



Comparison of Oil and Gas Tax Burdens in Nine Producing States

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The conclusions and opinions expressed in this study are those of the author and do not necessarily reflect the opinions of LECG.

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Executive Summary.

Oil and gas prices have been volatile for the last few years and continue to be so. As a consequence, states which obtain significant tax revenues from oil and gas production experience swings in tax receipts. The impact of energy price volatility on tax revenues varies across states because their tax structures differ significantly.

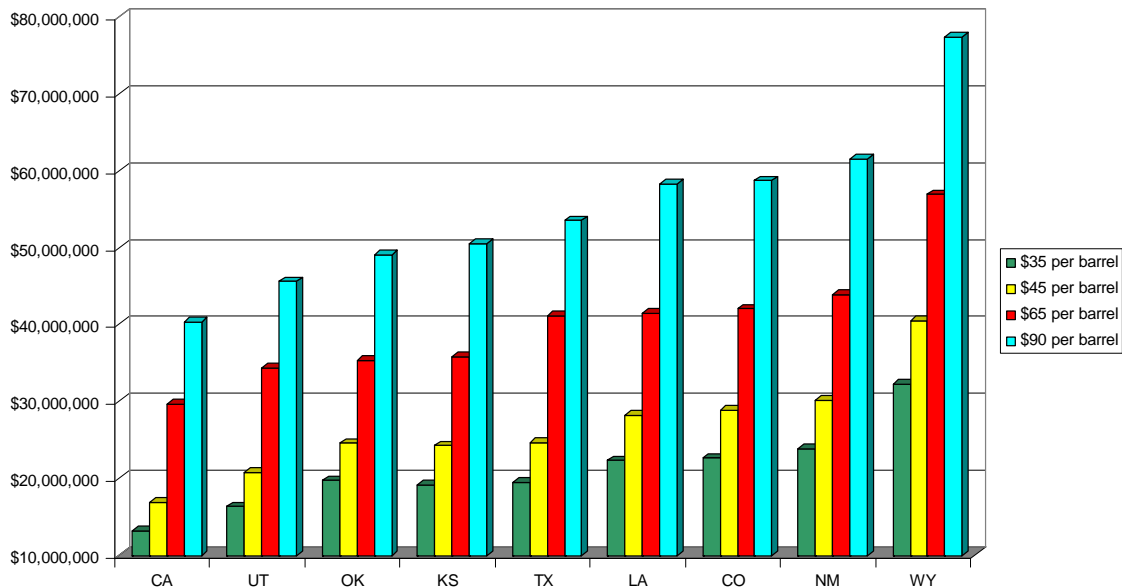
The total tax burden on oil and gas companies depends on (a) the type of taxes imposed, (b) the base of each tax, and (c) the tax rate for each type of tax. Most states rely on some combination of severance taxes (taxes on production), corporate income taxes, property taxes, and sales taxes. The volatility of those revenues depends on the degree to which tax bases respond to changes in oil and gas prices. The analysis shows that:

- ❑ In the States in which property taxes are assessed using the value of oil and gas reserves, tax liabilities are most affected by changes in energy prices. Since fluctuations in oil and gas prices impact the estimated value of both current and future production, property tax revenues can increase (and decrease) dramatically with oil and gas price variations.
- ❑ Corporate income taxes are next in terms of volatility. Because the tax is usually based on net income, oil and gas price rises that drop to the bottom line can lead to disproportionate increases in profits and tax revenues.
- ❑ Severance taxes tend to be proportional with oil and gas prices: a 10% increase in oil or gas prices is likely to increase tax revenues 10%.
- ❑ Sales taxes on purchases of capital equipment tend to be the smallest component of taxation on oil and gas, and the least variable. Often the impact of an increase in oil or gas prices on sales tax receipts is minimal, unless the price increase is significant enough and expected to persist long enough to lead to expanded exploration and development activity.

Based on these characteristics, the study finds that states that rely more heavily on property taxes and corporate income taxes have more variable tax receipts. Indeed, in Texas while oil prices grew 58% between 2004 and 2006 and gas prices increased 13%,¹ the value of oil, gas and mineral properties rose by 79%.²

To compare tax burden across states, the study develops two hypothetical firms using average profit characteristics taken from publicly traded companies: one for oil and one for gas production, respectively. The study then examines tax revenues from each source and analyzes the extent to which they grow in each state under different oil and gas price assumptions. Results from this analysis are shown in the following Charts.

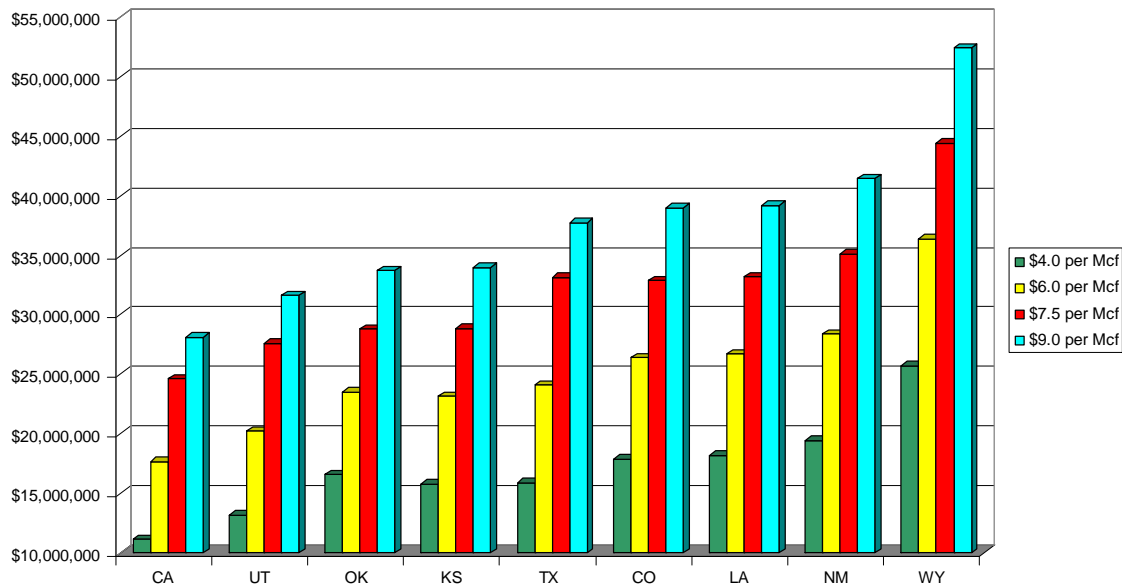
**Rankings of States by Total Tax Collections
Based on a Benchmark Oil Firm**



¹ http://tonto.eia.doe.gov/dnav/pet/pet_pri_dfp1_k_a.htm,
http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_STX_a.htm

² *Annual Property Tax Report, Tax Year 2006, Issued January 2008*, Texas Comptroller of Public Accounts

**Rankings of States by Total Tax Collections
Based on a Benchmark Gas Firm**



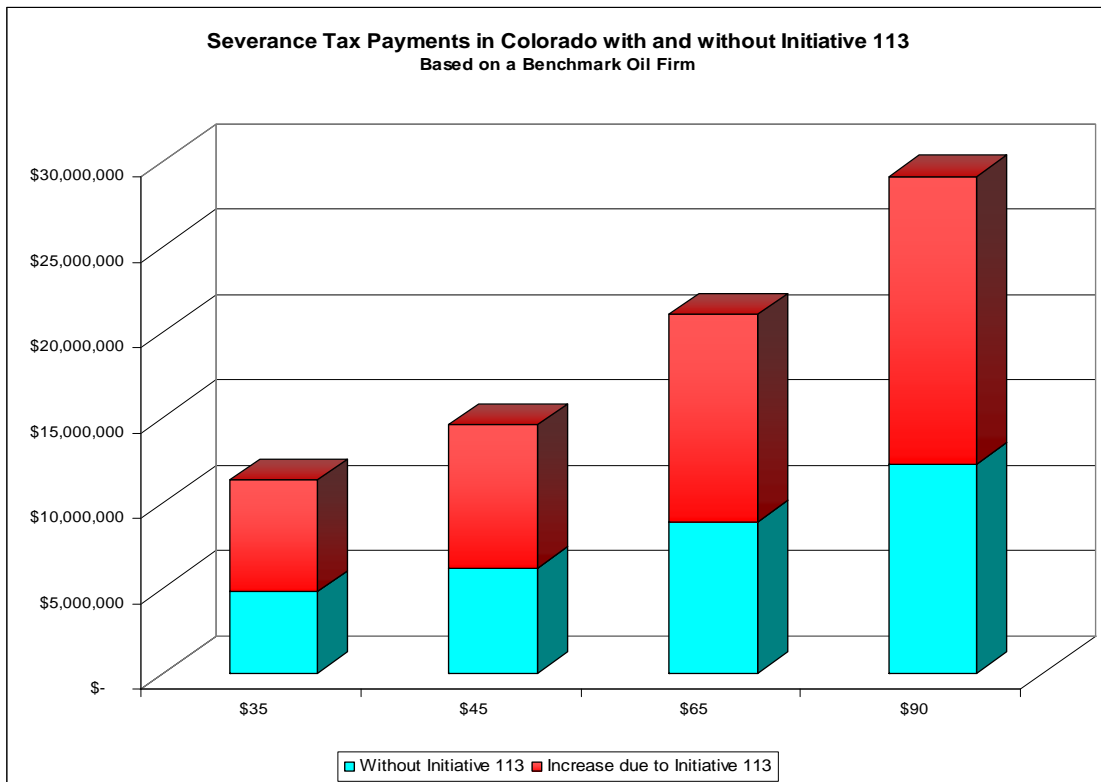
In examining these results, there are two general conclusions:

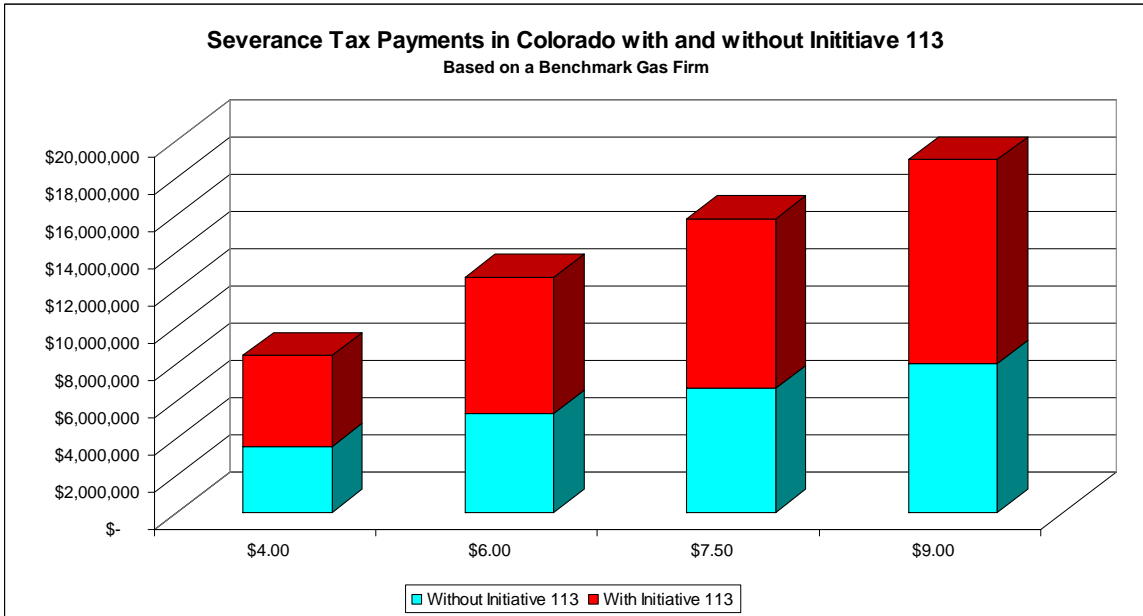
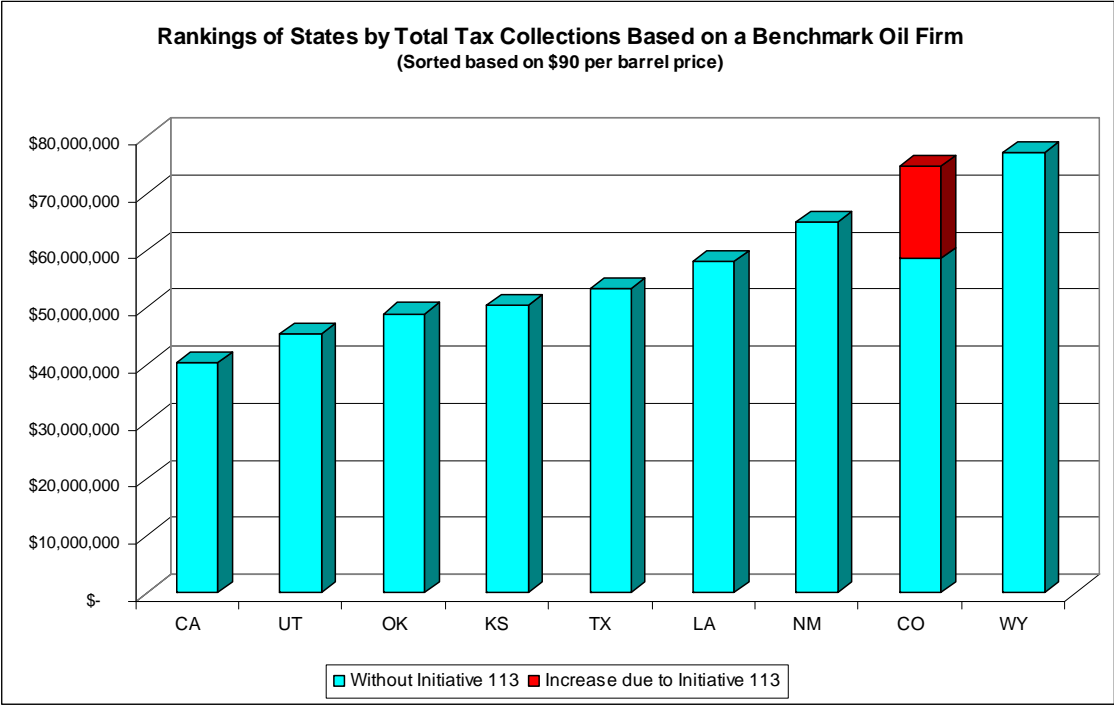
- First, most states have similar levels of tax receipts for comparable companies, suggesting that overall average tax rates in most states are comparable. Wyoming tends to have higher receipts, but the others appear to collect similar totals.
- Second, reliance on different tax tools changes the rankings of states as energy prices change. Oklahoma, for example, with its high reliance on the sales tax and the severance tax, is in the middle of the group when prices are low but at the low end of the producing states in tax receipts at high prices.

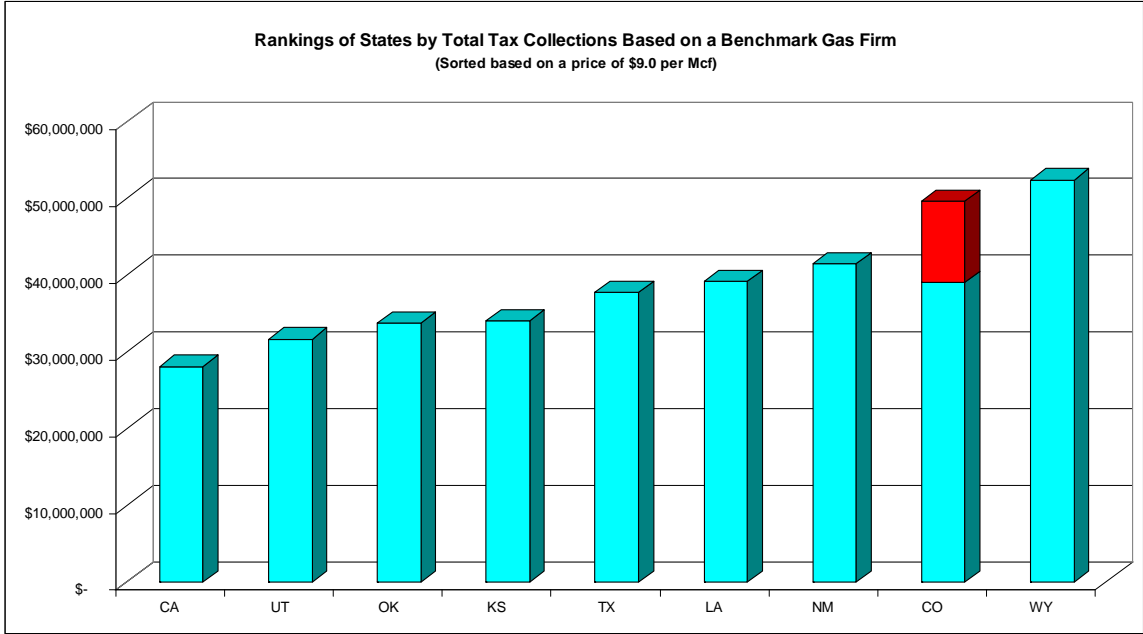
Finally, the study analyzes the impact of initiative 113 recently introduced in Colorado that would change the qualifications for “stripper” well exemptions and eliminate the property tax credit against severance tax. The study finds that:

- Initiative 113 will produce additional tax liabilities, whose amount depends on the prices of oil and natural gas;

- By eliminating the tax credit for property tax payments, Initiative 113 would increase severance tax obligations by 137%, making the tax burden on oil and gas firms the second highest of the states studied; and that
- States with high severance taxes have low tax burdens from other taxes and, conversely, states with high tax burdens from other taxes pay low severance taxes. Currently Colorado has the highest tax burden from taxes other than the severance tax. Correspondingly its tax burden from severance taxes is the second lowest. Proposition 113 would make the severance tax in Colorado the fifth highest among the states included in this study.





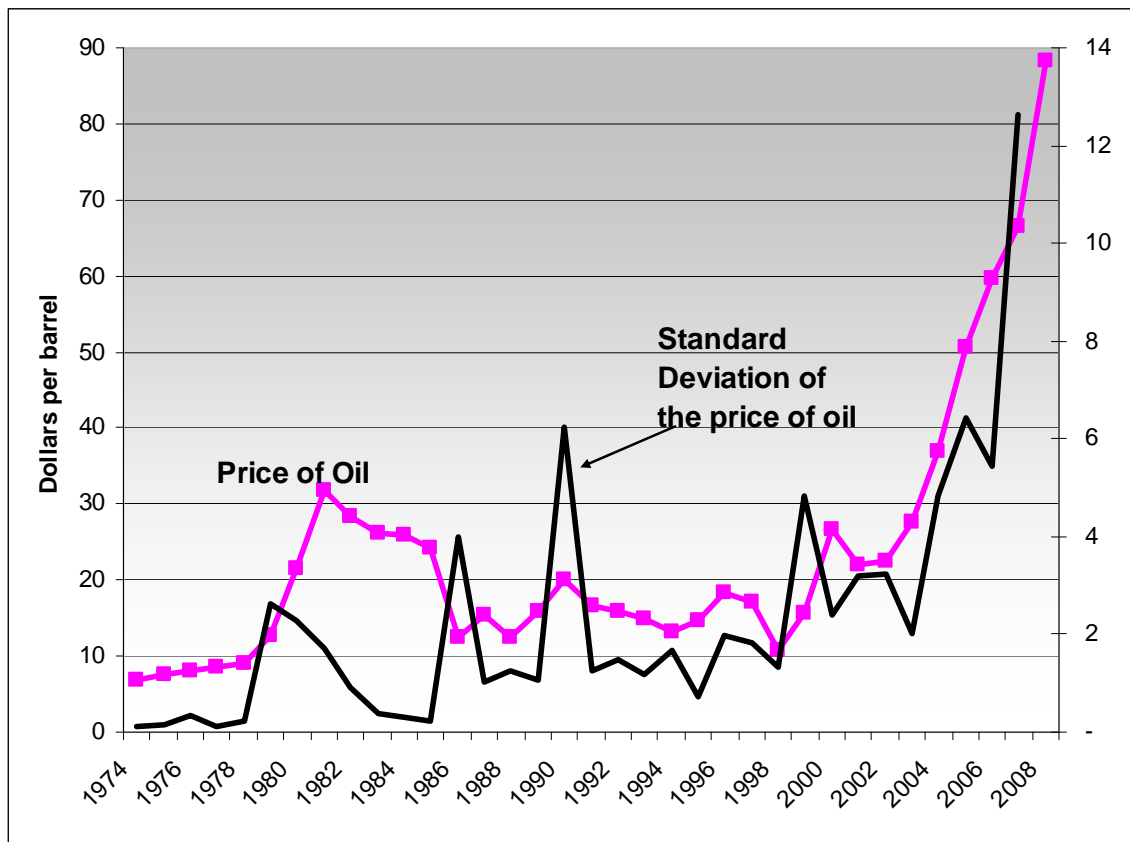


I. Introduction.

A. Overview

As the prices of both oil and natural gas have grown, so has their volatility.³ For states whose revenues significantly depend on oil and gas production, such volatility has brought about cycles in state revenues, thus creating a public policy dilemma: while price increases lead to windfalls in revenues, when they fall, programs that depend on those revenues face shortfalls.

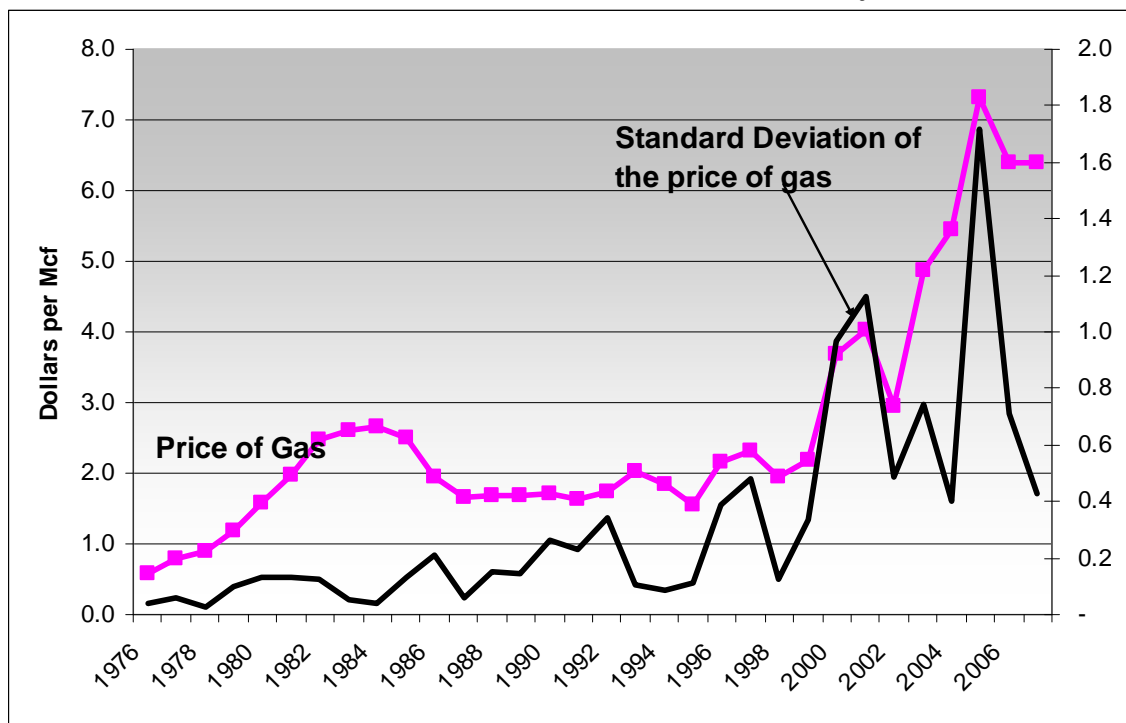
Price of Oil and its Volatility



http://tonto.eia.doe.gov/dnav/pet/hist/f000000__3m.htm

³ The standard deviation of the distribution of prices within a year is used to measure the volatility of prices.

Price of Natural Gas and its Volatility



<http://tonto.eia.doe.gov/dnav/ng/hist/n9190us3m.htm>

A comparison of the taxes imposed on the oil and gas industry in major producing states can provide two important yardsticks for state policymakers to use in evaluating their own tax structure. First, a comparison of total tax burdens can provide information on how heavily other states tax the industry, thereby giving legislators a sense of how their state's industry is taxed relative to others.⁴ Second, by examining the impact of changes in oil and natural gas prices on total revenues, one can identify which states are most subject to revenue volatility.

Oil and gas producing states have adopted different strategies in taxing the industry. Some emphasize severance taxes on the value of current production while others put more emphasis on property taxes or corporate income taxes. Revenues from each of these taxes will increase to some degree when oil or gas prices rise, but some are more responsive than others. Thus a comparison of tax revenues from oil and gas production

⁴ To the extent that the tax burden influences the profitability of investment projects, oil and gas companies will tend to invest more in states with a smaller tax burden and less in those with a larger one.

across producing states –and thus across far and wide differing tax regimes- will yield rankings that will change as oil and natural gas prices change.

A recent study by the Colorado Legislative Council Staff (the “CLCS report”) carried such a comparison for the states of Colorado, Wyoming, Utah, New Mexico, and Oklahoma.⁵ Their analysis offered an estimate of gross revenues from oil and gas production in a given calendar year but did not explore how those revenues may change as oil and gas prices change. Consequently, it has limited applicability in estimating the comparative tax burden faced by companies in different states under different oil and natural gas price regimes, and offers little guidance in examining the relationship between tax structures and revenue volatility.

The method used in this study is different: it explicitly models the impact of changes in oil and gas prices on the total tax burden faced by oil and gas producers in major producing states by using standardized firms. Unlike the analysis prepared by the CLCS, which relied on estimated aggregate tax collections, the focus of this report is on determining the likely tax burden faced by a typical company in each producing state, and estimating how that burden varies with oil and gas prices.

To carry out this approach, the study develops two standardized companies representative of companies operating in Colorado: an oil company and a gas company.⁶ While the specific tax burdens computed for these standardized companies may not correspond to payments by any actual company, the ranking across states is more revealing than comparisons of specific tax rates because it compares apples to apples. This method also abstracts from differences in production and drilling costs to focus on the issue of examining comparative tax burdens as prices change. Consequently, the conclusions are appropriate to address business climate comparisons and revenue volatility implications rather than estimating total dollar tax collections a particular state might expect under different price scenarios. The study covers the largest 9 producing states in the Lower 48:

⁵ Memorandum to Representative Kathleen Curry on “Effective Severance Tax Rate” Marc Carey and Todd Herreid, Colorado Legislative Council Staff, September 8, 2006.

⁶ While nearly all companies have production of both oil and gas, the focus is on pure gas and pure oil tax incidence. Combined firms will have tax burdens that are a combination of the two tax regimes.

California, Colorado, Kansas, Louisiana, New Mexico, Oklahoma, Texas, Utah and Wyoming.

This analysis faces certain limitations. In addition to the need to use a standard set of assumptions in modeling typical firms and applying tax law, the study had to select standardized firms appropriate for Colorado. As discussed later, the choice of a model firm can impact the results since the profit characteristics of the firm depend on those parameters.⁷

This report first examines the differences in severance, corporate income, property and sales taxes in each state as they apply to oil and gas production. Next, four price scenarios that span the range of likely outcomes in years to come are chosen and two standardized firms to use for comparisons across states are modeled. The following section provides estimates of relative tax burdens facing the standardized oil and gas companies, with sensitivity analysis used to demonstrate the impact of higher or lower oil and gas prices on relative tax burdens. Finally, the study analyzes the tax revenues that would be generated if the qualifications for stripper well exemptions in Colorado were changed to 7 and 1/2 barrels of oil or 45 MCF per day from their current levels of 15 barrels of oil and 90 MCF per day as proposed in a recently introduced initiative.⁸

⁷ As an example, California's industry differs from that in other states because the fields tend to be older (requiring more steam injection) and produce less oil than in other states. On the other hand, the average company in California is significantly larger than in other states.

⁸ [http://www.leg.state.co.us/lcs/initrefr/0708InitRefr.nsf/dac421ef79ad243487256def0067c1de/482914cdf6b8bd3f872574030067c929/\\$FILE/ATT548K8/2007-2008%20%2379.pdf](http://www.leg.state.co.us/lcs/initrefr/0708InitRefr.nsf/dac421ef79ad243487256def0067c1de/482914cdf6b8bd3f872574030067c929/$FILE/ATT548K8/2007-2008%20%2379.pdf)

B. Purpose of the Report.

The objective of this analysis is to assist interested parties in comparing the tax burden on typical oil and natural gas companies operating in Colorado to the burden those companies would face if they operated in other states, as well as to examine the implications of those tax structures for revenue volatility. The study takes no position on the merits of different tax structures or on their appropriateness either in general or as specifically applied to oil and gas companies and recognizes that rankings based on typical firms from other states may yield different results to the extent that those firms differ from those operating in Colorado.

This report was prepared at the request of the Colorado Petroleum Association, and I was compensated for its preparation. I was given complete control of the report's contents. The views expressed in the report are the product of independent and objective analysis, and do not necessarily reflect the views of either LECG or the Colorado Petroleum Association.

II. Comparing Tax Contributions.

A. Types of Taxes.

Oil and natural gas companies pay four major types of taxes:

- Production taxes levied on the value of the oil or gas extracted from the ground;
- Corporate Income taxes levied on the net income of corporations (including those that produce oil and gas);
- Property Taxes applicable to oil and gas properties which may be based on the assessed value of future expected production from oil or gas reserves in the ground (mill levies used to compute property taxes usually vary by county); and
- Sales Taxes on purchases of both inputs and equipment needed for capital improvements.

Not all states with oil and gas production levy all of these taxes, nor do all states use the same rates or even the same taxable bases. Moreover, many of these taxes interact: for example, corporate income taxes often allow deduction of other taxes, particularly severance taxes and property taxes.

B. Differences in Statutory Tax Structures.

1. Severance Taxes.

All states included in this study levy severance taxes or other direct taxes on oil and natural gas production and since they are largely value-based, their collections rise as oil and gas prices do. Severance taxes are assessed on both natural gas and oil production at rates that vary by state. California levies a *de minimis* tax (about 5 cents per barrel in 2006) to cover the operating cost of the Department of Conservation's Division of Oil, Gas and Geothermal Resources.

In several states, the value that is taxed is reduced by other factors, most notably, property taxes. In Colorado and Kansas, property taxes directly offset some of the severance tax liability. Moreover, in several states, including Colorado, the tax is

progressive and increases with the level of sales. Most states treat oil and natural gas in the same way, and most states levy the tax on the value of production. Louisiana has a flat rate on gas (30-37 cents per Mcf) while imposing a value-based tax on oil.

Comparing effective severance tax rates across states is complicated by statutory complexities imposed in each state, which may include exemptions, differences in measured tax bases, and special features of each state's structure including the treatment of low production -stripper- wells.

In 2007 there were 422,255 low production wells –stripper wells- which account for about 18% of total US oil production and nearly 9% of gas production. Differences among states, however, are significant: in Colorado, for example, 39% of oil production comes from such wells while the corresponding percentages for Kansas, Oklahoma and Texas are 76%, 66% and 38%. In Kansas 52% of gas production comes from stripper wells while in Louisiana it is less than 4%.⁹

The tax treatment of stripper wells differs significantly across states: some statutes simply exempt oil and gas production from stripper wells from the tax,¹⁰ while others (like Louisiana or New Mexico) have exemptions with price triggers and rate reductions that make an accounting of the impact of oil and gas price fluctuations on the tax burden attributable to the severance tax complicated.¹¹

In September 1995, the Energy Information Agency of the Department of Energy published a study of State Energy Severance Taxes for the period 1985-1993, but it has

⁹ <http://www.iogcc.state.ok.us/PDFS/2007-Marginal-Well-Report.pdf>.

¹⁰ See, for example Colorado's Revised Statute 39-39-105: "except that oil produced from any wells that produce fifteen barrels per day or less of oil and gas produced from wells that produce ninety thousand cubic feet or less of gas per day for the average of all producing days for such oil or gas production during the taxable year shall be exempt from the tax".

¹¹ See, for example Louisiana's Revised Statute 47:633: "(aa) On oil produced from a well classified by the commissioner of conservation as an oil well, and certified by the Department of Revenue that such well is incapable of producing an average of more than ten barrels of oil per producing day during the entire taxable month, the tax rate applicable to the oil severed from such well shall be one-quarter of the rate set forth in Subparagraph (a) of this Paragraph and such well shall be defined, for severance tax purposes, as a stripper well, provided that such well has been certified by the Department of Revenue as a stripper well on or before the twenty-fifth day of the second month following the month of production.....

(bb) Crude oil produced from certified stripper wells shall be exempt from severance tax in any month in which the average value set forth in Subparagraph (a) of this Paragraph is less than twenty dollars per barrel.

not been updated since then.¹² More recently Professor Gerking from the University of Central Florida has analyzed the impact of severance taxes in the ten largest oil producing states for the period 2001-2003.¹³

A simple way to calculate the effective severance tax rate for each state is to obtain data on actual revenues and divide them by the value of production. This calculation reflects all incentives granted against all types of taxes as well as the ways different states compute the tax liability.¹⁴ The study uses 2007 data taken from the U.S. Census Bureau's State Government Tax Collections which lists revenues from different taxes collected by state, including severance taxes.¹⁵ These data, however, combine revenues from both oil and natural gas. To separate between those two components, the study estimates the value of oil and natural gas production by state using price and production estimates provided by the Department of Energy.¹⁶ In the cases of Colorado, Kansas and Utah the study excludes the production of stripper wells from that amount.¹⁷ The resulting estimated rates range from a minimum of one tenth of one percent in California to a maximum above 6% in Louisiana and New Mexico.

Under current Colorado statutes, severance taxes of up to 5% of oil and gas sales at the wellhead are imposed but a tax credit for 87.5% of property taxes is granted.¹⁸ As a result, property taxes above 5.7% completely offset the severance tax obligations. Only 5

¹² State Energy Severance Taxes, 1985-1993, DOE/EIA-TR/0599, September 1995.

¹³ Shelby Gerking, Effective Tax Rates on Oil and Gas Production: A Ten State Comparison, May 2005.

¹⁴ While this approach uses an average tax rate, instead of rising marginal rates in a few states, most producers already are at the higher tax brackets at recent oil prices, so the potential underestimation of revenues implied by using the average is likely to be minimal.

¹⁵ <http://ftp2.census.gov/govs/statetax/07staxss.xls>

¹⁶ http://tonto.eia.doe.gov/dnav/pet/pet_crd_crpdn_adc_mbb1_m.htm and

http://tonto.eia.doe.gov/dnav/ng/ng_prod_sum_dcu_sco_a.htm.

¹⁷ Colorado exempts oil production from wells that produce less than 15 BOPD or gas production from wells that produce less than 90,000 CFPD. Kansas exempts oil production from wells that produce less than 5 BOPD. Utah exempts oil production from wells that produce less than 20 BOPD or gas production from wells that produce less than 60,000 CFPD.

¹⁸ Colorado's Revised Statute CRS 39-29-105 establishes that: "With respect to oil and gas, there shall be allowed, as a credit against the tax ... an amount equal to eighty-seven and one-half percent of all ad valorem taxes assessed during the taxable year ... upon oil and gas leaseholds and leasehold interests and oil and gas royalties and royalty interests for state, county, municipal, school district, and special district purposes".

of the 30 oil and gas producing counties in Colorado have property taxes below 5.7%, so severance taxes are effectively paid only in those counties.¹⁹

2. Corporate Income Taxes.

All of the states included in this report, except Wyoming, levy a corporate income tax. Texas imposes a franchise tax on earned surplus which is equivalent to a corporate income tax. Statutory tax rates for corporate income differ significantly. Moreover, in some states, the rates are constant, while in others they rise with income. In the case of Kansas the study uses direct information from the Department of Revenue;²⁰ for all other states it uses tax rates compiled by the Federation of Tax Administrators (FTA).²¹

Effective corporate income taxes differ from their statutory levels due to the treatment of deductions in each state. To take these disparities into account, this study uses a report published by the Multistate Tax Commission -- a joint agency of state governments created in 1967 and comprised of their tax administrators -- that includes estimates of effective corporate income tax rates by state.²² Based on that report, effective corporate income tax rates range from zero in Wyoming to 7.4% in California, with most states in the range of 3.5-5.6%. Colorado is at the lower range of the states in effective corporate income tax rates.

¹⁹ **State incentives to maximize oil and gas recovery**, IOGCC, 2007, <http://www.iogcc.state.ok.us/PDFS/2007-Marginal-Well-Report.pdf>.

²⁰ <http://www.ksrevenue.org/pdf/TaxRates.pdf>

²¹ http://www.taxadmin.org/fta/rate/corp_inc.html

²² http://www.mtc.gov/uploadedFiles/Multistate_Tax_Commission/Resources/Studies_and_Reports/Corporate_Tax_Sheltering/Tax%20Shelter%20Report.pdf The effective rates adjust for tax sheltering, and do not adjust for deductions for other taxes paid.

3. Property Taxes.

All of the states analyzed in this report except Louisiana²³ and Oklahoma²⁴ impose a property tax on oil and gas properties. The basis of the tax in most states is the value of reserves but four exceptions must be considered:

1. In Wyoming, minerals are exempt from the property tax, but they must pay a gross products tax.
2. New Mexico imposes "ad valorem production" and "ad valorem production equipment" taxes in lieu of property taxes. The assessed value equals the taxable value of the product times the uniform assessment ratio (1/3). In turn, the taxable value equals 150 percent of the value of the products after deducting: royalties paid to the U.S. government, the State of New Mexico, and/or Indian tribes; and (2) trucking expenses (i.e. allowable transportation and processing expenses).²⁵
3. In Kansas, the property tax on oil is assessed as:

Value of oil sold * Present Worth Factor (PWF) * 30%.

The PWF is based on a 15% discount rate and five years of income ("Table I") or seven years of income ("Table II") depending on the depth of the well. Its purpose is to discount future income to present value combined with a depleting income stream (reservoir decline). The PWF incorporates the life and performance characteristics of a reserve based on the percentage rate of decline that is computed for each particular lease as set out under the "Percentage Rate of Decline".²⁶

4. Colorado's Revised Statute CRS 39-7-102 establishes that in the case of oil and gas properties: *"the assessor shall value such oil and gas*

²³ <http://www.rev.state.la.us/>

²⁴ www.tax.ok.gov/gptaxindex.html

²⁵ **New Mexico Oil and Gas Ad Valorem Production and Production Equipment Taxes -- Description and Summary of Statistical Reports** by Tom Clifford and Al Maury, Tax and Revenue Department. <http://www.tax.state.nm.us/pubs/TaxreseStat/AdValoremProductionandEquipmenttaxes.pdf>

²⁶ *2008 Year Oil&Gas Appraisal Guide*, State of Kansas, Department of revenue.

leaseholds and lands for assessment, as real property, at an amount equal to eighty-seven and one-half percent of the selling price of the oil or gas sold therefrom during the preceding calendar year”.

For the other three states, the taxable value is assumed to be the value of the company’s reserves estimated as the net present value of expected operating cash flows over a period of 15 years. In other words, the standardized firm models are used to estimate operating cash flows under different long-run oil and gas prices. The net present value of those cash flows during 15 years is then calculated using a 12% discount rate, as a recent report by Morgan Stanley estimates the oil industry’s approximate cost of capital to be 12%.²⁷

In the case of Wyoming, the effective rate is taken from Gerking (2005).²⁸ For the property tax mill rates of the other six states, the following published sources are used:

- California, *California City Documentary and Property Transfer tax Rates*;²⁹
- Colorado, *Thirty-Sixth Annual Report to the Governor and to the General Assembly* (2006);
- Kansas, information from the Director of Property Valuation in the Department of Revenue;³⁰
- New Mexico, *2006 Property Tax Facts*;³¹
- Texas, *2006 Annual Property Tax Report* prepared by the State Comptroller;³²
- Utah, Utah State Tax Commission Property Tax Division.³³

²⁷ *Integrated Oil*, March 2008.

²⁸ http://ccg.co.campbell.wy.us/assessor/html/oil__gas_valuation.html
<http://revenue.state.wy.us/PortalVBVS/uploads/ProjectAR10-05.pdf>; Shelby Gerking, “Effective Tax Rates on Oil and Gas Production: A Ten State Comparison”, 2005.

²⁹ <http://www.californiacityfinance.com/PropTransfTaxRates.pdf>

³⁰ (<http://www.ksrevenue.org/pdf/pvd2008MVlevy.pdf>)

³¹ <http://www.tax.state.nm.us/pubs/TaxreseStat/2006propertytaxfacts.pdf>

³² <http://www.window.state.tx.us/taxinfo/proptax/annual06/96-318.pdf> issued January 2008.

³³ Utah Property Tax, Annual Statistical Report, Prepared by: Property Tax Division, Utah State Tax Commission, <http://propertytax.utah.gov/finalannualstats/2006annual.pdf> and <http://propertytax.utah.gov/taxrates/taxarearates2007.pdf>.

4. Sales Taxes.

All of the states analyzed in this report impose a sales tax, as do some counties and cities. The state sales tax rates used for this report are those listed by the FTA.³⁴ The local rates are those applicable to the counties in each state with the most oil and gas production activity. In this analysis, it is assumed that the sales tax is imposed only on equipment and materials acquired by the firm to purchase or upgrade physical assets such as property, industrial buildings or equipment (i.e., capital expenditures).³⁵ The rates go from a minimum of 4.3% in Colorado to a maximum of 8.25% in Texas and California. The Appendix presents the tax rates for each state.

³⁴ <http://www.taxadmin.org/fta/rate/sales.html>

³⁵ This analysis will understate the total sales tax revenue to the extent that there are other taxable inputs (i.e., non-capital goods used in production) excluded from this analysis.

III. Comparing Tax Contributions across States.

A. Price Scenarios.

1. Oil Price Scenarios.

In the last 10 years, oil prices have fluctuated widely: average annual prices have ranged from \$10.8 a barrel to \$66.5 and spot prices recently topped \$130 a barrel.

OIL PRICES	
(Dollars per barrel) ³⁶	
1997	\$17.2
1998	\$10.8
1999	\$15.5
2000	\$26.7
2001	\$21.9
2002	\$22.5
2003	\$27.5
2004	\$36.9
2005	\$50.5
2006	\$59.6
2007	\$66.5

Moreover, while long-run projections are highly uncertain, with expectations ranging from prices that are higher than at present to those showing a sharp reduction, **NYMEX** futures hover around \$130 and many industry analysts consider that the long run price will not fall below \$90.

Given this history, the study uses four benchmark prices to conduct sensitivity analysis: \$35, \$45, \$65 and \$90 per barrel. The \$90 price can be expected to be a high level for future oil prices, while a return to prices at \$35 represents the lower bound. \$65, lies

³⁶http://tonto.eia.doe.gov/dnav/pet/hist/f000000__3m.htm

close to the level that would be predicted using empirical time-series estimates and assumes reversion to long-run inflation-adjusted prices.

2. Gas Price Scenarios.

Gas prices also have been highly variable in recent years. As shown below, average annual prices have ranged from \$2.0 to \$7.3 per Mcf, with sharp spikes occurring in recent years. **NYMEX** natural gas settlement prices have recently topped \$12.0 per Mcf but they are not likely to remain so high.

U.S NATURAL GAS WELLHEAD PRICES³⁷ (Dollars per MCF)

1997	\$2.3
1998	\$2.0
1999	\$2.2
2000	\$3.7
2001	\$4.0
2002	\$2.9
2003	\$4.9
2004	\$5.5
2005	\$7.3
2006	\$6.4
2007	\$6.4*

* estimated

Sensitivity analysis is carried out by selecting four prices which bound the likely variations in the future price of natural gas: \$4.00 per Mcf at the low end and \$9.00 per Mcf at the high end, with intermediate prices of \$6.00 and \$7.50 per Mcf.

B. Standardized Firms.

Not only do oil and gas companies pay different taxes, with different assessed bases, and with different rates, but, equally pertinent, the companies themselves are dissimilar.

³⁷ <http://tonto.eia.doe.gov/dnav/ng/hist/n9190us3m.htm>

Some produce mainly oil, while others produce almost equal amounts of oil and natural gas; some are integrated with refining operations or treat natural gas, while others have pipeline transportation assets. Accordingly, the seemingly straight-forward estimation of cost structures which is crucial to perform a comparison of tax contributions across states is actually complex.

To focus on the consequences of different tax structures, this study constructs two standardized firms: a stand-alone oil company, and a stand-alone natural gas company. Since the focus of this report is Colorado, the standardized firms use characteristics that are appropriate for companies operating in that State. This allows a comparison of the tax burden of firms operating in Colorado to the tax burden *those* firms would face if they operated in other states.³⁸ In developing the standardized firms for Colorado, information on financial, production, and reserves parameters on publicly-traded companies was gathered. The reasonableness of the parameters was tested by consulting with industry experts familiar with the Colorado oil and gas industry. The analysis finds that the ranking of different states is sensitive to the assumptions used in developing the standardized firm.

1. The Standardized Oil firm.

In the case of oil, data were obtained from publicly traded companies in the oil extraction sector.³⁹ While none of the comparables were strictly oil producers, the set of companies included is limited to those whose oil reserves represent more than two-thirds of the total value of its oil and gas reserves.⁴⁰

The standardized firm used in this study is assumed to produce 19,700 barrels of oil per day (bopd) and owning reserves expected to last 15 years. Depending on the oil price, this implies a company with annual revenues ranging from \$252 million (\$35 oil price) to

³⁸ If the standard of measure was another state, both the size of the standardized firms and their cost structures could be different.

³⁹ Source: Reuters.

⁴⁰ My analysis first identified all oil and gas companies, and eliminated those that had significant integrated operations (i.e., refining). Information from the most recent annual 10K filings for each company was obtained from the SEC and production, costs, reserves, and profitability measures were compiled. After eliminating companies with missing information, the remaining 5 companies were used to compute medians for the key information required for the model.

\$647 million (\$90 oil price). Based on data from oil companies that were researched, total production costs are estimated to rise from \$25 to \$45 per barrel in the different price scenarios, as G&A and other expenses are assumed to rise with the price of oil.⁴¹

Using median values for production and assumed prices, total sales in each scenario are calculated, which serves as the base for most states' severance tax estimate. Sales tax revenues are estimated using capital expenditures (\$9 per barrel). From total sales, costs of goods sold (largely lease expenses) of \$9.60 per barrel are subtracted to get gross profits. Net income before taxes is obtained by subtracting (a) D,D,&A (\$8.2-\$13.0 per barrel depending on the price of oil), (b) G&A (5.5% of revenue), and (c) other expenses (ranging from \$5.3 to \$13.5 per barrel)⁴². The tax base of the state corporate tax is estimated by subtracting other taxes (property and severance taxes) from net income and applying the effective rate for each state. In the case of California, Texas and Utah, the base for the property tax is the value of oil reserves in the ground, estimated to be the long-run net present value of expected cash flows at each assumed price.⁴³ In the case of the other states, the base for the property tax is the value of production.

2. The Standardized Gas firm.

The same procedure is followed to construct a standardized natural gas firm. Again, the parameters are obtained from publicly-traded companies whose primary operations are in natural gas.⁴⁴ After excluding companies with limited data, median values from the 17 remaining comparable companies are used.

The standardized gas company produces 128 million cubic feet per day (MMcf) and owns reserves expected to last 15 years. Depending on gas prices, this implies a gas firm

⁴¹ Given that production is held constant, other inputs, such as capital expenditures and D,D,&A are assumed to be invariant to changes in prices of oil.

⁴² Sources are based on median values from the public companies. In the case of other expenses, the medians for the middle price case are used and the expenses are adjusted proportionally with the oil price for the two other scenarios.

⁴³ Cash flows are based on net income after taxes less capital expenditures (\$9 per barrel) and adding back depreciation.

⁴⁴ Firms whose gas reserves represent more than 2/3 of the total value of its oil and gas reserves are included.

with annual revenues ranging from \$187 million (\$4 per Mcf) to \$421 million (\$9.00 per Mcf). As with the oil company, the severance tax is based on sales. The base of the sales tax is approximated by capital expenditures (\$1.70 per Mcf). To calculate corporate income taxes, the cost of goods sold (\$.81-\$1.21 per Mcf), G&A (5.5%-7.9% of sales), DD&A (\$1.50-\$2.57 per Mcf), and other expenses are subtracted from sales. The taxable income base is obtained by then subtracting the severance and property taxes paid. The property tax base is determined using the methodology discussed earlier for the oil firm.

IV. Results.

A. Overview.

Results from the analysis are shown in Charts 1-5 for the oil company and Charts 6-10 for the gas company. In each case, the study calculates separately severance tax collections, corporate income tax collections, property tax collections and sales tax collections under each of the four assumed price scenarios. Total tax burdens are then shown in Chart 5A-D for oil, and Chart 10A-D for gas for different prices, where in each case the states are shown in rank ordering from lowest to highest tax burden.

Comparison of the charts provides the following set of observations:

- The 9 states place different emphasis on different taxes, with some relying primarily on property taxes while others rely on income taxes.
- Because some taxes are more volatile than others (i.e., they change more with prices), rankings of total tax burdens change with rising oil or gas prices.
- While the oil firm revenues are larger than the gas firm's, the relative tax burden rankings for gas companies are consistent with those for oil companies.
- There are significant differences in total tax collections among states, although most fall in a narrow band.

B. Differences in Tax Emphasis among States.

By looking at the various charts, it is clear that the reliance on different tax tools differs across states. Wyoming, for example, ranks lowest in corporate income tax collections for both oil and gas but quite high in property tax collections. California has the opposite ranking, emphasizing corporate and sales taxes over income and property taxes. The following characterizations can be made:

- Wyoming raises nearly all of its revenues from property and severance tax collections.

- California relies on standard business taxes, using a higher corporate income tax rate than in most states, and de-emphasizing property and severance taxes.
- Colorado relies heavily on taxes that vary proportionately with the price of oil: both severance tax and property tax collections are directly associated to the value of production.
- Most of the other states put primary emphasis on severance tax collections, with the share in total tax collections ranging from the mid 40's in Utah and Wyoming to the mid 60's in Louisiana.⁴⁵
- The combined corporate and sales tax burdens in these states range from 10% to 40% of total tax collections.

C. Tax Volatility Comparisons.

An examination of the charts also demonstrates that some taxes are more responsive than others to changing oil or gas prices. At one extreme, sales tax collections are not affected by changing commodity prices since the collections only apply to equipment purchases which are assumed to be invariant to the prices of oil and gas.⁴⁶ At the other, property taxes have the greatest potential to respond to price changes since the value of reserves is sensitive to changes in prices. An increase in oil prices not only increases the value of today's oil production, but the projected value of all future production as well.⁴⁷

Corporate taxes are second in terms of revenue volatility to the state. Because the profitability of an oil or gas company rises as a percentage of revenues for these firms,

⁴⁵ Calculations are based on an oil price of \$90 per barrel.

⁴⁶ The model assumes little production response to changes in oil or gas prices. Recent evidence suggests that the response is small for most regions of the country. However, there may be price points at which decisions to abandon wells are reverted, or new methods are introduced to increase production. In such cases, this analysis will understate changes in sales taxes.

⁴⁷ In some states, there is an additional increase resulting from an increase in projected recoverable reserves resulting from a higher price that has not been modeled. This may lead to an understatement of the potential increase in property taxes in these scenarios. Offsetting that potential understatement, however, is a lagged response in valuing the reserves in some states (particularly in California where limitations imposed by Proposition 13 restrict increases in the value of "older" reserves).

taxes imposed on profits tend to rise at a faster rate than prices.⁴⁸ For example, in the case of the standardized oil firm in California, the increase in oil prices from \$35 to \$90 (157%) results in a 351% increase in California corporate income tax collections.

Severance taxes, rise proportionally with price increases because they are directly tied to current revenues and rates do not change materially for most operators.

D. Oil and Gas Firm rankings Compared.

As discussed earlier, the standardized oil and gas companies differ in some respects. First, the gas company is smaller, reporting lower revenues at each price considered than its oil counterpart. Second, at high prices profitability is higher for the gas company than for the oil company because the operating costs of the former are somewhat smaller.

However, while there are some adjustments in relative rankings among the states between oil and gas scenarios, they generally provide the same overall conclusions. Indeed, Wyoming, New Mexico and Colorado are always the high tax states. Moreover, overall tax rate burdens implied by the scenarios in both oil and gas show the same approximate levels and rates of increase.

E. Total Tax Collections.

Total tax collections vary across states and change dramatically with oil and gas price changes. Changes in oil or gas prices will change not only total tax collections, but also the relative burden faced by oil or gas companies in those states.

Starting with the high price cases (Chart 5D and 10D for oil and gas, respectively), total tax collections for the standardized oil firm range from \$40.3 million in California to

⁴⁸ This relationship has been widely documented in the press, with record profits being reported by oil companies in the wake of the recent oil price spike. Profitability for those companies rose much faster than production.

\$77.3 million in Wyoming. In the case of gas, total tax collections range from \$27.3 million in California to \$52.4 million in Wyoming.

Price changes have major impacts on tax revenue volatility. Tax levies on the oil company raise an average of 180% across states as oil prices rise from \$35 to \$90, while rising 135% on the gas company as gas prices rise from \$4.00 to \$9.00.

Some states experience higher-than-average growth, including California (206% in oil and 144% in gas) and Utah (179% in oil and 132% in gas), while others experience slower growth such as Wyoming (140% in oil and 103% in gas) and Oklahoma (149% in oil and 103% in gas).

F. Colorado's Ranking.

Colorado has a tax structure leading to tax revenues that vary almost proportionately in response to changing oil and gas prices since the base of both the property tax and the severance tax are the value of production.

V. Additional tax liabilities created by new tax provisions in Colorado.

Colorado Ballot Initiative 113 proposes two major adjustments in the current tax regime applicable to oil and gas firms:

1. Change the qualifications for stripper well exemptions to 7 and 1/2 barrels of oil or 45 MCF per day, from their current levels of 15 barrels of oil and 90 MCF per day; and
2. Eliminate a tax credit for a portion of property taxes in the payment of severance taxes.⁴⁹

In Colorado, almost 40% of oil production and 8% of gas production come from stripper wells. The following table shows the number of wells in Colorado that produce less than 15 barrels of oil per day but more than 7.5 and would hence be subjected to the new provisions of the severance tax statute.

Number of oil stripper wells by daily production

Production Rate Bracket	Number of oil Wells	Annual Oil Production (Mbbbl)	Average Daily Oil production per well (bbl/day)	Associated Annual Gas Production (MMcf)	Average Gas Rate per well (Mcf/day)
10-12 barrels/day	170.0	502.1	8.1	935.6	15.1
12-15 barrels/day	171.0	606.5	9.7	1,151.3	18.4

The additional tax liability of each well is a function of the price of oil. The following table shows the tax liability per well for different oil prices.

Additional tax liability per oil well

Oil Price	\$35	\$45	\$65	\$90
10-12 barrels/day	\$4,135	\$5,316	\$7,679	\$ 10,633
12-15 barrels/day	\$4,965	\$6,384	\$9,222	\$ 15,961

The following table shows the tax liability for all oil producing wells.

⁴⁹ [http://www.leg.state.co.us/lcs/initrefr/0708InitRefr.nsf/dac421ef79ad243487256def0067c1de/482914cdf6b8bd3f872574030067c929/\\$FILE/ATT548K8/2007-2008%20%2379.pdf](http://www.leg.state.co.us/lcs/initrefr/0708InitRefr.nsf/dac421ef79ad243487256def0067c1de/482914cdf6b8bd3f872574030067c929/$FILE/ATT548K8/2007-2008%20%2379.pdf)

Additional tax liability from oil production

Oil Price	\$35	\$45	\$65	\$90
10-12 barrels/day	\$ 702,940	\$ 903,780	\$1,305,460	\$ 1,807,560
12-15 barrels/day	\$ 849,100	\$ 1,091,700	\$1,576,900	\$ 2,729,250
Total	\$ 1,552,040	\$ 1,995,480	\$2,882,360	\$ 4,536,810

Thus, depending on the price of oil, the new provisions of the severance tax statute will produce additional tax liabilities ranging from 1.5 to 4.5 million dollars.

In the case of the associated gas coming from oil wells, the additional tax liabilities would range from 213 to 563 thousand dollars depending on the price of gas.

The following table shows the number of gas wells in Colorado that produce less than 90,000 cubic feet of natural gas per day but more than 45,000 and would thus be subjected to the new provisions of the severance tax statute.

Number of gas stripper wells by daily production

Production Rate Bracket	# gas Wells	Annual Gas Production (MMcf)	Average Gas Rate per Well (Mcf/Day)
60,000-72,000 cf/day	1,431.0	29,112.2	55.7
72,000-90,000 cf/day	1,574.0	38,984.2	67.9

The revenue of each well is a function of the price of gas. The following table shows the revenue produced per well for different gas prices.

Additional tax liability per gas well

Gas Price	\$4.0	\$6.0	\$7.5	\$9.0
60,000-72,000 cf/day	\$ 2,441	\$ 4,883	\$ 6,103	\$ 7,324
72,000-90,000 cf/day	\$ 2,972	\$ 5,944	\$ 7,430	\$ 8,916

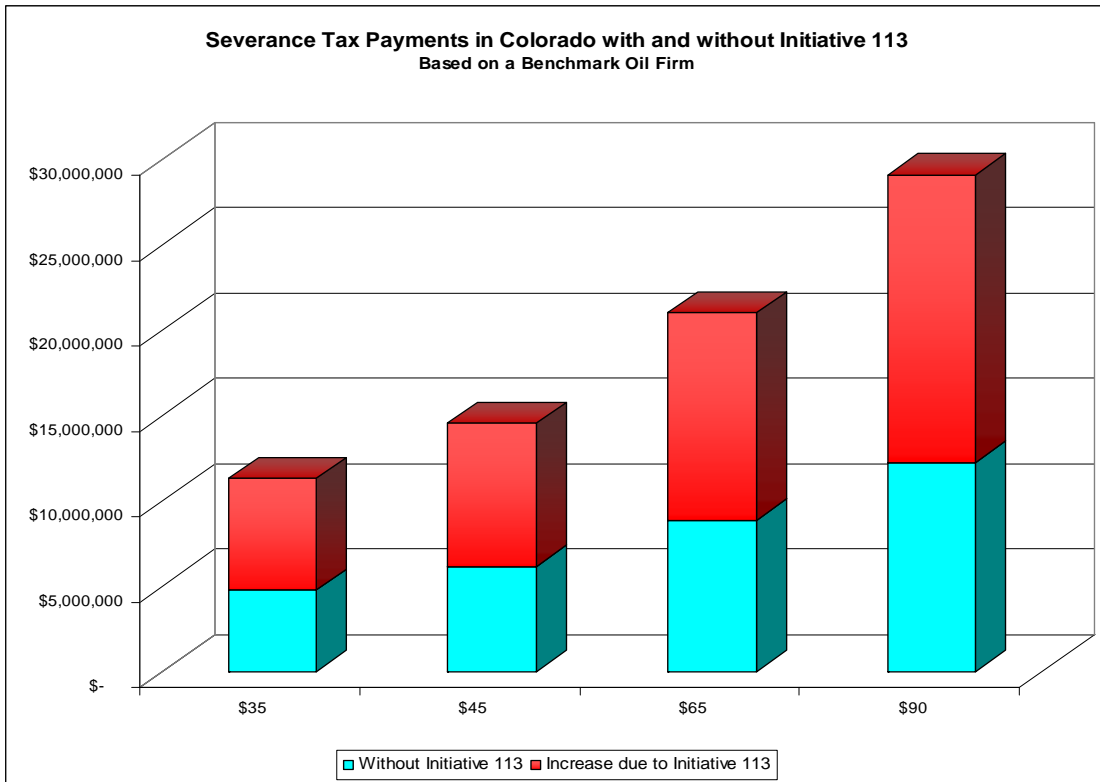
The following table shows the tax liability for all gas producing wells.

Additional tax liability from gas production

Gas Price	\$4.0	\$6.0	\$7.5	\$9.0
60,000-72,000 cf/day	\$3,493,464	\$6,986,928	\$ 8,733,660	\$10,480,392
72,000-90,000 cf/day	\$4,678,104	\$9,356,208	\$ 11,695,260	\$14,034,312
Total	\$8,171,568	\$16,343,136	\$ 20,428,920	\$24,514,704

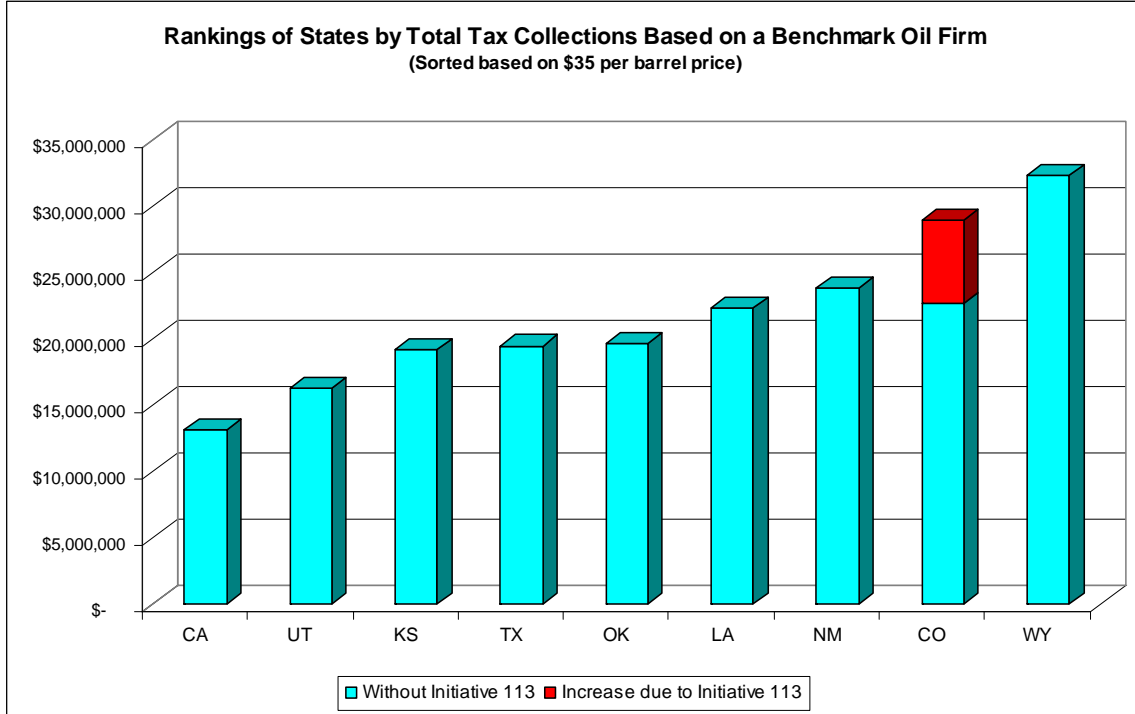
Thus, depending on the price of gas, the new provisions of the severance tax statute will produce additional revenues ranging from \$8.2 to \$24.5 million dollars. All in all, depending on the prices of oil and natural gas, Initiative 113 is likely to create new direct tax liabilities on stripper wells that range from \$9.9 to \$29.6 million dollars per year.

On the other hand, under current statutes, severance taxes of up to 5% of oil and gas sales at the wellhead are imposed but a tax credit for a portion of property taxes is granted. Property taxes above 5.7% completely offset the severance tax obligations so the net result is more or less a 1% tax rate on gross production. In fact, only 5 of the 30 oil and gas producing counties in Colorado have property taxes below 5.7% so state severance taxes are effectively only paid in those counties.⁵⁰ By eliminating this offset, the proposed Ballot Initiative would increase severance tax obligations from their current level to 4.5%.

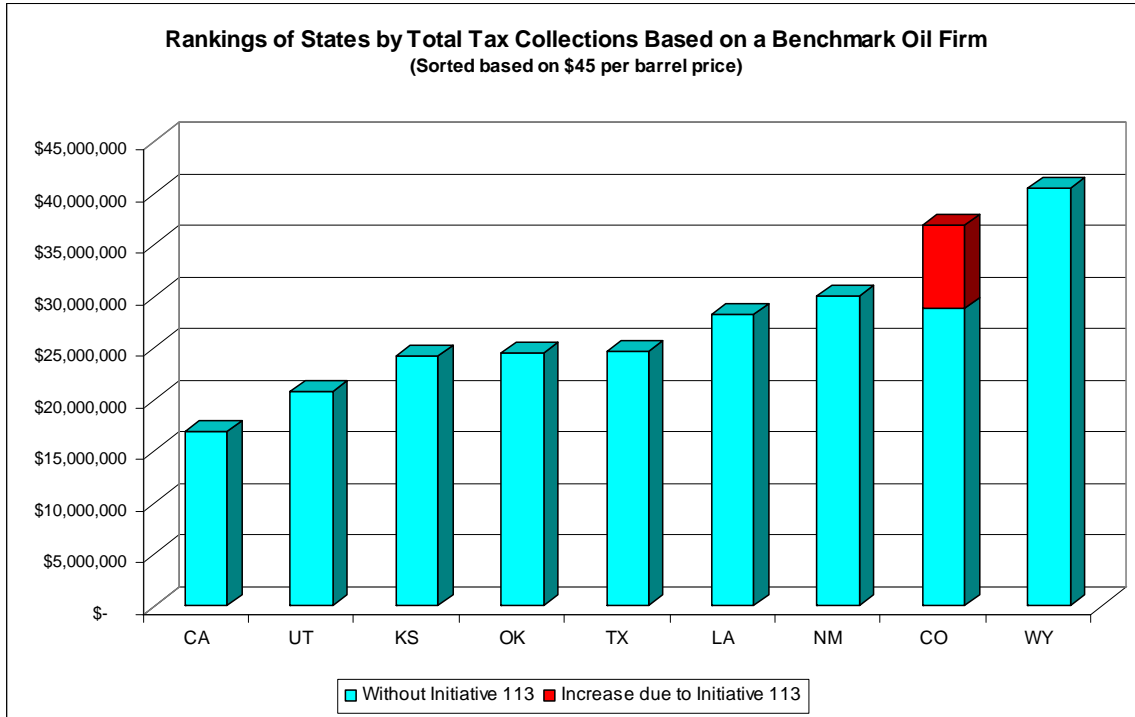


⁵⁰ State incentives to maximize oil and gas recovery, IOGCC, 2007, <http://www.iogcc.state.ok.us/PDFS/2007-Marginal-Well-Report.pdf>.

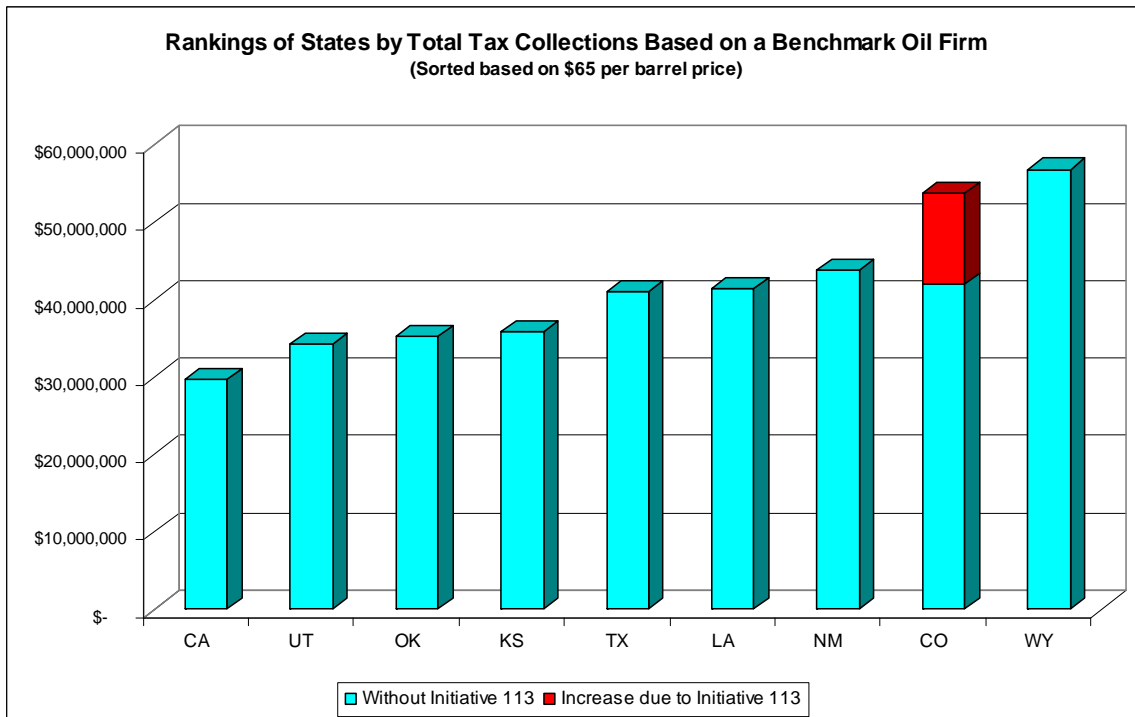
By so doing, the tax burden on oil firms in Colorado would increase significantly. At a price of oil of \$35 per barrel, total tax collections on oil firms would become the second highest among the states considered, instead of the third without Initiative 113.



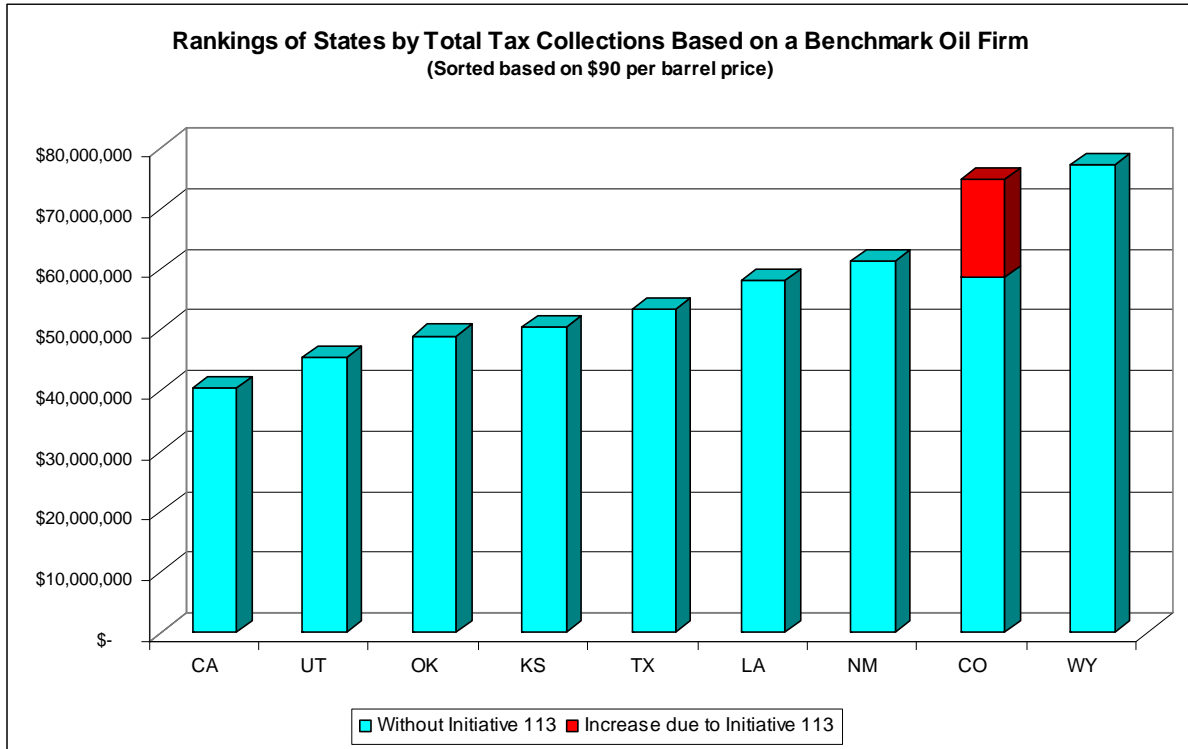
At a price of oil of \$45 per barrel, total tax collections on oil firms in Colorado would become the second highest among the states considered.



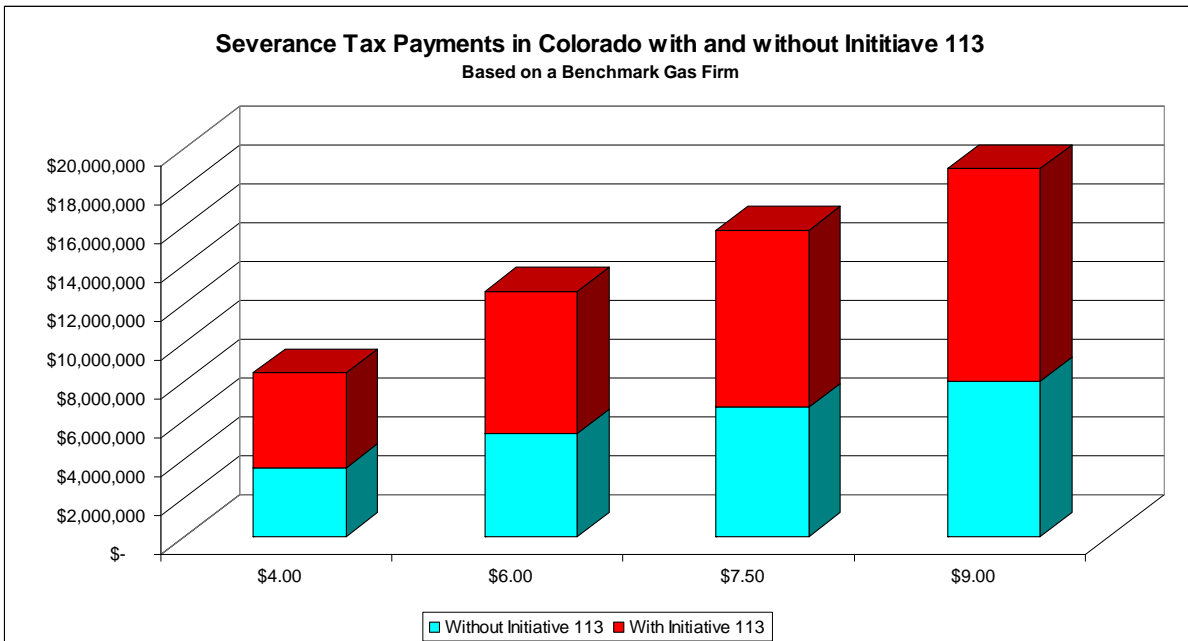
At a price of oil of \$65 per barrel, total tax collections on oil firms in Colorado would become the second highest among the states considered.

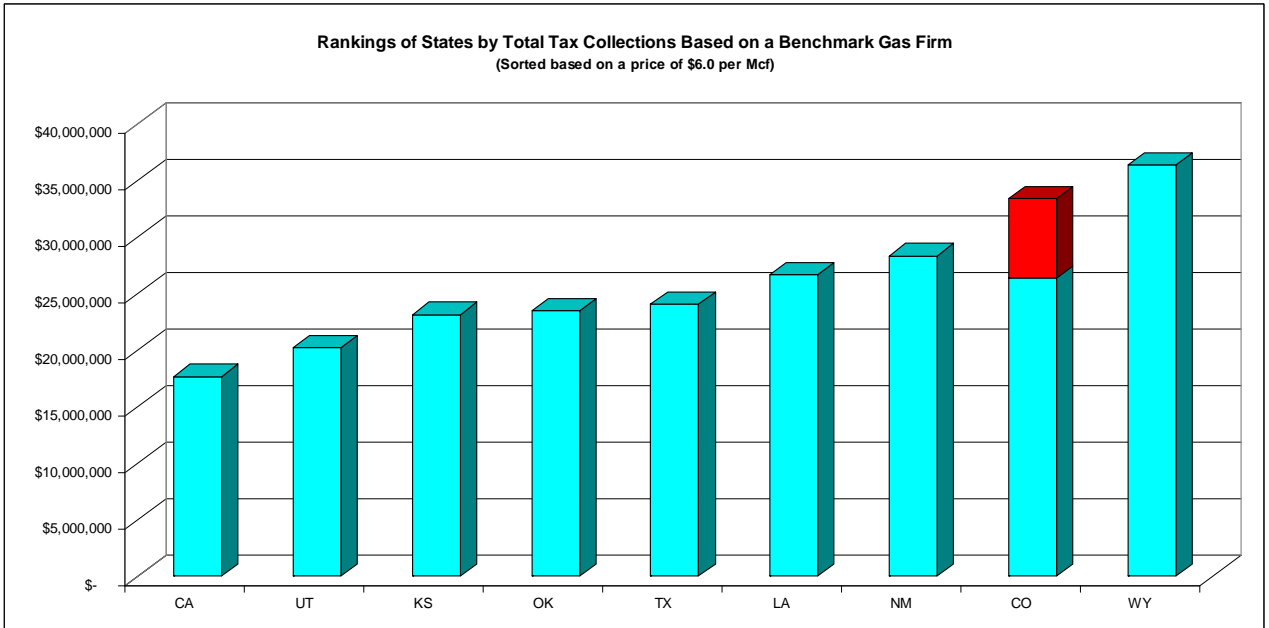
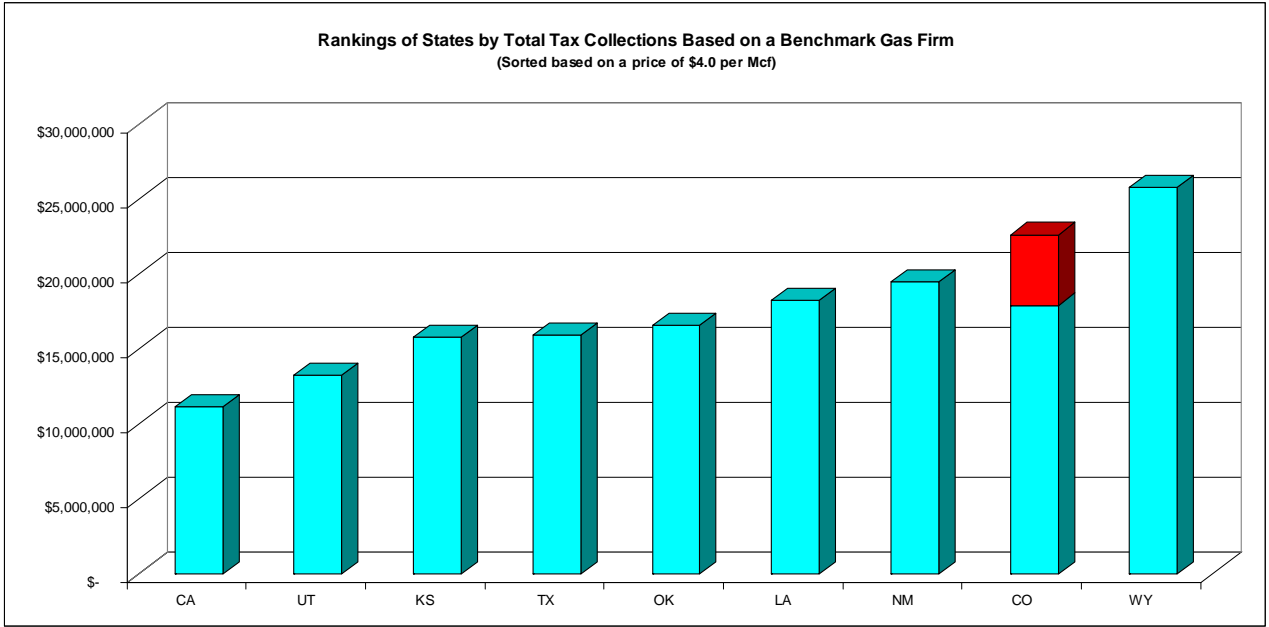


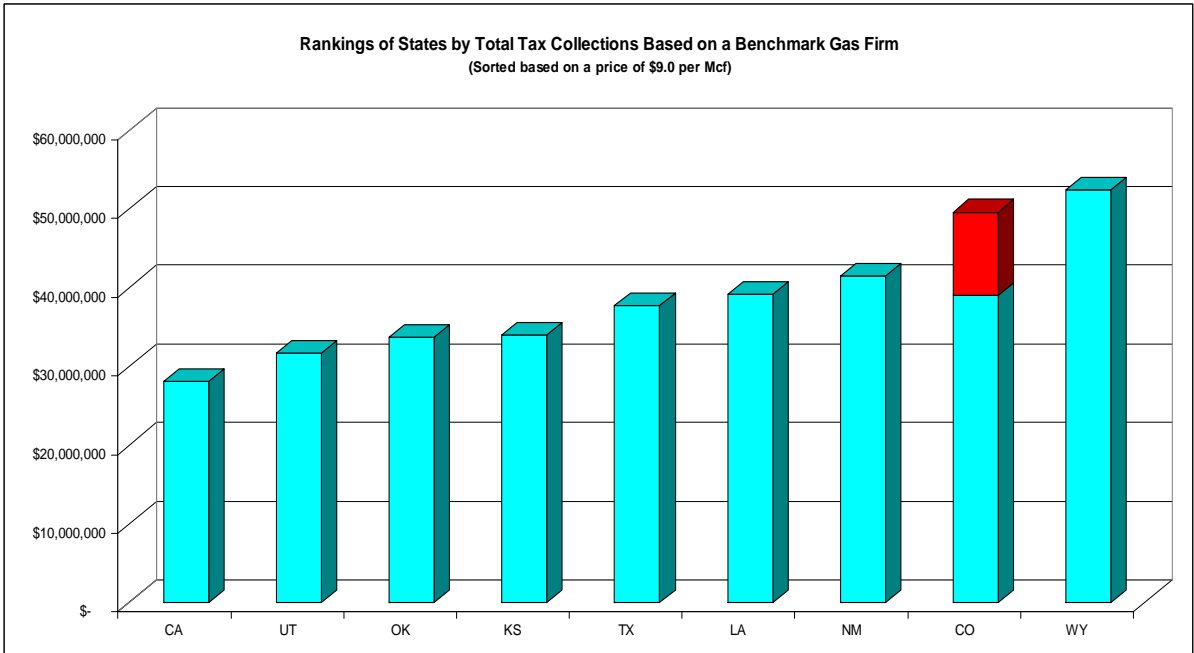
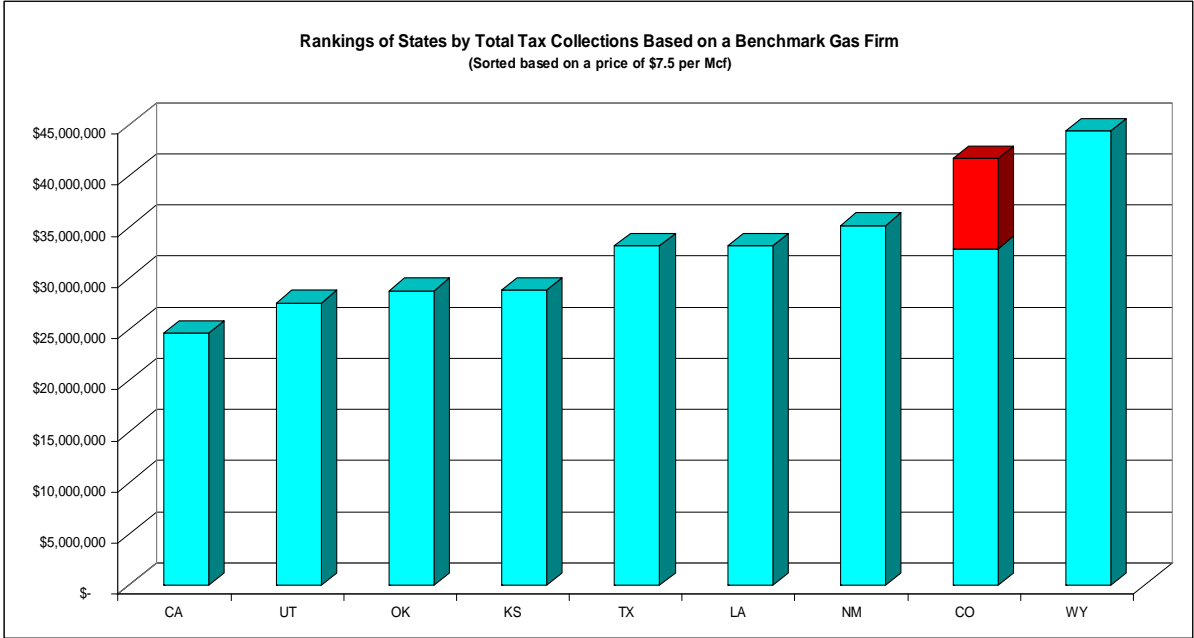
At a price of oil of \$90 per barrel, total tax collections on oil firms would become the second highest among the states considered.



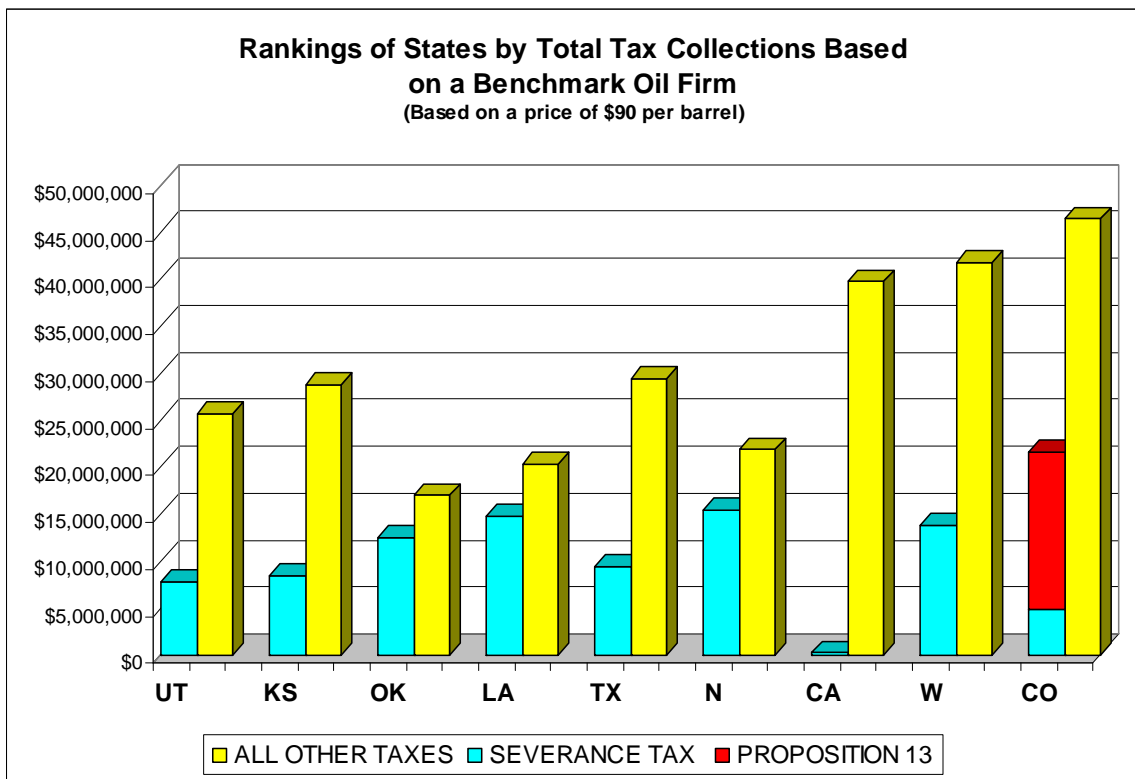
The exact same result is applicable to gas firms.



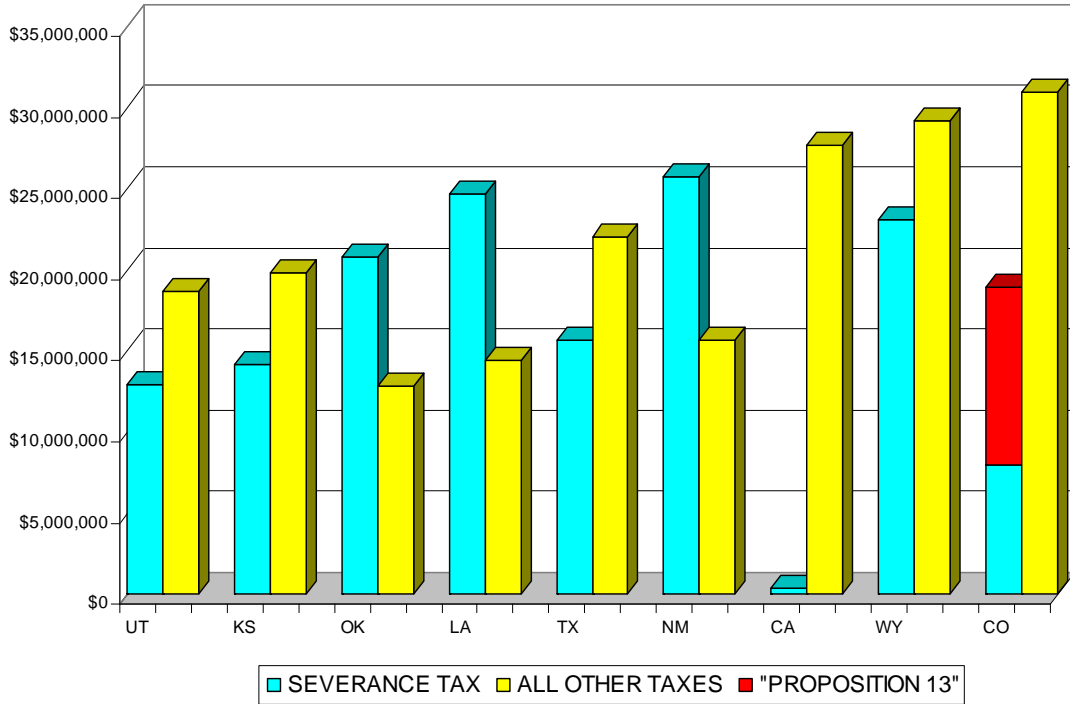




Louisiana and New Mexico, the states with the highest severance taxes, have the lowest tax burden from other taxes –except for Oklahoma. On the contrary, states –like California, with low severance taxes have a high tax burden from other taxes. Currently Colorado has the highest tax burden from taxes other than the severance tax. Correspondingly its tax burden from severance taxes is the second lowest. Proposition 113 would make the severance tax in Colorado the fifth highest among the states included in this study.



**Rankings of States by Total Tax Collections Based
on a Benchmark Gas Firm
(Based on a price of \$9.0 per Mcf)**



VI. Conclusions

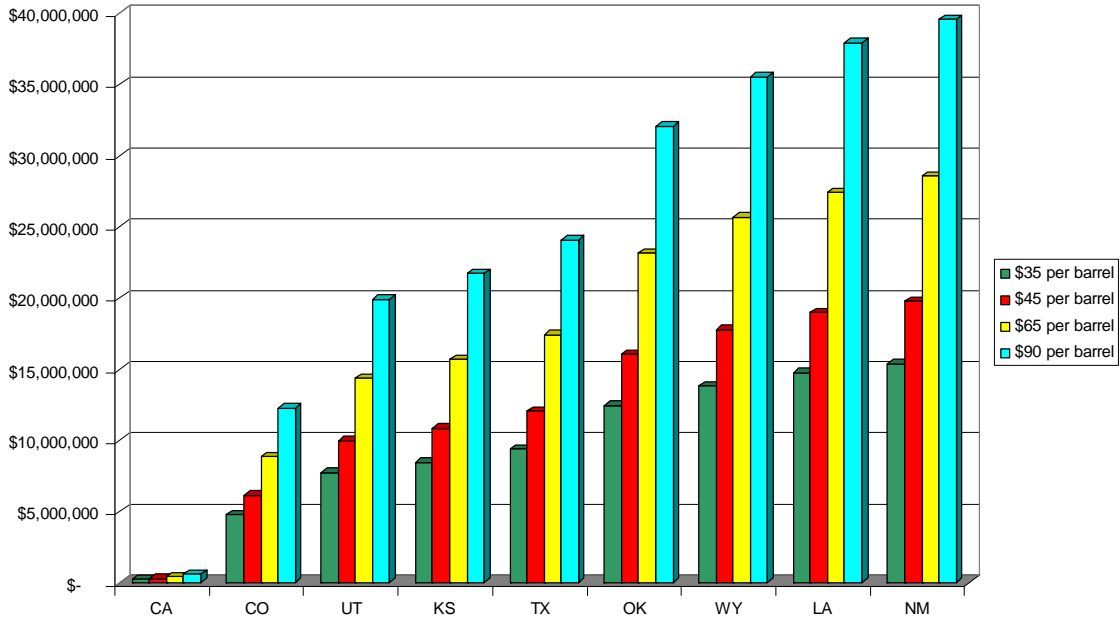
Comparisons of tax burdens on oil and gas producers across states are complicated by the multiplicity of tax portfolios and the fact that taxes are unequally responsive to price changes. Furthermore, the volatility of tax receipts differs across states because each state combines tax regimes differently. In some states, existing tax provisions provide disproportionate increases in tax revenues when oil and gas prices rise for two reasons:

- ❑ Price changes impact the estimated value of reserves more than proportionately because they modify both the value of current production and the expected value of future production; and because
- ❑ Corporate income tax collections rise faster than revenues since costs do not grow as fast as prices.

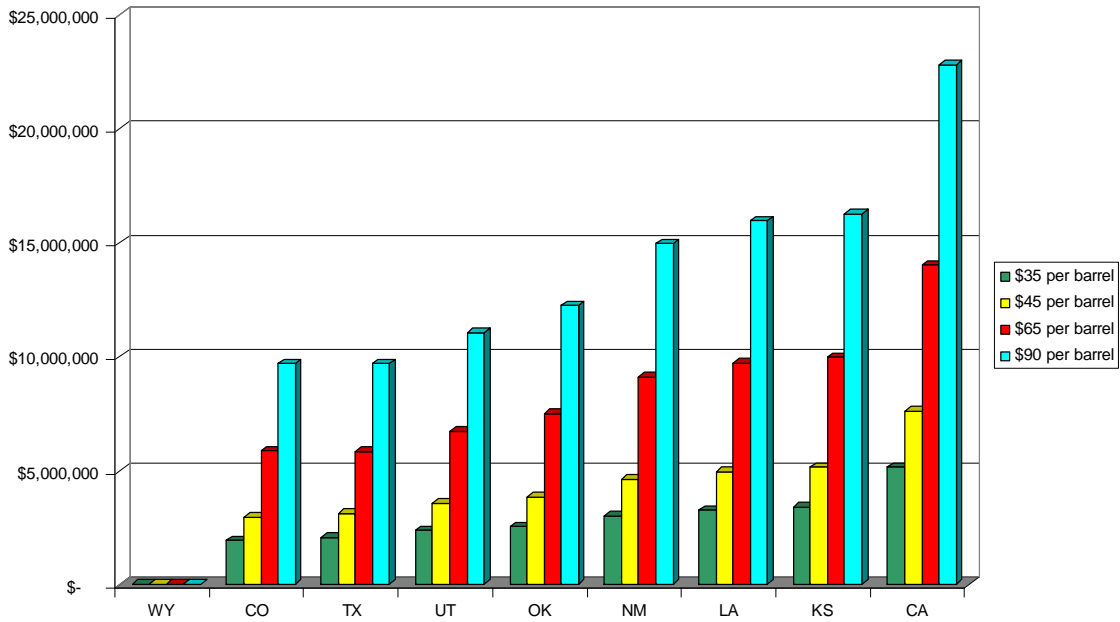
- States with high severance taxes have low tax burdens from other taxes and, conversely, states with high tax burdens from other taxes pay low severance taxes. Currently Colorado has the highest tax burden from taxes other than the severance tax. Correspondingly its tax burden from severance taxes is the second lowest. Proposition 113 would make the severance tax in Colorado the fifth highest among the states included in this study.

As a result, a comparison of total tax burdens depends directly on the assumed level of prices for oil and natural gas. For example, while at an oil price of \$35 per barrel, Colorado has a lower tax burden than New Mexico and Oklahoma, at higher prices the opposite is true.

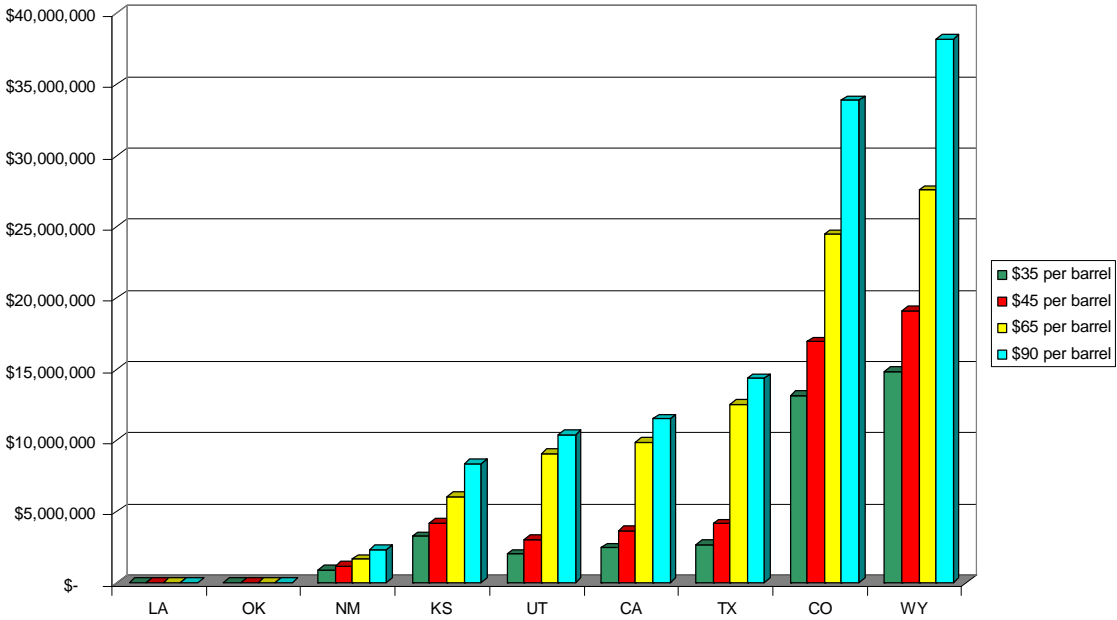
**Chart 1: Rankings of States by Severance Tax Collections
Based on a Benchmark Oil Firm**



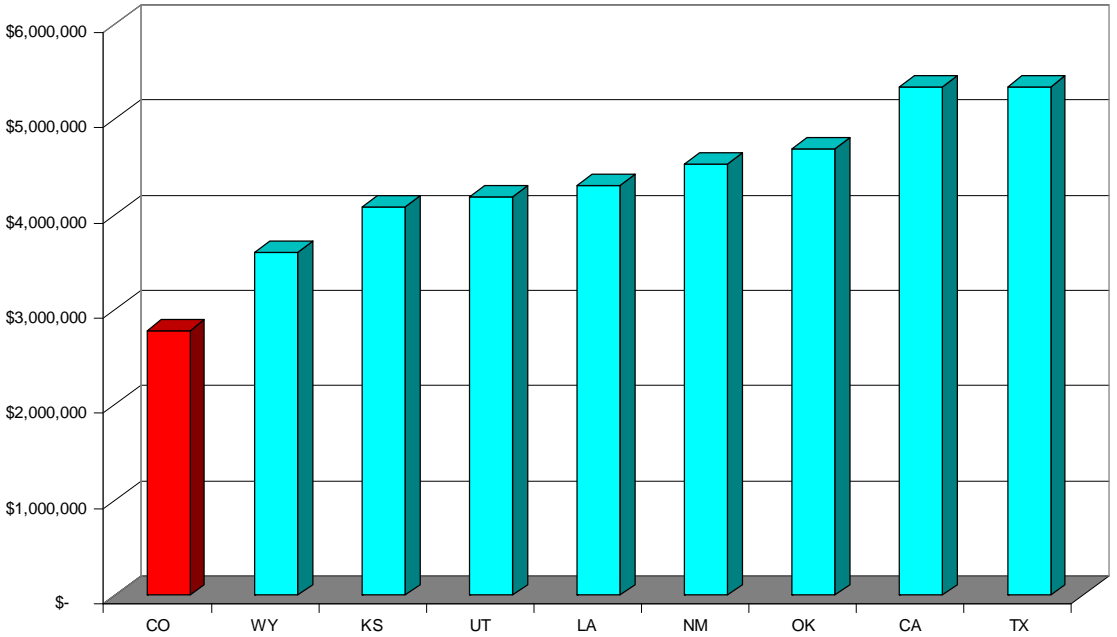
**Chart 2: Rankings of States by Corporate Income Tax Collections
Based on a Benchmark Oil Firm**



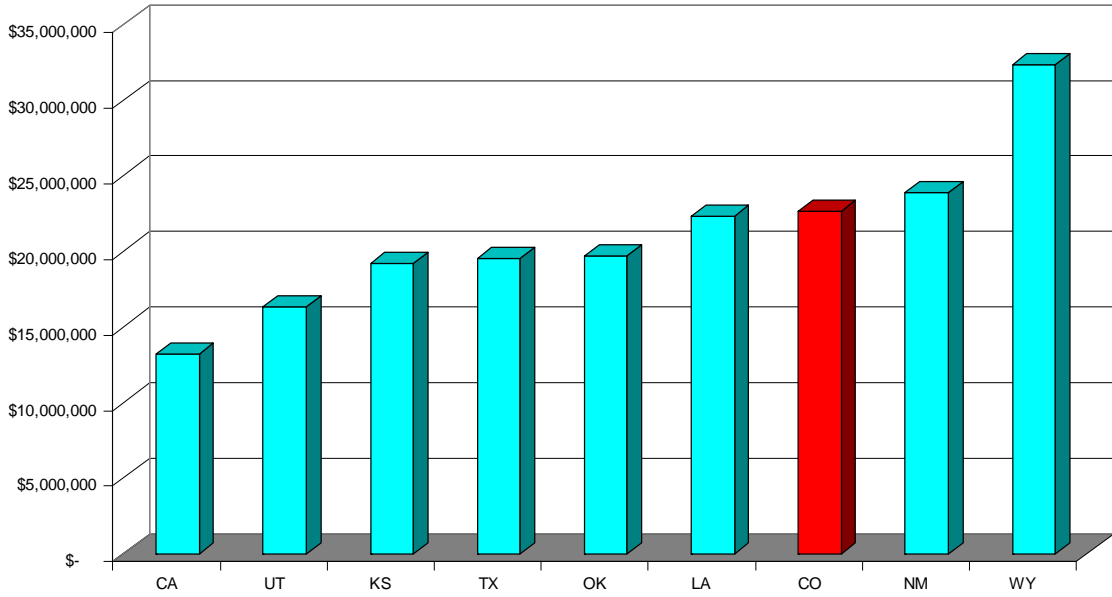
**Chart 3: Rankings of States by Property Tax Collections
Based on a Benchmark Oil Firm**



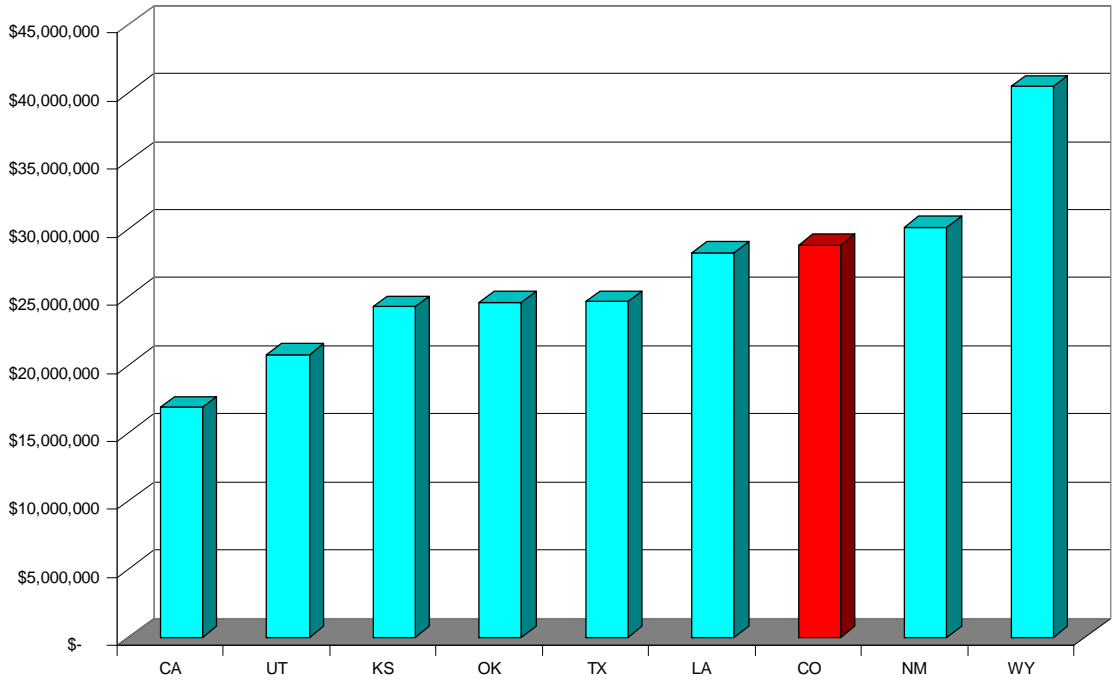
**Chart 4: Rankings of States by Sales Tax Collections
Based on a Benchmark Oil Firm**



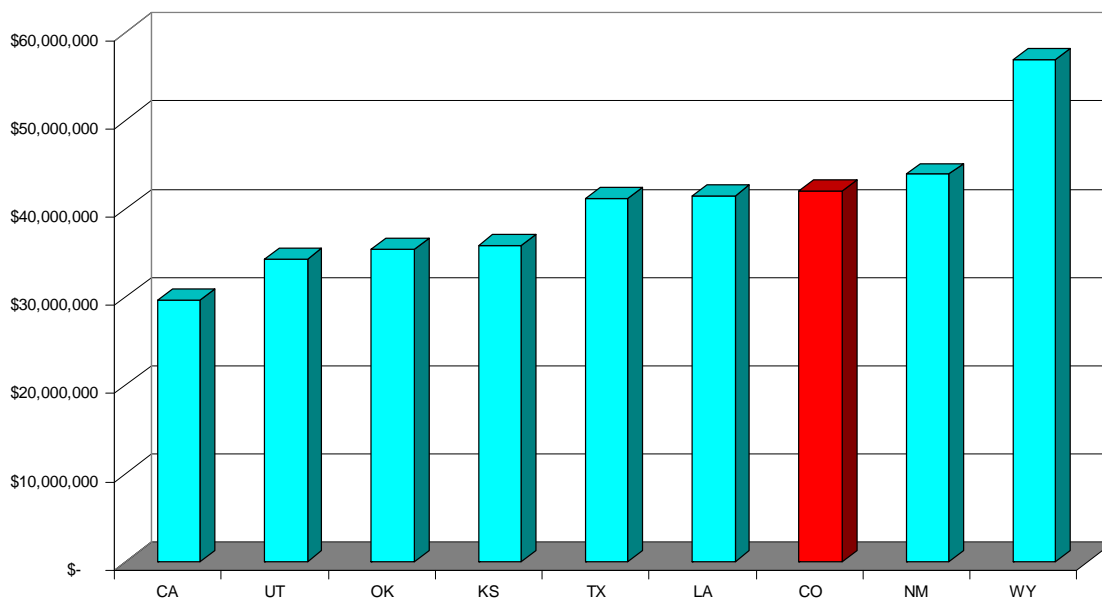
**Chart 5A: Rankings of States by Total Tax Collections
Based on a Benchmark Oil Firm
(Sorted based on \$35 per barrel price)**



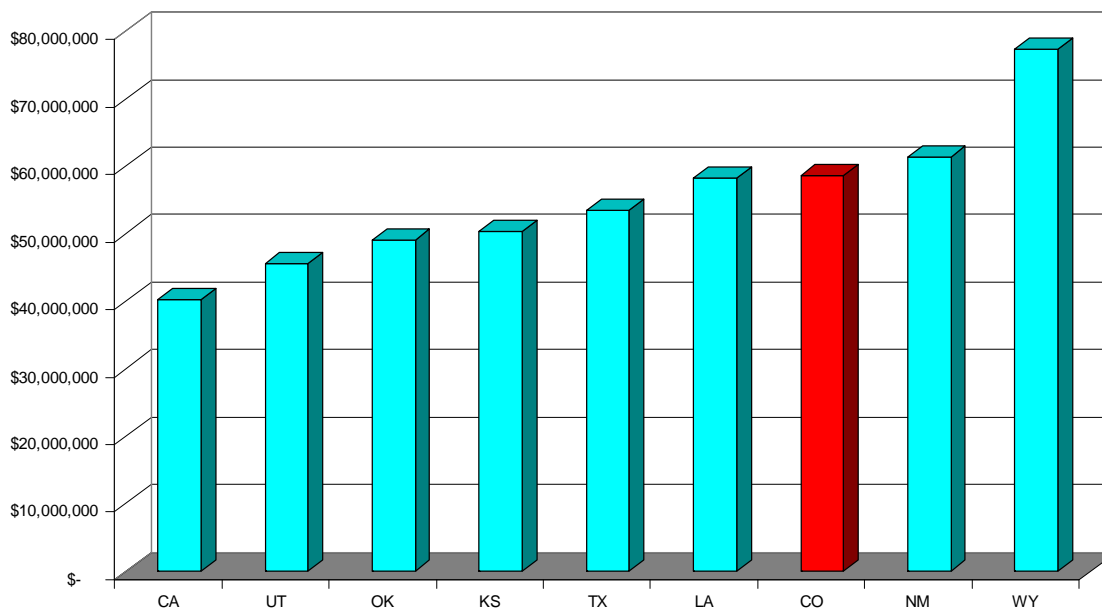
**Chart 5B: Rankings of States by Total Tax Collections
Based on a Benchmark Oil Firm
(Sorted based on \$45 per barrel price)**



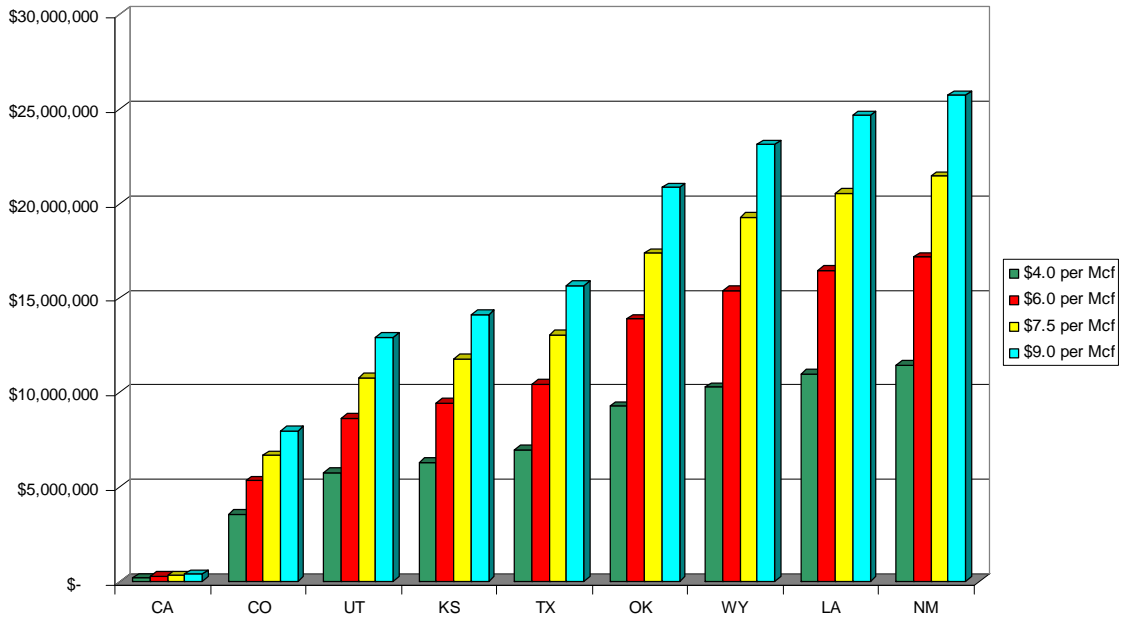
**Chart 5C: Rankings of States by Total Tax Collections
Based on a Benchmark Oil Firm
(Sorted based on \$65 per barrel price)**



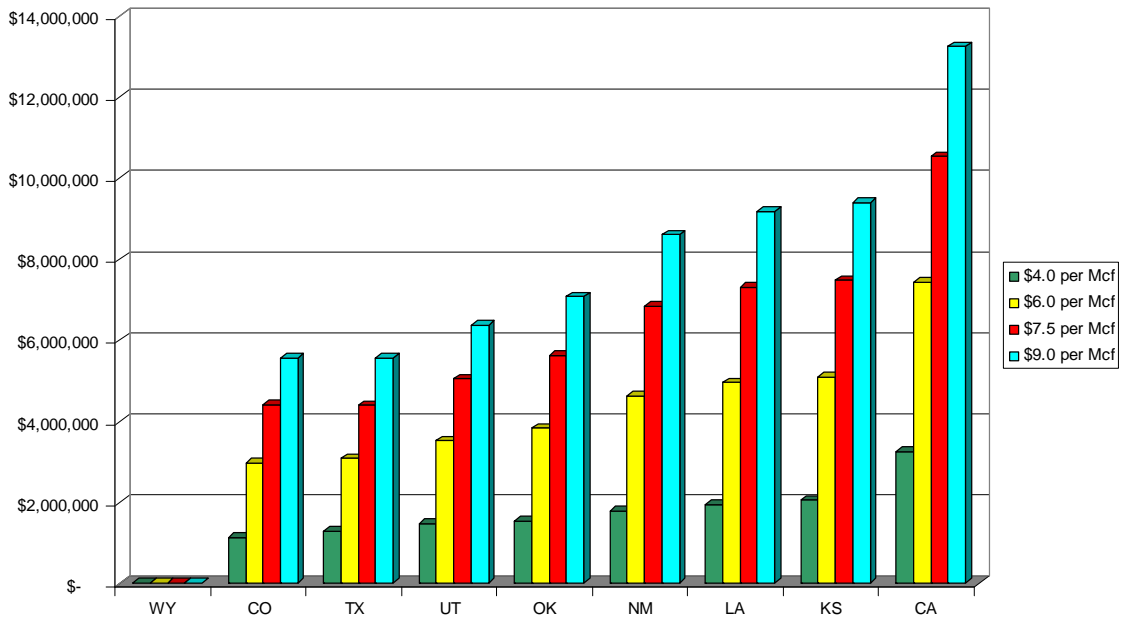
**Chart 5D: Rankings of States by Total Tax Collections
Based on a Benchmark Oil Firm
(Sorted based on \$90 per barrel price)**



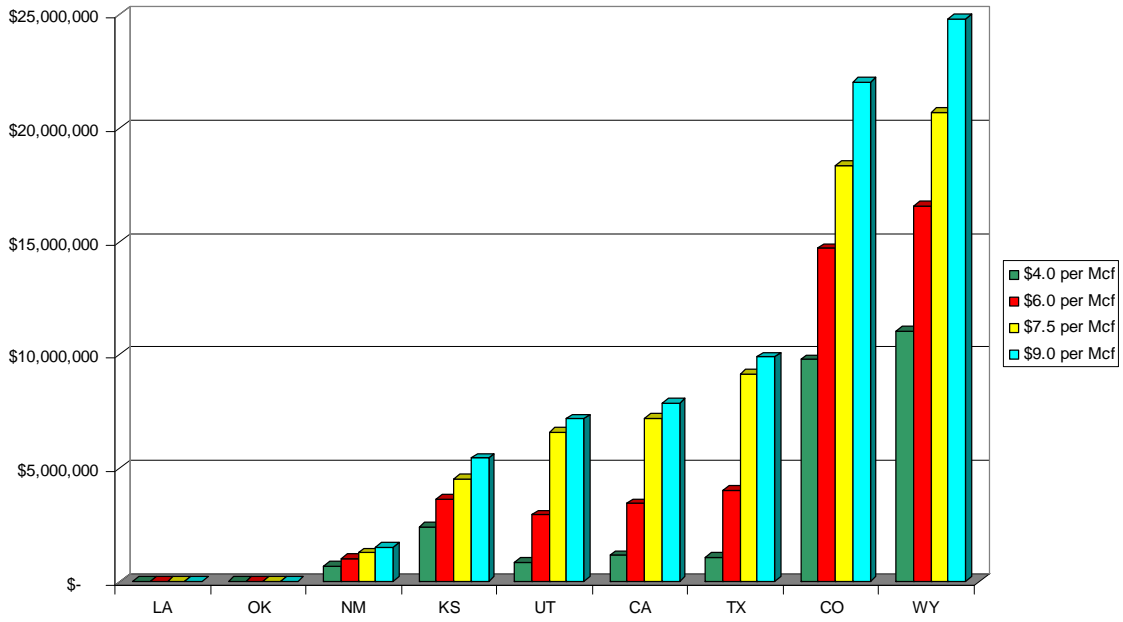
**Chart 6: Rankings of States by Severance Tax Collections
Based on a Benchmark Gas Firm**



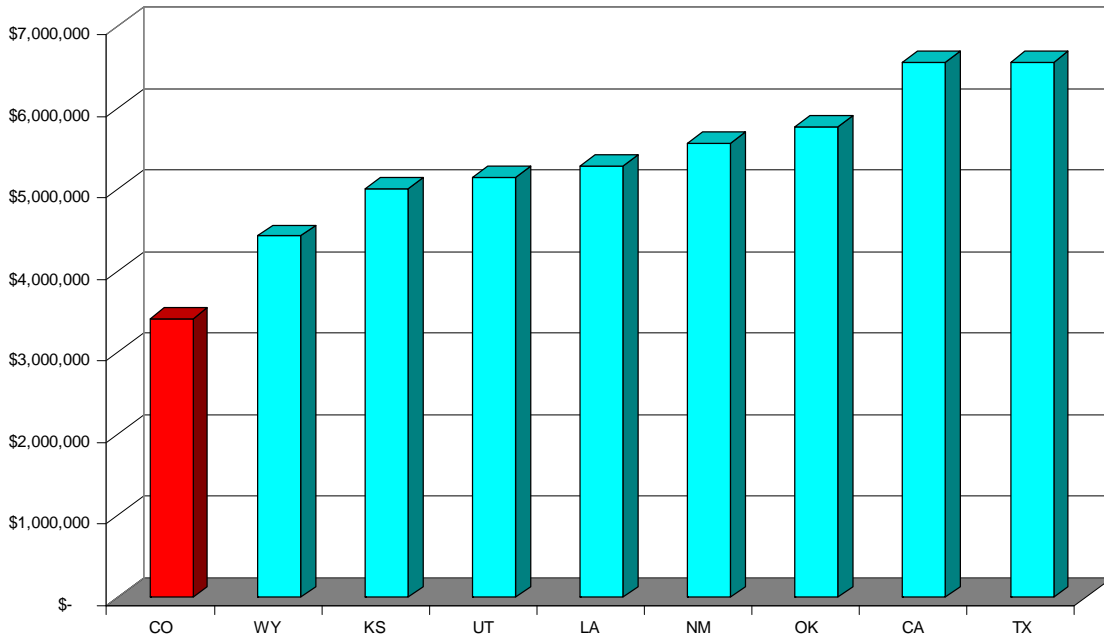
**Chart 7: Rankings of States by Corporate Income Tax Collections
Based on a Benchmark Gas Firm**



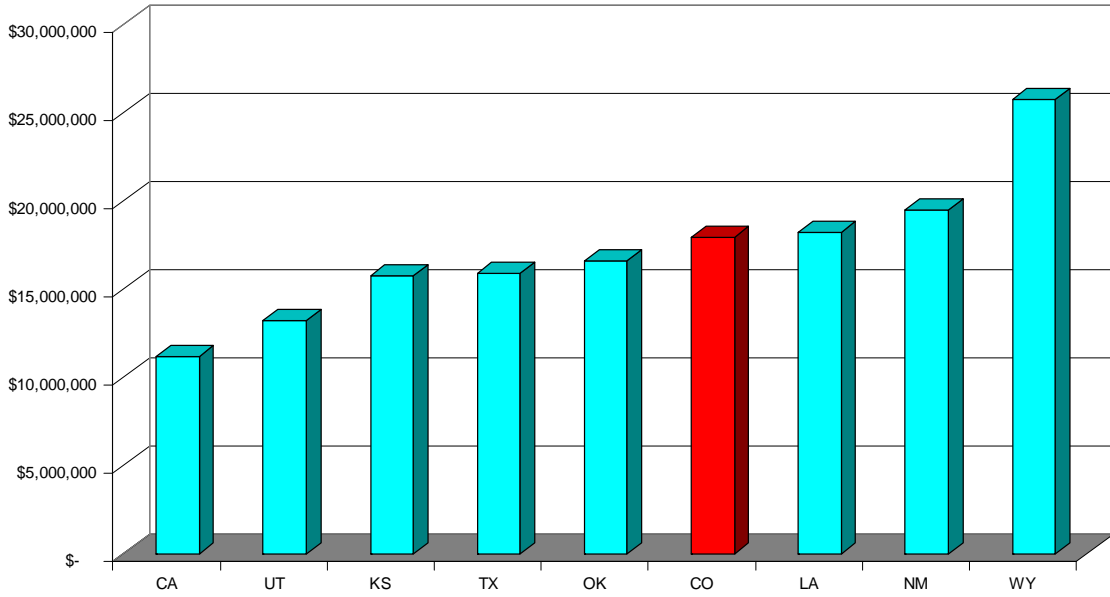
**Chart 8: Rankings of States by Property Tax Collections
Based on a Benchmark Gas Firm**



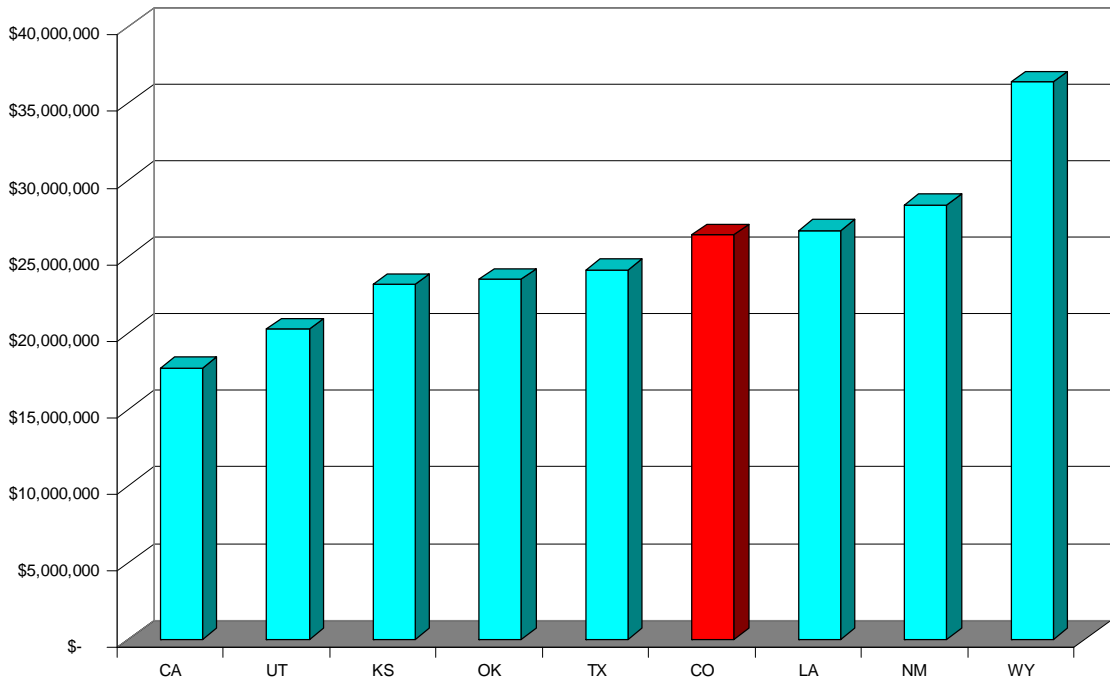
**Chart 9: Rankings of States by Sales Tax Collections
Based on a Benchmark Gas Firm**



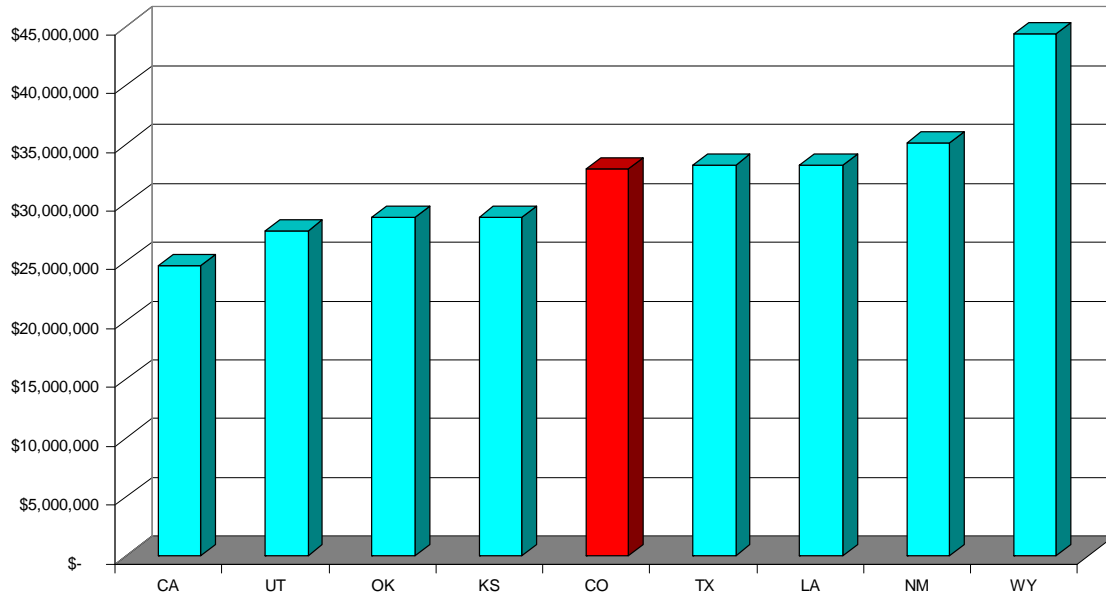
**Chart 10A: Rankings of States by Total Tax Collections
Based on a Benchmark Gas Firm
(Sorted based on a price of \$4.0 per Mcf)**



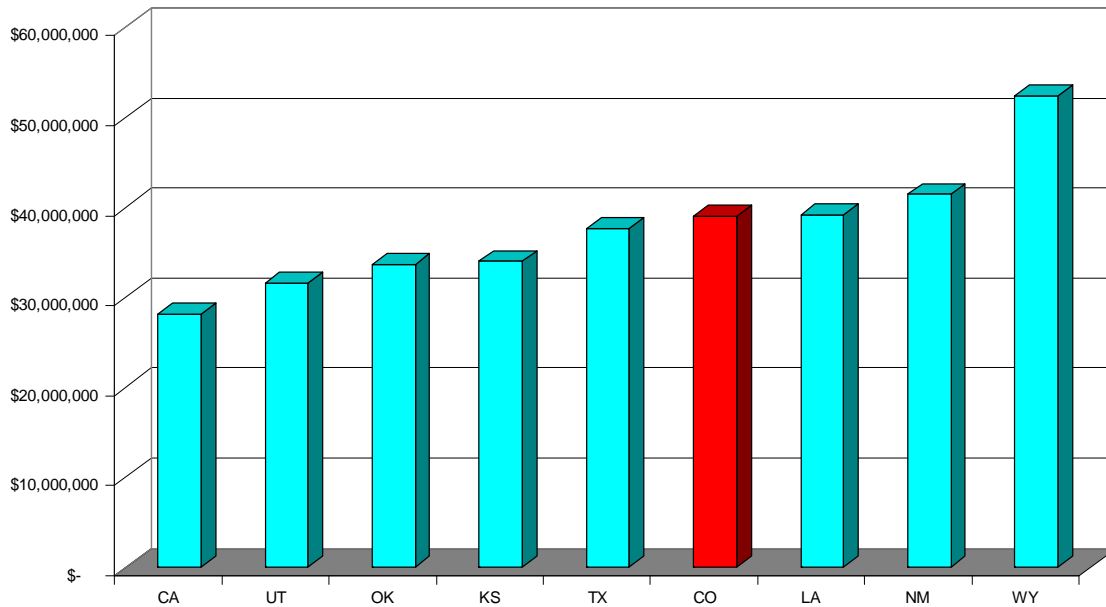
**Chart 10B: Rankings of States by Total Tax Collections
Based on a Benchmark Gas Firm
(Sorted based on a price of \$6.0 per Mcf)**



**Chart 10C: Rankings of States by Total Tax Collections
Based on a Benchmark Gas Firm
(Sorted based on a price of \$7.5 per Mcf)**



**Chart 10D: Rankings of States by Total Tax Collections
Based on a Benchmark Gas Firm
(Sorted based on a price of \$9.0 per Mcf)**



APPENDIX: TAX RATES USED IN THE ANALYSIS

	CA	CO	KS	LA	NM	OK	TX	UT	WY
Corporate Income Tax	7.40%	3.53%	5.60%	5.65%	5.38%	4.25%	3.44%	3.81%	0.00%
Property Tax	1.10%	5.24%	1.15%	-	0.72%	-	1.50%	1.04%	5.90%
Sales Tax	8.25%	4.30%	6.30%	6.65%	7.00%	7.25%	8.25%	6.47%	5.57%
Severance tax	0.09%	1.90%	3.36%	5.86%	6.12%	4.96%	3.72%	3.07%	5.49%