related to employment growth in all but one case. A doubling of population over a ten-year period was estimated to lead to an employment level 2.72 times larger in the succeeding period than it would have been with zero growth.

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[4] Consumption patterns differ markedly with income. For any given industry, what may be important is the number of consumers within certain given income groups rather than the total local population level.

[5] This affects the amount of income that consumers will have left over to purchase the output of the industry. The more money that must go toward rent, the less that will be available for the purchase of clothing or television sets.

[6] This issue is discussed in the *Population and Residential Location* report.

[7] A discussion of the complex relationship between the movement of people and jobs is contained in Burns (1966). The principal factors affecting the migration of population among areas are discussed in the *Population and Residential Location* report.

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A number of other factors are also relevant but are more difficult to quantify. State and local taxes affect disposable income, as do the level of transfer payments (welfare, social security, and other transfers that do not enter directly into income data). Climate may affect the demand for some goods; more umbrellas per capita are sold in Portland, Oregon, than in Phoenix, Arizona; more air conditioners are sold in Phoenix. Differences in taste among regions will also account for some of the variations in demand.

Separating the influence of the level of demand on employment in an area presents considerable problems. The size of the local population, often used as a measure of demand, also measures the availability of labor. Demand, output, and employment interact in a complex way as shown in Fig. 4.1. A growth in local population leads to an increase in labor supply and in the demand for output, leading to an increase in demand for labor. The growth in labor demand stimulates the increase in population as migrants arrive seeking jobs. As employment increases, so does local income, which stimulates a further increase in demand (the multiplier effect). Within this dynamic system it is difficult to determine the extent to which the growth in market demand stimulates the growth in employment or whether the growth in employment opportunities attracts people.[6] Undoubtedly, the relative strength of the two effects differs from place to place. Retired persons seeking the sun in Phoenix or Miami are little interested in jobs, although their purchasing power has attracted businesses to these cities. Many of the autoworkers in Detroit were attracted by the job opportunities.
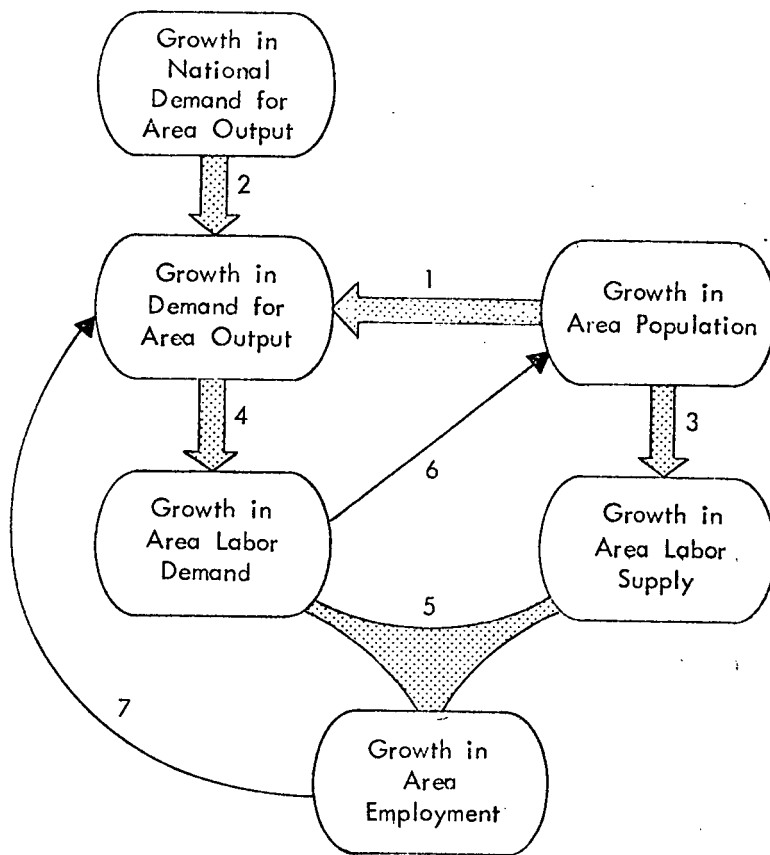
Market Growth and Employment Growth[7]

There is considerable evidence that growth in employment follows rather than leads growth in population. Of 22 industries examined by Burrows, Metcalf, and Kaler (1971), previous population growth was significantly related to employment growth in all but one case. A doubling of population over a ten-year period was estimated to lead to an employment level 2.72 times larger in the succeeding period than it would have been with zero growth.

[4] Consumption patterns differ markedly with income. For any given industry, what may be important is the number of consumers within certain given income groups rather than the total local population level.

[5] This affects the amount of income that consumers will have left over to purchase the output of the industry. The more money that must go toward rent, the less that will be available for the purchase of clothing or television sets.

[6] This issue is discussed in the *Population and Residential Location* report.

[7] A discussion of the complex relationship between the movement of people and jobs is contained in Burns (1966). The principal factors affecting the migration of population among areas are discussed in the *Population and Residential Location* report.

Fig. 4.1—The relationship between population,
labor force, and employment in a local area

LINKAGES

1. Population growth leads to expanded local market for goods and
   services and increased size leads to increased import substitution.
2. National growth leads to expanded local market for goods and services.
3. Population growth leads to increased local labor supply.
4. Increased demand for local goods and services leads to increased
   demand for labor.
5. Increased labor demand and supply lead to increased output.
6. Growth in demand for labor encourages population inmigration.
7. Increased output leads to increased local income causing an increase
   in local demand.

Thompson and Mattila (1959) found that the correlation between absolute growth in manufacturing employment (1947-1954) and previous absolute population growth across states (1940-1947) was +.90, and that the correlation between manufacturing growth and previous absolute income growth (1940-1947) was +.87. Correlations between population growth (1947-1954) and previous employment growth (1940-1947) were lower, implying that population movements may precede job movements. Wheat (1973) concludes that previous population growth acts to stimulate employment growth by creating a growing market. Polzin (1976) studied the employment patterns of retail activities in 109 SMSAs; one might expect this sector to be heavily influenced by demand. However, he concluded that the relationship between population and retail employment was influenced by both cost and demand conditions and there was no fixed relationship. He found (p. 449) that "a given percentage change in population would have a greater impact on sales in small rather than large cities." However, population growth also leads to an increase in the local labor force, which may encourage firms to move toward the region. These results do not indicate whether consumer demand or labor supply is exerting the dominant influence.

Relative Importance of Markets

There is some consensus that differences in the the growth of local markets have been the single most important factor in differences in local employment growth rates. Perloff et al. (1960, p. 44) concluded that since 1950, markets "operate as the dominant locational force in the economy." Supporting evidence came from rank correlations between population level and employment in certain manufacturing industries across states. Market oriented industries such as printing and publishing achieved correlations of +.93, while more resource-oriented industries were lower—+.58 for lumber and wood products, +.63 for leather, and +.69 for petroleum and coal products.

A number of studies have placed the fraction of employment that is market-oriented at about half of total employment. McLaughlin and Robok (1949) estimated that 49 percent of all relocating companies were primarily concerned with locating near their markets. Lichtenberg (1960) placed the figure at 43 percent. McCarthy (1963) found that 59 percent of the respondents to his survey were primarily market oriented, and Wheat (1973) concluded that between 55 and 75 percent of the variance in absolute employment growth among regions and between 35 and 55 percent of the variance in per capita growth could be explained through differences among regions in the rate of growth of their markets. McMillan (1965) found that markets were the most important single variable (see Table 3.1 above).

Wheat's measure is interesting since he attempted to examine the interactions among explanatory variables. Climate and market interacted; thus, temperature-weighted market and wage variables could explain a considerable amount of the variance in growth, even after the independent effects of the individual variables had been accounted for. He summarizes (p. 190):

> The market-climate interaction effect is easily the most important. Many market-oriented firms apparently insist on locations that are not too northerly. The rule: the closer you can get to the market, the better—unless winter gets too rugged.

Population movements and climate may account for at least half of the variation in regional growth rates. Rising real incomes, the introduction of air conditioning, and the construction of the necessary social overhead capital have allowed the South and West to attract many Northeastern families. These factors are beyond the direct control of local and federal governments.

The evidence for the importance of previous population growth in determining employment growth is not as strong as the assertions reported above seem to indicate. None of the models attempted to estimate the relationship simultaneously, to determine whether the growth in employment in an area attracted inmigrants or vice versa. From a study of migration toward the Pacific Coast states, Gordon (1959, p. 495) concluded that, "Changes in net migration [tend,] for the most part, to lag somewhat behind changes in employment." However, Bright and Thomas (1941, p. 773) decided that the reverse was true and that "an important part of the migration to California has been of a hedonistic character rather than a primarily economic character and has been motivated more by climate and legend than by superior job opportunities." This importance of amenities (discussed below) rather than of jobs was also stressed by Ullman (1954). Perloff et al. (1960, p. 471), summarized the issue in this way:

> The economic opportunity offered by expanding employment and relatively high per capita incomes was largely responsible for the population growth —and the population growth, in turn, generated new employment opportunities. To some degree, however, population seems to have served as an independent stimulus to growth. . . . This suggests that the amenities of coast and climate have been a direct stimulus to population growth—for example, by attracting retired persons *with income*—and hence, to regional development.

However, Burns and Mittelbach (1963) found that the percentage of persons aged 65 and over in 1960 in Los Angeles or in California as a whole was not significantly higher than in all SMSAs or the nation as a whole. The aged also tended to have very low incomes. Burns (1964) found that, in relating quarterly employment changes to quarterly population changes, the highest coefficient of determination was achieved with no lag between the two series—that is, with an instantaneous adjustment between job opportunities and population increase.

There is some evidence that regional shifts in employment may have been due to previous population shifts, as well as that some population shifts have followed the redistribution of employment opportunities.

There is also some evidence that jobs have followed people to the suburbs. Using pooled cross-sectional and time series data for 15 SMSAs, Steinnes (1977, p. 76) found that for both manufacturing and service jobs, businesses followed household location rather than the reverse. In fact, he found that people tended to move away from manufacturing jobs, presumably because of pollution or other disamenities. He concluded that "the efforts of central cities to attract and retain manufacturing may be accelerating, not retarding the flight of residents from the city."

INTERMEDIATE MARKETS

The level of employment in their principal buyers is an important locational determinant for industries whose chief market is other industries. In addition, the

presence of industries that provide vital inputs will make an area attractive to some industries. In a detailed analysis of output growth in 84 industries across countries, Harris and Hopkins (1972) found that 32 industries[8] were significantly influenced by the output growth of major customers. For example, the petroleum refining industry tended to locate close to the petroleum extraction industry (a major supplier), and the metal containers industry tended to locate near the beverages industry (a major buyer). A lower number of industries responded strongly to a growth in local consumption expenditure.

The extent to which an industry is affected by intermediate markets clearly depends upon the relative importance of suppliers and buyers and on the transportation costs involved. These linkages may have important relevance for policy. For example, if a local municipality succeeds in attracting some firms to an industrial development area, it may improve its chances for attracting more companies by seeking additional firms in industries that are strongly linked. Similarly, if a federal policy has been identified as influencing the location of a specific industry, the full effects can be better understood if linked industries are known. Linkages can be identified through input-output tables.[9] The costs of transporting inputs and outputs are also important. Two industries may be very strongly linked in terms of buying and supplying inputs but are able to locate a considerable distance apart because of the low cost of transporting the commodity.

An alternative approach to identifying locational linkages has been used in research conducted at the Urban Institute (Bergsman, Greenston, and Healy, 1972 and 1975). In this research, correlations between employment levels in three-digit and four-digit SIC industries across SMSAs were calculated and factor analysis used to construct groups of industries that clustered together. The grouped industries are not strongly linked by interindustry shipments identified through input-output tables, implying that transportation costs rather than the level of interindustry purchases determine spatial grouping.

TRANSPORTATION

Transportation costs affect both the revenue a firm receives from its sales and the prices it must pay for its inputs. It is difficult to separate these two components in most of the studies that have been conducted. Lichtenberg (1960) estimated that 51 percent of manufacturing industries were sensitive to changes in transportation costs. Of these, 84 percent were transport-sensitive to the costs of transporting commodities to consumers, and only 16 percent were sensitive to the costs of transporting inputs. Harris and Hopkins (1972) also found that more firms were sensitive to output transportation costs than to input transportation costs. This may be attributable to the fact that firms are able to adapt their production techniques to changes in relative factor costs. In areas where transportation costs are high, a firm may be able to reduce its input transportation costs per dollar of value added by purchasing inputs already processed rather than buying raw materials and processing intermediate goods itself. There are fewer options available to reduce

[8] Identified as groups of three-digit and two-digit SIC industries. They identified 85 sectors in all.
[9] *Input-Output Structure of the U.S. Economy: 1967,* Vol. 1, U.S. Department of Commerce, Washington, D.C., 1974.

output transportation costs. A survey by the Fantus Company, Inc. (1966), specialists in the industrial location process, placed transportation costs first among the factors considered in location choices. In general, firms whose product embodies a high value added per ton or per cubic yard—for example, electronics companies—will be less sensitive to transportation costs than other firms. However, they may be very sensitive to the quality of transportation services, including the speed of delivery, the likelihood of damage, and the possibility of larceny. Some of the switch of high-value freight from railroads to trucking may be a result of quality differences betweem them.

Final Product Transportation

Costs of transporting commodities to consumers have been affected by the rapid growth of trucking. The share of trucking in total freight transportation has risen from 9.5 percent in 1940 to 21.3 percent in 1970. If the volume carried by oil pipelines is ignored, then the change is from 10.5 percent to 27.0 percent, the increase coming almost entirely at the expense of the railroads. Truck transportation reduces the cost of small-load short-haul freight movements relative to large-load, long-haul movements (Chinitz and Vernon, 1960) and has led to decentralization of industries as firms moved toward highway linkages and away from railheads. The growth of trucking has also increased the tendency for firms to locate near the market for their products. Cities whose businesses use short-haul, small-load transportation[10] and can relocate wherever there are trucking facilities will experience more rapid loss of employment than cities whose industries rely on heavy-load, long-haul transportation.[11] The iron and steel industry has probably not experienced extensive relocation in response to transport cost changes.

Many older cities that had developed around rail terminals are ill-equipped to make the transition to truck transportation. Building densities are high and access inadequate. Congestion is heavy and parking spaces and truck terminals too few and too small. Firms may have moved away from older cities to escape these problems. Boston, New York, Baltimore, and Philadelphia, which have traditionally housed a large number of small firms whose products are fairly transportation-intensive—for example, apparel—have been unable to compete with newer, truck-oriented cities.

Input Transportation Costs

Input transportation costs will have effects similar to those of final commodity transportation costs. That is, the growth in trucking has led to decentralization of employment. In addition, the rapid growth in the use of private automobiles for commuting to and from work has increased the cost of transporting labor to work relative to the cost of transporting materials (Moses and Williamson, 1967). When the transportation costs of materials were of prime importance, companies located on railroad spurs in the central city. With the increase in labor force commuting

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[10] These industries may include apparel, food processing, printing and publishing, and specialized durable goods.

[11] These industries may include primary metals and heavy equipment.

costs, companies have tended to relocate closer to their labor supply.[12] For companies requiring skilled labor, this will mean a move to the suburbs. Companies requiring unskilled labor, which is less mobile than skilled labor, will tend to remain or relocate within the city because of the availability of public transportation for their workforce. Chicago companies surveyed by Hartnett (1972, Tables 3.2 and 3.3) placed a high value on accessibility to a large, unskilled labor pool and, therefore, implicitly upon public transportation. The strong positive effect of high labor requirements per dollar of value added on the probability of a firm locating in the CBD rather than in the suburbs, found by Kemper (unpublished Table 3.1), provides further evidence of this.

The shift of freight transportation from railroads to trucking has been a significant force in the suburbanization of employment and perhaps even in the move of companies from the old manufacturing belt to new regions.[13] However, causation may also run in the reverse direction. The change in methods of transportation may result from company relocation that occurred from other causes. A firm that moves to a suburban location or to a new industrial site in the South may be forced to change from rail to truck transportation since suburbs and new sites in the South are generally better served by highways than by railways. It is difficult to separate these two effects.

LABOR

Labor is the most important single factor of production. Nearly half of the value added in manufacturing in 1972 was spent on payrolls. Two-thirds of these payrolls were for production workers. Among the many dimensions of the labor input into the production process that are relevant to the industrial growth process and location decisions are:

- *The size of the unskilled labor market pool.* A company that experiences considerable seasonal or cyclical fluctuations in demand may find it useful to be located in an area with a large labor pool so that it can hire easily in times of need (the apparel industry in New York is one example). Companies tend to lay off unskilled workers during a recession more readily than skilled workers (Vernez et al., 1977, Sec. VIII).
- *The skill level of the labor force.* Training labor can be expensive, so an area that already has a supply of skilled labor will be an attractive location.
- *The wage level.* The price at which labor of a given skill is available is important.
- *Unionization.* It has been argued that companies move to avoid high wages and expensive working conditions imposed by powerful unions.
- *Racial composition of labor force.* It has been argued that companies relocate to avoid having to hire minority employees—a business parallel to the alleged residential "white flight."

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[12] The incentive to do so comes from the fact that a company moving to the suburbs may offer its workers lower wages since the work force will spend less time traveling. If the work force is unionized so that wages are equalized throughout the metropolitan area, no such saving will be enjoyed (although the company may find it easier to hire in the suburbs).

[13] The shift of some firms to other regions may be a result of transportation rate regulation. This is discussed in Sec. VI.

Size of the Labor Pool

Summarizing the results of a survey of companies located in Chicago, Hartnett (1972, p. 35) concluded that:

> The 705 study firms located and/or remained within the City of Chicago because, among their particular industrial location requirements, they placed a high priority on labor availability. . . . The suburban firms interviewed reinforced the assumption that the City of Chicago is better endowed with supplies of labor than is the suburban portion of the Chicago SMSA. . . . Among all the locational factors, labor availability was paramount.

This finding is reinforced by the statistical analysis of Kemper (unpublished), who found that labor-intensive companies were much more likely to locate in a CBD than in a suburban area (see Table 3.1). Struyk and James (1975) found that low-wage companies tended to locate in low-income neighborhoods in the city.[14] Availability of a pool of unskilled workers is probably important to labor-intensive, low-wage industries and appears to distinguish central city areas from suburban locations.

The availability of a pool of labor may reduce operating costs of businesses over time by reducing the need for labor hoarding. When a company experiences a decline in orders during a cyclical downturn, resulting in underemployment in its workforce, it does not immediately dismiss workers. A firm may avoid a number of costs by maintaining a "reserve labor force" during economic slowdowns, including turnover costs that would otherwise be incurred at the beginning of the next economic recovery: advertising for prospective employees, interviewing and selecting new workers, and training new personnel. There is some empirical evidence of this behavior (Miller, 1971; Clark, 1973). Where there is a large pool of unemployed, the company may be able to maintain a smaller reserve labor force because it will find that workers it lays off during slowdowns will be available for rehiring during the recovery. The fact that central cities suffer a higher rate of unemployment than their suburban areas has probably attracted labor-intensive firms for this reason.

Although the size of the unskilled labor pool is correlated with the average rate of unemployment, it is not immediately apparent whether new companies are attracted by the pool of labor or the pool of labor is attracted by local employment growth. In one of the few attempts to separate the effects of labor migration on employment growth from the effects of employment growth on migration, Muth (1968) devised a system of simultaneous equations in which the migration of labor was a function of local employment opportunities and, at the same time, growth in employment was a function of the availability of labor. He concluded, from an estimation across large SMSAs, that there was a greater tendency for jobs to follow labor than for labor to follow job opportunities. This reinforces the importance of previous population growth in encouraging employment growth.

Labor Skill and Regional Employment Shifts

Differences in the skill levels of regional labor forces may be related to regional employment shifts. Growth in manufacturing employment has been most rapid in

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[14] They also found that some high wage companies were located in poverty areas and were growing rapidly. These tended to be nuisance industries, emitting air or noise pollution.

those areas in which the productivity of labor per dollar of wages was highest. However, differences in regional growth rates have been associated with a narrowing of interregional productivity differentials—rapidly growing regions have experienced a decline in their relative productivity advantage.

Table 4.2 shows the regional shares of manufacturing employment, payroll, and value added in 1963 and 1972. In 1963, the Middle Atlantic region had a higher share of national manufacturing wages than of national manufacturing employment, indicating a higher than average wage. By 1972 this had been reversed, and the region had 20.9 percent of the nation's manufacturing employment but only 19.5 percent of the nation's manufacturing payroll.[15] The decline in value added in this region was not as large as the decline in employment, implying an increase in relative value added per worker. The decline in the labor force has been associated with a rise in relative productivity.

The ratio of value added to payroll for manufacturing by census division is shown in Table 4.3 for 1963 and 1972. Those areas whose shares of manufacturing employment declined between 1963 and 1972—New England, Middle Atlantic, East

Table 4.2

THE REGIONAL SHARES OF MANUFACTURING EMPLOYMENT, WAGES, AND VALUE ADDED, 1963–1972

Region	1963 Shares			1972 Shares		
	Employment	Wages	Value Added	Employment	Wages	Value Added
New England	8.4	7.8	7.1	7.2	6.4	6.4
Middle Atlantic	24.0	24.4	22.6	20.9	19.5	20.0
East North Central	26.4	29.2	29.2	26.1	30.6	28.2
West North Central	6.0	5.9	6.1	6.4	6.3	6.7
South Atlantic	12.5	10.0	11.0	14.4	12.7	12.5
East South Central	5.2	4.1	4.8	6.6	6.1	6.0
West South Central	5.1	4.6	5.7	6.6	6.1	7.0
Mountain	1.7	1.7	1.8	2.0	2.0	3.0
Pacific	10.6	12.1	11.4	10.4	10.6	11.3
Total[a]	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Bureau of the Census, *Census of Manufactures, 1963*, U. S. Department of Commerce, Washington, D. C., 1965; and *Census of Manufactures, 1972*, Washington, D. C., 1974.

[a]Total may not add because of rounding.

North Central, and Pacific—also had the lowest ratios of value added to payroll in 1963. Labor was expensive relative to its productivity. The ratios were equal to or below the national average. The two divisions whose share of manufacturing employment had increased most, East South Central and West South Central, exhibited the highest ratios in 1963. The attraction of labor priced low relative to its productivity seems to have been one factor in determining the differential growth rates in manufacturing employment among regions.

[15] The relationship between payroll and employment may be confused by differences among regions with respect to the numbers of low-paid, clerical, nonproduction labor. The data presented in this discussion must therefore be regarded as only a tentative exploration of a subject that merits further research.

Table 4.3

RATIO OF VALUE ADDED TO PAYROLL
IN MANUFACTURING BY REGION,
1963-1972

| Region | Value Added/Payroll | | % Change |
	1963	1972	1963-72
New England	1.73	1.89	9.25
Middle Atlantic	1.78	1.90	6.70
East North Central	1.92	1.99	3.65
West North Central	2.00	2.11	5.50
South Atlantic	2.11	2.15	1.90
East South Central	2.23	2.31	3.47
West South Central	2.36	2.40	1.70
Mountain	2.03	2.19	7.88
Pacific	1.82	2.04	12.09
Nation	1.92	2.03	5.73
Variance[a]	0.051	0.038	-25.5

SOURCE: Bureau of the Census, *Census of Manufactures,
1963*, U.S. Department of Commerce, Washington, D. C.,
1965; and *Census of Manufactures, 1972*, Washington, D. C.,
1974.

[a]The variance, v, of a variable X_i, is defined as

$$v = \Sigma_i \frac{(X_i - \overline{X})^2}{n-1}$$

where $\overline{X}$ is the mean value—in this case the value for the
nation as a whole—and n is the number of observations, in
this case 9. The variance provides a measure of the amount
of variation in the value of the variable among observations.

The difference in growth rates may not continue indefinitely. As an area grows rapidly, the pool of low-priced labor gets used up. Conversely, as a region declines, wages fail to grow at the national rate. The relative advantages of the growth areas are slowly eroded, and declining areas become more attractive. This trend is shown in Table 4.3. Between 1963 and 1972, the national ratio of value added to payroll rose by 5.73 percent, from 1.92 to 2.03. Where the share of manufacturing employment fell between 1963 and 1972, the ratio grew faster than in the nation as a whole, indicating that value added was growing faster than payroll and at a rate above the national average. In regions that had experienced a net increase in their share of manufacturing employment during the same time, the ratio grew more slowly than average (with the exception of the small Mountain region). This appears to represent a movement toward an equilibrium distribution of manufacturing employment. The variance of the ratio among regions is becoming less: .051 in 1963 and .038 in 1972. Smith (1975) examined the coefficient of variation among states of received income per worker between 1880 and 1960. It had declined throughout the entire period, the decline being most rapid from 1950 to 1960. Although the data are too aggregated to permit any firm conclusions, some tentative hypotheses can

be offered. First, changes in production techniques and the price of some inputs[16] have allowed employers to take advantage of the low-priced labor in the South, South Central, and Southwest. Second, as this expansion of employment has occurred, the ready supply of labor was used up and higher wages had to be offered to attract the labor necessary for continued growth. Through this process, the competitive advantage of growth regions has declined over time, and their growth rate relative to that of the rest of the United States might be expected to decline in the future. Smith (1975, p. 179) used a neoclassical growth model to examine regional growth patterns. He concluded that "immigration is a direct and significant factor which increases employment in high income states. This, in turn, tends to lower the capital-labor ratio, which induces convergence of state income per capita."

The relationship between regional employment shifts and employment productivity illustrates the importance of understanding the factors determining changes in the spatial distribution of economic activity. If the hypothesis is correct, then federal policies affecting regional labor productivity, including manpower and training programs and education, are important.

Labor Skill

Labor productivity is enhanced by the level of education of the workforce, which attracts businesses. The skill or embodied human capital of a labor force can be approximated by education. Sviekauskas (1975) measured the effect of education on productivity. Labor productivity was defined as the value added per man hour and was compared across SMSAs at the two-digit SIC level of aggregation for manufacturing industries. The education variable[17] was significant in six of the 14 industries selected for analysis, including food processing (SIC 20), furniture (SIC 25), printing and publishing (SIC 27), fabricated metal products (SIC 34), nonelectrical machinery (SIC 35), and transportation equipment (SIC 37). The industries whose productivity was most strongly affected by the educational level of the local population were SICs 20 and 27.

Availability of skilled workers is often cited by companies as a reason for choosing a particular location, and it may be as important as the availability of unskilled or semiskilled workers for companies located in the central city. A recent study conducted by Cornell University based on a survey of large companies in New York, found that the availability of skilled labor was, by far, the most important factor in defining an attractive business environment (Weinstein, 1977).

Both Kemper (unpublished) and Stone (1974) find that companies relying on craftsmen and employees who have professional skills are much more likely to select a suburban location than a central city location. There is a tendency for companies to locate near the supply of the type of labor they use most intensely. The rapid growth of many firms in suburban locations follows the movement of skilled workers to the suburbs (Steinnes, 1977).

To assess the extent of the movements of skilled labor to the suburbs, three measures of the education achievement of the population in central cities and

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[16] Of particular importance in this regard is the introduction of low-cost industrial air conditioning in the 1950s and the extension of the federal interstate highway system to the South.

[17] Defined as the median years schooling completed by the population of the SMSA over the age of 25.

metropolitan areas as a whole may be derived: the median years of schooling completed by the two populations, the percentage of each population with less than five years of schooling, and the percentage of high school graduates. These data are computed for a sample of 30 large SMSAs. The ratio of the value for the city to the value for the SMSA as a whole was computed for each of these three measures for 1960 and 1970 and is shown in Table 4.4. A value of unity for this ratio shows that both the city and SMSA have identical scores, which implies that the educational attainments of the population in the city and in its suburbs are the same. A value above unity indicates that the city has a higher score than its SMSA as a whole, while a value below unity indicates a lower score for the city. If the 1970 indicator has moved further from unity than the 1960 indicator, then there has been an increase in the disparity between the city and its suburbs.

Table 4.4

CHANGE IN THREE LABOR FORCE QUALITY INDICATORS AND CITY/SMSA RATIO
FOR SELECTED CITIES AND SMSAs, 1960-1970

Selected SMSAs	Median Years of Schooling, City/SMSA		% with Less than Five Years of Schooling, City/SMSA		% High School Graduates, City/SMSA	
	1960	1970	1960	1970	1960	1970
Atlanta	0.95	0.95	1.21	1.52	0.91	0.87
Baltimore	0.93	0.88	1.24	1.47	0.84	0.77
Boston	0.92	0.98	1.48	1.55	0.84	0.83
Buffalo	0.91	0.89	1.35	1.49	0.79	0.78
Chicago	0.92	0.93	1.33	1.46	0.84	0.82
Cincinnati	0.95	0.95	1.39	1.47	0.90	0.90
Cleveland	0.86	0.88	1.51	1.72	0.69	0.68
Columbus	0.94	0.99	1.08	1.26	0.90	0.91
Dallas	1.00	1.00	1.02	1.10	1.01	0.99
Dayton	0.91	0.93	1.49	1.62	0.84	0.80
Denver	0.99	0.99	1.30	1.42	0.93	0.91
Detroit	0.93	0.91	1.39	1.56	0.84	0.80
Houston	0.99	1.00	0.91	1.03	1.03	1.01
Indianapolis	0.95	0.99	1.29	1.14	0.90	0.97
Kansas City	0.96	0.99	1.23	1.28	0.95	0.93
Los Angeles	1.00	1.00	1.25	1.24	1.01	1.00
Miami	0.92	0.88	1.12	1.32	0.87	0.83
Milwaukee	0.94	0.97	1.19	1.32	0.89	0.87
New York	0.94	0.95	1.17	1.20	0.90	0.90
Newark	0.81	0.82	1.82	2.16	0.61	0.60
Philadelphia	0.91	0.90	1.35	1.46	0.79	0.78
Phoenix	1.02	1.00	0.74	0.93	1.02	0.98
Pittsburgh	0.93	0.95	1.14	1.23	0.87	0.86
Portland	1.00	0.99	1.15	1.29	1.00	0.96
Rochester	0.01	0.91	1.37	1.57	0.82	0.77
St. Louis	0.91	0.82	1.35	1.70	0.75	0.69
San Diego	1.01	1.01	1.03	1.06	1.01	1.01
San Francisco	0.98	0.99	1.34	1.54	0.94	0.94
Seattle	1.00	1.00	1.17	1.39	0.99	0.96

SOURCE: Bureau of the Census, *The Statistical Abstract of the United States, 1973*, U. S. Department of Commerce, Washington, D. C., 1974.

In terms of median years of schooling completed, central cities tended to narrow the disparity with the SMSA between 1960 and 1970. The ratio either grew or remained constant in all but seven of the 30 metropolitan areas.[18] In these SMSAs,

[18] Baltimore, Buffalo, Detroit, Miami, Philadelphia, Phoenix, and Portland.

the central city fell behind the suburbs in upgrading the median educational attainment.

The relative concentration of population with low educational attainment—less than five years of schooling—in the central city has increased (the ratio has risen) for all the listed cities except Indianapolis and Los Angeles.

The ratio of the percent of population that have graduated from high school in the central city to the corresponding percent in the SMSA as a whole was below unity in 1960 for all but six cities, indicating a general trend for suburban areas to attract a disproportionately large share of the population at this level of education. By 1970, only three cities still had ratios above unity. In most cities this ratio declined between 1960 and 1970, indicating a faster growth in this fraction in suburban areas than in the central cities. Clearly, the more educated members of the workforce have moved toward the suburbs.

To an inmigrating company, job training programs may be an important source of the appropriate labor skill supply. Even if the skill level of a labor force in an area is low, state or federally subsidized training programs may still be adequate incentives for firms to locate there. The Fantus Company (1966) found that such programs in Appalachia were regarded as a positive inducement by inmigrating firms. However, when asked what could be done to improve the business climate in Chicago, only ten out of 117 firms suggested instituting local job training programs (Hartnett, 1972; and Tables 4.8 and 4.9 below). The EDA survey (Table 3.4 above) found that only a few companies ranked vocational educational facilities as important, and even fewer ranked higher educational facilities important in determining location.

Wages

The wage at which labor of a given skill can be hired is obviously a powerful factor to a company, given the share of the wage bill in total business costs. The role of low-cost labor in the rapid development of the South has already been cited. Fuchs (1962) used state wage levels as an explanatory variable in his analysis of regional growth and estimated that one-third of the adjusted interregional shifts in employment were attributable to low wages; 8 percent of all industries placed a primary emphasis on labor. However, changes in the comparative advantage of a region with respect to the wage rate can occur rapidly. The use of wages in a regression analysis, with no measure of productivity, does not provide an accurate measure of the cost of labor.

It has traditionally been argued that wage differentials within a metropolitan area tend to be slight and therefore to play a very small role in intra-area location decisions. In a detailed study of the labor market in Chicago, Rees and Schultz (1970, p. 11) concluded that the metropolitan area is, in fact, composed of "a number of different kinds of submarkets, marked by wage differentials related to patterns of residential and nonresidential areas, concentrations of particular kinds of industry, and concentrations of non-white populations."

Wages may play an important role in intercity growth differences. They are not determined exogenously. Many factors play a role. The willingness of labor to work in any given area is obviously important. An extreme example is the high wages paid to all types of labor in Alaska to compensate the workers for the harsh conditions and social dislocation suffered in working on the trans-Alaskan pipeline

as well as for the high prices of goods and services in Alaska. There are less extreme examples. Izraeli (1973) performed a cross-sectional comparison among SMSAs and found that wages are higher in cities with high local taxes, high costs of living, and low levels of amenities. The labor market appears to equalize real income of different skill levels between alternative locations, perhaps even within the city.[19] For example, Hoch (1972) found that money income was positively related to city size, a relationship that was attributable in part to higher commuting costs in large cities. Goldfarb and Yezer (1976) examined intercity variations in wage rates for selected occupations. They found that wages increased with city size, most rapidly in smaller cities. Although variations in white collar wages were explained in large part by cost of living differences, the far larger variations in blue collar wages could not be explained by cost of living differences. Neither race nor federal wage policies added any explanatory power to the analysis. The differences may arise because blue collar workers are less mobile than white collar workers and therefore interarea wage differentials are not reduced rapidly by migration.

The wage level in any one sector is affected by wage levels in other sectors. If labor in one sector in a region, either through union activity or unique local advantages, has a high wage level, then competition between sectors may drive up wages in other sectors. For example, the high wages obtained in the automobile industry in Detroit have probably resulted in that city's also having one of the highest wage levels in the nation in nonmanufacturing business. Hanna (1959) studied income differentials across states and found that in states with a high level of employment in high-wage industries, incomes in typically low-income industries tended to be above the national average.

Overall, there is too little evidence relating wages to metropolitan growth to estimate the effect these wage differentials may have on the course of development.

Unionization

Companies have cited high rates of unionization as reasons for leaving the Northeast (Beckman, 1974). There is little evidence to suggest that, other than through its influence on wages, unionization is a factor in location decisions (Wheat, 1973; Fuchs, 1962). The fraction of the labor force that is unionized appears to respond to the rate of growth of an area, rather than vice versa. High-growth areas have experienced an increase in unionization, while declining areas have lost union membership, partly perhaps because of the outmigration of highly unionized industries from declining areas.

Between 1964 and 1970, the percentage of the national nonagricultural labor force that was unionized fell from 29.5 to 27.9 percent. Table 4.5 lists the percentage of nonagricultural workers who were union members in selected states in 1970 and the change in this percentage between 1964 and 1970. In New York, New Jersey, and Pennsylvania, representing the Middle Atlantic division, the rate of unionization declined 2.9, 2.8, and 1.5 percentage points, respectively. Georgia, Virginia, and North and South Carolina, situated in the growing South Atlantic division, all experienced an increase in the percentage of their work forces unionized, as did

[19] However, *within* a metropolitan area, real income is equalized to some extent through changes in land values. Land prices tend to reflect the desirability of a neighborhood, and residents in an unattractive location are compensated by lower property prices.

Table 4.5

LEVELS AND RATES OF CHANGE OF LABOR FORCE
UNIONIZATION BY SELECTED STATES, 1964–1970

State	% Nonagricultural Labor Force Unionized, 1970	Change in %, 1964-1970
Nation	27.9	-1.6
New York	35.6	-2.9
New Jersey	29.5	-2.8
Pennsylvania	37.2	-1.5
Georgia	16.2	+2.2
South Carolina	9.6	+2.2
North Carolina	7.8	+0.4
Virginia	16.7	+1.1
Tennessee	20.6	+1.4
Texas	14.4	+0.3
California	30.5	-2.8

SOURCE: Bureau of the Census, *Statistical Abstract of the United States 1973*, U. S. Department of Commerce, Washington, D. C., 1974, p. 250.

Tennessee (East South Central) and Texas (West South Central). California experienced a decline, which is consistent with the decline in the share of national manufacturing employment experienced by the Western division.

The older manufacturing areas still exhibit the highest levels of union membership, but this is not necessarily associated with high incidences of labor disputes that might encourage companies to move out. Days lost through work stoppages have been at or below the national average in the New York area.[20] For example, in 1971, 37 out of every 10,000 working hours were lost in labor disputes nationally, but in New York and northeastern New Jersey only 23 out of 10,000 working hours were lost.

There is some evidence that unionization is associated with increases in wages. Hall (1971) found that union membership was associated with a considerable increase in wages, even controlling for occupation and industry. His results are shown in Table 4.6. He divided the sample of workers into four subgroups, by race and sex. The largest differentials attributable to union membership were found for white males and, in general, for rural rather than urban areas. Black females experienced a significant gain from unionization only in the South, while black males gained only in urban areas except in the South where they gained in both rural and urban. For all groups, location in the Northeast and North Central regions did reduce the advantages of union membership. The apparent greater advantages of union membership in rural areas for whites may be attributable to the low overall rate of unionization in those areas.

[20] *Regional Report No. 25*, U.S. Department of Labor, Bureau of Labor Statistics, Middle Atlantic Region, 1972.

Table 4.6

WAGE DIFFERENTIALS ASSOCIATED WITH UNION
MEMBERSHIP BY COLOR, SEX, AND REGION, 1967

Region		Percentage Difference			
		White Males	Black Males	White Females	Black Females
Northeast	Urban	12	11	9	0
	Rural	22[a]	---	18[a]	-28[a]
North Central	Urban	16	24	20	4[a]
	Rural	30	---	21	---
South	Urban	24	34	24	22
	Rural	31	33	23	49
West	Urban	17	22	18	6[a]
	Rural	29	---	2[a]	---

SOURCE: Adapted from Table 4 in Robert E. Hall, "Prospects
for Shifting the Phillips Curve Through Manpower Policy,"
Brookings Papers on Economic Activity, No. 3, 1971, p. 686.

[a]Not significant at the 95 percent confidence level.
---Not estimated because of small sample size.

Minority Hiring

There is little evidence concerning the effect that minority hiring may have had upon location decisions. Stone (1974, p. 71), in a study of firms relocating in Boston, found that "the percentage of minorities [in the work force] was about the same for firms leaving as for staying." There was some indication that the income of minorities moving to the outer-suburban ring was above average. Outmigration of employment, at least in Boston, appears to involve as much minority participation and possibly more higher-wage minority participation than is involved in firms remaining in the city. If firms were moving to avoid hiring minorities, these types of results would be unexpected. However, the influence of the large concentrations of minorities on growth and location decisions of companies needs more research.

LAND

Although a shortage of low-priced land in central cities has often been advanced as a reason for the decline in manufacturing activity in those areas, there is little evidence to substantiate this view. Measuring the availability of land in an urban area is a difficult task since land embodies many locational factors that may or may not be important to a company, depending upon its factor requirements. Square footage is not the only consideration in the purchase or lease of land. The purchaser is interested in the availability of transportation linkages, the ease with which trucks can make deliveries and collections, and the proximity of a railroad spur or a shipping pier; he is also concerned with the safety of the neighborhood, what

precautions will have to be taken to minimize losses due to theft and vandalism, and the security necessary to protect his work force. The level of municipal services is also a factor—the reliability of waste disposal, roads, and police patrols. The activities of neighboring companies may also affect the value of a location. They might contribute economies of agglomeration—shared security, personnel, business services, or a rail spur—or they might lower the attractiveness of the area through air pollution or road congestion. To the price per square foot must be added property taxes, including any incentive reductions, and the availability and costs of mortgage loans.

In its study of firms relocating in suburban areas in New York, the Beckman Commission (1974) found that outmigration was accompanied by massive increases in floor area. Firms moving to Nassau and Suffolk counties between 1961 and 1973 had occupied 7763 million square feet in New York City but 13,176 million square feet at their new sites. This 70 percent expansion in area was accompanied by only a 4.5 percent increase in employment. Firms moving to Westchester and Rockland counties expanded their floor space from 1297 to 3354 million square feet while their employment fell from 8150 to 7860. However, the increase in land use per employee does not necessarily imply that lack of land was the reason for moving; it may simply reflect the optimum mix of factors in the new location where land is much cheaper. That is, the decision to move may have had various causes, but once the decision was made, the companies adopted techniques of production reflecting lower land prices at their new location. Harris and Hopkins (1972) found few industries whose growth was affected by land prices. These tended to be service rather than manufacturing industries.

It is doubtful whether the availability of land is a barrier to development. There is a great deal of vacant land and space within the nation's largest cities. However, local institutional restrictions on the use of land, including zoning ordinances, problems of acquiring planning permission, and assembling lots of sufficient size may pose barriers to companies wishing to expand or set up operation in a city.[21] The frequency with which local bureaucratic red tape and regulations were mentioned as a problem associated with central city locations attests to their potential influence.[22]

Hamer (1973) studied land prices for different types of industries in Boston and concluded that little could be done to reduce the comparative advantage of suburban locations with regard to low-cost, accessible land. In many instances, manufacturing businesses have been bought out of their central city location by office and residential building developers. The City Planning Commission in New York City estimates that 40 percent of the loft space in lower Manhattan, originally used by the apparel industry, is now used for residential or commercial purposes. Elsewhere, old manufacturing sites are redeveloped as civic centers providing cultural and recreational facilities. However, in some cities, industrial parks, which can be occupied at a fairly low cost by manufacturing firms, lie idle. In this case, price of central city land is not the major problem. There are no reliable data on interregional and intraregional land prices and quality that would permit identification of industries and regions where land prices are a problem for manufacturing develop-

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[21] Members of the New York State Job Development Authority expressed this view to me in an informal discussion. The problem is also addressed in Hamer (1973) and Noll (1970, p. 502 ff).

[22] See the discussion of the importance of the local public sector below.

ment. High prices indicate that land has a number of alternative uses that would generate employment. Commercial development of land, particularly office buildings, tends to generate more jobs per acre than manufacturing development. The high price of urban land is unlikely to pose a development problem.

RAW MATERIALS

Proximity to raw materials, once a major determinant of the location of several manufacturing sectors,[23] has declined in importance. As Niedercorn and Kain (1963, p. 130) explain:

> This is an inevitable concomitant to the later stages of economic development because value added by labor and capital becomes a larger and larger proportion of the total value of output. Today's complex products require much more processing per unit of raw material than those of a generation ago. So, location near the source of raw materials no longer gives an area a decisive advantage in many branches of manufacturing, because raw material costs have become a smaller fraction of total costs.

A similar conclusion was reached by Chinitz and Vernon (1960). This has led to a decline in employment in the old manufacturing belt, whose preeminence was based upon its extensive deposits of coal and iron ore.

Lichtenberg (1960) estimated that the location of 8 percent of manufacturing employment was determined by closeness to raw materials. Wheat (1973) estimated that between 1 and 8 percent of the differences in absolute employment growth among states could be explained by differences in the availability of raw materials (15 percent of the differences in per capita growth could be explained this way). He cited, in particular, refining in the Southwest, lumber in the Southeast and Northeast, and pulp and paper in the South and West.

Fuchs (1962) estimated that one-third of the employment shifts between regions from 1929 to 1954 were due to differences in resource endowments. However, he included climate as a resource. Although, as Fuchs argues, climate can be regarded as a resource for the aircraft industry, the climate variable may capture the effects of population movements (market), and be correlated with cheap and plentiful supplies of labor.[24]

Raw materials may affect location decisions within urban areas in a different way. Handling raw materials encourages firms that use them extensively to seek a suburban rather than a central city location so as to minimize the costs of constructing land-intensive truck-loading facilities and warehousing. Although the effect is weak, this tendency is perceptible in Kemper's results (see Table 3.1).

ENERGY

Recent international developments and the response of the federal government have made the energy sector and the effects of federal energy policies areas of

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[23] For example, the steel mills at Gary are strategically located between the iron ore sources in northern Michigan and the coal of Pennsylvania.

[24] Fuchs did include the longitude of the principal city in the state as an exogenous variable in his cross-state analysis. However, the potential correlations between these independent variables does not rule out the hypotheses offered above.

considerable importance. In 1974, manufacturing used one-third of all energy consumed in the United States, 24.1 quadrillions of Btus. The residential and commercial sectors accounted for 24 percent, and transportation a further 25 percent (*U.S. Statistical Abstract*, 1975, p. 531). If that part of transportation consumption used for the transportation of goods and services is included, then manufacturing consumes nearly one-half of all the energy used in the United States.

The rapid increase in energy prices since 1971—as can be seen in Fig. 4.2—is likely to have had and to continue to have considerable impact upon industrial development. For 25 years following World War II, the real cost of energy declined, encouraging the adoption of energy-intensive techniques. During the early 1970s this trend was abruptly reversed. Between 1962 and 1974, value added in manufacturing rose from $192 billion to $381 billion, an increase of 100 percent. During the same time period, expenditure on energy rose from $6.2 billion—3.2 percent of value added—to $19.5 billion—5.1 percent of value added, an increase of more than 200 percent. Industries will substitute among alternative energy sources—not all have increased in cost at the same rate—they will attempt to conserve energy, and they will substitute other factors of production for energy by altering their location, prices, and level of output.

Little is known about the influence of energy prices in determining the rate of growth of industry. There are a few "energy dependent" industries whose location is determined by the availability of low cost fuel. The most obvious is aluminum smelting, whose high demand for electricity has resulted in the concentration of the industry in the Pacific Northwest, close to cheap hydroelectric power.[25] For most industries, however, expenditures on energy are less than 1 percent of the value of shipments. Table 4.7 shows the percentage of the value of shipments that is spent on energy (electricity, natural gas, oil, and other fuels) by industry (identified at the two-digit SIC level).

Attempts to relate the level of employment or the rate of growth of employment in an industry to the cost of fuel and electricity have met with little success. Harris and Hopkins (1972, p. 93) found that employment for many industries was positively related to energy costs. This, they concluded, was a result of "two offsetting tendencies—lower fuel or power costs would be an incentive for greater employment, but on the other hand, greater employment in an area would tend to drive up fuel costs." Energy costs rarely achieve top priority in any of the surveys of industrial location. Huntington and Kahn (1976) examined the relationship between growth rates in employment in 13 two-digit manufacturing industries across states and related the two variations in energy prices by states. They found that energy prices performed better than industrial concentration, per capita income, or climate as an explanation of regional growth. It was significant for eight of the industries they examined. The most responsive industries were chemicals, petroleum products, food products, and transportation equipment. However, when they included population, a dimension of market demand, as an explanatory variable, the significance of energy prices was reduced. In view of the small number of explanatory variables and the simple regression model used, little weight can be attached to their findings.

[25] There is a wide range in the cost of electricity to industrial and commercial concerns. See, for example, U.S. Bureau of the Census, *Census of Manufactures, Special Report S.6, 1972,* U.S. Department of Commerce, Washington, D.C., 1975.
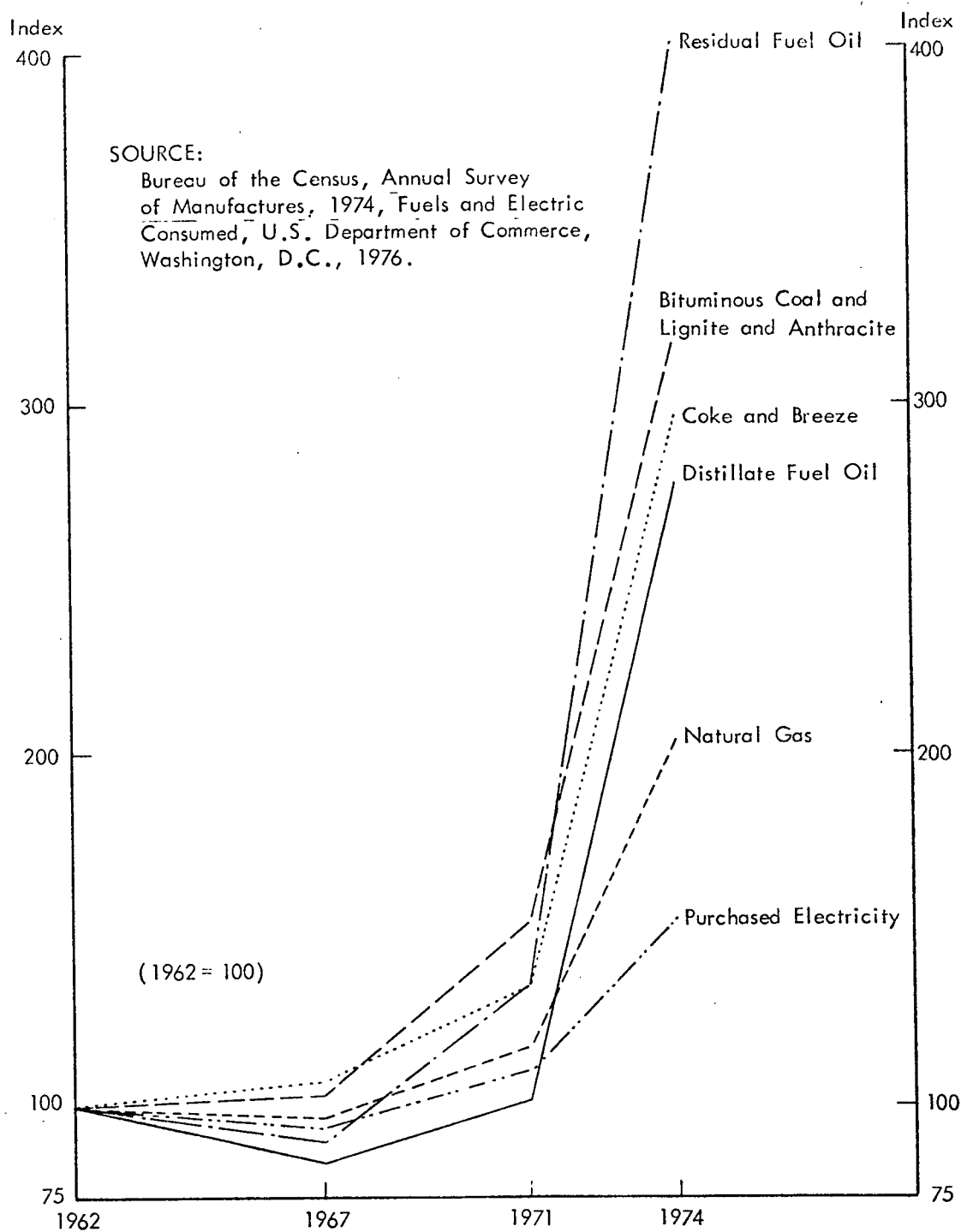
Fig. 4.2—Cost per unit of selected fuels and purchased
electricity consumed by all manufacturing industries:
1974, 1971, 1967, and 1962

Table 4.7

ENERGY EXPENDITURE AS A PERCENT OF
VALUE OF SHIPMENTS BY TWO-DIGIT
MANUFACTURING SIC, 1971

	Industry	Percent
SIC	Description	
20	Food Processing	0.44
22	Textiles	0.66
23	Apparel	0.13
24	Lumber and Wood Products	0.66
25	Furniture and Fixtures	0.30
26	Paper and Allied Products	0.22
27	Printing and Publishing	0.17
28	Chemicals	1.72
29	Petroleum and Coal Products	1.66
30	Rubber and Plastics	0.42
31	Leather	0.31
32	Stone, Clay and Glass	3.08
33	Primary Metal	1.97
34	Fabricated Metal	0.34
35	Nonelectrical Machinery	0.31
36	Electrical Machinery	0.21
37	Transportation Equipment	0.18
38	Instruments	0.22
39	Miscellaneous	0.20
	All Manufacturing	0.79

SOURCE: Bureau of the Census, *Census of Manufactures, 1972*, U. S. Department of Commerce, Washington, D. C., 1974.

Further research to identify the effects of energy prices on industrial growth must be based upon a disaggregation below the two-digit SIC level.[26] If a more disaggregated approach is used, a negative relationship may be discernible. Figure 4.3 shows, for a group of three-digit and four-digit SIC industries, the relationship between an industry's relative success in New York[27] and its energy intensity. New York is one of the most expensive places to purchase energy, and, therefore, a negative relationship would be expected. The dotted line represents the relationship expressed by the plots and does show a strong negative relationship. As the energy intensity increases, relative success in New York declines. Obviously, more detailed research of this type is needed if one is to evaluate results of the recent increases in energy prices and proposed federal energy programs.

Another problem with identifying the importance of energy is that, as well as its cost, the quality of supply—freedom from interruption, 24-hour availability, or low fluctuation in voltage—is important to some industries.

[26] Studies based upon the national input-output tables include several industries that are clusters of three-digit SIC industries.

[27] Measured as the difference between national employment growth and growth in employment in the New York SMSA between 1968 and 1973.
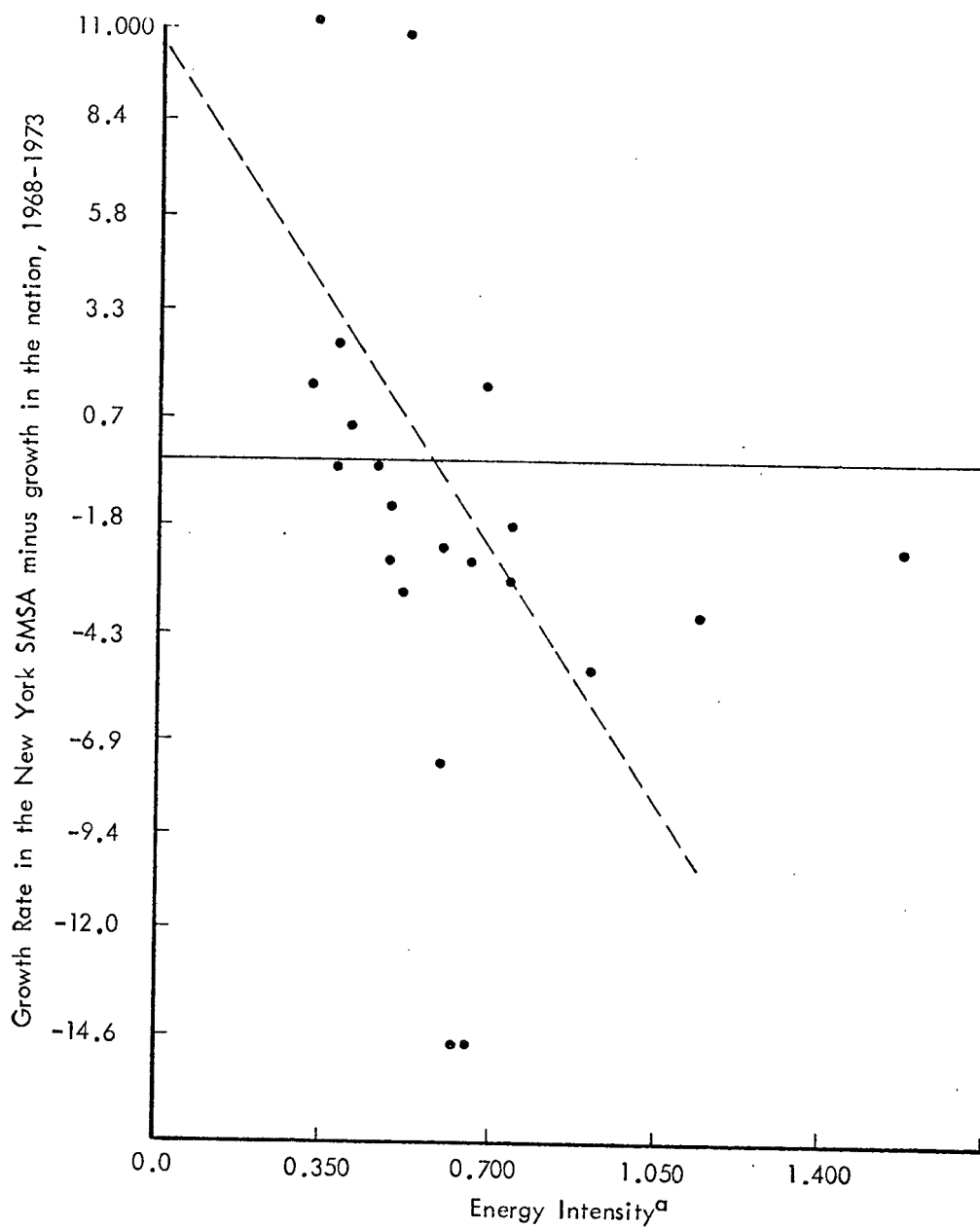
Fig. 4.3—Energy intensity and relative success of industries
in New York City

[a] Defined as expenditure on energy as a percent of the value of shipments.

Estimates of the price elasticity of a factor (the change in the quantity consumed in response to a change in price) and the cross elasticities (change in the quantity consumed of one factor in response to a change in the price of another factor) are both useful in the case of energy, where federal policies may substantially alter its relative price. From an analysis of factor shares of total output in the United States, Berndt and Wood (1975) concluded that: (1) Energy demand is responsive to a change in its own price—a price elasticity of -0.47; (2) energy and labor are slightly substitutable; (3) energy and capital are substantial complements; and (4) capital and labor are quite substitutable. They conclude that an increase in energy prices will lead to a reduced capital intensity and that investment tax credits will lead to increased energy intensity.

FINANCE

The availability and cost of finance are important factors in economic development. There has been very little research into the effects that differences in regional capital markets may have on different growth rates. It is usually assumed that the capital market is a national market and that all borrowers face similar interest rates and loan availability. However, the banking industry is heavily regulated at both the state and federal level (Gardner, 1973). This regulation may have influenced interest rate differentials, which, in turn, influenced local growth rates.

The interest rate measures one aspect of the cost of business loans. Large businesses are able to borrow in the national money markets. However, the local rate reflects the local cost of credit and is important to small business since a significant portion of borrowing is done locally (Straszheim, 1969). The local bank's loan officer is in a position to uncover detailed information—both formally and informally—during the evaluation of a business loan application. It would be difficult for a more distant bank to collect the same information as cheaply. Most small businesses must therefore rely on local banks, and so the local interest rate is probably an important factor. The share of bank loans in nonfarm business finance is small; for noncorporate small businesses, however, it is large. In view of the importance of the central city's role as an incubator for new businesses and of the small size of many central city businesses, variations in bank behavior among cities may be important. Straszheim identified a significant regional variation in loan rates, with a larger spread in small-loan rates than in large-loan rates. He also found that, over time, these variations are narrowed during periods of tight credit.

Other aspects of bank credit deserve attention. The interest rate alone does not reflect the availability of credit. Entry into the banking field is quite severely restricted. Peltzman (1965) estimated that there were 50 percent fewer new banks than there would have been in the absence of regulation. Pakonen (1971) found that the entry rates were reduced even further in unit-banking states.[28] Restricted entry allows banks to discriminate among loan applications to minimize risk. Gardner (1973) found that banks in St. Louis behave much more conservatively than they would in the presence of more competition. Clearly, this risk-averse behavior may dampen growth by causing new companies to shift to more congenial areas.

[28] In Illinois and Missouri, for example, branch banking is not allowed. This prevents banks from enjoying any economies of scale that might result from the operation of more than one branch.

TAXES AND MUNICIPAL SERVICES

The burden of taxes is often advanced as one of the reasons why both people and companies move away from central cities. High taxes in New York State were cited as a reason for leaving the area by 54 out of 109 relocating companies interviewed (LCER, 1974). However, no empirical analysis has been able to find a significant relationship between local taxes and economic development. Because of the complexity of the tax structure and the considerable variations among cities, the analysis of the role of the local public sector is a difficult task. Taxes at a particular location are offset to some degree by the level of municipal services that the company enjoys. High taxes accompanied by a high level of services—fire and police protection, garbage disposal, and roads, for example—may be preferred to lower taxes accompanied by a much lower level of services. An additional problem is that many cities and states have offered certain companies tax breaks to encourage their inmigration (Beckman, 1974).

State and local governments have shown a considerable interest in tailoring the tax price at which they offer their services to manufacturing firms. There is considerable evidence that manufacturing concerns generate a fiscal surplus; that is, they tend to pay more in taxes than it costs the municipality to provide the services demanded (Gerweck and Epp, 1974; Groves and Riew, 1963; Kee, 1968; and Leowenstein, 1963). Attracting new industries is therefore of considerable concern to local governments.

Taxes

Individuals and businesses pay a variety of direct and indirect taxes. Of primary importance, although most difficult to relate to location decisions, are personal and corporate income taxes;[29] next in importance is the local property tax, levied annually on the value of land and, usually, buildings and, rarely, on other capital assets; third is the local sales tax, which affects the revenue a company receives from marketing its output and also, in some cases, the price that it must pay for supplies and equipment; last is the menu of additional taxes that cities have imposed, including payroll taxes, license fees, and commercial occupancy taxes.

There have been several attempts to make empirical estimations of the importance of taxes. Thompson and Mattila (1959) found no significant relationships between state and local taxes (as a percentage of personal income) and the absolute or percentage growth in all industries or for any single industry. Schmenner (unpublished), using data on relocating industries, was also unable to uncover any significant effect of taxes on location.

The Advisory Commission on Intergovernmental Relations (1963) also attempted to uncover a relationship between state and local tax rates and the manufacturing growth rate but concluded that federal tax neutralization policies leave very small tax differentials between neighboring states. In a more detailed study, Williams (1961) compared production costs for average establishments in two-digit and four-digit SIC industries before and after taxes. He found that state and local taxes contributed only 3 or 4 percent of value added costs and had very little effect

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[29] Personal income taxes are important both for the individuals who must pay them and for wage costs, since taxes will be partly capitalized through employee wage demands.

on the cost rankings of industrial states for specific industries. Levin (1974) attempted to relate the size of urban-suburban property tax differentials to patterns of industrial location in urban areas in Michigan but found no effect.

No relationship was found in a detailed study of economic development in a large number of small municipalities in Missouri. Further, tax breaks and exemptions were typically attempted in areas with an older, more established entrepreneurial and civic leadership group. CONSAD (1969, p. 1.12) concluded that:

> Tax exemptions and subsidies, traditionally associated with local economic development programs, were found to be given greater emphasis in the least urbanized areas having the least "new blood." They were not correlated with economic development success.

In an examination of housing and employment in Milwaukee, Orr (1975) found some tentative evidence in the manufacturing and wholesale sectors that differences in tax rates did affect the distribution of employment opportunities within the metropolitan area. It is difficult to measure this relationship with any confidence, since changes in tax rates and in the level of municipal services will be reflected in land prices. In areas where municipal tax rates are high relative to the quality and quantity of public services, land prices will be driven down, compensating the firm for the low level of services and reducing the tax burden.

The failure of any study to uncover a significant relationship between taxes and plant location should not be taken as conclusive evidence that local taxes are not relevant to the development process. If the location decision is a two-stage process (Sec. III), then the methods used in these analyses are inappropriate. States or regions are too large to reflect the influence of local tax rates. In addition, many of the studies have analyzed total employment rather than the distribution of marginal (relocating) plants among local jurisdictions. For example, "reasonable taxes" ranked third in the factors examined by the McGraw-Hill survey (Table 3.3). Schmenner (unpublished) concludes that, based upon present evidence, cities and towns need neither fear that high tax rates alone will drive out businesses nor rejoice that low tax rates will guarantee rapid economic development. Tax credits, tax forgiveness, and subsidized loans offered by many state and local governments as incentives to attract businesses may have little effect. Weinstein (1977, p. 75) concludes:

> Taken as a whole, these incentives probably represent a serious misallocation of resources. In the main, government is subsidizing firms for performing activities they would have undertaken in any case. Furthermore, when one considers that any incentive designed to reduce a company's state or local tax bill will increase that firm's federal tax liability—due to the deductibility of state and local taxes in computing federal net taxable income—the superfluity of tax incentives becomes even more apparent. The result is a form of reverse revenue sharing in the amount of 48 cents on the dollar.

Municipal Services

The role of public services in industrial location is even more difficult to assess than the role of taxes. The effectiveness of municipal services can influence the crime rate, the level of amenities, the overall atmosphere within which business is conducted, the quality of neighborhood schools, and the quality of the air. The only insight into the role of the quality of municipal services has come from question-

naires and surveys. The Economic Development Administration (1971) survey found that fire and police protection were the two factors among community attributes most frequently cited as being of prime importance (Table 3.4). In the survey conducted by Hartnett (1972), reported in Tables 4.8 and 4.9, services were ranked 13th (out of 23) among *vitally important* (Table 4.8) and tenth among *important* factors (Table 4.9). However, several public service-related factors were also listed, including the "condition of the neighborhood" and "zoning."

An interesting insight into another aspect of municipal services and the role of local government also emerges from Hartnett's survey. The last question asked firms what they felt the city could do to improve the business climate. There were 117 responses. The city should: train labor (10), offer financial incentives (9), purchase its supplies from industries located in the city (3), reduce taxes (31), reduce the number of rules and regulations (8), cut red tape (10), end harassment by city inspectors (21), reduce time lost from inspection visits (6), and improve its attitude (11). The fact that regulations, red tape, harassment, inspection time, and attitude accounted for 56 of the responses, compared with 40 percent for taxes and financial incentives, shows the potential importance of these aspects of municipal behavior that have received little attention.

Table 4.8

RANKING AND NUMBER OF VITALLY IMPORTANT RESPONSES
FOR EACH LOCATIONAL FACTOR

Factor	Ranking	Number of Responses
Public transportation	1	112
Unskilled labor	2	89
Female production workers	3	79
Room for subsequent expansion	4	65
Market in city of Chicago	5	58
Semi-skilled labor	6	47
Skilled labor	6	47
Rail siding	8	42
Expressway	9	40
Traffic access	10	30
Suppliers in city of Chicago	11	24
Cost or rent of facilities	12	19
Municipal services	13	17
Market in rest of Chicago SMSA	14	16
Condition of neighborhood	15	15
Zoning	16	14
Market elsewhere	16	14
Non-production workers	18	9
Parking	19	8
Taxes	20	4
Suppliers in rest of Chicago SMSA	20	4
Suppliers elsewhere	20	4
Industrial climate	23	2
Prestige of location	23	2

SOURCE: Harry D. Hartnett, "Industrial Climate in Central Cities," *American Industrial Development Conference Journal*, Vol. 7, No. 2, April 1972, p. 25. Reprinted by permission of the author and the *American Industrial Development Conference Journal*.

Table 4.9

RANKING AND NUMBER OF IMPORTANT RESPONSES
FOR EACH LOCATIONAL FACTOR

Factor	Ranking	Number of Responses
Traffic access ·	1	90
Condition of neighborhood	2	84
Cost or rent of facilities	3	72
Room for subsequent expansion	4	63
Expressway	4	63
Market elsewhere	6	53
Public transportation	7	50
Suppliers in city of Chicago	8	48
Semi-skilled labor	9	47
Municipal services	10	44
Parking	11	42
Market in rest of Chicago SMSA	12	39
Industrial climate	13	35
Market in city of Chicago	14	34
Skilled labor	15	29
Rail siding	16	22
Zoning	17	21
Suppliers in rest of Chicago SMSA	17	21
Unskilled labor	19	20
Non-production workers	20	19
Taxes	21	18
Female production workers	22	17
Suppliers elsewhere	23	8
Prestige of location	24	6

SOURCE: Harry D. Hartnett, "Industrial Climate in Central Cities," *American Industrial Development Conference Journal,* Vol. 7 No. 2, April 1972, p. 26. Reprinted by permission of the author and the *American Industrial Development Conference Journal.*

EXTERNAL ECONOMIES

Urban researchers have long hypothesized that companies may receive certain advantages by locating in a large urban area, advantages that result from processes external to the individual company but that can reduce the cost or improve the productivity of labor when the company does business there. Urban areas, with their diverse economic bases and large labor forces, may offer advantages to some industries that cannot be found in suburban or nonmetropolitan areas. By identifying those industries or even types of firms that seem to be especially attracted by agglomeration economies, federal and local urban development policies could be tailored to them and be used more effectively. Further, substantial agglomeration economies imply that the process of decline in employment in some urban areas will be self-sustaining. If firms move out of the city or substantially reduce their level of employment, then the economies of agglomeration, and therefore the competitive position of remaining companies, will be impaired.

There is some evidence that several industries experience advantages from agglomeration. This may apply to metropolitan areas as a whole. Sveikauskas (1975) found that a doubling of city size was associated with 6 percent increase in labor productivity.[30] In a more detailed analysis of 73 SMSAs also using value added per capita as the dependent variable, Segal (1976) found that although there were constant returns to scale across the entire sample, large cities enjoyed economies of agglomeration. He included a large number of independent variables[31] and found that the influence of size was positive if the sample were grouped into two categories and SMSAs with population in excess of two million were treated separately. He concluded (p. 347) that

> Constant returns to scale obtained across cities of different size, and an "agglomeration effect," imbedded in the constant term of the production function for the largest cities, makes units of labor and capital 8 percent more productive in these cities. The presumed reason for this is that there are pronounced net benefits of agglomeration in production in large metropolitan areas—areas with over 2 million population in 1967.

The behavior of industries that are geographically concentrated provides some insight into the possibility of industrial economies of scale that are external to the individual company. An industry is concentrated in an area if its share of employment in that area is above its average share of total employment in the nation. Industries tend to concentrate within certain zones in SMSAs. The grouping of apparel companies in the West side of lower Manhattan is an obvious example. Struyk (1972) found such concentrations in all major industries in four metropolitan areas.[32] Struyk and James (1975) found that concentrated industries responded differently to economic factors than nonconcentrated industries. Firms in areas of industry concentration grew or declined more slowly than firms in the same industry located elsewhere. Overall, however, concentrated industries seemed to perform less well than nonconcentrated industries in central cities. Kemper (unpublished) found that firms in concentrated industries were much more likely to locate in central cities, particularly in the central business district, than in suburban areas.

Struyk and James (1975) felt that central cities should exploit their comparative advantage by providing aid to their enclaves of concentrated industries. Once a decline started, they argued, it would feed on itself. Further, given the stability of concentrated firms, industrial location studies should focus upon nonconcentrated industries, since these were much more volatile in their response to changes in transportation, markets, and other factors. The failure of most location studies to distinguish between the behavior of firms in areas of concentration and nonconcentration may have led to considerable bias in the results.

The argument that economies of scale favor large cities has also been applied to municipal services (Mera, 1973).[33] If economies of scale exist, then the cost of providing a given level of services would be less in large cities than in small. This is important in determining the perceived burden of local taxes on industry. But

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[30] Measured as value added per worker in manufacturing.

[31] Including the capital stock, attributes of the labor force, the industrial structure, and the regional location of the city.

[32] The industries were identified at the two-digit SIC level of disaggregation and constituted at least 5 percent of the manufacturing labor force.

[33] See also the response of Borukhov (1975) and Mera (1975).

it is difficult to determine whether an increase in per capita expenditure on services (which seems positively related to city size) represents an increase in the quality of services provided or an increase in costs associated with size (diseconomies of scale). The evidence in favor of the existence of economies of scale is inconclusive (Harrison, 1974) with the possible exception of sewage and waste treatment facilities. In that service category, per capita costs may in fact decline as city size increases.

The diversity of the urban economy offers certain advantages to companies that rely upon face-to-face interaction with either competitors or suppliers of specialized inputs or services. Although improvements in communication have obviated the need for some types of personal interaction, formal and informal contacts with bankers, designers, scientists, and others may be important to some businesses. This aspect of the interservice advantages of a central city location is well expressed by a New York toy manufacturer (quoted in the *New York Times*, February 28, 1975, p. 53): "If I take my staff out of town we miss a new idea by 90 days." The types of interactions allowed in the diverse business center of a large city may provide the necessary inputs for the development of new companies.

Stone (1974) found that heavy users of specialized business services tended to locate in the center of Boston rather than in suburban areas. Kemper (unpublished) found that firms relying on specialized inputs were more likely to locate in New York City's CBD than in less central locations.

Even during periods of national and regional decline, the central city remains a powerful incubator for new companies. The ready supply of labor of a variety of skills, inexpensive small sites (particularly loft space), the presence of a multitude of business services, and the availability of transportation linkages and public services make the city, and particularly the CBD, an attractive location for embryo companies. However, Struyk and James (1975) found that the incubator effect for new manufacturing jobs operated only in some areas in some cities. For example, the ratio of the share of employment in new establishments to the share of base year employment in the central industrial district, a measure of the concentration of new jobs in that area, exceeded unity only in Cleveland and New York City, and was well below unity in Boston, Minneapolis, St. Paul, and Phoenix (Leone and Struyk, 1976). The "incubator function" is therefore not general to all cities. Leone (unpublished) found that, in New York City, this function may be insensitive to cyclical fluctuations. In 1969-71, New York City gained 19,665 jobs through the birth of new companies, in spite of the economic recession. This was only about 3,000 less than the number gained during 1967-69, a period of economic expansion. Pred (1966) argued that innovation and invention are positively related to both city population size and city population growth rate. He examined patents per capita in different locales, and concluded (p. 129) that "the larger the city ... the larger the volume of short-distance information flows, and the greater the awareness of specific technical problems and existing production process improvements."

AMENITIES

The quality of life—the availability of recreational and cultural facilities, the cleanliness of the environment, the freedom from congestion and crime, and the quality of local schools—is an important consideration in the location decisions of

some companies. If a firm is not tied to a large labor pool, raw materials, or rail or water linkages, then the attractiveness of a location as a place to live may play an important role. The importance of the climate in Wheat's (1973) analysis is one illustration of this.

The most important effects of differential levels of amenities would be through the migration patterns of households. Executives may encourage the relocation of their company to an area they find attractive as a place to live. Amenities may provide a small monetary incentive for relocation as well. Workers who live in pleasant, unpolluted, and uncongested surroundings will accept lower wages (Izraeli, 1973). In a study of the economies of air pollution abatement in Chicago, Cohen, Fishelson, and Gardner (1974) estimated that the average annual benefits from cleaning the air in Chicago to meet federal standards would be about $300 per household. This figure is quite close to estimates in a number of other studies. As much as half of the benefits of the change may be reflected in reductions in the wages necessary to attract workers to Chicago (Izraeli, 1973). A firm with 100 employees located in a clean-air city may find that its wage bill is $15,000 per annum less than it would be in a more polluted city. Other important amenities may include the level and quality of cultural and recreational facilities. The distribution of these amenities may affect the degree of suburbanization as well as interregional moves. Climate and geography may have spurred the moves to the South, West, and Mountain areas, while problems of crime, pollution, and congestion may have encouraged suburbanization.[34]

LEADERSHIP

Leadership, both civic and entrepreneurial, is one of the most nebulous, yet perhaps one of the most important, factors in explaining shifting patterns of economic development. The topic has been an issue among economic historians for many years. Thompson (1965), in an anecdotal description of the fates of three cities, provides an excellent introduction to the subject. He describes the adjustment of Boston to the loss of employment in the footwear industry, once a major industry. Leadership, civic and private, he surmises, may have been important in developing the research industry as a substitute. He also discusses the importance of leadership in the emergence of Chicago rather than St. Louis as the dominant Midwestern city.

The importance of individuals, as city leaders or as leaders of private institutions, in the adaptation of a city to changing economic conditions is difficult to assess. Was it far-sighted administrators in municipal government and in local universities who led Boston to recovery from the extensive unemployment at the end of World War II?[35] Has the failure of some cities to diversify and capture growth industries resulted from their inadequate pool of natural endowments, from a failure of civic leaders to pursue an effective economic development policy, or from the failure of the policies themselves? In informal surveys, the attitude of

[34] The importance of amenities in determining interregional and intraregional patterns of population migration is discussed in the *Population and Residential Location* report.

[35] This was attributable to the migration of the shoe and textile industries to the South.

local officials appeared quite frequently as an important determinant of locational choice.[36]

An attempt has been made to measure the leadership quotient in a number of small communities and to correlate this, together with other factors, with the rate of income growth in a number of small Missouri municipalities (CONSAD, 1969). The research concluded (p.1-11):

> The least successful areas seemed to lack business-oriented entrepreneurial leadership. This may be a serious drawback for such areas since entrepreneurial leadership can more readily communicate with industrial prospects than can non-entrepreneurial leadership. However, entrepreneurial leadership may be more interested in personal economic gain than in helping the unemployed.

Municipal leadership may often arise from within the Chamber of Commerce. From a series of case studies of economic recovery in New York State, Beckman (1974, p. 66) concluded:

> The fact that the Chamber of Commerce, the Development Agency, the schools, the city and town government, the power and light company, sometimes even the local citizenry in a fund raising campaign, are jointly contributing to induce a company to settle there has proven a potent factor in successful retention and acquisition of industry.

What factors may lead to the appearance of local entrepreneurial talents is not known. Thompson (1965) offers tentative support for a "long-wave" cycle in a city's industrial activity resulting from the cyclical appearance and acceptance of innovations and far-sighted managers. In this respect, federal education programs, federal sponsorship of research, and the dissemination of information, together with loans to small businesses, may be helpful. However, measuring and predicting the results of these programs is very difficult.

GENERAL CONCLUSIONS

The number of factors that affect industrial behavior is large, and the avenues through which their effects are felt are diverse. Both measurement problems and interaction effects make it analytically difficult to separate the influence of individual factors. However, some consistency in the patterns of factor effects does emerge. The major factors and the principal ways in which they have operated on the employment shifts from central cities to suburban areas and to growth regions are depicted in Fig. 4.4.

Markets

Movements in population may have been the single most important factor in explaining differences in economic growth among regions and the suburbanization of employment. Population has migrated from the Northeast and North Central areas to the West and South. There has also been a movement away from large cities toward smaller urban areas, suburbs, and nonmetropolitan areas. These

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[36] See Hartnett (1972) whose results are reproduced above. See also Beckman (1974) who reports on a number of case studies of upstate New York towns that have successfully attracted businesses.
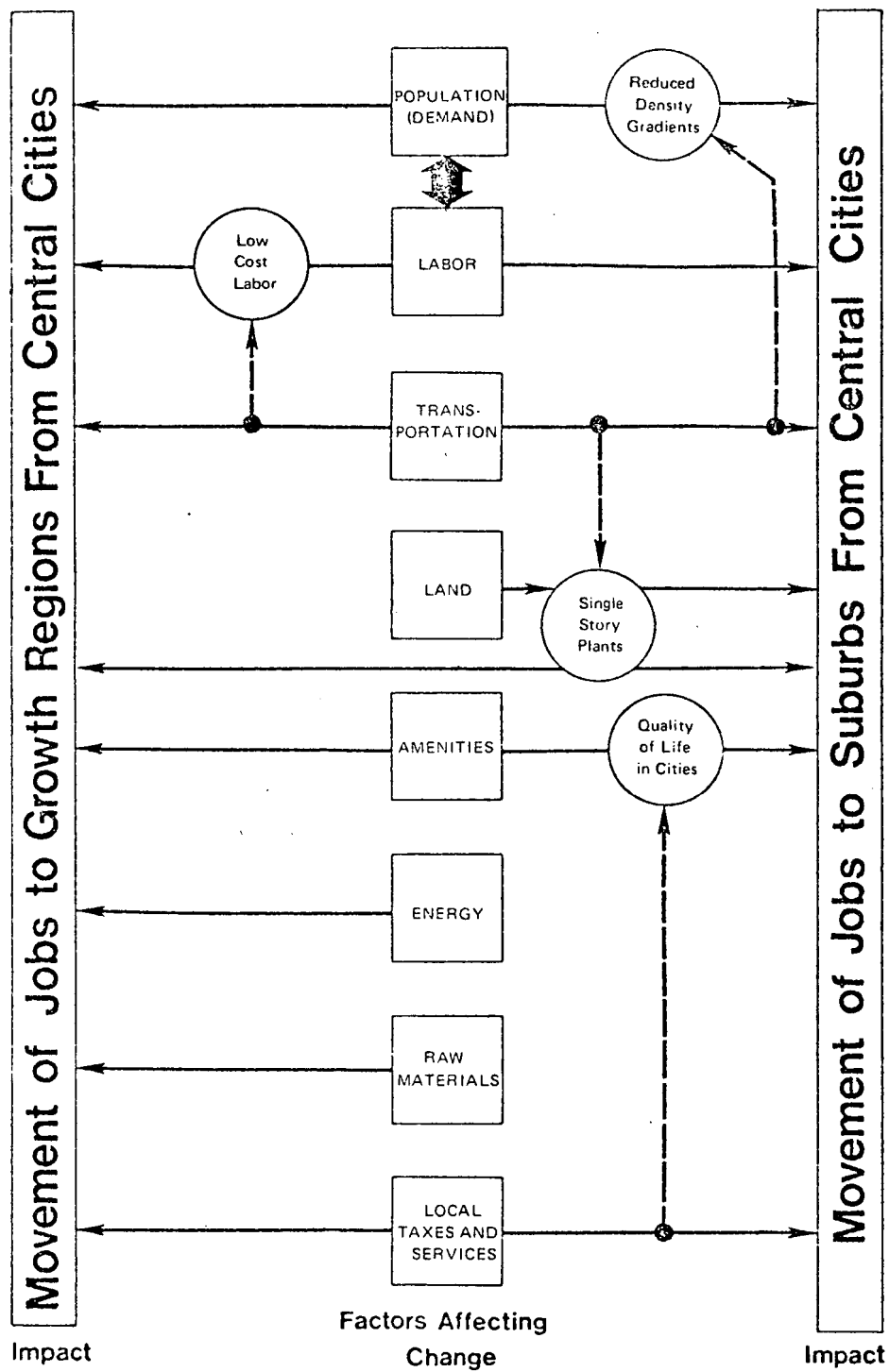
80

Fig. 4.4—Major factors affecting employment shifts
from central cities to suburbs and to growth regions

changes have been caused by rising incomes, improved transportation systems, and the pursuit of an improved environment.[37] Although some households have moved to seek jobs, there is mounting evidence that companies have followed population rather than vice versa.

Population growth offers businesses growing demand for output and also a growing labor supply. Local service industries—wholesale, retail, and personal services—have responded to the growth in demand, while others have responded to growth in labor supply. It is difficult to separate these effects empirically. The rapid employment growth in areas where labor force participation has been below average has probably been in response to untapped and plentiful labor supplies.

Intermediate markets are also an important locational determinant for some industries. Industries tend to cluster together spatially in a distinct and predictable way.

Transportation

The extension of the federal interstate highway system and the growth of trucking have opened up many regions where prohibitive transportation costs had previously stifled industrial development. The decline in importance of the railroad and the increased importance of trucking has allowed rapid growth in areas not served by rail networks. Highway-oriented new towns in the South and West have grown at the expense of railway-oriented cities in the Northeast.

Increased reliance on private automobiles, congestion in the central city, and construction of commuter highway systems have encouraged the suburbanization of population. The increase in the cost of transporting labor relative to the cost of transporting raw materials may have caused some firms to relocate in suburban areas closer to the residences of skilled labor. Firms relying on low-skilled labor have remained behind in central city locations. Increased use of truck transportation, together with the emphasis on single-story, linear-flow manufacturing plants, has also encouraged the relocation of manufacturing jobs in suburban locations.

Labor

Regional differences in employment growth have been associated with regional differences in labor productivity. Above average employment growth in manufacturing has occurred in regions whose labor productivity (measured by the value added per worker) was above the national average. The differential rate of growth of employment in manufacturing among regions has narrowed regional differences in labor productivity, which might indicate a narrowing of regional growth differentials in the future.

Local labor productivity is linked to the education level of the local population. The higher the median years of schooling completed by the local population, the higher is labor productivity; therefore, the availability of local training programs and the quality of the local educational system may play a role in attracting companies to an area. The education level of the population in suburban areas has tended to increase more rapidly than that in central cities, which may have encouraged

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[37] Reasons for interarea migration of households and for the suburbanization of population are discussed in the *Population and Residential Location* report.

the suburbanization of firms seeking skilled labor. However, a large pool of unskilled labor attracts some firms to central city locations, particularly if effective public transportation services are available.

There is little evidence concerning the effects of wage differentials on local economic development. High wages do act as a deterrent for some industries. Wage levels are less important than the cost of labor relative to its productivity. There is no evidence to suggest that a high rate of unionization causes slow employment growth, although unionization does lead to higher wages. However, slow employment growth may lead to a decline and fast growth to an increase in the rate of unionization. Some companies have cited high rates of unionization as reasons for leaving the Northeast. There is no evidence that the presence of a concentration of minorities in the local labor force deters economic development.

Land

The development of single-floor production techniques together with increased reliance on trucking may have encouraged some firms to seek locations in growth regions where land is cheap. There is little evidence concerning the relative importance of land, although the use of truck transportation may have introduced more land-intensive plant designs, thereby encouraging suburbanization. High prices in central cities may have displaced manufacturing activity with commercial activity and encouraged the suburbanization of certain service industries, including wholesale and retail firms. Overall, however, the availability of suitable land in central city locations does not appear to have been a factor in central city employment loss, although local regulations concerning the use of land—zoning restrictions and planning permissions—may deter industrial expansion.

Raw Materials

Decreased reliance on location near raw materials has allowed the decentralization of industrial activities from sites near sources of raw materials and has reduced the comparative advantage of locations in traditional manufacturing centers.

Energy

There is a wide range in the costs of energy at alternative locations. Although for most industries energy costs are less than 1 percent of the value of shipments, the wide range of prices may lead to differences in economic development. The Northeast is the most expensive region in this regard. There is tentative evidence that the energy intensity of an industry may be inversely related to its success in the Northeast.

The fact that labor and energy are substitute factors of production implies that, in locations where energy costs are high, manufacturers will use more labor-intensive techniques, leading to a higher level of employment but lower per capita earnings.

Taxes and Public Services

There is very little empirical evidence that local taxes influence industrial

location decisions or explain differences in growth rates among regions. This may be because of difficulties in measuring their incidence, including capitalization of tax and service differentials in land values, and to the type of analytic models used, rather than because taxes are unimportant. Tax breaks given by local governments to attract companies may not have much influence.

The quality and availability of local public services may play a role in location decisions among a number of alternative municipalities in a selected region. Local bureaucratic red tape may also slow down local economic development.

Amenities

Rising income has allowed individuals to purchase an improved environment. Population has moved toward attractive climates in the South and West, leading to growth in demand and labor supply. Households have even accepted lower wages for the opportunity to live in an improved environment. Households have sought improved residential amenities—more parks, less pollution, and a lower crime rate—by moving to the suburbs. The fiscal problems in some central city areas have led to reduced expenditure on amenity-determining services—including crime prevention, recreation, cultural affairs, and water treatment—leading to outmigration.

Other Factors

A number of other factors may have played a role in location decisions, but the empirical evidence is slight. The availability and cost of loans appear to vary between regions. This may be especially important to small firms that must rely on local bank loans as a source of funds.

There is evidence that, for some industries, there are economies of scale or economies of agglomeration. Industries that are concentrated in a particular location grow or decline more slowly than nonconcentrated industries. The established, large, industrial cities have a comparative advantage in this respect. Central cities may also offer advantages not available at suburban locations of face-to-face interaction because of their diverse economic structure. However, rapid improvements in communication technology have reduced the importance of face-to-face interaction. Civic leadership, the ability to formulate far-sighted policies and to grasp opportunities, although difficult to quantify, may play a decisive if ill-defined role in economic development.

RADIAN CORPORATION

Radian Contract # 100-029

FINAL REPORT

A PROGRAM TO INVESTIGATE

VARIOUS FACTORS IN

REFINERY SITING

Submitted to:

COUNCIL ON ENVIRONMENTAL QUALITY
Washington, D.C.

and

ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C.

15 February 1974
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Prepared by:

Radian Staff

2.2   Specific Site Selection

This section is concerned with the factors involved in the siting of oil refineries. There is a basic premise to the discussion of the choice of sites. This premise is that a given refinery has economic justification to the company searching for a site. This justification depends upon two major factors. Those factors are that the company can find a market in the region of the site under consideration and that a raw material source is available to a refinery which could supply that market.

If a company decision is assumed to favor the siting of a refinery for a given regional market, two types of factors apply to the choice of a site. The first set of conditions are those associated with unconstrained economics. The second set are concerned with siting constraints including the physical availability of the minimum required resources, legal constraints, environmental considerations, the acceptance of a refinery by the residents of a given area, and other possible constraints.

Each of these types of factors is discussed in this report section. The relative importance of site as a factor in a company decision to build a refinery is considered in the Summary Section of this report. The overall considerations also put into perspective the importance of economic considerations as compared to the less tangible constraining factors involved in oil refinery siting.

Siting Considerations

The following sections of this report contain a discussion of two types of the factors considered in oil refinery siting. The first type is concerned with the economic factors pertinent to a given company that has determined an interest in a site related to a given marketing region. The second set of factors relates to the constraints that might apply to a refinery dedicated to serving that marketing region.

Economics

Economic analysis is the primary basis for evaluating any industrial venture including the construction of a new petroleum refinery. After justification for additional refining capacity is established, economic factors are examined in order to select the most profitable or optimum refinery location.

Refinery location comparisons and factors affected by site changes are evaluated on a common basis by some economic measure or indicator. Economic measures commonly used include rate of return on investment, present worth determination, etc. All of these evaluation methods consider the following major financial items in comparing potential plant locations:

- production costs,
- capital requirements,
- sales profit.

The entries in the above list will be explored for site implications in the subsections below.

Production Costs

Production costs represent the expenses that are incurred during refining of raw petroleum to finished products. The major cost centers included for production costs are:

- raw materials,
- variable expenses,
- fixed expenses,
- non-operating expenses.

Fixed Expenses

Fixed expenses for a refinery operation include salaries, services, office expense, insurance, and taxes. The first four items listed are expected to remain fairly constant for any potential refinery site. Of course, variations can occur. For example, a highly isolated refinery site may require higher salaries to attract key professional personnel (DU-043). However, professional level salaries as well as refinery services, office expense, and insurance are fairly uniform across the United States.

On the other hand, tax burdens are highly dependent on location. The tax burden includes state, municipal, and other local taxes. The effect of taxes can be felt between locations within a state as well as from state to state. For example, some localities offer tax-exempt revenue bond financing for industries such as refineries coming into their areas (OP-010).

Tax schedules for potential refinery locations must be assessed for economic impact on production costs. Many factors may affect taxes on a particular refinery. For example, some states exempt new industry from ad valorem taxes for a specified period of time. This tax exemption may include real estate improvements, machinery and equipment, and raw materials (OP-010).

New philosophies of taxation are also being considered in some areas. For example, tax relief may be given to refiners for facilities designed to control pollution. Another idea deals with assessment of an "added value" tax for products manufactured within a state (OP-010).

Summary

The previous sections have contained discussions of the economic bases and constraints frequently encountered in the selection of refinery sites.

It is helpful in understanding the siting decisions made by companies to review the effect of siting on the overall costs associated with the operations of the company relative to a refinery. A mid-1973 based example is presented for a new modern refinery scheduled for initial operation in 1976 (GR-081).

Crude is assumed to cost $2.65 per barrel F.O.B. the Persian Gulf. Costs to bring the crude to a U.S. Gulf Coast on-shore crude terminal were estimated at $1.435 per barrel. While this estimate was prepared shortly before the Presidential proclamation of April 18, no cost for import quota tickets was allowed, and the major difference between crude cost and the landed cost was tanker transportation. It is expected that the case is a generally valid example. Note that the numerical values in this published example are not necessarily fully consistent with the values in the examples of Section 2.1. This present example is used here to illustrate the economic siting criteria presented in the following paragraphs.

The cost allowed for piping the crude to a Gulf Coast refinery was $0.015 per barrel. Refining costs brought the product value to $6.99 per barrel. Product pipeline charges were assumed at $0.30 per barrel. Distribution costs from marketing terminal to sale add $4.058. When sales prices are allocated for fuel oil and distillates, the resulting gasoline price is $0.442 per gallon including $0.11 for excise tax or $18.58 per barrel.

This example illustrates that the overall effect of siting within a given small geographical region on product value is not great. If the on-shore crude terminal and the product marketing terminals are fixed, the transportation costs to and from the refinery represent only $0.315 per barrel in a total gasoline cost of $18.58 per barrel in this example. The choice among suitable sites is not sensitive to this factor. The economics of the choice between geographical areas is discussed in Section 2.1.

A refinery is generally justified to serve a wide geographical market region. For example, the Mobil Joliet refinery is reported to be justified on the basis of product supply to a multi-state region in the Midwest and Great Lakes region (WO-022). In the sense of broad project justification economics, sites within perhaps a one hundred mile radius could be considered, and profitability would be little affected by the selection of suitable sites within that large area.

Even though the choice between suitable specific sites is not critical in overall economics, the company will still wish to optimize siting based on the factors previously discussed. Such factors as excessive local land costs would be avoided, and tax and financing incentives would be sought. An economically optimum site would be determined among sites available over a rather wide area.

Since sites can be considered over a wide area, the constraints previously discussed can play an important part in site choice. Unfavorable sites can be economically avoided. There is little economic penalty in avoiding an urban area with stringent regulations on fuel quality, or in avoiding a site that would require very limited effluents due to existing ambient levels.

An isolated refinery cannot exchange such stocks as lube stocks or asphalt stocks with other producers readily, which might be a penalty associated with site restrictions. But in general, such inconveniences can be accommodated, and the company can retain considerable flexibility in site choice.

2.3   Summary

The data in this section provide a basis for establishing priority ratings on sites for study of the environmental effects of installation of new oil refineries. A basis is established for study of the influence of environmental regulations and revisions in those regulations on refinery investment decision and on refinery location. The most likely type of refinery is indicated, which provides a basis for estimating the environmental implications of refining industry investment. The following conclusions are indicated.

1. The relative product and raw material prices prevailing in mid-1973 do not appear to justify refinery investment, although the economics are much improved from recent past years. The sensitivity analyses show that only slight increases in product values are required for venture just-ification. Crude price increases since mid-1973 will require further product price increments.

2. If product value increases for the various products are across-the-board rather than as selective increase for selected products, high conversion refineries are indicated, preferentially on the East Coast. The tendency in the recent past to export refinery capacity to the Caribbean will be reversed.

3. Although market prices of refinery products can be reduced on the East Coast by siting refineries on the East Coast, the price increase for that geographical market for remote refineries is not great. Factors other than economics may determine the locations of refineries for the East Coast market. The location of the crude source is a less important factor than market location. Crude transportation costs are less than product transportation costs.

4. Localized site selection within a given marketing region is not strongly sensitive to costs. Environmental and esthetic considerations may play a significant role in local site determination in terms of restrictive zoning regulations. Economics indicate that refineries should be centralized in the market area, but the incentive is not strong. Historically, siting was dependent upon water supply and waste-water disposal considerations, but this dependence is weakening as water make-up and discharge both decrease with increasing water recycling practices.

5. Stagewise refinery construction might be practiced to accommodate local near-term fuel oil demands. The low conversion refinery initially constructed for this purpose could be planned for later modification to a high conversion refinery by adding such facilities as incremental cat cracking, hydrocracking, incremental cat reforming, alkylation and isomerization.

6. Refinery investment has been inhibited by unfavorable current economics in recent past years. In mid-1973, investment returns were approaching satisfactory levels. Ventures were also inhibited by uncertainty concerning the type of refinery needed as lead and sulfur regulations were developing. A major inhibiting factor has been the lack of assurance of a raw material supply. As an example, the relaxation of import restrictions was followed by a large number of venture announcements. Recently, embargoes have resurrected this uncertainty and inhibition.

7. Product price controls must be sufficiently flexible to accommodate current raw material price activity if confidence in return on investment is to be sufficient to stimulate investment ventures.

APPENDIX   C

Effect on Prices of a Refinery Tax

A PRELIMINARY ANALYSIS

OF SELECTED ECONOMIC

IMPACTS OF A TEXAS REFINERY TAX:

A STAFF REPORT PREPARED FOR THE

SENATE STUDY TO REPLACE AD VALOREM TAXES

by

TEXAS ENERGY ADVISORY COUNCIL

DATE: December 12, 1978

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C O N T E N T S

A PRELIMINARY ANALYSIS OF SELECTED ECONOMIC IMPACTS OF A TEXAS REFINERY TAX:
A STAFF REPORT PREPARED FOR THE SENATE STUDY TO REPLACE AD VALOREM TAXES

JAMES C. CHANG*

INTRODUCTION

The production of crude oil and petroleum products has long been
playing an important role in the state of Texas. The dominance of Texas
refinery capacity (approximately 26 percent of the total U.S. capacity) not
only enables the state to export two-thirds of its refined products, but
also induces petrochemical firms to locate in the Gulf Coast Area. The
portion of the nations refining capacity in Texas is increasing; 52% of
new capacity in 1977 was in Texas. In 1976, over 8 percent of nonfarm
labor and proprietors income in Texas was directly generated from the oil
and gas extraction, refinery and petrochemical industries.

The Senate Study to Replace Ad Valorem Taxes has examined the fea-
sibility of replacing a portion of ad valorem property taxes with a "refin-
ery tax." More specifically, one proposed form of a refinery tax would be
levied on the crude oil purchased by refineries at 5 percent of the market
value of the crude inputs. Thus, imposition of the tax would not cause direct
changes in the (existing) state tax revenues. A 5 percent increase in the
cost of crude oil, however, will affect to some extent the price consumers in
Texas pay for refinery products and might affect the production levels of refin-
eries and petrochemical firms in Texas, which could have indirect, long-run
impacts on the Texas economy. On the other hand, such a tax appears to offer
an opportunity to increase the portion of Texas tax requirements paid by the
rest of the nation.

* James C. Chang is an economist with Texas Energy Advisory Council.
This report does not necessarily represent the views of the Council members.

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Therefore, the consideration of levying the new tax in a complex and senstiive economy deserves and requires a careful study which measures both direct and indirect effects of the proposed tax. The purpose of this paper is to present and analyze a portion of the possible impacts of a 5 percent refinery tax on the state's economy; the central question of the effects of such a tax on the output levels from existing refineries and the effects on the industries' decisions to locate new refinery facilities in Texas is not answered. This basic question goes unanswered because of the lack of detailed refinery cost data and a thorough understanding of the dynamic and complex investment decision process of the refinery industry. The basic Texas conditions important to industry location decisions have been documented earlier and have not materially changed. The reader may refer to a previous report on the subject by Holloway, White and Clemons[1] for a decision of the favorable business climate in Texas relative to other locations in the nation.

PROCEDURES

It is necessary to take account of numerous market interactions among industries and between the cost of crude oil and the price of refinery products in order to estimate the effects of a refinery tax. The problem is complex. The Texas Energy Forecasting Model, (TEFM) formulated around the Texas input-output structure seems to fit the needs of the present study. Thus, this model was utilized as a basic tool for the analysis.

The TEFM is a fairly large scale economic model which was designed for forecasting and impact studies. The structure of the model has been discussed

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[1] Milton L. Holloway, David White and Olin Clemons. Selected Texas and U.S. Refinery Data: Taxes, Operating Costs, Capacity, Prospects for Growth And Other Information Relevant to Refinery Tax Considerations.

in great detail in two reports published by Texas Energy Advisory Council,[1]

and will not be repeated in this report. Documentation and computer programs
of the model are maintained by and available at TEAC.

Similar to any other models, certain assumptions were made in the TEFM.
Major assumptions of the model are as follows: (1) Interindustry relation-
ships of the Texas economy are specified by the 1967 Texas Input-Output Model[2]
and adjusted for changes in energy prices, fuel consumption, and fuel substitution
throughout the study period. (2) Prices and supplies of Texas crude oil,
natural gas, lignite and uranium are given. (3) Growth rates of Texas exports
are exogenous and are determined by the U.S. industry growth levels. (4) Given
the technological changes, energy requirements are associated with Texas output.
(5) If an energy shortage occurs, Texas energy exports in the model will be
reduced to satisfy the domestic demand first.

Standard (Case I) economic projections were made by running the TEFM
without changing the basic assumptions and parameters. The results show what
will prevail if no refinery tax is imposed. The second set of projections were
estimated by assuming that a 5 percent tax is levied on the crude inputs of
Texas refineries (Case II) beginning in 1980. Since it is generally expected
that higher refined product prices, resulting from higher procurement cost of
crude oil for refineries, could reduce exports of refined products a pessi-
mistic case was assumed by setting the growth rate of refined product exports

[1] Milton L. Holloway, Herbert W. Grubb and W. Larry Grossman. An
Economic Analysis of Declining Supplies in Texas; Income, Employment, Tax
and Production Effects as Measured by Input-Output and Supply-Demand
Simulation Models. Governor's Energy Advisory Council, February 1975.
Milton L. Holloway, Texas Energy Outlook: The Next Quarter Century,
Governor's Energy Advisory Council, Austin, Texas, March 1977.

[2] Herbert W. Grubb. The Structure of the Texas Economy, Vol. 1 Office of
the Governor, Office of Information Services, Austin, Texas, March 1973.

for Texas at zero (Case III). That is, the only refinery capacity growth allowed in the model is that expansion required to supply Texas requirements; Texas based refineries would constitute a declining share of the national refining capacity. The results of the three cases will be summarized in the next section.

ANALYSIS

There are numerous variables included in the TEFM; however, only the projections of key variables are presented. As shown in Table 1, a 5 percent refinery tax may increase the Texas refined product energy bill by 3 percent in Case II. The average price of refined porducts at the refinery gate would increase by about 3¢ per gallon. But the aggregate refined product bill may decrease by 14 percent in 1990 if there is a strong resistance to Texas refined products from other states; such a decrease results from a slower growth in refining capacity which in turn negatively affects the growth of related indust-ries, and to some extent the entire Texas economy, leading to lower consumption of energy.

Consumption of refined products will not decline drastically as long as the growth in exports of Texas refinery products can be maintained, However, the consumption could decrease by almost 20 percent in 1990 when the growth of exports becomes stagnant. As expected, there will be an upward pressure for the refined product prices. Generally speaking, a 5 per cent refinery tax may cause a 3 percent increase in gasoline prices regardless of the magnitude of export growth of refined products.

It should be noted that the projections under Case III are not likely to prevail, since the demand for refined products is relatively inelastic in the short-run. Furthermore, a 3 percent increase in the product price is not

TABLE I. EFFECTS OF A REFINERY TAX

Projections	Case I	Case II	Case III
1. Refined Product Energy Bill, 1985 (Millions of 1978 prices)	$78,510	$81,071	$75,481
Percent change over Case I	---	+3.26 %	-3.86 %
2. Refined Product Energy Bill, 1990 (Millions of 1978 prices)	102,615	105,981	88,073
Percent change over Case I	---	+3.28 %	-14.17 %
3. Refined Product Consumption, 1985 (Million barrels)	2,480	2,475	2,283
Percent change over Case I	---	- .20 %	-7.94 %
4. Refined Product Consumption, 1990 (Million Barrels)	3,216	3,210	2,590
Percent change over Case I	---	- .19 %	-19.46 %
5. Gasoline Price, 1985 (Cents/gallon in 1978 prices)	$ .71	$ .74	$ .73
Percent change over Case I	---	+3.42 %	+3.38 %
6. Gasoline Price, 1990 (Cents/gallon in 1978 prices)	.71	.74	.74
Percent change over Case I	---	+3.42 %	+3.42 %

likely to impede the exports seriously. The dominant position of Texas refinery industry may enable the state to export a majority of the tax burden. Of course, the extent to which the tax may be exported will affect future refinery expansion in Texas.

CONCLUSIONS

A five percent refinery tax on crude oil inputs at Texas refineries would result in higher refinery product costs to Texas consumers who would buy less and pay more for gasoline and other products. Consumption levels would decrease by 5 million barrels per year by 1985 and the average price per gallon would rise by 3¢. The total bill for Texas refinery products bought by Texans would increase by $2.6 billion by 1985 and $3.4 billion by 1990. The growth of the refinery industry in Texas could be affected; data limitations do not allow evaluation of this possibility. If, however, refinery expansion is impacted such that exports of refinery products to the rest of the nation do not rise above current levels, growth of the Texas economy would be somewhat impacted while increasing the unit cost of refinery products to Texans. If such a refinery growth slowdown occurred, Texas employment and personal income would be affected negatively by 18 thousand jobs (.2%) and $.27 billion (.4%) by 1985.

APPENDIX   D

Correspondence

APPENDIX D1

General

The Attorney General of Texas

November 30, 1978

JOHN L. HILL
Attorney General

Supreme Court Building
P.O. Box 12548
Austin, TX. 78711
512/475-2501

701 Commerce, Suite 200
Dallas, TX. 75202
214/742-8944

4824 Alberta Ave., Suite 160
El Paso, TX. 79905
915/533-3484

723 Main, Suite 610
Houston, TX. 77002
713/228-0701

806 Broadway, Suite 312
Lubbock, TX. 79401
806/747-5238

4313 N. Tenth, Suite F
McAllen, TX. 78501
512/682-4547

200 Main Plaza, Suite 400
San Antonio, TX. 78205
512/225-4191

An Equal Opportunity/
Affirmative Action Employer

Honorable Peyton McKnight
Senate Study to Replace
  Ad Valorem Taxes
P. O. Box 12068
Austin, Texas 78711

Opinion No. H-1264

Re: Whether a tax on crude oil or on refined products is a tax on motor fuels and special motor fuels.

Dear Senator McKnight:

You have requested our opinion regarding a proposed statute which would tax refinery production. Your first question is:

> Would a tax imposed on the fair market value of refinery products, prior to their sale, use, transfer, or other disposition, be, as to that portion applicable to the value of motor fuels, considered a motor fuels tax which would be subject to the requirements of Articles 9 and 10 of Title 122A, Taxation-General, R.C.S.?

Chapters 9 and 10, title 122A, impose a tax on the "first sale, distribution, or use" of motor and special fuels. Attorney General Opinion WW-876 (1960) (defining "first sale"). Tax.-Gen. arts. 9.02, 10.03. The motor fuel tax "shall be in lieu of any other excise or occupation tax imposed . . . on the sale, use, or distribution of motor fuel." Tax.-Gen. art. 9.02(5). The proposed tax on refinery production would be before any "sale, use, transfer, or other disposition" of the motor fuels and therefore would not be a transaction which is taxable under chapters 9 or 10. Thus, the allocation provisions of those statutes would not apply to a refinery tax. However, article 8, section 7-a of the Texas Constitution provides in part:

> Subject to legislative appropriation, allocation and direction, all net revenues remaining after payment of all refunds allowed by law and expenses of collection derived from motor vehicle registration fees, and all taxes, except gross production and ad valorem taxes, on motor fuels and lubricants used to propel motor vehicles over public roadways, shall be used for the sole purpose of . . . [public roads and highways];

provided, however, that one-fourth (1/4) of such net revenue
from the motor fuel tax shall be allocated to the Available
School Fund. . . .

(Emphasis added).

If the proposed refinery tax is an ad valorem tax or a tax on gross production, the revenue need not be allocated pursuant to article 8, section 7a. However, it appears that the proposed tax might be an occupation tax in which case one quarter of the tax revenue is allocated to education under article 7, section 3 of the constitution. Attorney General Opinion V-1027 (1950). As we have not been provided with the precise language of the contemplated statute, we cannot give a conclusive answer as to the character of the tax.

Your second question is:

If the answer to question (1) is in the negative, would the use of current contracts and other sales products make a difference such that the answer to question (1) would become affirmative?

We do not believe that the use of "current contracts and other sales data" as evidence of the market value of refinery production would bring the tax within chapters 9 and 10, title 122A. We believe such information is relevant to a determination of market value. Cf. Tax.-Gen. art. 3.02; Attorney General Opinion M-968 (1971). A refinery's products would be assessable with or without information regarding sales and contracts. The tax would not be contingent on there being a sale, transfer or other distribution.
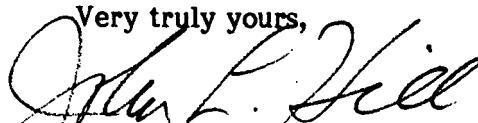
You also ask:

Would an ad valorem tax on the crude oil inputs into the refinery be a motor fuels tax such that the revenues therefrom would be subject to the requirements of Title 122A, Articles 9 and 10?

We do not believe that revenue from a tax on the crude oil received by a refinery for processing is subject to chapters 9 and 10, title 122A. Crude oil does not meet the definition of motor or special fuel and therefore is not taxed under chapters 9 and 10. Tax.-Gen. arts. 9.01(1), 10.02(1), (2).
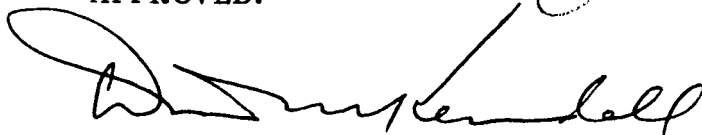
S U M M A R Y

An ad valorem tax on refinery production or crude oil is not subject to chapters 9 and 10, title 122A, Taxation-General.

Very truly yours,

JOHN L. HILL
Attorney General of Texas

APPROVED:

DAVID M. KENDALL, First Assistant

C. ROBERT HEATH, Chairman
Opinion Committee

jsn

MONTANA BUREAU OF MINES AND GEOLOGY
MONTANA COLLEGE OF MINERAL SCIENCE AND TECHNOLOGY
BUTTE, MONTANA 59701
(406) 792-8321

July 21, 1978

Mr. Ken Shepardson
Study Director
The Senate Study to Replace Ad Valorem Taxes
P. O. Box 12068
Austin, Texas   78711

Dear Mr. Shepardson:

Reference is made to your recent phone call and your letter of July 18.

The coal severance tax (Sec. 84-1312 RCM) has been controversial in Montana and elsewhere. As you are aware, a suit has been filed against the state by a group of midwestern utilities, and although the attorneys for the state are confident of winning, I have strong doubts.

Answers to your questions are as follows:

1. Has the new coal severance tax had any effects on coal production in Montana?
    To the best of my knowledge the answer is yes--more contracts have gone to Wyoming, and none of the current producers have cited any new contracts. Further, one utility (Basin Electric) chose to site its new generating plant south of the Montana border--partly because of the severance tax. Other corporate entities considering Montana coal mining ventures have expressed opinions that the tax is high, but that they may have to come into Montana anyway.

2. Has the severance tax had any effect on out-of-state sales of coal? Specifically, has the severance tax caused out-of-state sales of coal to decline either in numbers or in amounts purchased, or both?
    This is difficult to answer because of contracts entered prior to establishment of the tax. Coal production in Montana, however, has not grown as much as expected. Wyoming production, on the other hand, has increased rapidly.

3. Has the severance had any effects on marginal coal producers, if any, in Montana?
    A slight adverse effect compounded by other factors caused an increase in imports of furnace coal from Wyoming.

4. Have the coal producers been able to pass through the full amount of the tax to purchasers, both in state and out of state, or have the producers been able to pass through only a portion of the tax and been forced to absorb the rest?

Answer: They pass it through, but the utilities who buy the coal are stuck with Public Service Commission rate posting. That is one of the reasons behind the suit.

I am sending copies of this letter to the Montana Coal Council and the Montana Taxpayers Association, in the hope that they may have some pertinent facts to add.

Sincerely,

S. L. Groff, Director
and State Geologist

SLG:jd

Copy to Montana Coal Council
        Montana Taxpayers Association

ARCO/Chemical Company   Division of AtlanticRichfieldCompany
3500 Entex Building
1200 Milam Street
Houston, Texas 77002
Telephone 713 654 4602

C. J. Francisco
Vice President
Strategic Materials

September 28, 1978

Ken Shepardson, Study Director
The Senate Study to Replace Ad Valorem Taxes
P.O. Box 12068
Austin, Texas 78711

Dear Mr. Shepardson:

I have been giving considerable thought to your August 30
letter requesting our views on the impact of taxes in
selecting a location in which to conduct business.   In
order to clarify my thinking, I have recast the inquiries
you made into a question and answer form.   I hope this
is satisfactory to you.

> Q.   What types of taxes are important to business
> location questions and which taxes would be
> less important?

> A.   In evaluating site locations, the magnitude of
> the tax is more relevant than the type of tax.
> It can vary widely between locations under
> consideration.

> Q.   How would a shift from a general property tax
> to a refinery tax affect a decision such as the
> one ARCO Chemicals has made?

> A.   As you point out in your letter, decisions relating
> to site selection may be significantly impacted by
> a tax burden if all other factors are equal.   As
> you know, labor costs and labor availability, raw
> material supply and market distribution, etc.,
> have a significant relevance in decisions of this
> type and are never equal in evaluating alternative
> sites.   Whether a refinery tax would change our
> decisions or alter proposed plans is contingent on
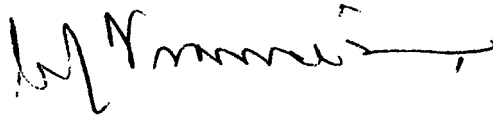> too many unknown factors to address at this time.

Q. How would other types of tax affect business
in Texas (i.e., sales, income, value-added,
etc.)?

A. We realize your study committee is charged
with the difficult task of evaluating alternative
types of taxes so that a portion of the ad
valorem tax support of schools may be elimi-
nated. We are pleased this issue is getting
such careful consideration, since administration
of taxes at best may be minimally discriminatory,
and at worst deliberately and unnecessarily
biased where a burdensome tax is imposed on
a limited segment of the population. Therefore,
a shift to some other type of tax could sub-
stantially increase taxes for one group of
taxpayers (business) and not another.

Q. Has something happened in the last year to
mitigate the effect of a refinery tax so that
Texas remains an attractive site for a new plant?

A. When the 5% tax on crude oil input to a refinery
was not enacted last year, we interpreted this
as reassurance that Texas would not permit tax
discrimination against refining/fuel marketing
and the petrochemical industries.

Q. Does Texas still have such a good "business
climate" that a 5% tax would not lead a company
to choose a non-Texas site?

A. We have considered Texas to have a "good business
climate". It has been possible to project taxes
for several years with some degree of accuracy.
Should it become apparent that the ad valorem
tax system, the cornerstone of which is equity
between taxpayers, may be replaced by a discrimi-
natory tax, the decision making process for selection
of a new plant could be affected. An abrupt or
imminent major change in projected taxes may com-
plicate the final evaluation of a proposal by injecting
doubt of its future profitability.

Given the time constraints of a prompt answer and the complexities of the subject matter, I have attempted to be helpful in this reply. It would be necessary for us to spend a considerable effort in a comprehensive study of the broad question of alternate forms of taxation.

In the future we would welcome the opportunity to discuss with you specific proposals being considered by your committee.

Very truly yours,

CJF/df

August 24, 1978

Mr. Ken Shepardson
Study Director
The Senate Study to Replace Ad Valorem Taxes
P.O. Box 12068
Austin, TX 78711

Dear Mr. Shepardson:

As you noted, your questions regarding the international refining industry are complex. It would take several days work to fully develop answers, which would still be fraught with uncertainties.

The term "capacity" is too simplistic. This has historically been defined as crude oil distillation capacity and used to measure the health of the industry. But Europe's growth in "capacity" in the late 1960's and early 1970's was interpreted as a sign of health. It was actually the first symptom of future illness. In short, growth in refining capacity is meaningless unless the downstream facilities are capable of turning out the products needed.

But I'll try to hit the high spots and give a few references.

1. Yes European refiners will be in a better position to meet their rising demand for premium type gasoline. But their plans are geared to meeting internal demand (also including home heating oil from cat crackers). Unless their gasoline market falls apart, few if any would be in a position to make unleaded gasoline for export to the U.S. Even with this round of expansion, they are not close to U.S. octane producing capability. Also Germany currently has more severe lead restrictions than the U.S. (OGJ, Nov. 28, '77, p. 55).

The current cracking expansion in Europe will have little effect on the U.S.

2. I seriously doubt if the U.S. will be importing more gasoline. First, few refiners can supply the quality we need and gasoline demand is expected to plateau in this country in 1979 or 1980 due to federally mandated fuel economy standards for passenger cars. Light trucks are exempted and of course one already sees the popularity of these vehicles. So future demand is not totally clear.

3. I have no expertise on gasoline pricing. Gasoline in this country is under price control. The Europeans must make their gasoline from crude oil selling at the world price. U.S. refiners are processing artifically cheap crude.

4. Growth in capacity elsewhere will have little impact on the U.S. as long as crude oil processed here is artifically cheap. Also growth is academic. Caribbean refiners, who were historically big suppliers of heavy fuel oil to the U.S., have a large surplus of capacity for making low sulfur heavy fuel oils. This would be the natural source to tap first if the U.S. had to up its import needs.

5. There are some natural forces at work in the U.S. to increase refining capacity. If coal does not fill the energy gap in the coming years, petroleum products will have to. I am betting on petroleum.

An unnatural force is the low cost of petroleum products here, which stems from price controlled old crude. This spurs consumption and continuing inflation and devaluation of the dollar.

Continuing price controls on half the product barrel (gasoline and jet fuel) however dampen these forces for domestic expansion. There is an exception however. Small refiners are now subsidized under the entitlements program. This has led to a proliferation of inefficient, inflexible plants.

If the price of domestic crude were brought up to world levels via taxes or the free market, product demand growth would probably be crimped, lessening the need for regular, big expansion of domestic capacity. And the dollar would probably strengthen. But, foreign refiners, particularly in the area of heavy fuel oil, would be better able to compete in the U.S. market.

Please see the refining section of our special Petroleum 2000 issue for some outlook on the future. It is available from our Tulsa offices.

As I mentioned earlier, "capacity" is too simplistic a term to describe the status of the refining industry. U.S. refiners are facing millions of dollars in investment in converting their refineries to handle sour crude (See OGJ, Oct. 10, '77, p. 39). Little of this outlay will show up in increased "capacity."

If the refining industry in Texas can match its configuration with product demand and available crude it will stay healthy without big gains in capacity.

One avenue you should explore is the growing integration of refineries with ethylene (or olefins) plants, or petrochemicals.

The huge ethylene industry here was built on cheap liquified petroleum gas. As reserves of natural gas decline, these feedstocks will diminish in importance.

The ethylene industry in the U.S. is now turning to refineries for its feedstocks, such as naphtha and gas oils.

Sincerely,

L. L. Aalund

LRA/lrj

My name is Edward H. Coltharp. I reside in Abilene, Texas. I am Executive
Vice President of the West Texas Chamber of Commerce. This statement is submitted on
behalf of the West Texas Chamber of Commerce which serves 132 counties in West Texas.

Since 1918, when the West Texas Chamber of Commerce was formed, it has been
working to improve the quality of life for all West Texans. From its beginning the
chamber has adhered to the basic position that the primary ingredient for a quality
life is a good job or a good profitable business. If one could achieve either, then
one would have the time, money and inclination to bring into being those educational,
civic, religious, cultural and recreational activities and institutions that add to and
enhance our lives.

Therefore, creating more and better job and profit opportunities has been and
is today the major concern of the West Texas Chamber of Commerce. Our members and
over 150 local chambers of commerce in West Texas have worked long and hard and have
spent a tremendous amount of money to create and maintain a govenmental climate that
will attract and create new job and profit opportunities for all Texans. Great progress
is being made.

For many years West Texas witnessed an out-migration of its population due to
lack of employment opportunities or underemployment.

Since 1970 we in West Texas have, through plenty of hard work and capital in-
vestment, reversed that trend. We estimate that we must create a minimum of 5,000
new jobs and the necessary profit opportunities that will create those jobs each year
just to take care of our West Texas young people as they are ready to enter the job
market.

The West Texas Chamber of Commerce stands opposed to a tax that in its opinion
would result in an unacceptable adverse impact on the oil and petrochemical industry
in West Texas, the area's greatest contributor economically.

Too many Texans have worked too hard and too long to stand for this drastic
change in Texas tax policy. A policy that would set a very devastating precedent of
a selective manufacturer's or processor's tax.

In the last ten years Texas has been remarkably successful in attracting
new industry and encouraging existing industry to expand. This success has been the
envy of much of the nation and it has been accomplished largely because of a state
and local government attitude that encouraged industry to locate here or to expand
the operations already here. All Texans have benefited enormously because of this
success. More and better job and profit opportunities were created, the tax base
was enlarged and more and more funds were available for contributions to churches,
schools, cultural activities and recreational facilities.

The petroleum industry is the number one economic factor in West Texas. It
creates more job and profit opportunities and pays more taxes than any other industry
in West Texas and I suspect the same is true for all of Texas. Anything that ad-
versely affects the petroleum industry will immediately adversely affect all West
Texans, and I expect the same is true for all Texans.

We, in West Texas, still have high hopes that refining of Alaska crude will
give us still more job and profit opportunities. But such will not be the case if
a refinery tax is enacted.

In our opinion, if a refinery tax is enacted, then Texas will lose the
Alaskan crude refining business almost certainly. Plus we believe that the refiner-
ies in Texas would abandon any plans to expand and would immediately begin to shift
refining to other states where they would not be at a competitive disadvantage.
And, as Texas refineries wear out they would cease to be profitable and will grad-
ually close down.

(over)

We know that at the present time approximately 10% of the nation's refinery capacity is unused and with the modern system of crude oil transportation it would be quite simple and quick to begin to direct crude oil from Texas refineries to refineries outside the state. For the small and independent refineries whose operations are confined to Texas, a refinery tax could be the beginning of their end.

About 46% of the nation's petrochemical capacity is now in Texas and in our opinion what would happen to Texas refineries would also happen to the Texas petrochemical industries.

What we need from the Legislature is action that would encourage Texas refineries and Texas petrochemical plants to increase their activities and investments and create more jobs and profits instead of less jobs and profits.

Some proponents of this tax say that it would not affect the output of Texas refineries and that a large part of the tax would be paid by out-of-state people. We disagree because our figures show that at the present time only 55% of the Texas refinery output goes out-of-state. Forty-five percent is bought by Texans and our estimate is that Texans would pay substantially more per gallon because of the tax.

In the final analysis in our opinion we are talking about two things: (1) Jobs for Texans, and (2) profit opportunities that will yield more taxes in the long run than would be added by a refinery tax. If the tax is enacted in our opinion jobs now held by Texans and profits invested in Texas and taxes now being paid to Texas will be forced out of the state. And, we are not talking just about jobs, profits and taxes of the refineries, but also about the jobs, profits and taxes that are created by the vast number of other businesses and industries that are dependent upon the refineries. According to the U. S. Department of Interior, Texas refineries and petrochemical plants provided over 100,000 jobs during 1977 and we estimate that there are 500,000 jobs in related trades and services.

Finally, one of the distinct possibilities that begins to raise its head when we think about a manufacturer's tax is, what will a future legislature do when taxes from the refineries begin to shrink as they surely will?

Who will be the next industry to be selected for a processing or manufacturing tax? The meat packers, the cotton gins, the milk product plants, the vegetable and fruit processors? You know, I am sure, that agriculture is the next largest industry in Texas.

How are we going to convince the next industrial plant location team who visits West Texas or Texas that their particular industry won't be next in line to be selected for a similar tax?

This radical change in Texas tax philosophy will create an uncertainty over future selective tax policy and evidence emerging apparent hostility by the Texas Legislature toward industry that will fatally destroy Texas' reputation for a favorable climate for attracting investment and jobs to Texas.

If the other states that we have been so successful in getting industry to move to Texas from could have a choice in what they could do to stop this movement of industry into Texas, I firmly believe it would be to get the Texas Legislature to establish this kind of tax.

Gentlemen, for the sake of thousands of present jobs and thousands of future jobs for Texans, do not recommend refinery tax legislation.

Texas needs more jobs, not less and I can't believe that this committee will be the one to begin to destroy present and future jobs for Texans by advocating a counter productive tax on this crucial industry.

2

APPENDIX   D2

Responses from Refiners

FINA

AMERICAN PETROFINA, INCORPORATED

POST OFFICE BOX 2159 · DALLAS, TEXAS 75221

C. W. SHOUSE
VICE PRESIDENT

November 10, 1978

Mr. Ken Shepardson, Study Director
The Senate
Study to Replace Ad Valorem Taxes
P. O. Box 12068
Austin, Texas 78711

Dear Mr. Shepardson:

Almost two years ago, in March 1977, before the Texas House
Ways & Means Committee, I presented testimony as group vice
president, Refining, American Petrofina, Incorporated, in
opposition to the refinery tax bill, HB 1200. In the meantime,
our position on a "refinery tax" has not changed.

As an interested party, I submit the attached statement to be
considered with other input received during the public hearings
on November 9 and 10 conducted as a part of the Senate study
to replace ad valorem taxes.

If you desire amplification on any point, or additional data,
please do not hesitate to contact me.

Very truly yours,

C. W. Shouse

CWS:pv
Att.

cc: Mr. W. H. Abington (w/att.)
     Mr. John W. Wagner   "
     Mr. Joe A. Moss   "

STATEMENT OF

C. W. SHOUSE

My name is C. W. Shouse. I represent American Petrofina,
Incorporated.

American Petrofina, Incorporated, with corporate headquarters
in Dallas, Texas, owns and operates two refineries, both located in Texas,
having a total capacity of about 150,000 barrels per day. These refineries,
located at Big Spring and Port Arthur, provide jobs for 1,325 Texans
directly and several times that number when sales and distribution of
the refined products and services for the plants are considered.

The effect of the proposed refinery tax would be so devastating
that American Petrofina would probably have to abandon operations at one or
both of its refineries. Because most of our products are sold in competition
with refineries from states other than Texas, we would not be able to pass
along the tax to non-Texas customers who make up 69% of our market. Much
of our Texas gasoline business is in border areas along the New Mexico,
Oklahoma and Louisiana state lines and we, along with independent jobbers
who market our products at the retail level, would experience extreme
financial difficulties due to competition from refiners within those states
whose plants are located near the state lines. We are within 50 to 100
miles of 75,000 barrels per day of refining capacity in New Mexico, and
420,000 barrels per day in Louisiana. A 5% refinery tax which would be
levied upon our operations would be almost as much as American Petrofina's
total earnings in 1977, which were $38,064,000. Further, none of these
earnings were attributable to refining activities. They came solely from

the production of crude oil, natural gas and the manufacture and sale of petrochemicals and plastics. Obviously, we simply could not support any significant part of an additional $30 million plus levy. From reading the financial reports of others in the refining industry, I believe that we are reasonably typical. It is also obvious that we are not in a position to move to another state. A "refinery tax" would simply cut off our roots by making uneconomic the refining, pipeline, petrochemical and marketing investment which we have made here since our incorporation twenty-two years ago.

CROWN CENTRAL PETROLEUM CORPORATION

PRODUCERS · REFINERS · MARKETERS OF PETROLEUM PRODUCTS AND PETROCHEMICALS

P. O. BOX 1759. HOUSTON. TEXAS 77001

JAMES A. ROBINSON
VICE PRESIDENT - REFINING

November 10, 1978

Mr. Ken Shepardson, Study Director
The Senate Study to Replace Ad Valorem Taxes
P. O. Box 12068
Austin, TX   78711

Dear Mr. Shepardson:

We would like to submit the following comments to the Committee regarding the study to replace Ad Valorem Taxes by the imposing of a 5% tax on the crude oil input in our Texas Refinery.

Crown Central Petroleum Corporation has been an employer and corporate taxpayer in the State of Texas for over fifty years. Our primary business is that of an independent refiner-marketer of petroleum and petroleum products. However, we are also engaged in exploration, production and transportation of crude oil. We purchase over 95% of our crude oil from others. Our only refinery, which has a nominal crude capacity of 100,000 barrels, is located on the Houston Ship Channel near Pasadena, Texas. Historically, most of the crude oil processed in our refinery was produced in Texas. However, because of the declining domestic production, we have become dependent upon foreign sources for over 65% of our refinery's requirements.

Approximately 450 of the company's employees are directly engaged in the operation of our refinery. In addition, Crown employs exploration, production, pipeline and staff personnel in various parts of the State and Houston offices. The company spends significant funds in connection with contract labor and personnel in Texas. In 1977, the refinery payroll alone was in excess of $10 million, and the company paid over $2 million directly to the State of Texas for property and franchise taxes.

Crown has grown from a relatively small company into a substantial employer and taxpayer in the State of Texas as the result of having become a significant marketer of petroleum products, particularly gasoline, in the southeast and the east coast of this country. In fact, more than 85% of our 1977 product sales occurred in these markets. Our principal competitors are other independent refiner-marketers whose refineries are located outside the State of Texas.

The marketing of petroleum products is a highly competitive business where .10 of a cent makes a significant difference. If Crown were required to pay the proposed 5% tax on the crude charge, we feel that we would be unable to pass these added costs through to our customers in our marketing areas while competing with companies that do not experience that cost. As a result, we feel we would be forced to absorb these taxes in order to remain competitive in the marketplace. Moreover, since we do, at times, refine crude oil under processing agreements to others, we would have to absorb this tax in our processing fees or these firms would look for non-Texas refiners to perform that task for them.

The refining and marketing of petroleum products is not only highly competitive, it is a business where profit margins are slim. Crown's total 1977 profits were equivalent to less than 1¢ per gallon on sales, which included profits from activities other than refining and marketing. At 1977 crude oil prices, the proposed 5% tax would impose a tax of approximately 1 1/2¢ per gallon on the refinery production for that year. Based on current crude oil prices, this tax would require Crown to pay more than $24 million in taxes in 1977. Our net profits from all operations, including refining, before federal income taxes, were $21.9 million in 1977. This tax of $24 million would exceed the total net profits earned before federal income taxes in one of the company's best years.

Crown is but one example of the many independent refiners that would sustain immediate, severe, and irreparable financial problems if this tax is imposed. Even major domestic refiners and multi-national oil companies would reconsider their capital expenditure programs for the future and continued operation of their Texas refineries.

The enactment of this tax would also impact adversely on the Texas petrochemical industry and other related petroleum industries in the State. The imposition of this tax can change the attitude of other States with regard to refinery siting. Many states that formerly opposed the location of refineries within their bounderies may have reversed their position by now, realizing the benefits of a local supply and overall economic benefits that refineries and associated petrochemical plants can bring to their citizens.

The imposition of this tax would further limit the ability of Texas refineries to compete with refined petroleum products imported from off-shore. The problems associated with the rising cost of State government cannot be resolved by impairing the economic viability of the State's two largest industries. Shifting the tax burden in such a punitive manner will, in the end, cause the State a loss of revenues.
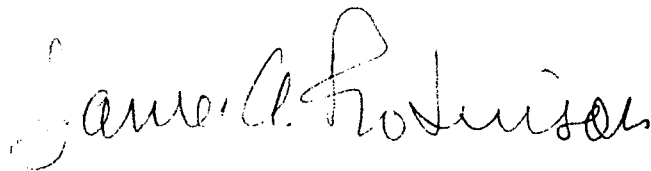
        We urge that you consider this matter carefully. We believe that an in-depth economic analysis will prove that this tax will be detrimental to the welfare of the people in the State of Texas.

        I would like to take this opportunity to thank you for your consideration in this matter.

Very truly yours,

CROWN CENTRAL PETROLEUM CORPORATION

JAR:EH

November 20, 1978

Mr. Ken Shepardson
Study Director
The Senate Study to Replace Ad Valorem Taxes
P.O. Box 12068
Austin, Texas   78711

Dear Mr. Shepardson,

Thank you for the opportunity to appear at the hearings on The Senate
Study to Replace Ad Valorem Taxes with a 5% Tax on Crude Inputs.

If you need any further information please contact me in San Antonio.

Very truly yours,

PIONEER REFINING, LTD.

J. E. Campion, Executive Vice President
Tomlinson Refining, Inc.
General Partner

JEC:ew

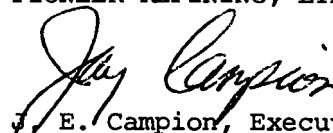STATEMENT REGARDING THE SENATE STUDY TO REPLACE AD VALOREM
TAXES WITH A 5% TAX ON REFINERY CRUDE INPUTS

My name is Jay Campion. I am with Pioneer Refining, a small, independent

refiner located fifty (50) miles southeast of San Antonio. To best present

our viewpoints and comments regarding the effects of a 5% tax on crude oil

inputs, I would like to review Pioneer's position and experience as a refiner

and marketer in South Texas. Pioneer is capable of processing 6,000 barrels

per day of crude oil, and our principal products are light and heavy straight

run naptha, kerosene, diesel fuel, gas oil and residual fuel oil. With the

exception of residual fuel oil, which is currently transported to Corpus Christi,

our refined products are normally sold in the highly competitive San Antonio

market. Exxon, Texaco, Mobil and Coastal States all have terminaling facilities

in San Antonio. Sigmor has recently expanded its Three Rivers refinery and

is completing an eight inch products' pipeline into the city. Tesoro in

Carrizo Springs and Howell in San Antonio also compete in this marketplace.

As an indication as to just how competitive the San Antonio market is,

in October a reasonably small refinery with an over supply of diesel fuel

entered the San Antonio market at two to three cents per gallon below the

posting of all other suppliers. This action and this refiner's relatively

small volume of diesel fuel was adequate enough to drop the prices in San

Antonio to the extent that it was more profitable for Pioneer to transport,

by truck, diesel fuel to Corpus Christi incurring a one and one-half cent per

gallon additional freight cost than to sell that product in San Antonio. On

the other hand, just a few short months ago due to over supply in the Corpus

area, diesel fuel moved the 140 to 150 miles up into the San Antonio market which

again affected local supply and prices. This is healthy and desirable competition; and, a good example of the economics of supply and demand at work, a key function in our free enterprise system.

Pioneer's point is that, in our opinion, Texas refiners will not be able to pass through a 5% cost increase brought about by a tax on refinery inputs. Increased crude oil costs do not necessarily result in corresponding increases in the selling prices of refined products. For example, the upper tier posted price for South Texas light crude oil increased $1.18 per barrel from June, 1977 to June, 1978, but there were no corresponding increases in the selling prices of refined products over that same time period. Pioneer's diesel fuel was selling for $.3325 per gallon in the summer of 1977. It increased through 1977 to a high of $.34 per gallon in December but immediately decreased in February, 1978, to $.335 per gallon where it remained until September, 1978. Therefore, we saw a net effect of only $.0025 per gallon or $.10 per barrel on diesel fuel. The residual fuel oil market was disastrous. Most, if not all, refiners lost money on residual fuel oil sold during the winter months. Although prices inched their way up to $11.90 per barrel in May, 1978, the Department of Energy's announcement of a retroactive entitlement program for East Coast imported residual fuel oil caused the prices to drop to an all time low in a fifteen month period of $10.00 per barrel - anywhere from $1.00 to $2.00 per barrel below net crude cost. Naptha prices which remained fairly constant during that twelve month period did increase substantially through the late summer months of 1978. Assuming a generous one cent per gallon price increase in the twelve months June '77 - June '78 with naptha representing anywhere from 25% to 40% of the initial cut of the crude barrel, combined with

the $.10 per barrel increase in diesel prices only $.40 to $.60 of the $1.18 per barrel crude-cost increase was recovered during those twelve months. As crude oil posted prices are continuing to increase per Department of Energy regulations, having to absorb an additional 5% cost increase would cause severe financial hardship. Pioneer, for example, having realized a net income before taxes of $585,000 for the eleven months ended August 31, 1978, would, with all other factors being equal, have incurred a $238,000 net loss if a 5% tax was imposed on the value of our crude inputs for this eleven month period. Pioneer could not absorb such a loss on a continuing basis and remain economically and financially viable. (The $585,000 before tax income represents only a 3.2% margin on sales, leaving very little room for either decreased revenues or increased cost of crude oil) The loss of Pioneer Refining as a viable employer in a rural South Texas area or the loss of any refining capability in Texas would cause substantial and irreparable harm to many communities. Pioneer pays some $400,000 in salaries and wages, and purchases several hundred thousand dollars of goods and services per year from independent business in San Antonio and rural South Texas.

Although I am not familiar with the other refined product markets throughout Texas, I do not believe there is any significant difference between these other markets and San Antonio. Although we are affected by products being brought in to the Corpus Christi area, those Texas refiners located closer to Louisiana and Oklahoma will probably incur even greater losses in having to compete with out of state refined products with a $.60 to $.70 per barrel disadvantage.

We therefore believe that the imposition of a refinery tax on crude inputs would have far reaching disastrous effects on the Texas oil industry, our employees, and those businesses providing goods and services to the industry.

Thank you for this opportunity to present our views on the Senate Study to Replace Ad Valorem Taxes with a 5% Tax on Crude Inputs.

J. E. Campion
Pioneer Refining, Ltd.
San Antonio, Texas

November 10, 1978

RAC: 747-78
File: 219.090

UNI⑦N

Robert A. Campbell
Manager, Beaumont Refinery

November 8, 1978

Mr. W. H. Abington
Executive Vice President and
General Counsel
Texas Mid-Continent Oil and
Gas Association
201 Vaughn Building
Austin, Texas 78701

Dear Mr. Abington:

The Union Oil Company of California operates a 120,000 barrel
refinery at Beaumont, Texas. We are concerned about the pro-
posed 5% tax on the value of crude oil input to refineries in
Texas and are opposed to this tax for the following reasons:

> This tax would place all refiners in Texas at
> a competitive disadvantage with refiners from
> other states by approximately 1 1/2 cents per
> gallon.
>
> Texas refiners would be less competitive in
> Colonial Pipeline.
>
> Crude oil currently moves via the CAP line
> from the Gulf Coast to Chicago for approxi-
> mately 3/4 cent per gallon or one-half the
> cost of the proposed tax of 1 1/2 cents per
> gallon. Thus, refiners in Chicago would
> have the advantage over coastal refiners
> in Texas.

We feel that the 5% tax would result in a shift of crude runs
out of Texas and a loss of industrial production and labor in
Texas.

Yours very truly,

Robert A. Campbell

COB/bjw

WRITTEN STATEMENT

OF

UNION OIL COMPANY OF CALIFORNIA

ON

REFINERY TAX PROPOSALS

For Submittal to

THE SENATE STUDY TO REPLACE AD VALOREM TAX

Austin, Texas

November 16, 1978

The Union Oil Company of California operates a 120,000 barrel refinery at Beaumont, Texas and we appreciate the opportunity to submit our views on the Texas Refinery Tax issue. We are concerned about the proposed 5% tax on the value of crude oil input to refineries in Texas and are opposed to this tax for the following reasons:

> This tax would place all refiners in Texas at a competitive disadvantage with refiners from other states by approximately 1 1/2 cents per gallon.

> Texas refiners would be less competitive in Colonial Pipeline.

> Crude oil currently moves via the CAP line from the Gulf Coast to Chicago for approximately 3/4 cent per gallon or one-half the cost of the proposed tax of 1 1/2 cents per gallon. Thus, refiners in Chicago would have the advantage over coastal refiners in Texas.

We feel that the 5% tax would result in a shift of crude runs out of Texas and a loss of industrial production and labor in Texas.

We trust that the above brief comments will be helpful to the committee in evaluating the proposed tax.

WINSTON REFINING COMPANY

P. O. BOX 1508

FORT WORTH, TEXAS 76101

November 8, 1978

Mr. Ken Shepardson, Study Director
The Senate Study to Replace Ad Valorem Taxes
Post Office Box 12068
Austin, Texas   78711
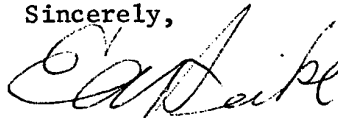
Dear Mr. Shepardson:

Winston Refining Company owns and operates a small petroleum refinery located
at Fort Worth, Texas. It has a capacity of 20,000 barrels per day. The effect
of a 5% tax on the value of crude oil charged to the refinery would be consider-
able, and we therefore would strongly oppose the tax for the following reasons.

1. Since it would not be possible to increase refined product prices, as
    the Texas market place is supplied by out-of-state refiners as well
    as Texas refiners, the 5% tax would represent an additional cost.
    In the case of Winston, this would result in a pretax loss of about
    1.7 million dollars instead of the pretax profit of 1.6 million
    dollars which was earned in the 12 month period ending June 30, 1978.

2. The result of the institution of the 5% tax would cause the reduction
    of crude oil refined in Texas and the subsequent increased importation
    of refined products and thus have a depressing effect on Texas re-
    finers. As a matter of fact, this could cause the shutdown of some
    Texas refineries with a resultant loss of jobs.

3. This tax would be a very narrow based tax and it could have a punitive
    effect on the refining industry in the State of Texas. As such we
    would feel that it is not equitable since it focuses on one industry
    alone. We believe that attention should be paid to broader base
    taxation rather than this one.

It is for these reasons that Winston Refining Company strongly urges that your
study with reference to the 5% refinery tax give full recognition to the effect
this tax would have on crude oil refining in the State of Texas.

Sincerely,

E. A. Heike
President

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APPENDIX   E

MISCELLANEOUS INFORMATION

Refinery Construction - United States

New and Expanded Facilities

Company and Location	Project	Capacity b/d
Amoco Oil Co., Texas City, Texas	Cat reform	14,000
Ashland Petroleum Co.	Cat reform	20,000
Canton, Ohio	Crude	45,000
Catlettsburg, Ky.	Cat reform	27,000
	hf alky	11,000
	Light ends	33,000
Atlantic Richfield Co. Carson, Calif	Crude	130,000
	Cat reform	3,000
Cherry Point, Wash.	Coke calcine	1,480 t/d
	Cat reform	5,500
Houston, Tex	Cat reform	2,000
Philadelphia, Pa.	FCC	29,000
Beacon Oil Co. Hanford, Calif.	Crude	2,700
C&H Refinery Inc. East Coast	New ref	30,000
	Gas oil crack	12,000
	Vac	30,000
	BTX	30,000
	Asphalt	3,500
Calcasieu Refining Ltd. Lake Charles, La.	Crude	3,000
Cascade Energy Co. Ranier, Ore.	New ref	30,000
Cities Service Co. Lake Charles, La.	Crude	23,000
Clark Oil & Refining Corp. Blue Island, Ill.	Crude	5,000
	Cat reform	2,800
Hartford, Ill.	Crude	5,000
Continental Oil Co Commerce Ciey, Colo.	Cat poly	1,000

Company and Location	Project	Capacity b/d
Lake Charles, La	Crude	74,000
	Vac dist	26,000
	FCC	30,600
	Desulf	41,400
	Cat poly	300
Wrenshall, Minn	Cat reform	400
	Cat HDT	400
CRA Inc. Coffeyville, Kan.	Crude	17,130
	Vac dist	6,845
	FCC	4,500
	Cat reform	7,000
	Cat HDT	6,100
Crown Central Petr. corp. Houston, Tex	Cat reform	22,000
	Cat HDT	22,000
Delta Refining Co. Memphis, Tenn.	FCC	25,000
	HDS	. . . . .
Diamond Shamrock Corp. Sunray, Tex.	FCC	32,500
Dow Chemical Co. Brazosport, Tex	New fef	210,000
	Resid	63,000
	Hydrofine	48,000
	Hydrofine	32,000
	Hydrogen	60 MMscfd
	Light ends	6,000
	Amine treat	3,000
Eddy Refining Co. Houston, Tex	Cat reform	1,500
Exxon Co. Bayway, N.J.	Isom	35,000
Getty Refining and Marketing Co. Delaware City, Del.	Arom-toluene	2,500
El Dorado, Kans.	Cat reform	3,500
	Cat HDT	5,000
Gulf Oil Co. Alliance Belle Chasse, La.	FCC	11,000
Port Arthur, Tex.	Cat reform	40,000
	Cat HDT	40,000
	Arom	3,000

Company and Location	Project	Capacity b/d
Hampton Roads, Energy Co. Portsmouth, Va.	New ref	183,000
	Cat reform	29,838
	Hydroref	78,487
	Hydroref	56,858
	Cat HDT	40,250
	Isom	1,695
	Isom	11,607
	Hydrogen	70 MMscfd
Hill Petroleum Co. Krotz Springs, La.	Ref expan	30-000
Howell Corp. Corpus Christi, Tex.	Crude	20,000
	Vac dist	10,000
	Cat hycrack	10,000
	Hydrogen	22.0 MMcfd
International Processors St. Rose, La.	New ref	30,000
Kern County Refinery Inc. Bakersfield, Calif.	Crude	12,100
Kerr-McGee Refining Corp. Wynnewood, Okla.	FCC	8,500
	Cat reform	8,500
	Cat HDT	9,000
	Cat HDT	6,500
	Asphalt	4,250
LaGloria Oil & Gas Co. Tyler, ex.	Crude	16,700
	FCC	6,485
	Cat reform	6,129
	Cat HDT	10,295
	Alky	1,729
	Isom	3,412
	Coke	81t/d
Lake Charles Refining Co. Lake Charles, La.	New ref	10,000
Lion Oil Co. Bakersfield, Calif.	Cat reform	1,500
	Cat HDT	1,800
El Dorado, Ark.	Cat reform	1,250

Refinery Construction cont.

Company and Location	Project	Capacity b/d
Marathon Oil Co. Garyville, La.	FCC	75,000
	hf alky	20,000
	Butane isom	7,000
Mobil Oil Corp Paulsboro, N.J.	FCC	30,000
Mobile Bay Refining Co. Chickasaw, Ala.	Crude	12,000
Mohawk Petroleum Corp. Inc. Bakersfield, Calif.	Crude	10,200
	Vac dist	9,900
	Cat reform	6,000
	Hydroref	11,600
	Cat HDT	6,000
Mt. Airy Refining Co. Mt. Airy, La.	Ref expan	12,400
	Vac	25,810
	Naph desulf	35,420
	Penex	7,840
	Platform	28,815
	Atm gas oil	36,000
	Vac gas oil	17,130
	Isomax	43,840
	Hydrogen	32 MMscfd
Western Refining Co. Inc. Woods Cross, Utah	Cat reform	3,000
Young Refining Co. Douglasville, Ga.	Cat HDT	800

RANK OF REFINING STATES

Rank	State and Number of Plants	Crude Oil Capacity*	Percent of U.S.
1.	Texas (53)	4,597,075	27.29
2.	California (40)	2,373,933	14.09
3.	Louisiana (23)	2,097,616	12.45
4.	Illinois (12)	1,181,250	7.01
5.	Pennsylvania (10)	801,620	4.76
6.	New Jersey (4)	644,000	3.82
7.	Ohio (7)	589,950	3.50
8.	Indiana (7)	576,650	3.42
9.	Oklahoma (12)	547,775	3.25
10.	Kansas (11)	456,295	2.71
11.	Washington (8)	381,950	2.27
12.	Mississippi (5)	328,541	1.95
13.	Minnesota (3)	217,800	1.29
14.	Wyoming (13)	190,880	1.13
15.	Kentucky (4)	166,470	.99
16.	Utah (9)	158,335	.94
17.	Montana (7)	157,181	.93
18.	Michigan (6)	152,200	.90
19.	Delaware (1)	140,000	.83
20.	New Mexico (8)	115,680	.69
	All Other States (42)	973,483	5.78
	Total U.S. (285)	16,848,684	100.00

*Barrels per calendar day, January 1, 1978
SOURCE: The Oil & Gas Journal

6/26/78

TEXAS REFINERY RECEIPTS OF CRUDE OIL

(Thousands of Barrels)

By Source of Origin:

Year	Intrastate	Interstate	Foreign	Total
1967	710,489	251,465	-0-	961,954
1968	735,130	264,682	-0-	999,812
1969	766,763	251,444	-0-	1,018,207
1970	794,407	246,687	-0-	1,041,094
1971	796,387	250,103	17,707	1,064,197
1972	860,768	228,246	23,552	1,112,566
1973	863,495	181,943	128,872	1,174,310
1974	803,030	158,596	227,065	1,188,691
1975	765,811	138,001	308,619	1,212,431
1976	727,736	123,976	456,114	1,307,826
1977	711,956	127,170	594,561 (41%)	1,433,687

By Method of Transportation:

Year	Pipelines	Tank Cars and Trucks	Tankers and Barges	Total
1967	805,556	8,625	147,773	961,954
1968	828,752	9,982	161,078	999,812
1969	858,704	9,473	150,030	1,018,207
1970	892,731	9,857	138,506	1,041,094
1971	901,035	7,527	155,635	1,064,197
1972	951,161	8,783	152,622	1,112,566
1973	920,765	9,619	243,926	1,174,310
1974	857,158	13,506	318,027	1,188,691
1975	812,550	15,285	384,596	1,212,431
1976	791,475	12,607	503,744	1,307,826
1977	770,120	15,819	647,748	1,433,687

SOURCE: U.S. Department of Energy

6/26/78

TEXAS CRUDE OIL PRODUCED AND TEXAS REFINERY INPUT

(Thousands of Barrels)

Year	Crude Oil Production	Crude Oil Refinery Input	Percent Input to Production
1929	296,876	211,693	71.3
1930	290,457	215,312	74.1
1931	332,437	217,356	65.4
1932	312,478	196,578	62.9
1933	402,609	218,145	54.2
1934	381,516	241,359	63.3
1935	392,666	262,300	66.8
1936	427,411	301,239	70.5
1937	510,318	357,429	70.0
1938	475,850	374,829	78.8
1939	483,528	399,233	82.6
1940	493,209	399,725	81.0
1941	505,572	429,892	85.0
1942	483,097	375,103	77.6
1943	594,343	407,992	68.6
1944	746,699	491,920	65.9
1945	754,710	487,927	64.7
1946	760,215	503,340	66.2
1947	820,210	521,606	63.6
1948	903,498	599,496	66.4
1949	744,834	547,385	73.5
1950	829,874	555,306	66.9
1951	1,010,270	661,502	65.5
1952	1,022,139	679,146	66.4
1953	1,109,164	713,272	70.0
1954	974,275	703,432	72.2
1955	1,053,297	764,396	72.6
1956	1,107,808	815,836	73.4
1957	1,073,867	786,851	73.3
1958	940,166	735,839	78.3
1959	971,978	777,758	80.0
1960	927,479	801,775	86.4
1961	939,191	798,914	85.1
1962	943,328	837,820	88.8
1963	977,835	876,529	89.6
1964	989,525	898,004	90.4
1965	1,000,749	889,679	88.9
1966	1,057,706	921,619	87.1
1967	1,119,962	960,895	85.8
1968	1,133,380	997,367	88.0

TEXAS CRUDE OIL PRODUCED AND TEXAS REFINERY INPUT

(Thousands of Barrels)

Year	Crude Oil Production	Crude Oil Refinery Input	Percent Input to Production
1969...............	1,151,775	1,020,142	88.6
1970...............	1,249,697	1,038,498	83.1
1971...............	1,222,926	1,067,427	87.3
1972...............	1,301,685	1,112,960	85.5
1973...............	1,294,671	1,171,326	90.5
1974...............	1,262,126	1,188,124	94.1
1975...............	1,221,929	1,210,366	99.1
1976...............	1,189,523	1,304,452	109.7
1977 (P)..........	1,137.542	1,431,159	125.8

(P) Preliminary
SOURCE: U.S. Bureau of Mines